Revisiting Population Taxonomy: Using A Social Equity Framework to Analyze Health Disparities Among Obese Black American Ethnic Subgroups

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by

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DEDICATION

This dissertation is dedicated in memory of my grandmother, Daisy Adams.

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ABSTRACT

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Celia S. Gabrel

The United States (US) is becoming increasingly racially and ethnically diverse primarily due to the surge of immigrants from around the world. These immigrants have differing cultures, religions, and values, which can impact their interaction with the healthcare, housing, education, and other sectors. Yet the current US government official policy for classifying race and ethnicity does not capture the diversity in the population, which has implications for the instruments utilized for monitoring in national and other surveys. The accurate assessment and classification of race and ethnicity is vital for public officials since policy implementation, developing regulations, as well as the management and assessment of results against goals require timely and accurate data. These public administration functions are impeded when the data lack precision or fail to make meaningful distinctions among groups for whom the consequences may differ.

This study examines whether the current federal policy for classifying race/ethnicity or the routinely used taxonomies for race/ethnicity in national health surveys capture the diversity in the US population. To demonstrate the importance of assessing the diversity in the US population, this study also examines the heterogeneity in one of the racial categories, the Black population, by utilizing secondary data from a nationally representative survey to investigate differences in health, health care access and utilization. Specifically, it utilized a social equity framework to assess the differences in health, health care access and utilization among obese persons within three of the largest Black American subpopulations (US-born Blacks, African-born Blacks, and West Indian-born Blacks) and Whites.

The results show that the current federal policy, "*The Standards for the Classification of Federal Data on Race and Ethnicity (Statistical Policy Directive No. 15)*" requires federal agencies and programs to record, collect, and present data on race and ethnicity using one ethnicity (Hispanic or Latino) and five racial categories (American Indian or Alaska Native,

Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White). These categorizations however, fail to address the diversity in the US population and most national health survey instruments only collect information on this minimum requirement. Of the five national surveys reviewed only one, the National Health Interview Survey (NHIS), collected detailed information that can be used to decipher the diversity in the population.

The findings from an analysis of the NHIS indicate that differences in health, health care access and utilization exists, and it varies between and within the Black ethnic subgroups and Whites. These findings present several implications and opportunities for public administrators. The analysis highlighted subgroup heterogeneity within the growing Black American population and as this population continues to grow; understanding and tracking this heterogeneity will become more important to ensure that our policy and administrative institutions operate more effectively to meet the needs of this population.

There is a need to standardize the classification of race and ethnicity in the US to capture information on the diversity in the population. This may be accomplished by expanding the established standards by providing a comprehensive list of categories that include national origin/ancestry ethnicity categories. This expanded categorization would allow government and other officials to accurately assess the population and develop and monitor policies geared towards addressing health and other disparities or inequities.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADLs	Activities of Daily Living
AOA	American Obesity Association
BMI	Body Mass Index
BRFSS	Behavioral Risk Factor Surveillance System
CAPI	Computer-Assisted Personal Interviewing
CDC	Centers for Disease Control and Prevention
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CMS	Centers for Medicare and Medicaid Services
CPS	Current Population Survey
DF	Degree of Freedom
ERIC	Education Research Index Catalog
HCC	Health Care for Community
IADLs	Instrumental Activities of Daily Living
ICMA	International City/County Management Association
IRB	Institutional Review Board
JSTOR	Journal Storage
MEPS	Medical Expenditure Panel Survey
NAMCS	National Ambulatory Medical Care Survey
NAPA	National Academy of Public Administration
NHAMCS	National Hospital Ambulatory Medical Care Survey
NHANES	National Health and Nutrition Examination Survey
NHIS	National Health Interview Survey
NHLBI	National Heart, Lung, and Blood Institute
NIH	National Institutes of Health
NLC	National League of Cities
NSHC	National Survey of Children's Health
OECD	Organization for Economic Co-operation and Development
PAIS	Public Affairs Information Service
SE	Standard error
SIPP	Survey of Income and Program Participation
SPSS	Statistical Package for the Social Sciences
SUDAAN	Survey Data Analysis Program
UN	United Nations
US	United States
USDA	US Department of Agriculture
WHO	World Health Organization
YLL	Years of Life Lost

CHAPTER ONE - INTRODUCTION

> "*Equity in health is not about eliminating all health differences so that everyone has the same level of health, but rather to reduce or eliminate those [differences] which result from factors which are considered to be both avoidable and unfair. Equity is therefore concerned with creating equal opportunities for health and with bringing differentials down to the lowest levels possible."* (Whitehead 1990, 7)

A. Problem Statement

The primary aim of this research is to demonstrate the importance of utilizing the appropriate racial and ethnic taxonomy in data collection instruments used to monitor the Nation's health. This will be accomplished by reviewing the current policy governing the collection and reporting of data on race and ethnicity as well as several national data sources utilized to monitor the Nation's health. Using a social equity framework, this study also examines a major health issue affecting one of the racial and ethnic populations. Specifically, this study examines whether differences in health, health care access and utilization exist among obese Black American ethnic subgroups (US-born Blacks, African-born Blacks, and West Indian-born Blacks) in the US. If differences do exist, what are the implications and how might they be addressed? The analysis is from the perspective of public administration and the implications concern priorities for public administrators.

The advent of immigration has led to increase diversity in the world. In 2005, 191 million people (3 percent of the world's population) lived in a country other than the one in which they were born, with one third having moved from a developing country to one that is developed, one third moving from one developing country to another, and the final third moved within the developed world. Of the 228 countries and areas in the United Nations' (UN) compilation of migration statistics, the US led the world as a host country, with 38 million migrants, almost 13 percent of the population (United Nations 2006).

The population of the US is now comprised of multi-ethnic individuals from various countries, cultures, and languages. However, inadequate attention has been given to this variation within the population and this diversity poses challenges for policy makers, health and other service providers, and researchers who require information on race and ethnicity to understand if policies are achieving their intended outcomes. This diversification also highly impacts the health care system where ethnicity may have an indirect effect on health outcomes by influencing health beliefs and the way the health care system is accessed (Williams and Jackson 2000). One of these health issues is obesity which has become a worldwide epidemic.

According to the World Health Organization (WHO), obesity has become a global epidemic affecting almost 400 million adults worldwide, and is projected to affect more than 700 million by the year 2015 (2006). This epidemic is not only affecting developed nations, but is also widespread in developing countries with levels ranging from "less than 5 percent in certain African nations, China, and Japan, to over 75 percent in urban Samoa" (World Health Organization 2003). Among developed countries, the US has the highest prevalence of obesity in the Organization for Economic Co-operation and Development (OECD) nations, with adult rates exceeding 30 percent compared to 20 percent in the United Kingdom and Canada, and just under 10 percent in France (Organization for Economic Co-operation and Development 2006).

Obesity has become a significant health issue in the US, where more than 66 percent of adults and 17 percent of children and adolescents are overweight or obese, with at least one-third of the adult population being obese (Ogden et al. 2006). The cause of obesity has been linked to many factors including genetics, behavioral, environmental, and cultural (US

Department of Health and Human Services 2001). However, researchers posit that obesity is more than likely due to environmental and other factors than genetics. According to the National Institutes of Diabetes and Digestive and Kidney Disease (2008) "Obesity tends to run in families, suggesting a genetic cause. However, families also share diet and lifestyle habits that may contribute to obesity. Separating genetic from other influences on obesity is often difficult." Obesity has also been identified as a risk factor for several chronic diseases including hypertension, type 2 diabetes, heart disease and some cancers (Burton et al. 1985). But until the past few years, obesity was not classified as an illness by governmental policies (Medicare) and most private insurance excluded the condition (Lyles 2004). In 2004, the Centers for Medicare and Medicaid Services (CMS) revised its coverage policy manual to consider obesity an illness. This allowed obese Medicare beneficiaries to receive treatment for obesity, rather than treatments for specific obesity-related conditions (Centers for Medicare and Medicaid Services 2004; Mann et al. 2007).

Because of the high prevalence of overweight and obesity and the associated risk for other adverse health conditions, the US federal government (US Department of Health and Human Services 1980) has included reducing the prevalence of overweight and obesity as a national priority since 1980, as outlined in the Healthy People publication. Healthy People is a set of health objectives for the Nation to achieve over a 10 year period and is designed to create measures to improve the health of the US population. The plan is developed by a consortium of health professionals from various federal, state, local, and private organizations. In Healthy People 2000, (US Department of Health and Human Services 1990) the objective was reducing the rate of overweight in adults and adolescents. Due to the increased prevalence of the obesity epidemic however, by Healthy People 2010 (US

Department of Health and Human Services 2000), another age group (children) was added to the objective; changing it to reducing overweight and obesity in adults, adolescents, and children. The target of the Healthy People 2010 obesity objective for adults is to reduce the proportion of obesity to 15 percent. However recent data from the National Health and Nutritional Examination Survey (NHANES) suggests an increase in the proportion of obese adults from 23 percent in the baseline year (1984-1994) to 32.2 percent in 2003-2004 (Ogden et al. 2006).

The increasing prevalence of obesity is not only a concern for the federal government, but state and local governments have also prioritized obesity because of the growing numbers in their populations. Most states are attempting to address their obesity problem and some have done so by introducing legislation to combat it. Researchers from the University of Baltimore (Cotten, Stanton and Acs 2006), in the latest version of the UB Obesity Report Card identified eight different types of legislation that have been introduced or passed to control obesity at the state level, which includes: 1) nutrition standards, 2) vending machine usage, 3) body mass index measured in school, 4) recess and physical education, 5) obesity programs and education, 6) obesity research, 7) obesity treatment in health insurance, and 8) obesity commissions.

Despite these measures being instituted by states, the proportion of obese individuals is still increasing. Data from the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS), a state-based surveillance system, indicated that between 1995 and 2005 the number of states reporting an obesity rate of less than 20 percent decreased from 50 states in 1995, to 28 in 2000, to only four in 2005 (Centers for Disease Control and Prevention 2006). Both national- and state-level data indicate that

the prevalence of obesity among adults continue to increase, especially among minority racial/ethnic populations (Ogden et al. 2006; Centers for Disease Control and Prevention 2006). The greatest obesity prevalence in 2003-2004 was seen among Hispanics and non-Hispanic Blacks, with non-Hispanic Black women having the highest rate of 50.3 to 57.5 (Table 1).

Obesity is not the only disease for which the Black population has the highest prevalence. Compelling evidence indicates that race and ethnicity correlate with persistent, and often increasing, health disparities among subgroups of the US populations in all areas of disease and health (Centers for Disease Control and Prevention 2006). According to Williams and Brayboy-Jackson (2005), racial inequities in health are substantial in the US and Geiger (2006) reported that at no point in the US history has the health status of racial/ethnic minorities equaled or even approximated that of White Americans.

Table 1.
Prevalence of obesity in adults by gender age, and race/ethnic group: United States 2003-2004

	Men (Percent)				***Women (Percent)***			
	All (≥ 20 years)	20-39 years	40-59 years	≥ 60 years	All (≥ 20 years)	20-39 years	40-59 years	≥ 60 years
All	31.1	28.0	34.8	30.4	33.2	28.9	38.8	31.5
Non-Hispanic White	31.1	27.2	35.6	30.6	30.2	23.8	37.8	28.9
Non-Hispanic Black	34.0	32.3	37.6	31.1	53.9	50.3	57.5	54.0
Mexican American	31.6	32.7	31.8	29.5	42.3	35.7	48.3	43.8

Source: Ogden, C.L., M.D. Carroll, L.R. Curtin, M.A. McDowell, C.J. Tabak, and K.M. Flegal. 2006. Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association* 295, no. 13: 1549-55.

Differences in health status, access to health care, and utilization of services exist among racial/ethnic groups. According to James et al. (2007), racial/ethnic minorities reported worse health status than did non-Hispanic Whites. Minorities were less likely to have health insurance or a usual source of care compared to Whites in 2003-2004 (Table 2).

Yet these overall data for the aggregated minority racial/ethnic groups mask disparities within racial/ ethnic subgroups. These and other health disparities among racial/ethnic minorities continue to be a challenge in the US and will require the concerted efforts of many disciplines to reduce its impact. While they are not able to address all the health disparities found in the US, public administrators can play a critical role in helping those at greatest risk for health inequities/disparities by improving data collection, identifying and finding ways to reduce and ultimately eliminate these inequities.

Table 2.
Reported differences in health status, health care access and utilization among racial/ethnic groups, 2003-2004

	Poor or fair health	No health insurance	No usual source of care
Non-Hispanic White	8.0	12.0	14.6
Non-Hispanic Black	14.6	17.3	17.9
Hispanic or Latino	13.3	34.4	30.9
American Indian/Alaska Native	16.5	34.6	20.8
Asian	8.6	16.5	19.2

Source: National Center for Health Statistics. 2006. *Health, United States, 2006 With Chartbook on Trends in the Health of Americans*. 12 December 2006 <http://www.cdc.gov/nchs/data/hus/hus06.pdf>.

B. Background

1. Healthy People 2010 and Health Disparities/Inequities

According to the National Academy of Public Administration (NAPA),

> "The US faces critical issues in the fair, just and equitable formation and implementation of public policy, distribution of public services, and management of the organizations that do the work of the public. While many public programs are delivered equitably there are also: fundamental class, racial, and ethnic differences in access to basic services; differences in the quality of programs provided and services received; systematic differences across racial/ethnic lines in the way people are treated by public officials; and disparities in outcomes for population groups (e.g., by race or income) as a result of differences in social conditions and individual behavior as well as differential distribution, access, and treatment." (2001, 1)

These inequities or inequalities (often referred to as disparities in the US) between populations exist in all nations, and achieving equity is a goal being sought by many countries. In the US, eliminating health disparities among different segments of the population is the second overarching goal of the Healthy People 2010, the Nation's health strategic plan. This includes differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation. To meet this goal, several objectives have been selected across a wide range of health issues (i.e., obesity, cancer, diabetes, and heart diseases) to measure the Nations' progress. One of these objectives is access to quality health services (US Department of Health and Human Services 2000). While these are national objectives, the US does not currently have a national health policy or plan and therefore must rely on the efforts of individual states to achieve this objective since under federalism states are responsible for the health of their citizenry.

Access to health care refers to timely utilization of services to achieve the best health possible (Institute of Medicine 1998). Access has also been classified as potential and realized access. Potential access is the presence of resources to enable appropriate and timely care and realized access is the actual utilization of services (Aday and Andersen 1981; Aday and Andersen 1984; Gulzar 1999, 17). Several indicators have been used to measure potential and realized access, including health insurance coverage, having a usual source of care, and type of service used (US Department of Health and Human Services 2000).

The Healthy People 2010 section entitled "Achieving Equity—The Healthy People Perspective," also references a systematic approach for improving health that will take the efforts of various entities:

> "Healthy People 2010 recognizes that communities, states, and national organizations will need to take a multidisciplinary approach to achieving health equity—an approach that involves improving health, education, housing, labor, justice, transportation, agriculture, and the environment, as well as data collection itself. In fact, current data collection methods make it impossible to assess accurately the health status for some populations, particularly relatively small ones. However, the greatest opportunities for reducing health disparities are in empowering individuals to make informed health care decisions and in promoting communitywide safety, education, and access to health care" (US Department of Health and Human Services 2000).

This systemic approach sets the overall goals and objectives for the various entities (individuals, communities, states, and national organizations) to meet the established targets of the Healthy People 2010.

Many states following the federal government's lead have used the Healthy People 2010 goals and objectives to guide their activities and have adopted the goal of eliminating health disparities as a priority (State Healthy People Plans, 2000). For example, in its State Health Improvement Plan 2001-2005, Pennsylvania prioritized eliminating health disparities as one of its eight public health issues (Zimmerman 2001) and North Carolina includes removing health disparities among the disadvantaged as the second of six 2010 health goals (Healthy Carolinians Task Force 2000).

Despite these goals and the "major advances in longevity, health status and health care in the US, significant disparities persist in key health indicators across all racial/ethnic groups" (US Department of Health and Human Services 2003, 123). Data from the National Center for Health Statistics (NCHS 2006) indicated that Hispanics and American Indians under 65 years are more likely to be uninsured than those in other racial/ethnic groups. Disparities related to obesity show that it varies by race and ethnicity with Black non-Hispanic women reporting higher rates compared with women of Mexican origin and non-Hispanic White women.

Although only one-third of the US population identifies themselves as minorities, the CDC (2004, 755) reports that "they continue to bear a disproportionate burden of disease, injury, premature death, and disability. These disparities can mean lower life expectancy, decreased quality of life, loss of economic opportunities, and perceptions of injustice." This is evident by the fact that almost all racial/ethnic minority groups, except for Asians, rate their overall health worse than do non-Hispanic Whites. They also reported "higher prevalence of specific health problems, such as diabetes or obesity, which can have serious consequences on health longevity" (James et al. 2007, 7). Studies have also shown that "of all racial groups, Blacks live the fewest years, and they live a high proportion of those years with a chronic health problem" (Hayward and Heron 1999, 77).

2. Obesity

One of these chronic health conditions which is having a large impact on Black Americans is obesity. Obesity is frequently measured by body mass index (BMI), and having a BMI of 25-29.9 kg/m^2 is considered overweight and a BMI greater than or equal to 30 kg/m^2 is considered obese (National Institutes of Health 1985). While two-thirds of Americans are considered overweight or obese, with more than one-third being obese, the prevalence of overweight and obesity among Black Americans is 76 percent compared to 64 percent among Whites and 45 percent of Blacks were obese compared to 31 percent of Whites (Ogden et al. 2006). Obesity has also been associated with several chronic health conditions including cancer, diabetes, stroke and cardiovascular diseases (National Institutes of Health 1985). These diseases are also the leading causes of death among Black Americans. According to the CDC (2005, 1), "although the top three causes and seven of the 10 leading causes of death are the same for Blacks and Whites, the risk factors and incidence,

morbidity, and mortality rates for these diseases and injuries often are greater among Blacks than Whites".

3. US population

The US Census Bureau continues to report that the population is becoming more racially and ethnically diverse. As the minority populations (Hispanics, Black, Asians, American Indians, Native Hawaiians and Pacific Islanders) increase their proportions of the total population, the non-Hispanic White population proportion decreases. According to projection reports (US Census Bureau 2008):

> "In 2008, minorities represented roughly one-third of the population but by 2042, they are expected to become the majority, and by 2050, 54 percent of the population will be minorities. The Hispanic population is projected to nearly triple, from 46.7 million to 132.8 million during the 2008-2050 period reflecting an increase from 15 percent to 30 percent. The Black population is projected to increase from 41.1 million, or 14 percent of the population in 2008, to 65.7 million, or 15 percent in 2050. The Asian population is projected to climb from 15.5 million (5.1 percent) to 40.6 million (9.2 percent). Among the remaining minority racial groups, American Indians and Alaska Natives are projected to rise from 1.6 to 2 percent of the total population); the Native Hawaiian and Other Pacific Islander population is expected to more than double, from 1.1 million to 2.6 million. The non-Hispanic, White population is projected to be only slightly larger in 2050 (203.3 million) than in 2008 (199.8 million) accounting for 46 percent of the total population in 2050, down from 66 percent in 2008."

One of the components driving the US population growth is immigration. Over the last 40 years, immigration from Latin America and Asia has been the major force changing the racial and ethnic composition of the American population. The shift in immigrant source countries, combined with modest differences in natural increase among the different race and Hispanic origin groups, has resulted in increased racial and ethnic diversity (Grieco 2010). New flows of immigrants from Africa and the Caribbean are also part of the racial and ethnic transformation of the US. Although they are outnumbered by Hispanic and Asian immigrants, the number of Black immigrants is growing at a remarkable rate.

4. Black population in the US

The Black population, now the second largest minority group following the Hispanics, "has the highest rate of morbidity and mortality for almost all diseases compared to all other racial/ethnic groups in the US" (Read, Emerson and Tarlov 2005, 205). The classification of Black Americans refer to people having origins in any of the Black racial groups of Africa or who indicated their race as "Black or African American (US Census Bureau 2006). Almost 35 million people or 12.1 percent of the total population in 2005, reported Black as their only race and 1.9 million or 0.6 percent, reported Black and one or more races (US Census Bureau 2007).

The Black population is becoming more diverse through immigration, increasing from 125,000 in 1960, to 2.8 million in 2005, accounting for about 8 percent of all US Blacks (Kent 2007). These estimates included a growing number of immigrants from Africa, the Caribbean, and various other countries. "Two-thirds of the 2.8 million foreign-born Blacks were born in the Caribbean or another Latin American country and nearly one-third were born in Africa and the remaining four percent were born in Europe, Canada, or elsewhere (Kent 2007, 4)." Within these places of origin exist variations by region and even countries; these variations include language, beliefs, diet, and culture.

Kent (2007) reports that ten countries accounted for the majority (70 percent) of Black African immigrants; with Nigeria and Ethiopia together accounting for about 30 percent of the total. From the Caribbean, Black immigrants were primarily from three countries: Jamaica, Haiti, and Trinidad and Tobago (64 percent). Guyana, located on the coast of South America, accounted for another seven percent.

According to information from the Census Bureau (2007), the majority of Black Americans (55 percent) resided in the South, 19 percent lived in the Midwest, 17 percent in the Northeast, and 10 percent in the West. Fifty-five percent of the population in the District of Columbia was Black and more than 25 percent of the people were Black in Mississippi, Louisiana, South Carolina, Maryland, and Alabama. In the Northeast, Blacks represented approximately 15 percent of the population in New York and New Jersey. Foreign-born Blacks on the other hand, were more likely to reside in two regions the Northeast (44 percent) and South (39 percent).

Foreign-born Blacks were more concentrated in metropolitan areas. One-third of the foreign-born Blacks were located in the New York metropolitan area, 14 percent resided in the Miami area, and six percent in the Washington, DC metropolitan area. In 2005, Caribbean-born Blacks were more likely to reside in the following states in rank order: New York, Florida, New Jersey, Massachusetts, Maryland, California, Georgia, Connecticut, Texas, and Pennsylvania. The top four states accounted for three-fourths of these immigrants. Those from Africa were more disperse (only two-thirds in the top ten states), residing in similar areas as their Caribbean-born counterparts, but also in Minnesota and Virginia (Kent 2007; US Census Bureau 2007).

The educational attainment of foreign-born and US-born Blacks is vastly different. Thirty-eight percent of African-born blacks have a college degree, compared to 20 percent of those born in the Caribbean, and 16 percent of US-born Blacks (Kent 2007). Immigrant Blacks were also reported to have higher socioeconomic achievement levels than US-born Blacks. According to Ewing (2003, 1), “immigrants averaged $8,000 more in median

household income, a 3.5 percent lower unemployment rate, and 8.5 percent lower poverty rate".

5. Classifying race and ethnicity in the US

Healthy People 2010 addresses the issue of data collection asserting that the "goal of eliminating health disparities will necessitate improved collection and use of standardized data to identify correctly disparities among select population groups." The current taxonomy used to assess race and ethnicity is the US is usually based on two questions, one which addresses the person's race based on several racial categories (i.e., White, Black, or Asian) and the other, which categories a single ethnic group, Hispanics. However, each of the racial groups includes a series of ethnic groups. While some instruments collect additional information to assess the variation in the Hispanic and Asian population, most fail to assess the diversity in the White and Black populations (Williams 1996).

6. Black Americans in research

As described previously, the Black population is not a homogenous group. It is composed of people born in the US (natives), as well as immigrants from Africa, the Caribbean, and Central and South America. However, most researchers "tend to treat them as a single, undifferentiated group, rather than as a people internally divided by ethnicity, class, gender, and generation" (Krieger et al. 1993, 88). In addition, research continues to ignore the cultural and national differences of the foreign-born Black population by categorizing them as a homogenous group with native-born Blacks. Arthur and Katkin (2006, 32) challenged researchers to "introduce ethnicity into the categorization and understanding of Blacks in health research because not assessing Black ethnicity can cause substantial problems in research with Black Americans." The authors also argued that a

study that examined Black ethnic groups distinctively and Whites collectively could provide explanations not seen from comparing all Blacks (regardless of ethnicity) and Whites.

Several studies have recognized that the Black population is a heterogeneous group and have documented differences in health outcomes and health status among this group. Read and colleagues (2005) compared the health status of US-born and foreign-born Blacks by region of birth to that of US-born Whites. The results indicated that US-born Blacks have significantly poorer self-rated health, higher odds of activity limitation, and higher odds of limitation due to hypertension compared to US-born Whites. The results for foreign-born Blacks varied by region of birth, with African-born Blacks reporting better outcomes than US-born Whites, Caribbean-born and European-born Blacks on all three measures.

Singh and Siahpush (2002) analyzed the variations in mortality, morbidity, and health behaviors among ethnic groups in the US and reported that each major racial/ethnic group showed significantly lower risk of mortality and morbidity than their US-born counterparts. For example, foreign-born Blacks had lower rates of chronic health conditions, obesity, and hypertension than did US-born Blacks. However, the results also showed that the health status of immigrants decreased as they become acculturated into the US society. Compared to those born in the US, immigrants residing in the US for less than one year were 61 percent less likely to be overweight compared to 38 percent for those with 1-5 years, and 13 percent for those with more than 15 years. Regardless of how healthy foreign-born Blacks are when they enter the US, the longer they stay, the more their health deteriorates. This also includes becoming obese, according to Wang and colleagues (2005, 237), "When individuals move from countries with less obesity to countries with more, weight gain is common."

The results from these studies demonstrate that studying the Black population as a heterogeneous group can provide useful information not seen when it is studied as a homogenous group. Given that the Black population has been reported to have the highest prevalence of obesity (Ogden et al. 2006) and other disparities in the US (Centers for Disease Control and Prevention 2004); and national data also reveal that immigrant Blacks in the US have lower rates of mortality and morbidity than their US-born counterparts (Singh and Miller 2004; Singh and Siahpush 2002), and the limited number of studies on the Black ethnic subpopulations reveal similar findings; the present study will examine whether differences in health exist within the Black subpopulation and if there are differences, what are the implications for public administrators. While this paper investigates various aspects of health disparities, such as access to health care, it will mainly focus on differences among/within the obese Black American population. Both US-born and foreign-born Blacks will be the target population and throughout this paper, the terms US-born and native-born as well as immigrant and foreign-born are used interchangeably.

Identifying and discovering ways to reduce racial inequities/disparities can be impeded by the way information on race and ethnicity is collected. Despite the existence of information that minority populations are considerably heterogeneous (not only within racial/ethnic groups, but in disease and their associated risk factors), policies and programs continue to focus on these groups as a homogenous group. This is evident in Healthy People 2010, where the objectives are based on the homogenous racial/ethnic categories and not on the ethnic subgroups within each racial and ethnic group. In addition, while the directive from the Office of Management and Budget (OMB) standardized the way in which agencies collect race/ethnicity data (1997), it still does not account for the heterogeneity within

racial/ethnic groups. Although the OMB's guidelines are the minimal standards for race classification, most federal agencies and other organizations do not go beyond these guidelines to collect additional information within racial/ethnic categories (Williams and Jackson 2000).

Failure to recognize the heterogeneity within populations can prevent the identification of health and other differences for specific subpopulations. The lack of adequate data on these subpopulations can also have serious policy implications, since most policies are based on available information and not having the appropriate data can affect how policies are drafted and implemented, as well as how resources are allocated and distributed.

C. Public Administration Significance

Public administration is guided by certain structures and values, one of which is social equity. Equity has been a topic of importance to the field of public administration for several decades and has been identified as a priority by experts in the field. The research of John Rawls and H. George Frederickson played an important role in shaping social equity as a theory in public administration. Rawls based his theory of justice as fairness and postulates that social and economic inequalities are just only if they result in compensating benefits for everyone, and in particular the least advantaged members of society (Rawls 1971). In 1968, Frederickson (1990, 228) developed a theory of social equity to remedy what he considered a "Glaring inadequacy in both thought and practice and suggested that this concept be the third pillar for public administration, holding the same status as economy and efficiency." In a later discussion of the state of social equity in public administration, he affirmed the importance of social equity for public administration and identified several reasons for this:

> "First, implementation is the work of public administrators because laws do not carry out themselves. Second, public administration is the law in action and requires interpretation of that law and discretion in its application. Third, public institutions are the settings in which elected officials, working in our system of democratic self-government, struggle with issues of fairness, justice, and equality. But, because public administrators are responsible for carrying out the laws and policies, they also have important struggles with fairness, justice and equality." (Frederickson 2005, 2)

Frederickson also calls for social equity in the performance and delivery of public services.

Shafritz and Russell (2005, 435) contend that "government organizations have a special obligation to be fair - to pursue social equity both with the employees and the public- because they represent the citizenry." Salamon (2002) in describing the various tools of governments includes equity as one of the criteria used to analyze each tool and contends that equity involves basic fairness in the distribution of benefits among those who are eligible. He further states that direct policy tools are the conventional mechanism through which to correct for inequalities.

Several national public administration organizations have also identified equity as a priority. The National Academy of Public Administrations (NAPA) is an organization chartered by Congress to assist federal, state, and local governments in improving their effectiveness, efficiency, and accountability. It has a standing panel on Social Equity in Governance, as one of its five standing panels (2006). In the panel's issue paper and work plan, the NAPA defines social equity "as the fair, just and equitable management of all institutions serving the public directly or by contract. This includes the fair, just and equitable distribution of public service and implementation of public policy and the commitment to promote fairness, justice, and equity in the formation of public policy" (National Academy of Public Administration 2005, 1). The Academy also admonished

public administrators to take action to alleviate and correct social equity problems as they develop, manage, and analyze public programs.

The International City/County Management Association (ICMA), the premier local government leadership and management organization, also prioritizes equity and includes the following statement in their declaration of ideals, "ICMA works to maintain and enhance public trust and confidence in local government, to achieve equity and social justice, to affirm human dignity, and to improve the quality of life for the individual and the community." (International City/County Management Association 2007) The ICMA (2005) also published a report on "Active Living and Social Equity" that provided local government managers, department heads, and staff with a basic understanding of the connections between active living and social equity, as well as offered a toolbox of local government strategies for promoting active living equitably. In addition, the report stated that "Social equity takes on many forms, including health, legal, and educational. But regardless of what form social equity takes, it requires that services be distributed fairly for all residents, regardless of socioeconomic status, race, class, ethnicity, gender, age, or ability" (International City/County Management Association 2005, 5).

The reported disparities in obesity and other health conditions across racial/ethnic groups warrant investigation and intervention on social equity grounds by public administrators and would be consistent with their professional responsibilities. While they may not be able to overcome all the social equity problems in the US, public administrators can make an effort to ensure that public services are fair and equitable since they manage nearly all aspects of public service at the local, state, and federal levels.

As public servants, public administrators are in positions to influence policy decisions or they are responsible for implementing policies that impact the delivery and quality of public services. They provide funding to agencies that provide care and other services to the population and are therefore in positions to dictate service indicators and the population to be served. Public administrators are also managers in non-governmental organizations contracted to provide services; they work directly with clients or with other organizations through collaboration or agreements. In these positions, public administrators have an opportunity to influence social equity at various levels. For example, administrators can include social equity measures in contract languages and ensure that these measures are being met by tracking this information on a regular basis. When inequities are found, they can develop strategies to alleviate these inequities and assess penalties to agencies that continue to fail these measures. Administrators can also develop training to ensure that social equity in health exists in their programs encompassing individuals regardless of their race, gender, or socioeconomic status.

An important contribution of this study is that it is responding to the call by the NAPA to take action to alleviate and correct social equity problems by identifying and documenting specific social inequities in health among obese Black American ethnic subgroups. This study may identity differences in health within the US Black population that may be addressed by public administrators by providing the "impetus for public policy to improve realized access to care and not just potential access" (Seid et al. 2006, 355). It will also inform future policy decisions and health service delivery in the US, with regards to the extent of inequities within one of America's vulnerable populations and future data collection.

D. Summary

Obesity is at a critical apex where all states, territories, and cities are affected in the US; however, it is not only limited to the US. The WHO also classifies obesity as a global epidemic affecting both developed and developing countries (World Health Organization 2003). In the US, obesity affects more than one-third of the population (Ogden et al. 2006) and threatens to reduce the life expectancy of the future generation, especially among the Black population. Although Black Americans account for only 13 percent of the population, they have the highest rate of not only obesity, but of morbidity and mortality for almost all diseases (Read, Emerson and Tarlov 2005).

The US Black population is a diverse group consisting of immigrants from many different countries, mainly the Caribbean and Africa; however, research often ignores the diversity and differences found within this population and current data collection taxonomy does not adequately capture this diversity. Therefore the present study examines whether current national health data collection systems collect information on the Black subpopulation and whether differences in health, health care access and utilization exists among obese persons within the Black American population by using data from the National Health Interview Survey (NHIS). If differences exist, what are the implications for public administrators since they have an opportunity: to be advocates and implementers of policies that could create a fair society where opportunities for health are fairly distributed and to ensure that adequate racial and ethnic data is used to in decision making.

E. Chapter Summaries

To accomplish the purposes outlined for this study, the remainder of the paper is organized in the following chapters:

- Chapter Two presents a review of the literature and outlines data classification and collection in the US as well as the obesity epidemic in the US. This includes a discussion of the measurement, prevalence, causes, consequences, and the associated cost of obesity. It also presents information on the theoretical framework (social equity) and the proposed research questions in this doctoral project.
- Chapter Three describes the planned methodology to address the research questions and hypotheses. It includes a description of the data source, variables used to operationalize the research hypotheses, and the analytic strategies to be employed.
- Chapter Four provides the main results from the data analyses for each of the research questions.
- Chapter Five concludes with the discussion and summary of the study findings, limitations of the data, as well as implications with recommendations for public administrators, and future studies.

CHAPTER TWO - REVIEW OF THE LITERATURE

This chapter is organized into three sections. The first section provides a targeted literature review of the measurement of race/ethnicity in the US. The second section focuses on obesity in the US and includes the definition, measurement, and obesity epidemic in the US. It also examines the causes, consequences, and associated cost of obesity. The third section includes a discussion of the theoretical framework that guides this work and a review of the related literature. The chapter concludes with the proposed research questions.

A. Measurement of race/ethnicity in the US

Race and ethnicity data are generally collected to track and monitor trends, inform funding and resource allocation, inform the development of policies, or meet legislative requirements and according to Mays et al. (2003, 84) race/ethnicity data is collected in public health: "to describe vital and health statistics, as a risk indicator for health outcomes, to improve the delivery of health services, as a marker of unmeasured biological differences, and as a proxy for unmeasured social factors." However, there are vast inconsistencies in the way information on race/ethnicity is collected across data sources even among the federal government. Since 1977, the federal government began a concerted effort to develop and implement a common language for reporting race and ethnicity. "The impetus to develop a standard was the need for comparable data to monitor equality in health care services, employment opportunities, education, and housing for population groups that experience discrimination" (Sorensen et al. 2003, 93).

1. Defining race and ethnicity

"Race and ethnicity are complex, overlapping concepts that serve political, social, policy, planning, epidemiologic, public health, and other purposes" (Bhopal 2002, 156).

According to Kent et al. (2001, 5), "most social scientists agree that race and ethnicity are social constructions and that humans cannot be classified by race according to biological factors. Instead, certain physical characteristics, such as skin color, are used to separate people into racial categories defined by society." They further stated that race and ethnicity are viewed as social constructs that is influenced by social and political factors. Marvella and Kelly (2005, 1662) in their article entitled "Conceptualizing and Categorizing Race and Ethnicity in Health Services Research" stated that "race consists of personal identity and group identity facets as well as the more familiar biological indicators. While ethnicity refers to the sharing of a common culture, including shared origins, shared psychological characteristics and attitudes, shared language, religion, and cultural traditions." Despite the difference identified above, race and ethnicity are rarely distinguished from one another and even when they are, as in the OMB requirement that defines the race and ethnic categories that are to be used by federal agencies in collecting statistical data, they do not distinguish between the variation found within the racial and ethnic groups.

2. **Federal policy for categorizing race and ethnicity**

The collection and reporting of information on race and ethnicity has a long history in the US. The measurement of race has been conducted by the Census Bureau since 1790 (Nobles 2000), and the vital statistics started reporting information on race in 1940 (Schulman et al. 1995). During this period, there was very little consistency in the way information on race was collected and reported at the federal level. This led to the introduction of the Statistical Policy Directive 15 by the OMB in 1977, which provided a standard for collecting and reporting race and ethnicity. The Directive specified four categories for race: White, Black, American Indian/Alaska Native, and Asian and Pacific

Islander and two categories for ethnicity: Hispanic and not Hispanic (Office of Management and Budget 1977). This Directive appeared to be one of the first attempts to standardized racial and ethnic data collection and reporting across the federal government.

According to Hattam (2005), "two aspects of the directive's taxonomy are especially noteworthy: the mutual exclusivity of the four racial categories and the sharp distinction the directive draws between race and ethnicity. Even though the directive variously specifies race as origin, geography, nationality, culture, and cultural identification, it nevertheless stipulates that census respondents must choose only one race." Because of the limitations of these categories, OMB later revised the directive.

In 1997, OMB issued a revision to Directive 15 to address the diversity in US population (Office of Management and Budget 1997). The revised standards now included five racial categories: White, Black/African American, American Indian/Alaska Native, Asian, and Native Hawaiian and Other Pacific Islanders. Individuals were also allowed to select more than one race. In addition, the standard also required that the ethnicity question be asked first followed by the race question.

Despite the directive by OMB, there are still varying inconsistencies in the way racial and ethnic information is gathered and reported across federal programs. Numerous studies dating back to the late 1970 have reported these inconsistencies (Office of Management and Budget 1977; Trevino 1988; Westermeyer 1988; Schulman et al. 1995; Friedman et al. 2000; Nobles 2000; Laws and Heckscher 2002; Mays et al. 2003; Sorensen, Wood and Prince 2003; State Health Access Data Assistance Center 2009) and more than 30 years later, the same issue still exists. This revised classification however, still does not address the racial and ethnic diversity in the population.

3. Collection of race and ethnicity in national surveys

Large scale surveys are usually the most useful source of information on racial and ethnic health in the US. Most states and local government rely on these sources to determine the health of their residents. For example, the BRFSS is one of the surveys frequently used by states to monitor preventive health practices and risk behaviors. However, race/ethnicity is not consistently collected by most surveys and some do not collect information on the heterogeneity within racial categories.

Researchers from the State Health Access Data Assistance Center (SHADAC) published two studies (2009) that examined the measurement and availability of data for race, ethnicity, and immigrant group identifiers. The studies compared seven publicly funded national surveys conducted by federal agencies that collect information on health insurance and access to care on an annual or periodic basis: the Current Population Survey (CPS), the NHANES, the NHIS, the National Survey of Children's Health (NSCH), the Medical Expenditure Panel Survey (MEPS), the Survey of Income and Program Participation (SIPP), and the BRFSS. These seven surveys represent four organizations: the Census Bureau, CDC and its data component the NCHS and the Agency for Healthcare Research and Quality. While all of these surveys conformed to the minimum standards mandated by the OMB, the implementation varied across all the surveys. Four surveys (CPS, NSCH, BRFSS, MEPS) used the five minimum OMB categories; three (NHANES, NHIS, SIPP) provided more detailed response options for the race question or asked detailed follow-up questions.

The NHANES, NHIS, and NSCH collect disaggregated information for American Indian or Alaska Native. Two surveys (NHANES, NHIS) provide more detailed information on Asians (Indian, Chinese, Filipino, Korean, Vietnamese, other Asian) and Native Hawaiian

and Other Pacific Islanders (Native Hawaiian, Guamanian or Chamorro, Samoan, other Pacific Islanders). None of the surveys reviewed collected detailed information on either the Black or White racial groups. The only available information in the surveys reviewed that may be used for expanding these racial groups was immigrant group or status.

Collecting and reporting information on immigrant group is not a part of the OMB requirement. However a few of the surveys reviewed by SHADAC (2009) collected information on immigrant status. Two surveys (NSCH, SIPP) ask whether the respondent was born in the US or not and three surveys (CPS, NHANES, NHIS) ask for country of birth. Of the three, the CPS provided the most detailed information with a list of over 100 countries; NHIS had information on respondents born in ten broad global regions; and the NHANES only distinguished between those born in the US from those born in Mexico or elsewhere. The researchers concluded that even though all the surveys are collected by federal agencies [and even within the same agencies]; their implementation of the minimum OMB standards was somewhat different. There was also no standard for the collection of data on immigrant status or groups.

Since there is heterogeneity within immigrant populations a study that focuses on immigrant versus native-born still fails to address variability within these categories and therefore when feasible, studies should assess this variation. The next section in this chapter demonstrates the need for such information and focuses on one of the health conditions, obesity, affecting the Black population in the US as well as examines their access and service utilization among obese Black Americans from the Caribbean, Africa, and those born in the US.

4. Summary

Over the last half a century, the racial and ethnic demographics in the US have changed primarily due to immigrants from all over the world. Yet very few data systems capture information on this diversity including the current federal policy for categorizing race and ethnicity. This limitation affects the data being used for reporting health and other outcomes and developing as well as assessing policies.

B. Obesity

Obesity is a condition of excessive body fat or adipose tissue accumulation that results in the impairment of health. (National Institutes of Health 1985; World Health Organization 2006) While there are several methods for measuring obesity (i.e., BMI, waist circumference, skin-fold thickness, and bioelectrical impedance analysis), it is most generally assessed by using BMI.

1. Measuring Obesity

BMI describes the relative weight for height, and is an approximation for measuring body fat. It is calculated by dividing the weight in kilograms by the height in meters squared. To estimate BMI using pounds and inches, the weight (pounds) is divided by height (inches squared) and then multiplied by 703 (National Heart Lung Blood Institute 1998). Several limitations have been reported for using BMI as a measurement of obesity: (1) it does not account for weight from muscle versus that from fat; and (2) it is an indirect measure that assumes independence of factors such as age, gender, body type, level of physical activity, and race/ ethnicity (Wyatt, Winers and Dubbert 2006). However, despite these limitations, most researchers consider BMI a reasonably accurate and logistically feasible predictor of body fat. According to the WHO (2006), "BMI provides the most useful population-level

measure of overweight and obesity as it is the same for both sexes and for all ages of adults." The National Institutes of Health (NIH) reports that "BMI is a simple measurement highly correlated with other estimates of fatness. It minimizes the effect of height and is useful for descriptive or evaluative purposes. It has the advantage of permitting comparison of populations" (1985, 7).

Clinical guidelines from the National Heart, Lung, and Blood Institute (NHLBI) of the NIH (1998), define obesity in adults as having a BMI greater than or equal to 30 kg/m^2 and overweight is defined as BMI between 25.0 and 29.9 kg/m^2. Table 3 provides a classification of overweight and obesity by BMI. Obesity can be further classified into various stages: stage I (BMI 30.0-34.9), stage II (BMI 35.0-39.9), and stage III (BMI greater than or equal to 40). Stage III classification is also referred to as morbid obesity, clinically severe or extreme obesity and research has shown that in many cases the underlying cause of morbid obesity is genetic (American Obesity Association 2005).

Table 3.
Classification of overweight and obesity by BMI

	Obesity Class	BMI (kg/m2)
Underweight		<18.5
Normal		18.5-24.9
Overweight		25.0-29.9
Obesity	I	30.0-34.9
	II	35.0-39.9
Extreme Obesity	III	≥40

Source: National Heart Lung Blood Institute. 1998. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. *National Institutes of Health*. 4 November 2006 <http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf>.

2. Potential Causes of Obesity

The primary cause of obesity is an energy imbalance over time which occurs when the number of calories consumed is less than the calories used (Centers for Disease Control

and Prevention 2006; World Health Organization 2006). This translates into eating too many calories and engaging in too little physical activity. Other potential causes that have been suggested include genetic, metabolic, behavioral, environmental, cultural, and socioeconomic factors (US Department of Health and Human Services 2001).

a. Genetic Factors

The adage that "it runs in the family," may actually be a true statement when it comes to obesity. Heritability studies conducted with twins (Maes, Neale and Eaves 1997), even those raised a part (Stunkard et al. 1990); and adoptions (Stunkard et al. 1986), have indicated that genetic factors influence body weight. Heritability is the proportion of phenotypic variance that is due to genetic effects (Bell, Walley and Froguel 2005, 224), and variance estimates range from 20 to 90 percent (Maes, Neale and Eaves 1997). Genetic make-up can also cause disorders such as Bardet-Biedl syndrome and Prader-Willi syndrome which are characterized by obesity (Centers for Disease Control and Prevention 2006).

Although genes play a role in influencing how individuals metabolize calories, "The rapid obesity epidemic is more likely due to a changing environment that encourages consumption and discourages expenditure of energy. Therefore, most obesity causes come not as a result of defective biology but are rather caused by an obesogenic environment" (Loos and Bouchard 2003, 416).

b. Behavioral and Environmental Factors

An individual's environment can have an impact on his or her risk of obesity. This includes lifestyle behaviors such as the type and quantity of food a person consumes, as well as the level of physical activity performed. Social and economic changes in the US have reduced physical activity and increased the availability of high fat foods. Americans'

personal energy expenditures have been reduced because more people have sedentary jobs, cars, television, computers, video games, as well as other conveniences that have reduced the need for outdoor activities such as walking or biking. The lack of sidewalks or safe neighborhoods has also diminished the opportunity to expend energy (Wyatt, Winers and Dubbert 2006; Wellman and Friedberg 2002).

Additional environmental factors affecting obesity include access to cheap, high calorie meals prepared outside the home. "Almost half of Americans' total annual food purchases are for food that is prepared and consumed either outside the home or brought into the home for consumption" (Tillotson 2004, 618). Americans have also introduced eating into every aspect of their lives. Complete meals are now available in bookstores, movie theatres, and many other unconventional settings. Supermarkets now sell fully or partially prepared meals. Also, most foods and snacks are now available for quick and easy preparation in microwaves.

Not only has the type of food being consumed change, but so has the portion size. People may be eating more during a meal and snack because of larger portion sizes. Fast food restaurants are now super-sizing their meals or offering value meals (larger portions or grouped menu items sold at lower prices); and snacks now come in sizes that contain two or more servings per container. Tillotson (2004, 624), noted that "plentiful and inexpensive food shapes American lifestyles today with the likes of fast-food dollar deals, all-you-can-eat restaurants, gigantic packaged soft drinks and sweet treats, as well as supermarkets with 40,000-plus great-tasting foods."

Americans are also consuming more calories per day. The Department of Agriculture's Economic Research Service (US Department of Agriculture 2003) estimates

that "the food supply in 2000 provided 3,800 calories per person per day, which is 500 calories above the 1970 level and 800 calories above the 1957 and 1958 levels. The US Department of Agriculture (USDA) also reports that the average daily caloric intake in 2000 was 2,700 calories per person per day. This represented an increase of 24.5 percent, or about 530 calories, between 1970 and 2000" (2003, 14). This increase in calorie intake and easy access to high sugar and fatty foods, as well as the influences of individuals' culture are contributory factors to obesity which is associated with increased risk to several medical complications.

Another behavioral contributory factor of obesity that has been discussed is food addiction. Studies have suggested that overeating in obese individuals share similarities with the loss of control and compulsive behavior found in drug addicted individuals (Wang et al. 2004; Volkow and Wise 2005).

c. Cultural Factors

The food culture and views of attractiveness and body image may serve as risk factors for obesity among certain ethnic groups. According to Walker-Sterling (2005, 194), "The food culture of African Americans nurtures the soul, but unwittingly compromises health." In addition, dietary patterns often vary within racial/ethnic groups. Obesity trends among immigrants have also been attributed to healthier behaviors in countries of origin, the selective migration of healthy individuals, and/or the cultural protections afforded by supportive social networks (Read, Emerson and Tarlov 2005). People of African descent in the US are also reported to be heavier than those in less-industrialized West Africa, while people living in the Caribbean are in between the two (2005).

Studies have found that, African American (and in some cases Hispanic) women are often heavier than their White counterparts, but express less dissatisfaction with their bodies (Cachelin et al. 2002; Wyatt, Winers and Dubbert 2006). African-American and Hispanic women's views of the ideal body size tend to be larger than those of White women and African American men reported having a preference for larger female body size compared to White men (Becker et al. 1999; Powell and Kahn 1995).

The spread of obesity has also been linked to social ties. In a recent study of a large social network of more than 12,000 persons over a 32 year period, Christakis and Fowler (2007) reported that an individual's chance of becoming obese increased by 57 percent when their friend became obese, 40 percent if there sibling became obese, and 37 percent if their spouse became obese. The rates were even higher among same-sex family members and friends, with rates as high as 71 percent for same sex friend, 67 percent among sisters, and 44 percent for brothers. The authors concluded that the "Spread of obesity in social networks appears to be a factor in the obesity epidemic which may be used to slow the spread of obesity" (2007, 378).

3. Consequences of Obesity

Like the contributory factors to obesity, the consequences are numerous. The following section discusses the mortality, morbidity, and costs associated with obesity.

a. Morbidity and Mortality

Obesity is associated with increased risk of morbidity and mortality from numerous diseases. Over 30 major diseases are reported to be associated with obesity, including coronary heart disease, hypertension, diabetes, some cancers, sleep apnea, osteoarthritis, dyslipidemia, gallbladder disease, and stroke (Centers for Disease Control and Prevention

2006; National Heart Lung Blood Institute 1998). Table 4 lists the diseases for which obesity is known to be a risk factor and those associated with obesity.

It is well documented that obesity is associated with various diseases (National Heart Lung Blood Institute 1998; US Department of Health and Human Services 2001; Hu 2003; Bray 2004; Wyatt, Winers and Dubbert 2006). Strum and Wells (2001), in a cross-sectional analysis of data from the Health Care for Communities (HCC), a national household phone survey, found that obesity has a strong association with both the occurrence of chronic medical conditions, and physical health-related quality of life, such as poverty, lifetime smoking history, or recent heavy drinking.

Table 4.
Diseases Linked to Obesity

Known risk factors for:	Obesity is also associated with:
• diabetes	• complications of pregnancy
• coronary heart disease	• menstrual irregularities
• hypertension	• hirsutism (excess body and facial hair)
• stroke	• stress incontinence (urine leakage caused by weak pelvic floor muscles)
• high blood cholesterol	• psychological disorders, such as depression
• gallbladder disease	• increased surgical risk
• osteoarthritis	• increased mortality
• sleep apnea and other breathing problems	
• some forms of cancer (uterine, breast, colorectal, kidney, and gallbladder)	

Source: National Institutes of Diabetes and Digestive and Kidney Disease. 2006. *Statistics Related to Overweight and Obesity*. October 2006. *Weight-Control Information Network*. 9 December 2006 <http://win.niddk.nih.gov/statistics/index.htm#preval>.

I. Diabetes Mellitus (Type 2)

The most common obesity-related co-morbidity is type 2 diabetes. Type 2 diabetes is attributed to reduced insulin (hormone needed to provide energy) production and the body's failure to properly use insulin (insulin resistance). According to Bray (2004, 2583), "the

insulin-resistant state that is so common in obesity probably reflects the effects of increased release of fatty acids from fat cells that are then stored in the liver or muscle. When the secretory capacity of the pancreas is overwhelmed by battling insulin resistance, diabetes develops."

More than 80 percent of type 2 diabetes appears to be related to being overweight (National Institutes of Diabetes and Digestive and Kidney Disease 2006) both in males and in females (Colditz et al. 1995; Chan et al. 1994; Field et al. 2001). For women, the Nurses Health Study (Colditz et al. 1995), found that the risk of developing type 2 diabetes increases as BMI increases and this risk begins to increase in normal weight women when BMI exceeds 22 kg/m². Similar results were also reported from a cohort of male health professionals (Chan et al. 1994).

II. Hypertension and Stroke

Over 75 percent of hypertension cases are reported to be directly attributed to obesity (American Obesity Association 2005; Krass et al. 1998). Hypertension is strongly associated with obesity and the prevalence of obesity among patients with hypertension is much higher than the population prevalence of obesity (Cossrow and Falkner 2004). "The high prevalence of obesity is also reported to be a contributing factor to the high prevalence of hypertension in minorities, especially among African Americans who have an earlier onset and run a more severe course of hypertension" (American Obesity Association 2005).

Overweight and obesity is also considered to be a major risk factor in stroke. In a 10-year follow-up study to assess the health risk associated with overweight among women in the Nurses Health Study and men in the Health Professionals Survey, Field et al. (2001) reported that the risk of developing hypertension and stroke increased with severity of

overweight among both men and women. Compared to their same-sex counterparts with BMI between 18.9 and 24.9, those with BMI of 35.0 or more were 2.5 times more likely to develop hypertension and two times more likely to develop a stroke. Overweight and hypertension also interact to affect cardiac function and this combination leads to a greater likelihood of cardiac failure (Bray 2004).

III. Coronary Heart Disease (CHD)

Overweight, obesity, and excess abdominal fat are directly related to cardiovascular diseases. The Nurses Health Study (Willett et al. 1995) found that the risk of developing coronary artery disease increased three to four times in women who had a BMI greater than 29.

IV. Gallbladder Disease

The risk of gallstones increases as BMI increases in both male and females. According to Field et al (2001), obese participants (BMI $\geq$ 35) were two times more likely to develop gallstones. Thirty percent of the individuals with gallstones were overweight and obese compared to 10 percent of the non-obese (American Obesity Association 2005).

V. Cancer

Obesity has been linked to certain types of cancers. "In women, cancers of the reproductive system and gallbladder are more common; and in men, obesity increases the risk of colon, rectum, and prostate cancer" (Bray 2004, 2587).

VI. Mortality

According to the US Surgeon General (US Department of Health and Human Services 2001, XIII), "overweight and obesity are associated with 300,000 premature deaths annually" and is the second leading cause of preventable deaths in the US (Mokdad et al.

2004). Deaths due to obesity have been well documented and are usually measured with estimates such as years of life lost (YLL) and estimated life expectancy.

Using data from the US Life Tables and the NHANES, Fontaine (2003) estimated the YLL due to obesity across the life span of adults aged 18 to 85 years. The results showed that the optimal BMI associated with the least YLL or the greatest longevity is approximately 23 to 25 for Whites and 23 to 30 for Blacks. The maximum YLL for White men aged 20 to 30 years with BMI $\geq$ 45 is 13 and 8 for White women. YLL were also greatest among the younger age group.

Peeters et al. (2003) reported a decline in life expectancy of 6 years and 7 years respectively among obese (BMI $\geq$ 30) males and females in an analysis of the reduction in life expectancy and increase in premature deaths associated with overweight and obesity in 40 year olds. Olshansky and colleagues (2005) estimated the effects of obesity on the life expectancy of the entire US population and reported an overall reduction of one-third to three-fourths of a year. The authors contend that though this estimate seems insignificant, it is larger than the negative effect of all accidental deaths combined.

In a prospective study of 900,000 US adults followed for 16 years to study the role of weight in cancer deaths, Calle (2003) estimated that overweight and obesity accounted for 20 percent of all cancer deaths in women and 14 percent in men. In both men and women, BMI was significantly associated with higher rates of death due to cancer of the esophagus, colon and rectum, liver, gallbladder, pancreas, and kidney. The authors concluded that increased body weight was associated with increased death rates for all cancers combined and for cancers at multiple sites. Individual behavioral risk factors such as smoking (current smoker)

in combination with obesity have been reported to substantially contribute to all-cause and circulatory disease mortality (Freedman et al. 2006).

While previous studies estimated the number of annual deaths attributed to obesity at 280,000 in 1991 (Allison et al. 1999), and 414,000 in 2000 (Mokdad et al. 2004); the latest research estimates the annual number of deaths associated with obesity at 112,000 in 2000 (Flegal et al. 2005). This variation can be explained by the methods used for calculating the estimates. Despite these discrepancies, the impact of obesity on mortality and morbidity is evident and increases the cost of providing care.

b. Economic Impact

The adverse health effects associated with obesity also have a significant impact on the cost of health care in the US. In a recent study of the factors responsible for the rise in health care spending in the US over the past 15 years, obesity was listed as one of the main factors (Thorpe 2006). According to Thorpe, the rise in health care spending is directly linked to the doubling of the obesity prevalence in the US over the past 20 years and obesity is a key factor underlying the rise in treated disease prevalence.

A study using the 1998 Medical Expenditure Panel Survey (MEPS) and the 1996 and 1997 NHIS examined the effects of obesity on health care cost. They estimate that medical expenses attributed to overweight and obesity accounted for $78.5 billion ($92.6 billion in 2002 dollars) or 9.1 percent of the total annual US medical expenditures in 1998. Of the estimated $78.5 billion, $26.8 billion was related to obesity (Finkelstein, Flebelkorn and Wang 2003). The authors also estimate that Medicare spent about $23.5 billion on care attributed to overweight and obesity in 1998 with obesity accounting for $13.8 billion. Combined Medicaid programs spent approximately $14.1 billion and of this, $10.7 billion of

those resources were associated with obesity. Out-of-pocket and private insurance spending was $12.8 billion and $28.1 billion respectively. Together, Medicare and Medicaid financed approximately half of all medical spending related to overweight and obesity, making the public sector the biggest payer for care related to overweight and obesity.

Arterburn et al. (2003) estimated that the medical expenditures for morbidly obese adults exceeded $11 billion in 2000. Using data from the 2000 MEPS they also calculated the per capita health care expenditures. The results showed that when compared to normal weight adults (BMI 18.5-24.9), per capita health care costs for morbidly obese adults (BMI $\geq$ 40) were substantially greater (81 percent or $1,975). Expenditure differences were also noted across classes of obesity. Strum (2001) also reported that obesity was associated with a 36 percent increase in inpatient and outpatient spending and a 77 percent increase in medications, compared to normal weight individuals.

Wee et al. (2005), examined age, gender, and racial differences in expenditures related to overweight and obesity among US adults. Using data from the 1998 MEPS, they estimated that in comparison to the mean annual health care expenditure of $2,970 for normal weight adults, the mean expenditures for overweight adults were $3,038 and $4,333 for obese adults. Expenditures also varied across gender and race. The weight-related health care expenditures were similar for men ($2,703) and women ($3,895) but varied substantially according to race/ethnicity and age, with the strongest associations observed among White and older adults.

Obesity also affects loss of productivity and employee absenteeism. Using data from the 1988-2002 NHANES, a study on the impact of obesity on work limitations and cardiovascular risk factors in the US workforce was conducted by Hertz et al. (2004). The

researchers reported that the prevalence of obesity had significantly increased from 20.4 percent to 29.4 percent of the US workforce. Obese workers reported the highest prevalence of work limitations (6.9 percent vs. 3.0 percent among normal-weight workers) defined as limits in the amount or kind of work they can do because of physical, mental, or emotional problem. The highest prevalence of hypertension, dyslipidemia, type 2 diabetes, and metabolic syndrome was also observed in obese workers compared to normal weight workers.

Researchers also analyzed data from a national telephone survey of the US workforce to examine the relationship between health-related work loss and obesity (Ricci and Chee 2005). Twenty-two percent of the more than 7,000 respondents were obese and more than 42 percent of obese workers reported some health-related lost productivity time in the past two weeks compared to normal and overweight workers. Ricci and Chee estimated the total annual cost of lost productivity time due to obesity at $42.3 billion. Obese workers also cost US employers and estimated $11.7 billion annually in lost productivity, most is attributable to presenteeism (reduced performance while at work).

Schmier et al. (2006) conducted a literature review on the cost and resource use associated with obesity in the workplace. The review evaluated several components of cost such as absenteeism, sick leave, disability, and injuries. The results indicated that overall, employees who were overweight or obese had higher injuries, sick leave or disability usage, and health care cost based on claims data were higher for those with higher BMIs.

4. Benefits of Weight Loss

Studies have documented the potential benefits of weight loss. Weight loss in overweight and obese individuals can improve physical, psychological, as well as social

health; and may help control diseases worsened by being overweight and/or obese and may also decrease the likelihood of developing these diseases (National Heart Lung Blood Institute 1998). A ten percent decrease in body weight is reported to significantly decrease obesity-related health risks. The following health benefits are associated with weight loss:

- Weight loss of five to fifteen percent of total body weight can lower an individual's chances for developing heart disease or having a stroke (National Institutes of Diabetes and Digestive and Kidney Disease 2005); and
- Weight loss may improve blood pressure, triglyceride and cholesterol levels, and lower blood sugar (US Department of Health and Human Services 2001).

5. Obesity in the US

The prevalence of obesity in the US is currently monitored by two surveys; the NHANES at the national level which uses measured height and weight to calculate BMI and the state-level BRFSS, which relies on self-reported height and weight information. Both surveys indicate that obesity has drastically increased over the past few decades.

Recent information from the CDC (National Center for Health Statistics 2006, 9), reports that "among adults 20–74 years of age, overweight and obesity rates have increased since 1960–1962. These increases are driven largely by increases in the percentage of adults who are obese. From 1960–1962 through 2003–2004, the age-adjusted percentage of adults who are overweight but not obese has remained steady at 32 percent to 34 percent. During the same time period however, the percentage of obese adults has increased from 13 percent to 34 percent." Most of the obesity increase also occurred in the last decade with rates

increasing from 15.1 percent in 1976-1980 to 23.3 percent in 1988-1994 to 31.1 percent in 1999-2000 to 32.2 percent in 2003-2004 (Figure 1).

a. Current Overall Prevalence of Obesity

According to the American Obesity Association-AOA (2005), approximately 60 million adults are obese and nine million are considered clinically obese. Using measured height and weight information from the 2003-2004 NHANES, estimates indicate that 32.2 percent of the US adult population is obese and 4.8 percent is clinically obese (Ogden et al. 2006). Based on information from the BRFSS, among the total adult population surveyed, 23.9 percent were obese. Although this prevalence is lower than what is reported by the NHANES, it may be attributed to the limitations of the data collection methods used by the BRFSS (Centers for Disease Control and Prevention 2006). Yun et al. (2006) compared the national estimates of overweight and obesity prevalence across different demographic groups using BRFSS and NHANES data. They found that compared to NHANES, BRFSS disproportionately underestimates the prevalence of obesity and overweight across different gender, race, age, and education subgroups. Therefore, this section will rely on data from the NHANES to describe the prevalence of the obesity epidemic in the US.

The overall prevalence of obesity in adults age 20 years and older by gender, age, and race/ethnicity (Ogden et al. 2006) reveals that the rate of obesity is similar among males (31.1 percent) and females (33.2 percent). Among age groups for both males and females, the prevalence of obesity increases with age, until about age 60, where it starts to decline. The same pattern is observed for extreme obesity. Obesity was also more prevalent among non-Hispanic Blacks (45 percent) and Mexican American (36.8 percent) compared to non-Hispanic Whites (30.6 percent).

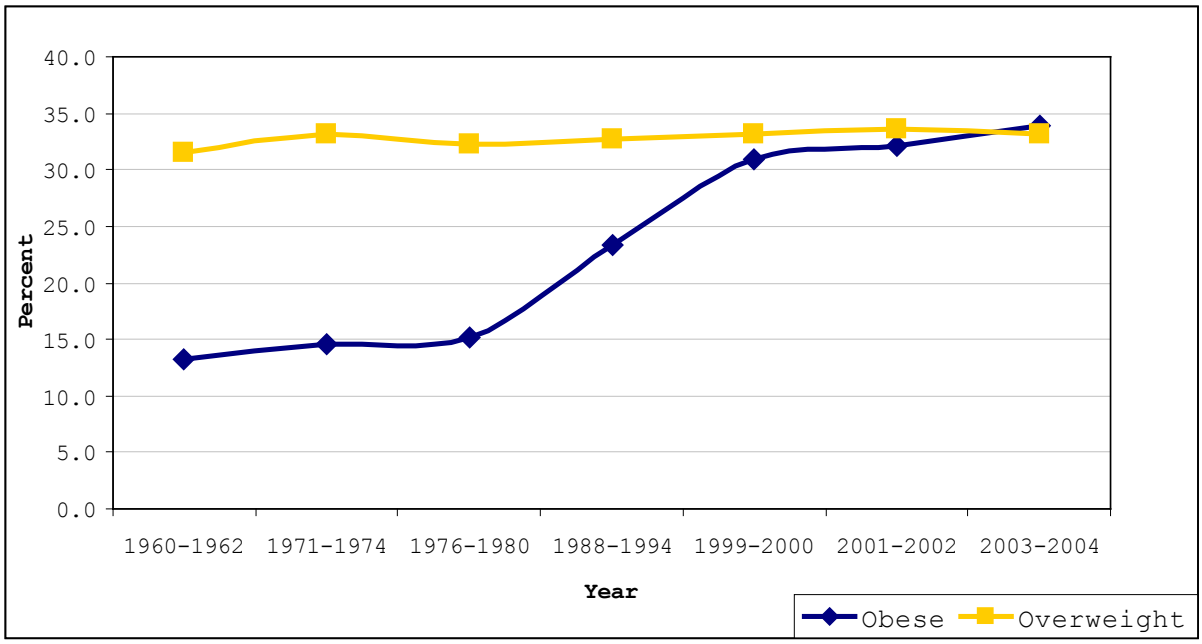

Figure 1. Trends in overweight and obesity among US adults aged 20-74 years, 1960-2004
Source: National Center for Health Statistics. 2006a. *Health, United States, 2006 With Chartbook on Trends in the Health of Americans*. 12 December 2006 <http://www.cdc.gov/nchs/data/hus/hus06.pdf>.

b. Prevalence of Obesity Among Minorities

Across gender and race/ethnicity, minority women were disproportionately affected by obesity compared to their White counterparts. A higher percentage of non-Hispanic Black women (53.9 percent) and Mexican American women (42.3 percent) were obese compared to non-Hispanic Whites (30.2 percent). The highest rate of obesity (57.5 percent) was found in Black women between the ages of 40 and 59 years. The proportion for Mexican American and Whites in the same age category was 48.8 and 37.8 percent respectively. The prevalence of obesity did not differ by race/ethnicity among men (Ogden et al. 2006). Among African Americans, obesity is also one of the major risk factors for six of the ten leading causes of death, including heart disease, cancer, stroke, respiratory disease, and nephritis (LaVeist 2005).

c. Prevalence of Obesity and Socioeconomic Status (SES)

The association between obesity and SES (measured by educational levels) was examined by Zhang & Wang (2004) using the NHANES from 1971 to 2000. Their analysis showed that the prevalence of obesity increased significantly over the past four decades, in all gender-ethnic-SES groups. Among the three SES groups examined (less than high school, high school, and college or above to indicate low, medium, and high SES, respectively), the high education group had the highest rate of increase in the prevalence of obesity over the study period. The prevalence of obesity in Black men with high education increased six fold between NHANES I (1971 to 1975) and NHANES 1999 to 2000, whereas the prevalence of obesity in Black men with medium education increased only 40% during the same period. In White women, the prevalence of obesity in the high-education group quadrupled, whereas the rate in the low-education group had only a 66% increase. The same pattern was found in White men and Black women. Prevalence of obesity in low-educated Black women was stable across time, but the rate among the more highly educated almost tripled over the study period. The researchers concluded that individual characteristics may not be the main factor that has contributed to the dramatic increase in obesity in the US, but that social-environmental factors play an important role.

Chang & Lauderdale (2005) utilizing the NHANES from 1971 to 2002 examined the income differentials in BMI and change over time in the prevalence of obesity at different levels of income. The results also revealed that over the course of three decades, obesity has increased at all levels of income and those classified as poor did not experience the largest weight gain. From 1971 to 2002, among middle-income Black women, the rate of obesity increased 27 percent, but only 14.5 percent for poor Black women. Among White women,

the wealthiest showed only a 13 percent increase in the prevalence of obesity while the poorest had an increase of 22.6 percent. There were no significant changes observed among Mexican American women in the rate of obesity at any income levels.

The study also showed that among males, the increase in obesity was 21.1 percent for Black men at the highest level of income, but only 4.5 percent for the near poor and 5.4 percent for the poor. There was also a positive association between income and weight among Black men, showing that weight increases as income increases. Among Mexican American men, those of the upper-middle income group showed the largest increase in obesity, and these men also exhibited a positive relationship between income and obesity prevalence in the most recent survey. The prevalence for White men was similar to that seen in White women, with the poorest group showing the highest increase in obesity prevalence 22.6 percent.

Both of these studies demonstrate that the previous findings of a higher rate of obesity among low SES groups is no longer the case. The prevalence of obesity among high SES, whether measured by income or level of education is increasing and they are at similar risk as the low SES individuals.

6. Summary

Obesity is defined as excessive body fat and is frequently classified by a BMI of 30 kg/m^2 or greater. In addition to poor diet and inactivity other potential contributing factors to obesity include genetic, metabolic, behavioral, environmental, cultural, and socioeconomic US (Department of Health and Human Services 2001). It also causes or worsens a number of health problems and has been associated with coronary heart disease, hypertension, diabetes, some cancers, sleep apnea, osteoarthritis, dyslipidemia, gallbladder disease, and stroke

(Centers for Disease Control and Prevention 2006). Obesity has been reported to reduce life expectancy (Peeters et al. 2003), work productivity (Hertz et al. 2004), and all groups regardless of race/ethnicity, income level or education are becoming more obese. However, Black Americans have the highest rate of obesity compared to all other groups (Ogden et al. 2006).

C. Conceptual Framework - Social Equity

Before applying the concept of social equity to this research a review of the literature was conducted to define and review the methodologies used to operationalize social equity and its related terms. In the literature, "equity, equality, and [parity] as well as their antonyms inequity, inequality, and [disparity] are terms often used interchangeably to refer to similarities and differences in measures between groups. However, there are subtle and important differences" (South East Health 2003, 2). "The term inequity has a moral and ethical dimension. It refers to differences [in health and health care], which are unnecessary and avoidable, but in addition, are also considered unfair and unjust" (Whitehead 1990, 5). Inequality/disparity on the other hand, does not have an ethical or judgmental context. According to Braveman (2006) the term health equity is rarely used in the US but is more commonly cited in international literature. The more common term health disparity is used in the US to denote health or health care differences between racial/ethnic groups, while in Europe and other regions of the world, the term health inequalities usually refers to differences in health between socioeconomic groups. Regardless of how it is described, the literature is replete with evidence of existing disparities in the US and the world.

Frederickson's (1990) theory of social equity and Rawls' (1971) theory of justice helped to define the concept of social equity. The concept of social equity has been

identified as the third pillar of public administration (Frederickson 1990; Svara and Brunet 2004). While there is no standard definition of social equity, the literature identifies several definitions operationalized by various researchers. In their introductory text, Shafritz & Russell (2005, 434) defines social equity as "the principle that each citizen, regardless of economic resources or personal traits, deserves and has a right to be given equal treatment by the political system." Seeing that equity no longer includes just race and gender but a host of other categories like sexual orientation and ethnicity, the NAPA's Standing Panel on Social Equity offers the following definition of social equity in public administration:

> "It is the fair, just and equitable management of all institutions serving the public directly or by contract, and the fair and equitable distribution of public services, and implementation of public policy, and the commitment to promote fairness, justice, and equity in the formation of public policy." (2001, 11)

NAPA (2005, 4) also identifies four broad measures of social equity which can be useful as indicators of inequity: access, quality, procedural fairness, and outcomes. These measures are described below.

- **Access or distributional equity** is a commitment to reduce omission and neglect that contribute to systemic inequality in accessing services.
- **Procedural fairness** is a determination to eliminate acts of commission that deprive individuals of fair and consistent treatment and to act with urgency when member of groups are systematically treated unfairly.
- **Quality** ensures that those who receive services and benefits are not slighted and consigned to a level of quality that does not measure up to acceptable standards.
- **Outcomes** reject systematic differences in life chances across groups in society. Social equity does not accept the idea that certain groups must be limited to poorer outcomes and promotes the idea of narrowing and eliminating disparities.

These measurements were also discussed by Svara and Brunet (2004, 101) in their article "*Addressing the Coverage of Social Equity in Introductory Courses in Public Administration*." The article provides a framework for understanding and measuring social equity. Their description of the four areas for which public administrators who are concerned about social equity are as follows:

- Procedural fairness- which involves the examination of problems or issues dealing with due process, equal rights, and equal protection. This criterion examines fairness in management practices in areas like hiring, promotion, and award of contracts.
- Access or distributional equity focuses the policies, services, and practices of how services or benefits are delivered to citizens.
- Quality or process equity insures that there is consistency in the quality of services delivered to all groups and individuals regardless of the distributional criterion used.
- Outcomes focus on whether government policies and programs have the same impact on the groups of people or individuals being served.

Table 5 summarizes the four primary areas of social equity identified by NAPA and Svara and Brunet.

Since the present research project focuses on social equity in health, a review of the literature on health equity was also conducted. Like social equity, health equity has been defined by numerous researchers (Whitehead 1990; Braveman and Gruskin 2003; Braveman 2003; International Society for Equity in Health 2005; Braveman 2006). The most frequently cited definition of health equity was introduced by Whitehead (1990, 7) which stated that "Equity in health implies that ideally everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from

achieving this potential, if it can be avoided." She also described equity in health care as "Equal access to available care for equal need, equal utilization for equal need, and equal quality of care for all" 1990, 9). The International Society for Equity in Health (2005) defines health equity as "The absence of systematic and potentially remediable differences in one or more aspects of health between groups of people characterized socially, geographically, or demographically." Braveman (2003, 182) argued that "Pursuing equity in health can be defined as striving to eliminate disparities in health between more and less-advantaged social groups."

Table 5.
Comparison of the Primary Areas of Social Equity

Indicators	**Definitions**	
	(NAPA 2005)	(Svara and Brunet 2004)
Access or distributional equity	Seeks to promote equality in the provision of services and benefits.	Concerned with how services are provided.
Procedural fairness	Eliminate acts of commission that deprive individuals of fair and consistent treatment.	Issues dealing with due process, equal protection and equal rights.
Quality	Ensures that the quality of services measure up to acceptable standards.	Consistency in the quality of services provided.
Outcomes	Promotes the idea of narrowing and eliminating disparities.	Focus on the results of government policies on people.

Based on the above definitions and measurements of equity, a study examining health equity should look for inequities or disparities in health and health care. After reviewing several articles on health disparities and health equity, Braveman in a recent publication proposed the following operational definition for health disparity/inequity to aid in its measurement and monitoring: "A health disparity/inequality is a particular type of difference in health or in the most important influences on health that could potentially be shaped by

policies; it is a difference in which disadvantaged social groups or groups (defined as the poor, racial/ethnic minorities, women, or other groups who persistently experienced social disadvantage or discrimination in the past) systematically experience worse health or greater risks than more advantaged groups" (2006, 180). She also outlined three basic sets of research questions that must be addressed in order to monitor equity in health and health care. "First, how do levels of health vary across different social groups? Second, how do levels of key determinants of health vary across social groups? And third, how have both levels of health and health determinants in different social groups and gaps between groups changed over time?" (Braveman 2003, 186)

Whitehead (1990, 5) identified seven determinants of health disparities and considered the following four as more likely to be unfair and avoidable: (1) health-damaging behavior in which the degree of choice of lifestyles is severely restricted; (2) exposure to unhealthy, stressful living and working conditions; (3) inadequate access to essential health services and other basic services; and (4) natural selection, or health-related social mobility, involving tendency for sick people to move down the social scale. In the US, many disparities can be considered avoidable, since they exist because people have unequal access to sources such as health care, education, and live or work in unhealthy conditions (Carter-Pokras and Baquet 2002).

According to Braveman and Gruskin (2003) health-related equity may be monitored from four perspectives: (1) equity in receipt/utilization of health care services, (2) equity in allocation of health care resources, (3) equity in financing of health care, and (4) equity in the quality of health care services.

D. Studies Examining Social Equity

This section discusses the most relevant studies that have been conducted or proposed to examine social equity in the US. Using client survey data from a Manpower Demonstration Research Corporation study, Susan Gooden (2004) reported differences in the experiences of Black, Hispanic, and White clients with welfare agencies in four large cities across several Temporary Assistance for Needy Families policy areas. The study found significant differences in the dollar amounts Black, White, and Hispanic clients received as lump sum diversionary payments. Based on the clients' experiences in the area of diversion, case management, sanctioning, dispute resolution, and reasons for exiting welfare, the negative impact of discrimination was most pronounced for Blacks (actual probability of $798 versus a predicted probability of $832, if treated as White). Blacks were also found to have fewer probabilities of exiting welfare than do Whites and Blacks and Hispanics were much more likely to be sanctioned for "compliance reasons" than were Whites.

In her article on "*Addressing Racial Disparities in Social Welfare Programs: Using Social Equity Analysis to Examine the Problem,*" Gooden (2006) provided guidance to welfare agencies on the importance of routinely examining their programs using the social equity analysis (procedural fairness, access or distributional equity, quality or process equity, and outcomes) to identify racial differences. She also admonished researchers, policymakers, and welfare administrators to "Routinely collect empirical data to assess whether there is consistency in their programs; acknowledge that racial disparities is a serious problem; use social equity analysis to ask important questions; hold agencies accountable for problematic results; and reward agencies which demonstrate exceptional performance" (2006, 2).

Riccucci (2009) examined patterns of social equity in federal employment utilizing the construct of social equity in terms of justice, fairness, and equality in the distribution of federal jobs across racial, ethnic, and gender lines. In particular, she examined the degree to which the federal government fills jobs in its upper levels equally and fairly in terms of race, gender, and ethnicity. The study showed that, with few exceptions, these groups, despite continued calls for greater equity, remain in lower-level, lower-paying, less prestigious jobs. According to Riccucci (2009, 379),"White women have made some progress in terms of reaching higher-level positions, but their pay continues to lag behind White as well as Asian men. Despite small changes over the past 20 years, and slight variations between and among the groups, people of color overall continue to be concentrated in lower-level, lower-paying jobs in the federal government."

As discussed above, most studies in the US use the term disparities when examining inequities in health. Hug (2006) in his presentation at the Fifth Social Equity Leadership Conference, identified several health and health care indicators for measuring each area of social equity and stated that there are numerous, often large health disparities in all the social equity measurement areas. The following indicators were identified for each measurement area:

- Access/distribution – health insurance coverage, usual source of care, utilization of health care service;
- Procedural – referral to specialist, explanations of conditions, respect, and waiting time;
- Quality – disease management, preventive care, and overall satisfaction; and
- Outcome – mortality rates and [morbidity rates] for various diseases and conditions.

Using data from various sources, Hug provided evidence of disparities across racial/ethnic groups with minorities experiencing greater disparities than Whites. For example, Blacks (8.4 percent) and Hispanics (10.5 percent) were more likely to be uninsured compared to Whites (8 percent); 37.4 percent of Hispanics and 22 percent of Blacks compared to 17.9 percent of Whites reported problems with getting referred to a specialist; and the death rate for major cardiovascular diseases in 2001 was highest for Blacks (421.3) compared to Hispanics (236.3) and Whites (313.4). Hug also pointed out that there were: "systematic inequalities in access to health services among minorities, inequities in the fair and consistent treatment in the health care system, and inequities in the quality of health care" (National Academy of Public Administration 2006, 15).

Building upon Hug's assessment of inequality in access to health services, there are several potential applications to the different measures of social equity (procedural, access/distributional, outcomes, and quality) as they relate to different areas of health: access to health care, health status, health conditions, and medical visits. These areas may be measured by addressing the following questions:

- Access/distributional equity
    - Are there racial/ethnic differences in the type of insurance coverage?
    - Are there racial/ethnic differences in the usual place of care for health services?
- Procedural equity
    - Are there racial/ethnic differences in the process for obtaining health coverage?
    - Are there racial/ethnic differences in the treatment of patients?

    - Are there racial/ethnic differences in referral to specialist?
    - Are waiting times for medical visits similar for the same service or are there racial/ethnic differences?
- Process/quality equity
    - Are there racial/ethnic differences in the quality of care received based on the type of insurance coverage?
    - Does the quality of service vary by location of the service?
    - Are there racial/ethnic differences in the quality of services received?
    - Are there racial/ethnic differences in patients' satisfaction with services?
- Outcome equity
    - Are there racial/ethnic differences in the perception of self-assessed health status?
    - Are there racial/ethnic differences in the obesity-related health outcomes?

Based on the previous discussion and the reported differences in services and health between racial/ethnic groups, it is important to examine if these differences exist within racial/ethnic groups. Therefore, a framework was developed to guide this analysis. Figure 2 depicts the framework designed to examine inequities in health using the four areas for measuring social equity. Social equity in health is shown as the overall goal (outcome) with the four intermediate areas (access, procedural fairness, quality, and outcome) and their inter-relatedness. These areas can all be influenced by an individual's demographic, socio-economic, behavioral/cultural, and environmental characteristics. This framework will be used to identify health differences and therefore provide information and opportunities for intervening to reduce disparities. The following section provides a discussion of the various

components of the framework based on the literature as it pertains to obese Black Americans as well as obesity studies for other minorities. Following the practice used in the US, the term disparities will be used interchangeably with inequities, although not all disparities are inequitable.

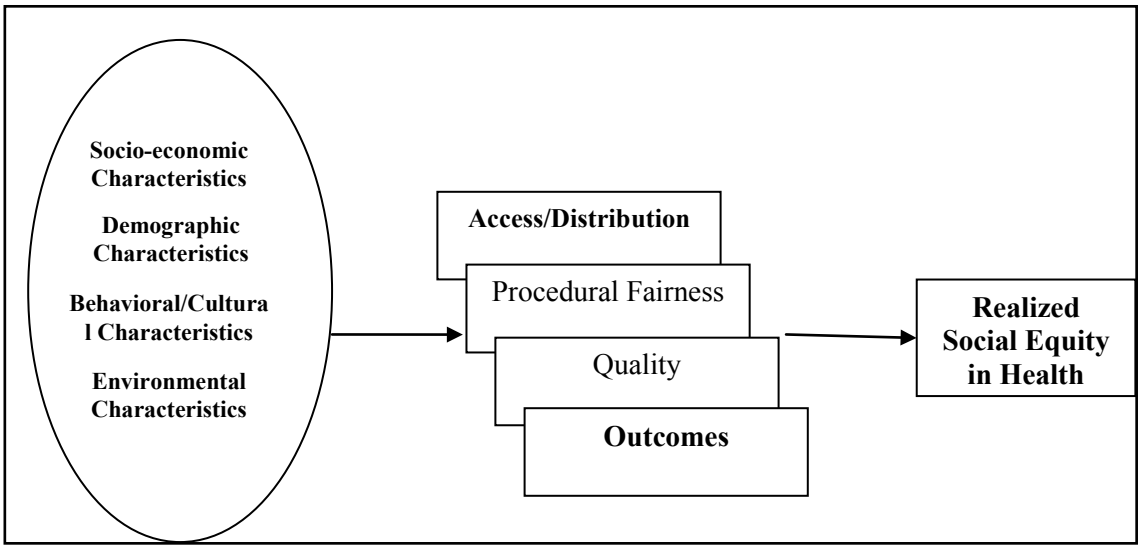

Figure 2. Framework for measuring social equity in health

E. Studies Relevant to this Research

This section of the literature review focuses on studies of obesity among foreign-born Blacks in the US. A computerized on-line search of English-language articles from 1985 (implementation of the new measurement for obesity) to present was performed to discover research relevant to obesity and health inequities/disparities (health status, health care quality, access to health care, and treatment at health care facilities). The databases searched included the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Education Research Index Catalog (ERIC), Journal Storage (JSTOR), Medline, Public Affairs Information Service (PAIS) International, and SocIndex, as well as citations from the bibliographies of relevant articles.

The following terms were used to search for relevant articles: health disparities, inequities in health, minorities, Black or African American, Hispanics, Asians, ethnic groups or subgroups, foreign-born or immigrant, US-born, native, chronic health conditions and diseases in combination with obesity, overweight, and BMI with limits to studies on Americans.

1. Inclusion and Exclusion Criteria for this Study

Inclusion criteria included empirical and comparison studies of obesity, measured by BMI between adult foreign-born and US-born Blacks or foreign-born and natives; health disparities/inequities defined by health status, health care quality, access to health care, and treatment at health care facilities among Blacks and Whites; studies that examined health and health-related issues among Blacks. Studies that also looked at other minority population subgroups (Asians, Hispanics) were also included to examine and compare the variation within subgroups. The methods section was also reviewed for inclusion. Most studies were quantitative and used national databases like the NHIS, NHANES, or other cross-sectional and longitudinal surveys.

The following exclusion criteria were selected to ensure that only studies focusing on the population and outcomes of interest were included. Studies that focused on the clinical or biomedical aspects of obesity and chronic health conditions; studies on the majority immigrant population; and those examining children defined as those less than 18 years of age were excluded.

2. Studies on Obesity and Inequity in Health

Table 6 presents the methods and findings from several studies that investigated obesity among the foreign-born and US-born Blacks or foreign-born and natives; health

disparities/inequities among Blacks and Whites, as well as between subgroups in the Black and other minority populations. The following narrative briefly summarizes the information presented in Table 6.

a. Measures of Social Equity

This section presents indicators and methods of measuring social equity in health using studies that operationalize the four areas of social equity as it relates to health. These include heath status, access to health care, utilization of health care services, and health care quality.

I. Outcome-Measured by Health Status

Health status disparities are differences in the incidence or prevalence of disease, disability, or illness (LaVeist 2005, 109). Reports from the literature indicate that in comparisons of US-born and foreign-born adults, US-born Blacks have higher rates of obesity than other racial/ethnic groups. Using data from the Family Core and Sample Adult components of the 1998-2003 NHIS, Dey and Lucas (2006) studied the physical and mental health status of immigrants in the US. The authors found that US-born adults were almost 50 percent more likely to be obese than their immigrant counterparts and the prevalence of obesity was higher among US-born Blacks than any other racial ethnic groups regardless of nativity. The prevalence of chronic diseases such as hypertension and cardiovascular diseases was lower among immigrant Blacks than native-born Blacks. More immigrant Blacks also rated their health as excellent or very good (64 percent) compared to US-born Blacks (51 percent). Native-born Blacks were two times more likely to report limitations in both activities of daily living (ADLs) and instrumental activities of daily living (IADLs).

Research on the health status of Black immigrants in the US has detailed differences among subgroups. Read and colleagues (2005) examined data from the 2000-2001 NHIS to compare the health status (measured by self-rated health, activity limitation, and limitations due to hypertension) of Blacks born in the US, Africa, the West Indies, and Europe to that of US-born Whites. Differences among the subgroups were reported with, US- and European-born Blacks having poorer self-rated health, higher odds of activity limitation and limitations due to hypertension compared to African- and Caribbean-born Blacks and US-born Whites. The results also indicated that Black immigrants differed significantly from each other, with Africans experiencing the best health, followed by West Indians, and Europeans.

Bryant (2003) investigated the relationship between place of birth and reported health status among 9,697 Black US-born and foreign-born women from the 1991 NHIS. Results indicated that more foreign-born Black women rated their health status as excellent compared to US-born women. These results also varied by age, with more US-born women aged 18-49 years reporting excellent/very good health status than their foreign-born counterparts. Differences in reported health status were also observed for employment status, educational attainment, household composition, and poverty status. Lucas, Barr-Anderson, and Kington (2003), in examining health status, health insurance, and health care utilization patterns of immigrant Black men also reported similar results. Compared to their US-born counterparts, foreign-born Black men were in better overall health and reported less functional limitations compared to US-born Black men.

II. Access/Distributional- Measured by Health care Access and Utilization

According to Dey and Lucas (2006), foreign-born adults (26 percent) were more likely to be uninsured than their native born (11 percent) counterparts and Hispanic adult

immigrants followed by Blacks, and Asians were most likely to be without insurance. Foreign-born adults were also more likely to be without a usual source of care compared to their US-born counterparts. Lucas, Barr-Anderson, and Kington (2003) reported that foreign-born Black men were less likely than their US-born counterparts to have health insurance despite the higher rates of employments and higher education. They were also less likely to report seeing a physician or being hospitalized in the past six months.

III. Procedural Fairness and Quality-Measured by Health care Quality

"Health care disparities are differences in the quality of care that are not due to clinically appropriate treatment decisions or patient preferences" LaVeist (2005, 109). In a study of obesity among US immigrant racial subgroups by duration of residence, Goel et al. (2004) in examining data from the 2000 NHIS reported that among immigrant subgroups, longer duration of residence in the US is associated with higher BMI. With regards to discussing their diet and eating habits with a clinician, the researchers found that foreign-born respondents (18 percent) were less likely to report receipt of counseling compared to US-born respondents (24 percent) and foreign-born Blacks and Hispanics were less likely to receive dietary counseling compared to US-born Whites. Nineteen percent of foreign-born compared to 23 percent of US-born respondents reported that a clinician recommended beginning exercise within the last 12 months. After adjustments, immigrant Black, but not immigrant Hispanic or Asian respondents were less likely to report exercise counseling than were US-born Whites. Native Blacks were also less likely to report exercise counseling.

Table 6.
Studies on obesity, immigrant population and measures of social equity

Author	Sample	Variables	Access/ Distributional	Procedural/ Quality	Outcome
(Dey and Lucas 2006)	US-born and foreign-born	Obesity			+
		Chronic diseases			+
		Health status			+
		Activity limitation			+
		Health insurance	+		
		Usual source of care	+		
(Read, Emerson and Tarlov 2005)	Black American subgroup from Africa, Caribbean, Europe, US	Health status			+
		Activity limitation			+
		Hypertension			+
(Goel et al. 2004)	US-born and foreign-born	Obesity			+
		Health status			+
		Chronic diseases	+		
		Usual source of care	+		
		Insurance	+		
		Dietary counseling		+	
		Exercise counseling		+	
(Kaplan et al. 2004)	Hispanic American subgroup	Health status			
		Chronic conditions			
		Activity limitations			
		Insurance			
		Usual source of care			
(Bryant 2003)	US and foreign-born Black women	Health status			+
Lucas, Barr-Anderson and Kington 2003)	US-born and foreign-born Black males	Health status			+
		Activity limitation			+
		Health insurance	+		
		Doctors visit	+		
		Hospitalization	+		
(Singh and Siahpush 2002)	US-born and foreign-born	Obesity			+
		Chronic diseases			+

NOTE: + = reported differences

b. Mediating/Confounding Factors

Social equity in health among the obese population may also be influenced by other variables such as demographic, socio-economic, behavioral/cultural, and environmental.

I. Demographic and Socio-economic Characteristics

It is important to consider demographic variables such age, gender, race/ethnicity, and marital status, as well as socio-economic variables measured by education, occupation, and/or income when discussing health equity. Age, gender, and race/ethnicity impact health equity because these factors can determine the need for and utilization of health services. These factors for the most part are also interrelated within themselves and with socio-economic variables. For example, your age determines whether or not you can work, and studies have shown that females and minorities tend to earn less than their male and majority counterparts respectively.

Demographic and socio-economic factors have been recognized as contributors to health disparities. LaVeist (2005, 157) reports that "people with low SES due to factors such as limited education and low income, have higher rates of morbidity and mortality compared to those who have more economic resources." Researchers from the Kaiser Foundation have also reported that, "on average, individuals with more education and more income tend to have better access to health care and better health outcomes than those with less education and income" (The Henry J. Kaiser Foundation 2007, 1).

II. Behavioral/Cultural Characteristics

Culture and behavior can independently influence health. Since the US is a diverse country with both native-born and immigrants from various countries; these factors cannot be omitted in any discussion of health and health care. An individual's culture can dictate their

care seeking pattern, as well as their attitudes towards the health care system (Dreeben 2001). Culture also impacts an individual's behavior such as diet, smoking, and exercise which are all linked to health outcomes. It also impacts an individual's perception of beauty and body image. For the foreign-born, acculturation (measured by length of stay in country) into the US lifestyle has been reported to be detrimental to an individual's health (Singh and Siahpush 2002). Studies that examined the impact of demographic, socio-economic, behavioral, and cultural characteristics on obesity and social equity are described below.

After controlling for demographic and socioeconomic variables including age, marital status, education, income, and geographic region, Lucas (2003) reported that the odds ratio for foreign-born Black men to report fair or poor health was significantly lower than for US-born Black and White men. The higher odds of being uninsured among foreign-born Black men compared with either US-born or White men remained even after controlling for the above.

Goel et al. (2004) examined the magnitude of change in BMI and duration of residence in the US by fitting a linear regression model with BMI as the continuous outcome and the categorical variable of years in the US as the primary association of interest. After adjusting for age, gender, race/ethnicity, education, and income, they found that living in the US for 10 years or more was associated with a significantly higher BMI. No significant association was found in foreign-born Blacks.

Using data from 1993-1994 NHIS, Singh and Siahpush (2002) examined how immigrants' risks of health behaviors and morbidity vary with increasing length of residence in the US. Logistic regression models were fitted to the weighted NHIS data to determine the extent to which risks of cigarette smoking, obesity, hypertension, or chronic medical

conditions vary among major ethnic-nativity groups and by length of residence. After controlling for age, gender, race/ethnicity, marital status, family size, place and region of residence, education, employment status, and family income, the results indicated that US-born Blacks had higher rates of obesity and hypertension compared to immigrant Blacks. The risk of obesity and hypertension also appeared to increase consistently with increasing duration of residence in the US across all groups.

The association of length of residence in the US and obesity among Hispanic immigrants was studied by Kaplan and colleague (2004). The study utilized data from the 1998 NHIS for 2,420 foreign-born Mexican, Cuban, and Hispanics from other Latin American countries. The overall rate of obesity was lower among foreign-born (19.7 percent) than US-born (28.2 percent) Hispanics, and Mexican immigrants had the highest rate of obesity. Current nonsmokers, co-morbidity (more than two chronic conditions), presence of functional limitations, and country of birth were significantly associated with obesity.

After adjusting for socioeconomic characteristics, demographic characteristics, smoking, health status, access to health services, and psychological well-being, the results indicated that Hispanic immigrants' length of residence in the US is associated with increasing level of obesity. Long-term immigrants ($\geq$ 15 year) had a nearly four-fold higher risk of obesity than recent immigrants (< 5 years). However, the rate of obesity among long-term immigrants was lower than that among US-born Hispanics.

Using data from the 1992-1995 NHIS, Lauderdale and Rathouz (2000), examined whether BMI and the odds of being overweight or obese varied among six major Asian American ethnic group (Chinese, Filipino, Japanese, Asian Indian, Korean, and Vietnamese).

The authors also investigated whether BMI varied by nativity (US- versus foreign-born), years in the US or socioeconomic status. The results indicated that BMI and the proportion overweight or obese were lower among each of the Asian American ethnic groups than the US population in general, however the proportion varied by ethnicity and nativity. US-born Asian Americans were significantly more likely to be obese or overweight than the foreign-born. The odds of being overweight or obese increased for foreign-born Asian Americans with longer duration in the US. There was only a weak association between economic status (measured by family income adjusted for family size), and BMI for foreign-born Asian American women and a positive association for foreign-born men.

Another behavioral/cultural factor that affects the health seeking patterns of African Americans is racism. "Racism can affect health by giving rise to racial discrimination at the individual and institutional level. The former is an important but neglected stressor that can lead to adverse changes in health status, while the latter can result in the inequitable distribution of desirable institutional resources" (Williams 1996, 497). According to Boulware and colleagues (2003), the literature is replete with documentation of racial discrimination in medical research and the health care system, most notably the Tuskegee Syphilis Study. African Americans' knowledge of this history has been linked to a low level of trust in medical research and medical care and differences in trust of health care providers have been implicated in racial disparities in health and access to health care among African Americans.

In their study examining differences between African Americans and Whites in attitudes toward physicians, health insurance plans, and hospitals; Boulware et al. (2003) also identified differences in patterns of trust of physicians, health insurance plans, and hospitals.

The authors concluded that "differences in trust of components of the health care system may reflect divergent cultural experiences of Blacks and Whites as well as differences in expectations for care" (2003, 358)

III. Environmental Characteristics

Environmental factors such as neighborhood or location have been shown to influence health. Boardman and colleague's (2005) article on racial differentials in obesity: the impact of place revealed that neighborhoods characterized by high proportion of Blacks had a greater prevalence of obesity than areas in which the majority of the residents were White. Similar results were also reported by Glass et al. (2006) in a study conducted in Baltimore of neighborhood psychosocial hazards and an individual's risk for increased obesity. The results indicated that residents of neighborhoods in the highest quartile of the Neighborhood Psychosocial Hazards scale were nearly twice as likely to be obese compared to residents in the least-hazardous neighborhoods (53 percent compared to 27 percent). After controlling for age, gender, race/ethnicity, education, household wealth, alcohol consumption, tobacco use, self-reported physical activity, and dietary intake, living in a neighborhood with greater psychosocial hazards was found to be independently associated with obesity.

F. Gaps in Past Literature

While most of the studies dichotomized the Black population into US- and foreign-born Blacks, they all found variations among the two groups and in some cases better outcomes for immigrants compared to US-born Blacks or Whites. These studies however, failed to examine the differences between Blacks of different ethnicities or places of birth,

which according to Arthur and Katkin (2006, 27) "may be an important factor in health outcomes among Blacks residing in the US."

A small number of studies have documented the differences in obesity among other racial/ethnic subgroups, including Asian Americans (Lauderdale and Rathouz 2000) and Hispanic Americans (Kaplan et al. 2004; Khan, Sobal and Martorell 1997). Like other studies that examined diversity in ethnicity, they also reported differences in obesity and health outcomes among these ethnic subpopulations. However, very few studies have examined differences in health and health care among obese individuals, especially among the Black ethnic subpopulation.

G. Limitations of Previous Studies

The major limitation of the studies described above is that the majority of the studies only examined US-born and foreign-born Blacks and not the Black subgroups. The two studies that examined Black subgroups did not examine obesity. Although the study conducted by Read and colleagues (2005) involved examining Black subgroups, they only used two years of data and restricted the study to only the outcome measure of social equity (self-rated health, activity limitation, and limitation due to one of the obesity-related chronic health condition, hypertension). The authors also did not focus on obese individuals.

The proposed study will utilize four years of data and will focus not only on the outcome measures of social equity in health, but also on the access/distributional measures of social equity as they relate to disparities among obese Black Americans.

H. Summary

Equity in health has been described as equal access for equal need, equal utilization for equal need, and equal quality of care for all (Whitehead 1990), yet disparities in health

and health care continue to plague Black Americans in the US. Some of these inequities in health are unnecessary and avoidable and could be prevented if health and health care was equitable. For example, more than 45 percent of Blacks in the US were obese compared to 31 percent of Whites (Ogden et al. 2006); however, Blacks were less likely to receive dietary and exercise counseling from a clinician compared to Whites (Goel et al. 2004). Disparities in health also vary within the Black population and studies have documented that while immigrant Blacks may have better health outcomes than their US-born counterparts, they tend to have less access to health care services (Dey and Lucas 2006). Based on the premise of equal access for equal need, equal utilization for equal need, and equal quality of care for all, a study examining these factors using the social equity framework may identify opportunities for intervention in reducing health disparities. Using the social equity framework this study examined differences in health, access to and utilization of health care services among obese Black Americans.

I. Proposed Research Questions

According to Gamble and Stone (2006, 97), "research and policy reports generally note three types of racial/ethnic health disparities: disparities in health status, access to care, and quality care." However, these reports are based on existing data sources that rarely collect information on minority subgroups, and "current disparities analyses probably mask variation among subpopulations" (Griffith et al. 2006, 482). Therefore, this study will examine various national health surveys to see if they collect information on Black American subgroups and whether variations exist in obesity and selected measures of social equity in health among the Black American ethnic subpopulations.

Based on the literature review this study addresses four research questions:

1. Do routinely used taxonomies for race/ethnicity in national health surveys capture the distinctions among major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks)?

To demonstrate the importance of capturing the distinction within the population this study also examines the remaining questions:

2. What is the estimated prevalence of obesity among the major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks) and US-born Whites? Does it differ among the groups?
3. How does the prevalence of obesity among US-born Blacks, Caribbean-born Blacks, and African-born Blacks compare by sociodemographic, behavioral, and health characteristic with US-born Whites?
4. Do significant differences in BMI by race / ethnicity remain after controlling for access to health care (measured by health insurance coverage and usual source of care) and health status (measured by self-assessed health status)?

CHAPTER THREE - METHODOLOGY[1]

This chapter discusses the method used to examine the research questions developed in Chapter two. It also describes the data sources and explains the design and data analysis strategies employed to address the research questions and hypotheses.

A. The Data Source

Data for this study were drawn from several sources including national surveys used to report the Nation's health and health care utilization. For the first research question, the list of national surveys was selected from the surveys used in the most recent "*Health, United States*," publication, an annual report on the Nation's health status and included:

- The MEPS which produces nationally representative estimates of health care use, expenditures, sources of payment, insurance coverage, and quality of care for the U.S. civilian non-institutionalized population.
- National Ambulatory Medical Care Survey (NAMCS) is a national survey designed to provide information about the provision and use of medical care services in office-based physician practices in the United States.
- NHANES provide estimates of the health status of the civilian non-institutionalized population of the United States.
- National Hospital Ambulatory Medical Care Survey (NHAMCS) collects data on the utilization and provision of medical care services provided in hospital emergency and outpatient departments.

[1] The material in this section is based on information obtained from the 2000-2004 National Health Interview Survey Data File Documentation. Available at http://www.cdc.gov/nchs/about/major/nhis/quest_data_related_1997_forward.htm

- NHIS monitors the health of the U.S. population through the collection and analysis of data on a broad range of health topics.

These surveys were analyzed to see how each survey classified race and ethnicity.

The remaining sections focus on the data source used to address the three other research questions. The analyses for these questions were based on information from the 2000-2003 NHIS (National Center for Health Statistics 2001; National Center for Health Statistics 2002; National Center for Health Statistics 2003; National Center for Health Statistics 2004).

1. The Study Design

The NHIS is a cross-sectional multipurpose population based survey that provides national estimates of the health of civilian non-institutionalized individuals residing in the US. The survey has been continuously collected since 1957 and is the primary source of information on the amount, distribution, and effects of illness and disability in the US population. (National Center for Health Statistics 2006)

The survey is administered by the US Census Bureau under contract by the NCHS. Data are collected through in-person household interviews using computer-assisted personal interviewing (CAPI), and is conducted by trained interviewers in English and Spanish. Data are collected in sampled households, and one family, one sample adult, and one sample child (if children under age 18 are present) is randomly selected for additional data collection.

2. Population and Sample

The NHIS utilizes a stratified multistage probability design that permits the representative sampling of households. Sampling and interviewing are continuous throughout each year. The sampling strategy was also designed to oversample for Blacks or

African Americans and Hispanics, to allow for more precise estimation of health in these populations. The sample for the survey is redesigned and redrawn every ten years to cover the changing US population. Because of the multistage sample design, a weight variable is necessary to calculate estimates from the NHIS. (Gentleman and Pleis 2002)

The combined 2000-2003 interviewed sample of the NHIS consists of 386,913 persons from 149,647 households in 152,301 families. A sample of one randomly selected adult per household yields a total adult sample of 127,596. Table 7 depicts the individual and combined NHIS interviewed sample and the response rate for the adult sample module, as well as the percentage of Blacks interviewed for each year (2000-2003) of survey.

Table 7.
Interviewed Sample from the National Health Interview Survey, 2000-2003

Year	Household	Families	Persons	Sample Adult (Percentage of total)			
	Number						
				Total	Response Rate (%)	% of Total for Blacks	% of Total for Foreign-born Blacks
2000	38,633	39,264	100,618	32,374	72.1	14.1	1.2
2001	38,932	39,633	100,761	33,326	73.8	13.9	1.3
2002	36,161	36,831	93,386	31,044	74.3	13.5	1.2
2003	35,921	36,573	92,148	30,852	74.2	13.6	1.2
Total	**149,647**	**152,301**	**386,913**	**127,596**	**73.6**	**13.8**	**1.2**

3. Instrument

The survey contains a core set of questions that remains relatively unchanged from year to year among three components: family core module, sample adult core module, and sample child core module. The family core questionnaire collects information on the household composition and sociodemographic characteristics, basic indicators of health status and utilization of health care services of every family member residing in the household. The sample adult and child core collects information on health status, health care services, and behavior (National Center for Health Statistics 2006).

Data are reviewed and analyzed extensively to ensure their validity and reliability. Numerous studies have validated the survey by using it to estimate various aspects of health, health care, as well as health care access and utilization. The data collected are primarily quantitative and include nominal, ordinal and interval variables.

B. Institutional Review Board

The proposal for this study was submitted to the University of Baltimore Institutional Review Board (IRB) as an exempt application for approval. An exemption was approved by the IRB because the data for this study are publicly available from the NCHS through the internet and there are no personal identifiers in the data that can be linked back to any of the survey participants.

C. Study Participants

The inclusion criteria for this study are: respondents with BMI less than or equal to 65 kg/m^2, since values >65 kg/m^2 seem questionably large (Bates et al. 2008) and non-Hispanic respondents aged 18 years and older in the following categories: US-born Blacks, foreign-born Blacks from the Caribbean, Africa, and US-born Whites (reference group). European-born Blacks were excluded because they tend to have very small numbers and their characteristics are reported to be similar to Whites because they are usually from a predominately White racial context (Read and Emerson 2005). Respondents with an unknown place of birth, race/ethnicity, and BMI were excluded from the study. Only those respondents that indicated Black-only or White-only as their race will be selected. Since this study will focus on differences within the Black subpopulation, including multiple race or Hispanic ethnicity (Black and any other race/ethnicity) may introduce other health, cultural, and demographic factors unique to that population. In addition, the multiple race designation

is a recently introduced concept (since 2000) and the sample size may be too small to do any meaningful analyses.

D. Operationalizing Social Equity for this Study

The choice of variables for this study was guided by the conceptual framework of social equity as it related to health. Social equity in health will be measured by identifying inequities/disparities in health. Health inequities/disparities are defined as differences in which disadvantaged groups (such as the racial/ethnic minorities) systematically experience worse health or greater risks than more advantaged groups (Braveman 2006, 180). This will include inequities/disparities in health that occur within/between Black ethnic subgroups, in addition to differences between each Black ethnic subgroups and Whites. Equity in health will mean that all things being equal, all Black ethnic subgroups and Whites have equal (same or similar) outcomes.

Social equity in health was measured by identifying inequities/disparities in health insurance coverage, usual source of care, and medical visits which served as proxies for the enabling factors of access to health care which has been identified by Whitehead (1990), as one of the determinants of health disparities that is more likely to be unfair and avoidable. The study also examined inequities in selected obesity-related diseases (hypertension, diabetes, cancer, and cardiovascular diseases), as well as self-reported health status which will serve as need factors.

E. Variables in the Study

The selected variables were based on those relevant to the conceptual framework, study objectives, and research questions. They also depended on the responses to each

variable (level of missing data). The independent, dependent, and control variables for this study are defined and identified below.

1. Dependent variable

Obesity status was the primary dependent variable in this paper and obesity in the NHIS is measured by BMI. BMI is the standard method for the measurement of obesity in most studies as discussed in Chapter Two. Obesity is defined as having a BMI $\geq$ 30 kg/m^2 among adults and the NHIS calculates BMI from respondents' self-reported height and weight. BMI was used both as a continuous variable and as a categorical variable based on the NIH's classifications for all other analyses.

2. Independent variables

One of the major independent variables was equity in health as measured by health care utilization, access to health care, as well as health status. These variables also served as the measures of association for the multivariate analyses (regression).

a. Health care access and utilization

Indicators of health care access and utilization included health insurance, usual source of care, and physician contact. These variables were the most cited indicators for measuring health care access and utilization (Dey and Lucas 2006; James et al. 2007; Aday and Andersen 1981). The NHIS asked respondents about the type and source of health insurance coverage and includes a detailed list of both public and private coverage. Questions regarding contact with a physician or other health care professional are asked for two reference periods (past two weeks and past 12 months). Respondents are also asked about their usual source of care and the type of provider.

b. Health status

Indicators of health status employed in this study included: self-assessed health and self-reported chronic diseases. Self-reported health has been recognized as an important indicator of health that is associated with a wide array of outcomes, from well-being to health service utilization by Heithoff et al. (1997) and poorer health status of racial/ethnic minority Americans is reflected in higher death rates for many common causes of disease (James et al. 2007). Self-rated health was assessed by asking respondents to rate whether their health in general was "excellent, very good, good, fair or poor."

The NHIS also includes an extensive list of self-reported conditions checklist. The conditions of interest in this study will include the obesity-related conditions that are prevalent in Black Americans (hypertension, diabetes, cardiovascular disease, and cancer). As previously reported (Dey and Lucas 2006), cardiovascular disease includes coronary heart disease, heart attack, stroke, and angina. Information on diseases was obtained by asking if the respondent have ever been told by a doctor or other health professional that he/she had a particular disease.

c. Racial and ethnic subgroups

The other independent variable was the racial and ethnic subgroups. This variable was composed from a combination of ethnicity, race, region of birth, and place of birth; and these variables were all collected as the following in the survey data. Respondents were asked "Do you consider yourself to be Hispanic, or Latino?" and "What race do you consider yourself to be?" Respondents were also asked "Where were you born?" and the choices included all the states in the US, other countries, and US Territories. The NHIS classified individuals born in US Territories as foreign-born, since these respondents were more likely

to be culturally similar to other foreign-born respondents than US-born respondents (Goel et al. 2004).

For this study, only individuals who selected Black-only as their race and non-Hispanic or Latino as their ethnicity were selected for the Black ethnic category. They were classified as US-born if they were born in one of the 50 states and the District of Columbia, Africa-born if they selected Africa as their region of birth, and Caribbean-born if they selected Mexico, Central America, and Caribbean Islands, as well as South America as their region of birth. Individuals selecting the US Virgin Islands will also be classified as Caribbean-born. Those who selected White-only as their race, non-Hispanic or Latino as their ethnicity, and are born in the US will serve as the reference group.

3. Control variables

The NHIS provides information on a host of sociodemographic, behavioral, and cultural variables. The control variables select for this study have been identified in previous discussions as factors associated with obesity and/or equity in health.

a. Sociodemographic

The sociodemographic variables of interest in this study include gender, age, region, and education. Educational attainment was used as the proxy for socioeconomic status instead of income (very poor response rate and is mainly imputed information), because it is stable over an adult lifespan, regardless of changes in health status (Krieger, Williams and Moss 1997) and has similar measures across countries. To assess geographic variations, a regional variable based on the US Census definition of region was included (Northeast, Midwest, South, and West).

b. Health behaviors

Other factors such as the frequency of physical activity and smoking will also be used. Cigarette smoking status was based on questions related to lifetime and current use of cigarettes. Smoking status at the time of the interview was categorized as current smoker, former smoker, or never smoked. Current smokers are persons who report smoking every day or some days. While nonsmokers are adults who have never smoked 100 cigarettes in their lifetime, and former smoker are adults who have smoked 100 cigarettes but were not smoking as of the date of the interview (Barnes et al. 2006; Dey and Lucas 2006).

The physical activity measure was based on questions that asked about the intensity and frequency of physical activity. They include: (1) how often respondents do vigorous activities for at least 10 minutes that cause heavy sweating or large increases in breathing or heart rate; and (2) how often do you do light or moderate activities for at least 10 minutes that cause only light sweating or a slight to moderate increase in breathing or heart rate? These responses were used to create a leisure-time physical activity variable.

Similar to what have been reported in previous studies (Barnes and Schoenborn 2000; Barnes et al. 2006), regular leisure-time physical activity is defined as engaging in light-moderate leisure-time physical activity for greater than or equal to 30 minutes at a frequency greater than or equal to five times per week or engaging in vigorous leisure-time physical activity for greater than or equal to 20 minutes at a frequency greater than or equal to three times per week. Inactive is defined as never participating in, or being unable to participate in any leisure-time physical activity for a minimum of 10 minutes. Some activity is defined as participating in at least one session of light, moderate, or vigorous leisure-time physical activity of at least 10 minutes but does not meet the requirement for regular activity.

c. Acculturation

Acculturation is defined as "those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups" (Redfield, Linton and Herskowits 1936). According to (Landrine and Klonoff 2004, 529),

> "Although there are numerous scales for measuring acculturation among diverse ethnic minority groups, health researchers tend to use simple, proxy measures that differentiate the traditional from their more acculturated counterparts. Foremost among such measures are speaking English versus another language at home; completing a health survey in English versus another language; being born in versus an immigrant to the Anglo host country; number of years of residence in said country; receiving health care from biomedical versus indigenous-folk healers; living in a city versus on an Indian reservation; or living in an integrated versus segregated-minority neighborhood, with the former categorized as acculturated and the latter as culturally-traditional in each case."

In this study acculturation was measured by the proxy variable length of stay in the US for foreign-born individuals. This information was ascertained by asking respondents about the number of years that they have lived in the U.S.

4. Matrix of proposed study variables

Table 8 provides a summary of the study variables, survey questionnaire where the variable can be found (see Appendix III for the actual questions from the survey), response categories, and recoded study categories. These variables were obtained from the sample adult and person public-use data files of the 2000-2003 NHIS.

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Sociodemographics				
Gender	Family Core	SEX	Male	Male
			Female	Female
Age	Family Core	AGE_P	0-85+	18-39 40-59 60+
Hispanic ethnicity	Family Core	ORIGIN_I	Yes No	Combined with Race (see Race)
Race	Family Core	RACERPI2	White only	Non-Hispanic White-only
			Black/African American only	Non- Hispanic Black-only
			AIAN only	Non-Hispanic Other
			Asian only	Non-Hispanic Other
			Race group not releasable	Non-Hispanic Other
			Multiple race	Non-Hispanic Other
Geographic region	Family Core	REGION	Northeast	Northeast
			Midwest	Midwest
			South	South
			West	West
Foreign-born	Family Core	USBRTH_P	USA: born in one of the 50 states or D.C	US-born
			USA: born in a US territory	Foreign-born
			Not born in the US or a US territory	Foreign-born
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Education	Family Core	EDUC_R1	Less/equal to 8th grade	<12 year
			9-12th grade, no diploma	<12 year
			High school graduate	12 years
			GED recipient	12 years
			Some college, no degree	< 16 years
			AA degree, technical or vocational	< 16 years
			AA degree, academic program	<16 years
			Bachelor's degree (BA, BS, AB, BBA)	16+ years
			Master's, professional, or doctoral degree	16+ years
			Child under 5 years of age	Unknown
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Geographic region of birth	Family Core	REGIONBR	United States	US-born
			Mexico, Central America, Caribbean Islands	Caribbean-born
			South America	Caribbean-born
			Europe	Other
			Russia (and former USSR areas)	Other
			Africa	African-born
			Middle East	Other
			Indian Subcontinent	Other
			Asia	Other
			SE Asia	Other
			Elsewhere	Other
			Unknown	Unknown

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Citizenship	Family Core	CITIZENP	Yes, citizen of the US	Citizen
			No, not a citizen of the US	Non-citizen
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Length of residence	Family Core	YRSINUS	Less than 1 year	< 5 yrs.
			1 yr., less than 5 yrs.	< 5 yrs.
			5 yrs., less than 10 yrs.	5 to < 10 yrs.
			10 yrs., less than 15 yrs.	10 to < 15 yrs.
			15 years or more	15 + yrs.
			Unknown	Unknown
Health and behavioral characteristics				
Self assessed health status	Family Core	PHSTAT	Excellent	Excellent/very good
			Very good	Excellent/very good
			Good	Good
			Fair	Fair/poor
			Poor	Fair/poor
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Weight status	Adult Core	BMI	9.15-99.95	<18.5 18.5-24.9 25-29.9 30-34.9 35-39.9 40-65
			Unknown	Unknown

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Hypertension	Adult Core	HYPEV	Yes	Yes
			No	No
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Diabetes	Adult Core	DIBEV	Yes	Yes
			No	No
			Borderline	No
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Cancer	Adult Core	CANEV	Yes	Yes
			No	No
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Heart disease (combination of several heart-related illnesses)	Adult Core	CHDEV ANGEV MIEV STREV	Yes	Yes
			No	No
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Usual source of care	Adult Core	AUSUALPL	Yes	Yes
			There is no place	No
			There is more than one place	Yes
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown

Table 8.

Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Usual place to go to for care	Adult Core	APLKIND		
			Clinic or health center	Usual place
			Doctor's office or HMO	Usual place
			Hospital emergency room	Usual place
			Hospital outpatient department	Usual place
			Some other place	Usual place
			Doesn't go to one place most often	Usual place
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Utilization (health care visits)	Adult Core	AHCNOYR2	None	None
			1	1-3 visits
			2-3	1-3 visits
			4-5	4-9 visits
			6-7	4-9 visits
			8-9	4-9 visits
			10-12	> 10 visits
			13-15	> 10 visits
			16 or more	> 10 visits
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
Smoking	Adult Core	SMKSTAT1	Current	Smoker
			Former	Former
			Never smoked	Non-smoker
			Smoker, current status unknown	Unknown
			Unknown if ever smoked	Unknown

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
Physical activity	Adult Core	VIGFREQW	Less than once per week	Never/Unable
			1-28 times per week	Some physical activity
			Never	Never/Unable to do physical activity
			Unable to do vigorous activity	Never/Unable to do physical activity
			Refused	Unknown
			Not ascertained	Unknown
	Adult Core	MODFREQW	Less than once per week	Never/Unable
			1-28 times per week	Some physical activity
			Never	Never/Unable to do physical activity
			Unable to do strength activity	Never/Unable to do physical activity
			Refused	Unknown
			Not ascertained	Unknown
Health insurance coverage	Family Core	PRIVATE	Yes, information	Private
			Yes, but no information	Private
			No	
			Refused	
			Not ascertained	
			Don't know	
		MEDICARE	Yes, information	Medicare
			Yes, but no information	Medicare
			No	
			Refused	
			Not ascertained	
			Don't know	

Table 8.
Summary of the proposed study variables of interest

Variable	Survey Questionnaire	Variable name	NHIS response categories	Study categories
		MEDICAID	Yes, information	Medicaid
			Yes, but no information	Medicaid
			No	
			Refused	
			Not ascertained	
			Don't know	
		MILITARY	Yes, Military/VA only	Military
			Yes, TRICARE/CHAMPUS	Military
			Yes, unknown type	Military
			No	
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
		CHIP	Yes, information	CHIP
			No	
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
		OTHERPUB	Yes	Other public
			No	
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
		OTHERGOV	Yes	Other gov't.
			No	
			Refused	Unknown
			Not ascertained	Unknown
			Don't know	Unknown
		UNINSURED	Combination of the "No" responses to the above identified insurance coverage.	Uninsured

F. Data Analysis Strategy

Before data analysis was conducted, four years of data were combined to increase the sample size and the reliability of the estimates which is a common procedure recommended by the NCHS (National Center for Health Statistics 2003). Each year's survey variables were reviewed for consistency and were recoded and renamed if the same variable had a

different name in any of the surveys. If all of the surveys did not contain a particular variable, it was excluded. A frequency distribution of all variables was conducted to identify outliers and to provide a description of each variable. Variables with refused and not ascertained responses were recoded to unknown/missing. Unknown/missing information was also examined for inclusion or exclusion of the variable from the study. Table 9 provides the percentage of the unknown/missing information for each of the selected variables. The percentage of missing information ranged from zero to less than five percent.

Because this study focused on Black American subgroups, the small numbers in each subgroup may preclude examining/contrasting one or more of these. Therefore the Caribbean-born and African-born Blacks may be combined into foreign-born Blacks for some analyses. Some variables with less than five observations were also combined for chi square analyses.

The Statistical Package for the Social Sciences (SPSS) for Windows version 14.0 was the primary data management and statistical analyses software. Estimates were weighted as required and the **Su**rvey **Da**ta **An**alysis Program (SUDAAN) served as the secondary statistical software to account for the complex sample design and to compute standard errors. Since four years of data were combined for the study, the sum of the weights was about four times the size of the civilian non-institutionalized population; therefore, each year's weight was divided by four as required by the survey description documentation (National Center for Health Statistics 2004). A significance level of 0.05 was used for all statistical tests.

Table 9.
Summary of missing data

Variable	Missing data (%)
Sociodemographics	
Gender	0
Age	0
Race	0
Education	1.2
Region in US	0
Foreign-born	0.1
Geographic region of birth	0.2
Citizenship	0.3
Length of residence in US	1.1
Lifestyle behaviors	
Smoking	1.1
Physical activity	2.9
Health status	
Self assessed health status	0.1
BMI	4.7
Obesity-related diseases	
Hypertension	0.2
Diabetes	0.1
Cancer	0.1
Heart disease	0.2
Access to care	
Health insurance	0.5
Usual source of care	0.6
Visits	1.7

1. Goals of the Study

The primary aim of this study is to demonstrate the importance of utilizing the appropriate racial and ethnic taxonomy in data collection instruments used to monitor the Nation's health by using a social equity framework to examine whether differences in health, health care access and utilization exist among obese Black Americans from Africa, the Caribbean, and those born in the US and whether these differences are associated with BMI. The major objectives are: (1) to examine whether various national health surveys collect

information on Black American subpopulations (2) to determine the prevalence of obesity among Black American ethnic subgroups, (3) to compare the extent of the differences in access to health care, utilization, and health among obese Black American ethnic subgroups and Whites, and (4) to examine the association between BMI and Black American ethnic subgroups.

The analysis was conducted in four steps. The first step of the analysis was to use descriptive statistics (i.e., frequencies and means) to summarize the information and sample population. The second step was to determine the prevalence of obesity among the four groups. The third step was to compare selected sociodemographic, behavioral, and health characteristics of the obese sample across the four groups. The final step utilized multiple regression analyses to explore the relationship between BMI and race/ethnic subgroups controlling for influential sociodemographic and health parameters.

Figure 3 identifies the set of sociodemographic, behavioral, and health variables gleaned from the literature that was included in this study to investigate the objectives identified above. It also includes the expected direction of the relationship between the dependent variable weight status and the independent variables.

Prior to identifying any associations, relationships, differences, or making predictions about the data; descriptive statistics were used to summarize the sample population. To provide a description of the sample, exploratory data analyses were conducted which included frequencies, graphs, percentages, and measures of central tendency and variability. Analyses included separate estimates for each of the selected Black American ethnic subgroups (US-born Blacks, Caribbean-born Blacks, and African-born Blacks), as well as that of Whites which served as the reference group. All data were weighted to reflect

national population estimates. The following section outlines the research questions with accompanying hypotheses, and data analysis strategies for addressing the identified objectives.

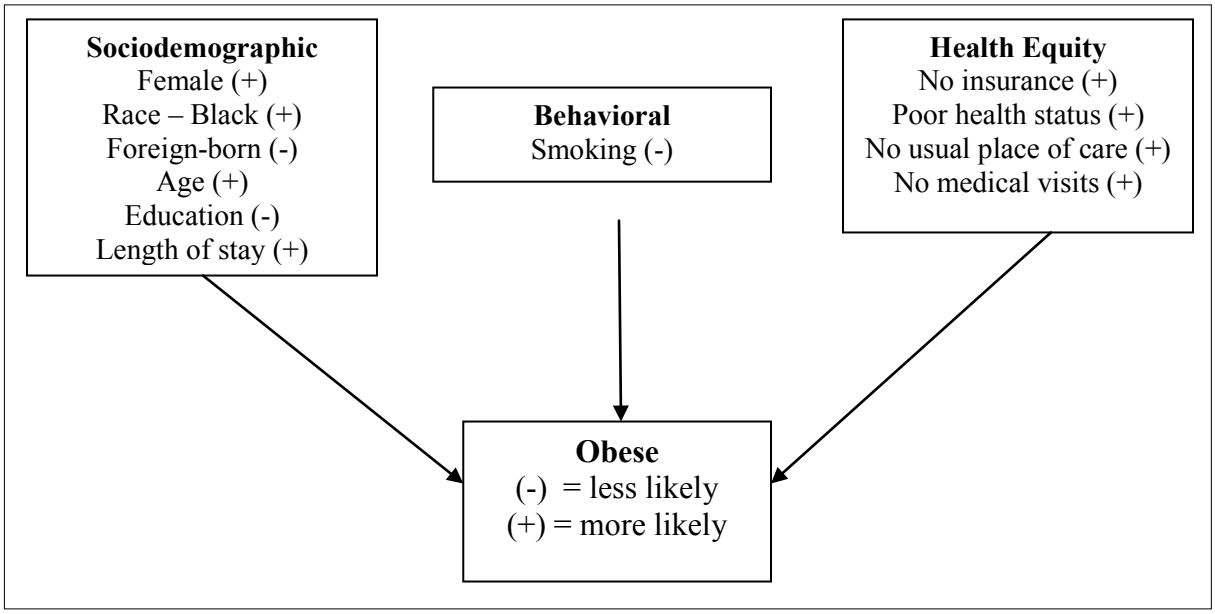

Figure 3. Factors affecting obesity

2. Research Questions and Hypotheses

Research Question 1

Do routinely used taxonomies for race/ethnicity in national health surveys capture the distinctions among major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks)?

Null hypothesis 1*: Routinely used taxonomies for race/ethnicity in national health surveys do not capture the distinctions among major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks)?*

Data analysis strategy:

A literature review and various survey instruments from national surveys that are generally used to report the Nation's health and health care utilization were reviewed. As

stated above, the list of national surveys was selected from the survey used in the "*Health, United States*," publication which presents information on health status and health care utilization, resources, and expenditures (National Center for Health Statistics 2010). Each survey's questionnaire was reviewed to determine what data were collected on immigrant status, in particular those that distinguished specific immigrant groups within the Black population.

Research Question 2

What is the estimated prevalence of obesity among the major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks) and US-born Whites? Does it differ among the groups?

***Null hypothesis 2**: There is no statistically significant difference in the mean prevalence of obesity among US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites.*

Data analysis strategy:

The prevalence of obesity among the Black American subgroups was estimated by univariate and bivariate analyses, including frequencies and percentages. Analyses included separate estimates for each of the selected Black American subgroups (US-born Blacks, Caribbean-born Blacks, and African-born Blacks), and to provide context and comparison that of Whites. Analysis of variance (ANOVA) was used to determine if statistically significant differences existed in group means and if so which contrast. One-way ANOVA determines whether a relationship exists between three or more group means (Myatt 2007). ANOVA was used for the analysis since the test variable (BMI) is a continuous variable and

the group (racial/ethnic subgroup) variable has more than two categories (US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites).

Research Question 3

How does the prevalence of obesity among US-born Blacks, Caribbean-born Blacks, and African-born Blacks compare by sociodemographic, behavioral, and health characteristic with US-born Whites?

***Null hypothesis 3**: There is no statistically significant difference in obesity among US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites by sociodemographic, behavioral, and health characteristics.*

Data analysis strategy:

Descriptive univariate and bivariate analyses including frequencies and percentages were performed to describe the sample, and to make estimates of the population. In addition estimates of obesity prevalence were contrasted according to sociodemographic, behavioral, and health characteristics. Chi-square tests were used for all comparisons where both variables were categorical. Chi-square is a hypothesis test to use with variables measured on a nominal or ordinal scale (Myatt 2007). All variables whose bivariate associations have a significant P-value (< 0.05) were candidates for the regression analysis.

Research Question 4

Do significant differences in BMI by race/ethnicity remain after controlling for access to health care (measured by health insurance coverage and usual source of care) and health status (measured by self-assessed health status)?

Null Hypothesis 4A: BMI does not differ by race/ethnicity after controlling for access to health care (measured by health insurance coverage and usual source of care) and health status (measured by self-assessed health status).

Null Hypothesis 4B: BMI does not differ by race/ethnicity after controlling for access to health care (measured by health insurance coverage and usual source of care), health status (measured by self-assessed health status), and selected sociodemographic variables (gender, age, education, region, smoking, exercise).

Data analysis strategy

Multiple linear regression models were developed to determine whether race/ethnic subgroup was significantly associated with BMI while accounting for potential confounders, measures of social equity in health (health status, health insurance coverage, and usual source of care), including adjustments for potential sociodemographic confounders (age, gender, education, region, smoking, exercise). BMI was treated as a continuous outcome measure for all of the models and race/ethnic subgroup was used as the primary association of interest with each measure of social equity in health. Additional tests were conducted to examine if the above association varied by age, gender, education, region, smoking, exercise.

Multiple linear regression is a statistical method use to assess the relationship between a dependent variable and a set of independent variables (StatSoft 2010). In order to use regression analysis, the dependent variable must be continuous and the independent variables can be either continuous or dichotomous. The model equation for multiple linear regression is as follows (Myatt 2007):

$$y=a+b_1X_1+b_2X_2+\ldots+b_nX_k$$

y is the value of the dependent variable

a is a constant or intercept

b_1 to b_n are correlation coefficient for each predictor variable

X_1 to X_n are the independent variable that is explaining the variance in y

The multiple linear regression model is based on several assumptions: (1) it can only accurately estimate the relationship between dependent and independent variables if the relations are linear. Scatterplots are generally used as an exploratory step in regression to identify possible departures from linearity. (2) It assumes that there is no multicollinearity in the data. Multicollinearity occurs when predictors are highly correlated among themselves and can be assessed by correlation matrix, tolerance, or variance inflation factor. (3) There should be no autocorrelation among the error terms. (4) The data are homoscedastic meaning the variances are equal. Both nonautoregression and homscedasticity can be checked by scatterplot. (5) The error terms should be normally distributed. This is the least critical of the regression assumptions (Tabachnick & Fidell 1996; Kahane 2001). When conducting regression analysis, most authors recommend that there should be 10-20 cases for every independent variable in the model (StatSoft 2010).

There are several types of multiple regression analyses (e.g., enter or simultaneous, stepwise, forward, backward), which differ in the way the independent variables are entered into the regression equation (Nicol and Pexman 1999). In the simultaneous or enter method, all the variables are entered into the model and their contributions are assessed. With the forward selection, variables are sequentially entered into the model in an order determined by the strength of their correlation with the dependent variable. The effect of adding each variable is assessed as it is entered and variables that do not significantly add to the success of the model are excluded. Backward selection, all the variables are entered into the model

and the weakest independent variable is then removed and the regression re-calculated. This procedure continues until only useful variables remain in the model. With the stepwise selection procedure, each variable is entered in sequence and its value assessed. If adding a variable contributes to the model it is retained, then all other variables are re-assessed to see if they still contribute to the model; if not, they are removed. This method ensures that the smallest set of independent variables is included in the model (Brace, Kemp and Snelgar 2006).

The method selected for variable selection was the simultaneous regression option with BMI as the dependent variable. Two models were designed to answer the research question above and each model was analyzed using multiple linear regression analysis.

Model 1 *Y (BMI) = a + b1 (Health Insurance Coverage) + b2 (Usual Source of Care) + b3 (Self-assessed Health Status) + b4 (Racial/ethnic Subgroup)*

Model 2 *Y (BMI) = a + b1 (Health Insurance Coverage) + b2 (Usual Source of Care) + b3 (Self-assessed Health Status) + b4 (Racial/ethnic Subgroup) + b5 (Gender) + b6 (Age) + b7 (Education) + b8 (Region) + b9 (Smoking) + b10 (Exercise)*

G. Summary

The methodology outlined in this chapter provides a detailed description of the data source to be used and the analytical strategies to be employed in: identifying surveys that collect information on Black American subgroups and examining the differences in health, health care access and utilization among obese Black and White Americans. The strategies included using univariate analysis (description), hypothesis testing with chi-square, ANOVA, and multiple linear regression. The results of these analyses are reported in the chapter four.

CHAPTER FOUR – RESULTS

This chapter reports the findings from the data analysis based on the research questions described in chapter three. It includes the findings from the survey instruments reviewed (Table 10), the descriptive characteristics of the sample population (Table 11 and Figure 4), and presents the results of the univaritate, bivariate/multivariate analyses (Figure 5 and Tables 12-16), correlation matrix (Table 17), regression analysis that show which of the health equity and demographic characteristics are associated with BMI (Tables 18), and the results summary (Table 19).

A. Research Questions and Hypotheses

The results for each of the research questions outlined in the data analysis strategy section are detailed below.

1. Findings from the selected health survey questionnaires

Of the more than 50 government surveys utilized to produce the Health, United States publication, only five were national surveys that produced information on the Nation's health and health care utilization: MEPS, NAMCS, NHANES, NHIS, and NHAMCS. All of the national surveys that produced information on the Nation's health and health care utilization used the OMB required categories for race and ethnicity. Three of the surveys, MEPS, NHAMCS, and NAMCS did not collected information on country of birth or other items that can be used to identify immigrant status. While NHANES collected information on country of birth, it is limited to US-born and a list of Spanish speaking countries for the other country category (Table 10). Of the five surveys, only one captured information that can be utilized to identify the diversity within the Black population, the NHIS. The NHIS collects information from a list of almost 700 countries; these are aggregated into 10 regions based on

the countries' geographic proximity to one another on the public use file. The more detailed information on respondents' place of birth can be accessed through the NCHS Research Data Center.

Table 10
Black immigrant groups classification in selected national health surveys in the US

	NHANES 2007/2008	NHIS 2007	NAMCS 2007	NHAMCS 2007	MEPS 2007
Immigrant groups	No	yes	No	No	No
Mexico, C. America, Caribbean		yes			
Mexico		yes			
South America		yes			
Europe		yes			
Russia		yes			
Africa		yes			
Middle East		yes			
India		yes			
Asia		yes			
SE Asia		yes			
Elsewhere		yes			

2. Descriptive Characteristics of Sample

Table 11 summarizes the basic sociodemographic characteristics of the sample population overall and each racial and ethnic subgroup. The sample consisted of 92,156 (unweighted) adults aged 18 years and older, which represented an estimated 158,954,266 non-Hispanic Black and US-born White adults. Eighty-six percent of the sample was non-Hispanic US-born Whites and 14 percent was non-Hispanic Blacks. Of the non-Hispanic Blacks, 90 percent were US-born, seven percent were born in the Caribbean, and three percent were born in Africa (Figure 4).

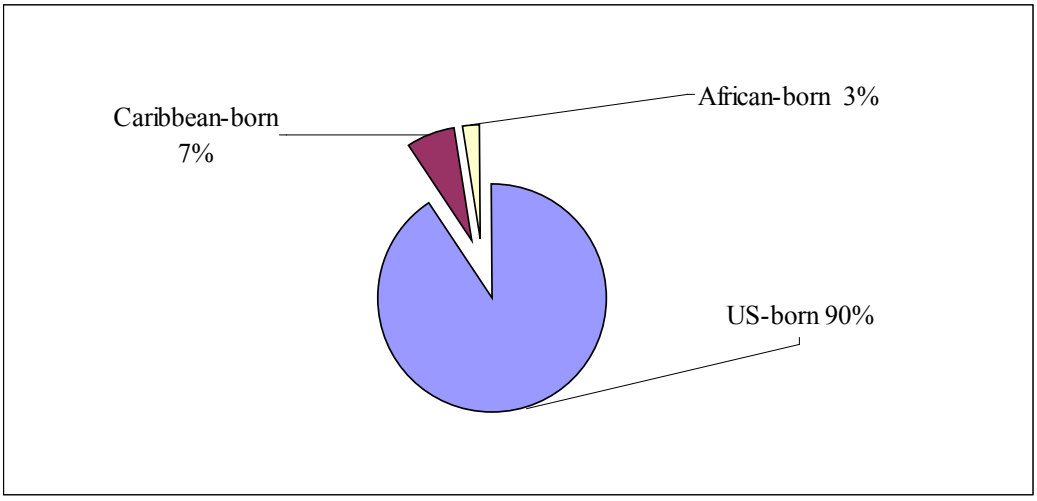

Figure 4. Percent distribution of Black ethnic subgroups for non-Hispanic Black adults 18 years of age and over: United States, 2000-2003
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

The gender distribution was predominantly female overall and for US-born Blacks and Whites as well as Caribbean-born Blacks. However, African-born Blacks were more likely to be males (63 percent) than females (37 percent). The mean age of the sample was 46 years (SE=0.12) and the average ages of each of the racial and ethnic subgroup was African-born Blacks (M=36; SE=0.79), US-born Whites (M=47; SE=0.13), US-born Blacks (M=42; SE=0.25) and Caribbean-born Blacks (M= 42; SE=0.47). The majority of the sample completed high school (31 percent); and US-born Blacks were least likely to have completed high school (24 percent). A higher percentage of African-born Blacks (38 percent) was found in the highest education category compared to US-born Whites (26 percent) and US-born Blacks (13 percent) had the lowest proportion of individuals in this category. Among foreign-born Blacks, the majority of those born in the Caribbean have lived in the US for more than 15 years (55 percent), while the majority (32 percent) of those born in Africa reported a length of stay of less than five years. Most native-born (60 percent) and African-born Blacks (39 percent) resided in the South compared to US-born Whites (35 percent), while most Caribbean-born Blacks (59 percent) resided in the Northeast.

Table 11.
Demographic characteristics of the study population stratified by adult non-Hispanic Black ethnic subgroups and US-born Whites: United States, 2000-2003 – weighted estimates

Selected Characteristics	Total	Black subgroups			US-born Whites
		US-born	Caribbean-born	African-born	
	Number				
Total (weighted)	158,954,268	19,772,891	1,530,529	553,032	137,097,815
	Percent Distribution or Mean (standard error)				
Gender					
Male	48.6 (0.20)	44.8 (0.49)	43.1 (2.76)	62.9 (3.28)	49.2 (0.22)
Female	51.4 (0.20)	55.2 (0.49)	56.8 (2.76)	37.1 (3.28)	50.8 (0.22)
Age at interview					
Mean	46.0 (0.12)	42.4 (0.25)	42.0 (0.47)	35.7 (0.79)	46.6 (0.13)
18-39	39.5 (0.28)	47.7 (0.68)	46.4 (1.50)	64.3 (2.86)	38.2 (0.31)
40-59	37.5 (0.24)	35.6 (0.54)	41.5 (1.80)	32.4 (2.80)	37.7 (0.26)
60+	23.0 (0.23)	16.7 (0.47)	12.1 (1.07)	3.3 (1.01)[a]	24.1 (0.26)
Education[1]					
Less than high school	13.8 (0.22)	23.7 (0.64)	18.4 (1.22)	8.0 (1.78)	12.4 (0.22)
High school/GED	31.2 (0.26)	32.3 (0.53)	28.2 (1.81)	16.6 (2.60)	31.1 (0.30)
Some college	30.3 (0.22)	30.6 (0.69)	35.3 (1.74)	37.7 (3.04)	30.2 (0.23)
College or more	24.7 (0.31)	13.4 (0.46)	18.0 (1.36)	37.8 (3.35)	26.3 (0.35)
Length of stay in US					
Non-immigrant	98.8 (0.08)	100 (0.00)	…	…	100 (0.00)
< 5 yrs.	0.20 (0.02)	⋯	10.3 (1.06)	32.1 (3.04)	⋯
5 to < 10 yrs.	0.21 (0.02)	⋯	14.1 (0.97)	24.1 (3.34)	⋯
10 to < 15 yrs.	0.24 (0.02)	⋯	21.1 (1.71)	13.9 (2.04)	⋯
15 + yrs.	0.06 (0.05)	⋯	54.6 (1.67)	30.7 (3.15)	⋯
Geographic region in US					
Northeast	19.1 (0.31)	12.9 (0.56)	58.6 (3.70)	28.1 (3.59)	19.5 (0.36)
Midwest	27.8 (0.41)	19.9 (0.80)	1.6 (0.47)	23.9 (3.67)	29.3 (0.44)
South	38.1 (0.44)	60.3 (1.11)	36.9 (3.78)	39.3 (3.99)	34.9 (0.48)
West	14.9 (0.30)	7.0 (0.34)	2.7 (0.67)	8.6 (1.78)	16.2 (0.34)

[a] Estimates have a relative standard error of greater than 30% and less than or equal to 50%. These should be interpreted with caution as they do not meet the standard of reliability or precision.
… Not applicable.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

The overall mean BMI for all racial and ethnic subgroups was 27 kg/m^2, with a SE of 0.03. However, the mean BMI was higher for US-born Blacks (M=29 kg/m^2; SE=0.70) and Caribbean-born Blacks (M=27 kg/m^2; SE=0.28); whilst that for African-born Blacks (M=26 kg/m^2; SE=0.33) and US-born Whites (M=27 kg/m^2; SE=0.03) was lower (Table 12).

Table 12.
Prevalence of obesity among adult Black ethnic subgroups and US-born Whites: United States, 2000-2003 - weighted estimates

		Black subgroups			
	Total	US-born	Caribbean-born	African-born	US-born Whites
	Number				
Weighted sample size	158,954,268	19,772,891	1,530,529	553,032	137,097,815
	Percent distribution or mean (SE)				
	100.0	100.0	100.0	100.0	100.0
BMI (kg/m^2)					
Mean (SE)	26.9 (0.03)	28.6 (0.70)	27.2 (0.28)	25.9 (0.33)	26.6 (0.03)
Underweight (<18.5)	2.0 (0.06)	1.4 (0.12)	0.72 (0.26)	2.4 (0.82)	2.1 (0.06)
Normal weight (18.5-24.9)	39.6 (0.23)	30.1 (0.52)	36.9 (2.29)	45.3 (3.15)	40.9 (0.25)
Overweight (25.0-29.9)	35.2 (0.19)	34.4 (0.46)	39.8 (1.72)	39.0 (3.14)	35.3 (0.20)
Obese (≥30.0)	**23.2 (0.20)**	**34.0 (0.48)**	**22.5 (1.94)**	**13.3 (2.22)**	**21.7 (0.21)**
Class I (30.0-34.5)	64.5 (0.038)	57.1 (0.80)	66.1 (3.42)	63.7 (8.98)[a]	66.4 (0.44)
Class II (35.0-39.9)	22.4 (0.31)	24.3 (0.69)	23.0 (2.91)	[b]	22.0 (0.36)
Class III (≥40.0)	12.9 (0.26)	18.6 (0.64)	10.9 (2.66)	12.7 (7.76)	11.7 (0.28)
Mean (SE)	34.9 (0.04)*	35.8 (0.09)	34.5(0.40)	34.5 (0.91)	34.7 (0.05)

[a] Estimates have a relative standard error of greater than 30% and less than or equal to 50%. These should be interpreted with caution as they do not meet the standard of reliability or precision.
[b] Estimates have a relative standard error of greater than 50% and are not shown.
* Statistically significant at the $p \leq .05$ level for ANOVA.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

An ANOVA was conducted to test for significant differences across the groups by examining the group means and the variance within these groups. It indicated that there was a significant overall difference in BMI according to racial and ethnic subgroups, $F(3, 92{,}156) = 433$, $p < .0001$. Table 13 presents the results of the post hoc multiple comparison tests. The Scheffé test detected significantly higher differences in the mean BMI rate

between five groups- US-born Whites and US-born Blacks, US-born Whites and Caribbean-born Blacks, US-born Blacks and Caribbean-born Blacks, US-born Blacks and African-born Blacks, Caribbean-born Blacks and African-born Blacks. The Scheffé test controls for simultaneous multiple contrast to maintain an overall contrast significance level. These results indicate that the Black Americans differ in BMI and may be potentially different in the prevalence of obesity and therefore should not be treated as a homogenous group but should be examined as a heterogeneous group.

Table 13.
Results of the analysis of variance body mass index among adult Black ethnic subgroups and US-born Whites (Scheffé test to control for multiple contrast): United States, 2000-2003 - weighted estimates

				95% Confidence Interval	
Racial and ethnic subgroup comparison		Mean difference	SE	Lower	Upper
US-born Whites	US-born Blacks	-2.0141*	0.06	-2.1710	-1.8572
	Caribbean-born Blacks	-.5365*	0.19	-1.0666	-.0064
	African-born Blacks	.7237	0.31	-.1550	1.6024
US-born Blacks	US-born Whites	2.0141*	0.06	1.8572	2.1710
	Caribbean-born Blacks	1.4776*	0.20	.9305	2.0248
	African-born Blacks	2.7378*	0.32	1.8487	3.6269
Caribbean-born Blacks	US-born Whites	.5365*	0.19	.0064	1.0666
	US-born Blacks	-1.4776*	0.20	-2.0248	-.9305
	African-born Blacks	1.2602*	0.37	.2371	2.2834
African-born Blacks	US-born Whites	-.7237	0.31	-1.6024	.1550
	US-born Blacks	-2.7378*	0.32	-3.6269	-1.8487
	Caribbean -born Blacks	-1.2602*	0.37	-2.2834	-.2371

* Mean difference is statistically significant at the $p \leq .05$ level.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

3. Prevalence of obesity

Of the total sample population, 24 percent (21,754 in the unweighted sample and 36,894,647 in the weighted sample) were obese. As shown in Figure 5, African-born Blacks

(46 percent) and US-born Whites (42 percent) were more likely to be in the normal weight category, Caribbean-born Blacks (35 percent) were more likely to be overweight, and US-born Blacks were more likely to be classified as obese (35 percent).

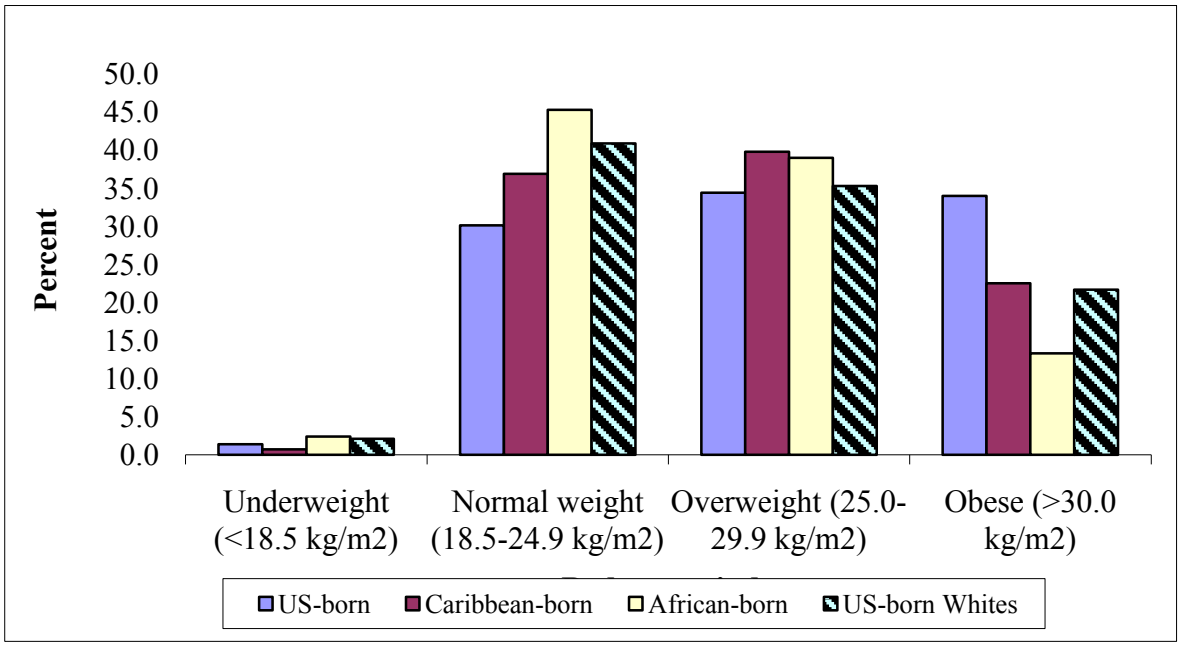

Figure 5. Prevalence of obesity among adult Black ethnic subgroups and US-born Whites: United States, 2000-2003
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

The prevalence of obesity was more than 1.5 times higher for US-born Whites (22 percent) and Caribbean-born Blacks (23 percent) compared to African-born Blacks (14 percent), and 2.5 times as high for US-born Blacks (36 percent). Within the obesity class categories, US-born Whites had the lowest prevalence of class II obesity and Caribbean-born Blacks had the lowest rate within the class III category.

4. Differences in the mean prevalence of obesity

Among the obese population, the mean BMI was similar across all of the racial and ethnic subgroups. An ANOVA was conducted to test for significant differences across the groups by examining the group means and the variance within these groups. It indicated that there was a significant overall difference in the prevalence of obesity according to racial and

ethnic subgroups, $F (3, 21750) = 55$, $p < .0001$. Table 14 presents the results of the post hoc multiple comparison tests. The Scheffé test detected significantly higher differences in the mean obesity rate between two groups- US-born Blacks and US-born Whites, and US-born Blacks and Caribbean-born Blacks. All other comparisons were not significant.

5. Differences in the prevalence of obesity by demographic/behavioral characteristics

The racial and ethnic group differences in the prevalence of obesity by sociodemographic and behavioral characteristics are shown in Table 15. There were overall racial and ethnic subgroup differences (chi square test) in the prevalence of obesity on each of the socio-demographic and behavioral variables. The prevalence of obesity was higher among females than males across all racial and ethnic subgroups except for US-born Whites. The rate for females was almost twice as high as the rate for males for US-born Blacks (62 percent vs. 38 percent) and Caribbean-born Blacks (65 percent vs. 36 percent). US-born White females were less likely to be obese compared to all the Black ethnic subgroups, while US-born White males were more likely to be obese compared to all the Black ethnic subgroups.

The prevalence of obesity varied across age groups by racial and ethnic subgroups. Obesity prevalence was highest among 18-39 year olds for US-born Blacks (44 percent) and African-born Blacks (50 percent) and highest among 40-59 year olds for Caribbean-born Blacks (47 percent) and US-born Whites (45 percent). Among all racial and ethnic subgroups, obesity was lowest among those 60 years and older. Compared to US-born Whites aged 18-39 years, Black ethnic subgroups were more likely to be obese and less likely than Whites to be obese among those aged 60 years and older.

Table 14.
Results of the analysis of variance for the prevalence of obesity among adult Black ethnic subgroups and US-born Whites (Scheffé test to control for multiple contrast): United States, 2000-2003 - weighted estimates

Racial and ethnic subgroup comparison		Mean difference	SE	95% Confidence Interval	
				Lower	Upper
US-born Whites	US-born Blacks	-1.0813*	0.08	-1.3179	-0.8448
	Caribbean-born Blacks	0.2246	0.34	-0.7247	1.1738
	African-born Blacks	0.1290	0.73	-1.9164	2.1744
US-born Blacks	US-born Whites	1.0813*	0.08	0.8448	1.3179
	Caribbean-born Blacks	1.3059*	0.35	0.3382	2.2735
	African-born Blacks	1.2103	0.73	-0.8437	3.2643
Caribbean-born Blacks	US-born Whites	-0.2246	0.34	-1.1738	0.7247
	US-born Blacks	-1.3059*	0.35	-2.2735	-0.3382
	African-born Blacks	-0.0956	0.80	-2.3459	2.1548
African-born Blacks	US-born Whites	-0.1290	0.73	-2.1744	1.9164
	US-born Blacks	-1.2103	0.73	-3.2643	0.8437
	Caribbean -born Blacks	0.0956	0.80	-2.1548	2.3459

* Mean difference is statistically significant at the $p \leq .05$ level.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

Overall obesity was lowest among those with less than a high school education (17 percent). Within racial and ethnic subgroups, the highest rates were observed among high school graduates for US-born Blacks (32 percent) and Whites (34 percent), and among one-third of those with some college education for Caribbean-born Blacks. African-born Blacks had the highest prevalence rate among those with a college education or higher (37 percent). US-born (25 percent) and Caribbean-born (26 percent) Blacks with less than a high school education were almost twice as likely as US-born Whites (15 percent) to be obese. Among college graduates, US-born Whites (20 percent) reported higher rates of obesity compared to US-born (12 percent) and Caribbean-born (14 percent) Blacks.

Regionally, the majority of obese US-born Blacks (62 percent) and Whites (37 percent) resided in the South, while Caribbean-born (61 percent) and African-born Blacks

(40 percent) were more likely to reside in the Northeast. For immigrants, more than half of the Caribbean-born Blacks who have lived in the US for 15 years or more were obese compared to 32 percent of African-born Blacks. The estimated prevalence of obesity increases with increasing length of stay in the US among Blacks from the Caribbean. Those with 15 or more years in the US were about seven times more likely to be obese than new comers with less than five years.

Most obese adults have never smoked with rates ranging from 50 percent of US-born Whites to 84 percent of Caribbean-born Blacks. Compared to smokers (21 percent), non-smokers (53 percent) were more than two times as likely to be obese across all the racial and ethnic subgroups. Among Caribbean-born Blacks, non-smokers were nine times more likely to be obese. US-born White non-smokers reported lower obesity rates compared to the Black ethnic subgroups. US-born Blacks and Whites reported the highest prevalence of current cigarette smoking (20 percent and 21 percent respectively).

Overall, about one-fourth of the obese population engaged in regular leisure-time physical activity. The prevalence of obesity was higher among inactive adults (45 percent) compared to those who reported regular physical activity (26 percent) and was twice as high as those who participated in regular physical activities for all racial and ethnic subgroups except US-born Whites. US-born Whites were more likely to report regular physical activity compared to each of the Black ethnic subgroups. More than half of the obese respondents from each of the Black ethnic subgroups reported being inactive in their leisure-time compared to 43 percent of US-born Whites.

6. Differences in the prevalence of obesity by health characteristics

This section examines the different aspects of social equity in health as it relates to the Black ethnic subgroups and Whites. Specifically the discussion focuses on several measures of access to health care and health status which were the selected indicators for social equity in health for this analysis, as discussed previously. Table 16 presents the racial and ethnic group differences in the prevalence of obesity by health characteristics.

There were significant overall racial and ethnic subgroup differences on each of the health characteristics, with the exception of being diagnosed with diabetes. In terms of health insurance coverage, the majority of the study population overall (73 percent) and within each of the racial and ethnic subgroups were covered by private health insurance (range from 56-78 percent). US-born Whites were more likely to be covered by private insurance compared to each of the Black ethnic subgroup; and Caribbean-born Blacks were least likely to be covered by private insurance. Foreign-born Blacks from Africa (24 percent) and the Caribbean (30 percent) were more likely to be without health coverage compared to US-born Blacks (20 percent) and Whites (11 percent). Both Caribbean-born and African-born Blacks were three times more likely than US-born Whites and about two times more likely than US-born Blacks to be uninsured. A higher percentage of US-born Blacks reported coverage from public sources compared to US-born Whites and foreign-born Blacks.

Caribbean-born (59 percent) and African-born Blacks (70 percent) were more likely than US-born Whites (51 percent) and Blacks (44 percent) to rate their health status as excellent or very good. US-born Blacks and Whites were twice as likely as Caribbean-born Blacks to perceive their health as only fair or poor. The report of at least one obesity-related

health condition was similar across all racial and ethnic subgroups. However, as it relates to each of the selected obesity-related conditions, US-born Whites were significantly more likely to report being diagnosed with cancer and cardiovascular diseases compared to all the Black ethnic subgroups. They were also significantly more likely than African-born Blacks to have ever been told they have hypertension (40 percent and 26 percent respectively).

Among obese Black ethnic subgroups, Caribbean-born adults (17 percent) were most likely to report no usual source of care for health services and were about two times as likely as US-born Whites (9 percent) to be without a usual place for health care. Obese African adults (22 percent) were more likely than others in the Black ethnic subgroup (15 percent to 19 percent) and US-born Whites (14 percent) to report not seeing a physician in the past 12 months. Each racial and ethnic subgroup was about six times less likely to not have an office visit compared to those with an office visit.

Table 15.
Prevalence of obesity among adult Black ethnic subgroups and US-born Whites by selected sociodemographic and behavioral characteristics: United States, 2000-2003 - weighted estimates

Selected Characteristics	Total	Black ethnic subgroups			US-born Whites	Overall Chi-square
		US-born	Caribbean-born	African-born		
	Number					
Total	36,894,647	6,730,717	344,745	73,580	29,745,605	
	Percent distribution (SE)					
Total	100 (0.00)	100 (0.00)	100 (0.00)	100 (0.00)	100 (0.00)	
Gender						204.0*
Male	49.2 (0.42)	37.7 (0.90)†	34.7 (4.19)†	44.1 (8.29)	52.0 (0.47)	
Female	50.8 (0.42)	62.3 (0.90)	65.3 (4.19)	55.9 (8.29)	48.0 (0.47)	
Age at interview						199.3*
Mean (SE)	47.2 (0.15)	43.6 (0.31)	43.3 (1.01)	40.3 (1.20)	48.1 (0.16)	
18-39	33.8 (0.42)	43.9 (0.97)†	38.7 (3.13)†	50.4 (7.81)†^	31.4 (0.48)	
40-59	43.9 (0.39)	39.6 (0.96)	47.3 (3.49)	49.6 (7.81)	44.8 (0.46)	
60+	22.3 (0.35)	16.5 (0.68)	14.0 (2.19)	0 (0.00)	23.8 (0.40)	
Education						253.1*
Less than high school	16.5 (0.34)	24.6 (0.96)†	25.7 (3.61) †‡	- [b]†‡^	14.6 (0.34)	
High school/GED	33.8 (0.40)	32.4 (0.88)	27.6 (4.53)	19.0 (4.94)	34.2 (0.45)	
Some college	31.4 (0.38)	31.3 (0.89)	32.9 (2.52)	33.3 (7.38)	31.4 (0.44)	
College or more	18.3 (0.35)	11.7 (0.64)	13.8 (3.31)	36.9 (7.33)[a]	19.8 (0.41)	
Geographic region in US						656.4*
Northeast	17.5 (0.42)	11.4 (0.62)†	60.5 (6.09)†‡	40.4 (8.36)†‡^	18.3 (0.50)	
Midwest	29.1 (0.58)	20.3 (1.00)	- [b]	22.8 (6.24)	31.4 (0.66)	
South	40.4 (0.65)	62.2 (1.29)	36.4 (6.11)	33.5 (10.20)[a]	35.6 (0.74)	
West	13.0 (0.34)	6.2 (0.44)	2.4 (2.21) [a]	3.3 (1.55)[a]	14.7 (0.41)	

Table 15.
Prevalence of obesity among adult Black ethnic subgroups and US-born Whites by selected sociodemographic and behavioral characteristics: United States, 2000-2003 - weighted estimates

Selected Characteristics	Total	Black ethnic subgroups			US-born Whites	Overall Chi-square
		US-born	Caribbean-born	African-born		
			Percent distribution (SE)			
US Length of stay in US						15.6[c*]
Non-immigrant	98.9 (0.11)	100.0 (0.00)	…	…	100.0 (0.00)	
< 5 yrs.	0.1 (0.03)	…	8.6 (2.92) [a]	23.4 (6.86)^	…	
5 to < 10 yrs.	0.2 (0.03)	…	13.9 (2.37)	26.6 (6.03)	…	
10 to < 15 yrs.	0.2 (0.03)	…	23.9 (3.90)	17.6 (6.82)[a]	…	
15 + yrs.	0.5 (0.07)	…	53.6 (3.30)	32.3 (8.29)[a]	…	
Lifestyle behavior						328.8*
Current smoker	20.7 (0.34)	20.3 (0.62)†	9.2 (1.70)†‡	-[b]†‡^	20.9 (0.40)	
Former smoker	26.8 (0.36)	18.2 (0.62)	6.5 (1.92)[a]	19.3 (4.91)[a]	28.9 (0.41)	
Non-smoker	52.6 (0.41)	61.5 (0.75)	84.2 (1.86)	78.2 (5.27)	50.2 (0.46)	
Physical activity [c]						75.1*
Regular activity	26.0 (0.41)	24.2 (0.86)†	21.9 (3.90)	25.8 (6.73)	26.4 (0.45)	
Some activity	29.3 (0.40)	24.4 (0.68)	26.5 (2.91)	- [b]	30.4 (0.47)	
Inactive	44.8 (0.50)	51.3 (1.04)	51.6 (5.29)	49.7 (6.55)	43.2 (0.55)	

[a] Estimates have a relative standard error of greater than 30% and less than or equal to 50%. These should be interpreted with caution as they do not meet the standard of reliability or precision.
[b] Estimates have a relative standard error of greater than 50% and are not shown.
[c] Relates only to Caribbean-born and African-born Blacks.
… Not applicable.
NOTE: Statistical significance tests at the P ≤ .05 reflecting differences in the prevalence of obesity is denoted by * for overall chi square test, † for Black ethnic subgroups and US-born Whites, ‡ US-born Blacks and other Black ethnic subgroups, ^ for Caribbean-born and Africa-born Blacks.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

Table 16.
Prevalence of obesity among adult Black ethnic subgroups and US-born Whites by selected social equity in health characteristics: United States, 2000-2003 - weighted estimates

Selected Characteristics	Total	Black ethnic subgroups			US-born Whites	Chi-square
		US-born	Caribbean-born	African-born		
		Number				
Total	36,894,647	6,730,717	344,745	73,580	29,745,605	
		Percent Distribution (SE)				
Total	100 (0.00)	100 (0.00)	100 (0.00)	100 (0.00)	100 (0.00)	
Health insurance						622.9*
Private	72.7 (0.41)	58.0 (0.95)†	53.5 (3.99)†‡	59.1 (8.08)†‡	76.3 (0.45)	
Medicare	7.4 (0.20)	10.0 (0.57)	6.5 (2.30)[a]	0.0 (0.00)	6.9 (0.21)	
Medicaid	5.8 (0.21)	12.2 (0.59)	9.3 (2.32)[a]	8.4 (3.79)[a]	4.3 (0.21)	
Other	1.8 (0.13)	1.9 (0.24)	[b]	0.0 (0.00)	1.8 (0.16)	
Uninsured	12.3 (0.27)	17.8 (0.61)	30.1 (3.63)	32.4 (7.12)	10.8 (0.31)	
Self-assessed health status						91.5*
Excellent/very good	50.0 (0.43)	44.3 (0.89)†	58.6 (4.42)‡	70.3 (6.07)†‡	51.1 (0.49)	
Good	32.0 (0.37)	32.9 (0.83)	30.5 (4.11)	21.7 (5.40)	31.9 (0.42)	
Fair/poor	18.0 (0.34)	22.8 (0.83)	10.9 (2.00)	[b]	17.0 (0.36)	
Obesity-related conditions						
At least one condition	49.1 (0.42)	50.1 (0.86)	40.8 (4.91)‡	35.8 (7.00)‡	49.0 (0.47)	10.3
Diabetes	13.6 (0.28)	14.8 (0.63)	13.7 (2.19)	12.4 (5.8)[a]	13.3 (0.30)	6.4
Hypertension	41.1 (0.42)	44.9 (0.90)	36.6 (4.96)	26.4 (6.20) †‡	40.4 (0.46)	23.1*
Cardiovascular diseases[c]	10.4 (0.24)	8.4 (0.44)†	3.1 (1.08)[a]†‡	0.6 (0.62)[b]†‡^	11.0 (0.27)	55.3*
Cancer	7.3 (0.19)	3.2 (0.27)†	1.1 (0.76) [a]†	-	8.3 (0.23)	80.5*
Usual place of care						101.1*
Usual source of care[d]	90.8 (0.24)	89.8 (0.52)†	83.5 (2.86)†‡	88.2 (5.23)	91.1 (0.27)	
No usual place	9.2 (0.24)	10.2 (0.52)	16.5 (2.86)	11.8 (5.23) [a]	8.9 (0.27)	

Table 16.
Prevalence of obesity among adult Black ethnic subgroups and US-born Whites by selected social equity in health characteristics: United States, 2000-2003 - weighted estimates

Selected Characteristics	Total	Black ethnic subgroups			US-born Whites	Chi-square
		US-born	Caribbean-born	African-born		
	Percent distribution (SE)					
Doctors' visits						37.7*
None	13.9 (0.33)	15.0 (0.63)†	19.0 (2.80)†	21.8 (6.36) [a]	13.6 (0.37)	
At least one visit						
1-3 visits	37.7 (0.37)	39.9 (0.83)	42.7 (3.44)	39.4 (6.74)	37.2 (0.44)	
4-9 visits	29.6 (0.35)	28.6 (0.82)	27.3 (3.86)	24.1 (7.81)[a]	29.9 (0.39)	
10 visits or more	18.7 (0.32)	16.4 (0.66)	10.9 (2.01)	14.7 (4.41)	19.3 (0.35)	

[a] Estimates have a relative standard error of greater than 30% and less than or equal to 50%. These should be interpreted with caution as they do not meet the standard of reliability or precision.
[b] Estimates have a relative standard error of greater than 50% and are not shown.
[c] Includes coronary heart disease, heart attack, stroke, and angina.
[d] Includes doctors office or HMO, hospital outpatient department, emergency department, some other place, and more than one place.
NOTE: Statistical significance tests at the $P \leq .05$ reflecting differences in the prevalence of obesity is denoted by * for overall chi square test, † for Black ethnic subgroups and US-born Whites, ‡ US-born Blacks and other Black ethnic subgroups, ^ for Caribbean-born and Africa-born Blacks.
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

7. Factors associated with BMI

Prior to conducting multiple linear regressions on the models, the independent variables were correlated with the dependent variable, BMI, in order to determine if a relationship existed between the variables. A correlation is a measure of the direction and magnitude of the linear relationship between two variables (Nicol & Pexman 1999). The possible values range from -1.0 to +1.0. Positive numbers indicate a positive correlation and negative numbers indicate a negative correlation (Myatt 2007). High levels of collinearity are defined by a correlation of 0.80 or greater (Menard 2002).

Table 17 reports the correlation of the independent variables. The matrix of correlation using the Pearson correlations showed no evidence of high correlation between the independent variables, meaning the R matrix did not include r-values above the 0.80 threshold. Six positive correlations were revealed between the dependent variable BMI, and the independent variables health status, race/ethnic subgroup, age, education, exercise, and length of stay. Five variables were negatively correlated with BMI, insurance status, usual place for care, gender, smoking, and region. The correlation coefficient was significant between BMI and all of the independent variables except smoking and length of stay.

The sample size was assessed to ensure that the models have an adequate number of cases for the analysis. Eleven explanatory variables were examined in this study and the lowest number of cases used in these analyses (unweighted) was 89,956 which yield a ratio of 8,177.8 cases per independent variable which is adequate to detect relationship. The adjusted Wald-F test was used to assess the importance of each variable in the model, after adjusting for other variables.

Table 17.
Correlation of social health and sociodemographic variables with BMI

	BMI	Insurance type	Health status	Place of care	Race/ethnic subgroup	Gender	Age	Education	Region	Smoking	Exercise	Length of stay
BMI	1.0000	-0.0079*	0.1196*	-0.0442*	0.1173*	-0.0766*	0.0718*	0.0364*	-0.0182*	-0.0004	0.0774*	0.0056
Insurance type	-0.0079*	1.0000	0.0028	0.3315*	0.0812*	-0.0377*	-0.2059*	0.0919*	-0.0473*	-0.0726*	0.0466*	0.0159*
Health status	0.1196*	0.0028	1.0000	-0.0519*	0.0736*	0.0216*	0.2371*	0.2133*	-0.0328*	-0.1017*	0.2154*	0.0008
Place of care	-0.0442*	0.3315*	-0.0519*	1.0000	0.0236*	-0.1201*	-0.1853*	0.0276*	-0.0481*	-0.0456*	0.0011*	0.0048
Race/Ethnic subgroup	0.1173*	0.0812*	0.0736*	0.0236*	1.0000	0.0290*	-0.0761*	0.1068*	-0.0596*	0.0587*	0.0969*	-0.0291*
Gender	-0.0766*	-0.0377*	0.0216*	-0.1201*	0.0290*	1.0000	0.0411*	0.0003	0.0091*	0.1076*	0.0494*	-0.0007
Age	0.0718*	-0.2059*	0.2371*	-0.1853*	-0.0761*	0.0411*	1.0000	0.1314*	0.0206*	-0.1049*	0.1788*	0.0041
Education	0.0364*	0.0919*	0.2133*	0.0276*	0.1068*	0.0003	0.1314*	1.0000	-0.0198*	-0.0887*	0.1856*	-0.0030
Region	-0.0182*	-0.0473*	-0.0328*	-0.0481*	-0.0596*	0.0091*	0.0206*	-0.0198*	1.0000	-0.0121*	-0.0435*	0.0714*
Smoking	-0.0004	-0.0726*	-0.1017*	-0.0456*	0.0587*	0.1076*	-0.1049*	-0.0887*	-0.0121*	1.0000	-0.0519*	0.0436*
Exercise	0.0774*	0.0466*	0.21539*	0.0011	0.0969*	0.0494*	0.1788*	0.1856*	-0.0435*	-0.0519*	1.0000	0.0104*
Length of stay	0.0056	0.0159*	0.0008	0.0048	-0.0291*	-0.0007	0.0041	-0.0030	0.0714*	0.0436*	0.0104*	1.0000

*Significant at the P <= .05.

The two models were analyzed using multiple linear regressions to determine whether the independent variables were related and to what degree they were related to the dependent variable of BMI. For each model the following statistics are reported: estimated regression coefficients (beta) with its estimated 95% confidence intervals, p-value, and R-square. "The beta value is a measure of how strong each predictor (independent) variable influences the criterion (dependent) variable. The beta is measured in units of standard deviation" (Brace et al. 2006:208). Therefore, a positive beta value indicates as one value increases the other value increases or when one value decreases the other value decreases. A negative beta value indicates as one value increases the other value decreases or as one value decreases the other value increases. "Thus, the higher the beta value the greater the impact of the predictor variable on the criterion variable. R-square (R^2) is the square of the measure of correlation and indicates the proportion of the variance in the criterion variable which is accounted for in the model" (Brace et al. 2006:208).

In the multiple regression analyses using the full sample (Table 18), the association between race/ethnic subgroup and BMI was statistically significant, after adjusting for the social equity variables (Model 1) and the inclusion of gender, age, education, region, smoking status, and exercise (Model 2). The results for Model 1 revealed that all four independent variables were significant predictors of BMI, insurance coverage, health status, usual source of care, and race/ethnic subgroups. The R^2 value for the model was 0.0446, meaning that 4.5 percent variance in BMI can be explained from the four variables combined. The F-value of 326.95 the model was significant at $p \leq 0.05$. Those who reported no insurance (-0.19) predicted a lower BMI than those with private insurance. Two of the three estimated coefficient for racial/ethnic subgroup were positive, indicating a significantly

higher predicted BMI for US-born Blacks (1.79) and Caribbean-born Blacks (0.66) compared to US-born Whites.

The inclusion of the sociodemographic and behavioral (gender, age, education, region, smoking status, and exercise) variables in the model (Model 2) improved the explanatory power of the model, R^2 = 6.9 percent. The F value was 211.88 and was significant at the $p \leq 0.05$. After controlling for these variables, insurance type and age were not significantly associated with BMI. However, gender, education, region, smoking, and physical activity were significantly associated with BMI. The findings further revealed that compared to males, females had a lower mean BMI. Adults with less than a college education (less than high school diploma, diploma, and some college), those who resided outside of the Western region (resided in the Northeast, Midwest, and South), were not current smokers (former and nonsmokers) or who did not regularly exercised (some activity and inactive) showed a higher average BMI than their reference counterparts. There were significant differences between the racial/ethnic subgroups and the estimated coefficients for racial/ethnic subgroup were still positive, indicating a significantly higher mean BMI for US-born Blacks (1.80) and Caribbean-born Blacks (0.58) compared to US-born Whites. The total explained variation in BMI increased from 0.0446 in Model 1 to 0.0687 in Model 2 and the incremental R^2 was significant at $p \leq 0.05$._When length of stay in the US was added to the model (not shown), the change in R^2 was statistically significant.

Table 18.
Multiple regression results of BMI in relation to racial/ethnic subgroups: adults 18 years and older, United States, 2000-2003 – weighted estimates

	Model 2 (R = 0.0446)			Model 3 (R = 0.0687)		
Variables	Beta Coeff.	95% Confidence Interval		Beta Coeff.	95% Confidence Interval	
Intercept	26.04*	25.98	26.11	24.41*	24.22	24.60
Health insurance						
Private	-	-	-	-	-	-
Public	-0.09	-0.42	0.24	-0.13	-0.47	0.21
Uninsured	-0.19*	-0.33	-0.04	0.00	-0.15	0.16
Self assessed health status						
Excellent/Very Good	-	-	-	-	-	-
Good	1.74*	1.63	1.84	1.64*	1.53	1.75
Fair/Poor	2.41*	2.26	2.57	2.29*	2.12	2.46
Usual source of care						
Usual place	-	-	-	-	-	-
No usual place	-0.64*	-0.77	-0.50	-0.72*	-0.85	-0.59
Race/ethnic subgroup						
White	-	-	-	-	-	-
US-born Blacks	1.79*	1.65	1.93	1.80*	1.66	1.94
Caribbean-born Black	0.66*	0.12	1.19	0.58*	0.05	1.10
African-born Black	-0.35	-0.97	0.28	-0.62	-1.29	0.06
Gender						
Male				-	-	-
Female				-1.09*	-1.18	-1.01
Age at interview				0.00	0.00	0.00
Education						
<12 years				0.34*	0.18	0.50
12 years				0.74*	0.63	0.85
< 16 years				0.72*	0.61	0.83
16+ years				-	-	-

Table 18.
Multiple regression results of BMI in relation to racial/ethnic subgroups: adults 18 years and older, United States, 2000-2003 – weighted estimates

	Model 2 (R = 0.0446)		Model 3 (R = 0.0687)	
Variables	Beta Coeff.	95% Confidence Interval	Beta Coeff.	95% Confidence Interval
Geographic region in US				
Northeast			0.18*	0.02 0.34
Midwest			0.58*	0.44 0.72
South			0.3*	0.16 0.44
West			-	- -
Lifestyle behavior				
Current smoker			-	- -
Former smoker			1.45*	1.32 1.58
Non-smoker			1.1*	0.98 1.22
Physical activity				
Regular activity			-	- -
Some activity			0.63*	0.53 0.73
Inactive			0.69*	0.58 0.80

*Significant at the P <= .05
Data Source: CDC/NCHS, National Health Interview Surveys, 2000-2003

B. Summary

A review of the routinely used taxonomies for race/ethnicity in national health surveys shows that only one of the surveys, NHIS, captured the distinctions among major Black American ethnic subpopulations. The analysis also reveals that there are differences among obese Black ethnic subgroups, and US-born Whites. The prevalence of obesity was highest among US-Blacks compared to other groups and African-born Blacks had the lowest prevalence. Among the obese population, the mean BMI was similar across all the racial and ethnic groups.

There were significant overall racial and ethnic subgroup differences on each of the health characteristics examined (health insurance, self assessed health status, selected obesity-related conditions, usual source of care, and doctors' visits) between all the groups. Overall, the multiple regression analyses suggest that after adjusting for several health, sociodemographic, and behavioral factors, the influence of racial/ethnic subgroup on the full model was significantly associated with BMI. US-born Blacks and Caribbean-born Blacks had significantly higher mean BMI compared to their US-born White counterpart. The R^2 values suggest that the variables included in the models explained 4-7 percent of the variation in BMI. There was a significant difference between the "full" model and the "reduced" models.

Table 19 summarizes the results of whether the findings supported the hypotheses. The next section provides a detailed discussion of the relevant results and how these findings compare to existing literature.

Table 19.
Summary of Findings

Hypotheses	Results	Analysis
H_{01}: Routinely used taxonomies for race/ethnicity in national health surveys do not capture the distinctions among major Black American ethnic subpopulations (US-born Blacks, Caribbean-born Blacks, and African-born Blacks)?	Supported for NHIS	**Questionnaire review**
H_02: There is no statistically significant difference in the mean prevalence of obesity among US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites.		**ANOVA**
Overall	Supported	
US-born Whites and US-born Blacks	Supported	
US-born Whites and Caribbean-born Blacks	Unsupported	
US-born Whites and African-born Blacks	Unsupported	
US-born Blacks and US-born Whites	Supported	
US-born Blacks and Caribbean-born Blacks	Supported	
US-born Blacks and African-born Blacks	Unsupported	
Caribbean-born Blacks and US-born Whites	Unsupported	
Caribbean-born Blacks and US-born Blacks	Supported	
Caribbean-born Blacks and African-born Blacks	Unsupported	
African-born Blacks and US-born Whites	Unsupported	
African-born Blacks and US-born Blacks	Unsupported	
African-born Blacks and Caribbean-born Blacks	Unsupported	
H_03: There is no statistically significant difference in obesity among US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites by selected sociodemographic, behavioral, and health characteristics.		**Chi-square**
US-born Blacks		
Sociodemographic	Supported	
Behavioral	Supported	
Health	Unsupported for diabetes & hypertension	
Caribbean-born Blacks		
Sociodemographic	Supported	
Behavioral	Unsupported for physical activity	

Table 19.
Summary of Findings

Hypotheses	Results	Analysis
Health	Unsupported for diabetes & hypertension	
African-born Blacks		
Sociodemographic	Unsupported for gender	
Behavioral	Unsupported for physical activity	
Health	Unsupported for diabetes place of care & visits	
$H_0$4A: BMI does not differ by race/ethnicity after controlling for access to health care (measured by health insurance coverage and usual source of care) and health status (measured by self-assessed health status).		**Linear Regression**
Overall model	Supported	
US-born Blacks	Supported	
Caribbean-born Blacks	Supported	
African-born Blacks	Unsupported	
$H_0$4B: BMI does not differ by race/ethnicity after controlling for access to health care (measured by health insurance coverage and usual source of care), health status (measured by self-assessed health status), and selected sociodemographic variables (gender, age, education, region, smoking, exercise).		**Linear Regression**
Overall model	Supported	
US-born Blacks	Supported	
Caribbean-born Blacks	Supported	
African-born Blacks	Unsupported	

CHAPTER FIVE – DISCUSSION

> *"Health disparity/inequality is a particular type of difference in health or in the most important influences on health that could potentially be shaped by policies; it is a difference in which disadvantaged social groups or groups (defined as the poor, racial/ethnic minorities, women, or other groups who persistently experienced social disadvantage or discrimination in the past) systematically experience worse health or greater risks than more advantaged groups." (*Braveman 2006, 180)

The overall goal of the present study is to demonstrate the importance of utilizing the appropriate racial and ethnic taxonomy in data collection instruments used to monitor the Nation's health. This was accomplished by using a social equity framework to examine whether differences in health, access to health care and utilization exist among obese Black Americans from Africa, the Caribbean, and those born in the US. The major areas of social equity in health examined include health insurance coverage, usual source of care, and self-assessed health status. This chapter provides a discussion on each of the research hypotheses and compares them to earlier research. Information is also presented on the limitations/strengths of the study and concludes with a discussion of the implications of the study for public administration and recommendations for future research.

A. Review of the Findings

Several objectives guided this research they include: (1) the extent to which various national health surveys collect information on Black American subgroups and (2) to demonstrate the importance of assessing the diversity in the US population, this study examines the heterogeneity in one of the racial categories, Black or African Americans, by utilizing secondary data from a nationally representative survey to investigate differences in health, health care access and utilization.

1. Taxonomies for race/ethnicity in national health surveys

The US has become a more racially and ethnically diverse society yet the current taxonomy used to assess the health of the population does not accurately reflect the demographics of the population. After reviewing several national surveys used to monitor the Nation's health, the results indicated that only one of the five surveys examined collected information on the Black subpopulation that can be used to monitor the subpopulation. The NHIS' public use files provide information on region of birth that can be used to assess the health status of the various Black racial and ethnic subgroups. While the NHANES collected information on the country of birth, it did not provide information on the actual country of birth to allow for further categorization of ethnicity. Similar studies (SHADAC 2009) also reported that only a small number of publicly funded national surveys, that capture information on health insurance and access to care, collected detailed information such as, country or region of birth.

The Commonwealth Fund and other partners conducted a comprehensive analysis of the statutes, regulations, policies, and procedures of federal agencies to identify when the collection and reporting of data on race, ethnicity, and primary language are required. The report's major findings indicated that: "(1) the collection and reporting of data on race, ethnicity, and primary language are legal and authorized under Title VI of the Civil Rights Act of 1964 and that no federal statutes prohibit this collection, although very few require it. (2) An increasing number of federal policies emphasize the need for obtaining racial and ethnic data. There is high-level agreement that primary language data should be collected as well. (3) General agreement prevails that racial, ethnic, and primary language data are critical to promote health and quality health care for all Americans. (4) Despite its

importance as a tool for assessing the progress of stated goals, federal data collection is not uniform. Data requirements and methods for collection and reporting vary across federal agencies and do not fully reflect consensus on the value of gathering this information" (Perot and Youdelman 2001, v). The report further recommends that Department of Health and Human Services recommit to the national goal of eliminating racial and ethnic disparities in health through policies and actions that will ensure collection and reporting of data necessary to support and facilitate achievement of this goal.

The inadequate collection of data on racial and ethnic subpopulations in the US may be primarily due to the limitation of the current policy governing the classification of race and ethnicity (OMB 1997). This policy authorizes the acceptable national taxonomy for data collection on race and ethnicity. According to Mays et al. (2003), "as nations become more racially diverse, a natural evolution can occur in the measurement of race and ethnicity. For example, in 1976, the federal government mandated (OMB Directive 15) the inclusion by federal data collection agencies of Hispanic origin as an ethnic overlay to race. This mandate reflected the new immigration patterns that resulted in proportionally greater prevalence of Hispanic backgrounds and the emergence of Latino political power in the US." In 1997, Directive 15 was revised due to the growing criticism that the minimum categories in the Directive do not reflect the increasing diversity of the Nation's population that resulted from the growing number of interracial unions and immigration (OMB 1997).

Despite this revision, the minimum standards only classify the population into five racial categories (White, Black/African American, American Indian/Alaska Native, Asian, and Native Hawaiian and Other Pacific Islanders) and one ethnic group, Hispanics; however individuals are allowed to select more than one race. Since its introduction in 1997, this

policy did not adequately classify the population because it masked the diversity in the population. For example, in 1997 when the policy was announced, the foreign-born population of the US represented 9.7 percent (25.8 million) of the total population. This was the largest foreign-born population in US history representing an increase of 6.0 million, or 30 percent, over the 1990 census figure of 19.8 million (Schmidley and Campbell 1999). In 2003, when the policy was implemented, 11.7 percent of the population was foreign-born (Larsen 2004), and in 2007, 12.7 percent was foreign-born (Grieco 2010). Therefore, from the introduction of the policy, the population was more racially and ethnically diverse than what was required.

Although the OMB indicates that its guidelines are the minimum standards and data may be collected and reported in more detail, most federal and other organizations do not collect this information beyond the minimum requirement and therefore fail to characterize the heterogeneity within their population. Because of this deficiency in data classification, some states such as California, Massachusetts, and New York collect and report health and other data on racial and ethnic subgroups that reflect the racial and ethnic characteristics within their states (McDonough et al. 2004).

Categorizing groups into five major racial categories is no longer sufficient to address the needs of the population because of its vast diversity. According to Grieco (2010), the immigrant population, through their own varied origins, will continue to contribute to the racial and ethnic diversity of the US. This is evident by the current diversity found in the Black population. Yet the current classification of ethnicity data is only mandated for Hispanic or Latino in spite of the variation in ethnicity among other groups. Law and Heckscher (2002, 59) contends that "there is no evident reason why only people identified as

Hispanic or Latino should be allowed to claim an ethnicity, while everyone else must somehow fit into a race." To demonstrate the importance of classifying information on the racial and ethnic diversity in the US, this study used data the NHIS, the only national health data source of the five reviewed, that collects detailed information on the racial and ethnic subpopulations to examine whether differences in health, health care access and utilization exist among this group.

2. Prevalence of obesity

The second research hypothesis proposed was that there is no statistically significant difference in the mean prevalence of obesity among US-born Blacks, Caribbean-born Blacks, African-born Blacks, and US-born Whites. This hypothesis was supported by the data. The analysis highlighted the subgroup heterogeneity within the growing obese Black American population and suggests that obesity is a significant health problem among Black Americans, especially those born in the US. US-born Blacks were significantly more likely to be obese compared to Blacks from the Caribbean and Whites. No significant differences in mean BMI were found between US-born Whites and the foreign-born Black subgroups and this could be due to the small sample size of the group, since sample size affects the statistical analysis (Berman 2002). Similar to previous studies (Dey and Lucas 2006; Read and Emerson 2005; Read, Emerson and Tarlov 2005; Singh and Miller 2004; Singh and Siahpush 2002) the analysis demonstrated that groups varied in the prevalence of obesity and thus fuels the need for more detailed classification of race and ethnicity.

3. Differences by demographics, behavioral and health characteristics

Interesting sociodemographic differences were detected and were generally consistent with previous studies (Dey and Lucas 2006; Read and Emerson 2005; Read, Emerson and

Tarlov 2005; Singh and Miller 2004; Singh and Siahpush 2002). Not only did the groups vary in terms of demographics, but they also have differing health and behavioral characteristics. As illustrated in this analysis, African-born Blacks generally had lower rates of obesity across the spectrum of demographic and behavioral characteristics measured, except for those with a college education. African-born Blacks with a college degree were two times more likely to be obese compared to the other racial and ethnic subgroups. This finding was somewhat surprising since education is generally associated with better health outcome. However, this may be a cultural effect where obesity is seen as a sign of affluence in many sectors of the African population (Puoane et al. 2002).

As stated earlier, access to health care plays an important role in the quality of health care, the years of healthy life, and the presence or absence of health disparities. This analysis like Dey and Lucas (2006) and Read and Emerson (2005) found that foreign-born Blacks reported substantially better health outcomes (health status and obesity-related health conditions) than US-born Blacks and Whites. However, they were more likely to experience disparities as it relates to lack of insurance, having a usual place to go to for care and the number of visits to the doctor. A surprising finding is that despite the disparities in access to care, foreign-born Blacks still reported better health outcomes than US-born Americans. It has also been suggested that the health difference identified among African-born Blacks may be related to the fact that they are younger and more educated that their US-born counterparts (Read and Emerson 2005).

The influence of acculturation measured by duration of residency in the US mimics what has been reported by previous scholars (Dey and Lucas 2006; Read and Emerson 2005; Read, Emerson and Tarlov 2005; Singh and Miller 2004; Singh and Siahpush 2002).

According to Read and Emerson (2005), length of time in the US has a significantly negative effect on health status. Results indicated that for Blacks born in the Caribbean, as length of stay in the US increases, the rate of obesity increases. While the same pattern was not observed in the African-born sample, those residing in the US for more than 15 years had the highest prevalence of obesity compared to those with less than 5 years. This trend has implications for public policy, since with the decreasing health of the foreign-born Black population; there is the potential for increase in the Black/White health disparities gap, and a greater strain on the already fragile US health care system (Read and Emerson 2005).

4. Factors associated with BMI

The analysis attempted to determine the contribution of race/ethnic subgroup with BMI. After controlling for the effects of selected health, sociodemographic, and behavioral covariates, only two measures of social equity in health were fairly consistent determinants of BMI – perceived health status and usual place of care. Overall, the direction of significant associations between the independent and dependent variables remained. The tests of interactions were significant indicating that the effect of race/ethnicity on BMI varied by access to health care and health, as well as gender, age, region, smoking, and physical activity. Conditional on all other variables in the model, significantly higher BMI was associated with US-born Blacks and Caribbean-born Blacks compared to US-born Whites.

By using recent nationally representative data, this study shows important differences in health care utilization, health status, and health care access among obese Black Americans that are born in the US, the Caribbean, African, and US-born Whites. The results indicate that once all of the explanatory powers of the control variables are accounted for, the significant contribution of the racial and ethnic subgroup still exist and remain a factor that

should be examined and reported on. These findings further underscore the need for research and information that increases society's understanding of the complex pattern of associations among race, ethnicity, immigrant status and health (Williams et al. 2007).

B. Limitations/Strengths of the Study

Although this study contributed to the literature, it is necessary to mention the potential limitations that may affect the results discussed in Chapter 4. The study only reviewed national surveys that collected information on health care access and utilization and therefore does not provide information on other national or state surveys that may collect information on the heterogeneity (country/ region of birth) in the population. For example, several states recognizing the need to have data that accurately classifies the diversity in their population, have elected to collect and even mandated the collection, coding, and reporting of data on race and ethnicity that is expanded beyond the OMB requirements (McDonough et al. 2004).

The use of secondary data is a limitation since it limited the research hypotheses to the available variables in the survey. Proxy measures were used for socioeconomic status (education) and acculturation (length of stay). Information on items such as country of birth was not available and so the analysis was based on region and very little information was collected on immigrant status (foreign-born vs. US-born). Several other factors were not available for analysis, such as dietary pattern and family history. This was done to protect the anonymity and confidentially of the respondents.

The data are self-reported, and some respondents may have over- or underestimated actual measures. The measure for obesity (BMI) was based on self reported information which may often result in underestimation. Therefore, the prevalence of obesity is

presumably higher than shown in this study but research has shown that this underestimation is about 9.5 percentage points (Yun et al. 2006). Health status was also based on self-reported information which may vary due to the respondents' cultural belief and not on actual health differences. However, studies have shown that very little variation is due to cultural differences (Read, Emerson and Tarlov 2005).

Limited sample sizes for African-born and Caribbean-born Blacks precluded more detailed analyses and may require that some of the results be interpreted with caution. However, the sample for immigrant Blacks in the NHIS is comparable to that found in the Census data thus making it generalizable to the US population. Finally, one important caveat of this study is that because this was a retrospective cross-sectional study, it cannot be concluded that the detected differences or associations caused obesity in the population or is due to inequity.

Despite these limitations, the study has several strengths. The first being the generalizability of the study results to the Black US population. The NHIS is one of the largest national surveys that can be used to produce national health and health care estimates. Its sample design makes it possible to combine years of data to produce more reliable estimates for smaller subgroups like foreign-born Blacks (National Center for Health Statistics 2003). The use of the NHIS offered an opportunity to examine smaller population subgroups that are not typically assessed in research. Other strengths include the determination of the prevalence of obesity among Black ethnic subgroups and the disparities they experienced. The study was able to identify differences in demographic, behavioral, and health characteristics between and among Black American ethnic subgroups and Whites. It also provided a glimpse of the heterogeneity of the Black population and highlights that the

Black population is a diverse group and this variation is associated with obesity. It also demonstrates the need to implement a more expanded racial and ethnic taxonomy to conduct research that evaluates the diversity within subgroups.

C. Implications of the Study

As one of the tenets of public administration, social equity was the theoretical framework used to guide this study and evaluate its findings. It is defined by the NAPA as "The fair, just and equitable management of all institutions serving the public directly or by contract, and the fair and equitable distribution of public services, and implementation of public policy, and the commitment to promote fairness, justice, and equity in the formation of public policy" (2001, 11). Social equity in health was measured by identifying differences in health insurance coverage and usual source of care which served as proxies for the enabling factors of access to health care which has been identified by Whitehead (1990), as one of the determinants of health disparities that is more likely to be unfair and avoidable. The results of the study reveal that differences exist both within and between racial and ethnic subgroups and thus the need for adequate data on race and ethnicity to evaluate and promote health equity. The results also reveal several important findings that can be applied to the field of public administration. The discussion focuses on the collection of reliable data on specific racial and ethnic subpopulations and the need to measure and address social inequities within racial and ethnic groups.

The use of a nationally representative dataset permitted the examination of the Black population in several dimensions. This study identified differences within the larger Black category designation and demonstrates that there are material differences between these subpopulations. Yet the current taxonomy prescribed for data collection does not classify

information on subpopulations within racial categories. New or improved validated tools are needed to assess ethnicity specifically and accurately (Arthur and Katkin 2006).

Improving data collection is essential to addressing social inequities in the US since policy implementation, developing regulations, as well as the management and assessment of results against goals require timely and accurate data. . While there are multiple data sources available; there continues to be inconsistency in the collection and reporting process (State Health Access Data Assistance Center 2009). One of the major findings in this analysis is that there is heterogeneity in the Black American population and where there are differences, there is the potential for inequities to exist within this group.

To address health disparities among Blacks in the US, a concerted effort must be made to understand their health issues. This requires good data that is collected at the lowest level possible. Having this knowledge better equips government officials to provide the appropriate services to the relevant subgroups and to more efficiently use resources in working towards the ultimate goal of reducing disparities as well as inequities. While there have been discussions to collect information on ethnicity for the Hispanics, Asians, and American Indians (Srinivasan and Guillerno 2000; Burhansstipanov 2000; Zambrana and Carter-Porkas 2001), which to date most of the national surveys collect (State Health Access Data Assistance Center 2009), there has been very little discussion, however, to do the same for the Blacks.

Uniform standards for the collection of racial and ethnic data has been established for federal agencies by the OMB (which in turn requires that organizations receiving funding from these agencies use the uniform standards), but there is no requirement to collect information on specific racial and ethnic subpopulations. The current taxonomy used for

racial and ethnic data collection does not adequately capture information on Black subpopulations despite the fact that the US is quickly becoming a racially and ethnically diverse country. Research has also shown that reliable data on minorities and their subpopulations are not readily available at the state and local levels where decisions regarding health care are made (State Health Access Data Assistance Center 2009). Most data on race and ethnicity cannot be compared across systems because of the inconsistencies in the collection of the information, even within the same organization. As the Black population continues to grow in the US, understanding and tracking subgroup heterogeneity will become more important to ensure that our policy and administrative institutions operate more effectively to meet the needs of this population. The study also identifies some specific implications for practitioners, researchers, and policymakers.

1. Implications for practice

Public administrators and other practitioners should look for opportunities to include equity and improved data collection as they develop new policies and fund programs. This could allow them to: (1) track their progress on providing equitable services; (2) identify at risk populations by collecting information at the lowest level possible such as on racial and ethnic subpopulations, language, and socioeconomic status; and (3) target efforts to address the identified need. Administrators should refrain from categorizing the Black population as a homogenous group since this research and others have revealed the heterogeneity and health differences in this population.

As resources continue to diminish, there is an increased need for collaboration across programs, disciplines, and sectors as it relates to the elimination of health disparities and identifying as well as addressing inequities in the Black population and other populations.

There is a need to update the revised OMB Directive 15 to include the collection of information on ethnicity within racial categories. Researchers (Law and Heckscher 2002; Ford and Kelly 2006) have recommended that a system based on an ethnic concept not limited to Hispanics/Latinos, but one providing a comprehensive list of categories, similar to categories used in the NHIS and in the Census. This would include a listing of national origin/ancestry ethnicity categories. This method of classification would be somewhat similar to what is done in Great Britain. "The taxonomy for classifying race and ethnicity in Great Britain is based almost exclusively on nativity to reflect the diversity in their population. The categories include: White, Black Caribbean, Black African, other Black, Indian, Pakistani, Bangladeshi, and Chinese. This classification is used only for highly specialized enumerations in the US" (Willis 2001, 1048). Administrators also have an opportunity to influence policies and should work with policymakers to ensure that the appropriate racial/ethnic classification and equity is included in the formulation and implementation of policies.

2. Implications for policy

Health disparities affect everyone because they lead to decrease productivity, increase health care costs, and social inequity (Centers for Disease Control and Prevention 2004). Legislators can work to: (1) increase their understanding of health inequities through increase data collection; (2) provide funding and support policies that address expanded data collection and equity for all publicly funded programs; and (3) pass laws that require the collection of data at the nativity level for each racial group or at least one that accurately reflects the current composition of the population.

Among the Black population, obesity is one of the major risk factors for six of the ten leading causes of death, including heart disease, cancer, stroke, respiratory disease, and nephritis (LaVeist 2005). As public administrators, issues of equity and justice are fundamental concerns and as leaders, legislators should identify opportunities and elicit participation from the Black American population to address inequities. One such opportunity is to work with Black Americans to ensure that data is collected on Black subgroups similar to what is done for the Asian and Hispanic racial and ethnic groups. There is also a need for increase participation in research and other mechanisms that collect information on the population such as the census or national surveys.

3. Implications for research

Research continues to treat the Black population as a homogenous group which masks the diversity and inequities that exist within this population. Arthur and Katkin (2006, 32) challenged researchers to "introduce ethnicity into the categorization and understanding of Blacks in health research because not assessing Black ethnicity can cause substantial problems in research with Black Americans. Studies of Black ethnic groups can also be thought of as holding race as a constant, and allowing for the in-depth exploration of health-related psychosocial factors related to ethnicity; it provides researchers with the opportunity to tease apart ethnicity- and culture-related factors without race being the primary issue." Evidence-based research on Black subpopulation is needed to drive policy decisions and additional data collection. This study provides a foundation for the argument to collect data on race and ethnicity at the lowest level and the need for additional research to examine other areas of social equity in the Black population and to increase our knowledge by designing studies to adequately measure and report inequities in the Black population.

D. Challenges to implementing expanded racial/ethnic taxonomy

Although the finding from this study revealed the importance of collecting, presenting, and analyzing data on detailed race/ethnicity, there are several challenges that may preclude the immediate adoption of this recommendation. This classification will become more important as ethnic groups increase, acculturate, and gain political power. A major barrier to implementation will be the political consequences that may arise (e.g., implications of congressional redistricting). The collection and reporting of detailed ethnic data may transform what the new data will say about the residents in political districts. The high cost of reprogramming information systems to capture data on this expanded taxonomy will be a major concern for federal and other organizations. The new taxonomy will also present challenges for analysis and trending of data. The implementation may also cause controversy within ethnic subgroups who may believe that they are being labeled and linked to negative press. Despite these challenges, it is important to collect and report information that addresses the growing diversity of the US population. It should be noted that it is also necessary to go beyond just race and ethnicity and include other variables such as socioeconomic status during data analysis.

E. Future Studies

Whilst this study was able to identify differences among obese Blacks in the US and the importance of collecting information on racial and ethnic subgroups, it was not able to assess inequities within this population or the other factors not in the dataset that may explain these differences. Further researcher should focus on the other factors that may explain the observed differences such as country of birth or culture. Other research methods such as focus groups should be used to assess whether the identified differences are associated with

inequities within and between Black ethnic subgroups and Whites. Hispanics are the fastest growing minority population in the US but very few studies have examined the diversity and health status of Hispanic Blacks. Like other minorities, they tend to experience disparities at every level, including education, health, and housing. Another area for future examination is the inequity in the quality of care provided to Blacks. One of the measures of social equity is the consistency in the quality of services provided to all (Svara and Brunet 2004). Several studies have reported disparities in the quality of care, but none examined it among the obese Black subpopulation. While the current research could not address these areas, it is a start to pointing out important directions for future research.

F. Conclusion

Although evidence of racial and ethnic health care disparities is well documented, the evidence-base for developing interventions to eliminate these differences remains limited especially among subpopulations. One reason may be the lack of annual and periodic data to monitor the racial and ethnic variation in the health, access to health care and utilization. Large surveys are currently the most useful source of information on the health of the population, yet their sporadic and sometimes nonexistent collection of racial and ethnic subpopulation data undermines the monitoring, planning, evaluation, and development of policies.

There has been limited attention to diversity within the Black population, but this study has provided additional evidence that there may be important health variations within this group. The results also suggest that combining subgroups to create a single category called foreign-born Blacks or the homogenous group called Blacks or African American hide important differences among this population. Although this study focused on obese Black

Americans, there is heterogeneity in all racial and ethnic as well as other groups and therefore the potential for inequity to exist within these groups. It is time to reevaluate the current OMB standards to ensure that the country's racial, ethnic, and cultural diversity is being classified, so that the future policy or revision does not impede progress in this area but promote it. According to Ford and Kelly (2006, 1664), "having a unified, federal policy in place for guiding the collection of race and ethnicity data is critical."

While most health or disease related functions are seen mainly as the responsibility of public health agencies, the need for collaboration between public health and public administration, as well as other disciplines is critical to address health and other inequities. Some of the factors that influence inequities in health are usually functions that are the responsibilities of public administrators, such as health care financing, housing, and education. Public administrators working collaboratively with public health and other officials to accurately identify and measure areas of social inequity may lead to potential solutions that may not only address but may even reduce the inequities most racial and ethnic groups and subgroups are facing. Social equity also takes on many dimensions which cannot be assessed from existing data sources. Therefore, it is time for public administrators to heed to the admonishment of the NAPA (2005), to take action to alleviate and correct social equity problems as they develop, manage, and analyze public programs. One way to do this is to ensure that the appropriate racial and ethnic taxonomy is being used to classify the population.

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APPENDICES

Appendix I: Glossary of Key Concepts

Blacks Refer to people having origins in any of the Black racial groups of Africa. It includes people who indicated their race as "Black or African American." US Census Bureau 2006)

Body Mass Index (BMI) An anthropometric measure of body fat which describes the relative weight for height. It is calculated by dividing weight in kilograms by height in meters squared. Classification of weight by BMI: National Heart Lung Blood Institute 1998)

Underweight	(<18.5 kg/m^2)
Normal	(18.5-24.9 kg/m^2)
Overweight	(25.0-29.9 kg/m^2)
Obese	($\geq$ 30.0 kg/m^2)

Foreign-born Defined as people residing in the United States who are not US citizens at birth. This includes all naturalized citizens, legal permanent residents, undocumented immigrants, and persons on long-term temporary visas. Schmidley 2001, 56)

Health Equity Equity in health implies that ideally everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from achieving this potential, if it can be avoided Whitehead 1990).

Health Disparities Inequality is a particular type of difference in health or in the most important influences on health that could potentially be shaped by policies; it is a difference in which disadvantaged social groups or groups (such as the poor, racial/ethnic minorities, women, or other groups who persistently experienced social disadvantage or discrimination in the past) systematically experience worse health or greater risks than more advantaged groups (Braveman 2006, 180).

Immigrant Aliens admitted for legal permanent residence in the United States or those residing illegally.

Native People born in either the United States, Puerto Rico, or a U.S. Island Area such as Guam or the U.S. Virgin Islands, or people born in a foreign country to a U.S. citizen parent(s). (Schmidley 2001, 56)

Obesity A condition of excessive body fat or adipose tissue accumulation that results in the impairment of health. It is defined as BMI $\geq$ 30 kg/m^2. Burton et al. 1985)

Place of birth	The foreign country where a person was born.
Social Equity	The fair, just and equitable management of all institutions serving the public directly or by contract, and the fair and equitable distribution of public services, and implementation of public policy, and the commitment to promote fairness, justice, and equity in the formation of public policy. (National Academy of Public Administration 2005, 1)
White	Refers to people having origins in any of the original peoples of Europe, the Middle East, or North Africa. It includes people who indicated their race as "White" US Census Bureau 2006).

Appendix II: List of National Surveys that Asked Questions Related to Foreign-born

Questions Asked in the National Health Interview Survey (NHIS) Related to Foreign-born	
Items	***Survey Questions and Response Options Categories***
Place of Birth	[fill: Were you/Was ALIAS] born in the United States? — Yes — No
Country of Birth	**In what country [fill: were you/was ALIAS] born?** — Lists almost 700 countries to select from but the public use fill collapses this listing into the following options.
Year of Entry	**In what year did [fill F_TEMPNAME] come to the United States to stay?** Year:
Length of U.S.	**In what year did [fill3: you/ALIAS] come to the United States to stay?** Years:
Citizenship Status	**[fill: Are you/Is ALIAS] a CITIZEN of the United States?** — Yes, born in the United States — Yes, born in Puerto Rico, Guam, American Virgin Islands, or other U.S. territory -Yes, born abroad to American parent(s) — Yes, U.S. citizen by naturalization — No, not a citizen of the United States

Source: 2007 NHIS Questionnaire – Family: **ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2007/English/qfamily.pdf**

Questions Asked in the National Health Interview Survey (NHIS) Related to Foreign-born	
Items	***Survey Questions and Response Options Categories***
Country of Birth	**In what country {were you/was NON-SP Head} born?** — United States — Other country
Select Country of Birth	▪ ARGENTINA ▪ BELIZE ▪ BOLIVIA ▪ BRAZIL ▪ CHILE ▪ COLOMBIA ▪ COSTA RICA ▪ CUBA ▪ DOMINICAN REPUBLIC ▪ ECUADOR ▪ EL SALVADOR ▪ GUATEMALA ▪ HONDURAS ▪ MEXICO ▪ NICARAGUA ▪ PANAMA ▪ PARAGUAY ▪ PERU ▪ PHILIPPINES ▪ PUERTO RICO ▪ SPAIN ▪ URUGUAY ▪ VENEZUELA ▪ OTHER COUNTRY

Source: NHANES Questionnaire – Family:
http://www.cdc.gov/nchs/data/nhanes/nhanes_07_08/DMQ_e_eng.pdf

Appendix III: Questions from the NHIS Family and Adult Core Questionnaires

SOCIODEMOGRAPHICS

{Are/Is} {you/name} male or female?

(1) Male
(2) Female

{Do/Does} {you/name=s} consider {yourself/himself/herself} to be Hispanic or Latino?

(1) Yes
(2) No
(7) Refused
(9) Don't know

What race or races {does/do} {name/you} consider {himself/herself/yourself} to be? Please select 1 or more of these categories.

(01) White
(02) Black/African American
(03) Indian (American)
(04) Alaska Native
(05) Native Hawaiian
(06) Guamanian
(07) Samoan
(08) Other Pacific Islander
(09) Asian Indian
(10) Chinese
(11) Filipino
(12) Japanese
(13) Korean
(14) Vietnamese
(15) Other Asian
(16) Some other race
(97) Refused
(99) Don't know

How old is {sample adult name}?

(000-120) 0-120 years old
(7) Refused
(999) Don't know
(9) Don't know
(997) Refused

What is the HIGHEST level of school {you/subject name} {have/has} completed or the highest degree {you/subject name} {have/has} received?

(0) Never attended / kindergarten only
(1) 1st grade
(2) 2nd grade
(3) 3rd grade
(4) 4th grade
(5) 5th grade
(6) 6th grade
(7) 7th grade
(8) 8th grade
(9) 9th grade
(10) 10th grade
(11) 11th grade
(12) 12th grade, no diploma
(13) GED or equivalent
(14) HIGH SCHOOL GRADUATE
(15) Some college, no degree
(16) Associate degree: occupational, technical, or vocational program
(17) Associate degree: academic program
(18) Bachelor's degree (Example: BA, AB, BS, BBA)
(19) Master's degree (Example: MA, MS, MEng, MEd,MBA)
(20) Professional School degree (Example: MD, DDS, DVM, JD)
(21) Doctoral degree (Example: PhD,EdD)
(97) Refused
(99) Don't know

Where {were/was} {you/subject name} born?

(1-51) One of the 51 states in the United States
(57) United States, state unknown
(99) Not in the US

If "(99) Not in the US" select country from the list of countries

About how long {have/has} {you/subject name} been in the United States?

(01-94) 01-94 years
(95) 95+ years
(97) Refused
(99) Don't know

{Are/Is} {you/subject name} a CITIZEN of the United States?

(1) Yes, born in one of the 50 United States or the District of Columbia
(2) Yes, born in Puerto Rico, Guam, American Virgin Islands, or other U.S. territory
(3) Yes, born abroad to American parents
(4) Yes, U.S. citizen by naturalization
(5) No, not a citizen of the United States
(7) Refused
(9) Don't know

HEALTH CONDITIONS

These questions are about selected obesity-related diseases

Have you EVER been told by a doctor or other health professional that you had...Hypertension, also called high blood pressure?

(1) Yes
(2) No
(7) Refused
(9) Don't know

Have you EVER been told by a doctor or other health professional that you had... (Coronary heart disease?, Angina, also called angina pectoris?, A heart attack (also called myocardial infarction)?, A stroke?)

(1) Yes
(2) No
(7) Refused
(9) Don't know

Have you EVER been told by a doctor or other health professional that you had... Cancer or a malignancy of any kind?

(1) Yes
(2) No
(7) Refused
(9) Don't know

Have you EVER been told by a doctor or health professional that you have diabetes or sugar diabetes?

(1) Yes
(2) No
(3) Borderline
(7) Refused
(9) Don't know

These questions are about body mass index

How tall are you without shoes?
FEET:

(02-07) 2-7 feet
(97) Refused
(99) Don't know

INCHES:

(00-11) 0-11 inches
(97) Refused
(99) Don't know
(997) Refused
(999) Don't know

How much do you weigh without shoes?
POUNDS:

(050-500) 50-500 pounds
(997) Refused
(999) Don't know

These questions are about health status

Would you say {your/subject name's} health in general is excellent, very good, good, fair, or poor?

(1) Excellent
(2) Very good
(3) Good
(4) Fair
(5) Poor
(7) Refused
(9) Don't know

HEALTH BEHAVIOR

These questions are about cigarette smoking

Have you smoked at least 100 cigarettes in your ENTIRE LIFE?

(1) Yes
(2) No
(7) Refused
(9) Don't know

Do you NOW smoke cigarettes every day, some days or not at all?

(1) Every day
(2) Some days
(3) Not at all
(7) Refused
(9) Don't know

On the average, how many cigarettes do you now smoke a day?

(01-94) 1-94 cigarettes
(95) 95+ cigarettes
(97) Refused
(99) Don't know

These questions are about physical activities

How often do you do VIGOROUS activities for AT LEAST 10 MINUTES that cause HEAVY sweating or LARGE increases in breathing or heart rate?

(000) Never
(997) Refused
(001-995) 1-995 times
(999) Don't know
(996) Unable to do this type activity

TIME PERIOD:

(0) Never
(4) Year
(1) Day
(6) Unable to do this type activity
(2) Week
(7) Refused
(3) Month
(9) Don't know

About how long do you do these vigorous activities each time?

(001-995) 1-995
(997) Refused
(999) Don't know

TIME PERIOD:

(1) Minutes
(7) Refused
(2) Hours
(9) Don't know

Each time you do these vigorous activities, do you do them 20 minutes or more, or less than 20 minutes?

(1) Less than 20 minutes
(7) Refused
(2) 20 minutes or more
(9) Don't know

How often do you do LIGHT OR MODERATE activities for AT LEAST 10 MINUTES that cause ONLY LIGHT sweating or a SLIGHT to MODERATE increase in breathing or heart rate?

(000) Never
(997) Refused
(001-995) 1-995 times
(999) Don't know
(996) Unable to do this type activity

TIME PERIOD:

(0) Never
(1) Day
(2) Week
(3) Month
(4) Year
(6) Unable to do this type activity
(7) Refused
(9) Don't know

About how long do you do these light or moderate activities each time?

(001-995) 1-995
(997) Refused
(999) Don't know

TIME PERIOD:

(1) Minutes
(7) Refused
(2) Hours
(9) Don't know

Each time you do these light or moderate activities, do you do them 20 minutes or more, or less than 20 minutes?

(1) Less than 20 minutes
(2) 20 Minutes or more
(7) Refused
(9) Don't know

How often do you do physical activities specifically designed to STRENGTHEN your muscles such as lifting weights or doing calisthenics? (Include all such activities even if you have mentioned them before.)

(000) Never
(001-995) 1-995 times
(996) Unable to do this type of activity
(997) Refused
(999) Don't know

TIME PERIOD:

(0) Never
(1) Day
(2) Week
(3) Month
(4) Year
(6) Unable to do this type of activity
(7) Refused
(9) Don't know

These questions are about drinking alcoholic beverages

In ANY ONE YEAR, have you had at least 12 drinks of any type of alcoholic beverage?

(1) Yes
(2) No
(7) Refused
(9) Don't know

In your ENTIRE LIFE, have you had at least 12 drinks of any type of alcoholic beverage?

(1) Yes
(2) No
(7) Refused
(9) Don't know

In the PAST YEAR, how often did you drink any type of alcoholic beverage?

(000) Never
(001-365) 1-365 days

TIME PERIOD:

(0) Never/None
(1) Week
(2) Month
(997) Refused
(999) Don't know
(3) Year
(7) Refused
(9) Don't know

In the PAST YEAR, on those days that you drank alcoholic beverages, on the average, how many drinks did you have?

(01-94) 1-94 drinks
(97) Refused
(95) 95+ drinks
(99) Don't know

In the PAST YEAR, on how many DAYS did you have 5 or more drinks of any alcoholic beverage?

(000) Never/None
(001-365) 1-365 days

TIME PERIOD:

(0) Never/None
(1) Week
(2) Month
(3) Year
(7) Refused
(9) Don't know

HEALTH CARE

Is there a place that you USUALLY go to when you are sick or need advice about your health?

(1) Yes
(2) There is NO place
(3) There is MORE THAN ONE place
(7) Refused
(9) Don't know

What kind of place do you go to most often -a clinic, doctor's office, emergency room, or some other place?

(1) Clinic or health center
(2) Doctor's office or HMO
(3) Hospital emergency room
(4) Hospital outpatient department
(5) Some other place
(6) Doesn't go to one place most often
(7) Refused
(9) Don't know

DURING THE PAST 12 MONTHS, HOW MANY TIMES have you seen a doctor or other health care professional about your own health at a DOCTOR'S OFFICE, A CLINIC, OR SOME OTHER PLACE? DO NOT INCLUDE TIMES YOU WERE HOSPITALIZED OVERNIGHT, VISITS TO HOSPITAL EMERGENCY ROOMS, HOME VISITS, DENTAL VISITS, OR TELEPHONE CALLS.

(00) None
(01) 1
(02) 2-3
(03) 4-5
(04) 6-7
(05) 8-9
(06) 10-12
(07) 13-15
(08) 16 or more
(97) Refused
(99) Don't know

The next questions are about health insurance

{Are you/Is anyone} covered by any kind of health insurance or some other kind of health care plan?

(1) Yes
(2) No
(7) Refused
(9) Don't know

What kind of health insurance or health care coverage {do/does} {you/subject name} have? INCLUDE those that pay for only one type of service (nursing home care, accidents, or dental care), exclude private plans that only provide extra cash while hospitalized.

(01) Private health insurance plan from employer or workplace
(02) Private health insurance plan purchased directly
(03) Private health insurance plan through a state/local government or community program
(04) Medicare
(05) Medi-Gap
(06) Medicaid
(07) SCHIP (State Children's Health Insurance Program)
(08) Military health care/VA
(09) TRICARE/CHAMPUS/CHAMP-VA
(10) Indian Health Service
(11) State-sponsored health plan
(12) Other government program
(13) Single Service Plan (e.g. dental, vision, prescriptions)
(14) No coverage of any type