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**Healthcare Utilization and the Association with
Cardiovascular Health of African-born and U.S.-born Blacks.**

by

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ABSTRACT OF THE DISSERTATION

Healthcare Utilization and the Association with Cardiovascular Health of
African-born and U.S.-born Blacks.

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Abstract: African born - Blacks are the fastest growing immigrants in the United States comprising 4.8% of the total foreign-born population. African-born Blacks are also culturally, ethnically, religiously, educationally diverse from their U.S-born and other foreign-born Black counterparts. The pathway by which they arrive and reasons for migrating into the United States (U.S.) also differentiate them from each other. Yet, most studies of Blacks in the U.S. largely overlook the heterogeneity within this group rather consolidating them as one monolithic group which may have implications for the health status of the African-born Black residing in the United States.

The cardiovascular health of African-born Blacks in the U.S. has been largely unexamined despite recent studies reporting an upsurge in the burden of cardiovascular disease in Sub-Saharan Africa. It is likely that African-born Blacks are migrating into the U.S. with cardiovascular risk factors and diseases that they are unaware of due to subpar

healthcare systems already overburdened, lack of effective preventive strategies and lack of economic resources to treat effectively even when aware. In addition, immigrant populations are often identified as a vulnerable population due to their limited English language proficiency, immigration status, lack of socioeconomic resources, and stigma and marginalization due to religious and cultural background. In the case of the African-born Black this is further exacerbated by racial discrimination due to the color of their skin resembling their U.S.-born counterpart which elevates their risk of poor health and inadequate medical care in the United States. Lastly, acculturation has been linked to adopting lifestyle behaviors such as poor diet, lack of physical activity, smoking status and being obese that further increase the risk of African-born Blacks developing cardiovascular diseases.

African-born Blacks in the U.S. often report a higher likelihood of being uninsured, often have inadequate health insurance coverage, usually identify no usual source of care or healthcare provider and often do not get the needed preventive services. This study aimed to determine whether healthcare utilization is associated with cardiovascular health among African-born and U.S.-born Blacks and to evaluate whether the associations depended on length of stay.

Understanding the healthcare utilization of African-born Blacks and its association with their cardiovascular health could help in reducing the disparities in the gaps observed between Blacks and Whites in the U.S and elucidate how and if the gaps observed can be attributed to African-born Blacks being lumped in with U.S.-born Blacks. There is a need to disaggregate data on African-born Blacks in national databases on the health-related

risk behaviors, chronic health conditions, use of preventive services, access to healthcare and healthcare utilization of African immigrants.

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Introduction

Healthcare utilization refers to the use of health care services by persons for the purpose of preventing and curing health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis (Carrasquillo, 2013). Access to healthcare in the United States is unequal for certain vulnerable populations including immigrant populations. For the African-born Black immigrant, unequal access often results in lack of realized access to healthcare even when individuals might be in dire need due to financial, cultural, language, and geographical barriers. African-born Blacks represent a small portion of the foreign-born black community in the United States and as such have not been well studied.

Foreign – born black population

The American Community Survey estimates the foreign-born Black population to be at approximately nine percent of all Blacks in the U.S., totaling about 4.2 million in 2016 (U.S. Census Bureau, n.d.). Almost half of the population are from the Caribbean (49%), followed by African-born immigrants (39%); the remaining 12 percent are from other regions (Anderson & Lopez, 2018). African Caribbeans in the U.S., as well as African Americans are products of the Atlantic slave trade, slavery and European colonialism (Jie Zong and Jeanne Batalova, 2011; Showers, 2016). As such, African Caribbeans are more likely to be naturalized citizens than all other foreign born populations and are the most oft studied black immigrant population (Jie Zong and Jeanne Batalova, 2011). African Caribbeans are often considered a model minority though as they arrive with certain social capital such as income, education and occupational advantages (Thornton, Joseph, Chatters, & Forsythe-Brown, 2017).

However, compared to the total foreign born population, African Caribbeans are less likely to be educated, less likely to speak English and have lower incomes (Jie Zong and Jeanne Batalova, 2011). Yet there are variations in the differences among Caribbean countries. For example, Jamaica and Trinidad and Tobago are English speaking countries. These immigrants are more likely to be educated and have higher median incomes compared to those from the Dominican Republic and Cuba who are Spanish speaking and cannot earn good incomes upon arrival due to their limited English proficiency (Jie Zong and Jeanne Batalova, 2011).

African-born Blacks, unlike African Caribbeans' are less well studied and there are notable differences between both populations. African-born Blacks account for 4.8 percent of the U.S. immigrant population with about 52 percent arriving in 2000 or later (Capps, McCabe, & Fix, 2012) while African Caribbeans' account for 10 percent and about 70 percent arriving before 2000 (U.S. Census Bureau, 2012). African-born immigrants are much more likely to migrate through diversity programs such as visa lottery or employment than they are through family sponsored visas (Read, Emerson, & Tarlov, 2005). However, a large portion have also arrived in the U.S. as a result of the Refugee Act of 1980, which allowed individuals and families fleeing from conflict-ridden areas the ability to resettle in the United States. These arrivals accounted for about 38 percent of refugee arrivals in 2017, second only to refugees from Asia (Anderson, 2017).

Compared to African Caribbeans' the educational attainment of Africans is higher than all other population groups and U.S.-born Blacks (Capps, McCabe, & Fix, 2011). African-born immigrants are often younger than African Caribbean's and all immigrant populations (median age of 38 years vs. 46.7 years respectively); are more likely to be

male (53% vs. 46% respectively); are more likely to participate in the labor force (75.1% vs. 66.5% respectively); and they tend to have a higher income (U.S. Census Bureau, 2012). Despite a higher income, the poverty rates of African-born immigrants are higher than all U.S.-born and foreign born populations (U.S. Census Bureau, 2012). Like African-Caribbeans' there is variation among African regions for example; consider that 59 percent of Nigeria born immigrants have a college degree or more compared to 10 percent of Somalia born immigrants (Anderson & Lopez, 2018) suggesting that the social capital advantages is not equal for all Africa born immigrants.

Consistently, U.S-Born Blacks have been found to have worse health status than all foreign-born Blacks (Hamilton, 2015; Hamilton & Green, 2018; Hamilton & Hummer, 2011). Additionally, Caribbean-born Blacks have been found to have worse health status than their African-born counterpart (Hamilton, 2014). The presence of African-born Blacks in the U.S. creates a unique scenario for examining the health status of people of similar racial/genetic descendancy, but with different ethnicities, cultures, environments and mode of immigration unlike Caribbeans'.

Further investigation is required to enlighten our understanding of reasons for health disparities among disparate Black populations, particularly that which adds to the little research on African-born Blacks compared to Caribbean-born Blacks.

Cardiovascular Health

Among the diseases of high prevalence among all Black population is cardiovascular diseases. Cardiovascular disease (CVD) is a global problem with three quarters of cardiovascular deaths taking place in low- and middle- income countries. CVD is also the leading cause of death in the U.S for Black Americans (Murphy, Xu,

Kochanek, & Arias, 2018) and despite concerted efforts to improve the cardiovascular health of all Americans, it remains a major public health challenge. There has been much documented about the variations in CVDs between Blacks and Whites in the United States and in recent years, variations have been noted within the Black population as well.

In an effort to eliminate racial/ethnic disparities in CVD, the American Heart Association developed a comprehensive measure they termed “Ideal cardiovascular health” defined by “the presence of both ideal health behaviors (nonsmoking, body mass index < 25 kg/m², physical activity at goal levels, and pursuit of a diet consistent with current guideline recommendations) and ideal health factors (untreated total cholesterol < 200 mg/dL, untreated blood pressure <120/<80 mm Hg, and fasting blood glucose 100mg/dL)” (Lloyd-Jones et al., 2010). Blacks in the U.S. been reported to have poorer cardiovascular health in several of these metrics compared to Whites (Carnethon et al., 2017).

Furthermore, there have been ethnic disparities in cardiovascular health or diseases among Blacks (Hicks et al., 2003). Infact, Fang et.al (1996) found that the variation in mortality from cardiovascular disease within the Black population according to birthplace far exceeds the interracial differences between Blacks and Whites (Fang, Madhavan, & Alderman, 1996). Cole et al. (2018) reports that foreign-born Blacks are less likely than U.S.-born Blacks to be aware of cardiovascular risk factors (Cole, Reed, Tannis, Trinh-Shevrin, & Ravenell, 2018). Another study found that foreign-born Blacks had higher odds of diabetes but lower odds of obesity than U.S.-born Blacks (Horlyck-Romanovsky et al., 2019). However, these studies did not disaggregate the data to

identify ethnic origins which studies have reported is necessary so as not to obscure the unique variations within this groups.

In a study by Lee et al. (2013) U.S-born Blacks living in the 50 states were found to be more likely than U.S. Virgin Island Blacks to report ever having a stroke and coronary heart disease, be hypertensive, diabetic, or obese (Lee et al., 2013). Foreign-born Caribbean have been found to be less likely than U.S-born Caribbean and U.S.-born Blacks to have elevated systolic and diastolic blood pressure, elevated total cholesterol, be obese, and be smokers (Davis & Huffman, 2007). Similarly, Carlisle (2012) found that foreign-born Caribbean were less likely than their U.S.-born counterpart to report a cardiovascular condition (Carlisle, 2012). Gyamfi et. al. (2017) found that despite the fact that West African-born Blacks had blood pressure control rates similar to those for U.S.-born Blacks, they had better health outcomes than both U.S.-born and Caribbean born Blacks (Gyamfi et al., 2017),

Recent studies have found African-born Black men to have higher rates of hypertension and diabetes than U.S.-born Black men but also found that they were less likely to be obese or have ever or currently smoked (O'connor et al., 2014; Ukegbu et al., 2011; Yu, Ramsey, Castillo, Ricks, & Sumner, 2013). Hyman et al. (2000) found lower prevalence of hypertension in first generation African-born Blacks compared to U.S.-born Blacks (Hyman, Ogbonnaya, Pavlik, Poston, & Ho, 2000) and so did Poston et. al (2001) while Commodore-Mensah et al. (2016) found a high prevalence of hypertension, diabetes and obesity in a sampled population of West African immigrants (Carlos Poston et al., 2001; Commodore-Mensah et al., 2016). In addition, the cardiovascular health of African-born Blacks even when thought to be better has been found to dissipate the

longer they reside in the United States, although the results have not been conclusive (Golub et al., 2018; Koya & Egede, 2007).

Lastly, research suggests that the minority status of U.S.-born Blacks significantly affects their health. Read, Emerson and Tarlov (2005) and Elo et.al. (2008) have shown in their research a health advantage for all foreign-born Blacks except European-born Blacks, reporting similar health outcomes as U.S.-born Blacks when compared to U.S.-born Whites (Elo, Mehta, & Huang, 2008; Read et al., 2005). Similarly, South Africans have been found to have stroke mortality rates twice as high than Whites and similarly high rates of hypertension (Opie & Seedat, 2005). South Africans like U.S-born Blacks are a racial minority and have suffered similar oppression and discrimination due to apartheid.

This suggests that more differences are to be observed based on one's identified ethnicity than along racial lines and adds to the call to disaggregate the data for the Black population in future research studies.

Access to Care and Healthcare Utilization

Access to health care of African-born Blacks differs also from the Caribbean born and U.S-born counterpart. Caribbean-born Blacks are much more likely to be insured than their overall foreign-born population, however they were more likely to have public health insurance coverage than all other foreign-born population (Jie Zong and Jeanne Batalova, 2011). African-born Blacks in comparison are more likely to have private health insurance coverage than all other foreign born population (Echeverria-Estrada & Batalova, 2019). Due to the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), certain legal documented immigrants are

eligible for public health insurance and they include those who are lawful permanent residents and refugees or asylees (Singer, 2004) creating a safety net for those who are unable to get insurance through employment. However, they are only eligible after residing in the U.S. for five years. Employment based insurance is the primary source of private health insurance. Alternatively, insurance can be purchased through federal or state marketplace plans or through private licensed brokers or agents. Undocumented immigrants also called illegal aliens are not eligible for private or public insurance in the United States. Many immigrants are therefore not getting the needed preventive and primary care services.

Lower rates of insurance is also a contributing risk factor to ideal cardiovascular health for the African-born Black as individuals without insurance are less likely to be unaware of their cardiovascular risk profile and thereby less likely to prevent cardiovascular diseases (Cole et al., 2018; Kenik, Jean-Jacques, & Feinglass, 2014; Langellier et al., 2012; Venters & Gany, 2011). Similarly, healthcare utilization is a contributing risk factor to ideal cardiovascular health for the African-born Black as they are more likely to have undiagnosed cardiovascular health factors or diseases, are less likely to be treated for them and are less likely to utilize healthcare prior to an urgent crisis (Brooks et al., 2010; Dinkler, Sugar, Escarce, Ong, & Mangione, 2016; Rooks et al., 2008; Spatz, Ross, Desai, Canavan, & Krumholz, 2010). Even when insurance is available, researchers have found that individuals who lack a usual source of care are more likely to have problems with getting care, tests, treatments and delay needed urgent care (Dallo, Wilson, & Stimpson, 2009; Rodríguez, Vargas Bustamante, & Ang, 2009; Spatz et al., 2010; Wilper et al., 2008).

Study Focus

This study focuses on African-born Blacks due to their limited access to healthcare. Ideally, we would be able to compare migrants' characteristics such as healthcare utilization rates to those of non-migrants in the origin country just before migration. However, U.S.-born Blacks similarly report low access to and utilization of healthcare (Artiga, Foutz, Cornachione, & Garfield, 2016) and to the best of my knowledge no study has examined the healthcare utilization of African-born Blacks compared to U.S.-born Blacks. The implication here is that African-born Blacks who migrate to the U.S. will have their health status further compromised due to unequal access to health care and limited healthcare utilization like their U.S. born counterparts.

Therefore, the health of African-born immigrants becoming like U.S.-born Blacks due to acculturation could further increase the gap in cardiovascular diseases. This dissertation explores African-born immigrants' access to and utilization of healthcare services in Minnesota and how these factors are associated with cardiovascular health compared to the U.S.-born black population utilizing data from the Survey of the Health of All the Population and the Environment (SHAPE).

Three primary aims serve as the basis for the manuscripts in this work. Manuscript 1 is a critical literature review on cardiovascular health and health care utilization among U.S.-Born and African-Born Blacks. Manuscript 2 characterizes the differences in access to health and health care utilization of both East and West African-born immigrants and U.S.-born Blacks. Manuscript 3 characterizes the predictors of healthcare utilization related to the cardiovascular health of African-born Blacks compared to U.S.-born Blacks.

Data Source

This study uses secondary data from the survey of the health of all the population and the environment (SHAPE) - adult survey racial and ethnic public use data file 2006. SHAPE is an ongoing public health surveillance project that monitors the health of residents in Hennepin county, Minnesota. SHAPE 2006, is the third in the series, and is a partnership between the Hennepin county human services and public health department, and the university of Minnesota school of public health. The SHAPE 2006 - adult survey data were collected using a mixed-mode approach consisting of telephone interviews and self-administered surveys that were mailed to sampled households. Both the mail and phone versions of the survey were implemented in English, Hmong, Spanish, Somali, and Vietnamese. In order to produce estimates that represent the entire county's population, sampling weights were created. This weighting adjusted for disproportional sampling of households by strata, unequal selection probability of respondents from the households, and post-stratification adjustments for gender, age, geographic location and racial/ethnic group. (Hennepin County Human Services and Public Health Department., 2008)

I utilize 2006 data because

- It best matched to the research questions as well as providing the nation of origin. National database sets do not provide specific information on countries of origin as it is considered protected data and are not publicly available therefore African-origin blacks in their dataset may identify as Hispanic/Latino or Afro-Caribbean.
- This data set also purposefully studied for African immigrants as a whole whereas subsequent datasets purposefully studied for East African immigrants only.

- This data set also provided a full cardiovascular health profile as subsequent years changed the questions on these variables and thus did not allow for trends to be observed.
- It was also a relatively large sample set compared to the other years studied. A recent study using national database from 2010 – 2016 i.e. 6 years of data, had a total sample size of 1345 African immigrants, so having one year of data with 412 African-born was a good reason to utilize this data. (Turkson-Ocran et al., 2020)

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Manuscript 1: Cardiovascular Health and Healthcare Utilization among U.S.-Born and African-Born Blacks: A Literature Review

Introduction

To date, researchers do not have a definitive explanation why Blacks in the United States (U.S.) are more predisposed to worse cardiovascular outcomes than their White counterparts (Jamerson, 2004). Similarly, there appears to be a major difference observed among people of African – born origin. Traditional African populations show a low prevalence of cardiovascular risk factors (Sewali et al., 2015) such as high blood pressure or hypertension, high cholesterol, high glucose (diabetes mellitus), obesity, physical activity, smoking status and diet (Lloyd-Jones et al., 2010). Forrester (2004) reports that genetics seem to be the most likely factor to explain this scenario; however, no causative gene has been identified and researchers have been unable to support the proposal that populations of African origin are genetically predisposed to developing cardiovascular diseases (CVD). Hence, it might be instructive to look at non-genetic factors such as cultural, social and behavioral determinants, and lifestyle factors that might account for the cardiovascular disparities experienced by African origin Blacks in the United States.

Africans now make up 39% of the overall foreign-born Black population in the U.S. (up from 24% in 2000), and their population more than doubled between 2000 and 2016 (Anderson & Lopez, 2018). They are now the fastest growing group of foreign Blacks in the United States (Anderson, 2017). However, as a result of studies treating Blacks in the U.S. as a monolithic group, it is challenging to determine the contribution of cultural, social, behavioral and lifestyle contributions to the cardiovascular health and

other health outcomes of U.S.-born versus African-born Black subgroups (Agyemang, Bhopal, & Bruijnzeels, 2005; Capps, McCabe, & Fix, 2011; Sheldon & Parker, 1992).

Results of research by Venters and Gany (2011) suggest that African-born Blacks experience better health outcomes, including a lower prevalence of chronic diseases such as hypertension, because of the “healthy immigrant effect.” Their research suggests that immigrants are likely healthier than their host counterparts due to migrant selectivity during the immigration process. Despite this claim, studies in other immigrant groups show that through acculturation, the health of immigrants declines as they adopt the lifestyle practices and health behaviors of their host society (Markides & Rote, 2019; Weinstein, Geller, Negussie, & Baciu, 2017). It is unclear whether the acculturation effect is impacted by region of birth or if it is the result of other factors such as youth. For example, Golub et.al. (2018) showed in their study that African refugees from Liberia had the highest levels of hypertension after resettlement compared to all other refugee immigrants, while those from “other African countries” (Burkina Faso, Burundi, Chad, Congo, Eritrea, Ethiopia, Nigeria, Sierra Leone, Togo) had the lowest levels of hypertension. Within a year of resettlement in the United States, immigrants from “other African countries” had the lowest levels of diabetes while those from Somalia had the highest levels of diabetes. There were several confounding factors observed among resettled refugee adults with longer length of stay in the U.S., including increased odds of Type 2 diabetes and hypertension, irrespective of country of origin (Golub et al., 2018).

Cardiovascular disease (CVD) is the leading cause of death globally (American Heart Association, 2019). In the U.S., Blacks are disproportionately affected. The American Heart Association reports that “little has changed since 2005 when notable

disparities were observed in prevalence, disease management and outcomes” in the rates of CVD observed in Blacks in the United States (Carnethon et al., 2017). The prevalence of hypertension or high blood pressure, a risk factor of CVD is said to be highest in the world amongst U.S.-born Blacks (Carnethon et al., 2017).

Recent studies of Africans residing in the U.S. are increasingly showing similar or higher rates of cardiovascular risk factors among this group. Njeru et.al (2015) found that Somali immigrant patients had a significantly higher prevalence of diabetes, pre-diabetes and obesity than did non-Somali patients (Njeru et al., 2016). Measuring CVD risk factors in a population of Nigerians and Ghanaians in the U.S., Commodore-Mensah et al. (2016) found a prevalence of hypertension at 40%, diabetes at 16%, and of being overweight or obesity at 88%. Overall, 80% of those sampled were reported to have at least two CVD risk factors (Commodore-Mensah et al., 2016). These statistics are alarming given the fact that 79% of those in the study were employed, 60% had a college degree or higher, and 48% were uninsured.

Educational attainment, type of occupation, and earnings directly and indirectly influence immigrants’ access to health care resources (Derose, Escarce, & Lurie, 2007). This could explain why there was such a high prevalence of CVD risk in the immigrant population in Commodore-Mensah’s study described above. Legal status is another vulnerability risk factor to accessing healthcare even though 77% of immigrants reported that they were permanent residents of the United States. It is likely that these high-risk rates are because of acculturation since 67% of those sampled lived in the U.S. for 10 years or more. This therefore invalidates the argument for the healthy immigrant effect among African-born Blacks (Okwuosa & Williams, 2012). It further emphasizes the need

for researchers to delineate data on African-born Blacks from that of U.S.-born Blacks. Such knowledge might enable effective programs to reduce the gap between Blacks and Whites in the U.S. through concerted prevention and treatment efforts addressed uniquely to each group. Failure to do so will see CVD rates remain unchanged in the Black population.

A study of West African immigrants in the U.S. found an association among women having health insurance with reduced risk of CVD. Commodore-Mensah et al. (2018) found that amongst immigrant populations in the U.S., African immigrants were the least likely to be insured and were also less likely to report having seen a doctor in the past year. Not surprisingly, they also reported African immigrants had the highest prevalence of hypertension and diabetes (Commodore-Mensah et al., 2018).

Despite these findings, no study has comparatively analyzed the association between healthcare utilization and cardiovascular health among African-born and U.S.-born Blacks. The purpose of this critical literature review, therefore, is to appraise existing studies examining cardiovascular health in African-born Blacks compared to U.S.-born Blacks alone and report direct associations between healthcare utilization and cardiovascular health.

Methods

Search strategy for identification of studies

One hundred two (102) studies were systematically examined related to the cardiovascular health of African-born and U.S.-born Blacks to assess whether healthcare utilization was examined as a predictor for cardiovascular health. Searches were undertaken using keywords and medical subject headings (MESHs) in PUBMED, Web of

Science and CINAHL electronic databases. Subsequently, the reference list of relevant identified articles was examined to retrieve other studies that were not included in either of the three databases. Keywords and MESHs, truncated and exploded to capture as many articles as possible, were used in the development of search strategies, including: African immigrants, Sub Saharan African born, Africa born Blacks, African American, U.S. born Black, Black Americans, Blacks, healthcare utilization, healthcare use, healthcare accessibility, health access, access to health care, realized access, cardiovascular disease, cardiovascular health. The exact search terms were: Search (((((((African immigrants) OR sub Saharan African born) OR Africa* born blacks)) AND (((African immigrants) OR Africa* born blacks) OR sub Saharan African AND adult)) AND (((African Americans*) OR US born Blacks*) OR Black Americans) OR Blacks)) AND (((((((healthcare utilization) OR healthcare use) OR healthcare accessibility) OR health access) OR access to health care) OR realized access))) AND (((((((cardiovascular disease) OR cardiovascular health) OR CVD) OR cardiometabolic health) OR CVD risk factors) OR cardiovascular risk factors) OR cardiovascular disease risk factors.

Articles were included if they were published in English and included adults only. In order to not limit the search, articles were selected from 1900 through 2019, however, articles were limited to adult-only populations.

Study Selection and Data Extraction

A 3-stage screening process was conducted, starting with a title review, followed by an abstract review, and ending with a full-text article review (Figure 1). Inclusion criteria were: studies comparing U.S.-born with African born Blacks; studies of cardiovascular health factors (i.e., hypertension, obesity, physical activity, smoking, glucose levels

(diabetes mellitus), high cholesterol, nutrition); studies of access to healthcare or healthcare utilization (i.e., insurance status, usual source of care, having a regular provider). Exclusion criteria were: studies of mortality or using qualitative data only.

In the title review phase, 102 articles were screened, and 48 articles were excluded, yielding 54 relevant articles. Articles were excluded that did not indicate if foreign-born Blacks in the study originated from Africa. Abstracts of the paper were examined for keywords however to avoid losing any relevant articles all 54 articles were left to be reviewed fully. The full texts of the articles were then thoroughly examined for eligibility based on the inclusion criteria and methodological soundness. A pooled analysis was performed on all studies.

Results

Description of studies

Seven (7) studies were eventually included in this review, as one eligible study was dropped as the participants included in the study were identical in one of the studies selected (Carlos Poston et al., 2001). Four (4) of the studies compared African-born Blacks residing in the U.S and U.S.-born Blacks only. Three (3) of the studies compared Africans living in Africa to U.S.-born Blacks residing in the U.S. All of the studies examined systolic blood pressure (sBP), diastolic blood pressure (dBP), and body mass index (BMI); five (5) studied diabetes (fasting glucose); three (3) studied cholesterol (total cholesterol), three (3) studied physical activity and smoking, and one (1) examined subjects' fruit and fiber intake. Only one of the seven studies looked at an access to healthcare factor (insurance), and no healthcare utilization measure was examined (Table 1).

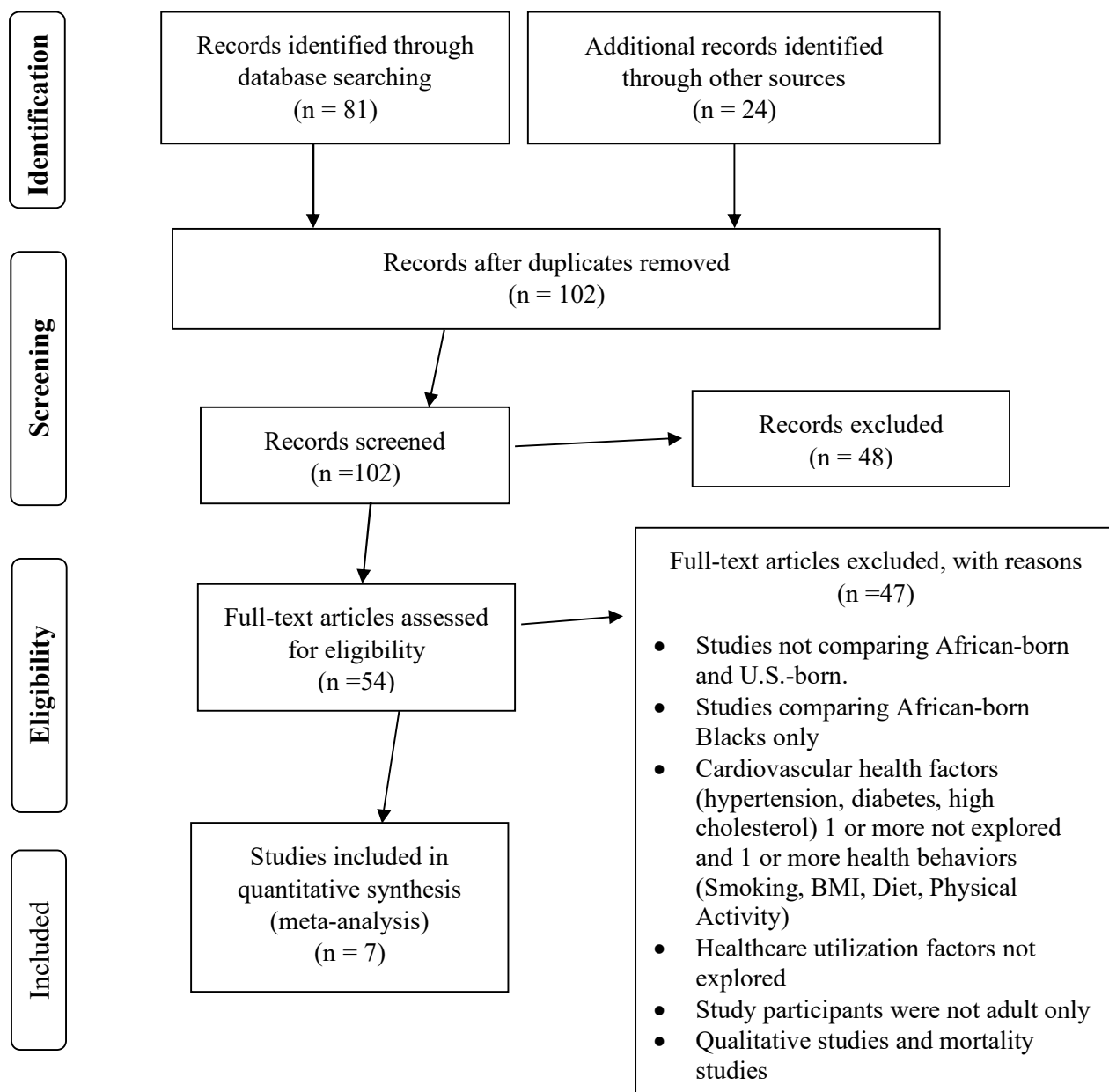


Figure 1. Study selection and data extraction. Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal.pmed1000097

Black Africans Living in the U.S. vs. U.S.-Born Blacks

In the four studies examining Africans residing in the U.S., the majority had lived in America for 10 years or more (over 80% in one study). Sample sizes in the studies ranged

from 95 to 214 individuals. Three of the studies examined men only (O'Connor et al., 2014; Ukegbu et al., 2011; Yu, Ramsey, Castillo, Ricks, & Sumner, 2013) while the study by Hyman et al. (2000) examined men and women. Two of the studies used physical measurements that were taken after a 12-hour fast using a standard epidemiological protocol of rest in a seated position for a period, then taking three separate blood pressure measurements with two minutes separating each reading. The first reading was omitted and the last two were averaged to obtain the sBP and dBP (Hyman, Ogbonnaya, Pavlik, Poston, & Ho, 2000; Ukegbu et al., 2011).

According to the American College of Cardiology (ACC) and American Heart Association (AHA), Blood pressure (BP) should be categorized as normal (<120/80 mm Hg), elevated (120-129/<80 mm Hg), stage 1 hypertension (130-139/80-89 mm Hg), or stage 2 hypertension (140/90 mm Hg) sBP/dBP ranges (Cifu & Davis, 2017). Blood was drawn for lipid and glucose profiles. Optimal total cholesterol level is about 150 mg/dL (Grundy et al., 2019) and according to the Center for Disease Control (CDC) “a fasting blood glucose level of 99 mg/dL or lower is normal, 100 to 125 mg/dL indicates prediabetes, and 126 mg/dL or higher indicates diabetes.” (“Getting Tested | Basics | Diabetes | CDC,” n.d.). Table 2 shows a detailed analysis of the measurements which were available for all four studies by sex. Africans were not delineated into regions of origin except in the O'Connor et.al study. The mean age of participants ranged from 34 years to 45 years. The mean sBP ranged from 121.8 to 130 mm Hg; the mean dBP ranged from 71 to 82.7 mm Hg; and the mean fasting glucose ranged from 86 to 103.2 mg/dL. The mean total cholesterol levels ranged from 153 to 200.9 mg/dL. Lastly, the mean BMI

levels ranged from 26.3 to 31.3. Ukegbu et al. (2011) did not report total cholesterol levels.

Physical activity was reported for those who indicated exercising moderately or more (i.e. 30 minutes or more), for at least three times a week (Hyman et al., 2000; O'Connor et al., 2014; Yu et al., 2013). The range of participants who exercised moderately was from 17% to 72%; Ukegbu et al. (2011) did not report physical activity levels. Lastly, two studies reported smoking rates from 0% to 21% (O'Connor et al., 2014; Yu et al., 2013). African women reported lower levels on all measurements compared to U.S.-born Black women, indicating a lesser risk of CVD for African born women living in the U.S.

A pooled analysis for males residing in the U.S. was calculated (Table 3). There were no significant differences in the ages of African men and U.S.-born Blacks who were sampled. African men reported higher sBP and dBP, indicating a higher risk of hypertension compared to U.S.-born Black men.

African men also reported significantly higher levels of glucose than did U.S.-born Black men (93.6 ± 14.7 mg/dL compared to 89.6 ± 8.6 mg/dL). U.S.-born Black men however, reported higher cholesterol levels and BMIs, physical activity and smoking levels. Comparing this pooled analysis of the men with the women studied in Hyman et al.'s (2000) study, the women studied were older, had a higher BMI, were less likely to smoke, and were just as likely to be physically active across both African-born and U.S.-born Blacks.

Table 1. Description of selected studies, by year of publication*

Author (Year)	Title	Journal	Populations	N	Years in U.S.	Gender	Risk Factors
O'Connor et al. (2014)	Worse cardiometabolic health in African immigrant men than African American men: reconsideration of the healthy immigrant effect	<i>Circulation</i>	African-born, African American	214	11 ± 9 (0.1-42)	Males	BMI, hypertension, cholesterol, diabetes, physical activity, smoking, insurance
Cooper et al. (1997)	The prevalence of hypertension in seven populations of West African origin	<i>American Journal of Public Health</i>	West African (Nigeria and Cameroon); Caribbean (Jamaica, St. Lucia, Barbados); U.S.-born Black (metropolitan Chicago)	10,014	-	Males & females	BMI, hypertension
Hyman et al. (2000)	Lower hypertension prevalence in first-generation African immigrants compared to US-born African Americans	<i>Ethnicity & Disease</i>	African-born, African American	182	< 5 - 7% 5-10 - 3% >10 - 80%	Males & females, not delineated	BMI, hypertension, cholesterol, diabetes, diet, physical activity
Poston et al. (2001)	Genetic bottlenecks, perceived racism, and hypertension risk among African Americans and first-generation African immigrants	<i>Journal of Human Hypertension</i>	African-born, African American	185	< 5 - 7% 5-10 - 3% >10 - 80%	Males & females	BMI, hypertension, cholesterol, diabetes, smoking
Ukegbu et al. (2011)	Metabolic syndrome does not detect metabolic risk in African men living in the U.S.	<i>Diabetes Care</i>	African-born, African American	95	10 ± 7 (0.2-27)	Males	BMI, hypertension, diabetes, cholesterol
Yu et al. (2013)	Triglyceride-Based Screening Tests Fail to Recognize Cardiometabolic Disease in African Immigrant and African- American Men	<i>Metabolic Syndrome Related Disorders</i>	African-born, African American	155	10 ± 10	Males	BMI, hypertension, diabetes, smoking, physical activity, cholesterol
Okosun et al. (1998)	Association of waist circumference with risk of hypertension and type 2 diabetes in Nigerians, Jamaicans, and African- Americans	<i>Diabetes Care</i>	Nigerian, Jamaica, African-American	5,042	-	Males & females	BMI, hypertension, diabetes
Cooper et al. (2015)	Elevated hypertension risk for African-origin populations in biracial societies: Modeling the Epidemiologic Transition Study	<i>Journal of Hypertension</i>	African American (Chicago), Jamaican (Kingston), Rural Ghanaian, South African (Cape Town), Seychelles	2500	-	Males & females	BMI, hypertension

Notes: * All studies were cross-sectional in design

Table 2. Subjects and cardiovascular risk factors among African and U.S-born Blacks residing in the United States, by sex and year of publication

Author (Year)	Origin of population	N (%)	Mean Age \pm SD	sBP* \pm SD	dBp** \pm SD	Fasting glucose \pm SD	Total cholesterol \pm SD	BMI***	Physical Activity %	Smoker %
Male subjects										
Hyman et al. (2000)	Africa	19 (59.3)	43 \pm 7.2	126.6 \pm 20.1	82.0 \pm 12.7	99.8 \pm 41.3	197.3 \pm 46.9	26.3 \pm 3.2	72	-
	U.S.	13 (40.6)	43 \pm 7.1	129.5 \pm 15.5	82.7 \pm 9.9	95.3 \pm 11.3	191.0 \pm 55.5	31.1 \pm 5.7	50	-
Ukegbu et al. (2011)	Africa	39 (41)	38 \pm 5	130 \pm 14	79 \pm 10	94 \pm 9	-	28 \pm 4.3	-	-
	U.S.	56 (59)	38 \pm 6	121 \pm 13	71 \pm 9	89 \pm 8	-	30.5 \pm 6.4	-	-
Yu et al. (2013)	Africa	80 (52)	36 \pm 9	126 \pm 13	76 \pm 9	92 \pm 8	158 \pm 31	27.3 \pm 3.8	27	6
	U.S.	75 (48)	35 \pm 8	121 \pm 12	71 \pm 10	88 \pm 8	174 \pm 41	29.8 \pm 6.2	35	21
O'Connor et al. (2014)	West Africa	68 (32)	40 \pm 10	126 \pm 14	76 \pm 10	92 \pm 14	166 \pm 33	27.2 \pm 3.8	32	8
	Central Africa	41 (19)	35 \pm 8	125 \pm 13	74 \pm 10	92 \pm 9	153 \pm 30	28.0 \pm 4.3	17	0
	East Africa	29 (13.5)	35 \pm 7	122 \pm 11	74 \pm 9	92 \pm 7	161 \pm 31	26.9 \pm 3.4	31	12
	U.S.	76 (35.5)	34 \pm 8	121 \pm 12	71 \pm 9	86 \pm 7	175 \pm 41	29.3 \pm 5.5	49	16
Female subjects										
Hyman et al. (2000)	Africa	66 (44)	40 \pm 5.8	121.8 \pm 15.4	77.6 \pm 11.0	91.7 \pm 16.9	199.4 \pm 59.2	28.9 \pm 3.9	30	-
	U.S.	84 (56)	44.9 \pm 9.0	124.8 \pm 17.0	82.7 \pm 9.9	103.2 \pm 42.7	200.9 \pm 45.9	31.3 \pm 5.7	50	-

Notes:

*Systolic blood pressure

**Diastolic blood pressure

*** Body mass index

African-born men were more likely to have elevated risk of hypertension and higher glucose levels than African-born women, while African-born women were significantly more likely to have high cholesterol. U.S.-born Black men were significantly less likely to have higher glucose levels and higher cholesterol than U.S.-born Black women and they had similar elevated risks of hypertension.

Table 3. Results of pooled analysis for cardiovascular risk factors among African born and U.S.-born black males residing in the United States

Region	N (%)	Mean Age \pm SD	sBP* \pm SD	dBp** \pm SD	Fasting glucose \pm SD	Total cholesterol \pm SD	BMI***	Physical Activity %	Smoker
African Total Average	276 (56)	37.8 \pm 7.7	126 \pm 14.2	77 \pm 10.1	93.6 \pm 14.7	167.1 \pm 29 [†]	27.3 \pm 3.8	35.8% ^{††}	6.5% ^{††}
United States Total Average	220 (44)	37.5 \pm 7.2	123 \pm 13	74 \pm 9.5	89.6 \pm 8.6	180 \pm 46 [†]	30.2 \pm 6	45% ^{††}	18.5% ^{††}

Notes:

*Systolic blood pressure

**Diastolic blood pressure

*** Body mass index

[†]Ukegbu et al. (2011) missing

^{††}Hyman et.al (2000) and Ukegbu et.al (2011) missing

Overall, using the Centers for Disease Control (CDC) for BMI classification with normal weight defined as 18.5 to <25 kg/m², overweight 25.0 to <30 kg/m², and obesity as 30.0 kg/m² or higher, each study reported mean BMI levels of participants.

Overweight/obesity is closely linked to hypertension and cardiovascular diseases and we see this connection in several of the studies with high mean BMIs correlating to high blood pressure levels (Jiang, Lu, Zong, Ruan, & Liu, 2016; Mozaffarian et al., 2016). Cholesterol levels were significantly higher in U.S.-born Blacks than in African-born Blacks, for both males and females. An unhealthy diet, lack of physical activity, smoking and obesity were all behavioral risk factors associated with high cholesterol. A review of

relevant literature shows a pattern of higher smoking rates and higher prevalence of overweight/obesity and although comparatively higher than among African-born Blacks, U.S-born Blacks reported a relatively low prevalence of physical activity compared to the national sample (Center for Health Statistics, 2018). Lastly, O'Connor et al. (2014) found that African immigrant Black men were less likely to have health insurance. They concluded that African-born Black men were therefore less likely to visit a primary care provider, and despite self-reporting as healthy, these factors further contribute to the higher prevalence of undiagnosed diabetes (O'Connor et al., 2014).

African Blacks Living Outside the U.S. vs. U.S.-Born Blacks

The studies comparing Black Africans in their country of origin and U.S.-born Blacks provide some interesting results. Richard Cooper was the primary author or co-author of all three studies that examined Black men and women in West Africa, East Africa, South Africa, the Caribbean and the United States. Due to insufficient reporting on some of the measurements, only the results from blood pressure and BMI measurements can be reported here. Systolic and diastolic blood pressure was measured as reported above. Height and weight in light clothing with no shoes and measured on a digital scale were used to calculate BMI (R. S. Cooper et al., 2015; Richard Cooper et al., 1997; Okosun, Cooper, Rotimi, Osotimehin, & Forrester, 1998).

Tables 4 and 5 show the results by region of origin and sex. For African-born Black men, the mean age ranged from 34 to 47 years while for women, it ranged from 30 to 46 years. For men, sBP ranged from 118.9 to 127.9 mm Hg while for women, it ranged from 110.5 to 122.6 mm Hg. For men, dBP ranged from 68.5 to 81 mm Hg while for women, it ranged from 66.2 to 79.6 mm Hg. For men, BMI ranged from 21.7 to 29.7

kg/m² while women ranged from 22.6 to 34.1 kg/m². The pooled analysis (Table 6) shows that for both Black men and women, Africans residing in their country of origin were younger, less likely to have an elevated risk of hypertension, and less likely to be overweight and obese than their U.S.-born counterparts. Both African and U.S.-born men were more likely to have higher blood pressure rates than were the women, while the inverse was the case for BMI with both African and U.S.-born women being significantly more likely to be overweight or obese than their male counterparts.

Table 4. Cross sectional studies on Hypertension and BMI of Males by Nativity - Outside the U.S vs U.S-Born

#	First Author, Year	Country	N (%)	Mean Age ± SD	sBP*	dBP**	BMI** *
1	Cooper, Richard et.al (1997)	Nigeria	1171 (25.5)	-†	121.5 ± 19.7	73.3 ± 13.0	21.7 ± 3.6
	Cooper, Richard et.al (1997)	Cameroon	1357 (29.6)	-†	121.8 ± 15.7	76.1 ± 11.7	24.3 ± 3.3
	Cooper, Richard et.al (1997)	Caribbean	1345 (29.4)	-†	125.2 ± 18.9	74.7 ± 13.1	24.7 ± 4.1
	Cooper, Richard et.al (1997)	United States	708 (15.5)	-†	125.3 ± 19.5	73.9 ± 13.4	27.1 ± 5.5
2	Okosun, Ike S. et.al (1998)	Nigeria	875 (39)	41.5 ± 12.3	120 ± 19.1	71.6 ± 13.8	22.5 ± 4.4
	Okosun, Ike S. et.al (1998)	Jamaica	510 (23)	46.8 ± 14.2	122.3 ± 21.3	70.0 ± 15.1	23.8 ± 4.2
	Okosun, Ike S. et.al (1998)	United States	844 (38)	45.9 ± 14.1	126.4 ± 8.8	78.4 ± 12.0	26.5 ± 5.0
3	Cooper, Richard S et.al (2015)	Ghana	207 (18)	34.6 ± 6.7	118.9 ± 13.1	68.5 ± 11.4	22.2 ± 2.7
	Cooper, Richard S et.al (2015)	South Africa	232 (20)	33.7 ± 5.6	129 ± 17.1	79.6 ± 13.2	22.4 ± 4.3
	Cooper, Richard S et.al (2015)	Jamaica	249 (21)	34 ± 5.9	121.5 ± 12.8	71.2 ± 11.1	23.6 ± 4.5
	Cooper, Richard S et.al (2015)	Seychelles	230 (20)	36.5 ± 5.1	122.7 ± 14.6	75.0 ± 11.4	26.5 ± 4.9
	Cooper, Richard S et.al (2015)	United States	243 (21)	35.5 ± 6.2	127.9 ± 14.5	81.0 ± 12.1	29.7 ± 7.6

Notes: *Systolic blood pressure

**Diastolic blood pressure

*** Body mass index

† Cooper et.al (1997) Mean Age ± SD not provided

Overall, Africans residing outside the U.S., both males and females, appear to be less likely to have elevated hypertension risk and were also less likely to be obese than

African-born Blacks residing in the United States. However, they also tend to be younger and age is a known major risk factor to developing hypertension.

Table 5. Cross sectional studies on Hypertension and BMI of Females by Nativity - Outside the U.S vs U.S-Born

#	First Author, Year	Country	N (%)	Mean Age \pm SD	sBP*	dBp**	BMI** *
1	Cooper, Richard et.al (1997)	Nigeria	1338 (25)	- [†]	119.1 \pm 21.8	72.1 \pm 12.8	22.6 \pm 4.7
	Cooper, Richard et.al (1997)	Cameroon	1471 (27)	- [†]	118.9 \pm 21.8	73 \pm 12.8	25.2 \pm 4.5
	Cooper, Richard et.al (1997)	Caribbean	1814 (33)	- [†]	122.3 \pm 21.3	72.6 \pm 13.4	28.2 \pm 6.4
	Cooper, Richard et.al (1997)	United States	810 (15)	- [†]	122.4 \pm 19.6	72.7 \pm 11.8	30.8 \pm 7.7
2	Okosun, Ike S. et.al (1998)	Nigeria	1056 (37.5)	40.0 \pm 11.3	116.5 \pm 20.5	69.5 \pm 14.0	22.9 \pm 5.2
	Okosun, Ike S. et.al (1998)	Jamaica	776 (27.5)	45.9 \pm 13.2	121.3 \pm 21.9	69.3 \pm 14.7	28.0 \pm 6.5
	Okosun, Ike S. et.al (1998)	United States	983 (35)	44.4 \pm 13.3	121.3 \pm 21.7	73.2 \pm 12.6	29.4 \pm 6.9
3	Cooper, Richard S et.al (2015)	Ghana	293 (22)	34.0 \pm 6.6	110.5 \pm 15.2	66.2 \pm 11.48	25.5 \pm 5.2
	Cooper, Richard S et.al (2015)	South Africa	268 (20)	33.1 \pm 6.0	118.2 \pm 18.6	76.3 \pm 11.8	31.9 \pm 8.2
	Cooper, Richard S et.al (2015)	Jamaica	251 (19)	34.7 \pm 6.2	115.2 \pm 14.7	72.1 \pm 11.4	29.5 \pm 6.7
	Cooper, Richard S et.al (2015)	Seychelles	270 (20)	35.8 \pm 6.0	110.8 \pm 12.8	71.2 \pm 9.9	27.6 \pm 6.2
	Cooper, Richard S et.al (2015)	United States	257 (19)	35.0 \pm 6.3	117.5 \pm 16.1	79.6 \pm 13.2	34.1 \pm 8.8

Notes: *Systolic blood pressure

**Diastolic blood pressure

*** Body mass index

[†] Cooper et.al (1997) Mean Age \pm SD not provided

Limitations

Sixty percent of the men in the study by Yu et al. (2013) and 50% of the men in the study by O'Connor et al. (2014) had been in the Ukegbu et.al (2011) study. As a result of the limited heterogeneity in these studies, it is hard to agree with the position that the healthy immigrant effect is no longer valid for Black African immigrants like Ukegbu et.al (2011) and O'Connor et al. (2014) posit in their study.

Table 6. Pooled Analysis on Hypertension and BMI by Sex and Nativity - Outside the U.S vs U.S-Born

Males					
Region	N (%)	Mean Age \pm SD[†]	sBP	dBp	BMI
African Total - Average	4072 (51)	36.7 \pm 7.4	122.3 \pm 16.5	74 \pm 12.4	23.3 \pm 3.9
Caribbean Total - Average	2104 (26.4)	40.4 \pm 10	123 \pm 17.7	72 \pm 13.1	24 \pm 4.3
United States Total - Average	1795 (22.5)	40.7 \pm 10	126.5 \pm 14.3	77.8 \pm 12.5	27.7 \pm 6.0
Females					
Region	N (%)[*]	Mean Age \pm SD[†]	sBP	dBp	BMI
African Total - Average	4642 (49)	35.7 \pm 7.5	115.7 \pm 18.4	71.4 \pm 12.1	25.9 \pm 5.6
Caribbean Total - Average	2841 (30)	40.3 \pm 9.7	119.6 \pm 19.3	71.3 \pm 13.2	28.6 \pm 6.5
United States Total - Average	2000 (21)	39.7 \pm 9.8	120.4 \pm 19.3	75.2 \pm 12.5	31.4 \pm 7.8

Notes:

*Systolic blood pressure

**Diastolic blood pressure

*** Body mass index

[†] Cooper et.al (1997) Mean Age \pm SD not provided

Other possible factors such as lack of access to healthcare might explain the observed differences in the studies reviewed. In addition, all three studies were conducted in Washington D.C. while Hyman et al.'s (2000) was conducted in Houston, further limiting the generalizability of these studies to the general Black African population living in the United States. Hyman et.al (2000) recruited only health professionals to be included in their study, which implies a higher socioeconomic status that could further limit the generalizability of their results. These studies are also limited by their small sample size. In the studies comparing Black Africans living in their country of origin, the lack of cardiovascular health factors other than BMI and hypertension does not allow for a complete health profile of African-born Blacks.

Lastly, a simple pooled analysis may not be considered the gold standard for reporting aggregate data of studies as it might overlook potentially important subgroup characteristics (Bravata & Olkin, 2001). However, research has shown that a pooled analysis has “the ability to improve the power of small or inconclusive studies to answer questions and the ability to identify sources of diversity across various types of studies” (Ioannidis & Lau, 1999).

Implication of Findings for Future Research

The average length of stay for Black African immigrants residing in the U.S. was 10 years and therefore it is notable to conclude that length of stay as a proxy for acculturation is a risk factor for hypertension, high cholesterol and diabetes among these immigrants. However, Hyman et al. (2000) found that being African born was protective against hypertension, despite the fact that over 80% of subjects in that study lived in the U.S. for 10 years or more. This suggests that environmental or lifestyle influences can be accounted for among this group of participants.

Some studies have suggested a genetic influence as the reason for the observed differences in cardiovascular diseases between African-born and U.S.-born Blacks (Okwuosa & Williams, 2012). While that is beyond the scope of this review, future clinical studies should explore this idea. In addition, future research should further consider how social determinants of health put African-born Blacks residing in the U.S. at risk for cardiovascular diseases compared to U.S-born Blacks.

All the studies in this review suggest that waist circumference ratio or body fat, as well as visceral adiposity, were associated with the poor cardiovascular health of Africans rather than BMI. Other studies have also shown this association as well (Meyer,

Demerath, Friend, Hannan, & Sztainer, 2011; Okosun et al., 1998). More research is needed in this area and if found to be consistent, calls for a change in guidelines for cardiovascular risk factors should be made.

For all the studies, the majority of the African-born Blacks were from West Africa, particularly Nigeria. Nigerians tend to be highly educated, more likely to speak English as their first language, and more likely to be employed than their fellow Black Africans and the general U.S.-population (“RAD Diaspora Profile: The Nigerian Diaspora in the United States,” 2015). This gives them a vastly different profile and some confounding protective or risk factors compared to their fellow African-born counterparts. Studies have also suggested a lower prevalence of hypertension among Black West Africans, with one study reporting prevalence ranging from 15% in West Africa to 25% in East Africa, and between 42% and 54% in South Africa (R. Cooper & Rotimi, 1997; Gómez-olivé et al., 2017; Okosun et al., 1998). This review observed the same effect among Black Africans living in Africa but found West and East Africans living in the United States to have similar or slightly higher rates.

Like Gomez-olive et al. (2017), Cooper et. al (2015) found significantly higher rates of hypertension among Black South Africans. Research suggests that minority status of Black people living in a country where they are a minority status with marked residential segregation and economic inequality is a major risk factor for poor cardiovascular health (R. S. Cooper et al., 2015; David H, Lincoln, Adler, & Syme, 2010; Elo, Mehta, & Huang, 2008; Read & Emerson, 2005; Read, Emerson, & Tarlov, 2005). This is likely related to the stress they incur due to discrimination and racial bias. There needs to be further research on the direct link between racial bias and discrimination with

cardiovascular health in the Black population as African immigrants will no doubt face the same racial bias and discrimination upon migration.

Conclusion

The primary aim of this paper was to examine the differences in cardiovascular health of African-born and U.S-born Blacks in the United States. Study in this area is very limited with only four papers found that examined a few cardiovascular health factors, but with several limitations that make them ungeneralizable to the rest of the population. The secondary aim was to examine if any studies considered healthcare utilization as a potential risk factor in the cardiovascular disparities observed between African-born and U.S.-born Blacks. None of the studies examined this factor. Healthcare access and utilization has been found to be a risk factor to poorer cardiovascular health in other populations in the U.S. (Alcalá et al., 2015; Brooks et al., 2010; Rooks et al., 2008).

This review was unable to meet the two objectives, as the majority of the studies only reported BMI and hypertension rather than all seven cardiovascular health factors, and none examined healthcare utilization. Yet these results are an important contribution to the literature, indicating a very real need for future studies that can help close the gap in disparities between Blacks and Whites in the U.S. by understanding the diversity in the U.S. Black population. Spatz et al. (2010) found that the absence of a usual source of care, a healthcare utilization measure, was associated with being untreated for hypertension even among individuals with insurance. It is imperative that studies are conducted that examine the potential effect of healthcare utilization on the cardiovascular health of Blacks in the United States.

As a result of “urbanization and changes in individual and societal lifestyle such as an increase in tobacco use, excessive alcohol consumption, reduced physical activity and adoption of ‘Western’ diets that are high in salt, refined sugar and unhealthy fats and oils,” hypertension and cardiovascular diseases are steadily climbing in Africa (van de Vijver et al., 2013). Considering this, there needs to be increased prevention efforts among the African-born immigrant populations in the U.S. and early integration to the healthcare system to reduce the additional mortality burden which creates both a gap and economic burden on the American healthcare system.

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Manuscript 2. Differences in East and West African-born Blacks access to and utilization of healthcare services

Introduction

Access to health care is defined as, “the possibility to identify healthcare needs, to seek healthcare services, to reach the healthcare resources, to obtain or use health care services, and to actually be offered services appropriate to the needs for care” (Levesque, Harris, & Russell, 2013). An individual’s use of health service is often a function of their predisposition to use services, which enable or impede use and their need for care (R. M. Anderson, 2018), and is dependent upon a number of factors within and outside the healthcare infrastructure. In other words, utilization of health services is realized access (R. M. Anderson, 2018). However, access does not always equal utilization. High premiums, co-payments or deductibles, lack of culturally appropriate providers, lack of transportation, long waiting lists are just a few of the barriers of realized access to quality health care (National Academies of Sciences, Engineering, 2018).

In order to obtain high quality health care, immigrants into the United States must first gain entry into the health care system. In so doing, several measures must be considered. This includes: having health insurance (Vargas Bustamante & Van der Wees, 2012); having a usual source of care (Urrutia-Rojas, Marshall, Trevino, Lurie, & Minguia-Bayona, 2006); encountering difficulties when seeking care (Wafula & Snipes, 2014); and receiving care as soon as wanted (Adekeye, Adesuyi, & Takon, 2017). Immigrants, both documented and undocumented, face extreme challenges when seeking health care and are less likely than native born citizens to access and utilize health care (Derose, Escarce, & Lurie, 2007; Ku, 2009; Vargas Bustamante & Van der Wees, 2012);

A particular subset of immigrants, African-born Black immigrants, are at a high risk of unequal access and low health care utilization rates that will further increase the disparities observed between Blacks and other groups in the United States (U.S) if not addressed.

The primary objective of this paper is to explore the broader patterns of African-born immigrants' access to and utilization of healthcare among a very diverse Minnesotan population. In Minnesota, African Immigrants account for roughly 28% of the migrant population (Migration Policy Institute, 2017). The state is home to the 9th largest African community in the United States (Frederick, 2015). Over 60% of these immigrants are from East African countries and 25% are from West African Countries. Minnesota is also home to the largest Somali population of immigrants in the United States (Migration Policy Institute, n.d.).

Rationale for the Study

Why does this matter in the big scheme of things? African-born Black immigrants are often underrepresented in research studies conducted because despite evidence of heterogeneity between U.S.-born Blacks and African-born Blacks, the reasons for the differences observed in many of the health outcomes are not easily explained (Agyemang, Bhopal, & Bruijnzeels, 2005). There is little research on the social, ethnic and cultural differences between these groups and its impact on their health status differences. African-born Blacks, defined as those born on the continent of Africa, may identify with U.S.-born Blacks also known African-Americans, but they may differ demographically, socially, academically, financially, and in health status (Capps, McCabe, & Fix, 2011). Presently, the use of the terms "African American" and "Black"

in the U.S. hides the heterogeneity within the populations of African descent and has little scientific value (Agyemang et al., 2005). Research has shown that there are more genetic differences within than between populations (Sheldon & Parker, 1992), and that the genes responsible for different physical characteristics are few and rarely relate to diseases or behaviors (DeShaw, 2006).

African-born Blacks account for 4.8% of the U.S. immigrant population with about 52% arriving in 2000 or later (Capps, McCabe, & Fix, 2012). African-born immigrants are much more likely to migrate through diversity programs such as the visa lottery or employment programs than they are through family sponsored visas (Read, Emerson, & Tarlov, 2005). However, a large portion of these immigrants also arrived in the U.S. as a result of the Refugee Act of 1980, which allowed individuals and families fleeing from conflict-ridden areas the ability to resettle in the United States. These arrivals accounted for about 38% of refugee arrivals in 2017, second only to refugees from Asia (M. Anderson, 2017).

The educational attainment of Africans is also higher than all other population groups and U.S.-born Blacks (Capps et al., 2011). African-born immigrants are often younger than all immigrant populations, are more likely to be male, are more likely to participate in the labor force, and tend to have higher incomes (U.S. Census Bureau, 2012). Yet there are variations in the differences among the African regions. For example, some African countries are English Speaking vs. French Speaking as their primary language or consider that 59% of Nigerian-born immigrants have a college degree or more compared to 10% of Somalia-born immigrants (M. Anderson & Lopez, 2018). This suggests that the social capital advantages are not equal for all Africa-born immigrants.

These cultural, social and economic differences while easily overlooked in studies are highly significant regarding health behaviors, healthcare utilization and as such health outcomes.

Previous Literature

Studies on the use of health services among African-born immigrants is scarce and when available, are often myopic in nature. Unlike other immigrant groups, there is no national database or standardized database for African immigrants' health. Even in states where there are large populations of African immigrants, like New York City and Minnesota, data is not consistently collected on the health needs, access to, health beliefs, and health care utilization rates of this growing population. Many of these studies tend to focus on qualitative data. In addition, data are also often collected on immigrants from a single African country, thereby limiting the generalization of the results. Other studies often focus on a specific gender, on a specific condition or geographic location which does not give a full picture of the health care utilization rates of African-born immigrants.

These studies have gone on to show that African-born Blacks report lower access and healthcare utilization rates (Piwowarczyk et al., 2013). In a study of African-born Blacks in Washington DC, researchers found that 29% of all respondents were uninsured, 16% reported having no usual source of care, 9% reported delaying or foregoing needed care, 14% reported inability to see a doctor due to cost, and 27% reported never seeing a dentist (Siegel, Horan, & Teferra, 2001). In a study of Ethiopian and Nigerian immigrants in the U.S., 49% and 54% respectively had no usual source of care, only 36% and 35% respectively had seen or talked to a doctor in the past year and only 11% and 18% respectively had seen a dentist in the last year (Chaumba, 2011). Piwowarczyk et. al.

(2013) found that only 29% of Congolese women and 28% of Somali adult women had received an annual checkup in the past year, 5% and 4% respectively had received a mammogram in the past year, and only 26% and 13% respectively had received a pap smear in the last year (Piwowarczyk et al., 2013). These numbers are significantly lower than the average rates of utilization in the United States (Siegel et al., 2001).

The health care utilization rates of African-born Black immigrants alone compared to the larger Black population in the U.S. is largely unexplored. In comparison to U.S.-born Blacks in the few studies that have de-aggregated data of the Black population, healthcare access and utilization rates of African-born Blacks are usually lower despite reporting better general health status. In a multi-ethnic 2006 study, it was found that African-born Blacks were more likely than their U.S-born and Caribbean-born Black counterparts as well as all other ethnic sub-groups to have received medical care within the past year (Blendon et al., 2007). Odedina et. al. (2011), in their study comparing African-born Black men to U.S-born and Caribbean-born Black men, found that African-born men had significantly lower insurance rates and were less likely to report having a regular doctor, but more of them reported receiving an annual exam regularly compared to U.S.-born Black men, but less than Caribbean-born men (Odedina et al., 2011).

Interestingly, the larger Black population in the United States also reported lower access and utilization of health care compared to other racial/ethnic groups in the United States. (Artiga, Foutz, Cornachione, & Garfield, 2016). Studies have shown that Blacks are twice as likely to be uninsured than Whites in the U.S., more likely to have publicly funded insurance than private or employment-based health insurance and are less likely

to have a usual source of care (Copeland, 2005). In such studies, it is not delineated if the Black population consists of foreign-born counterparts. Delineation of U.S.-born versus African-born Blacks might show further disparities as U.S.-born Blacks tend to have greater access to healthcare given their higher rates of health insurance compared to their foreign-born counterparts (Gyamfi et al., 2017).

While socioeconomic and demographic differences as well as legal status considerations play a role in healthcare utilization among immigrants, researchers also argue that low healthcare utilization rates might be the result of the healthy immigrant effect. The Healthy Immigrant Effect (HIE) refers to the idea that recent migrants are in better health than the non-migrant population in the host country (Ichou & Wallace, 2019). HIE implies migrant selectivity with the idea that migrants are not simply a random sample of their origin population, but rather a select group who are healthier, wealthier, and more highly educated than the population they leave behind (Read & Emerson, 2005). Palloni and Arias (2004), for example, showed that despite migrants having a lower socioeconomic status (SES) than non-migrants in the host country, they nonetheless experienced a health advantage.

African-born Blacks appear to be healthier than African Americans of the same age and other foreign-born Blacks (Venters & Gany, 2011). Previous research has observed that the Black immigrant health advantage is better than expected due largely to the inclusion of African immigrants, who as a result of migrant selectivity are often younger and more educated and also newer immigrants (Read et al., 2005). Studies have shown that HIE holds true despite lower health insurance rates for African-born Blacks (Gyamfi et al., 2017). African-born Blacks may simply be underutilizing healthcare

because they do not need it. It is reported that immigrant populations, have lower per capita health expenditures than native born Americans even when insured (Flavin, Zallman, McCormick, & Wesley Boyd, 2018). Yet, as noted, there is much diversity among this group based on: cultural and religious background, health beliefs and practices, and primary languages; all of which can impact the decision to access or utilize health care. In addition, acculturation and length of stay erode the healthy immigrant effect with many immigrants displaying similar health profiles to their native-born counterparts (Doamekpor & Dinwiddie, 2015; Elo, Mehta, & Huang, 2008).

Health care utilization rates might explain any potential differences between African born Blacks and U.S.-born Blacks in a variety of health outcomes. This is because the healthy immigrant effect might not hold true if African-born Blacks are also faced with unequal access to health care and less utilization. Some immigrants having fled war or disaster-ravaged countries might have poorer health or more health risk factors while others may have better health and fewer health risk factors due to healthy migrant selectivity. Comparing within and between groups might help bridge the gaps in the literature and create targeted policies and interventions for both the U.S.- and African-born Blacks. This study aims to bridge that gap by comparing the health status, health access and healthcare utilization within African-born Blacks and between African-born Blacks and U.S.-born Blacks.

Research Questions

With respect to previous literature, this study aims to investigate the differences in healthcare utilization rates among U.S.- born Blacks vs. East and West African born Blacks in the state of Minnesota. The research questions addressed in this study include:

1) Do African-born and U.S.-born Blacks compare differently in terms of access to and utilization of health care services? 2) How do West and East African immigrants compare in terms of access to and utilization of health care services? 3) What is the impact of length of stay on East & West African immigrants healthcare utilization rates?

Data and Methodology

Research Data

This study uses secondary data from the Survey of the Health of All the Population and the Environment (SHAPE) - Adult Survey Racial and Ethnic Public Use Data File 2006 (29). SHAPE is an ongoing public health surveillance project that monitors the health of residents in Hennepin County, Minnesota. It is a population-based health survey that was initiated in 1998 and conducted a second time in 2002 (Hennepin County Human Services and Public Health Department., 2008). SHAPE 2006, is the third in the series, and is a partnership between the Hennepin County Human Services and Public Health Department, and the University of Minnesota School of Public Health.

The SHAPE 2006 - Adult Survey data were collected using a mixed-mode approach consisting of telephone interviews and self-administered surveys that were mailed to sampled households. The administration of the survey was conducted by the Survey Center of the Division of Health Research and Policy in the School of Public Health at the University of Minnesota. Of the 8,191 surveys which were completed as part of the SHAPE 2006 - Adult Survey project, 5,590 were conducted by telephone and 2,601 were by mail. In order to produce estimates that represent the entire county population, sampling weights were created. This weighting adjusted for disproportional sampling of households by strata, unequal selection probability of respondents from the

households, and post-stratification adjustments for gender, age, geographic location and racial/ethnic group (Hennepin County Human Services and Public Health Department., 2008).

For the purpose of this analysis, data from the SHAPE 2006 - Adult Survey was selected despite more recent iterations because it is the only iteration that identifies the regions of Africa from which foreign Blacks were born. Specifically, data was selected solely from one racial group (Black/African Americans); including both foreign-born and U.S.-born Blacks for this paper. U.S.-born Blacks consisted of those who identified themselves as Black or African American, not Hispanic/Latino, and born in the United States. African-born Blacks were those who identified themselves as Black, African or African American and born in an African country; this resulted in a sample size of 1,062. Foreign-born Blacks from non-African countries were small in numbers and were not included in the analysis.

Measures

The primary dependent variables were the measures of access to and utilization of healthcare which included: Access to Care variables - health insurance coverage (currently insured vs. uninsured and duration of health coverage (entire year vs. part of the year), dental coverage (insured vs. uninsured), level of difficulty paying for insurance (premiums, deductibles-pay); Source of Care variables – having a usual provider (yes or no) or usual place for healthcare; The Utilization variables included– last complete physical exam, last dental visit, last preventive screening exams (i.e. blood cholesterol, pap smear, mammogram, blood stool, and colonoscopy/sigmoidoscopy), received medical care within the past 12 months, and needing an interpreter when visiting the clinic.

The overall health care variables included self-reported assessment of general health status, physical and mental health, and presence of chronic disease and conditions (including diabetes, heart trouble, high blood pressure). Healthy lifestyle and behaviors variables included fruit and vegetable consumption, weight status, moderate and vigorous physical activity, current smoking and drinking habits. Socio-demographic variables included: gender, age (in years), level of education, employment status, marital status, primary language (English spoken at home vs. others) and national origin. The moderator variable of interest was length of stay. The number of years lived in the U.S. were coded dichotomously; “1” was assigned to recent immigrants, those who had lived in the U.S. for five years or less and “2” to established immigrants, those who had lived in the U.S. for over five years.

Analytic Procedures

Data analysis was performed in two stages. First, univariate analysis was performed to describe the study sample and distributions of selected variables. Second, chi-square analysis was used to determine the relationship between each variable and region of birth. North African and Central African - born Blacks were excluded from this research due to a small sample size (n=9). All analyses were performed using SPSS 26.0.

Findings

The sample consisted of 650 U.S.-born Blacks (194 males and 456 females) and 412 African-born Blacks (143 males and 269 females). Over half of the African-born Blacks were from Eastern Africa (76%); the rest were from Middle Africa (1.2%), North Africa (1.0%) and West Africa (21.8%). The majority of the African-born Blacks had

been in the United States for 6 to 10 years, about a quarter (26%) were recent immigrants having been in the country only 5 years or less; and 56 percent of them indicated a non-English language as their primary language.

Table 1 provides a detailed breakdown of the demographic characteristics for the sample. As shown, a large percentage of those surveyed were women, roughly 70% U.S. born and 65% African-born. Also, African-born Blacks were significantly younger with about 45% between the ages of 18 and 34 years old compared to the U.S. with 22% in the same age range. U.S.-born Blacks were more likely to be older with about 32% between the ages of 55 and over compared to those from Africa (15%). African-born Blacks were less likely to be educated than their U.S.-born Black counterparts with over 32% of African-born reporting less than a high school degree and another roughly 50% percent with only a high school degree or some college or vocational school compared to U.S.-born (12.5% and 68.7% respectively). African-born Blacks were more likely to be married (58.5%), more likely to be poor (47.9%), more likely to speak another language at home than U.S.-born Blacks.

Tables 2a and 2b show the health status, health behaviors and outcome differences between U.S.-born Blacks and African-born Blacks. Overall, African-born Blacks reported better general health status, better health behaviors, and better health outcomes than their U.S.-born counterparts. African-born Blacks in the sample were significantly more likely to report being in excellent health (34.7%), less likely to have unhealthy physical (64.1%) or mental health days (85%), depression (7.3%) or serious psychological distress (3.8%) when compared to U.S.-born Blacks. The data were significant at the 0.000 level. African-born Blacks were also significantly less likely to be

overweight or obese (55.8%), to have had a drink in the last month (85.4%), and to have ever smoked (93.4%). Again, the data were significant at the 0.000 level. U.S.-born Blacks were more likely to be physically active (36.7%), but there were no significant differences in fruit and vegetables consumption between the two group. The differences in this variable was not significant ($p = 0.209$). African-born Blacks were also significantly less likely to report ever been diagnosed with any chronic conditions, which included: diabetes (8.2%), hypertension (9.5%), high cholesterol (13.5%), and heart trouble (3.9%) than U.S.-born Blacks. There were no significant differences between U.S.-born and African-born Blacks in being under a doctor's care for these conditions except for high cholesterol. In this instance, U.S.-born Blacks were significantly more likely to be under a doctor's care (60%).

Table 1. Demographic differences between U.S.-born Blacks and African-born Blacks

	U.S.-Born		African-Born	
	n = 650	Percent	n = 412	Percent
Birth Region				
U.S. Born	650	100.0%	0	0.0%
Africa - Eastern	0		313	76.0%
Africa - Western	0		90	21.8%
Africa - Other	0		9	2.2%
Total	650	100.0%	412	100.0%
Length of Stay				
1yrs - 5yrs			109	26.5%
6yrs - 10yrs			194	47.1%
11yrs - 15yrs			70	17.0%
16yrs+			39	9.5%
Total			412	
Gender				
Male	194	29.8%	143	34.7%
Female	456	70.2%	269	65.3%
Total	650		412	
Age group				
18 - 24	54	8.3%	56	13.6%
25 - 34	91	14.0%	128	31.1%
35 - 44	138	21.2%	118	28.6%
45 - 54	162	17.7%	50	8.5%
55 - 64	115	17.7%	35	8.5%
65 or over	90	13.8%	25	6.1%
Total	650		412	
Educational Attainment				
Less than High School	81	12.5%	131	32.0%
High school / GED	175	26.9%	103	25.2%
Some College/Vocational School	272	41.8%	112	27.4%
College and above	122	18.8%	63	15.4%
Total	650		409	
Marital Status				
Married	157	24.3%	241	58.5%
Living Together	58	9.0%	10	2.4%
Separated/Divorced	177	27.4%	70	17.0%
Widowed	34	5.3%	21	5.1%
Never been married	221	34.2%	70	17.0%
Total	647		412	
Poverty Line				
< 100percent FPL	155	25.0%	193	47.9%
100percent FPL - 199percent FPL	152	24.6%	110	27.3%
200percentFPL	312	50.4%	100	24.8%
Total	619		403	
English As Primary Language				
Yes	642	98.8%	183	44.4%
No	8	1.2%	229	55.6%
Total	650		412	

Table 2a. General health differences between U.S.-born Blacks and African-born Blacks

	n = 650	Percent	n = 412	Percent	P-value
General Health					0.000*
Excellent	76	11.8%	143	34.7%	
Very Good	180	28.0%	119	28.9%	
Good	203	31.6%	97	23.5%	
Fair	138	21.5%	39	9.5%	
Poor	45	7.0%	14	3.4%	
Total	642		412		
Number of Unhealthy Days					0.000*
0 day	187	29.4%	261	64.1%	
1 - 2 days	58	9.1%	44	10.8%	
3 - 7 days	123	19.3%	46	11.3%	
8 - 13 days	57	9.0%	3	0.7%	
14 - 30 days	211	33.2%	53	13.0%	
Total	636		407		
Number of Unhealthy Mental Health Days					0.000*
0 day	292	45.7%	346	85.0%	
1 - 2 days	66	10.3%	16	3.9%	
3 - 7 days	103	16.1%	17	4.2%	
8 - 13 days	46	7.2%	3	0.7%	
14 - 30 days	132	20.7%	25	6.1%	
Total	639		407		
Serious Psychological Distress					0.024*
Yes	45	7.1%	15	3.8%	
No	586	92.9%	385	96.3%	
Total	631		400		
Weight Status					0.000*
Underweight	6	0.9%	11	2.9%	
Normal	179	28.1%	155	41.2%	
Overweight	174	27.3%	129	34.3%	
Obese	279	43.7%	81	21.5%	
Total	638		376		
# of days you drank in last month					0.000*
0	354	54.9%	351	85.4%	
1—3	90	14.0%	25	6.1%	
4—9	121	18.8%	27	6.6%	
10—19	53	8.2%	7	1.7%	
20+	27	4.2%	1	0.2%	
Total	645		411		
Smoking Status					0.000*
Everyday Smoker	135	21.0%	8	2.0%	
Someday Smoker	49	7.6%	5	1.2%	
Former Smoker	162	25.2%	14	3.4%	
Never Smoker	298	46.3%	383	93.4%	
Total	644		410		
# of days of moderate physical activity					0.023*
<5 days	405	63.3%	286	70.1%	
5+ days	235	36.7%	122	29.9%	
Total	640		408		
Yesterday, Servings of Fruits & Vegetables					0.209
0 serving	72	11.1%	61	15.1%	
1 serving	79	12.2%	59	14.6%	
2 servings	130	20.1%	75	18.6%	
3-4 servings	219	33.9%	131	32.4%	
5+ servings	146	22.6%	78	19.3%	
Total	646		404		

Table 2b. Specific health differences between U.S.-born Blacks and African-born Blacks

	U.S.-Born		African-born		
	n = 650	Percent	n = 412	Percent	P-value
Have you ever been diagnosed for?					
Diabetes					0.000*
Yes	535	83.3%	380	92.5%	
No	107	16.7%	31	7.5%	
Total	642		411		
Heart Trouble					0.000*
Yes	83	12.8%	16	3.9%	
No	563	87.2%	396	96.1%	
Total	646		412		
Hypertension					0.000*
Yes	277	43.0%	39	9.5%	
No	367	57.0%	371	90.5%	
Total	644		410		
Blood Cholesterol					0.000*
Yes	206	31.9%	55	13.5%	
No	440	68.1%	353	86.5%	
Total	646		408		
Depression					0.000*
Yes	174	26.9%	30	7.3%	
No	474	73.1%	380	92.7%	
Total	648		410		
Are you under a doctor's care for?					
Diabetes Care					0.627
Yes	92	90.2%	28	93.3%	
No	10	9.8%	2	6.7%	
Total	102		30		
Hypertension Care					0.675
Yes	231	84.6%	34	87.2%	
No	42	15.4%	5	12.8%	
Total	273		39		
Cholesterol Care					0.004*
Yes	120	60.0%	21	38.2%	
No	80	40.0%	34	61.8%	
Total	200		55		
Blood Pressure Care					0.241
Yes	235	80.8%	36	73.5%	
No	56	19.2%	13	26.5%	
Total	291		49		
Depression Care					0.533
Yes	75	43.9%	15	50.0%	
No	96	56.1%	15	50.0%	
Total	171		30		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Tables 3a and 3b show the access and healthcare utilization differences between U.S.-born and African-born Blacks. African-born Blacks were more likely to be uninsured than their U.S.-born counterpart (16.6% vs. 11%) but for those who were insured, were just as likely to have been insured the entire year as their U.S.-born counterpart. U.S.-born Blacks were more likely to report having a personal healthcare provider while African-born Blacks were significantly more likely to have never visited a dentist (13.2%), but there were no significant differences among dental insurance between both groups. African-born Blacks were less likely to have ever had preventive screening exams compared to U.S.-born Blacks, which included a physical exam (6.6% vs. 0.3%), a blood cholesterol check (21.3% vs. 6.6%), sigmoidoscopy or colonoscopy (45.7% vs. 27.8%), and for females a pap smear more than 3 years ago or never (32.6% vs. 6.8%). However, for women 40 and older, there were no significant differences between both groups in those who had or had not received a mammogram in the past year.

Table 4 shows the demographic and social structure breakdown for East and West African immigrants. East Africans represented 76% of the population (n=313) compared to 24% for West Africans. East Africans were more likely to: have lived in the U.S. longer: were more likely to be female (69.6%); a majority were between the ages of 25 and 34 (35%); were significantly more likely to have a high school degree or less (67%); more likely to report an income under the 100 percent federal poverty line (55.5%) and were less likely to report English as their primary language. West African-born Blacks were more likely: to be between the ages of 35 and 44 (36.7%); to have a college education or higher (24.4%); and were more likely to be poor (41.9%).

Table 3a. Healthcare access & utilization differences between U.S.-born Blacks and African-born Blacks

	U.S.-born		African-born		P-value
	n = 650	Percent	n = 412	Percent	
Current Insurance Status					0.000*
Insured, Public Any	282	44.2%	194	50.4%	
Insured, Private Only	277	43.4%	120	31.2%	
Insured, Type Unsure	3	0.5%	7	1.8%	
Uninsured	76	11.9%	64	16.6%	
Total	638		385		
Health coverage during the past 12 months					
Insured the Entire Year	486	75.7%	303	73.5%	0.061
Insured Only Part of the Year	108	16.8%	61	14.8%	
Uninsured for the Entire year	48	7.5%	48	11.7%	
Total	642		412		
Do you have a personal doctor or health care provider?					
Yes	513	79.7%	286	69.6%	0.000*
No	131	20.3%	125	30.4%	
Total	644		411		
When you are sick or need medical care, where do you usually go?					0.004*
Doctor office/clinic/public health or community clinic	501	77.6%	346	84.2%	
Hospital ER	59	9.1%	21	5.1%	
Urgent care	43	6.7%	11	2.7%	
Other (1VA, 5-minute clinic 6 some other places)	19	2.9%	17	4.1%	
No usual place	24	3.7%	16	3.9%	
Total	646		411		
Do you currently have insurance that pays for all or part of your dental care?					0.815
Yes	462	73.0%	290	72.3%	
No	171	27.0%	111	27.7%	
Total	633		401		
How long has it been since you last visited a dentist or dental clinic for any reason?					0.000*
Within the past year	402	62.4%	222	54.1%	
Within the past 2 years	100	15.5%	73	17.8%	
Within the past 5 years	82	12.7%	32	7.8%	
5 or more years ago	58	9.0%	29	7.1%	
Never	2	0.3%	54	13.2%	
Total	644		410		
Are you currently taking any medication that was prescribed for you to treat depression?					0.459
Yes	87	50.9%	14	43.8%	
No	84	49.1%	18	56.3%	
Total	171		32		
Do you take any prescription medication (if female, other than birth control pill), on a regular basis?					0.000*
Yes	359	55.5%	116	28.3%	
No	288	44.5%	294	71.7%	
Total	647		410		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 3b. Healthcare access & utilization differences between U.S.-born Blacks and African-born Blacks

How long has it been since your last complete physical exam?					0.000*
Within the past year	432	66.9%	271	66.1%	
Within the past 2 years	120	18.6%	64	15.6%	
Within the past 5 years	58	9.0%	34	8.3%	
5 or more years ago	34	5.3%	14	3.4%	
Never	2	0.3%	27	6.6%	
Total	646		410		
How long ago has it been since you last had your blood cholesterol checked?					0.000*
Within the past year	433	68.2%	243	60.3%	
Within the past 2 years	97	15.3%	47	11.7%	
Within the past 5 years	38	6.0%	23	5.7%	
5 or more years ago	25	3.9%	4	1.0%	
Never	42	6.6%	86	21.3%	
Total	635		403		
Had blood stool test using a home kit within 2 years, age\geq50					0.008*
Within Two Years	103	37.2%	44	53.7%	
More than Two Years Ago/Never	174	62.8%	38	46.3%	
Total	277		82		
How long ago had sigmoidoscopy or colonoscopy? age\geq50					0.015*
Less than Two Years	124	44.8%	33	40.7%	
Within the past 2 - 5 years	56	20.2%	9	11.1%	
Within the past 5 - 10 years	11	4.0%	2	2.5%	
10 or more years ago	9	3.2%	0	0.0%	
Never	77	27.8%	37	45.7%	
Total	277		81		
Had your Pap smear within 3 years? female only					0.000*
More than Three Years Ago/Never	23	6.8%	63	32.6%	
Within the past 3 years	313	93.2%	130	67.4%	
Total	336		193		
Had last mammogram with the past year, female\geq40					0.706
Yes	186	62.2%	54	60.0%	
No	113	37.8%	36	40.0%	
Total	299		90		
During the past 12 months have you received medical care?					0.022*
Yes	454	71.3%	264	64.5%	
No	183	28.7%	145	35.5%	
Total	637		409		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 4. Demographic Differences between East and West African-born Blacks

Total	n = 313	Percent	n = 90	Percent
Length of Stay				
0months - 5yrs	77	24.6%	29	32.2%
6yrs - 10yrs	151	48.2%	41	45.6%
11yrs - 15yrs	62	19.8%	7	7.8%
16yrs+	23	7.3%	13	14.4%
Total	313		90	
Gender				
Male	95	30.4%	42	46.7%
Female	218	69.6%	48	53.3%
Total	313		90	
Age group				
18 – 24	41	13.1%	12	13.3%
25 – 34	109	34.8%	18	20.0%
35 – 44	82	26.2%	33	36.7%
45 - 54	32	10.2%	16	17.8%
55 - 64	28	8.9%	7	7.8%
65 or over	21	6.7%	4	4.4%
Total	313		90	
Educational Attainment				
Less than High School	124	40.0%	6	6.7%
High school / GED	84	27.1%	17	18.9%
Some College/Vocational School	65	21.0%	45	50.0%
College and above	37	11.9%	22	24.4%
Total	310		90	
Marital Status				
Married	191	61.0%	47	52.2%
Living Together	5	1.6%	4	4.4%
Separated/Divorced	52	16.6%	18	20.0%
Widowed	15	4.8%	6	6.7%
Never been married	50	16.0%	15	16.7%
Total	313		90	
Poverty Line				
< 100percent FPL	171	55.5%	19	22.1%
100percent FPL - 199percentFPL	78	25.3%	31	36.0%
200percentFPL	59	19.2%	36	41.9%
Total	308		86	
English As Primary Language				
Yes	100	31.9%	75	83.3%
No	213	68.1%	15	16.7%
Total	313		90	

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Tables 5a and 5b provides the finding for health status, behaviors and outcomes; between East African and West African-born Blacks. Overall, East and West Africans were not significantly different in most of their health statuses, behaviors or conditions. However, more East Africans were likely to report their health as excellent (38% vs. 22%), while more West Africans were likely to report a number of unhealthy mental days than East Africans (26% vs. 12%). When it came to health behaviors, West Africans drank more than East Africans over the past month (67.4% vs. 91.1%) but were also more likely to have exercised 5 or more days of the week (40.9% vs. 26.7%). East Africans were more likely to report being diagnosed with hypertension (92.3% vs. 84.4%) and were more likely to be under a doctor's care to treat their hypertension than were West Africans (95.8% vs. 71.4%). Despite reporting a number of unhealthy mental days, of those who had been diagnosed with depression, West Africans were less likely to be under a doctor's care to treat their depression than were East Africans (14.3% vs. 60.9%).

Tables 6a and 6b show access and healthcare utilization differences between East and West African-born Blacks. Overall, East and West Africans were not significantly different in majority of their access to and utilization of healthcare practices. West Africans were more likely to be; uninsured (24.4% vs. 14.7%), uninsured for the entire year (20% vs. 9.6%) and found it extremely difficult to pay for their premium's-pays or deductibles compared to their East African counterparts (31.4% vs. 19.6%). They were also more likely to utilize urgent care as their usual source of care (6.7% vs. 1.3%). However, West Africans were more likely to have preventive screening exams compared to East Africans. Of those over 50, West Africans were significantly more likely to have had: a blood stool test kit within the past two years (70.6% vs. 40%); a sigmoidoscopy or

colonoscopy (64.7% vs 51.6%); and among the females more likely to have had a pap smear within the past three years (90.2% vs. 60.4%).

Table 5a. General health differences between East and West African-born Blacks

	East African		African-born		P-value
	n = 650	Percent	n = 412	Percent	
General Health					0.004*
Excellent	120	38%	20	22%	
Very Good	87	28%	30	33%	
Good	64	20%	31	34%	
Fair	29	9%	9	10%	
Poor	13	4%	0	0%	
Total	313		90		
Number of Unhealthy Days					0.062
0 day	208	67%	47	53%	
1 - 2 days	33	11%	11	13%	
3 - 13 days	32	10%	17	19%	
14 - 30 days	38	12%	13	15%	
Total	311		88		
Number of Unhealthy Mental Health Days					0.004*
0 day	273	88%	65	74%	
1 - 2 days	13	4%	8	9%	
3 - 13 days	9	3%	6	7%	
14 - 30 days	16	5%	9	10%	
Total	311		88		
Serious Psychological Distress					0.652
Yes	295	96.4%	82	95.3%	
No	11	3.6%	4	4.7%	
Total	306		86		
Weight Status					0.249
Underweight	8	2.9%	3	3.5%	
Normal	118	42.4%	31	36.0%	
Overweight	98	35.3%	29	33.7%	
Obese	54	19.4%	26	30.2%	
Total	278		86		
# of days you drank in last month					0.000*
0	285	91.1%	60	67.4%	
1—3	11	3.5%	14	15.7%	
4—9	13	4.2%	12	13.5%	
10+	4	1.3%	3	3.4%	
Total	313		89		
Smoking Status					0.519
Everyday Smoker	7	2.2%	1	1.1%	
Someday Smoker	10	3.2%	2	2.3%	
Former/Never Smoker	296	94.6%	85	96.6%	
Total	313		88		
# of days of moderate physical activity					0.010*
<5 days	228	73.3%	52	59.1%	
5+ days	83	26.7%	36	40.9%	
Total	311		88		
Yesterday, Servings of Fruits & Vegetables					0.250
0 serving	49	16%	11	13%	
1 serving	40	13%	19	22%	
2 servings	60	19%	12	14%	
3-4 servings	102	33%	27	32%	
5+ servings	59	19%	16	19%	
Total	310		85		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 5b. Specific Health Differences between East and West African-born Blacks

	n = 650	Percent	n = 412	Percent	P-value
Have you ever been diagnosed for?					
Diabetes					0.814
Yes	290	92.9%	83	92.2%	
No	22	7.1%	7	7.8%	
Total	312		90		
Heart Trouble					0.794
Yes	12	3.8%	4	4.4%	
No	301	96.2%	86	95.6%	
Total	313		90		
Hypertension					0.025*
Yes	287	92.3%	76	84.4%	
No	24	7.7%	14	15.6%	
Total	311		90		
Blood Cholesterol					0.470
Yes	39	12.6%	14	15.6%	
No	270	87.4%	76	84.4%	
Total	309		90		
Depression					0.903
Yes	23	7.4%	83	92.2%	
No	288	92.6%	7	7.8%	
Total	311		90		
Are you under a doctor's care for?					
Diabetes Care					0.742
Yes	20	90.9%	6	100.0%	
No	2	9.1%	0	0.0%	
Total	22		6		
Hypertension Care					0.032*
Yes	23	95.8%	10	71.4%	
No	1	4.2%	4	28.6%	
Total	24		14		
Cholesterol Care					0.270
Yes	13	33.3%	7	50.0%	
No	26	66.7%	7	50.0%	
Total	39		14		
Blood Pressure Care					0.098
Yes	24	82.8%	11	61.1%	
No	5	17.2%	7	38.9%	
Total	29		18		
Depression Care					0.031*
Yes	14	60.9%	1	14.3%	
No	9	39.1%	6	85.7%	
Total	23		7		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 6a. Healthcare access & utilization differences between East and West African-Born Blacks

	East		West		P-Value
	n = 313	Percent	n = 90	Percent	
Current Insurance Status					0.000*
Insured, Public Any	170	59.4%	20	22.2%	
Insured, Private Only	67	23.4%	48	53.3%	
Insured, Type Unsure	7	2.4%	0	0.0%	
Uninsured	42	14.7%	22	24.4%	
Total	286		90		
Health coverage during the past 12 months					0.005*
Insured the entire year	242	77.3%	55	61.1%	
Insured only part of the year	41	13.1%	17	18.9%	
Uninsured for the entire year	30	9.6%	18	20.0%	
Total	313		90		
Do you currently have insurance that pays for all or part of your dental care?					0.153
Yes	224	73.7%	58	65.9%	
No	80	26.3%	30	34.1%	
Total	304		88		
Do you have a personal doctor or health care provider?					0.245
Yes	224	71.6%	58	65.2%	
No	89	28.4%	31	34.8%	
Total	313		89		
During the past 12 months, have you visited a health care provider?					0.065
Yes	260	83.1%	67	74.4%	
No	53	16.9%	23	25.6%	
Total	313		90		
During the past 12 months, visited a mental health provider?					0.342
Yes	27	8.6%	5	5.6%	
No	286	91.4%	85	94.4%	
Total	313		90		
When you are sick or need medical care, where do you usually go?					0.022*
Doctor office/clinic/public health or community clinic	264	84.3%	75	84.3%	
Hospital ER	19	6.1%	2	2.2%	
Urgent care	4	1.3%	6	6.7%	
Other (IVA, 5-minute clinic & some other places)	15	4.8%	2	2.2%	
No usual place	11	3.5%	4	4.5%	
Total	313		89		
During the past 12 months have you received medical care?					0.227
Yes	195	62.7%	62	69.7%	
No	116	37.3%	27	30.3%	
Total	311		89		
Are you currently taking any medication that was prescribed for you to treat depression?					0.075
Yes	13	52.0%	1	14.3%	
No	12	48.0%	6	85.7%	
Total	25		7		
					0.708
Do you take any prescription medication (if female, other than birth control pill), on a regular basis?	87	28.0%	27	30.0%	
No	224	72.0%	63	70.0%	
Total	311		90		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 6b. Healthcare Access & Utilization Differences between East and West African-Born Blacks

	East		West		P-Value
	n = 313	Percent	n = 90	Percent	
How long has it been since you last visited a dentist or dental clinic for any reason?					0.226
Within the past year	176	56.4%	41	46.1%	
Within the past 2 years	52	16.7%	21	23.6%	
Within the past 5 years	27	8.7%	5	5.6%	
5 or more years ago	21	6.7%	7	7.9%	
Never	36	11.5%	15	16.9%	
Total	312		89		
How long has it been since your last complete physical exam?					0.109
Within the past year	215	68.9%	49	55.1%	
Within the past 2 years	46	14.7%	17	19.1%	
Within the past 5 years	21	6.7%	12	13.5%	
5 or more years ago	11	3.5%	3	3.4%	
Never	19	6.1%	8	9.0%	
Total	312		89		
How long ago has it been since you last had your blood cholesterol checked?					0.180
Within the past year	191	62.0%	45	51.7%	
Within the past 2 years	33	10.7%	14	16.1%	
Within the past 5 years	15	4.9%	8	9.2%	
5 or more years ago	4	1.3%	0	0.0%	
Never	65	21.1%	20	23.0%	
Total	308		87		
Had blood stool test using a home kit within 2 years, age ≥ 50					0.024*
Within Two Years	26	40.0%	12	70.6%	
More than Two Years Ago/Never	39	60.0%	5	29.4%	
Total	65		17		
How long ago had sigmoidoscopy or colonoscopy? age ≥ 50					0.002*
Less than Two Years	29	45.3%	4	23.5%	
Within the past 2 - 5 years	3	4.7%	6	35.3%	
Within the past 5 - 10 years	1	1.6%	1	5.9%	
Never	31	48.4%	6	35.3%	
Total	64		17		
Had your Pap smear within 3 years? female only					0.000*
More than Three Years Ago/Never	59	39.6%	4	9.8%	
Within the past 3 years	90	60.4%	37	90.2%	
Total	149		41		
Had last mammogram with the past year, female ≥ 40					0.531
Yes	41	58.6%	12	66.7%	
No	29	41.4%	6	33.3%	
Total	70		18		
When you go to a clinic, do you need an interpreter?					0.000*
Yes	143	48.3%	2	3.4%	
No	153	51.7%	55	94.8%	
Never been to clinic	0	0.0%	1	1.7%	
Total	296		58		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Tables 7a, 7b and 7c show the association between the length of stay in the U.S. for East & West African-born Blacks and access to and healthcare utilization. Overall, the findings show that there were significant associations for African-born Blacks between length of stay and several indices of healthcare access and utilization. Of the total African-born population, established immigrants were significantly more likely to have: health insurance during the entire year: were more likely to have a personal health care provider; and were more likely to report their usual source of care as a doctor's office or clinic or a community clinic. Recent immigrants were significantly more likely to have never had a complete exam than were established immigrants of the total African-born population.

Table 7b further shows that recent East African immigrants were more likely to report their usual source of care as the emergency room than were established East Africans. However, the majority of those surveyed in both groups were more likely to utilize a public clinic or visit a doctor's office. Table 7c shows that established female East African immigrants were more likely to have had a pap smear within the last 3 years. Lastly, established West African immigrants were more likely to report ever having had a physical exam, pap smear, and ever taking a blood cholesterol test. Each of these three variables were significant.

Table 7a. Association between indices of access to care and length of residency in the United States, by African nativity

	EAST AFRICA				WEST AFRICA				Total
Access to Care	Total N (%) (n=313)	Recent (≤5 years) N (%) (n=77)	Longer (>5 years) N (%) (n=236)	P-value	Total N (%) (n=90)	Recent (≤5 years) N (%) (n=29)	Longer (>5 years) N (%) (n=61)	P-value	P-value
Current insurance status				0.303				0.887	
Insured, public any	170 (59.4)	42 (62.7)	128 (58.4)		20 (22.2)	6 (20.7)	14 (23.0)		
Insured, private only	67 (23.4)	11 (16.4)	56 (25.6)		48 (53.3)	15 (51.7)	33 (54.1)		
Insured, type unsure	7 (2.4)	3 (4.5)	4 (1.8)		0	0	0		
Uninsured	42 (14.7)	11 (16.4)	31 (14.2)		22 (24.4)	8 (27.6)	14 (23.0)		
Health coverage during the past 12 months				0.160				0.079	****
Insured the entire year	242 (77.3)	55 (71.4)	187 (79.2)		55 (61.1)	13 (44.8)	42 (68.9)		
Insured only part of the year	41 (13.1)	15 (19.5)	26 (11.0)		17 (18.9)	7 (24.1)	10 (16.4)		
Uninsured for the entire year	30 (9.6)	7 (9.1)	23 (9.7)		18 (20.0)	9 (31.0)	9 (14.8)		
Do you currently have insurance that pays for all or part of your dental care?				1.000				0.219	
Yes	224 (73.7)	56 (73.7)	168 (73.7)		58 (65.9)	21 (75.0)	37 (61.7)		
No	80 (26.3)	20 (26.3)	60 (26.3)		30 (34.1)	7 (25.0)	23 (38.3)		
Do you have a personal doctor or health care provider?				0.137				0.064	****
Yes	224 (71.6)	50 (64.9)	174 (73.7)		58 (65.2)	15 (51.7)	43 (71.7)		
No	89 (28.4)	27 (35.1)	62 (26.3)		31 (34.8)	14 (48.3)	17 (28.3)		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 7b. Association between indices of access to care and length of residency in the United States, by African nativity

Healthcare Utilization	EAST AFRICA				WEST AFRICA				Total
	Total N (%) (n=313)	Recent (≤5 years) N (%) (n=77)	Longer (>5 years) N (%) (n=236)	P- value	Total N (%) (n=90)	Recent (≤5 years) N (%) (n=29)	Longer (>5 years) N (%) (n=61)	P-value	P-value
During the past 12 months, have you visited a health care provider?				0.492				0.761	
Yes	260 (83.1)	62 (80.5)	198 (83.9)		67 (74.4)	21 (72.4)	46 (75.4)		
No	53 (16.9)	15 (19.5)	38 (16.1)		23 (25.6)	8 (27.6)	15 (24.6)		
During the past 12 months, have you visited a mental health provider?				0.443				0.547	
Yes	27 (8.6)	5 (6.5)	22 (9.3)		5 (5.6)	1 (3.4)	4 (6.6)		
No	286 (91.4)	72 (93.5)	214 (90.7)		85 (94.4)	28 (96.6)	57 (93.4)		
When you are sick or need medical care, where do you usually go?				0.028*				0.025*	****
Doctor office/clinic/public health or community clinic	264 (84.3)	60 (77.9)	204 (86.4)		75 (84.3)	22 (78.6)	53 (86.9)		
Hospital ER	19 (6.1)	10 (13.0)	9 (3.8)		2 (2.2)	1 (3.6)	1 (1.6)		
Urgent care	4 (1.3)	0 (0.0)	4 (1.7)		6 (6.7)	0 (0.0)	6 (9.8)		
Other (IVA, 5-minute clinic 6 some other places)	15 (4.8)	3 (3.9)	12 (5.1)		2 (2.2)	2 (7.1)	0 (0.0)		
No usual place	11 (3.5)	4 (5.2)	7 (3.0)		4 (4.5)	3 (10.7)	1 (1.6)		
During the past 12 months have you received medical care?				0.652				0.802	
Yes	195 (62.7)	46 (60.5)	149 (63.4)		62 (69.7)	19 (67.9)	43 (70.5)		
No	116 (37.3)	30 (39.5)	86 (36.6)		27 (30.3)	9 (32.1)	18 (29.5)		
Are you currently taking any medication that was prescribed for you to treat depression?				0.548				0.212	
Yes	13 (52.0)	2 (40.0)	11 (55.0)		1 (14.3)	1 (33.3)	0 (0.0)		
No	12 (48.0)	3 (60.0)	9 (45.0)		6 (85.7)	2 (66.7)	4 (100)		
Do you take any prescription medication (if female, other than birth control pill), on a regular basis?				0.828				0.522	
Yes	87 (28.0)	22 (28.9)	65 (27.7)		27 (30.0)	10 (34.5)	17 (27.9)		
No	224 (72.0)	54 (71.1)	170 (72.3)		63 (70.0)	19 (65.5)	44 (72.1)		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Table 7c. Association between indices of access to care and length of residency in the United States, by African nativity

Screening Utilization	EAST AFRICA				WEST AFRICA				Total
	Total N (%) (n=313)	Recent (≤5 years) N (%) (n=77)	Longer (>5 years) N (%) (n=236)	P-value	Total N (%) (n=90)	Recent (≤5 years) N (%) (n=29)	Longer (>5 years) N (%) (n=61)	P-value	P- value
How long has it been since you last visited a dentist or dental clinic for any reason?				0.469				0.350	
Within the past year	176 (56.4)	45 (59.2)	131 (55.5)		41 (46.1)	16 (55.2)	25 (41.7)		
Within the past 2 years	52 (16.7)	14 (18.4)	38 (16.1)		21 (23.6)	3 (10.3)	18 (30.0)		
Within the past 5 years	27 (8.7)	5 (6.6)	22 (9.3)		5 (5.6)	2 (6.9)	3 (5.0)		
5 or more years ago	21 (6.7)	2 (2.6)	19 (8.1)		7 (7.9)	3 (10.3)	4 (6.7)		
Never	36 (11.5)	10 (13.2)	26 (11.0)		15 (16.9)	5 (17.2)	10 (16.7)		
How long has it been since your last complete physical exam?				0.258				0.009*	****
Within the past year	215 (68.9)	51 (66.2)	164 (69.8)		49 (55.1)	14 (50.0)	35 (57.4)		
Within the past 2 years	46 (14.7)	10 (13.0)	36 (15.3)		17 (19.1)	3 (10.7)	14 (23.0)		
Within the past 5 years	21 (6.7)	8 (10.4)	13 (5.5)		12 (13.5)	3 (10.7)	9 (14.8)		
5 or more years ago	11 (3.5)	1 (1.3)	10 (4.3)		3 (3.4)	1 (3.6)	2 (3.3)		
Never	19 (6.1)	7 (9.1)	12 (5.1)		8 (9.0)	7 (25.0)	1 (1.6)		
How long ago has it been since you last had your blood cholesterol checked?				0.837				0.001*	
Within the past year	191 (62.0)	45 (60.8)	146 (62.4)		45 (51.7)	10 (34.5)	35 (60.3)		
Within the past 2 years	33 (10.7)	8 (10.8)	25 (10.7)		14 (16.1)	3 (10.3)	11 (19.0)		
Within the past 5 years	15 (4.9)	2 (2.7)	13 (5.6)		8 (9.2)	2 (6.9)	6 (10.3)		
5 or more years ago	4 (1.3)	1 (1.4)	3 (1.3)		20 (23.0)	14 (48.3)	6 (10.3)		
Never	65 (21.1)	18 (24.3)	47 (20.1)						
Had blood stool test using a home kit within 2 years, age≥50				0.324				0.536	
Within 2yr	39 (60.0)	10 (71.4)	29 (56.9)		5 (29.4)	2 (40.0)	3 (25.0)		
≥2yr or never	26 (40.0)	4 (28.6)	22 (43.1)		12 (70.6)	3 (60.0)	9 (75.0)		
How long ago had sigmoidoscopy or colonoscopy? age≥50				0.749				0.909	
<2yr	29 (45.3)	7 (50.0)	22 (44.0)		4 (23.5)	1 (20.0)	3 (25.0)		
2-<5yr	3 (4.7)	0 (0.0)	3 (6.0)		6 (35.3)	2 (40.0)	4 (33.3)		
5-<10yr	1 (1.6)	0 (0.0)	1 (2.0)		1 (5.9)	0 (0.0)	1 (8.3)		
Never	31 (48.4)	7 (50.0)	24 (48.0)		6 (35.3)	2 (40.0)	4 (33.3)		
Had your Pap smear within 3 years? female only				0.003*				0.050*	****
Within past 3 year	90 (60.4)	16 (41.0)	74 (67.3)		37 (90.2)	10 (76.9)	27 (96.4)		
No	59 (39.6)	23 (59.0)	36 (32.7)		4 (9.8)	3 (23.1)	1 (3.6)		
Had last mammogram with the past year, female≥40				0.903				0.423	
Yes	41 (58.6)	8 (57.1)	33 (58.9)		12 (66.7)	2 (50.0)	10 (71.4)		
No	29 (41.4)	6 (42.9)	23 (41.1)		6 (33.3)	2 (50.0)	4 (28.6)		

*Statistically significant at <0.05 (Chi-Square Test); SHAPE 2006 Survey

Conclusion

To the author's knowledge, there is no study that has examined access to, and healthcare utilization rates of East and West African-born immigrants compared to the U.S.-born Black population. As previously stated, there were three key questions posed in this research: 1) What factors are associated with access to and healthcare utilization among U.S.-born versus African-born Blacks? 2) How do West and East African immigrants compare in terms of access to and utilization of health care services? 3) What is the impact of length of stay on East & West African immigrant's healthcare utilization rates?

The findings show that regarding access of care and healthcare utilization, African born Blacks differed significantly than did U.S.-born Blacks, as African-born Blacks were less likely to have had access or utilized healthcare within the past year. East and West Africans were more similar in their access and utilization rates, however despite having less access to healthcare West African immigrants were more likely to have utilized healthcare in the past year. Finally, length of stay in the U.S. plays a significant role in access and healthcare utilization rates observed in African immigrants as the data showed that established immigrants were more likely to fare better in their access and healthcare utilization within the past year, but there were also marked differences within the groups of East and West African immigrants.

In this study, African-born Blacks appear to be healthier than U.S.-born Blacks. This finding occurs despite the fact that most African-born Blacks in this sample have lived in the U.S. for five plus years or more. It appears that the healthy immigrant effect perseveres among African-born immigrants and is a major protective factor. It is important to note that these are self-reported data and therefore might lend itself to bias with African-born Blacks reporting better health status and healthy behaviors due to personal beliefs or cultural influences (Cooper

Brathwaite & Lemonde, 2016). Other studies have shown that despite self-reporting as healthy, African-born Blacks had worse cardiometabolic risk and were previously undiagnosed and thereby unaware of being prediabetic or diabetic (Ukegbu et al., 2011).

Health insurance is the main avenue of access to healthcare in the United States and a major barrier to healthcare utilization that disproportionately affects all Blacks. While this data set precedes the Affordable Care Act (ACA), studies of more recent data sets show that U.S.-born Blacks are still disproportionately more likely to lack insurance and forego needed medical care than their White counterparts (Taylor, 2019; Travers, Cohen, Dick, & Stone, 2017). Artiga et.al (2016) found that Blacks fared worse than all other racial and ethnic groups post ACA despite improvements in health insurance coverage and measures of health utilization, however their study does not disaggregate foreign Blacks from U.S.-born Blacks (Artiga et al., 2016).

Insurance status, having a personal health care provider and having a usual source of care were significantly different for African born immigrants compared to their U.S. born counterparts. Even among those who had insurance, utilization of healthcare was not guaranteed, however it is also known that uninsured subjects are less likely to have a usual source of care and are significantly more likely to not seek healthcare (Douangmala, Hayden, Young, Rho, & Schnepfer, 2012). African-born immigrants attributed cost or lack of insurance as a reason to delay needed medical and mental health care and skipping doses or taking smaller amounts of prescription medications (see appendix 2). This is supported by other studies such as that reported by Adekeye et al.'s 2017 study of African-born immigrants in Georgia (Adekeye et al., 2017).

African-born Blacks were less likely to have a personal healthcare provider but were equally as likely to have a usual source of care as their U.S.-born counterpart. In this study, a

doctor's office, clinic or a public health or community clinic were grouped as one usual source of care. It is likely that the availability of a public health or community clinic allows for African immigrants to have a place to go when they need medical care while also explaining why they are less likely to indicate having a personal healthcare provider as they might not see the providers in a community clinic as private to them. Douangmala et. al. (2011) found in their study of immigrants and refugees in Minnesota that most participants would not have utilized healthcare were it not for a free community clinic available to them (Douangmala et al., 2012).

Furthermore, it is reported that African-born Blacks have a more favorable perception of the U.S. healthcare system and rate the quality of medical services they have received as higher than their U.S-born counterparts (Blendon et al., 2007). This might help explain why U.S.-born Blacks were less likely to indicate a doctor's office or community clinic as their usual source of care and more likely to indicate the emergency room as a usual source of care despite having higher insurance rates and being more likely to have a personal health care provider. Rust et.al (2004) posit that the strongest modifiable predictors of healthcare utilization for U.S.-born Blacks are whether or not they have insurance or a usual source of care (Rust et al., 2004), but that does not take into account discrimination and or racism which have been found to be a major barrier to healthcare utilization for U.S.-born Blacks (Blendon et al., 2007; Rogers et al., 2018; Sewell, 2015).

In addition, African-born Blacks often needed a language interpreter to visit a medical clinic in this study, however East Africans needed this service significantly more than did West African immigrants even though East African immigrants were a younger population than West Africans (see Appendix 3). As stated earlier, the differences in cultural, educational, and social backgrounds undoubtedly play a significant role in decision making for an immigrant prior to

utilizing healthcare and is more apparent within groups than they are between groups among the Black population.

Minnesota, where this data was collected, is home to a large refugee population and is said to have the highest number of refugees per capita of any state, according to the U.S. Census (Shaw, 2018). These refugees are screened extensively for health reasons prior to moving to the U.S. and usually receive a health assessment within 90 days of arriving into the state (Minnesota Department of Health, 2013) as well as referral to primary care. Refugees are eligible for an eight-month short term health insurance program called Refugee Medical Assistance (RMA) and compared to undocumented immigrants are able to get insurance through the marketplace since the ACA went into effect (“Health Insurance | Office of Refugee Resettlement | ACF,” n.d.). Given what we see in this study, that seventy-eight percent of all African-born Blacks were East Africans, we can possibly infer that a majority are Somali, and this is a mix of both immigrants and refugees. This could help explain the observations noted when we compare East and West African-born Blacks access to and utilization of health care.

East Africans were significantly more likely to report being diagnosed with hypertension and being under a doctor’s care to treat their hypertension than were West Africans. This is similar to what other studies have found. Dookeran et.al. studied the health assessment services results of refugees who arrived from 2001 and 2005 and found that African-born refugees in Massachusetts (100% from East Africa) were disproportionately affected by hypertension (25%), second only to refugees from Europe and Central Asia (Dookeran, Battaglia, Cochran, & Geltman, 2010). Golub et. al. found in their study that recent refugees from East Africa who had resettled for more than one year in the U.S. reported the highest incidence of hypertension and diabetes compared to all other African refugee populations in the sample (Golub et al., 2018).

In this study, despite being more likely to be insured and not having trouble paying for insurance premiums, deductibles or co-pays, East African immigrants were still more likely to have not done a preventive screening exam in a timely manner. An at-home blood stool test is recommended every year, a sigmoidoscopy every five years, a colonoscopy every 10 years (Bibbins-Domingo et al., 2016) and for women over 40 a pap smear test is recommended every 3 years (Curry et al., 2018) and a mammogram every year is suggested (American Cancer Society, 2018). East Africans were twice as likely to have never conducted any of these preventive exams than their West African counterparts except for a mammogram. Studies have shown that East African health care behaviors are affected by several factors. For example, a study of African immigrants by Sewali et al (2015) found that religious belief as a protective factor, lack of knowledge about screening, and low perceived susceptibility greatly hindered their propensity to get screened (Sewali et al., 2015). Finally, further studies should aim to understand the cultural differences between East and West African-born Black in how they express and adapt to mental health condition given that West Africans were less likely to be under treatment for their depression than were East African-born Blacks.

Length of stay or residence in the U.S., a proxy measure of acculturation in the field of public health, was directly related to healthcare utilization for African immigrants in this study. A unique and unexpected finding of this study was that established East African immigrants still needed an interpreter when visiting a medical clinic (see Appendix 3). Okafor et.al. (2013), found in their study of Ethiopians and Nigerians that those with low English proficiency were more likely to report poorer self-reported health status than were those with high English proficiency. Ethiopians, people from East Africa, were less likely to be English proficient than were Nigerians, who are people from West Africa, in their study. However, they did not study

how length of stay interacted with English proficiency which could have shown a difference in self-reported health status (Okafor, Carter-Pokras, Picot, & Zhan, 2013). Similarly, Simbiri et.al. (2010) found that French speaking African immigrants had poorer access to healthcare due to language proficiency compared to English speaking Africans who cited other barriers (Simbiri, Hausman, Wadenya, & Lidicker, 2010). A separate analysis of this data (not reported in this paper) showed no difference in self-reported health status for recent East and West African immigrants. However, among established immigrants, West Africans were more likely to report excellent to good health than were East Africans (92% vs. 88%) while recent East Africans were more likely to report fair or poor health status with no recent West Africans reporting poor health status (12% vs 8%). It is likely that limited English proficiency does not change for East Africans despite length of stay and will always create a gap in their health outcomes if not addressed. Limited English proficiency is a barrier to medical comprehension as individuals who are non-English proficient have been found to be more likely to report problems understanding medical situations, confusion about their medications, trouble understanding medication labels, and bad reactions to medications than their English-proficient counterparts (Wilson, Chen, Grumbach, Wang, & Fernandez, 2005)

Recent East and West African immigrants were more likely to have been insured in the past year than were established immigrants, however, East Africans were more likely to be established immigrants and therefore had more access to healthcare and utilized healthcare overall. Recent immigrants were less likely to have a personal health care provider and were less likely to have a usual source of care for both East and West Africans. Another interesting find was that recent East Africans considered the hospital emergency room as their usual source of

care than did established immigrants while established West African immigrants considered the urgent care as their usual source of care than were recent immigrants.

Recent East African immigrants were more likely to have not had a complete physical exam, ever had their blood cholesterol checked, or had a pap smear within the screening guidelines. Harcourt et. al. (2014) also found in their study that established immigrants were more likely to have had a pap smear than were recent immigrants (Harcourt et al., 2014). This study found unexpected results as recent East African immigrants were more likely than established immigrants to have had a blood stool test, a sigmoidoscopy or colonoscopy and were as likely to have had a mammogram as established immigrants. It is likely that this occurred as a result of the required screenings of refugee populations, however it would not explain why they along with recent West African-born immigrants reported never having a physical exam. Of those who did delay medical care 90% of recent East African immigrants and 100% of recent West African immigrants indicated this was due to cost or lack of insurance. It is likely that recent immigrants are yet to navigate the healthcare system and are unaware of available free or low-cost resources that could help take care of their medical needs.

Limitations

There are several limitations worth noting in this study. First, this study uses a 2006 data set despite more recent iterations which does. As explained earlier this was because more recent data sets did not include a variable for country of origin. Second, since only one year of data was used in this study, it is not possible to establish causal relationships or trends. In 2018, the country of origin variable was added back to the survey, but the sample size for East and West Africans was small (n=457), but more importantly the questionnaire was modified such that

health status could not be compared between groups. Lastly, health status and other health outcomes were self-reported which can allow for recall bias.

The use of multiple modes of data collection also opens the possibility for mode differences in how participants responded to questions in the survey between those who replied by telephone versus those who replied by mail. Another potential source of bias may occur to the extent that non-respondents are somehow different from respondents on the health-related variables in this study as there were no comparisons done between respondents and non-respondents.

Implications of the study

The findings of this study provide further support for the need to improve public health surveillance for African-born Blacks to promote awareness, knowledge and care for their health needs which is different from US-born Blacks. Recent studies dispute the healthy immigrant effect and have shown that it is no longer valid due to assimilation of lifestyle despite immigrants entering the country with lower risk factors (O'connor et al., 2014; Okwuosa & Williams, 2012; Ukegbu et al., 2011). This underscores the need for more clinical studies that take into account the cultural, lifestyle, environmental and policy factors that impact the health of African immigrants in the United States.

It seems improbable that studies could be conducted on African immigrants from each individual country represented in the United States, however for African-born Blacks, a good practice will certainly be for states with huge immigrant or refugee Black populations to delineate them from U.S.-born Blacks and use this information to guide their public health resources, clinical recommendations and policies. This data set and in Minnesota at large report on very few other Black populations such as Caribbean-born Blacks who may report very

different health status and outcomes to African-born Blacks. It will be prudent even for states to be aware of the composition of Black populations and use that knowledge to help address the gaps observed between Blacks and Whites and create healthy equity for all their residents.

While length of stay is significant in understanding health differences observed among immigrants it cannot measure the reasons for change i.e. attitudes and behaviors that impact acculturation. Forty four percent of established East African immigrants still required an interpreter when visiting a medical clinic. Healthcare systems in Minnesota and in the U.S. must see this is an opportunity to increase health equity by addressing this need and reducing the risk of poor health outcomes.

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Appendix 1. Demographics & Social Structure Differences by Nativity

	U.S.-Born		African-Born		East African		West African	
	n = 650	Percent	n = 412	Percent	n = 313	Percent	n = 90	Percent
Employment								
Employed	603	92.8%	387	93.9%	295	94.2%	83	92.2%
Unemployed	47	7.2%	25	6.1%	18	5.8%	7	7.8%
Total	650		412		313		90	
Household Size								
1 – 3	495	76.2%	194	47.1%	147	47.0%	44	48.9%
4+	155	23.8%	218	52.9%	166	53.0%	46	51.1%
Total	650		412		313		90	
Sexual Orientation								
Heterosexual/Straight	604	96.5%	383	99.7%	300	99.7%	76	100.0%
Gay-Lesbian or Homosexual	9	1.4%	0	0.0%	1	0.3%	0	0.0%
Bisexual	13	2.1%	1	0.3%	301		76	
Total	626		384					
# of times moved in past year								
0	475	73.4%	297	72.3%	239	76.4%	54	60.7%
1	116	17.9%	91	22.1%	62	19.8%	26	29.2%
2+	56	8.7%	23	5.6%	12	3.8%	9	10.1%
Total	647		411		313		89	
Missed Rent/Mortgage Payment								
Yes	137	21.1%	57	13.8%	26	8.3%	31	34.4%
No	512	78.9%	355	86.2%	287	91.7%	59	65.6%
Total	649		412		313		90	
Food Insecurity								
Often	106	16.4%	41	10.0%	18	5.8%	23	25.6%
Sometimes	117	18.1%	52	12.6%	29	9.3%	22	24.4%
Rarely	116	18.0%	53	12.9%	34	10.9%	17	18.9%
Never	306	47.4%	266	64.6%	232	74.1%	28	31.1%
Total	645		412		313		90	
Applied for Social Services								
Yes	133	20.9%	157	38.5%	133	43.0%	22	24.4%
No	502	79.1%	251	61.5%	176	57.0%	68	75.6%
Total	635		408		309		90	

Appendix 2a. Healthcare Access & Utilization Differences by Nativity

	U.S.-born		African-born		P-value	East		West		P-value
	n = 650	%	n = 412	%		n = 313	%	n = 90	%	
During the past 12 months, was there a time when you needed medical care?					0.751					0.994
Yes	403	62.8%	254	61.8%		194	62.2%	56	62.2%	
No	239	37.2%	157	38.2%		118	37.8%	34	37.8%	
Total	642		411			312		90		
Did you delay or not get the care you thought you needed (medical)?					0.097					0.694
Yes	131	33.2%	68	27.0%		51	26.4%	16	29.1%	
No	264	66.8%	184	73.0%		142	73.6%	39	70.9%	
Total	395		252			193		55		
Was that because of cost or lack of insurance?					0.006*					0.344
Yes	77	58.3%	53	77.9%		39	76.5%	14	87.5%	
No	55	41.7%	15	22.1%		12	23.5%	2	12.5%	
Total	132		68			51		16		
During the past 12 months, was there a time when you wanted to talk with or seek help from a mental health professional?					0.000*					0.488
Yes	190	29.4%	33	8.0%		24	7.7%	9	10.0%	
No	457	70.6%	377	92.0%		287	92.3%	81	90.0%	
Total	647		410			311		90		
Did you delay or not get the care you thought you needed? (mental)					0.332					0.097
Yes	109	57.7%	22	66.7%		14	58.3%	8	88.9%	
No	80	42.3%	11	33.3%		10	41.7%	1	11.1%	
Total	189		33			24		9		
Was that because of cost or lack of insurance?					0.023*					0.665
Yes	45	41.7%	15	68.2%		10	71.4%	5	62.5%	
No	63	58.3%	7	31.8%		4	28.6%	3	37.5%	
Total	108		22			14		8		

Appendix 2b. Healthcare Access & Utilization Differences by Nativity

	U.S.-born		African-born		P-value	East		West		P-value
	n = 650	%	n = 412	%		n = 313	%	n = 90	%	
Are you currently taking any medication that was prescribed for you to treat depression?					0.459					0.075
Yes	87	50.9%	14	43.8%		13	52.0%	1	14.3%	
No	84	49.1%	18	56.3%		12	48.0%	6	85.7%	
Total	171		32			25		7		
					0.000*					0.708
Do you take any prescription medication (if female, other than birth control pill) , on a regular basis?	359	55.5%	116	28.3%		87	28.0%	27	30.0%	
No	288	44.5%	294	71.7%		224	72.0%	63	70.0%	
Total	647		410			311		90		
How difficult is it to pay for your prescription medications each month?					0.006*					0.314
Very difficult	62	17.4%	30	25.9%		21	23.9%	8	30.8%	
Somewhat difficult	88	24.6%	18	15.5%		11	12.5%	6	23.1%	
Not too difficult	82	23.0%	16	13.8%		12	13.6%	4	15.4%	
Not at all difficult	125	35.0%	52	44.8%		44	50.0%	8	30.8%	
Total	357		116			88		26		
During the past 12 months, was there any time you skipped doses, took smaller amounts of your prescription?					0.492					0.180
Yes	114	31.8%	33	28.4%		22	25.0%	10	38.5%	
No	244	68.2%	83	71.6%		66	75.0%	16	61.5%	
Total	358		116			88		26		
Did you feel you were discriminated against while receiving medical care?					0.031*					0.669
Yes	38	8.4%	11	4.2%		9	4.6%	2	3.3%	
No	412	91.6%	251	95.8%		186	95.4%	58	96.7%	
Total	450		262			195		60		

Appendix 3a. Association between Indices of Healthcare Utilization and Length of Residency in the U.S. by Nativity

	EAST AFRICA				WEST AFRICA				Total
	Total N (%) (n=313)	Recent (≤5 years) N (%) (n=77)	Longer (>5 years) N (%) (n=236)	P- value	Total N (%) (n=90)	Recent (≤5 years) N (%) (n=29)	Longer (>5 years) N (%) (n=61)	P- value	P-value
During the past 12 months, how difficult has it been for you and your family to pay for health insurance premiums, co-pays etc.?				0.710				0.949	
Very difficult	61 (19.6)	18 (23.7)	43 (18.2)		27 (31.4)	9 (33.3)	18 (30.5)		
Somewhat difficult	36 (11.5)	8 (10.5)	28 (11.9)		22 (25.6)	6 (22.2)	16 (27.1)		
Not too difficult	46 (14.7)	12 (15.8)	34 (14.4)		20 (23.3)	6 (22.2)	14 (23.7)		
Not at all difficult	169 (54.2)	38 (50.0)	131 (55.5)		17 (19.8)	6 (22.2)	11 (18.6)		
During the past 12 months, was there a time when you needed medical care?				0.165				0.984	
Yes	194 (62.2)	53 (68.8)	141 (60.0)		56 (62.2)	18 (62.1)	38 (62.3)		
No	118 (37.8)	24 (31.2)	94 (40.0)		34 (37.8)	11 (37.9)	23 (37.7)		
Did you delay or not get the care you thought you needed (medical)?				0.021*				0.498	****
Yes	51 (26.4)	20 (38.5)	31 (22.0)		16 (29.1)	6 (35.3)	10 (26.3)		
No	142 (73.6)	32 (61.5)	110 (78.0)		39 (70.9)	11 (64.7)	28 (73.7)		
Was that because of cost or lack of insurance?				0.067				0.242	****
Yes	39 (76.5)	18 (90.0)	21 (67.7)		14 (87.5)	6 (100)	8 (80.0)		
No	12 (23.5)	2 (10.0)	10 (32.3)		2 (12.5)	0 (0.0)	2 (20.0)		

Appendix 3b. Association between Indices of Healthcare Utilization and Length of Residency in the U.S. by Nativity

	EAST AFRICA				WEST AFRICA				Total
	Total N (%) (n=313)	Recent (≤5 years) N (%) (n=77)	Longer (>5 years) N (%) (n=236)	P-value	Total N (%) (n=90)	Recent (≤5 years) N (%) (n=29)	Longer (>5 years) N (%) (n=61)	P-value	P-value
During the past 12 months, was there a time when you wanted to talk with or seek help from a mental health professional?				0.339				0.408	
Yes	24 (7.7)	4 (5.2)	20 (8.5)		9 (10.0)	4 (13.8)	5 (8.2)		
No	287 (92.3)	73 (94.8)	214 (91.5)		81 (90.0)	25 (86.2)	56 (91.8)		
Did you delay or not get the care you thought you needed? (mental)				0.064				0.236	
Yes	14 (58.3)	4 (100)	10 (50.0)		8 (88.9)	3 (75.0)	5 (100)		
No	10 (41.7)	0 (0.0)	10 (50.0)		1 (11.1)	1 (25.0)	0 (0.0)		
Was that because of cost or lack of insurance?				0.134				0.090	****
Yes	10 (71.4)	4 (100)	6 (60.0)		5 (62.5)	3 (100)	2 (40.0)		
No	4 (28.6)	0 (0.0)	4 (40.0)		3 (37.5)	0 (0.0)	3 (60.0)		
How difficult is it to pay for your prescription medications each month?				0.832				0.017*	
Very difficult	21 (23.9)	4 (18.2)	17 (25.8)		8 (30.8)	0 (0.0)	8 (50.0)		
Somewhat difficult	11 (12.5)	3 (13.6)	8 (12.1)		6 (23.1)	3 (30.0)	3 (18.8)		
Not too difficult	12 (13.6)	4 (18.2)	8 (12.1)		4 (15.4)	1 (10.0)	3 (18.8)		
Not at all difficult	44 (50.0)	11 (50.0)	33 (50.0)		8 (30.8)	6 (60.0)	2 (12.5)		
During the past 12 months, was there any time you skipped doses, took smaller amounts of your prescription?				0.155				0.018*	
Yes	22 (25.0)	8 (36.4)	14 (21.2)		10 (38.5)	1 (10.0)	9 (56.3)		
No	66 (75.0)	14 (63.6)	52 (78.8)		16 (61.5)	9 (90.0)	7 (43.8)		
When you go to a clinic, do you need an interpreter?				0.019*				0.134	***
Yes	143 (48.3)	45 (60.0)	98 (44.3)		1 (1.7)	1 (4.8)	0 (0.0)		
No	153 (51.7)	30 (40.0)	123 (55.7)		55 (94.8)	18 (85.7)	37 (100)		
Did you feel you were discriminated against while receiving medical care?				0.921				0.028*	
Yes	9 (4.6)	2 (4.3)	7 (4.7)		2 (3.3)	2 (11.1)	0 (0.0)		
No	186 (95.4)	44 (95.7)	142 (95.3)		58 (96.7)	16 (88.9)	42 (100)		

Manuscript 3. Healthcare Utilization and Cardiovascular Health of African-born Immigrants and U.S.-born Blacks

Introduction

The substantial health differences among African Americans and other ethnic groups in the United States are well documented and attributed to a history of slavery, racism and segregation. According to several studies, the health disparities between African Americans and other racial groups are striking and are apparent when: infant mortality (Smith, Bentley-Edwards, El-Amin, & Darity, 2018); cardiovascular health (Mozaffarian et al., 2016); homicide related death (*Adolescent Firearm Homicide in Chicago 2013 – 2017: Young Black Males at High Risk*, 2019); and other measures of health status are examined (Noonan, Velasco-Mondragon, & Wagner, 2016).

Differences in the cardiovascular health amongst African American and African-born Blacks have long been of interest (Cooper & Rotimi, 1997; Okosun, Cooper, Rotimi, Osotimehin, & Forrester, 1998), but has not been researched as intensively or at a steady pace as with other diseases such as: HIV (Ashton, Bernhardt, Lowe, Mietchen, & Johnston, 2012; Ojikutu et al., 2013; Page, Goldbaum, Kent, & Buskin, 2009); Cancer (Blackman et al., 2018; Harcourt et al., 2014; Piwowarczyk et al., 2013; Sung, DeSantis, Fedewa, Kantelhardt, & Jemal, 2019); and unfortunately, in recent years, interest seems to have waned altogether. This might be due to the fact that the terms and concepts of ethnicity are still not defined, making it challenging to give proper attribution to any epidemiological advancement (Ford & Harawa, 2010).

The primary purpose of this paper is to examine the relationship between healthcare utilization and cardiovascular health among U.S.-born Blacks and African-born Blacks. A secondary aim is to determine the impact length of stay in the U.S plays on the cardiovascular health of African-born Blacks in the United States.

Rationale for the study

Cardiovascular disease (CVD) is the leading cause of death in the U.S. (Murphy, Xu, Kochanek, & Arias, 2018) and despite concerted efforts to improve the cardiovascular health of all Americans, it remains a major public health challenge. CVD is also a global problem, with three quarters of cardiovascular deaths taking place in low- and middle- income countries, many of which are in Africa (World Health Organization, 2017). Cardiovascular health has a combination of seven modifiable and non-modifiable risk factors which include four health behaviors (smoking, BMI, diet and physical activity) and three health factors (blood pressure, cholesterol and glucose (diabetes mellitus), all of which have been shown to reduce the risk of CVD and its outcomes (Lloyd-Jones et al., 2010).

Research suggests that the minority status of U.S-born Blacks significantly affects their health. Read, Emerson and Tarlov (2005) showed in their research that European-born Blacks had comparable rates of worse self-rated health, higher odds of activity limitation and higher odds of limitation due to hypertension than U.S.-born Blacks and compared to U.S.-born Whites (Read, Emerson, & Tarlov, 2005). In comparison, African-born Blacks had better health than U.S.-born Whites on all three measures. The authors concluded that the experience of being a racial majority or a racial minority in one's region of origin better explains the health differences observed in Black

immigrants. European-born Blacks, like U.S.-born Blacks, are a minority in their nation of origin which might explain why they had similar health outcomes compared to African-born Blacks who are a majority in their nation of origin. The same conclusion was reached by Elo et.al. (2008) in their study which examined the health status of Blacks in the U.S. and in which they concluded that there was a health advantage for all foreign-born Blacks except for European-born Blacks reporting similar hypertension rates as US-born Blacks (Elo, Mehta, & Huang, 2008).

The implication is that no matter the nation of origin, due to acculturation and length of stay, Black immigrant populations may eventually have similar rates of health outcomes as native-born minority Blacks. Therefore, the health of African-born immigrants becoming like U.S.-born Blacks due to acculturation could further increase the gap in CVD observed between Blacks and Whites in the U.S, despite concerted efforts to reduce these disparities. Hence, the need to study if there could be another explanation as to why there might remain a health advantage for African-born Blacks.

Previous Literature

The cardiovascular health of African-Born Blacks in the U.S. has largely been unexplored and limited to single cardiovascular health behaviors or health factors, single populations, specific gender; and often includes a very small sample size. An assessment of prior studies conducted in the United States revealed limited albeit recent studies that examined the overall cardiovascular health of African born immigrants, with two of the papers by one author (Commodore-Mensah et al., 2016; Commodore-Mensah et al., 2018) and the other two were a general review of prior studies (Commodore-Mensah et al., 2015; Okwuosa & Williams, 2012).

African immigrants had high age and sex adjusted prevalence of hypertension, diabetes and obesity in a study of immigrants in the United States pooled from seven years of National Health Interview Survey (NHIS) data. However, their rates were not the highest in all three risk factors (Commodore-Mensah et al., 2018). The authors expected a high prevalence of hypertension among African immigrants, but instead found a lower rate (28%) than the U.S-born Black population (33%). Similarly, Koya and Egede (2007) found that Africans were less likely to have hypertension, hyperlipidemia, and diabetes than immigrants from South or Central America, Europe or Russia, but were more likely to be obese and physically inactive than immigrants from Asia, Europe or Russia. Also, they had similar smoking rates to immigrants from South or Central America, which were the lowest rates among all regions (Koya & Egede, 2007). In a study of refugees and asylees in Massachusetts, African immigrants had significantly lower rates of hypertension, coronary artery disease, diabetes and obesity than immigrants from Europe and Central Asia (Dookeran, Battaglia, Cochran, & Geltman, 2010). In addition to lacking a complete cardiovascular health profile in these studies, they also do not delineate the country or region of birth of African immigrants even though studies show that there are differences in the health statuses of African immigrants by country or region of birth (Read et al., 2005).

Two of the studies provide a more complete profile of cardiovascular health because they include both health behaviors and health risk factors. A look at the cardiovascular health of Ghanaian and Nigerian immigrants in the Baltimore-Washington Metropolitan area revealed that 88% of those sampled were overweight or obese, 40% had hypertension, 16% had diabetes, 33% had appropriate lipid profile, 44% did not meet

physical activity recommendations, and only one individual reported being a smoker. In total 54% had three or more CVD risk factors (Commodore-Mensah et al., 2016). This study provides a complete profile of cardiovascular health of African immigrants in the United States. However, the study is greatly limited because it only involves West African immigrants, who, as studies show, have a different profile from African immigrants from other regions (Chaumba, 2011). Additionally, the sample was a convenience-sample of Africans from different churches and therefore this profile will differ greatly from a vast majority of African immigrants in the United States.

Similarly, Sewali et. al (2015) studied African immigrants in Minnesota from six regions (Somali, Ethiopia, Liberia, Sudan, Kenya and other). Somali, Ethiopia and Kenya are East African countries representing 69.8% of the sample; Liberia is a West African country representing 14% of the sample, and Sudan is a Northern African country representing 8.5% of the sample. Altogether, this study has the most diverse sample of African immigrants whose cardiovascular health were being studied. The authors of the study found that, 55% of all African immigrants indicated they were overweight or obese, 5.4% had diabetes, 8.3% had hypertension, 91.7% had never smoked, and 28% had at least 5 days of moderate physical activity. Liberians were more likely to be obese and have diabetes or hypertension, Sudanese were less likely to be obese and have diabetes or hypertension, and Kenyans were almost 5 times more likely to report having diabetes or hypertension compared to Somalis. Overall, after adjusting for other factors, the researchers report that East African immigrants had the lowest prevalence rates of hypertension and diabetes than the other regions (Sewali et al., 2015). The overall rates of hypertension and diabetes in this study (8.3% and 5.4% respectively), in comparison to

Commodore-Mensah's (2016) study, were extremely low and again underscores the strong need for delineating country or region of origin when studying the Black population in the U.S. but also within African-born populations.

This begs the question: could healthcare utilization explain any differences observed in the cardiovascular health differences among Black populations as immigrant Blacks become more acculturated into the United States? In African countries, the lack of integrated health care services for early detection and treatment of people with risk factors increases the risk of CVD burden (van de Vijver et al., 2013). In addition, many Africans have less access to effective and equitable healthcare services that can address this disease (World Health Organization, 2017). Studies have consistently shown that access and healthcare utilization impact health status and outcomes in the United States (DeVoe, Fryer, Phillips, & Green, 2003; Freeman, Kadiyala, Bell, & Martin, 2008). Access and healthcare utilization have been shown to be a risk factor for screening and prevention (Alcalá et al., 2015; Kenik, Jean-Jacques, & Feinglass, 2014), awareness (Cole, Reed, Tannis, Trinh-Shevrin, & Ravenell, 2018; Langellier et al., 2012) treatment (Brooks et al., 2010; Dinkler, Sugar, Escarce, Ong, & Mangione, 2016; Spatz, Ross, Desai, Canavan, & Krumholz, 2010) and presence of CVD indicators (Rooks et al., 2008) among other racial/ethnic groups in the United States.

While no study has compared the impact of healthcare utilization on the cardiovascular health of African immigrants and U.S-born Blacks, two studies noted the effect of access to health care i.e. having health insurance and having a health care provider and healthcare utilization i.e. usual source of care and number of physician visits on the cardiovascular health of African immigrants. In a study comparing the

cardiometabolic health of African men to African American men, they found that African men in this sample were less likely to have health insurance and a healthcare provider. This could explain why they had been previously undiagnosed and thus found to have worse cardiometabolic health than their African American counterparts (O'connor et al., 2014). Among West African women, having health insurance was found to be associated with lower CVD risk (Commodore-Mensah et al., 2016). Using the Gelberg-Anderson model this study will identify factors that predict healthcare utilization in African-born Blacks compared to U.S.-born Blacks. Using the SHAPE dataset from Minnesota, this study will investigate the relationship between the healthcare utilization and cardiovascular health of African-born and U.S-born Blacks.

Research Questions

This study aims to depict a clearer picture of the impact of healthcare utilization on cardiovascular health among African-born Blacks and U.S.-born Blacks, with a secondary aim to examine if length of stay is a significant predictor of cardiovascular health among African-born Blacks in the United States. The research questions addressed in this paper include:

- 1) What are the cardiovascular health differences between U.S.-born and African-born Blacks?
- 2) What predisposing, enabling or need factors are associated with healthcare utilization rates in U.S.-born and African-born Blacks?
- 3) What healthcare utilization factors are related to cardiovascular health?

Theoretical Model

The Gelberg-Anderson Behavioral Model of Health Services Use for Vulnerable Populations (2000) was used as a framework to guide this project's aims (Gelberg, Andersen, & Leake, 2000). This behavioral model is a multilevel model that was created by Ronald M. Anderson "...to assist in understanding why families use health services, to define and measure equitable access to health care, and to assist in developing policies to promote equitable access" (Andersen, 2008, pg. 651). The current version of the model suggests that people's use of health services is a function of their predisposition to use services, factors which enable or impede use, need for care and personal health behaviors. It was revised to include domains relevant to understanding the health utilization behaviors of vulnerable populations such as undocumented immigrants, children and adolescents, mentally ill, disabled persons, refugees, the elderly, and homeless persons (Aday, 1994).

The model's major domains are as follows:(Gelberg et al., 2000)

Predisposing factors. These factors influence healthcare use prior to the onset of illness. The predisposing traditional factors include demographic factors such as age and gender, health belief factors and social structure factors such as family size, ethnicity and education. Predisposing vulnerable factors include social structure characteristics such as acculturation, immigration status, literacy, childhood characteristics, living conditions, residential history, mobility and more.

Enabling factors. These factors enhance or impede the use of care by the individual. Enabling traditional factors include individual financing factors (for example health insurance status, income, and savings), usual source of care and wait time to see a doctor. Community enabling factors include; health policy, healthcare expenditures and

health services resources. Enabling vulnerable factors include competing needs like paying rent or debt, availability and use of information sources and access to public health benefits while community vulnerable factors include availability of social services.

Need factors. These factors reflect both actual and perceived illness levels and are the most immediate cause of utilization of health services. Individual-need traditional factors include the perceived need and the evaluated need of health conditions. Need-vulnerable factors include perceived and evaluated need regarding relevant conditions specific to vulnerable populations.

Personal Health Practices factors. Health behaviors that influence health status, health utilization and health outcomes. The personal health practices in the traditional domain includes diet, exercise, tobacco use, self-care, adherence to care & use of health services. The personal health practices vulnerable domain includes food sources and hygiene and unsafe sexual behavior.

This model has been used for varying vulnerable populations (Stein, Andersen, & Gelberg, 2007) (Shamburger-Rousseau, Conyers, & Armstrong, 2016) (Small, 2011). While immigrants have been identified as a vulnerable population, heterogeneity among the group challenges researchers in understanding the specific vulnerability to inadequate healthcare utilization for each immigrant population. Its application in this study to assess the healthcare utilization of African-born Blacks could be helpful in developing policies that promote equitable access for this population.

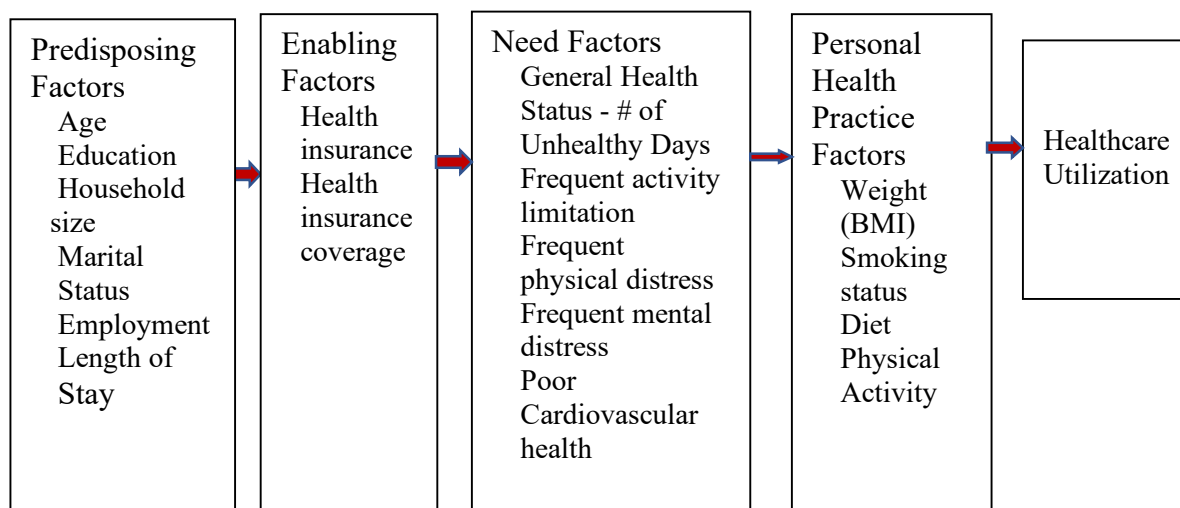


Figure 1: Adapted from Gelberg-Anderson Behavioral Model of Health Services Use for Vulnerable Populations

Data and Methodology

The Survey of the Health of All the Population, and the Environment (SHAPE) is an ongoing public health surveillance project that monitors the health of residents in Hennepin County, Minnesota. SHAPE is a population-based health survey that was initiated in 1998 and conducted a second time in 2002. SHAPE 2006, is the third in the series, and is a partnership between Hennepin County Human Services and Public Health Department, and the University of Minnesota School of Public Health. All statistical analyses were performed with SPSS software version 26.0. The SHAPE dataset is described extensively in a prior paper.

For the purpose of this analysis, data from the SHAPE 2006 - Adult Survey was selected despite more recent iterations because it is the only iteration that identifies: all seven cardiovascular health factors, as well as the regions of Africa from which foreign Blacks were born. Specifically, for this paper data was selected solely for one racial group (Black/African Americans); including both foreign-born and U.S.-born Blacks.

U.S.-born Blacks consisted of those who identified themselves as Black or African American and born in the United States, not Hispanic/Latino. African-born Blacks were those who identified themselves as Black, African or African American and born in an African country. This resulted in a sample size of 1,062. Foreign-born Blacks from non-African countries were small in number and were not included in the analysis.

Measures

In this study, the primary outcome variable is cardiovascular health. Three variables representing the health factors measured whether a respondent had ever been diagnosed with hypertension, high cholesterol and diabetes (Yes/No). The four health behaviors assessed were:: smoking status (Former or Never Smoker/Current Smoker), BMI clinical guidelines (Underweight <18.5 /Normal 18.5-24.9/Overweight 25-29.9/Obese ≥ 30), diet (eating ≥ 5 servings of fruits and vegetables yesterday Yes/No) and physical activity (5+ Days of moderate physical activity ≥ 30 min per week). Each variable's item was collapsed into "ideal" (Former or Never Smoker, Normal Weight, \geq servings of fruits and vegetables and 5+ days of moderate physical activity) and "not ideal" (the remaining items of each variable). To assess cardiovascular health, an absence of all three health factors were collapsed to indicate "ideal cardiovascular health," while an affirmative response to one or more was collapsed to indicate "non ideal cardiovascular health."

The primary independent variables were the healthcare utilization measures which include, having a personal healthcare provider (yes or no), having a usual source of care (yes/no) and receiving medical care within the past 12 months (yes/no). The moderator variable of interest were the length of stay in the U.S. for African-born Blacks (10 years or more, 5 – 10 years, 0 -5 years) and variables denoting respondent's access to health

care; currently insured (yes/no) and insurance coverage (insured for the entire year/insured part of the year/uninsured the entire year).

To assess the theoretical model, specific predisposing, enabling and need factors were put into a bivariate logistic regression model along with personal health practice factors. They include: predisposing factors (age, gender, education, household size, marital status, length of stay); enabling factors (health insurance, health insurance coverage); need factors (general health status - number of unhealthy days, frequent activity limitation, frequent physical distress, poor cardiovascular health); and personal health practice factors (weight, diet, physical activity and smoking status).

Analytic Procedures

A univariable model was used to assess statistically significant associations. A stepwise binary logistic regression model was used to determine which predisposing, enabling, needs and personal health practice factors independently predicted healthcare utilization in U.S.-born and African- born Blacks. Another binary logistic regression model was used to estimate the odds ratio of the healthcare utilization factors mentioned above on cardiovascular health while controlling for age, gender and BMI. The fourth model was used to estimate the odds ratio for length of stay on ideal cardiovascular health. All $P < 0.05$ were considered significant and 95% confidence intervals (CI) were calculated. All analyses were performed using SPSS 26.0.

Results

Table 1 shows that African-born Blacks were significantly more likely to be of ideal cardiovascular health (77%) than were U.S.-born Blacks (44%). However, when you look

at cardiovascular health behaviors, U.S.-born Blacks were more likely to eat the recommended daily servings of fruits and vegetables (22.6% vs. 19.3%) and be moderately physical active (36.7% vs. 29.9%) while African-born Blacks were more likely to be in the normal weight range (41.2% vs. 28.1%) and were more likely to be a former smoker or never smoked (96.8% vs 71.5%).

	U.S.-Born (N= 650)		African-Born (N=412)	
	Ideal N (%)	Non-Ideal N (%)	Ideal N (%)	Non-Ideal N (%)
Ideal Cardiovascular Health Factors	286 (44%)	364 (56%)	320 (77.7%)	92 (22.3%)
Diet	146 (22.6%)	500 (77.4%)	78 (19.3%)	326 (80.7%)
Physical Activity	235 (36.7%)	405 (63.3%)	122 (29.9%)	286 (70.1%)
Weight	179 (28.1%)	459 (71.9%)	155 (41.2%)	221 (58.8%)
Smoking Status	460 (71.5%)	184 (28.5%)	397 (96.8%)	13 (3.2%)
Hypertension	367 (57%)	277 (43%)	371 (90.5%)	39 (9.5%)
Diabetes	535 (83.3%)	107 (16.7%)	380 (92.5%)	31 (7.5%)
High Cholesterol	440 (68.1%)	206 (31.9%)	353 (86.5%)	55 (13.5%)

Predisposing, enabling, need and personal health practice factors predicting healthcare utilization for U.S-born Blacks were examined in Table 2.

Predisposing Factors

Age, gender and education were all significant predisposing factors for having a health care provider. Specifically, people who were 65 years or older were 6.09 times more likely to have a healthcare provider than those 18 to 64 years of age; females were 1.69 times more likely to have a healthcare provider than males and those with a high school degree or less were less likely to have a healthcare provider than those with a college degree. Gender and education were significant predisposing factors for receiving medical care. Females were 1.66 times more likely to have a healthcare provider while having a

high school degree or less and having a vocational or associate degree were less likely to have received medical care within the past year.

Table 2. Associations between Predisposing, Enabling, Need & Personal Practice Factors and Healthcare Utilization for U.S.-born Black

	Healthcare Provider	Received Medical Care	Sources of Care
	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)
Predisposing Factors			
Age			
65+ years	6.09 (1.32-28.19) *	-- ^a	-- ^a
45 – 64 years	1.26 (0.74- 2.16)	-- ^a	-- ^a
18 – 64 years	1 [Reference]	1 [Reference]	1 [Reference]
Gender			
Female	1.69 (1.02- 2.77) *	1.66 (1.10- 2.51) *	-- ^a
Male	1 [Reference]	1 [Reference]	1 [Reference]
Education			
High School Degree/Less	0.40 (0.18- 0.88) *	0.38 (0.21- 0.68) *	-- ^a
Vocational School/Associates	0.50 (0.21- 0.70)	0.45 (0.25- 0.81) *	-- ^a
College Degree or More	1 [Reference]	1 [Reference]	1 [Reference]
Enabling Factors			
Insurance			
Uninsured	0.46 (0.20- 1.08)	0.23 (0.13- 0.38) *	0.22 (0.08- 0.55) *
Insured	1 [Reference]	1 [Reference]	1 [Reference]
Insurance Coverage			
Uninsured for the entire year	0.18 (0.06- 0.51) *	-- ^a	-- ^a
Uninsured for part of the year	0.29 (0.16- 0.55) *	-- ^a	-- ^a
Insured for the entire year	1 [Reference]	1 [Reference]	1 [Reference]
Need Factors			
Cardiovascular Health			
Non-Ideal	2.33 (1.37- 3.95) *	-- ^a	-- ^a
Ideal	1 [Reference]	1 [Reference]	1 [Reference]
Unhealthy Days			
14 – 30 days	-- ^a	1.19 (0.67- 2.11)	-- ^a
1 – 13 days	-- ^a	1.71 (1.07- 2.71) *	-- ^a
0 days	-- ^a	1 [Reference]	-- ^a
Frequent Physical Distress			
Yes	3.09 (1.51- 6.35) *	-- ^a	-- ^a
No	1 [Reference]	1 [Reference]	1 [Reference]
Personal Practice Health Factors			
Current Smoking Status			
Yes			
No	0.22 (0.08- 0.55) *	-- ^a	0.43 (0.17- 1.09)
	1 [Reference]	1 [Reference]	1 [Reference]

^a Excluded from model due to insignificance at univariate level

* Significant at $P \leq 0.05$

Enabling Factors

For enabling factors, those who were uninsured for the entire year or part of the year were significantly less likely to have a healthcare provider than those who were insured the entire year, while being currently uninsured was significantly less likely to predict individuals both receiving medical care within the past year and having a usual source of care than those who were currently insured.

Need Factors

For need factors, those who had poor cardiovascular health were 2.3 times more likely to have a healthcare provider than those who were in ideal cardiovascular health and those who had frequent physical distress were 3.1 times more likely to have a healthcare provider than those who weren't. Those who were unhealthy for 13 days or less were 1.7 times more likely to have received medical care within the past year than those who were healthy the entire month. No need factor predicted a usual source of care.

Personal Health Practice Factors

Lastly, those who were current smokers were less likely to have a healthcare provider than those who were former or never smokers. No other personal health practice factors were associated with receiving medical care within the past year or having a usual source of care.

Table 3 summarizes the results of the predisposing, enabling, need and personal health practice factors predicting healthcare utilization for African-born Blacks.

Table 3. Associations between Predisposing, Enabling, Need & Personal Practice Factors and Healthcare Utilization for African-born Black

	Healthcare Provider	Received Medical Care	Sources of Care
	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)
Predisposing Factors			
Age			
65+ years	3.17 (0.68-14.61)	-- ^a	-- ^a
45 – 64 years	5.38 (1.16- 24.92) *	-- ^a	-- ^a
18 – 64 years	1 [Reference]	1 [Reference]	1 [Reference]
Gender			
Female	1.60 (0.92- 2.79)	1.69 (1.01- 2.84) *	7.94 (1.56- 40.39) *
Male	1 [Reference]	1 [Reference]	1 [Reference]
Length of Stay			
10+ years	2.16 (1.05- 4.47) *	-- ^a	4.48 (0.73- 27.46)
5-10 years	2.45 (1.29- 4.63) *	-- ^a	10.07 (1.59- 63.43) *
0-5 years	1 [Reference]	1 [Reference]	1 [Reference]
Enabling Factors			
Insurance			
Uninsured	-- ^a	0.19 (0.09- 0.38) *	0.08 (0.02- 0.38) *
Insured	1 [Reference]	1 [Reference]	1 [Reference]
Insurance Coverage			
Uninsured for the entire year	0.33 (0.15- 0.73) *	-- ^a	-- ^a
Uninsured for part of the year	0.35 (0.17- 0.71) *	-- ^a	-- ^a
Insured for the entire year	1 [Reference]	1 [Reference]	1 [Reference]

^a Excluded from model due to insignificance at univariate level

* Significant at $P \leq 0.05$

Predisposing Factors

For predisposing factors, those who were 45–64 years old were 5.38 times more likely to have a healthcare provider than those 18 to 64 years and those who were 65 years and older; and those who had lived in the U.S. ten years or more were 2.16 times more likely to have a healthcare provider than those who had lived in the U.S. for less than 5 years. Additionally, those who lived in the U.S for five to ten years were 2.45 times more likely to have a healthcare provider and 10.07 times more likely to have usual source of care.

Females were 1.69 times more likely to have received medical care within the past year and 7.94 times more likely to have a usual source of care than were males.

Enabling, Need and Personal Health Practice Factors

For enabling factors, those who are currently uninsured were less likely to have received a medical care within the past year and to have a usual source of care while those who had been uninsured for the entire year or for part of the year were less likely to have a healthcare provider. No need or personal health practice factors were associated with healthcare utilization for the African-born Black.

Healthcare Utilization and Cardiovascular Health

Table 4 reports the adjusted association between healthcare utilization and cardiovascular health for U.S. and African-born Black. For the African-born Black, no healthcare utilization measure significantly predicted non-ideal cardiovascular health and for the U.S.-born Black. Those who had no healthcare provider were less likely to have non-ideal cardiovascular health.

Length of Stay and Cardiovascular Health

A notable finding in this study was that length of stay in the U.S did not have a significant association with cardiovascular health in univariate analysis and was tested further in the model and no association was still found,

Overall, for both African and U.S.-born Blacks, older age and obesity remained significantly associated with poor cardiovascular health.

Table 4. Associations between Healthcare Utilization and Cardiovascular Health in African and U.S-born Blacks

	African-born Black	U.S.-born Black
	OR^a (95% CI)	OR^a (95% CI)
Age		
65+ years	43.91 (10.86- 177.48) *	12.93 (6.34- 26.36) *
45 – 64 years	11.51 (4.23- 29.28) *	4.86 (3.27- 7.19) *
18 – 64 years	1 [Reference]	1 [Reference]
Gender		
Female	0.32 (0.16- 0.66) *	0.94 (0.62- 1.43)
Male	1 [Reference]	1 [Reference]
Weight (BMI)		
Obesity (BMI >=30)	3.17 (1.12- 8.96) *	2.07 (1.31- 3.27) *
Overweight (BMI 25.0 - 29.9)	5.28 (2.19 - 12.75) *	1.59 (0.96 - 2.63)
Normal (BMI 18.5-24.9)	1 [Reference]	1 [Reference]
Received Medical Care		
No	1.06 (0.49- 2.31)	0.78 (0.50- 1.21)
Yes	1 [Reference]	1 [Reference]
Personal Healthcare Provider		
No	1.14 (0.50- 2.59)	0.52 (0.31- 0.87) *
Yes	1 [Reference]	1 [Reference]
No Usual Source of Care		
No	-- ^a	0.91 (0.52- 1.58)
Yes	1 [Reference]	1 [Reference]
Insurance		
Uninsured	-- ^a	0.91 (0.52- 1.58)
Insured	1 [Reference]	1 [Reference]
Insurance Coverage		
Uninsured for the entire year	0.39 (0.10- 1.46)	1.07 (0.37- 3.09)
Uninsured for part of the year	0.65 (0.21- 2.03)	1.36 (0.75 - 2.48)
Insured the entire year	1 [Reference]	1 [Reference]
Length of Stay		
10+ years	-- ^a	N/A
5 – 10 years	-- ^a	N/A
0 – 5 years	1 [Reference]	N/A

^a Excluded from model due to insignificance at univariate level

* Significant at $P \leq 0.05$

Discussion

The aim of this paper was to describe the cardiovascular health of U.S.-born and African-born Blacks and examine the relation between healthcare utilization and their cardiovascular health. Studies have shown that African-born blacks often self-report better health status than clinical measures indicate (O'connor et al., 2014). As expected, more African-born Blacks self-reported being in ideal cardiovascular health, i.e. not ever been diagnosed by a doctor or healthcare professional for high cholesterol, diabetes or hypertension, than did U.S.-born Blacks. However, given that the question asked was if a doctor or healthcare professional had ever diagnosed the participant with hypertension, diabetes or high cholesterol, it seems unlikely that these results are just an impression of being in better health than their U.S.-born counterparts.

Predisposing, enabling, need, and practice health factors are extremely helpful in our understanding of what aids or impedes healthcare utilization and as such contributes to cardiovascular health outcomes. Length of stay was added as a predisposing factor unique to the immigrant's ability to access and utilize care. For the African-born Black, this study showed that length of residence increased the odds of having a usual source of care and a healthcare provider, but not if they had received medical care in the past twelve months. It also showed that being uninsured decreased the odds of receiving medical care in the past twelve months and having a usual source of care. This is corroborated by prior research that found that lack of insurance is the single most modifiable predictor of healthcare utilization (Rust et al., 2004). Foreign-born immigrants are less likely to be insured than are native born persons, however, the longer they reside in the U.S. the more likely they are to be insured (Migration Policy Institute, 2004)

because documented immigrants become eligible for public insurance after five years and undocumented immigrants are only eligible to change their immigrant status to permanent ones after five years of residing in the United States (Singer, 2004).

Gelberg-Anderson's model also includes illnesses such as poor cardiovascular health as a need factor in whether a person utilizes healthcare or not (Stein et al., 2007). A notable finding is that U.S.-born Blacks who had poor cardiovascular health, had greater odds of having a healthcare provider, although this did not predict their likelihood for receiving medical care and having a usual source of care. Poor cardiovascular health did not predict healthcare utilization among African-born Blacks. It appears that lack of insurance was a significant enough factor in whether or not the African-born Black utilized healthcare despite the fact that 22% of African-born Blacks indicated that they had been diagnosed with all three cardiovascular health factors.

Similarly, level of education was associated with healthcare utilization in U.S.-born Blacks, but not in African-born Blacks, despite the fact that 57% of the African-born Blacks in this population have a high school degree or less compared to 39.4% U.S.-born Blacks in that same age group. Lower educational level is associated with lower economic resources and access to medical care and results in greater risk for cardiovascular diseases (Kubota, Heiss, Maclehose, Roetker, & Folsom, 2017). It is unclear why healthcare utilization was not associated with lower educational levels in African-born Blacks and further research is required to evaluate this relationship.

Having no usual source of care was not associated with the cardiovascular health of African-born Blacks and did not significantly predict non-ideal cardiovascular health in U.S.-born Blacks. This was an interesting find as research shows that adults who are

insured without a usual source of care were more likely to have problems with getting care, tests, treatments and delay needed urgent care (Devoe, Tillotson, Lesko, Wallace, & Angier, 2011). Spatz et.al (2010) report a similar finding, showing that those who were insured without a usual source of care remained associated with being untreated for hypertension (Spatz et al., 2010). Having a usual source of care has been found to be significantly associated with improved hypertension control (Dinkler et al., 2016). Dallo et.al (2009) found that foreign-born individuals with diabetes were less likely to have a usual source of care and be uninsured thereby compromising their quality of treatment and care (Dallo, Wilson, & Stimpson, 2009). More importantly, having a usual source of care increased the likelihood of preventive services, especially for immigrants (Rodríguez, Vargas Bustamante, & Ang, 2009), which is important in reducing the risk of cardiovascular health outcomes as foreign-born immigrants were more likely than their U.S-born counterparts to be unaware of their cardiovascular risk factors (Langellier et al., 2012). It is likely that due to safety nets provided in Minnesota, i.e. “providers that organize and deliver a significant level of health care and other needed services to uninsured, Medicaid and other vulnerable patients” especially for refugee immigrants, that there is a protective factor for the African-born Blacks giving them realized access to care that is otherwise not the norm (Lewin & Altman, 2000).

There was no significant association between length of stay and cardiovascular health for the African-born Black. Given that age remained a significant predictor of cardiovascular health in African-born Blacks, it was expected that there would be a significant association between length of stay and cardiovascular health. It is likely that the people who reported living in the U.S. for 10 years or more were a younger

population, migrating for educational purposes and then remaining in the United States moderating the acculturation effect. It was reported in 2017 that 82% of Sub-Saharan African immigrants were between the ages of 18 to 64 years of age, compared to 79% of other foreign-born immigrants and 59% of the U.S-born population in that same age group (Echeverria-Estrada & Batalova, 2019). Healthy and younger individuals are most likely to immigrate to the US, and therefore, are less likely to have major illnesses such as hypertension or cardiovascular diseases. This study did not indicate at what age African-born Blacks migrate into the United States. It is unclear whether immigrants therefore migrate to the United States with preexisting risks for cardiovascular disease and whether they are aware of those risks. Similarly, Koya et. al (2007) did not find any association between residing in the U.S. for 15 years or more and having diabetes or hypertension in an ethnically diverse group of immigrants.

The older age variable remained significant and had greater odds of being associated with poor cardiovascular health especially in African-born Blacks, but also in U.S.-born Blacks. African-born Blacks who were 65 years and older were 43 times more likely (95% CI 10.86-177.48) to be in non-ideal cardiovascular health when compared to U.S-born blacks of the same age who were only 12.93 times more likely be the same (95% CI 6.34-26.36). Age is a well-known risk factor for cardiovascular disease, particularly hypertension, although the etiology is still not well understood (North & Sinclair, 2012). Being overweight or obese was also significantly associated with non-ideal cardiovascular health for both African-born and U.S.-born Black. Recent studies have argued that body fat or waist circumference are a better predictor of cardiovascular disease than BMI in African-born Blacks (Meyer, Demerath, Friend, Hannan, & Sztainer,

2011; Okosun, Cooper, Rotimi, Osotimehin, & Forrester, 1998). This study does not support this position as the study found that BMI was significantly associated with cardiovascular health for African-born Blacks. More studies are required to understand the relationship between the measurement of obesity and cardiovascular diseases in African-born Blacks.

Limitations

This study has some limitations. Without knowing the immigrant status of the African-born Blacks in the sample used in this study, inferences cannot be made about additional reasons that might inhibit their ability to access or utilize healthcare. The sample size, especially for African-born Blacks, is also very small and limits the generalizability of this study. Additionally, self-reported data limits the validity of these results because non-experimental designs allow for undetected variations and risks that are not adjusted for. Lastly, when findings are statistically in-significant, it is unclear if the sample differences are due to sampling error or to a small sample size.

Summary

Despite these limitations, this study has significant strengths. This is to the author's knowledge the first study to examine the association between healthcare utilization and cardiovascular health of African and U.S.-born Blacks as well as determine if length of stay moderates that association.

In summary, the analysis shows that age, gender, and obesity are significant predictors of healthcare utilization for both U.S. and African-born Blacks. Length of stay was a significant predictor of healthcare utilization in African-born Blacks while illnesses

such as poor cardiovascular health, frequent physical distress and a number of unhealthy days were significant predictors of healthcare utilization in U.S-born Blacks. Age and obesity were also significant predictors for non-ideal cardiovascular health for both U.S. and African-born Blacks. A lack of a personal healthcare provider was significantly associated with having non-ideal cardiovascular health in U.S.-born Blacks. However, healthcare utilization did not significantly predict non-ideal cardiovascular health in African-born Blacks. Given the curious finding in this study related to length of residence being associated with healthcare utilization but not with cardiovascular health perhaps more attention needs to be paid in future studies to documenting at what age African born-Blacks immigrate to the U.S. and perhaps ask them to indicate how they assessed their health at the time of immigration as well as track their cardiovascular health. This also suggests that African-born blacks might develop protective factors against cardiovascular diseases the longer they reside in the United States.

Overall, this study provided valuable insight into the predictors of healthcare utilization for African-born Blacks but was unable to determine what other factors predict their cardiovascular health beyond what is already known. Future studies should examine the access to healthcare and healthcare utilization over a period of time for African-born Blacks separate from U.S.-born Blacks because this might be critically important in understanding the factors that present as cardiovascular risks in this minority group who appear to have worse cardiovascular health as they get older and stay longer in the United States.

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Conclusion

Summary of Key Findings

The main purpose of this dissertation project was to explore the African-born Black immigrants' access to and utilization of healthcare services and how these factors are associated with cardiovascular health compared to those of the U.S.-born Black population. The project used cross-sectional data from the Survey of the Health of All the Population and the Environment (SHAPE).

The aims of this project were to critically review the literature on cardiovascular health and health care utilization among U.S.-Born and African-Born Blacks; characterize the differences in access to health and health care utilization of both East and West African-born immigrants and U.S.-born Blacks, and to characterize the predictors of healthcare utilization related to the cardiovascular health of African-born Blacks compared to U.S.-born Blacks.

The first study (aim 1) sought to appraise existing studies examining cardiovascular health in African-born Blacks compared to U.S.-born Blacks alone and report direct associations between healthcare utilization and cardiovascular health. It was found that only four papers examined the differences in a few cardiovascular health factors between African & U.S-born Blacks but with several limitations that make them ungeneralizable to the rest of the population. The secondary aim was to examine if any studies considered healthcare utilization as a potential risk factor in the cardiovascular disparities observed between African-born and U.S.-born Blacks. None of the studies examined this factor.

The second study (aim 2) sought to explore the broader patterns of African-born immigrants' access to and utilization of healthcare. In particular, it examined the factors associated with access to and healthcare utilization among U.S.-born versus African-born Blacks; compared West and East African immigrants' access to and utilization of health care services, and lastly assessed the impact of length of stay on East & West African immigrant's healthcare utilization. African-born Blacks were less likely to have had access or utilized healthcare within the past year. East and West Africans were more similar in their access and utilization rates, however despite having less access to healthcare West African immigrants were more likely to have utilized healthcare in the past year. Finally, length of stay plays a significant role in access and healthcare utilization rates observed in African immigrants as the data showed that established immigrants were more likely to fare better in their access and healthcare utilization within the past year. East Africans were more likely to be established immigrants and therefore had more access to healthcare and utilized healthcare overall.

The third study (aim 3) examined the relationship between healthcare utilization and cardiovascular health among U.S.-born Blacks and African-born Blacks. A secondary aim was to determine the impact length of stay plays on the cardiovascular health of African-born Blacks in the United States. Age, gender, and obesity were found to be significant predictors of healthcare utilization for both U.S. and African-born Blacks. Length of stay was a significant predictor of healthcare utilization in African-born Blacks while illnesses such as poor cardiovascular health, frequent physical distress and a number of unhealthy days were significant predictors of healthcare utilization in U.S.-born Blacks. Age and obesity were also significant predictors for non-ideal

cardiovascular health for both U.S. and African-born Blacks. A lack of a personal healthcare provider was significantly associated with having non-ideal cardiovascular health in U.S.-born Blacks and no healthcare utilization significantly predicted non-ideal cardiovascular health in African-born Blacks. There was no significant association between length of stay and cardiovascular health for the African-born Black.

Contributions and Implications

This is the first study to examine the association between healthcare utilization and cardiovascular health of African and U.S.-born Blacks as well as determine if length of stay moderates that association. This study gives a clear cardiovascular health profile of the African-born Black something that has been largely missing from the literature. This study draws attention to the fact that language proficiency is an important need factor for utilizing healthcare despite length of stay. Understanding the language proficiency needs of African-born Blacks, especially in states like Minnesota with an influx of African refugee immigrants, can help healthcare systems provide efficient care for the people they serve.

This study draws attention to the need to differentiate within African-born Black populations in the United States as country or region of origin appear to have a significant impact on their health status. Every state needs to understand the profile of their black community in order to tailor programs unique to each sub-group otherwise there is a possibility that they render their interventions less effective.

This study highlights the differences in access to and healthcare utilization based on geographical region of residence which has an impact on the immigrant's health status. Like was mentioned earlier, Minnesota has a huge refugee population and as such

have provided services to meet their needs which might not be the case in other states without a high refugee population.

The findings of this dissertation provide further support for the need to improve public health surveillance for African-born Blacks to promote awareness, knowledge and care for their health needs which is different from US-born Blacks. While African-born Blacks reported better health status and a high prevalence of ideal cardiovascular health, they were significantly less likely to observe good health practices that improve quality of life and increase lifespan.

Lastly length of residence being associated with healthcare utilization but not with cardiovascular health is an important contribution to the literature as we seek to understand what is contributing to the high rates of CVD in Blacks in the United States. Turkson-Ocran et.al (2020) similarly reported no association between length of residence and cardiovascular health, therefore the observed association between length of stay and healthcare utilization suggests that African-born Blacks might be engaging in cardioprotective health behaviors the longer they reside in the U.S. resulting in better ideal cardiovascular health than their U.S.-born counterparts.

Study Limitations

The studies had several limitations.

- 1) This study uses 2006 data set despite more recent iterations which does not include a variable for country of origin
- 2) The use of only one year of data ensures that causal relationships or trends cannot be established.

- 3) The sample size, especially for African-born Blacks, is very small and limits the generalizability of this study.
- 4) Self-reported data limits the validity of these results because non-experimental designs allow for undetected variations and risks that are not adjusted for.
- 5) When findings are statistically in-significant, it is unclear if the sample differences are due to sampling error or to a small sample size.
- 6) The study did not report the immigrant status of African-born Blacks; therefore, inferences cannot be made about additional reasons that might inhibit their ability to access or utilize healthcare.

Future research and recommendations

First, this study needs to be replicated among more diverse and nationally representative data set of African-born Black immigrants. Public health efforts are required to recruit a large sample of African-born Blacks into future clinical or experimental studies to help us fully understand their health needs, healthcare utilization, protective and risk factors that affect their cardiovascular health.

Certainly, more awareness, screening and prevention efforts are needed among African-born Blacks. Public health interventions need to also consider the ethnic/cultural makeup of their foreign-born Black population as nationality or region of origin influences health behaviors, practices and healthcare decisions. Future studies should aim to understand the cultural differences between regions of African immigrants in how they express and adapt to mental health conditions.

In addition, more safety nets, easier access, and quicker integration into the healthcare system is essential to reducing cardiovascular health disparities among Blacks

in the U.S. and reducing the additional mortality burden which creates both a gap and economic burden on the American healthcare system.

More studies are needed that thoroughly examine the association between length of stay, acculturation and health behaviors such as smoking, diet, physical activity, alcohol habits, and the reasons for behavioral change in an effort to increase their cardiovascular health risk profile and reduce the gap still observed in the Black population. Further, longitudinal research is needed on duration of the “healthy immigrant” effect in African-born Black populations. Age of entry and immigration status are additional important factors to be assessed in future studies

Finally, future research should also seek to define the direct link between racial bias and discrimination with cardiovascular health in the Black population as African immigrants will no doubt face the same racial bias and discrimination upon migration that U.S-born Blacks face.

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