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RACIAL DIFFERENCES IN HYPERTENSION CLAIMS RATES FOR MEDICAID PATIENTS: HAS IT CHANGED SINCE 1991?

BY

Anthony Bernard Coleman

A doctoral project submitted to the faculty of the Medical University of
South Carolina in partial fulfillment of the requirements for the degree
Doctor of Health Administration
in the College of Health Professions

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Acknowledgement

This body of work is dedicated to my mother, Barbara Jean Coleman, and every other beautiful woman who has, and will raise strong black men.

Abstract of Doctoral Project Presented to the
Executive Doctoral Program in Health Administration & Leadership
Medical University of South Carolina
In Partial Fulfillment of the Requirements for the
Degree of Doctor of Health Administration

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Chairperson: Jim Zoller, MHA, Ph.D.
Committee: Walter Jones, Ph.D.
Jan Probst, Ph.D.

The purpose of this study was to determine whether the racial differences hypertension claim rates for Medicaid patients has changed since 1991. Age-specific and age-adjusted prevalence rates of hypertension in 2015, and the first 2015 claim rates by race and gender were calculated and compared to age-specific and age-adjusted prevalence rates of hypertension in 1991 and the first 1991 claim rates by race and gender. Gender-specific black-to-white risk ratios were also calculated. The comparison reveled that in both study groups, African-American females were more likely than African-American males, or whites of either sex to have hypertension diagnoses. Using Medicaid data from 12 unknown states for the 2015 calculations represented a significant limitations due to the possibility that any, most, or all of the 12 states could be excluded from the stroke belt, as well as the early 20th century phenomena such as the Great Migration, which may have caused underestimation of comparison in the prevalence and incidence of hypertension among Medicaid recipients in 2015; however, significant racial differences in the "occurrence" of hypertension still existed among them.

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INTRODUCTION

Background and Need

Hypertension, or high blood pressure as it's commonly referred to, is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease. According to the Centers for Disease Control (CDC), about 75 million American adults, or 1 of every 3 adults have hypertension, and over half (54%) of people with hypertension have their condition under control (www.cdc.gov).

In general, populations with a lower socioeconomic status experience higher rates of heart disease, cancer, injury-related deaths, diabetes, and depression than do populations above the federal poverty line. Those populations with lower socioeconomic status frequently include minority populations which are also characterized by lower rates of personal income, educational attainment, health insurance coverage, access to emergency and specialty care services, and reported health status of adults that are urban communities (Institute of Medicine, 2005).

"My people perish for lack of knowledge" - Hosea 4:6 (New King James Version, 1982). The same can be said today about minorities in America with regard to their health. Most minority communities lack the readiness, resources, and technical expertise necessary to develop successful and sustainable educational and community-based health programs (Gamm, Castillo, & Williams, n.d., p. 1).

Most African American communities have a distinct culture that can directly affect the likelihood of medical diagnosis (and by extension, medical claims) being in their healthcare facilities. Hearth disease, COPD, lung cancer, stroke, and diabetes are among the chief contributors to high mortality rates among African American populations, but why are these diseases not diagnosed sooner or at the same rate as white citizens (Singh & Saihpush, 2013, p. 288)? In addition to cultural aspects of African American communities, the social determinants of health care and health status are proving to have an equally significant effect on diagnosis of hypertension among blacks.

In 1997, Sung et. al published a study whose purpose was to determine whether there were racial differences in hypertension for people with low economic status. His study discovered that African Americans (females in particular) were more likely than African American males, or whites of either sex to have hypertension diagnosis.

In 2010, the 111th Congress enacted, and President Barack Obama signed into law the Patient Protection and Affordable Care Act (ACA), or “Obamacare”. Together with the Health Care and Education Reconciliation Act of 2010 amendment, it represented the U.S. healthcare system's most significant regulatory overhaul and expansion of coverage since the passage of Medicare and Medicaid in 1965.

The ACA's major provisions came into force in 2014. By 2016, the uninsured share of the population had roughly halved, with estimates ranging from 20–24 million additional people covered during 2016. The increased coverage was due, roughly equally, to an expansion of Medicaid eligibility and to major changes to individual insurance markets.

This significant overhaul has the potential to reverse the health disparities discovered in the Sung study and needs to be examined, establishing the need for this doctoral undertaking.

Problem Statement

Hypertension costs the nation $46 billion each year. This total includes the cost of health care services, medications to treat hypertension, and missed days of work (www.cdc.gov). **The specific purpose of this study is to determine whether or not the gap in hypertension between African Americans whites has changed since 1991**. Although hypertension can affect anyone, studies have shown it to disproportionately affect African Americans, especially those people in poverty, including urban, as well as rural Americans, **this is the problem under consideration**. as there is a common misconception in the United States of America that rural poverty is associated with whites and that urban poverty is associated with Blacks. Unfortunately, the corresponding healthcare implication is that poor healthcare access and limited economic resources are defined by the geographical and racial associations therein. Although the introduction and literature review chapters of this study make mention of hypertension disparities in a rural context, the actual research conducted in this study is limited to age, gender and race (black/white) stratifications.

In 2004, a study conducted by Mainous III et. al showed that rural African Americans were owners of hypertension at a disproportionate rate of 23%, when compared to 11% of rural whites, 13% of urban whites, and 20% of urban African Americans (Mainous, 2004).

The study also noted that, when controlling for relevant variables, including body mass index, health status, access to care, education, income, and insurance, compared with rural African Americans, rural and urban whites were significantly more likely to have better glycemic control and diastolic blood pressure control when compared with rural African Americans, drawing the conclusion in that nationally representative sample, that rural African Americans are at increased risk for a lack of control of hypertension (Mainous, 2004).

Rural African Americans are more than twice as likely to be living in poverty than whites and more likely than any other ethnic group. According to Barbara Wolfe and the University of Wisconsin-Madison Institute for Research on Poverty, there is substantial link between poor neighborhoods and less than adequate healthcare resources (Wolfe, 2011). In order to begin meaningful dialogue about how to improve the health status of poor communities, or any community, it is of vital importance to understand the misconceptions and realities associated with the regional and racial associations of that community. These introductory comments seek to create an understanding within the reader of the relationship between geographic location, ethnicity, availability of health care, and differences in health outcomes based on geography, race and access.

In order for this to happen, it is imperative that a clear picture of health care must be drawn from a domestic and international perspective. The implications of racial, geographic and socioeconomic health care disparities underline the need for improvement in the systematic approach and highlights the very real decision that many groups of people, African Americans in particular, may face in their lifetime: leave home and gain access to adequate healthcare or stay in their community and suffer the consequences.

Health disparities are defined, for the purpose of this study, as the differences in health statistics for one group as it relates to the rest of the general population (Hartley, 2004); in this study, hypertension within the African American population in the United

States is being compared to that of whites in the same demographic to determine whether or not the gap discovered by Sung et. al has changed. The specific indicators that will determine the disparities in the contrasting population groups will be the number of reported cases of hypertension by gender and race. Disparities in health outcomes among racial populations have long been a recognized public health problem (Williams, Lavizzo-Mourey, & Warren, 1994).

Although the primary purpose of this study is to determine whether or not the gap in hypertension between African Americans whites has changed since 1991, the introduction and literature review portions of this work seek to illuminate the notable contributions to the understanding of the disparities between rural and urban health despite the lack of focus on rural health disparities, as well as the need for continued research on the rural health aspect of this topic. For example, a prominent study found that rural whites and rural blacks were a greater risk of death than urban whites (Probst, Bellinger, Walsemann, Hardin, & Glover, 2011). Of the many studies that examine rural health, the one consistent trend that has been noted throughout the available studies on this subject is that health outcomes in rural areas are worse than in urban areas, with the African American owning worse characteristics than every other population group.

The behavioral aspect and associated disparities will be analyzed alongside health inequities. In this study, health equity is defined as:

> “Attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities” (National Partnership for Action

to End Health Disparities, 2011).

The health equity perspective of this study will look at the social aspects of living when whites are compared to blacks in order to determine any social effects that may or may not have contributed to the health disparities. Health equity is tied to health disparities, and in order to garner a complete understanding of the African American health situation, a social and scientific analysis should be conducted. For this reason, rural versus urban health status as it relates to incidence and prevalence are reported in this study in addition to this paper's primary purpose of determining whether or not hypertension disparities between black and white Medicaid recipients has changed since 1991.

The social aspect of health disparities, particularly those in rural areas, is largely a philosophical perspective and situation that is impacted at nationwide levels and has historical significance and influence. To say that this study looks to define the social perspective of the country with regard to rural health disparities among African Americans would be much too ambitious. Instead, this paper looks to compare the current state of African Americans versus whites as it relates to hypertension claims and how it compares to hypertension claims via a similar study conducted using Medicaid claims data from 1988-1991. The social impact of African American perception is also important because it examines the context in which the disparities are allowed to exist. Should this study yield similar or worsening results as the study conducted using the aforementioned data, such examination will open up other avenues of exploration into possible solutions to healthcare problems through social change instead of just concentrating on scientific change.

Any number of factors could be the reason for these disparities however, this study aims to determine whether or not the incidence and prevalence of hypertension has changed among African Americans, when compared to whites.

With the passage of the Affordable Care Act (ACA), health reform has begun to take shape and the US health care industry has begun to value preventive care from a population health-based perspective. This paper looks to explore the considerable racial differences in the prevalence rates of hypertension when blacks are compared to whites in an effort to offer suggestions on whether or not the ACA has had a positive impact on hypertension among African Americans.

Available technology in hospitals with predominantly black residents plays a role in hypertension claim disparities as well, but the lack of up to date technology and its adverse effect on early detection is not limited to hypertension. For example, the amount of breast cancer screenings for low-income, African-American women is significantly less than other populations primarily due to a lack of providers and provider technology available in [rural] areas (Coleman, Lord, Heard, Coon, Cantrell, Mohrmann, & O'Sullivan, 2003). The lack of participation in breast screening is another indicator outside of the hypertension realm which indicates that the health of African American population is suffering at a higher rate than whites. This study looks to determine whether or not hypertension diagnosis among black has changed since 1991.

Provider Access

A substantial percentage of blacks suffer from limited access to physicians, and/or limited access to more qualified (board certified) physicians when compared to whites. Bach et. al found that in the United States, black patients generally receive lower-quality health care than white patients, and that black patients may receive their care from a subgroup of physicians whose qualifications or resources are inferior to those of the physicians who treat white patients (Bach, 2004).

As a result, a body of research has been undertaken to identify strategies to strengthen the primary care workforce in hospitals that serve predominantly black populations. Among the potential solutions are: supporting primary care departments and teaching and mentoring of trainees, increasing the number of medical residency training tracks in Historically Black Colleges and Universities (HBCU's) that have medical school programs of study (which have been shown to produce black physicians), supporting loan repayment for students entering medical practice in rural and underserved areas, and increasing primary care reimbursement for rural providers. (Doescher et al., 2009).

Diagnostic Equipment

A healthcare facility is only as good as the equipment it can access. Lack of updated and modern technology in hospitals that serve majority African American areas can limit the abilities of the best provider. A deeper study into this could examine potential hurdles to technology finding its way into healthcare facilities that are located in areas where majority blacks live and the reasons thereof. Such an examination of challenges to acquiring necessary and updated technology is relevant to providing the appropriate level of diagnostic technology that will give African-Americans a better chance to live healthier, longer lives.

Probst, et al. studied the risk of death among rural and urban blacks, whites and Hispanics finding "higher risk of death in rural blacks and whites than urbanites is related to lower incomes, education and health coverage” (2011). Although this article brilliantly sheds a light on the lack of focus on the actual tools being used to assess patients is telling in the study, lack of health coverage can be attributed to the rural primary care shortage the nation currently experiences, yet it does not explain the reason why African Americans are not being diagnosed sooner, and with greater frequency so that they can get treatment faster and experience an overall lower mortality rate through controlling hypertension.

Communities that offer programs to its residents that address cultural barriers to health and disease education and prevention are better prepared to experience higher rates of health and wellbeing. However, there is a noticeable lack of programs that address technological shortcomings in healthcare programs. Long term health and quality of life are the result of various community systems and characteristics working together, not just medical coverage and a competent local medical response service; a key component to the success of those systems is the availability of competent physicians, current equipment, and hardware being available in those healthcare facilities. These systems maximize the impact by combining school, worksite, health facility and community-based health education, promotion and prevention programs with cutting edge technology and training.

Defining Urban and Rural

Although the primary focus of this study will not yield data regarding rural health disparities, it is important to note that according to the U.S. Census Bureau, 55% of African Americans live in rural areas in the United States (U.S. Census, 2010). The Census Bureau's urban-rural classification is a fundamental delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. For the 2010 Census, an urban area comprises a densely-settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core.

An urban area is defined as the encompassing at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas: Urbanized Areas (UAs) of 50,000 or more people; Urban Clusters (UCs) of at least 2,500 and less than 50,000 people. "Rural" encompasses all population, housing, and territory not included within an urban area (The Federal Register, 2011, p. 1).

According to the 2010 US Census, the U.S. Population was estimated at 309 million people (http://factfinder.census.gov), and approximately 60 million people lived in rural areas (19% of the population), while 250 million people lived in urban areas (81%) (http://factfinder.census.gov). Of the 60 million rural residents, 8.2 percent, or 4.9 million were African American. Although the limitations of this study prevent it from segregating and studying hypertension incidence and prevalence from a rural versus urban perspective, 8.2 percent of the rural population account for more than half the population of blacks in this country, a significant amount of people, and could be studied in more detail in a subsequent effort.

Education

Educational opportunities have been a key indicator of resources and advancement in American society for very long time; the opportunities for additional studies of citizens indicates a potential for advancement in industry, culture, or higher education (Bailyn, 1972). It is not necessary to argue the necessities of educational advancement in all areas of the United States, geographically and culturally. However, it is necessary to realize the shortcomings of the educational system as it relates to the healthcare disparities faced by African Americans. African Americans in non-rural areas have a distinct advantage in the area of educational opportunity compared to that of the rural African American. Urban areas have long been centers of educational importance to drive the industries that sustain large cities, yet from and industrial perspective, many rural areas lack increasingly advance educational institutions. This difference between educational opportunities in urban and rural areas will be explored so as to determine the effects on the health education and its corresponding opportunities, such as training programs and schools, and the effects on healthcare facilities.

The definitions of urban and rural have wide ranging implications due to the comparison of urban and rural populations in socioeconomic scenarios and data sets. The poverty and health disparities in the urban population have been noted, but the educational opportunities for African Americans may play an extremely large role in the continuing health disparities noted. The educational opportunities suffer in many of the same ways that the healthcare opportunities suffer. African Americans trail whites in high school and undergraduate level education attainment and often find themselves at a disadvantage regarding educational resources available to them (James, 2014). These educational disadvantages should be examined in order provide yet another avenue of socioeconomic evidence to the characteristics that are influencing the healthcare access to African Americans.

Healthy People

U.S. Department of Health and Human Services developed Healthy People, which is a comprehensive set of 42 disease prevention and health promotion topics and subsequent overarching goals for America. The goals are to attain high-quality, longer lives free of preventable disease, disability, injury, and premature death; to achieve health equity, eliminate disparities, and improve the health of all groups; to create social and physical environments that promote good health for all; and to promote quality of life, healthy development, and healthy behaviors across all life stages (Healthy People, n.d.). The most relevant goal to this research is the second goal of achieving health equity, eliminating disparities, and improving the health of all groups as it relates to the identification and eradication of preventable diseases in the first place.

When a health result differs between two groups of people, a disparity is present. Race, sex, age, disability, socioeconomic status, and geographic location all contribute to our ability to achieve good health however, for the purpose of this research, it is important to illuminate the impact that social determinants and socioeconomic status have on health outcomes of specific people, particularly African Americans. These disparities extend not only into mortality rates, but also prevalence of certain diseases, such as hypertension. It is a goal of this study is to illuminate the growing or shrinking disparities in timing and approaches to hypertension claims among African Americans, when compared to a study by Sung et. al published in 1997.

Healthy People 2020 defines a health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage (Healthy People, n.d.). Health disparities that adversely affect groups of people who have systematically experienced greater social or economic obstacles to health or health care based on their racial or ethnic group, religion, socioeconomic status, gender, mental health, cognitive, sensory, or physical disability, sexual orientation, geographic location, or other characteristics have been historically linked to discrimination or exclusion (U.S. Department of Health and Human Services, 2008, p. 28).

Diagnosis of health is a foundational health measure relevant to this research because it asks two fundamentally important questions related to this research: 1. Why do some people have preventable diseases identified while others do not? 2. How can healthcare executives and health policy professionals foster a social mission where everyone has the same chance to live a long, healthy life? Determinants of health include the personal, social, economic, and environmental factors that influence health status. Healthy People 2020 list six categories with regard to determinants of health: policymaking, social factors, health services, individual behavior, and biology and genetics. (Healthy People, n.d.). Throughout this study, health status factors will be considered along side personal health status factors when determining the influence on prevalence and incidence of hypertension in blacks when compared to 1991.

Study Overview

As previously stated in the introduction, this study is motivated by the apparent disconnect between the poor health, diagnosis of hypertension and morbidity rates of

African Americans and the health and mortality rates of whites. There are, most likely, several factors that play into the disparity between the two study groups; this study looks at whether or not the disparity has changed since 1991. This study will look at the claim rates of Medicaid recipients in 12 states from 2015 to determine whether or not the prevalence of hypertension claims among black men has decreased when compared to an identical study performed in 1991.

Research Question: Have claim rates of hypertension among African American Medicaid recipients changed since 1991?

Hypothesis: Hypertension claims have not changed since 1991, particulary among African Americans, who suffer from the disease at a higher rate than whites, as previously discovered in research using data from 1991.

Summary

The following chapters will cover a variety of topics deemed relevant to this study. The comparative study, published in 1997 asks the question of whether or not there is a difference in hypertensive claim rates among Medicaid recipients, and will be reviewed, discussed and compared to the current study in subsequent chapters. Current literature concerning the topic of health disparities among African Americans, as well as African Americans in rural areas, methods of research, study results, and discussion on the implications of the results will all be covered in later chapters.

Chapter two will dive into the current available literature on this topic from a global, domestic and rural perspective in order to determine any preconceived notions or existing trends in academia as they may relate to differences in medical care, disease detection and treatment, and more specifically, hypertension claim rates.

Chapter 3 will then give a detailed description of the methods of research used in this study, both analytic methods and reasoning methods, into order to provide a logical and well-rounded defense for why such methods were used.

Chapter 4 will report the results of the statistical techniques that were applied to the data. Chapter 5 will discuss the results from chapter 4 in the context of the problem statement, and state major conclusions derived from this research that can help reduce the difference in hypertension between blacks and whites in America.

REVIEW OF THE LITERATURE

Global Health Disparities

To being a health disparity study, the sample area must first be understood. Although this study will examine hypertension disparities between blacks and whites in the United States of America, it is important to provide context from a global perspective. According to the World Health Organization (WHO), Fifty-four percent of the world's population lived in urban areas in 2015, and the percentage of the world's population living in urban areas is projected to increase from 54% in 2015 to 60% in 2030 and to 66% by 2050 (WHO, 2016). This is particularly significant when considering that until the start of the 20th century only one in 10 people lived in urban areas (WHO, 2016). In absolute terms, more than 1 billion people were added to urban areas between 2000 and 2014.

According to Pauly et al., inequities in access to healthcare interact with inequities in access to social resources (such as housing, education, social assistance), and with institutionalized oppression to produce inequities in health outcomes (Pauly, MacKinnon, & Varcoe, 2009). Social resources are tangible and their benefits can be easily identified however, similar to African Americans in the United States, institutionalized oppression is much harder to measure due to its systematic mistreatment of a particular people based on their social identity group.

Institutional resource management and shortcomings can often stem from institutional oppression, which occurs when established laws, customs, and practice systematically reflect and produce inequities based on one's membership in targeted social identity groups (Portland Community College, n.d.). If, over time, the results of oppressive behavior translate into institutional laws, customs, and/or practices, then the institution is oppressive whether or not the individuals maintaining those practices have oppressive intentions. Institutional oppression creates a system of invisible barriers limiting people based on their membership in unfavored social identity groups. The barriers are only invisible to those seemingly unaffected by it. The practice of institutionalized oppression is based on the belief in inherent superiority or inferiority. It is fed by stereotypes, and prejudice. Minorities and the health care they receive (or do not receive) are not immune to this form of oppression.

The United Nations estimates that more than 90% of future urban population growth will be in low and middle-income countries (WHO, 2016). Although this study does not seek to define hypertension disparities among African Americans by rural and urban, it is worth noting that from a global perspective, a significant amount of people who reside in areas considered rural or remote face access challenges, and poorer health outcomes.

North America

In Canada, 95% of the land mass is considered rural, remote, and northern with fewer than 150 people per square kilometer with 30% (9 million people) living in rural, remote, and northern areas (MacKinnon & Moffitt, 2014). Rural health researchers in Canada commonly define the rural and small town communities as people living in communities of fewer than 10,000 and outside a 1-hour commuting zone of cities (Kulig, 2010). Health inequities in Canada are geographically distributed with people living in rural and remote communities experiencing a disproportionate burden of risk and disease (Fortier, 2012). This mistreatment is often supported and enforced by the mainstream society and its institutions, and is solely based on the person's membership in their social identity group. As such, social resources and their causes can blend over into institutional resource inadequacies due to the often blurred lines of healthcare systems and social groups that occurs in disadvantaged communities.

If we examine literature regarding health disparities from a global perspective, the government of Canada is among the chief offenders. Almost the entire population of Canada's three northern territories is made up of First Nation's People, or Native American Indians (MacKinnon & Moffitt, 2014). However, in Canada publicly funded health services are frequently allotted on the basis of population distribution that further disadvantages First Nation's People who are seen (in the United States at least) as second class citizens (MacKinnon & Moffitt, 2014). It is reasonable to assume that urban areas of Canada are populated with individuals with higher socioeconomic status and therefore, better access to healthcare through higher paying jobs with health insurance so it would seem as though publicly funded health services would do more good in areas where disadvantaged Canadians First Nation's People reside.

Sadly, this is not the case. As a result, 90% of the registered nurse workforce provides care for people living in cities and surrounding areas with the remainder of nurses working in rural, remote and northern communities where First Nation's People live (MacKinnon & Moffitt, 2014). Many remote and northern communities lack hospitals, so proportionately more nurses work in community settings, which include community health centers, home care agencies, nursing stations, and public health units

(Misner et al., 2008). As the lack of resources conditions an area, it becomes used to operating on less than adequate manpower, further exasperating the difference in healthcare delivery.

Bronchitis

Chronic bronchitis is a disease that affects some Canadians at a disproportionate rate than other Canadians. Chronic bronchitis is a chronic pulmonary disease, characterized by excess mucus in bronchioles that reduces oxygen absorption (www.lung.org). In Canada, Saskatchewan is a largely farming province with a greater proportion of rural population (35%) than Canada as a whole (20%) (www.publichealth.gc.ca). Pahwa et al. studied the prevalence of chronic bronchitis among farmers and non farmers in Saskatchewan, using contextual factors such as socioeconomic factors, the designation of residence in a rural dwelling or in town, indoor environment, number of others living in the home and whether or not fuel is used to heat the residence (Pahwa et al., 2012). His research found that such conditions raise exposure and vulnerability to chronic bronchitis, which is exacerbated by the lack of manpower and resources in healthcare.

Individual factors such as family history of respiratory problems, obesity and physical activity, environmental and occupational exposure, and educational attainment were used to further reveal conditions present that cause this group of people to be desperate owners of chronic bronchitis (Pahwa et al., 2012). The individual factor of educational attainment is one of the most relevant factors of this study because of its socioeconomic connection to lower health outcomes for this population.

The study found that 13.9% of respondents in the lowest socioeconomic range reported a chronic bronchitis diagnosis, compared with 5% of those in the highest socioeconomic range, and 6.3% of respondents who reported a chronic bronchitis diagnosis had a high school diploma or less education compared with 5.2% of respondents who had higher than a 12th grade education. (Pahwa et al., 2012). The Pahwa et al. study used contextual and individual factors to address the respiratory health status and the determinants of respiratory health in farmers based on educational attainment.

Most rural communities and their minority residents differ from a larger population center in that health services are accessed in only a few locations. Due to this reduced access, health care providers in rural areas must function in an expanded capacity, assuming additional diagnostic, emergency stabilization, and treatment responsibilities (Johnson, Tarlier, & Whyte, 2003). Rural populations are disadvantaged, as are their inhabitants, particularly African Americans in the United States when it comes to access to health care.

Nurses working in areas where the population is concentrated with African American residents must have a detailed knowledge of local geography, cultural barriers, and must rely on their instincts to properly address the health needs of those people living in their communities through their insights, understandings, and interpretations. Chinn and Kramer argue that this is accomplished through “emancipatory nursing praxis” which is described as the “simultaneous reflection and action toward transforming the world” (Chinn & Kramer, 2011). Nurses in remote and northern Canadian areas also feel that their actions are more visible, obscuring the boundaries between their personal and private lives (MacKinnon & Moffitt, 2014). Thus, nurses and technicians in rural and underserved environments are more susceptible to social biases as well as economic biases.

Nursing work in remote and northern Canadian requires contextual knowledge about their communities and the people they treat; some are neighbors and, sometimes, friends (MacKinnon & Moffitt, 2014). Knowing their community means that nurses must use this local knowledge to advocate for the appropriate response from a particular care provider or for needed health programs or services (MacKinnon & Moffitt, 2014). Without the emotional stamina and situational knowledge needed to advocate, minorities can suffer greatly in a short period of time. This response is known as “informed advocacy” and is done through a framework that (1) ensures the people’s concerns are heard (by listening with intention and responding with action), (2) contextualizing practices (by making visible or using information about the contexts of people’s lives to inform health care decision making), (3) safeguarding (by ensuring that people remained safe), and (4) addressing systematic health inequities by mobilizing local resources and by providing leadership that the health system or health policy level (MacKinnon & Moffitt, 2014).

MacKinnon et al. writes about a Community Health Nurse working in a remote nursing station cared for a 12-year-old boy with a small cut on his hand that could have easily been attended to at home. The boy stated that he cut his hand while filleting a fish, but as the nurse tended to his wound, a different story emerged. The boy did not attend school that day because he needed to get food for his 3 younger siblings (all under 5 years of age). Both his parents were unemployed and frequently gambled in an attempt to earn money for their family. According to him, his parents left the home 2 to 3 nights a week to play cards, returning inebriated and passing out. He explained to the nurse that this was the real reason he came to see the nurse.

The nurse lived in the community for many years and knew the boy and his family. She used informed advocacy framework to ensure his concerns were heard by listening to his entire story, including the part that seemingly had nothing to do with his injury, contextualized practices by using what she knew about his family to help make a decision regarding his health care, safeguarding by treading lightly and with sensitivity to his situation, and addressing systematic health inequities by taking action due to the realization that this situation was similar to what other children in the community went through.

MacKinnon writes about how she was told over and over again how difficult it was for nurses to develop and maintain the nursing skills needed to provide safe and supportive care for women and their families during labor and birth. She went on to say that rural nurses working in the hospital setting provided most of the care for childbearing women during labor with the physician arriving “in a timely way” for the birth (MacKinnon, 2010, p. 41). Situations like this happen frequently in rural, remote, and northern Canada, drawing a potential correlation between lack of access to safe, qualified medical care and high infant mortality, birth defects, etc among minority popultaions. It is a logical step to see how the documented problems with births, a procedure that involves a variety of diagnostic services, indicates a disparity in diagnostic services available to rural areas.

Cardiovascular disease

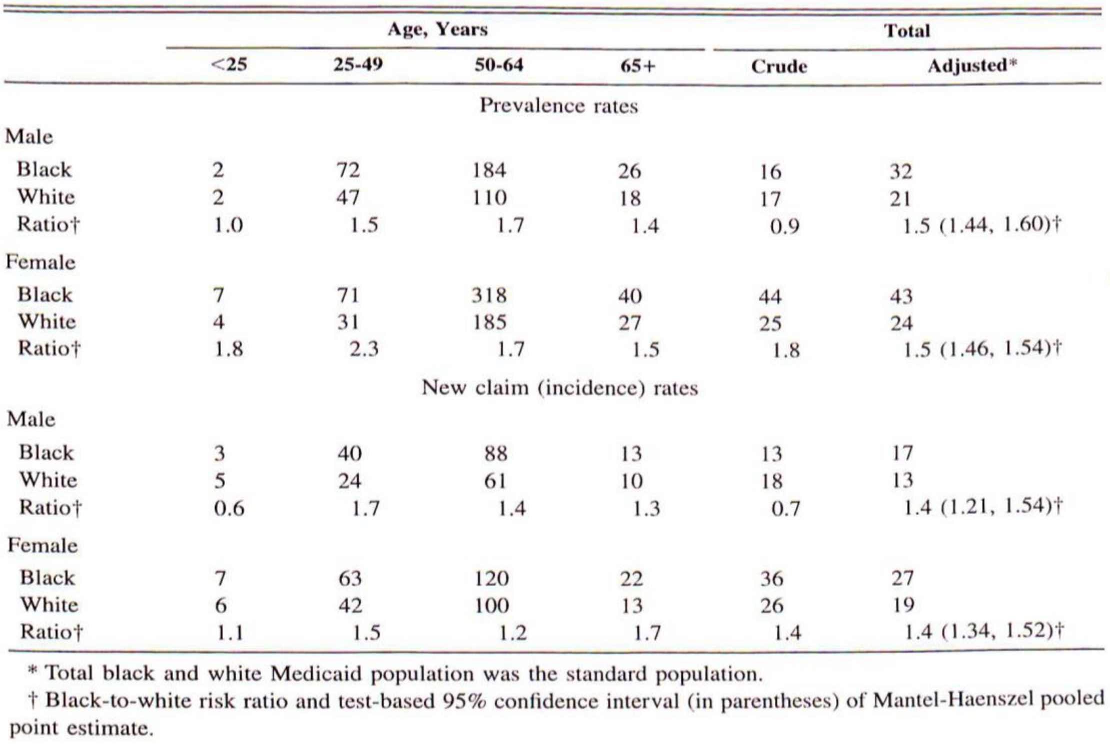
Cardiovascular disease is the leading cause of mortality worldwide, with 80% of cardiovascular disease deaths occurring in low and middle income countries (World

Health Organization [WHO], 2005). Hypertension and diabetes are both strong risk factors for cardiovascular disease morbidity and mortality. Hypertension is a major modifiable risk factor, and treating and controlling systolic and diastolic blood pressure are associated with significant reductions in the risk of cardiovascular disease (Lerner, Bernabe-Ortiz, Gilman, Smeeth, & Miranda, 2013).

The basis for this study builds on research conducted by Sung et. al where the purpose of that study was to determine whether there are racial differences in the rates of prevalence and new claims to Medicaid for hypertension treatment in a population of uniformly low economic status - i.e. 1,038,976 Georgia Medicaid recipients. The study calculated age-adjusted prevalence rates of hypertension in 1991, and the new claims rates by race and gender-specific black-to-white risk ratios. The study found that 2.9% of the total population studied had a hypertension diagnosis (new claim) in 1991, and hypertension was more prevalent in African American females than African-American males, or whites of either sex to have this diagnosis (Sung, 1997). The study also showed an age-adjusted hypertension incidence rate of 27 per 1,000 for black women, and 19 per 1,000 for white women (Table 1).

Table 1

Hypertension Prevalence and New Claim (Incidence) Rates (Per 1000) among Georgia Medicaid Recipients and Black-to-White Risk Ratio in 1991 by Gender, Race and Age (Sung, 1997).



	Age, Years				Total	
	<25	25-49	50-64	65+	Crude	Adjusted*
			Prevalence rates			
Male						
Black	2	72	184	26	16	32
White	2	47	110	18	17	21
Ratio†	1.0	1.5	1.7	1.4	0.9	1.5 (1.44, 1.60)†
Female						
Black	7	71	318	40	44	43
White	4	31	185	27	25	24
Ratio†	1.8	2.3	1.7	1.5	1.8	1.5 (1.46, 1.54)†
			New claim (incidence) rates			
Male						
Black	3	40	88	13	13	17
White	5	24	61	10	18	13
Ratio†	0.6	1.7	1.4	1.3	0.7	1.4 (1.21, 1.54)†
Female						
Black	7	63	120	22	36	27
White	6	42	100	13	26	19
Ratio†	1.1	1.5	1.2	1.7	1.4	1.4 (1.34, 1.52)†

* Total black and white Medicaid population was the standard population.

† Black-to-white risk ratio and test-based 95% confidence interval (in parentheses) of Mantel-Haenszel pooled point estimate.

Sung et. al confirmed that lower socioeconomic status among blacks in general has been associated with racial differences, not only in the prevalence of hypertension, but also in mortality from hypertension (Sung, 1997). This suggests that blacks in a lower socioeconomic status are more likely to be unaware of their hypertension diagnosis, resulting in increased mortality among that group.

South America

In Peru, a study was conducted regarding cardiovascular disease in rural, migrant and urban areas. The study found that 42.4% of the urban populations were aware of their cardiovascular disease diagnosis, compared to only 36.4% of the rural, underserved population; roughly 50 percent of the urban population that were aware of their cardiovascular disease diagnosis were receiving treatment, and 28.6% of those receiving treatment were controlling their cardiovascular disease; that amounts to 6% of the urban population who are aware of their diagnosis, receiving treatment and controlling their cardiovascular disease. By comparison, 16.7% of the rural population who were aware of their diagnosis were receiving treatment and none were controlling their cardiovascular disease (Lerner, Bernabe-Ortiz, Gilman, Smeeth, & Miranda, 2013). These results identify major unmet needs in awareness, treatment, and control of hypertension and diabetes in disadvantaged areas. This study and its abysmal numbers suggest that the issue of health disparities amongst disadvantaged individuals is not just an issue in the United States, but a global concern.

Australia

In Australia, one in four people living in disadvantaged areas suffer from cardiovascular disease compared with one in five people who live in Australian metropolitan areas (National Rural Health Alliance, n.d.). Improvements in the diagnosis and treatment of cardiovascular disease in recent years have not been equally distributed across the population. The burden of cardiovascular disease is disproportionately owned by lower socioeconomic groups, Aboriginal and Torres Strait Islander people, people from diverse cultural backgrounds, and those living in rural and remote communities (National Rural Health Alliance, n.d.). This disparity sounds similar to what blacks face in America. Australians living in rural and remote Australia experience more cardiovascular disease risk factors, higher rates of cardiovascular disease-related hospitalization and are more likely to die of cardiovascular disease than those in metropolitan areas (National Rural Health Alliance, n.d.) The further a person lives from the city, the greater risk of hospitalization and death due to cardiovascular disease (National Rural Health Alliance, n.d.). Such sentiments indicate that not only are these residents living in less than ideal circumstances, but are further removed from ideal care.

To address these concerns, Australia’s Healthy Heart community-based cardiac rehabilitation program was offered at a Community Health Service in Victory, Australia. The 8-week program, based on National Heart Foundation guidelines, consisted of exercise sessions, health education on diet, stress, smoking cessation, and behavioral change strategies. (Fletcher, Burley, Thomas, & Mitchell, 2014). Eighteen patients completed the healthy heart program, with eight participants (7 men and 1 woman) volunteering to take part in a focus group aimed to uncover common themes in barriers to cardiac rehabilitation in Australia. Evidence supports the benefits of cardiac rehabilitation for secondary prevention of coronary heart disease, although cardiac rehabilitation programs in Australia face barriers to attendance such as lack of transportation and sheer distance to cardiac rehab facilities; these barriers extend to diagnostic consistency as well as diagnostic availability (Fletcher et al., 2014). Focus group data revealed three themes that illustrated the success of the program, as well as the participants’ feeling of vulnerability when the program ended (Fletcher et al., 2014). The first theme, “recovering confidence” represents an increase in self-confidence and the need for a supportive environment (Fletcher et al., 2014). Individuals in lower socioeconomic groups are typically prone to sedentary lifestyles, which lead to a lack of fitness and low self-confidence. The second theme, “putting it into practice” centered on participants taking responsibility for making lifestyle changes and maintaining motivation (Fletcher et al., 2014). Some participants noted regular walking as the most common post-program activity while three other participants reported that pre existing back conditions had prohibited them from exercising regularly. This theme also uncovered the participants' need to receive ongoing diagnostic support in order to maintain risk factor reduction.

The final theme, "feeling abandoned" derives from the participants' feeling of difficulty in moving from a structured program to independent normal home life. The participants reported a perceived lack of support post-program, and a struggle in moving from the healthy heart program to pre existing community programs (Fletcher et al., 2014). Overall, the study showed that while the efficacy of cardiac rehabilitation is ultimately determined by long-term changes in cardiovascular risk, understanding participant perspectives on the sustainability of risk reductions is important (Fletcher et al., 2014). The participants understanding and perspective on prevention is critical to this study. By isolating the qualities of low socioeconomic populations and their perspective on diagnostic services, indications that social and educational changes can have significant impact

Africa

Rwanda is one of the poorest countries in Africa. The population is about 9.7 million and 87% live in poor, rural areas (www.ruralpovertyportal.org). In this country the ratio of health professionals to the general population was .72/1,000 in 2010, well below the World Health Organization recommendation of 2.3/1,000 (Republic of Rwanda [RoR], 2011; World Health Organization [WHO], 2006). According to the World Health Organization, there is a global shortage of 2.4 million health service providers affecting primarily low-income and underserved countries (World Health Organization [WHO], 2006).

As a result of this shortage, completely preventable "diseases of poverty" such as malaria, diarrheal diseases, many tropical diseases, and maternal and child illnesses are high in Rwanda (RoR, 2011). Since 2002, Rwanda has made impressive progress towards meeting its ambitious targets for improving the health of its people by 2020. For example, under-five mortality rates in Rwanda declined from 152 to 76 per 1,000 between 2005 and 2010; the rate of deliveries assisted by skilled staff increased from 39% to 69%; and the percentage of women between 15 and 49 years of age using modern contraceptive methods increased from 10% to 45% during the same time period (RoR, 2011). A concerted focus on poverty-stricken people played a large role, alongside population education, in improving the numbers.

In 2005, the Rwandan Ministry of Health partnered with the U.S. non-government organization Partners in Health to scale up comprehensive HIV care in the underserved poor health districts of southern Kayonza, Kirehe, and Burera. This partnership yielded five strategic priorities, including using the scaled up HIV prevention and treatment program as the foundation for the development of a comprehensive health system in rural Rwanda, and the prioritization of formal education and in-service training of Rwandan health professionals to establish long-term sustainability; the crux of training for in-service professionals centered on technician training in medicine and technology (Cancedda et al., 2014).

In support of the latter priority, Harvard Medical School and Harvard Medical School-affiliated academic medical centers have supported local trainers in the development and implementation of standardized clinical guidelines tailored to address Rwanda’s epidemiology and to achieve the health system’s goal of closing the equity gap in health service delivery between people who earn higher and lower incomes (Cancedda et al., 2014).

In Africa, countries with a strong economy are subject to the same health disparities regarding CSOM. Nigeria has one of the largest populations of youth in the world and is the world’s 20th largest economy as of 2015 (overtaking South Africa in 2014) and is set to become among one of the biggest economies in the world ("Africa’s largest economy," 2014; ("Youth of Nigeria," n.d.). However, a study of 696 rural and 270 urban school children in Nigeria showed a prevalence of CSOM in 6% of rural, poor children versus none in urban children (Ologe & Nwawolo, 2003). Indications showed that a large influence on this disparity was due to lack of education, and lack of access to health care.

Asia

In developed countries, children have a high prevalence of otitis media with effusion (OME) and severe otitis media with recurrent perforation of the tympanic membrane leading to chronic suppurative otitis media (CSOM) (World Health Organization [WHO], 2004). CSOM is defined as a chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharges or otorrhoea through a tympanic perforation (WHO, 2004). CSOM is a common problem affecting especially the lower socioeconomic group of people (Anggraeni et al., 2014). High prevalence of CSOM has been attributed to overcrowding, inadequate housing, poor nutrition and inadequate or unavailable health care (Bluestone, 1998), the same factors that affect blacks in the USA who are disproportionate owners of hypertension.

In Southeast Asia, hearing impairment because of CSOM is a major form of disability which causes significant social, educational and vocational burdens (Anggraeni et al., 2014). A multi-center study was conducted on children in Indonesia in order to determine areas with high prevalence of CSOM and a population-based estimate of childhood CSOM and hearing impairment for Indonesia. (Anggraeni et al., 2014). These studies found that children in underserved populations were desparate owners of CSOM when compared to Indonesian children with a higher socioeconomic status

Indonesia is a tropical archipelago along the equator with roughly 13,000 islands. The study was conducted at 6 sites on all the major islands of the archipelago, on elementary and secondary school students between the ages of 6 and 15. The study was conducted six days per week, following each child during a 3-day involvement. (Anggraeni et al., 2014). Consent, registration and questionnaires were filled out on day one, ENT surgeons examined the children on day two, and diagnostic audiometry and tympanometry was performed on day three for children with a history of hearing impairment, and who did not pass the audiology screening test, or had any otoscopic abnormality (Anggraeni et al., 2014). A total of 7,005 school children were examined from the six sites on five different Indonesian islands.

Of these, 3,563 (50.86%) were from urban areas and 3,443 (49.14%) lived in rural, disadvantaged areas. Each site had similar numbers of children examined in both areas, with 37.4% of the children in the 6-9 year age group, and 29.7% in the 13-15 year age group (Anggraeni et al., 2014). The study found that a history of ear discharge in the past was higher in areas with a lower socioeconomic status when compared with urban areas, and otoscopic examinations with findings of tympanic membrane perforation were found in 95 children with the majority of findings in rural areas (Anggraeni et al., 2014). Of the 116 children diagnosed with CSOM, 77% were in underserved areas. The prevalence of CSOM in underserved areas was higher than in urban areas (2.7% and .7%, respectively) (Anggraeni et al., 2014). This is due in part to the fact that otoscopic diagnosis are unavailable in health centers in Indonesia that serve primarily poor Indonesians and health practitioners rarely consider acute otitis media in the diagnosis. (Anggraeni et al., 2014).

Laos, is a landlocked nation bordered by China, Vietnam, Thailand, Cambodia, and Myanmar. Lao People's Democratic Republic is a Least Developed Country at the crossroads of a dynamic and fast developing region with 80% of its population living in rural areas, but less than 25% of physicians working in the area (UNICEF, n.d.)(Keuffel, Jaskiewicz, Paphassarang, & Tulenko, 2013). Of the 80% who live in rural areas, only 29% have access to clean drinking water, compared with 72% of the 20% living in urban areas, and 19% of urban residents have access to sanitary disposal, compared to 65% of their urban counterparts. (UNICEF, n.d.). This is in part due to difficult terrain that hampers development of infrastructure. As a result, access to health, education, water and sanitation remains inadequate and child mortality rates remain among the highest in the region with the majority of deaths caused by malaria, acute respiratory infections and diarrhea. The maternal mortality rate is one of the highest in the region, due to the absence of adequate pre-natal, delivery, and post-natal care (UNICEF, n.d.). Such statistics contribute to the lack of healthcare providers that are willing to enter the area to bring diagnostic services.

Over the past decade, policy-makers, ministers of health, donors, multilateral institutions such as UNICEF, and nongovernmental organization have recognized the importance of health workers as a critical input central to improving health outcomes. (UNICEF, n.d.). Keuffel et al. writes about multiple dimensions to this issue, including the insufficient number of health workers in parts of Africa and Asia according to need-based and economic demand based calculations, the uncertainty of the appropriate ratio of health worker cadres needed to optimize health outcomes within the budget constraints of developing countries, and the geographic skew of health workforce distribution (Keuffel, Jaskiewicz, Paphassarang, & Tulenko, 2013).The geographic characteristics of health facilities play a large and impactful role in the availability of diagnostic services and technology.

Harvard Medical School has gone so far as to offer a Global Health Delivery course for health professionals; the course is a week long and it addresses the effects of politics, health system governance, economic constraints, and other social factors on health education in low-income countries (Cancedda et al., 2014). Educational programs like the one mentioned above are critical to installing a framework that can serve to improve the health status of underserved and minority populations.

Domestic African-American Health Disparities

In 1900, the life expectancy at birth in the United States was 47.6 years for whites and 33.0 years for non-whites, who were mainly blacks. By 1990, the comparable numbers were 76.1 years for whites and 69.1 years for blacks (Williams, Lavizzo-Mourey, & Warren, 1994). Thus during the 20th century, substantial progress has been made in improving the health status of both blacks and whites, but blacks continue to bear a higher burden of death, disease, and disability. The report of the Secretary's Task Force on Black and Minority Health documented that racial and ethnic populations other than blacks also experience poor health status compared with the white population.

Most areas with majority black populations lack the resources necessary to understand what conditions and behaviors contribute to high mortality rates among them. Low access to care, low income, low levels of health insurance per capita, low education, and cultural effects of health care delivery are among the chief contributors to high mortality.

Cardiovascular disease is the leading cause of death in the United States and almost one in every four deaths can be attributed to the disease (www.cdc.gov, n.d.). More than 15 million persons in the US have chest pain caused by coronary heart disease; symptom that could be properly diagnosed by competent workers and healthcare facilities (O'Connor & Wellenius, 2012).

People in the lowest socioeconomic status, as measured by income, education and occupation are three times more likely to have cardiovascular disease than people in the highest income category, and less likely to have cardiovascular diagnostic visits at regularly scheduled intervals (O'Connor & Wellenius, 2012). CNN Money© did a study on the black-white economic divide where they found that Blacks and still typically earn far less than whites (median household income was $35,400 for blacks, $60,250 for whites,)(CNN, 2015), in part because whites dominate higher-paying fields, such as technology and finance. The income gap has held fairly steady for the past 40 years. This same study also found that the median household wealth for whites was twelve times more than that of blacks, whites owned homes at a rate 30% greater than blacks, the unemployment rate for whites was less than half the unemployment rate of blacks, and the poverty rate for blacks was more than 2.5 times greater than the poverty rate for whites (CNN, 2015). where children are concerned, just under 11% of white children were in poverty in 2013, but 38% of black children are poor (CNN, 2015). The impact of poverty on health in general, and cardiovascular health in particular is so profound that recent data support adding socio-economic status to cardiovascular disease risk assessment to reduce treatment disparities (Fiscella, Tancredi, & Franks, 2009).

However, very little data is available that compares urban-rural differences in the prevalence of cardiovascular disease diagnostic services. O'Connor et al. performed a study on rural-urban disparities in the prevalence of coronary heart disease; the study was performed using data available from the Centers for Disease Control (O'Connor & Wellenius, 2012). A cross-sectional telephone survey was used to ask respondents whether or not a doctor, nurse or other health professional ever told them they had angina or coronary hearth disease. Respondents were also asked to provide annual household income, age, ethnicity, gender height and weight. Any unanswered questions resulted in an omission of that respondent from the statistical analysis (O'Connor & Wellenius, 2012). The study showed that 4% of urban respondents reported coronary heart disease, compared to 5.5% of rural respondents, even after controlling for a range of well-established risk factors. Of the respondents, 14.9% of urban blacks were diagnosed with coronary heart disease compared to 6.3% rural blacks (O'Connor & Wellenius, 2012).

These results are consistent with existing literature indicating that blacks are less likely to be diagnosed with coronary heart disease than whites, although blacks are more likely to die from the disease than whites (www.minorityhealth.hhs.gov, n.d.). The study also addressed the question of whether the effect of income differed between rural and urban areas, and it was found that the associations between income and prevalence of coronary heart disease were more pronounced in rural areas compared with urban area (O'Connor & Wellenius, 2012). These results are a clear indication that people living in rural areas (where the majority of blacks in the United States reside) are less likely to be diagnosed with coronary heart disease than people living in urban areas, even after controlling for risk factors included in the study by O'Connor et al., who state that the economic and societal burden of the increased prevalence of coronary heart disease in rural locations is significant due to the actual treatment costs as well as the increased rate of complications and mortality among persons of lower socio-economic status. (O'Connor & Wellenius, 2012).

The Framingham Risk Score (FRS) is a gender specific algorithm used to estimate the 10-year cardiovascular risk of an individual. Framingham Risk Scoring is based on patient age, sex, smoking, blood pressure, and total and high-density cholesterol. (Fiscella et al., 2009). Low socio-economic status is associated with higher risk for cardiovascular disease however, it is not included in cardiovascular disease risk assessments such as Framingham Risk Scoring. The impact of poverty on cardiovascular health is so profound that data supports adding socio-economic status to coronary heart disease risk assessment to reduce treatment and diagnostic disparities (Fiscella, Tancredi, & Franks, 2009). Socio-economic status is often a clear indicator of healthcare availability and education. Data examined from the Atherosclerosis Risk in the Community Study and validated using mortality outcome data in the Third National Health and Nutritional Examination Survey showed that those in lower socio-economic groups exhibited higher risk of cardiovascular disease than those in higher socio-economic groups (Fiscella et al., 2009).

In the Atherosclerosis Risk in the Community Study, mortality among lower socioeconomic status persons were roughly double those of higher socio-economic status persons. In 2012, 29.1 million people, or 9.3% of the US population had diabetes up from nearly 21 million people in 2010, which was more than three times the number of people diagnosed in 1980 (www.cdc.gov/diabetes). Patients with diabetes account for more than 27 million annual outpatient office visits in the USA, and more than 68,000 people die annually from diabetes-related complications (www.cdc.gov). It is the seventh leading cause of death in the US and contributes to high rates of morbidity including renal failure, and complications leading to the development of cardiovascular disease (O'Connor & Wellenius, 2012). Of the 9.3 percent of the US population living with diabetes, a higher proportion of rural (where the majority of blacks in the U.S. reside) than urban persons reported diabetes (9.0 vs. 7.7%)(Hale, Bennett, & Probst, 2010). Obesity, advanced age and ethnicity, particularly being black, are reported to be well-established risk factors for the development of diabetes with rural blacks being disparate owners of diabetes at the highest rate of diagnosis (13.4% compared to 8.7% for rural whites and 6.8% for rural Hispanics)(Hale et al., 2010, see table 1).

These statistics indicate that people living in rural, underserved and socioeconomically challenged environments in the US are more likely to be afflicted with diabetes than people living in urban areas. The increased prevalence of diabetes in these areas causes a significant economic and societal burden because of treatment costs as well as the increased rate of complications and mortality among people of low socioeconomic status (O'Connor & Wellenius, 2012).

In addition to the increased likelihood of affliction for residents of underserved areas when compared with urban people, rural residents who suffer from diabetes have more challenges and barriers to post-hospitalization follow up care then urban residents do. Hospitalization is an indicator of inadequate diabetes control (Bennett, Probst, Vyavaharkar, & Glover, 2012). 30% of people with diabetes require more than one hospitalization per year (Jiang, Stryer, Friedman, & Andrews, 2003). Bennett et al. write about the need for coordination and the continuum of care when addressing diabetic treatment protocols. (Bennett et al., 2012). One of the main functions of primary care is to coordinate the delivery of health services between the patient and the myriad of delivery components of the system. Hence, in addition to providing basic services, primary care professionals serve as patient advisors and advocates in the coordination of an individual's total health care needs for the purpose of ensuring continuity and comprehensiveness. (Shi & Singh, 2015). Unfortunately, for the more than 33 million Americans living in non-metropolitan (rural) federally designated health professional shortage areas, barriers to access result in inadequate follow up diagnosis, discharge planning and coordination of post-hospitalization diabetes care (Shi & Singh, 2015).

Proper care transitions can improve the quality of care for patients with chronic conditions by decreasing hospitalizations, decreasing emergency department use, increasing the receipt of preventive diagnostic services, and achieving improved metabolic control. Conversely, lack of communication and information transfer between hospital-based and primary care physicians, inadequate information on discharge summaries, inadequate patient education, and patient barriers such as lack of transportation, financial constraints, lack of health insurance, and access to providers can lead to poor follow up care after hospital discharge. (Bennett et al., 2012). Rural residents with diabetes experience difficulties in obtaining needed transitional care; Medicare beneficiaries living in rural areas are in poorer health status than their urban counterparts.

Bennett et al. conducted a study using 1,411,346 Medicare beneficiaries. More than 14% had diabetes, with rural residents who were studied owning a disproportionate share of the disease (16.7% versus 13.5% of non rural residents who were studied) (Bennett et al., 2012, Table 1). Various demographics were considered, including race, sex and age. Rural residents, across these demographic characteristics, remained more likely to have diabetes. The prevalence of diabetes was also higher in rural areas across the ecological variables of primary care physician to population ratio, hospital availability, per capita income, and region. The study also found that Beneficiaries living in areas with proportionately few physicians were more likely to have diabetes.

Similarly, diabetes was more prevalent among beneficiaries living in a county without a hospital. Beneficiaries living in the rural south had the highest rate of diabetes compared to urban beneficiaries living in the western part of the US (18.3% and 9.3%, respectively) (Bennett et al., 2012, Table 1). Rural residents with the lowest per capita income in the county also had the highest rate of diabetes (Bennett et al., 2012, Table 1). Rural beneficiaries had the lowest percentage of follow up within 30 days of hospitalization (86.4% versus 89.2% of urban beneficiaries).

Smedley et al. wrote about how racial and ethnic minorities tend to receive a lower quality of healthcare than non-minorities, even when access-related factors, such as patients’ insurance status and income, are controlled. He theorized that the sources of these disparities are complex, are rooted in historic and contemporary inequities, and involve many participants at several levels, including health systems, their administrative and bureaucratic processes, utilization managers, healthcare professionals, and patients. These factors are precursors that have a direct correlation to the lack of equity in diagnostic services.

Prejudice is defined in psychology as an unjustified negative attitude based on a person's group membership (Dovidio et al., 1996). Schulman et al. (1999) assessed physicians' recommendations for management of chest pain after they viewed vignettes of "patients" (actors) who complained of symptoms of coronary artery disease. "Patients" varied only in race (black or white), sex, age (55 or 70 years), level of coronary risk, and the results of an exercise stress test. Schulman et al. found that physicians were less likely to recommend cardiac catheterization procedures for African Americans (odds ratio = 0.6, again that this group was 40% less likely to referred for catheterization) than for whites and men. Schwartz et al. demonstrated that significantly lower rates of referral were found only in the case of African-American women, whose rate of referral was approximately 12% less than that for white men, white women, and African-American men. There were no significant differences in rates of referral among the latter three groups, suggesting that a more accurate interpretation of the data would be that the effect of race on physician's referral patterns is modified by gender.

Schulman, Berlin, and Escarce (1999) noted that the findings of the study are consistent with the hypothesis that clinical decision-making may be influenced by physicians' conscious or subconscious perceptions on the basis of patients' race and gender, rather than on objective data. Schulman and colleagues wrote, "we doubt that the lower utilization rates observed consistently among black patients reflect an effort to provide more appropriate care to these patients" (Schulman, Berlin, and Escarce, 1999, p. 286).

Another experimental study, using first and second year medical students as subjects, assessed whether the race and gender of hypothetical patients influenced students' perceptions of presenting symptoms. Rathore et al. (2000) randomly assigned 164 medical students to view a video of either a black female or white male actor who presented with the same symptoms of angina. Students were then asked to rate the patients' health status, based on their assessment of how the patients' presenting symptoms would affect their quality of life. They were also asked to provide a diagnosis of "definite" or "probable" angina. The authors found that students were more likely to provide a diagnosis of "definite" angina for the white male patient than the black female patient, but rated the health status of the black female patient as lower than that of the white male. Thus, these subjects assessed the while male patient's cardiac symptoms to be more severe, yet perceived the black female patient's quality of life to be lower, despite objectively similar presentations from the two "patients." Minority students, however, did not rate the health status of the black female patient as significantly different than that of the white patient. When examined by students' gender, Rathore et al. found that the male students tended to rate the black female's health status as lower than the white male, while female students did not rate the two patients' heath status differently (Rathore et al., 2000).

These studies lend support to the hypothesis that physicians' diagnostic decisions are influenced by patient race.

Rural beneficiaries with less than .48 primary care providers per 1,000 residents experienced the lowest percentage of follow up within 30 days of hospitalization, compared to 90.1% of urban beneficiaries. Only 82.6% of beneficiaries in rural areas without a hospital followed up with a physician within 30 days of hospitalization compared with 89.3% of urban beneficiaries, 83.5% of rural beneficiaries in the lowest income quartile (<$21,169) compared with 95% of urban beneficiaries in the same quartile, and 85.3% of beneficiaries in the rural south compared with 88.4% of beneficiaries residing in urban areas in the south (Bennett et al., 2012, see Table 3). By contrast, rural beneficiaries in areas with >1.12 primary care providers per 1,000 residents, two or more hospitals and the highest income quartile still experience lower percentages of physician follow up within 30 days of hospitalization, suggesting that when even when controlling for all variables, rural residents have the worse access to care for diabetes follow up (Bennett et al., 2012, Table 3).

Education

The question of whether or not low education correlates to high risk of cardiovascular disease is answered in the data which states that persons with less than a high school diploma are more than fifteen times more likely to be diagnosed with cardiovascular disease (Fiscella et al., 2009). Such a study is a strong demonstration of a clear correlation between low education and cardiovascular disease. According to Lerner et. al, cardiovascular disease is the leading cause of mortality worldwide, with 80% of all cardiovascular disease deaths occurring in low and middle income countries (LMIC). This is in part due to what is described as the concept of the “rule of halves”, which suggests that approximately half of hypertension cases are detected, that half of those detected are not treated, and that half of those treated are not controlled. (Lerner et al., 2013, p. 53) Therefore, by connecting increased rates of cardiovascular disease to individuals with low education, we can correlate low education to high mortality. These "rule of halves" inherently condemns the half of the population that goes without proper diagnosis of their hypertension cases due to educational constraints. Lack of education leads to medical ignorance which can be fatal in many cases; the longer a person goes without a proper diagnosis the higher the risk of death. Historically, rural locations in the United States have relied on physicians for primary care services, and in 2005 roughly half of all rural physicians were family physicians, general internists, or general pediatricians (Fordyce, Chen, Doescher, & Hart, 2007). Even though more individuals have recently graduated medical school, fewer medical students are from rural locations or intend to practice in rural locations. (Shipman, Jones, & Erikson, 2013). Such sentiments show a disturbing trend of educated individuals leaving an already underserved educational area and practicing medicine in places other than where it is needed most desperately.

Hypertension is a long-term condition in which the blood pressure in the arteries is constantly elevated above the norm. In general, hypertension is asymptomatic, but it frequently results in a number of other medical conditions, including increased likelihood of stroke, coronary artery disease, loss of vision and kidney failure. There are numerous names for hypertension that are still in use and broken down into primary and secondary, with ninety to ninety-five percent of all cases being primary, meaning that they are due to lifestyle and genetic factors. Among the lifestyle factors that are closely associated with hypertension are excess body weight (Dorresteijn, Visseren and Spiering, 2012), alcohol and substance abuse (Briasoulis, Agarwal and Messerli, 2012), tobacco use (Virdis et al., 2010), and salt intake. The remaining cases are secondary in nature, which means that the hypertension results from certain specific, identifiable causes such as an endocrine disorder.

The reasons why hypertension is of importance in this study are twofold: first, hypertension can be controlled through lifestyle changes, the use of medication or a combination of both. African-Americans have a higher incidence of hypertension, and although this can be attributed to lifestyle choices, the reasons for this are thought to be genetic, as there is a higher incidence of hypertension in Africa among native populations, though in the case of Americans of African ancestry, other researchers have implicated a higher sensitivity to sodium and the higher prevalence of sodium in the modern American diet (Cogswell et al., 2012). While there is compelling research supporting each of these conclusions, there is also a compelling need to arrive at definitive answers to these questions, and yet, these questions do not receive nearly the attention they deserve (Brondolo et al, 2011).

In developed industrial societies, there is a range of pharmaceutical interventions that are available to manage hypertension. These interventions are generally available to people who are aware of their health status and have the means, specifically meaning that they have both the financial and logistical means of obtaining these interventions. The “results” component of this dissertation shall show that in the case of African American populations in the United States, there are multiple, significant barriers that prevent these interventions from being used; it will further be proven that irrespective of whether the researcher is considering an urban or rural milieu, these barriers are significantly more insurmountable for African-Americans due to their circumstances, and, in any case, this problem is more prevalent in black rather than white areas. Even in terms of implementing lifestyle changes, the research shows the dominant African American culture presents an obstacle that is not present in whites, because of a combination of the marginalization and subsequent attitude of self-reliance, combined with an unawareness of exactly what is available, even in that environment. Each of these points shall be considered in this discussion.

First, hypertension is quite common in the population as a whole with as many as one in three or seventy-five million adults in the United States having hypertension, though even with the many treatment options that are available, only fifty-four percent of these have the condition under management through one method or another (Centers for Disease Control, 2017). As this paper will show, the problem in this case extends beyond mere management and starts at the diagnosis of hypertension. As already mentioned, hypertension is generally asymptomatic and it is generally diagnosed as the result of a routine physical examination.

The traditional recommendation is that there be three separate sphygmomanometer readings conducted at monthly intervals to establish both the extent of the readings and their persistence, both of these criteria being necessary to establish a diagnosis of hypertension. The American Heart Association recommends at least three separate readings on at least two separate health care consultations and ambulatory blood pressure readings over a twelve to twenty-four hour period are the most accurate method of confirming the diagnosis. It is readily apparent that accurate diagnoses meeting these criteria are easiest under the circumstances when health care resources are readily available and the patient has the resources, financial and logistical, in order to obtain the diagnosis. There are exceptions to this rule when there is poor organ function, an in this case, the initial assessment of a hypertensive patent should include a rigorous medical history.

There are also twenty-four hour ambulatory blood pressure monitors and home blood pressure machines, but these are generally not available; in application, some of these are attached to a health care network that is available to those who have the benefit of health insurance. A complete screening for hypertension includes a panel of tests such as microscopic uninalysis, protein content in the urine, tests of blood urea nitrogen and creatine tests to determine the efficacy of kidney function (Fauci et al.,2008). Efficacy of endocrine function is determined through measurement of serum calcium, sodium and potassium as well as thyroid-stimulating hormone. In metabolic terms measurements are made of high-density lipoprotein, low-density lipoprotein, total cholesterol, triglycerides and fasting blood glucose as well as other tests: hemocrit, electrocardiograms and a chest radiograph (Fauci et al.,2008). These are the components of a very rigorous screening for hypertension and it is readily apparent that this level of rigor in the diagnosis is available only to those individuals with access to health care services. Further, this is available where the population is ether insured or wealthy enough to pay for this range of services, which skews its availability to individuals in low socioeconomic categories.

Even in those cases in which the diagnosis is made without this degree of rigor after the diagnosis is made, healthcare providers should seek to identify the underlying cause of the hypertension based on the known risk factors that are present in the patient's life. Primary hypertension is more common in adolescents and adults and has multiple risk factors including excess body weight and a family history of hypertension. Laboratory tests can be performed to determine whether the hypertension has led to any damage to the heart, kidneys or eyes. The importance here is that each of these sequelae are potentially chronic conditions that contribute to the burden placed on the health care system, both in terms of providing services and the costs incurred.

In adolescents and adults, hypertension is defined as either a systolic or diastolic blood pressure reading that is consistently higher than the accepted normal value of139 mm Hg systolic and 89 mmHg diastolic, though lower threshold values are used in the case of twenty-four hour ambulatory and home monitoring, which only increases the potential number of patients. Beyond just this, there are lower threshold values than those traditionally associated with hypertension, and prehypertension is the most recent designation for blood pressure in the range of 120-139 mm Hg systolic or 80-89 mm Hg diastolic. There are further designations of stages of hypertension that refine the diagnosis and are useful in the management of the condition; for example there is now a designated Stage III hypertension when systolic blood pressure exceeds 179 mm Hg or 109 mm Hg diastolic. Again, these are designations that are available only to individuals with access to health care, which generally means people in higher socioeconomic categories, and in an urban setting.

For example, socioeconomically depressed people are less likely to be able to avail themselves of a full range of such tests to diagnose hypertension; thus, the diagnosis in such demographic situations is likely to be less than absolutely rigorous and this is a theme that is encountered multiple times in the raw data. Since African-American populations are more likely to be socioeconomically depressed than white populations, it naturally follows that they are more likely to receive an inadequate diagnosis of hypertension. In the case of rural populations, there are other factors that come into play, such as the unavailability of health care in general as well as the limited number of specialists practicing there.

The rigorous medical screening described in this paper will isolate the cause of the hypertension as well as it's consequences. This is also reflected in the racial disparities for all population groups, irrespective of the age group or the urban versus rural setting shows that Although African-Americans are more likely to be diagnosed with hypertension when compared to whites, they are less likely to be screened for the disease.

METHODOLOGY

Overview of Research

Race, sex, age, disability, socioeconomic status, and geographic location are all factors that can affect the quality of an individual's healthcare. When a health result differs between two groups of people, a disparity is present. Healthy People 2020 defines a health disparity as "a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage (See www.healthypeople.gov/2020/about/foundation-health-measures/Disparities).

Health disparities adversely affect groups of people who have systematically experienced greater social or economic obstacles to health or health care based on their racial or ethnic group, religion, socioeconomic status, gender, mental health, cognitive, sensory, or physical disability, sexual orientation, geographic location, or other characteristics historically linked to discrimination or exclusion. This study will determine whether or not the difference in hypertension claim rates between African American and white Medicaid recipients has changed since 1991.

There are a number of areas where such disparities may be evident. For example, rural areas have consistency experienced shortages of family practice physicians. According to People for Quality Care (www.peopleforqualitycare.org), rural facilities have been put at a significant disadvantage when purchasing technologically sophisticated medical equipment needed to keep patients out of the hospital, when compared to urban facilities. However, even where such disparities exist, the findings would not explain the disparities between rural whites and rural African-Americans.

This study began with the research aim to determine whether or not rates of hypertension among African Americans has increased or decreased since 1991. It further hypothesized that cultural norms, combined with lack of knowledge and poor access to health care have led to the same rate of hypertension claims among African Americans, and at a higher rate than whites, as previously discovered in research using data from 1991.

It should also be noted that, in addition to access, accurate diagnostic testing is also an important factor due to the potential for a risk of higher severity as a result of not making a proper diagnosis in a timely manner. A delayed diagnosis poses a greater health risk to a patient because management and treatment of hypertension disease are more effective when caught early. Delayed or overlooked diagnoses raise morbidity rates as well. Thus, the research in this study is designed to determine whether or not hypertension claims among African Americans has changed since 1991. This study will focus on a diagnosis of hypertension by examining claim rates of Medicaid recipients in 12 states from 2015 to determine whether or not the prevalence of hypertension claims among African Americans has decreased when compared to an identical study performed in 1991.

According to the American Heart Association, African-Americans have the highest prevalence of high blood pressure in the world (AHA, 2016). Moreover, hypertension is worse in blacks and a leading cause of death for this group. Consequently, hypertension and subsequent cardiovascular testing is important to

African-Americans’ health.

The research question will be framed as follows: Has the difference in hypertension claim rates between African American and white Medicaid recipients changed since 1991? To answer this question, a retrospective quantitative data collection and analysis will be performed using 2015 Medicaid claim data from 12 states.

The Mantel-Haenszel method was developed in 1959 as a test used in the analysis of stratified or matched categorical data. It allows an investigator to test the association between a binary predictor or treatment and a binary outcome such as case or control status while taking into account the stratification (Agresti, 2002).

Data retrieval will be limited to Medicaid recipients in 12 states from 2015 and its data will be searched by demographic information on black and white participants from all ages. Other races or ethnic groups will be excluded in this analysis as was in the analysis from 1991 due to small population sizes.

In this study’s analysis, recipient IDs will be used to link diagnoses to individuals and to calculate hypertension claim rates according to the 9th International Code of Disease (ICD-9), and 10th International Code of Disease (ICD-10) codes 401.0, 401.1, 401.9, 110, 402.01, 402.11, 402.9, 402.0, 402.1, 402.91, and 110, 111, 111.9 respectively. These codes will be identified as hypertension prevalent cases. The analysis will be conducted by gender and race (white and African-American men and women) and age (less than 25 years, 25-49 years, 50-64 years, and 65 years and above) using overall crude rates and age-adjusted rates. The Mantel-Haenszel pooled point estimate will be used to calculate, by gender, the age-adjusted black-to-white risk ratio, summarizing the overall risk ration between groups. This study will also use the test-based 95%

confidence interval (CI) to indicate variations in ratio estimates. White male populations will be used as the standard when calculating age-adjusted rates for malignant hypertension, benign hypertension, and unspecified hypertension.

This analysis will employ the Mantel-Haenszel pooled point estimate to calculate, by gender, the age-adjusted black-to-white risk ratio, summarizing the overall risk ratio between groups. The test-based 95% confidence interval (CI) will be used to indicate variations in risk ratio estimates. This method is identical to the research method used by Sung et. al in order to minimize comparative variation between the results of the initial study, and the results this current study will yield. This analysis will also serve as an indicator of the current state of health disparities among African-Americans when compared whites. These findings could be used by researchers who want to consider the underlying factors, very possibly a mixture of complex sociocultural, psychological attitudes and practices. More importantly, they could be used by researchers who want to address how to improve cardiovascular health for African-Americans diagnosed with hypertension.

Research Design and Hypothesis: Quantitative Research Method on Retrospective Data

The research question in this study of whether or not the prevalence of hypertension claims among African Americans has changed when compared to an identical study performed in 1991 lends itself most readily to a quantitative approach. Quantitative methods allow for a broader study involving a greater number of subjects. They also tend to produce more objective and accurate results. They can provide summaries of data that support generalizations. As Kruger (2003) observed that quantitative methods allow researchers to summarize vast resources of information and facilitate comparisons across categories and over time.

The study would use retrospective Medicaid claim data maintained by the Office of Informational Services at the Center for Medicaid and Medicaid Services (CMS) at www.cms.gov/Research-Statistics-Data-and-Systems/Research-Statistics-Data-and-Systems.html

According to its website, The Center for Medicaid & Medicaid Studies “gathers and formats data to support the agency's operations. Information about Medicaid beneficiaries, Medicaid claims, Medicaid providers, clinical data, and Medicaid eligibility and claims is included.” This data is made available to the public, subject to privacy release approvals and the availability of computing resources. The record unit in the database is the individual beneficiary. The database includes what are called, “Identifiable Data Files”, which contain actual and specific information about both the patient and physician. The information on the patient includes: 1) Functional/ Health Status 2) Service Expenditure and Financing 3) Age 4) Gender 5) Demographic and sociocultural information 6) Race. Information on race is updated from SSA's Numerical Identification File (NUMIDENT). Race categories are American Indian, Alaska Native, Asian/Pacific Islander, Asian, Black, White, Hispanic, Other. Only those categorized as black and white will be used for this study comparison.

Retrospective studies collect data from existing medical records, as opposed to prospective studies which recruit subjects to participate in their designed research have obvious advantages. A prospective study would need to recruit and track patients with diagnoses of hypertension. It would not make sense to recruit subjects who had been diagnosed with hypertension and then follow the course of their treatment. This method of study design and execution would take a great deal more time. At the same time, it would not be able to collect data from as many patients, resulting in a smaller sample population. In addition, a prospective study would be more cost-prohibitive than a retrospective study.

Of course, there are disadvantages and limitations to the retrospective data collection method as well. As the researcher, I am limited to what is written in the records themselves; and there is no easy way to ask the subjects for elaboration or follow-up questions. Furthermore, there may be errors in recordkeeping on the medical records in question.

Target Population, Database and Sampling Method:

This study focuses on African-American hypertension as compared to whites, and whether or not the rate of prevalence has changed since 1991. Race would be determined from information self reported in the files. All subjects who identified as any race other than black or white would be omitted to match the focus of this comparative study. The study would then segregate findings into age categories of less than 25 years, 25 to 49 years, 50 to 64 years, and 65 years and above. One variable in hypertension and cardiovascular disease is age, so stratification is important to further research on this subject that may seek to determine risk throughout the span of a lifetime. Additionally, Sung et. al found that cardiovascular disease is most pervasive and advanced in two of the four age groups, findings that may lend themselves to generational implications that could define the degree of change in prevalence for this study. Although claim data contains information regarding Medicaid beneficiaries from its beginning to the present and is updated daily, only files from the year 2015 will be used in this study. There are two reasons behind this limitation: 1) the focus of the study is on the difference in hypertension prevalence between African-Americans and whites 2) 2013 was the first full year of the Affordable Care Act implementation; data before that time would introduce another variable of whether the level of cardiovascular testing was affected by affordability issue.

The remaining patients extracted from the Medicaid claim data would then be screened for those who had been given a diagnosis of "hypertension". The database would then be filtered by selecting the diagnostic codes for various types of hypertension. Please see the table below for the codes associated with different forms of hypertension and heart disease caused by hypertension. The chart lists the International Classification of Disease for both ICD-9 and ICD-10. ICD-10 replaced ICD-9 in October of 2015, so it will be necessary to search both given the study's time frame of records from the beginning through the end of 2015.

Table 2

ICD-9 and ICD-10 Diagnostic Codes for Hypertension and Hypertension Related Heart Disease (find-a-code)

DIAGNOSIS	**IDC-9**	**IDC-10**
Malignant Hypertension	401.0	110
Benign Hypertension	401.1	110
Hypertension, unspecified	401.9	110
Malignant Hypertension Heart Disease with Heart Failure	402.01	111.0
Benign Hypertension with Heart Disease with Heart Failure	402.11	111.0
Unspecified Hypertension Heart Disease with Heart Failure	402.9	111.0
Malignant Hypertension Heart Disease without Heart Failure	402.0	111.9
Benign Hypertension Heart Disease without Heart Failure	402.1	111.9
Unspecified Hypertension Heart Disease without Heart Failure	402.91	111.9

Using the demographic and sociocultural information on the electronic patient records, after the sample population of African-Americans and whites diagnosed with hypertension is identified in the claim data, it would then be divided into four groups: African American men, African American women, White men (the standard), and White women.

Data Collection & Analysis Procedures:

At this point, the study will create a sample population of Medicaid recipients with a diagnosis of hypertension. After obtaining this sample of subjects, the outputwould be and stratified into four age groups: under 25 years, 25-49 years, 50-64 years and over 65 years and compared to that of Sung et. al to determine whether or not the prevalence of hypertension has changed since 1991.

The data would then be further analyzed in an effort for the research to provide systematic data about the phenomena of African Americans being desperate owners of hypertension at a much higher rate than whites. It would also be further analyzed to determine if there is a difference in diagnosis when compared Sung et. al's findings that African American women were diagnosed at the highest rate when compared to African American men, white men and white women. SPSS (Statistical Package for the Social Sciences) software would be used to assist with data analysis. The data will be entered in columns, with each column set up as a separate, defined variable to generate summary descriptive statistics.

Limitations of Research Design

There are limitations to the research design used for this project. As with any stratified analysis, a major disadvantage is its inability to control simultaneously for multiple confounding variables, and as the number of strata increases, the number of people in each stratum decreases, which could create an issue with regard to sample size. There are some limitations to Medicaid Enrollment Data Base in general, as noted by the Office of Informational Services at the Center for Medicaid and Medicaid Services itself. Claim data is collected for the purpose of making healthcare payments, not for research, which could mean that the information extracted for the purpose of research is not as thorough or tailored for research as it could be.

There are also limitations in this study associated with all retrospective quantitative data collection. The study has to rely on information recorded by others. Mistakes in diagnosis and procedural coding are routinely made by medical office personnel and Medicaid billing staff. However, there is no evidence that more of these mistakes are made on one group's records than the others. Therefore, the limitation should not significantly alter the findings.

A more significant limitation in this study was that the patients cannot be accessed to get further information that might prove useful to analyzing the data. For example, it was found that rural African-Americans received less cardiovascular diagnostic testing and at a lower technological level than urban African-Americans. However, this study based on the database used cannot determine why. This disparity might be due to more racism on the part of rural practitioners than urban ones. This hypothesis could be tested with a survey instrument assessing physician racial prejudice, but the database does not identify practitioner names (nor did they agree to be part of such a study). Thus, although the research design can demonstrate that there is a disparity among cardiovascular testing of rural African-Americans with hypertension, it cannot determine the cause of such disparity. This limitation is common in descriptive-correlational quantitative research designs.

Ethical Issues

Conflict of interest assessment

The researcher had no academic, financial, or other personal interest that compromised the objectivity of the design, conducting or reporting of the research study. The researcher had no personal relationships or conflicts of interest related to the study.

Ethical issues raised by this study

There are very little privacy issues in using Medicaid claim data maintained by the Centers for Medicaid and Medicaid. All the medical records are anonymous and unknown even to the researcher, so there is no risk of participant identity being revealed. Furthermore, Medicaid's has implemented a process and application form for claim data. The files used in this study will be "Identifiable Data Files", which contain actual and specific information about both the patient and physician. These types of files require a formal request to be submitted to The Centers for Medicaid & Medicaid Services (CMS) for approval. These requests for identifiable data had to be developed and reviewed with the assistance of the Research Data Center (ResDAC). Contact was made through their website at www.resdac.org Once the data request was reviewed and approved by ResDac, it was submitted to the Center for Medicaid & Medicaid Services and access was obtained. The security measures in this application process should minimize risk of revealing any anonymous information. The procedure was designed to ensure that the research study was ethical.

STUDY RESULTS

The purpose of this study is to determine whether or not morbidity among African Americans has changed since 1991. As noted in the literature review of this research paper, Sung et al. published a study in 1997, finding that 2.9% of the total population had a hypertension diagnosis in 1991, and black women were more likely to have the disease when compared to African American males, or whites of either sex (Sung). The current study found that 1.4% of the total population had a hypertension diagnosis in 2015, and that black women are still more likely to have the disease when compared to African American males, or whites of either sex.

The current study included 2015 Medicaid claim data from 4,933,517 Medicaid recipients from 12 states, and used the same method as Sung to answer the research question. Although the current study population was nearly five times greater than the Sung population, each age group had statistically significant findings among them, and the age distribution between the two study groups was similar within 5% (See Table 2). For example, approximately 60% of the Medicaid recipients in the Sung et al. study were less than 25 years old, compared to 63% in the current study; 22% were 25-49 years old, compared to 17% in the current study; 5% were 50-64 years old, compared to 10% in the current study; and 13% were 65 and older, compared to 10% in the current study.

Table 3

Age distribution difference between foundational and current study.

	1991	2015	Diff.
Under 25	60%	63%	3%
25-49	22%	17%	-5%
50-64	5%	10%	5%
65+	13%	10%	-3%

The Sung et al. study showed an age-adjusted hypertension incidence rate of 27 per 1,000 for black women, and 19 per 1,000 for white women, compared to the current study results of 16 and 17, respectively (See Table 4).

Table 4

Age-adjusted hypertension incidence rates for black and white women.

	1991	**2015**	
Black	27	16	-11
White	19	17	-2

Sung et al. reported that hypertension was more common in patients between the ages of 25-49 and 50-64 whereas the current study group reflects hypertension more commonly affecting patients in those categories, as well as the 65+ age category (See Table 5).

Table 5

Hypertension prevalence differences by age group.

	1991	2015	Diff.
Under 25	8.8%	5.0%	-4%
25-49	43.1%	29.7%	-13%
50-64	34.2%	33.5%	-1%
65+	13.7%	31.8%	18%

Among black females however, the highest prevalence found in the current study was 76% of those 50-64 years old, compared to the Sung study, where the highest prevalence rate was 50% among black women 25-49 years old.

In the Sung study, 213 out of every 1,000 hypertensive patients were newly diagnosed cases, compared to 78 of every 1,000 hypertensive patients in the current study group. The overall proportional distribution of these incident hypertensive cases in by age was similar to that of the incident cases in the Sung study, as well as in the current study group. Among black females age 25-49, Sung reported a 50% prevalence rate compared to 36% in the current study. This is a strong indication that black females are taking better care of their health and living longer with hypertension.

Race and gender differences in claim rates

The literature review chapter of this research paper shows the age-specific and age-adjusted prevalence rates and new claim (incidence) rates of hypertension diagnosis by gender and race in the 1991 Medicaid population used in the Sung study (Table 1). The study showed that blacks were more likely than whites to have hypertension diagnosis claims, with the exception of young males. This finding differs from the current study where blacks are more likely than whites to have hypertension diagnosis claims, except for males younger than age 25 and 50-64, females age 50 and older. This means that hypertension is becoming more of a problem for whites age 50-64.

Table 6

Hypertension Prevalence and New Claim (Incidence) Rates (Per 1000) among Medicaid recipients in 12 states and Black-to-White Risk Ratio in 2015 by Gender, Race and Age

	Age, Years				
	<25	25-49	50-64	65+	Age-Adjusted
		Prevalence Rates			
Male					
Black	15	401	671	649	148
White	14	342	584	505	149
Ratio	1.1	1.2	1.1	1.3	1.0
Female					
Black	18	360	756	727	235
White	13	257	618	560	200
Ratio	1.4	1.4	1.2	1.3	0.9
		New claim (incidence) Rates			
Male					
Black	3	35	36	38	11
White	3	33	38	36	13
Ratio	1.0	0.9	1.1	0.9	0.8
Female					
Black	4	35	30	31	16
White	3	29	38	35	17
Ratio	1.3	1.2	0.8	0.9	0.9

Table 6 shows the age-specific prevalence rates and new claim (incidence) rates of hypertension diagnosis by gender and race in the 2015 Medicaid population. Black females, age 25-49 are more likely than white females to have hypertension diagnosis claims, a finding consistent with the Sung et al. study however, although black females in this age category are still disparate owners of hypertension, the comparison in table 5 demonstrates a 20% closure in the gap between black and white women in this age category.

Table 7

Hypertension Prevalence and New Claim (Incidence) Rates (Per 1000) comparison between 1991 (Sung et. al study) and 2015 (current study) with Black-to-White Risk Ratio by Gender, Race and Age and 25-year ratio percentage comparison (negative percentage indicates closing gap between Sung and current study)

	Age, Years									
	<25		25-49		50-64		65+		Age-Adjusted	
	Prevalence Rates									
	1991	2015	1991	2015	1991	2015	1991	2015	1991	2015
Male										
Black	2	15	72	401	184	671	26	649	16	148
White	2	14	47	342	110	584	18	505	17	149
Ratio	1.0	1.1	1.5	1.2	1.7	1.1	1.4	1.3	0.9	1.0
+/- Gap	7%		-23%		-31%		-11%		6%	
Female										
Black	7	18	71	360	318	756	40	727	44	235
White	4	13	31	257	185	618	27	560	25	200
Ratio	1.8	1.4	2.3	1.4	1.7	1.2	1.5	1.3	1.8	0.9
+/- Gap	-21%		-39%		-29%		-12%		-49%	
	New claim (incidence) Rates									
Male										
Black	3	3	40	35	88	36	13	38	13	11
White	5	3	24	33	61	38	10	36	18	13
Ratio	0.6	1.0	1.7	1.1	1.4	0.9	1.3	1.1	0.7	0.8
+/- Gap	67%		-36%		-34%		-19%		17%	
Female										
Black	7	4	63	35	120	30	22	31	27	16
White	6	3	42	29	100	38	13	35	19	17
Ratio	1.2	1.3	1.5	1.2	1.2	0.8	1.7	0.9	1.4	0.9
+/- Gap	14%		-20%		-34%		-48%		-32%	

Table 7 shows that when comparing both studies, the disparity in new claim rates among blacks and whites has been reduced in every age and gender category except for the youngest ages category (less than 25 years of age) where the ratio has increased for both men and women (67% and 14%, respectively). The greatest reduction in hypertension disparity was in women (-49% compared to +6% in hypertension prevalence disparity in men, and total reduction in disparity from a ratio of 1.8 in 1991 to 0.9 in 2015 compared to 0.9 to 1.0 for men). Black women age 25-49 reduced the disparity in hypertension prevalence more than any other age or gender group (39%).

With regard to incidence (new claim rates), women represented the greatest reduction in new hypertension claim disparities (-32% compared to +17% for men). Black women reduced the incidence disparity rate by 48% (1.7 to 0.9). In the current study, prevalence and incidence rates were consistently highest among persons 50-64 years old, with the exception of black women regarding incidence, where they were the lowest reported group (30 per 1,000, compared to 36 per 1,000 in black men, and 38 per 1,000 in both white men and women). This finding differs from the Sung et al. study where prevalence and incidence were consistently higher among persons in this age group. Black males age 65 and older, and white men and women age 50-64 had the highest new claim rate in this group, followed by black men age 50-64 and white men age 65 and older (both new claim rates were 36 per 1,000 in each group). These findings were inconsistent with the Sung et al. study where Black females had the highest new claim rate for this age group (120 per 1,000, followed by white females (100 per 1,000).

Prevalence rates however, told a different story and were consistent with findings in the Sung et al. study. His study reported that black women age 50-64 were diagnosed with hypertension at the highest rate, the same was found to be true in the current study (318 per 1,000 and 756 per 1,000, respectively). Also, as found in the Sung study, the age-adjusted incidence rates were higher in blacks than in whites for both sexes. When using the 2015 Medicaid population as a standard, the overall age-adjusted prevalence rates of hypertension were the lowest for black males (25 per 1,000 in the current study and 32 per 1,000 in the Sung study) and the highest for black females (69 per 1,000 in the current study and 43 per 1,000 in the Sung study). This differs considerably from the Sung et al. study and Table 1 where the overall age-adjusted prevalence rates of hypertension were lowest for white males (21 per 1,000 in the Sung study compared to 38 per 1,000 in the current study), suggesting that while black females are still owners of hypertension at a higher rate than any other race-gender category, black males are improving in this regard.

As noted in table 7, there is a significant increase in prevalence, suggesting that the reduction in disparities could have less to do with overall health improvements in the African American community and more to do with the worsening health among white Medicaid enrollees. These study results were very high, especially among black men between the ages of 50-64, where almost 70% have been diagnosed. The study also found that over 50% of all men & women over 50 years old had a hypertension diagnosis, regardless of race.

Overall, the current study finds that black females continue to have hypertension at a higher rate that black males, white females and white males (24%, 14.8%, 20% and 14.9%, respectively), and continue to lead in incidence per 1,000 (235, 148, 200 and 149, respectively). This is consistent with Sung et al. findings which claim that African-American females are more likely than African-American males, or whites of either sex to have hypertension diagnosis.

Limitations

There were two major challenges to this study that consequently equaled shortcomings in the quality and integrity of the findings (results). These challenges influenced the results in such a way that the interpretation of the data relied heavily on assumptions. The first significant challenge was identifying the origin of the data used for the current study. The origin of the data in the Sung study was clearly defined, as it came from Medicaid recipients in the state of Georgia whereas the origin of data used in the current study included Medicaid recipients from 12 states that were unknown to the researcher. In terms of representativeness, only 18% of the nation's states are classified as "Stroke Alley" states, which translates to roughly a one in five chance that any of the 12 states used in the current study are a "Stroke Belt" states.

This limitation is significant because data from the foundational study comes from a geographic location known as stroke alley, or the stroke belt. It is typically defined as a 9-state region consisting of Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee (See Figure 1). Some investigators also consider North Florida and East Texas to be part of the stroke belt, based on higher mortality rates when compared to other states in the Union (Siegel, Ramshaw). Although many possible causes for the high stroke incidence have been investigated, the reasons for the phenomenon have not been determined.

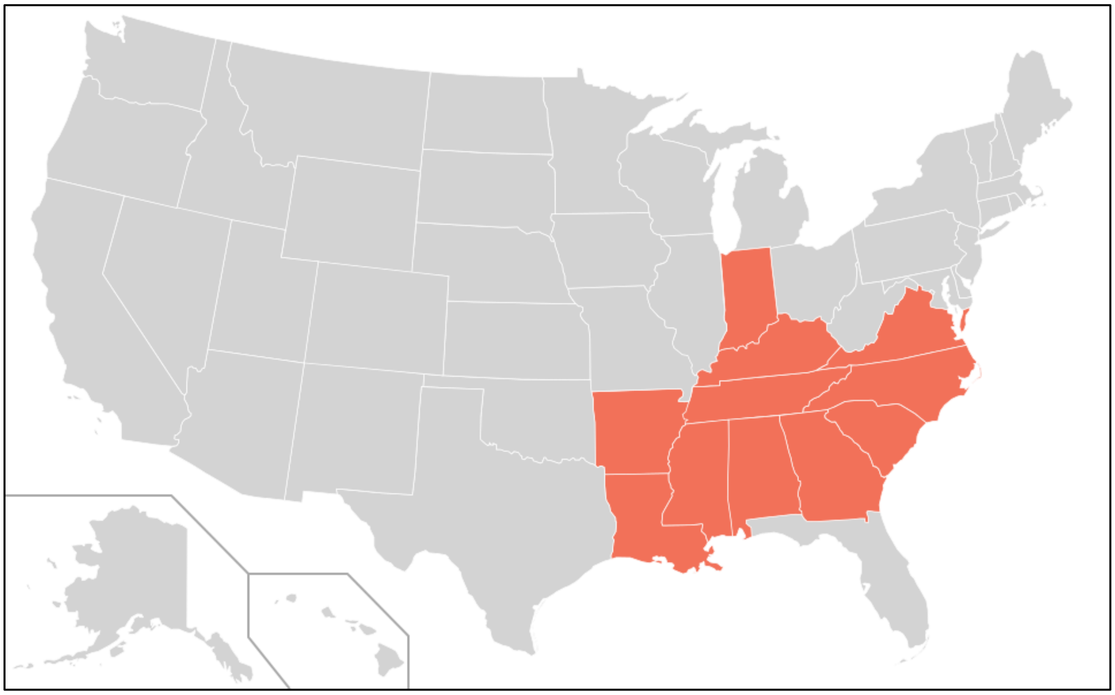


Figure 1. Stroke belt in the United States. Reprinted from National Institute of Health (NIH), 2014, retrieved from https://www.nhlbi.nih.gov/health/prof/heart/other/sb_spec.pdf. Reprinted with permission.

This region has been recognized by public health authorities for having an unusually high incidence of stroke and other forms of cardiovascular disease (Rodriguez). The stroke belt was first identified in 1962 by CDC researchers who noted a concentration of high stroke death rates in coastal counties of North Carolina, South Carolina, and Georgia (Vries). Similar high stroke rates were later observed in the Mississippi Delta region as well (Vries).

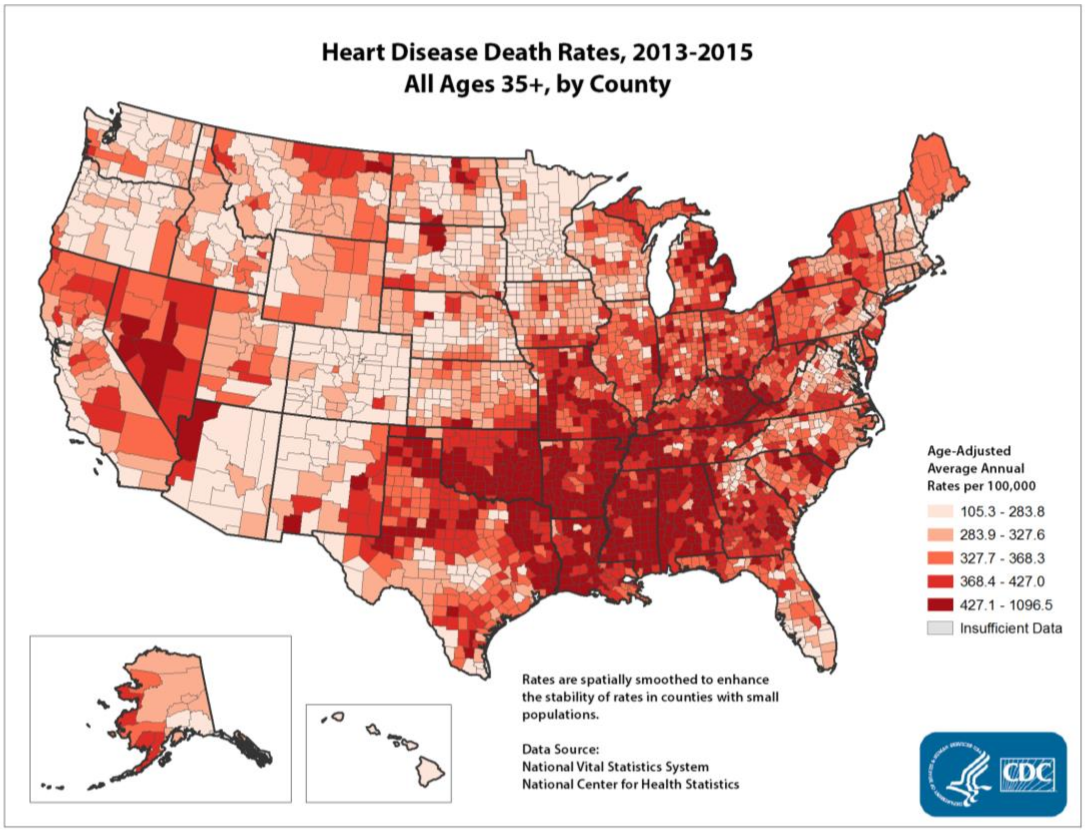


Figure 2. Heart Disease Mortality Rates by County. Reprinted from the National Center for Health Statistics, 2015, retrieved from https://www.cdc.gov/gis/mapgallery/mcintyre_heartdiseasedeath.html. Reprinted with permission.

Analysis by the CDC of U.S. mortality statistics from the period 1991 to 1998 found that for both blacks and whites the counties with the highest stroke death rates were in the southeastern states and the Mississippi Delta region (CDC). Stroke death rates for states ranged from a high of 169 per 100,000 in South Carolina to a low of 89 per 100,000 in New York (CDC). This variability further demonstrates the significant limitation placed on this study because in the best case scenario, the data used in the current study would include information from Medicaid recipients in all of the nine "stroke belt" states however, there is no way to determine whether the data used to conclude the findings in the current study come from any of those states or even Georgia. It is possible that the data came from outside the stroke belt, which would have inaccurately skewed the comparison of two data sets, falsely overstating the reduction in morbidity among blacks with hypertension between 1991 and 2014. More work could be done to further this research by conducting an analysis of Georgia Medicaid recipients in 2015 and comparing the results to those of the Sung study, and this study. This limitation affects generalizability of the current study in such a way that prevents the extension of the current research findings and conclusions from the study conducted to the population at large because there is no way to determine where on the range of hypertension prevalence and incidence the data originated.

The second major limitation to this study is that the data did not include information regarding where the target population was raised. This could be, in part due to the great migration (see Figure 3), or the relocation of more than 6 million African Americans from the rural South to the cities of the North, Midwest and West from 1916 to 1970 (Williams). Glymour et al. (2007) reported that adults who had resided in the stroke belt during childhood and had moved outside the region had higher stroke risk at ages 50 and older than adults who grew up in areas with lower stroke incidence.

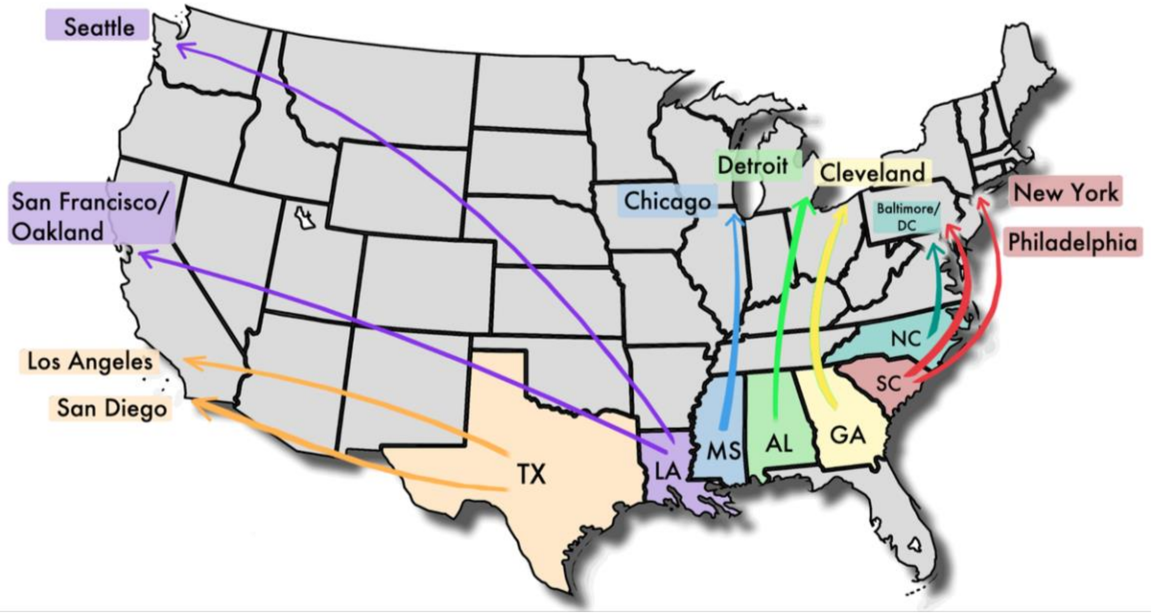


Figure 3. The Great Migration (Kopf). Reprinted from Priceonomics. 2016, retrieved from https://priceonomics.com/the-great-migration-the-african-american-exodus/. Reprinted with permission.

Another limitation is the lack of clinical health information technologies (HIT) in Medicaid claims. HIT are widely viewed as essential tools for improving the quality and efficiency of health care delivery. Medicaid agencies that make substantial investments in information technology have much to gain through the widespread use of clinical HIT, and can have significant influence on the adoption of HIT by providers. Medicaid agencies, however, face legal, regulatory, and financing challenges in relation to supporting HIT adoption, use, standardization, and interoperability (Alfreds).

The final limitation is the post ACA era the study group came from, which was mixed. The likelihood that all or none of the 12 states either expanded or did not expand Medicaid is low, and it is fair to say that the Medicaid expansion states included in this study, allowed all low-income adults (not just pregnant/disabled) to participate in Medicaid, therefore the population studied in this research is most likely “healthier” than the 1991 Georgia population used in the Sung study. This most likely had the effect of weakening the amount of persons with hypertension by adding more healthy individuals to the study. This limitation prevents the research from drawing solid conclusions regarding to what degree the actual rates of hypertension found in the study miscalculate hypertension within the original Medicaid recipients by themselves.

Medicaid recipients are often in poorer physical and mental health than populations covered through commercial insurance (Hadley). More than 60 percent of Medicaid recipients have at least one chronic or disabling condition. Because of the high level of disease burden, Medicaid patients' utilization rates of health services are substantial (Garis). Due to the eligibility rules and sociodemographic realities, many Medicaid recipients may move from being uninsured, to commercially insured, to Medicaid eligible, and back. This often leads Medicaid recipients to seek health care services and medications at multiple sites of care, compromising the accuracy and completeness of health care records, and often requiring unnecessary duplication of laboratory, radiology, and other ancillary tests (Alfreds). These factors create significant challenges for beneficiaries and providers often requiring a level of coordination that cannot be fully realized without clinical HIT and health information exchanges.

In this chapter, the study results were discussed and compared to the foundational study results. The limitations were also discussed. The implications and conclusions of this research, as well as recommendations will be discussed in the next chapter.

DISCUSSION OF RESULTS

As stated in the results chapter, 1.4% of the total population studied in 2015 had a hypertension diagnosis, compared to 2.9% of the total population in the 1997 Sung study. This 52% reduction suggests the Affordable Care Act (ACA) is working effectively along with other interventions to improve the health status of Americans; however, as found in the Sung study, African-American females are still more likely than African-American males, and whites of both genders, to have a hypertension diagnosis.

For example, the current study showed 235 of every 1,000 black adult females with hypertension, compared to 200 of every 1,000 white adult females, and 148 of every 1,000 black adult males, compared to 149 of every 1,000 white adult males with hypertension (Table 5). Black females in the 50-64 age group had a hypertension diagnosis of 756 per 1,000, the highest age-specific rate in the study (Table 6). Although the prevalence of hypertension in black females has increased, the incidence of new claims has decreased, suggesting that black females have adopted healthier lifestyle practices. This finding could also support literature cited in Chapter Two stating that blacks are less likely to be diagnosed with coronary heart disease than whites, although blacks are more likely to die from the disease than whites (www.minorityhealth.hhs.gov, n.d.).

Considering this information and possible correlation, further research could be done to study whether or not African-Americans with hypertension, and above the age of 50 are living longer.

These findings are also consistent with the literature review. Although substantial progress has been made in improving the health status of both African-Americans and whites, African-Americans continue to bear a higher incidence of death, disease, and disability. This could be due to worsening diet and cultural and age-related norms in the African-American community that discourage routine medical screenings from a preventive approach. I remember growing up hearing my mother talk to other relatives about how a particular family member would not go to the doctor, regardless of symptoms that may have warranted a visit.

It could also be due to findings communicated in the literature review chapter about how people in the lowest socioeconomic status (as measured by income, education, and occupation) are three times more likely to have cardiovascular disease than people in the highest income category (O'Connor & Wellenius, 2012). This is supported by the federal government setting Medicaid eligibility at or below 138% of the federal poverty line (KFF) and news article by Luhby, that "an economic divide still exists between black and white households where blacks typically still earn far less than whites" (Luhby). Further research could be done to study these and other hypertension contributing factors in African-American adults based on high, medium (middle class), and low (poverty) income levels.

Table 7 shows that when comparing both studies, the disparity in new claim rates among blacks and whites has been reduced in every age and gender category except for the youngest age category (less than 25 years of age) where the ratio has increased for both men and women (67% and 14%, respectively). This suggests that within the context of the problem statement in Chapter One, healthier lifestyle practices and an increased sense of awareness of the disease and other influences to make Americans less hypertensive. This also serves to highlight the societal and technological changes that have taken place between the two studies (1991 and 2015). Prior to 1991, healthcare was more of a reactive approach with large blind spots in prevention and lack of patient engagement. Cultural shifts, policy adjustments, the price of care, technological advancements, and an overall emphasis on preventive care over the last 25 years have created a more patient-enabled approach to health care. There also has been a general evolution in the streamlining of care through electronic health records, interoperability, computerized physician order entry, and a shift from a fee-for-service to an outcome based payment model.

Another reason for this reduction could be the increased intermingling of the black and white race. Over the past 60 years, interracial dating, marriage and families have become normalized as society has changed its views on these types of relationships. This could translate to less homogeneity in study samples, this diluting the sample size in the later study. The greatest reduction in hypertension prevalence was in women (a total reduction in disparity from a ratio of 1.8 in 1991 to 0.9 in 2015 compared to 0.9 to 1.0 for men). This could have a direct correlation with the fact that life expectancy for whites has gone down due to increased death rates among white women (1.6%), compared with no change in death rates for black women (Xu).

As stated in the results section (Table 7), African-American women aged 25-49 reduced the hypertension prevalence disparity gap when compared to white women in the same age group by 39%, more than any other age or gender group. This reduction is relatively large in magnitude and clinically significant because as discovered in the Sung study, African-American females were more likely than African-American males, or whites of either sex, to have a hypertension diagnosis.

With regard to incidence or new claim rates, and black/white ratios, women represented the greatest reduction between the two studies in new hypertension claim disparities (1.4 to 0.9 for females, compared to 0.8 to 0.7 for men). Black women age 65+ reduced the incidence disparity rate by the largest margin (from 1.7 to 0.9) when compared to white women of in the same age group, suggesting that in context of the problem, the ACA is working to the advantage of black women, as they are becoming less hypertensive when compared to white women in the same age group.

In the current study, prevalence and incidence rates were consistently highest among persons 50-64 years old, with the exception of black women regarding incidence, where they were the lowest reported group (30 per 1,000, compared to 36 per 1,000 in black men, and 38 per 1,000 in both white men and women). This finding differs from the Sung et al. study where prevalence and incidence were consistently higher among persons in this age group, supporting the conclusion that the ACA is working and black women age 64 and younger are adopting lifestyle changes resulting in a reduction in hypertension diagnosis among this group.

Black males age 65 and older, and white men and women age 50-64 had the highest new claim rate in this group, followed by black men age 50-64 and white men age 65 and older (both new claim rates were 36 per 1,000 in each group). These findings were inconsistent with the Sung et al. study where Black females had the highest new claim rate for this age group (120 per 1,000, followed by white females (100 per 1,000), suggesting that black women are healthier and that they have incorporated healthier lifestyle choices, or have been more willing to accept the assistance that Obamacare provides.

Conclusions/Implications

There are many conclusions that can be drawn from this research and data. It is clear that greater efforts should be made to diagnose and manage hypertension, particularly among blacks. The first step could be to curb this phenomenon with targeted health education, because most people are aware of hypertension as a condition and that this condition can lead to other, more severe chronic problems. However, they are often ignorant of two facts: 1) hypertension is often asymptomatic and 2) the condition can be managed through a variety of interventions that need not necessarily include medication.

The fact that hypertension is asymptomatic means that it must be found, usually through a medical screening. In a medical screening, there are any number of reasons why blood pressures might be elevated, including just the fact that a medical screening is taking place at that moment, a phenomenon called "white coat hypertension" (Martin and McGrath, 2014). This is why it is generally advised in a rigorous screening for hypertension that multiple readings be taken in a variety of settings and that laboratory tests be done as a supplement to or a consequence of these readings.

The major conclusion of this research project is that more targeted efforts should be made to diagnose and manage the condition among African-Americans, particularly African-American women. These results could be used to substantiate a health awareness and wellness campaign. For example, in the state of Georgia (where the Sung study data originated), Kaiser Permanente is an integrated health delivery system that accepts Medicaid health insurance. They provide coverage, physicians and inpatient quality care under the same umbrella. They have a considerable footprint in various markets in the US, including California, Hawaii, Colorado, the Washington D.C.-Maryland-Virginia (DMV) area, Atlanta, Georgia, Oregon and Washington State.

Kaiser Permanente was founded on the idea that everyone deserves the chance to live a healthy life, and delivers high-quality care and coverage in one place, making it possible to put their members at the center of their wellness strategy. This includes the design and creation of useful tools that make it easier for its members to manage their health. For example, their outpatient medical office buildings hold weekly health education classes specific to the demographic needs of the members they serve, which is a key component to generalizability as it relates to the results of this research project because it could be used to target the health needs of African-American women.

Other conclusions derived from this research are that there is a clear need for increased education of hypertension, its asymptomatic nature, and its potential consequences among the African American community. Tedesco et. al studied how socioeconomic differences affect hypertensive and diabetic outpatients, finding that sound health policy is critical to reaching the uneducated and make them aware of hypertension and the health care services available to them (Tedesco, 2001).

A Harvard study conducted by Amy et. al showed that education, more than genetic ancestry remained a significant predictor of BP only among the African Americans. This highlights a clear and significant need for increased educational attainment among blacks, particularly black women. In his 1978 book, *The Declining Significance of Race*, author William Julius Wilson argued that economic class continues to be more important than race in determining life outcomes for blacks (Wilson). He revisited this argument during a 2015 lecture at the Library of Congress' Thomas Jefferson Building on the ways race and class influence Americans' opportunities for success. Economic class is a direct byproduct of education which points back to the Harvard study mentioned at the beginning of this paragraph.

The results of this research project, in unison with Tedesco and Amy's findings could be used to substantiate this need, and secure funding through CDC's Division for Heart Disease and Stroke Prevention to add hypertension health education in predominately African-American communities where heart disease disparately affects mortality.

This awareness can be shared in local churches, schools, and homes, normalizing discussions around cardiovascular health. Since hypertension is a condition that can be managed through a number of interventions, and it is in the interests of everyone to detect hypertension early before it does any organic damage, it will be necessary to disseminate information about lifestyle changes to control and manage hypertension. These conclusions and suggestions can be generalized to the African-American community, with design/implementation advice and suggestions from the African-American community.

These education programs and lifestyle changes are of a preventive nature and include changes in the diet, increased physical exercise and weight loss. What must be made clear to the target population is that lifestyle changes, when they are consistently and conscientiously done, often exceed the effectiveness of a single medication when used for a similar period of time (Mancia et al., 2013). It should also be mentioned that where medication is warranted to manage hypertension, lifestyle changes are still recommended in conjunction with the use of medication, and that these lifestyle changes are the same in either case (Mancia et al., 2013).

As potentially beneficial as lifestyle changes can be, they do require a greater degree of health care provider involvement in terms of monitoring the changes and the effect they have, and also in terms of educating the patient about the lifestyle changes, how they are to be implemented, and the benefits that the patient can expect.

It has already been noted in this paper that interventions for hypertension management take many forms, including lifestyle changes. However, research has shown that when a person's lifestyle embraces a particular culture centering on self-reliance rather than inter-reliance, these lifestyle changes are less effective when the person is undergoing the change is in a state of social isolation (Appel, 2003). While research on the sociocultural role of intervention in cases of hypertension has been shown to help, it has also been oven that these same factors do play a role in seeking medical help in breast cancer, and that those roles do have a racial aspect (Ashing-Giwa, 1999; Griffith, Ober Allen and Gunter, 2011).

It is true that the findings are not completely comparable (e.g., breast cancer is not asymptomatic and the Ashing-Giwa study applies solely to women). All this notwithstanding, the study shows that there are racial aspects to the inclination to seek medical help and this includes medical screenings, even for problems that are asymptomatic.

Griffith, Ober Allen and Gunter (2011) discussed this problem specifically in regard to African-American men and the range of medical problems that they face, including hypertension, and conclude that African-American men are less likely to seek health care and this is a major reason why African-American men die, on average, seven years sooner than comparable white American men. Additionally, and, in what directly relates to this question and Ashing-Giwa (1999), men, irrespective of their race or socioeconomic standing, are less likely to seek help for a health problem. This gender disparity is even more pronounced in the example of asymptomatic conditions, which is evidenced by the fact that African-American men are more inclined to postpone treatment until their symptoms become apparent or they interfere with the person's life and, especially, work (Ravenell, Whitaker and Johnson, 2008). This, by its very nature, makes it unlikely that an asymptomatic condition will be detected early in its course, and that postponing detection and management only compounds the range and extent of the damage that results (Satcher, 2008), and this negates much of the possibility of managing and controlling the condition.

Poor African-Americans are also concerned with a lack of transportation, which may have been the result of a disparity in white versus African-American ownership of private automobiles, something that does become more pronounced with advancing age and more of a significant issue as there is a demonstrated correlation between functional health literacy and private automobile ownership (Williams et al., 1995).

The authors of this study point out the correlation, and feel that this increased functional health literacy, which can just be as simple as awareness and knowledge of where to go when the person feels the situation warrants action. This phenomenon can also be related to socioeconomic standing as already discussed in this paper.

Lifestyle changes to control hypertension are the most inexpensive method of treatment, and efforts must be made to increase acceptance of this in the population as a whole and especially among African-Americans. This can be accomplished by using this research as a foundation to begin discussions about a plan to implement lifestyle changes on their own terms, and in a manner that they will find culturally acceptable.

It is highly unlikely that any cultural change will take place in the African-American community if members of that community perceive the change coming from outside the community, using ethos of people from outside the community, and acting at the instigation of people outside the community. For these reasons, success will include the engagement of members of the community at an early stage, developing the educational and information program to ensure an understanding that this is done for the benefit of the community. Just as considering dietary change as a part of overall lifestyle change (a diet rich in nuts, whole grains, fish, poultry, fruit and vegetables) can lower blood pressure; part of this can also be accomplished through limiting dietary intake of sodium, while having a diet simultaneously rich in potassium, calcium, magnesium and protein (Yokoyama, et al., 2014). There is also evidence that exercise regimes, some of them very modest in scope, can have a positive effect in people suffering from hypertension, although the more minor the hypertension, the greater the effect of exercise (Brook et al., 2013); For this reason there are those cases in which lifestyle changes should be considered subsidiary to pharmaceutical intervention.

There are several classes of medication that, unfortunately, are used as a first line intervention in too many cases when medical personnel and resources are at a premium. These medications, collectively referred to as anti-hypertensive medications, are effective in treating hypertension. In the case of African-Americans, however, there is a litany of problems in using such medications that has already been recited in this paper, including the cost of the medication, the possible unavailability of these medications to certain segments of the population, the need for medical supervision in administering them, which may not be available, and, of course, the trust issue, which looms large in any of these discussions. While this section asserts that lifestyle change is the best first line of intervention when appropriate, medication as the best first line of hypertension treatment is a matter of considerable controversy, This controversy only makes matters more difficult when treating the African-American community as in this case controversy means uncertainty, which only increases the mistrust factor. It is, however, known that for the vast majority of people who require medication to control their hypertension, and whose hypertension is responsive to the medication, do require more than one medication to accomplish this.

Given this, it is understandable that the African-American community will only experience further distrust due to the complexity of the medication regime, as well as its cost. Here again, it is necessary to use this research to substantiate the need for education and information programs that are generalizable to the African-American population both in terms of its content and its delivery. Potential patients should also be cautioned about the use of anti-hypertensives in conjunction with diuretic and nonsteroidal anti-inflammatory drugs, especially including those that are available over the counter, can lead to acute kidney failure (Fauci et al., 2008). Furthermore, treatments which include vasoactive agents for people suffering from pulmonary hypertension may find themselves in a position that causes harm and incurs unnecessary expense (Fauci et al., 2008). Both aspects will be counterproductive when seeking to address this problem in the African-American community.

Further research could be done to support this theory, as there is limited evidence to support the idea that these interventions, even when effective in lowering blood pressure, are also effective in reducing the consequences of blood pressure, particularly heart disease. It is possible to target educational and informative activities to African-Americans through the way the information is presented and appropriate outreach. For this to be effective, health care providers must be intimately involved in this and the resistance to change must be addressed from a perspective of cultural comfort. This may be accomplished, for example, through areas where African-Americans congregate, such as barbershops, hair salons, and in terms of the community as a whole, in the African-American church.

African-Americans in general don’t trust white professionals. The open question is why this is the case. Ravenell, Whitaker and Johnson (2008) feel that this is a reflection of African-American culture and its isolation from mainstream white American culture. Griffith, Ober, Allen and Gunter (2011) and Satcher (2008) take this conclusion one step further, both concluding that in the African-American population there is a sentiment that the medical community is a predominantly white establishment that is operated by white people and intended to serve white populations.

When I think of my own experiences growing up in a black household with black relatives, I can understand how and why Griffith, Ober, Allen, Gunter and Satcher arrived at their conclusions. It has been my experience that the African-American population at large is generally distrusting of whites and their true intentions while medically caring for blacks. This basis of this skepticism has been substantiated by the numerous cases of unethical human experimentation that took place against blacks in the United States. The experiments include: the exposure of people to chemical and biological weapons (including infection of people with deadly or debilitating diseases), human radiation experiments, injection of people with toxic and radioactive chemicals, surgical experiments, interrogation and torture experiments, tests involving mind-altering substances, and a wide variety of others. Many of these tests were performed on children, the sick, and mentally disabled individuals, often under the guise of "medical treatment." In many of the studies, large portions of the subjects were poor, black, or prisoners (Hornblum). For example, J. Marion Sims, who is often referred to as "the father of gynecology, performed surgical experiments on enslaved African women without anesthesia throughout the 1840's (Lerner).

There is also the Tuskegee Syphilis Experiment, a clinical study conducted between 1932 and 1972 in Tuskegee, Alabama, by the U.S. Public Health Service. In the experiment, 399 poor black males who had syphilis were offered "treatment" by the researchers, who did not tell the test subjects that they had syphilis and did not give them treatment for the disease, but rather just studied them to chart the progress of the disease (Tuskegee). By 1947, penicillin became available as treatment, but those running the study prevented study participants from receiving treatment elsewhere, lying to them about their true condition, so that they could observe the effects of syphilis on the human body. By the end of the study in 1972, only 74 of the test subjects were alive. 28 of the original 399 men had died of syphilis, 100 were dead of related complications, 40 of their wives had been infected, and 19 of their children were born with congenital syphilis. The study was not shut down until 1972, when its existence was leaked to the press, forcing the researchers to stop in the face of a public outcry (TSE).

Summary

The purpose of this research was to determine whether the gap in hypertension between African-Americans whites changed in 2015, when compared to a similar study by Sung et. al using data from 1991. The reason for this undertaking is the problem of hypertension being an asymptomatic disease that leads to heart disease and stroke, the leading causes of death in the United States and, more importantly, how this disease disproportionately affects African-Americans, especially black women and those in poverty and in both urban and rural areas.

The conclusions and synthesis of the findings in the foundational study and the current study support that hypertension is still a major problem in the U.S. When left untreated, it can result in far worse chronic health problems that are themselves a major burden on the health care system. The evidence has shown that hypertension affects all people, irrespective of their race, but that it affects African-Americans to a disproportionate degree, despite how Americans are becoming better at managing lifestyle choices that lead to hypertension. The literature review also suggests that factors other than the household income status (such as education) may be responsible for the higher risk of hypertension in the black community.

The literature review chapter, domestic African-American health disparities section concludes that African-Americans, as a group, occupy a place in American society that leaves them distrustful of the white American establishment, which includes traditional medicine, as well as other treatments that might offer some potential for managing hypertension without resorting to medication, such as biofeedback and psychotherapy.

There is a whole litany of health problems that affect the African-American community to an extent that they do not affect white Americans, but here it is difficult to establish causality. Are these problems as prevalent as they are in the African-American community because of genetics, or is it because of the African-Americans' lowered socio-economic status, which restricts the possibilities for obtaining medical attention. In the case of rural African-Americans, the problem is compounded because of the unequal distribution of healthcare resources, with a disproportionate amount of them located in urban areas. As this paper has shown through survey data, there are concerns about health care that are shared by all people, but at the same time there are also great racial disparities in health care concerns and needs. Many of these issues could be ameliorated by improving transportation and/or scheduling but this involves expenditure of time, effort and money, and much of the *status quo*, including its other problems, will continue, despite the expenditure.

A program of education and information, with continued access via the Affordable Care Act will be more effective, and accomplished at a far lower cost than the alternatives. Furthermore, its effects will be intergenerational, that is, they will carry on and it is felt that these programs advocating lifestyle change will only become more effective as they remain in place and more people become aware of them. The peripheral benefits, such as a lowering of the prevalence and severity of other conditions, such as diabetes, will only yield additional benefits in terms of cost saving, resource allocation and improved quality of life (Ferrannini and Cushman, 2012). Other educational programs, such as those involving healthy eating, smoking cessation, and weight control, will only carry these benefits further, resulting in disproportionately positive benefits to the African-American population. However, these educational programs must accompany access to care over time via the Affordable Care Act in order for benefits to be realized.

The research methodology used in this study was gender-specific black to white risk ratios, using the Mantel-Haenszel pooled point estimate and the corresponding test-based 95% CI. The results of this research highlighted a 1.4% hypertension diagnosis in the 2015 study group, compared to a 2.9% hypertension diagnosis among the total population used in the Sung study. This 52% reduction, strongly concluded that the ACA, along with many other interventions are working to improve the health status of Americans however, more targeted efforts should be made to educate, diagnose and manage the condition, particularly among black woman and men 50 and older.

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