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EFFECT OF A FAITH-BASED INITIATIVE ON HOSPITAL READMISSIONS

by

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A DISSERTATION

Submitted to the graduate faculty at The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Science

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2013

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2013

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JOSEPH WEBB

ADMINISTRATION-HEALTH SERVICES

ABSTRACT

The purpose of this study was to examine the relationship between a faith-based initiative and hospital readmissions. The main data source used was the inpatient database of Methodist LeBonheur Healthcare System (MLH) in Memphis, TN. Data were collected from admissions that occurred during years 2008 through 2012 at four of MLH's five adult acute-care hospitals. Data from the U.S. Census Bureau's American Community Survey were also used in the study.

This study uses theoretical tenets from the Social Justice and Equity Theory and the Chronic Care Model as its conceptual framework. The study consisted of an aggregated cross-section data analysis. Univariate, bivariate, and multivariate statistics were calculated using PASW/SPSS statistical software, version 20. The dependent variable was hospital readmission within 30 days of an index admission. The independent variable was CHN member or non-CHN member. Due to the dependent variable being dichotomous, logistic regression was determined to be the most appropriate analysis.

Key findings in the study indicated that among inpatients admitted for chronic conditions, the likelihood of readmission for CHN members was not significantly different than that of non-CHN members. Secondly, among inpatients admitted for chronic conditions and residing in low socioeconomic neighborhoods, the likelihood of readmission was not significantly different between CHN and non-CHN members. Additional findings indicated that among patients with chronic illnesses, an increase in level of se-

verity of illness contributes significantly to higher odds of readmission. Finally, the study indicated that among the four chronic illnesses identified in the study, CHF has significantly higher odds of being readmitted within 30 days.

Keywords: chronic illnesses, healthcare disparities, faith-based initiative, index admission, preventable readmission

DEDICATION

This dissertation is dedicated to God Almighty, who is the head of my life and by whose grace I am here to complete the academic requirements for a doctoral degree. This is also dedicated to my loving parents, Magnolia Webb and my late father Stanford Webb Sr. I will always be grateful to them for the sacrifices and efforts they made, on behalf of their children, to assure that all opportunities to pursue higher education were available to them. I also dedicate to my siblings: Cornelius, Dan, Eliza, Robert, John, Esther, Leroy, Rosie, Tommy, Stanford Jr., Henrietta, and Mary Ann.

To my family including wife Berlinda, and children, Seneca, Brian, Davin, and Rana, I express my love and appreciation for all your support and patience with me during my period of commitment to this program of higher learning. Finally, to all of my nieces, nephews, cousins, aunts, uncles, and friends who have offered words of praise and support throughout this process.

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CHAPTER 1

INTRODUCTION

Effect of a Faith-Based Initiative on Hospital Readmissions

The United States has the most expensive healthcare system in the world, with per capita health expenditures far above those of any other nation (Bodenheimer, 2005). The U.S. healthcare system spends much more on healthcare and offers fewer services to its citizens, yet continues to have life expectancy that is less than other industrialized nations, such as Germany or Japan (Stephens & Ledlow, 2010). Healthcare cost is a major concern in the United States, and it continues to challenge payers as well as providers on cost reduction methods while maintaining and elevating quality. Hospitals in the United States currently receive an estimated 31% of their net revenues from Medicare, about 88% of which is for inpatient services and 12% for outpatient (Reinhardt, Hussey, & Anderson, 2004). A search for strategies to contain hospital costs and improve quality outcomes continues to grow as healthcare providers attempt to keep pace with the economic pressures from government and private insurers (White, Bazzoli, Roggenkamp, & Gu, 2005). U.S. healthcare expenditures rose by 9.7% per year during the period of 1988 through 1993. According to the federal government's projections, an annual growth rate of 7.2% will continue through 2013 with health expenditures rising from 14.9% of gross domestic product in 2002 to 18.4% in 2013 (Bodenheimer, 2005). Gallup news service indicates that healthcare costs are the most important financial concern facing Americans today (Guadalupe, 2007).

Excessive utilization of healthcare resources is a key driver of escalating costs. Reducing preventable hospital readmissions is part of the solution to achieving system-wide efficiencies. One strategy that can be used to reduce preventable re-admissions is to identify potential readmissions based on socio-demographic factors, care related factors, and acuity (Jweinat, 2010). By improving care transitions, hospitals may achieve lower re-admission rates. Avoidable re-admissions are viewed as defects in delivery of care during hospitalization and the transition out of the hospital (Bisognano & Boutwell, 2009). Literature indicates that minorities such as African Americans and Hispanics experience higher hospitalization and re-admission rates for certain major diseases and illnesses than their White counterparts (Kim, Ross, Melkus, Zhao, & Boockvar, 2010). The literature also indicates that elderly minorities receive a lower quality of healthcare than their White counterparts. Prior research shows that the inequities and disparities in providing clinical care to minorities has led to an overall increase in healthcare costs (Hofmann, 2010).

According to empirical studies, minorities tend to seek advice for care through their church or places of worship. The church can represent an effective method of facilitating health programs for African Americans. Many African American churches incorporate health into their mission and offer health programs through special committees and ministries (Resnicow et al., 2001). African American churches have served in a dominant role as an informal service provider since their inception (Blank, Mahmood, Fox, & Guterbock, 2002). Church based health initiatives can reach broad populations and have excellent potential for generating favorable outcomes. Churches and other forms of religious organizations are capable of influencing members' behavior and can generate

change (M.K. Campbell et al., 2007). In the context of this study, a faith-based initiative is a collaboration of churches that are working together with a health care organization to maximize health outcomes of its members and reduce or prevent unnecessary hospital readmissions.

Statement of the Problem

Policies established by the Affordable Care Act (ACA) reshapes U.S. healthcare by removing the walls between hospitals and care delivered in the community. Integrating care, moving it into the community and reducing preventable readmissions are key reform goals. The ACA policy is a sign of a shift to paying for better care of chronic conditions across the continuum of care and reducing some of the \$15 billion spent on readmissions each year (Coye, 2008). Specifically, the chronic conditions that the ACA is focused on are acute myocardial infarction, pneumonia, and congestive heart failure. This study also focused on diabetes because it is generally considered one of the common chronic illnesses that can result in readmissions. For the purposes of this dissertation, these four conditions will be referred to as the chronic conditions of particular interest. According to Don Berwick, former Centers for Medicare and Medicaid Services (CMS) Administrator, the new rules will cause hospitals to adopt practices that reduce errors and provide a safer environment for patients during their hospital stay (Carroll, 2011). Integrated systems and hospitals will need to take decisive actions. The challenge can be met by application of innovative system changes and technologies that address labor costs, continuous communications of information regarding patient status, and clinical protocols of efficient evidence-based management of complex patients at home (Coye, 2008).

Providers of healthcare are challenged with the burden of reducing healthcare cost at a time when demand is rising. Increasing costs incurred by healthcare systems are driven by a number of factors including (a) increasing costs of technology, (b) inefficiencies in the delivery process, and (c) demographic issues that affect the demand for health services. Among the demographic issues are a growing elderly population, persistent poor health status among low income populations, and a growing racially/ethnically diverse population that suffers from health disparities, which ultimately contributes to poor health status and higher costs (Cutts et al., 2011).

Preventable readmissions are viewed as being the result of poor quality or system failure (Vest, Gamm, Oxford, Gonzalez, & Slawson, 2010). Research indicates that faith-based initiatives can serve as a viable method of addressing many of the underlying causes of preventable readmissions to hospitals (M.K. Campbell et al., 2007). Faith-based initiatives are common among minorities. Many African Americans are more likely to seek care through faith-based initiatives than traditional health care institutions (Peterson, Atwood, & Yates, 2002).

Prior research examined church and faith-based initiatives that have been used to address healthcare issues among minorities. It shows that minorities such as African Americans have historically turned to the church for many of their healthcare needs (Blank et al., 2002). The present study examines the impact of a faith-based network on hospital 30-day re-admissions among African American patients with Medicare who are receiving care in an integrated delivery healthcare organization.

Purpose of the Study

This study analyzed the relationship between a faith-based initiative and hospital re-admissions. More specifically, the study examined whether African American patients with Medicare insurance who participate in faith-based initiatives are less likely than African American patients, who do not participate in a faith-based initiative, to be re-admitted to a hospital within 30 days post discharge. The study used the concept of faith-based initiatives to argue that African American patients who participate in faith-based initiatives are less likely to be re-admitted to a hospital within 30 days than those who do not.

Benefits of the Study

Results from this study will contribute to healthcare management literature. The economic impact associated with various healthcare utilization patterns has always been an area of concern for healthcare leaders. The U.S. Government, through leadership of CMS, is the largest purchaser of healthcare services in the United States (Moon, 2005). Under the ACA, CMS is requiring greater accountability and justification for services rendered by healthcare organizations. An example is the recent initiative by CMS to reduce or deny reimbursement for early re-admissions. The present study will contribute to the identification and comprehension of strategic activities needed to address preventable re-admissions, which is critical to healthcare leaders in their efforts to improve the quality of outcomes as well as for economic purposes.

Research Question

This study used theoretical tenets from the Social Justice and Equity Theory and the Chronic Care Model (CCM) as a framework to explain how faith-based initiatives are expected to affect hospital re-admissions. The following research question guided the investigation:

1. What impact does a faith-based network have on the likelihood of hospital re-admission among its participating African American members when compared to African American non-members?

CHAPTER 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Literature Review

In this section, the following topics are discussed: (a) hospital readmissions, (b) disparities in healthcare, (c) disparities in hospital readmissions, (d) faith-based culture among African Americans, and (e) faith-based network outcomes. Theoretical and conceptual frameworks are also discussed. The theoretical and conceptual frameworks used in this study are the Theory of Social Justice and Equity and the CCM. These frameworks are used to add depth to the discussion of faith-based initiatives, and its impact on hospital readmissions among African Americans who participate in faith-based networks compared to those who do not.

Hospital Readmissions

Rising healthcare costs are one of the nation's most challenging fiscal issues. Health spending on a national level is expected to reach \$2.6 trillion and 18% of the gross domestic product in 2010 (Jweinat, 2010). These costs are a major concern for the general public, government, and employers who purchase healthcare for their employees. In 2002, the United States spent \$5,267 per person for healthcare. Switzerland, which at the time was the second most expensive, spent \$3,445 per person. The third, fourth, and fifth most costly systems -- (a) Norway, (b) Canada, and (c) Germany -- spent less than 60%

of what the United States spent per capita. The federal government projects an annual growth rate of 7.2% through 2013 (Bodenheimer, 2005).

Controlling healthcare costs by reducing rehospitalizations is an important element of President Barack Obama's 2009 proposal for financing health care reform. Medicare expenditures for potentially preventable rehospitalizations may be as high as \$12 billion a year. The estimate for unplanned rehospitalizations in 2004 was \$17.4 billion (Jencks, Williams, & Coleman, 2009). Among Medicare recipients, one in five medical patients (19.6%) is readmitted within 30 days, accounting for \$15 billion in spending (Allaudeen, Vidyarthi, Maselli, & Auerbach, 2011).

Recent national hospital-specific risk-standardized 30-day readmission rates approached 25% for Medicare Congestive Heart Failure (CHF) patients (Ross et al., 2010). Readmitting a quarter of patients after CHF hospitalization within 30 days is not likely to represent optimal care for patients and suggest that there is a clear opportunity for improvement that might be achieved through enhancing the quality of inpatient care or through improved transitions from the inpatient to the outpatient environment (Krumholz et al., 2000).

Hospitalizations account for 31% of total health care expenditures. In Medicare, inpatient care accounts for 37% of spending and readmissions account for a significant portion of that cost. (Minott, 2008). In 2004, Medicare's cost for unplanned hospitalizations was \$17 billion out of a total Medicare cost of \$102.6 billion incurred during that period. As a measure of performance quality, CMS began reporting hospitals' 30-day readmission rates for heart failure in 2009 (Ross et al., 2010). Beginning in fiscal year 2012, CMS will be authorized to track hospital re-admission rates for certain high cost

conditions and assess a payment penalty for those with high re-admission rates. This clearly indicates that hospitals must pro-actively examine opportunities to improve in the areas of quality and patient-centered care in order to avoid payment penalties (Jweinat, 2010). According to the Medicare Payment Advisory Commission, hospital readmissions are prevalent, costly and largely preventable. The national 30-day readmission rates for acute myocardial infarction (AMI) , CHF, and pneumonia have had very little improvement from 2007 through 2010 (Kocher & Adashi, 2011).

In contrast to the Medicare Payment Advisory Commission's position that hospital readmissions are costly and preventable, it can be argued that not all readmissions can or should be avoided. Some readmissions are planned, some are unplanned and some are unrelated to the initial reason the patient came to the hospital. According to the American Hospital Association (AHA), recent evidence suggests that it is difficult to draw conclusions about quality of patient care using data only on readmissions ("AHA looks at recent research done on hospital readmissions," 2011). Inadequate discharge planning, lack of self-management training and poor follow-up may leave many individuals with chronic illnesses in a revolving door of hospitalizations (Perloe, Rask, & Keberly, 2011). Some readmissions are beyond the control of hospitals because of factors such as patients' chronic conditions, failure to follow care instructions, and socioeconomic situations. Therefore, misaligned policies could direct hospitals to reduce readmissions that are appropriate for safe patient care and may actually save lives. Some readmissions may be avoidable due to natural progression of the disease or a variety of other factors. Some readmissions are manifestations of problems in the broader health care system. Preventing readmissions is a complex, system- wide problem that involves hos-

pitals, physicians, and other providers who manage patients' care as well as patients and their families (Feldpush & Drevna, 2010).

High quality care is a major challenge in healthcare organizations and requires critical as well as strategic contributions from multiple components of the continuum of care. With increased specialization of healthcare, it is becoming even more critical that providers between settings operate in a team effort. Poor care in the inpatient setting can oftentimes lead to un-planned re-admissions, many of which are avoidable. Readmission rates are a key focus of payers and policy makers with an interest in promoting economic efficiency and quality (Bisognano & Boutwell, 2009)

Disparities in Healthcare

The United States is a multi-ethnic society with continuous growth in diversity. The 2010 U.S. Census indicates that 38.9 million Americans identified as Black/African Americans, 14.6 million as Asian/Asian American, and 50.4 million as Hispanic or Latino. Demographers estimate that by 2050, 14.6% of Americans will be African American, 8% will be Asian, and 24.4% will be Latino. This increase is an indication that in the coming decades, immigrants and their descendants across all ethnic groups will account for a major portion of the U.S. population growth (Brondolo, Gallo, & Myers, 2009).

Minority health is one of the most important issues facing the nation's healthcare system today. Racial/ethnic disparities in healthcare have been described extensively in the literature and are recognized as a national problem. The Institute of Medicine (IOM) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care issued its report in March of 2002. The study was commissioned by Congress and

had the following as its specific charge: (a) to assess the extent of racial and ethnic differences in healthcare that are not otherwise attributable to known factors such as access to care; (b) to evaluate potential sources of racial and ethnic disparities in healthcare at the provider, institutional, and system level; and (c) to provide recommendations regarding interventions to eliminate healthcare disparities (Nelson, 2003).

The 2003 and 2004 congressionally mandated National Healthcare Disparities Report showed that African Americans and Hispanics had higher hospitalization rates than Whites for uncontrolled diabetes and long and short-term complications (Jiang, Andrews, Stryer, & Friedman, 2005). This report emphasizes a need to integrate health care activities to reduce disparities and improve the quality of care (Moy, Dayton, & Clancy, 2005). Similarly, a substantial amount of research in recent years has demonstrated that health outcomes are not equitable among ethnic groups (Brondolo, et al., 2009). For example, the American Cancer Society shows that colon and rectal cancer death rates are currently nearly 50% higher in African Americans than in Whites (Hofmann, 2010).

Understanding disparities has presented many challenges. The 2002 IOM report states that disparities are indicated by differences remaining after accounting for needs and preferences according to the availability of health care. On the other hand, the National Healthcare Disparities Report used a broad definition stating any differences among populations are considered disparities (Moy et al., 2005).

Researchers are becoming more interested in understanding the pathways that may lead to health disparities in care. For example, research has explored how racism, poverty and other stressors relate to the health disparities of various populations through

psychosocial and bio-behavioral pathways. Although theoretical rationale speculates that racism and ethnic discrimination has an effect on the health of various populations, empirical evidence of these effects are still in their early stages. Much of the research on racism and health has studied the effects of racism on physiological systems. Laboratory and ambulatory monitoring studies documented the relationship between racism and psycho physiological reactivity including blood pressure and heart rate responses. These patterns of reactivity have been associated with the development of stress-related disorders such as hypertension and other cardiovascular diseases (Brondolo et al., 2009).

Similarly, increasing amounts of evidence are starting to show the effects of racism on the patient-provider relationship. For example, research shows that physicians make differential estimates of risk for disease and spend smaller amounts of time planning and collaborating with individuals from certain ethnic or racial groups. Furthermore, research shows that minority populations have a higher level of mistrust of healthcare providers (Hofmann, 2010). Providing more culturally sensitive healthcare is one way of addressing institutional racism. Medical education has begun to place a greater emphasis on training professionals to provide more culturally responsive care. Unless interventions are developed, it will remain difficult to make progress towards eliminating health disparities (Brondolo et al., 2009).

Empirical evidence indicates that disparities in health care can be costly. Researchers at Johns Hopkins School of Public Health and the University of Maryland found that eliminating health disparities for African Americans, Asians and Latinos would have saved an estimated \$229 billion in U.S. medical care expenditures between 2002 and 2006 (Hofmann, 2010). Research was done to assess the health impact of re-

solving racial disparities. An analysis using U.S. Mortality Data shows that the mortality rate of both African American infants and adults was more than double that of Whites in 2000. Had the age-specific mortality rates of the two races been comparable during the period of 1991 to 2000, calculations indicated that 886,202 deaths could have been avoided (Woolf, Johnson, Fryer Jr, Rust, & Satcher, 2008).

Disparities in Hospital Readmissions

Socio-demographic differences between readmitted and non-readmitted groups include age, race, payer status, and language. Race and Medicaid insurance are generally indicators for the underlying root cause aspects that lead to hospital readmission (Allaudeen et al., 2011).

African Americans have a higher prevalence of CHF than any other race or ethnic group. Readmission rates for African American patients discharged with CHF are 48% within 6 months. CHF is the only major cardiovascular condition that is increasing in incidence and prevalence accounting for 6 million hospital days annually at an aggregate cost of \$8 billion. Interest in disease management has generated a need to identify high risk groups that may benefit from post-discharge intensive intervention. The information would be useful in the allocation of resources to improve outcomes in these patients (Krumholz et al., 2000).

Another common cause of hospital readmissions is Diabetes Mellitus. A study was done on 124,867 diabetes patients, 50 years of age or older that had been discharged alive from a hospital in the same geographic area. Twenty six percent of the patients were readmitted within 3 months. Eighty seven percent of the readmissions were un-

scheduled. The risks for unscheduled and scheduled readmissions varied by patients' demographics, socioeconomic, and clinical characteristics. African Americans and Hispanics were more likely to have an unscheduled readmission than Whites. Patients with public insurance had a higher risk for an unscheduled readmission than patients with private insurance. Patients residing in low income urban areas versus higher income neighborhoods had higher risks for unscheduled readmissions. Risks for an unscheduled readmission consistently increased as the number of chronic conditions in patients increased (Kim et al., 2010).

Racial disparities in health care are well documented and eliminating them is a national priority. Reducing readmissions is a policy focus because it represents an opportunity to simultaneously reduce costs and improve quality. Understanding whether and why African American and other minority patients have higher readmission rates for common publicly reported conditions can help improve the design of interventions that target the most vulnerable patients and hospitals. Evidence shows that elderly African American Medicare patients have higher odds of 30-day readmissions than White patients for AMI, CHF, and pneumonia. The disparities were related to race as well as to the site where care was provided. Hospitals that provided care to a high proportion of African Americans seem to provide lower quality of care than hospitals that provide care to a higher proportion of White patients (Joynt, Orav, & Jha, 2011). Among a national cohort of White and African American patients admitted to skilled nursing facilities, African Americans are associated with a 40% increase risk of rehospitalization within 30 days of admission and a 50% increased risk of rehospitalization within 90 days of admis-

sion. Racial disparity is largely explained by patient characteristics and facility types but does persist after controlling for these factors (Li, Glance, Yin, & Mukamel, 2011).

The common thread that runs through the ACA is incentivized coordination of care across transitions which can be used strategically to reduce preventable readmissions (Kocher & Adashi, 2011). Disparities in preventable readmission rates exist by race, ethnicity, and age. A preventable readmission can be considered an unintended and undesired subsequent post-discharge hospitalization, where the probability is subject to the influence of multiple factors. Patients with higher levels of social support are less likely to experience preventable readmissions. Preventable hospital readmissions possess all the hallmark characteristics of health care events prime for intervention and reform (Vest et al., 2010). In order to reduce preventable readmissions, interventions to improve the quality of outpatient treatment should be done on behalf of racial and ethnic minorities with a primary focus on the elderly (Jiang et al., 2005).

Research examining the level of racial concentration of hospital care in the United States has found that a small number of hospitals care for a vast majority of African American patients. These hospitals differ in their characteristics from those of other hospitals and they often provide lower quality of care. The variation in performance among hospitals that care for high volume of African American patients represents a critical opportunity (Jha, Orav, Li, & Epstein, 2007)

Faith-Based Culture among African Americans

Since the inception of this country, the basis for health disparities in the United States has centered primarily on race and ethnicity. W.E.B. DuBois was among the first

to recognize the connection between health and socioeconomic status in his publication of *The Philadelphia Negro*, which highlighted factors such as low economic and social status, employment, education, leadership, and the African American church as contributing to the individual health status (Natale-Pereira, Enard, Nevarez, & Jones, 2011).

Almost immediately after taking office as president, George W. Bush sought to make good on his campaign promise to incorporate faith-based organizations into the social service network. Even though President Bush planned his initiative as a strategy to favor his Republican religious base, the groups that were found most likely to tap into government funds were not White evangelicals but African American congregations (Starr, 2001). The Black church has served a premier role as informal social service provider throughout its existence. Research has been done on its use as a formal entry point for social services. Research indicates that churches provide a range of prevention and treatment that contribute to the psychological and physical well-being of their congregations (Blank et al., 2002).

Most Americans identify with a church or some other form of religious institution, making it a good setting for reaching and recruiting participants for various types of programs and initiatives. Eighty percent of those surveyed identify themselves as Christian (M.K. Campbell et al., 2007). While 85% of American adults identify with a religion (Byrd, Fletcher, & Menifield, 2007), when compared to Whites, African Americans (a) exhibit higher overall levels of church attendance, (b) are more strongly subjectively identified with their church affiliation, and (c) are more likely to be members of a church-related group (Hunt & Hunt, 2001).

The church is an effective channel for delivering health programs to African Americans. Health promotion programs in schools, health care centers, and work sites can target physical interventions in certain population groups but tend to overlook the more sedentary groups. When spiritual dimensions are included in establishing improved health behaviors and healthy lifestyles, vital social needs are met. Resources provided by the church can facilitate health related programs conducted in the churches. The church has a direct connection with individuals within the community. Ethnically diverse and minority individuals may feel alienated from traditional health promotion activities but comfortable in their own place of worship. In the African American church, social support is provided to congregational members and surrounding community to assist with overcoming social and political barriers as well as disparities in access to healthcare resources (Peterson et al., 2002).

One example of a faith-based initiative is Methodist LeBonheur Healthcare (MLH). MLH is a five hospital faith-based integrated delivery system located in Memphis, Tennessee. MLH is a dominant force in its market with control of 47% of the market share. MLH was challenged with treating a large population of minority and elderly patients in a medium sized urban city. MLH provides more indigent care than any other healthcare organization in Tennessee. The population in Memphis and Shelby County is predominately African American, many of whom are of lower SES. The system established a faith-based care delivery network as a strategy for streamlining the clinical management of inpatients and reducing their utilization of hospital services. The initiative is currently working towards an integrated understanding of faith and health. It has become a conduit for a variety of data streams, information, and intelligence on how faith may

work best for health care and in health systems. An analysis of results of the initiative suggested that it has contributed to positive outcomes in terms of some key health care utilization metrics (Cutts et al., 2011).

Many African American churches include health as part of their mission and offer health services as well as other related programs through special committees and ministries (Resnicow et al., 2001). The African American church's valued and central position within the community is demonstrated by the variety of secular activities and functions they perform (Taylor, Chatters, & Levin, 2003). Numerous programs have focused on African American churches as a venue to reduce disparities that exist between African Americans and other racial/ethnic groups. African American churches have a long and rich history as the center of spiritual, social and political life for many African Americans. Churches and faith-based organizations have become critical partners in the effort to reduce disparities. These non-traditional channels are commonly used to deliver health-related interventions to populations that are considered hard to reach or who view traditional health resources with distrust (M.K. Campbell et al., 2007). Researchers have noted that many churches have organizational structures and communications systems that can be used to implement health programs to promote health messages (Kaplan, Calman, Golub, Ruddock, & Billings, 2006). The African American church has served in a dominant role as an informal social service provider throughout history and its use as an entry point to formal services has been heavily researched (Blank et al., 2002).

African American churches tend to provide more support programs to members of its congregation than White churches. One study indicates that African American churches provide more programs than other churches, in terms of numbers and types of

programs (Blank et al., 2002). This result remained significant after controlling for church size and budget. These programs and services include facilitation of linkages to community health resources and providing various forms of social and psychological support (Taylor et al., 2003). The fact that African American churches provide more supportive programs than White churches implies that these services might not be as accessible to African Americans in the community as they are to Whites. It could also mean that African American churches view themselves more as service providers or that community services available to African American are less acceptable (Blank et al., 2002).

African American and White Churches also perceive their missions differently. There have been some studies on evaluating the merits of services through churches and how formal systems are utilized when members of congregations are in need of more specialized services. Southern churches are recognized as centrally focused resources in the culture of their region. They serve as beacons of hope for their communities and because of their congregational commitment, they play a critical role in influencing the attitudes and behaviors of members (Blank et al., 2002).

Faith-based initiatives for lifestyle change show promise by not only improving access to populations in need of such intervention but by helping to promote health behaviors in African American communities (Dodani, Kramer, Williams, Crawford, & Kriska, 2009). African American churches are cohesive, spiritual, and social communities that foster the religious and social well-being and integration of individuals and families (Taylor et al., 2003). By developing lifestyle intervention programs within the threads of a faith-based community, not only can those who are in need of a lifestyle change be

reached, but those who are already in church programs can receive continued maintenance for themselves and their families. African American churches are an ideal setting for health programs due to their historical leadership in health screening and disease treatment in their communities (Dodani et al., 2009).

African Americans have a disproportionately higher incidence of hypertension along with several other chronic diseases, but are less likely to benefit from clinical lifestyle modification programs. Although behavior modification is an important step in controlling hypertension, African Americans have consistently been less successful with achieving desired behavior modifications. Faith-based initiatives for achieving lifestyle change show promise in helping to promote healthy behaviors in African American communities (Sunita, 2011).

Healthcare executives have not typically considered disparity issues critical to their organization's mission. Public hospitals and faith-based institutions have been expected to take responsibility for providing services to the underserved (Hofmann, 2010). There is a clear need to identify methods for containing cost and improving care. Given that over half of Americans consider themselves members of a religious organization and the churches' demonstrated ability to pull people together, there is great potential for faith-based interventions to address disparities (Kaplan et al., 2006).

Faith-Based Network Outcomes

The African American church is largely an untapped but potent resource if health care disparities are to be eliminated. The church community is a primary source of social support and community leadership in many African American communities. The African

American church serves not only as the bridge between the community and health care, but also as one of the primary providers of health care information. As such, the church can serve a critical role in improving health outcomes among African Americans (Giger, Appel, Davidhizar, & Davis, 2008). Churches are well accepted sites for cancer screening, blood pressure control, weight loss programs, cholesterol education, smoking cessation, diabetes education, stroke prevention, physical activity, and nutrition education (Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001).

Efficacy of church-based approaches may be due to the importance of church life in the African American population (Christie, Watkins, Weerts, Jackson, & Brady, 2010). African Americans are reluctant to seek or use traditional family support groups. With the role of the church as a healing source in the lives of African Americans, church based support groups reach families who might otherwise struggle alone (Pickett-Schenk, 2002).

The term faith-based organizations will also be used to reference churches and vice versa in this study. Faith-based organizations are potential partners in facilitating advances in health outcomes (Asomugha, Derose, & Lurie, 2011). In a systematic literature review of articles describing faith-based health activities, most programs focused on primary prevention, general health maintenance, cardiovascular health, or cancer. Significant effects reported included reductions in cholesterol and blood pressure levels, weight and disease symptoms, and increases in the use of mammography and breast self-examination (DeHaven, Hunter, Wilder, Walton, & Berry, 2004).

A randomized trial of 24 African American churches revealed that an intervention, consisting of exercising, diet, and self-management was well received by diabetic

participants and improved short term metabolic control (Samuel-Hodge et al., 2009). Similarly, a study evaluating the effectiveness of a faith-based diabetes education program for adult African Americans revealed that general knowledge about diabetes was increased (Wade, 2005). Finally, a translation of a diabetes prevention program for delivery in African American churches revealed successful outcomes in fasting glucose, weight, and body mass index (BMI) (Boltri, Davis-Smith, Okosun, Seale, & Foster, 2011).

A faith-based weight loss intervention in the lower Mississippi Delta developed from a partnership between academic and community partners. A community-based participatory approach was used. Participants lost an average of 2.34 kg from baseline to 16 week follow-up for a mean weight change of -2.7%. Participants reported enjoying the spiritual and group based aspects of the program (Yeary et al., 2011).

The Body & Soul project was a collaborative effort between the National Cancer Institute, American Cancer Society, and research groups that had conducted efficacy studies aimed at promoting increased fruit and vegetable consumption among African American church members. The Body & Soul health initiative employed a 24-week intervention consisting of African American church members who were enrolled during the 3 year study. The goal of the study was to examine the effectiveness of a faith-based community intervention designed to reduce obesity related outcomes in African American females. Results showed that attendance at project events, receiving educational materials, and self-reported quality of the motivational interviewing calls were associated with significantly greater fruit and vegetable intake, decreased fat consumption, and other secondary outcomes (M. K. Campbell, Resnicow, Carr, Wang, & Williams, 2007). Out-

comes indicated improvements in weight, BMI, waist-hip ratio, systolic blood pressure, and minutes exercised (Christie et al., 2010).

African American men are 60% more likely to develop prostate cancer and twice as likely as their White counterparts to die from the disease. A pilot study was performed to examine the efficacy of a spiritually based educational intervention for increasing informed decision making for prostate cancer screening among African American men. The study had a small sample size but did reveal findings that suggest that a spiritually based approach may be promising for use in promoting awareness of prostate cancer among church-attending African American men (Holt et al., 2009).

Cardiovascular related diseases (CVD) are the leading cause of death in the United States. Several risk factors have been associated with the development of CVD including (a) family history, (b) diabetes, (c) hyperlipidemia, (d) hypertension, (e) smoking, and (f) obesity. The constellation of these factors and hypertension is referred to as metabolic syndrome (Gaillard, Schuster, Bossetti, Green, & Osei, 1997). The metabolic syndrome is an accumulation of cardiovascular disease risk factors that often cluster together and are associated with being overweight. It is an increasingly common condition in the United States (Lucove, Kaufman, & James, 2007), and is especially prevalent among African American women (Gaillard et al., 1997). Vigorous physical activity is recommended as a key prevention to metabolic syndrome. Even though the health benefits of physical activity is widely known, only 30% of U.S. adults comply. White Americans are 1.6 times more likely to comply with recommended levels of activity than African Americans. A faith-based initiative consisting of 20 African American churches revealed that engaging in recommended levels of vigorous physical activity is associated with the ab-

sence of metabolic syndrome in a predominately obese sample of African American women (Shuval et al., 2011).

A church project tested the impact on cardiovascular risk profiles of African American women ages 40 years and older after 1 year of participation in one of three church-based nutrition and physical activity strategies. The groups consisted of a standard intervention group, a standard intervention group with spiritual (church-based) strategies, and a self-help strategy group. The intervention participants achieved clinically important improvements one year after program initiation (Yanek et al., 2001). In another faith-based initiative, forty one overweight or obese adults in a church congregation provided fasting blood samples and answered a wellness questionnaire before and after completing an 8-week diet and exercise program. The intervention decreased weight, body fat, and central adiposity, improved indexes of metabolic syndrome and increased self-reported wellness (Ivester et al., 2010).

Communities without access or resources for traditional health promotion programs benefit most from church-based community health promotion programs (CBHPP). Successful CBHPP have been found to have the following key elements: partnerships, positive health values, availability of services, access to facilities, community-focused interventions, health behavior change, and supportive social relationships. These elements are recommended for new programs to foster future success in promoting health behavioral change (Peterson, et al., 2002).

Conceptual Framework

Theoretical and conceptual support for this study is taken from literature in The Theory of Social Justice and Equity and the CCM.

Social Justice Theory

The United States is a society in which racial and ethnic characteristics are strongly associated with socioeconomic class and equitable opportunity (Epstein, 2004). The conditions that qualify an individual for equality are neither confining nor binding. When someone lacks the requisite potential for equality either from birth or accident, it is regarded as a defect or deprivation. There is no race or recognized group of human beings that lacks this attribute (Rawls, 1999). There are numerous kinds of equality and many reasons for being concerned with it. Some of the reasons for regulating social and economic inequalities are (a) some members of society are adequately provided for while others suffer hardship, hunger, and treatable illnesses; (b) to prevent one part of society from dominating the other; and (c) significant political and economic inequalities are often associated with inequalities of social status that encourage those of lower status to be viewed by themselves and by others as inferior (Rawls, 2001). A theory of social equity was developed in 1968 and put forward as the third component for public administration. The first two components were economy and efficiency. Social equity was given the same status as economy and efficiency, as values that should be adhered to by public administration. Since that time, considerable progress has been made on the concept of social equity. A significant amount of the progress in social equity thinking since its inception in 1968 has been driven by the efforts of John Rawls (Frederickson, 1990).

Using concepts within Rawls's theory of justice as fairness, there is overwhelming evidence that social inequalities affect health outcomes. Studies of the relationship between economic inequalities and health confirm the importance of individual economic status on health outcomes. Research also indicates that individual and household poverty are risk factors for diseases such as asthma, diabetes, cancer, and cardiovascular disease, all of which contribute to mortality. A deficiency in the capacity to pursue good health creates a disadvantage toward achievement of good health outcomes. A case can therefore be made that a more equitable distribution of healthcare aids in achieving good health outcomes (Coursen, 2009).

Vulnerable populations are defined as social groups who have an increased relative risk or susceptibility to adverse health outcomes. In order to reduce vulnerability to disease, society as a whole is responsible for ensuring justice and human rights (Flaskerud & Winslow, 1998). The Henry Ford Health System in Detroit, MI initiated a 3-year healthcare equity campaign to address potential sources of inequality in healthcare. The campaign defined healthcare as a provision of care that does not vary in quality by personal characteristics such as ethnicity, gender, geographic location and socioeconomic status (Hofmann, 2010). The Memphis, Tennessee based CHN faith-based initiative was created by MLH based on the realization that factors which affect population health exist primarily outside of hospital settings. Ultimately social determinants play a major role in health service requirements of the patient (Cutts et al., 2011). The United Kingdom released a report that proposed a framework for addressing socioeconomic inequalities in health. The framework suggested four levels for intervention: (a) improving the physical environment (e.g., housing, working conditions, and pollution

levels); (b) addressing social and economic factors (e.g., income and wealth, unemployment, and social support); (c) improving access to appropriate and effective health and social services; and (d) reducing barriers to adopting healthy lifestyles by changing behavioral risk factors. Because of the contribution of social class differences to disparities, a similar model could be useful for addressing racial and ethnic inequalities in health care in the United States (Cooper, Hill, & Powe, 2002).

Social Equity is a phrase that has implication to an array of value preferences, organizational design preferences, and management style preferences (Frederickson, 1990). Persisting disparities in health violate widely shared U.S. norms of equality of opportunity and the dignity of each person. Eliminating health disparities is important for the overall well-being of the entire U.S. society (Williams & Jackson, 2005). Research indicates that faith-based organizations (FBOs) can promote health and well-being both within congregations and throughout communities. This knowledge has sparked renewed thinking about how FBOs might best help improve health and promote health equity (Asomugha et al., 2011).

There are more churches per capita in the United States than in any other country. Faith communities are involved in public health and community development issues related to social justice (DeHaven et al., 2004). The African American church is at the center of the African American community. Historically, the African American church has not only provided a wealth of resources to its communities, it has also been deeply entrenched in daily affairs and frequently aided in social welfare functions such as providing for the indigent (Giger et al., 2008). The African American church has provided sup-

port to the congregation and surrounding community in an effort to overcome social and political barriers that create unequal access to health resources (Peterson et al., 2002).

Evidence shows that social support correlates with higher levels of physical activity and subsequently better health outcomes (Glickman & Peterson, 2009). Social support found in the African American church can be a key component for assisting members of its congregation and the African American community with overcoming deficiencies in health care access that are perpetuated by systemic disparities. The social support provided in African American churches has proven to be effective with getting members of communities involved with improving outcomes related to chronic diseases such as cardiovascular disease, diabetes and also improvements in healthy lifestyle behaviors (Christie et al., 2010).

Social justice has improved over the years and is intended to be the norm for all members of society. Unfortunately there are remaining systemic challenges that continue to promote disparities among certain minorities and vulnerable populations. Evidence shows that the African American church is an excellent resource for assisting with mitigating the shortfalls of social justice as it relates to the effects of inequities and disparities among members of its congregation and the community at large.

The Chronic Care Model (CCM)

The number of persons with chronic illnesses is growing at a high rate due to rapid aging of the population and greater longevity of persons with many chronic conditions (Wagner et al., 2001). The increasing incidence of chronic diseases is approaching epidemic levels (Barr et al., 2003). Chronic health conditions and chronic illnesses cannot

be cured. Effective strategies are therefore required to manage the illness and minimize consequences for patients, their families, and the health care system (Katterl & Kalucy). One method for managing chronic illness is the CCM. CCM is a multifaceted framework for enhancing health care delivery (Piatt et al., 2006) and a proposed solution to improving management, prevention of complications, and outcomes in patients with chronic diseases (R. J. Adams, Smith, & Ruffin, 2000). Proponents of CCM suggests that it should also be used for the prevention of chronic disease (Barr et al., 2003).

CCM identifies essential elements that encourage high quality chronic disease care (S. G. Adams et al., 2007) and provides guidelines for quality improvement initiatives such as the Health Disparities Collaboratives. CCM has six areas of focus, which are (a) self-management, (b) decision support, (c) delivery system design, (d) clinical information systems, (e) health care organization, and (f) community resources (Coleman, Austin, Brach, & Wagner, 2009). CCM synthesizes the elements of successful chronic disease management programs and relates them to improvements in outcomes. The six elements work in concert providing patients and their professional caregivers with resources and information essential for management of chronic disease (Glasgow, Tracy Orleans, Wagner, Curry, & Solberg, 2001). Literature indicates that the church in the African American community is viewed as a community asset. The value of the church as an asset is integral to the CCM community resources area of focus. In addition, the literature also indicates that many African American church-related initiatives focus on teaching and educating members of its congregations on how to manage the effects of chronic conditions such as diabetes, hypertension, and obesity. The latter activities are integral to the CCM self-management focus.

Systematic reviews and clinical studies have demonstrated that implementing CCM components in the care of patients with chronic diseases is associated with significantly improved outcomes (Adams, et al., 2007). A nurse-directed program consisting of two CCM components, self-management and delivery system redesign, was associated with a 56% reduction in hospital readmissions for CHF and a significant improvement in quality of life scores (Bodenheimer, Wagner, & Grumbach, 2002). Chronic Obstructive Pulmonary Disease (COPD) patients who were exposed to 2 or more CCM components experienced fewer unscheduled ED visits, fewer hospitalizations, and reduced hospital length of stay (LOS) when compared to control groups (S. G. Adams et al., 2007). Patients in rural communities with diabetes who were exposed to CCM showed improved scores as well as a gain in empowerment, readiness to change, and goal setting which supports translating their improved knowledge into behavior change (Siminerio, Piatt, & Zgibor, 2005). There is growing evidence that education and supportive interventions directed at helping patients change risky behaviors or become better self-managers improve outcomes across a range of chronic illnesses (Wagner, 2000).

With chronic diseases such as coronary heart disease, hypertension, asthma, and diabetes affecting more than 100 million Americans and accounting for three quarters of the nation's annual health care costs (Glasgow et al., 2001), effective models of organizational change and examples of changes in care still needs to be demonstrated if the United States is to transform care as called for by the IOM (Hroschikoski et al., 2006). Research indicates that chronically ill patients benefit from care that includes skilled clinicians and educators who have both clinical skills and self-management support skills, and population managers who understand team function and public health principles and ap-

proaches (Wagner, 2000). In essence, CCM is a guide to improving chronic illness management. Evidence demonstrates that in addition to improving the quality of chronic care, CCM can also contribute to a reduction in healthcare costs by reducing hospital admissions, ED visits, and physician consultations (Bodenheimer et al., 2002).

Hypotheses

FBOs are potential partners in facilitating advances in healthcare outcomes (Asomugha, Derose, & Lurie, 2011). The church community is a primary source of social support and community leadership in African American communities. Because of this relationship, the church plays a critical role in improving health outcomes among African Americans (Giger, Appel, Davidhizar, & Davis, 2008). A systematic review of literature regarding faith-based health activities revealed reports of significant effects such as (a) reduction in mean cholesterol and blood pressure levels, (b) reduction in mean weight and disease symptoms, and (c) increase in the use of mammography and breast self-examination (DeHaven, Hunter, Wilder, Walton, & Berry, 2004). The following research was designed to test the hypothesis that the likelihood of a 30-day hospital readmission for key diseases of high risk to African Americans is lower for those who participate in a faith-based network as opposed to those who do not. In this study, we focused on the Congregational Health Network (CHN) as a faith-based network.

Hypothesis 1: African American inpatients that are CHN members are less likely to be readmitted compared to African American inpatients that are not CHN members.

The 2003 and 2004 National Healthcare Disparities Report showed that African Americans and Hispanics had higher hospitalization rates than Whites for long and short

term complications for diabetes (Jiang, Andrews, Stryer, & Friedman, 2005). Literature also shows that elderly African American Medicare patients have higher odds of 30-day readmission than white patients for AMI, CHF, and pneumonia (Joynt, Orav, & Jha, 2011). The risk of unscheduled and scheduled readmissions varies by patient demographics, socioeconomics, and clinical characteristics. Patients with public insurance have a higher risk for readmission than patients with private insurance. Patients residing in urban areas versus higher income neighborhoods have higher risk of readmission (Kim, Ross, Melkus, Zhao, & Boockvar, 2010). The following hypothesis is designed to test the likelihood of readmission among African Americans with lower SES and who are members of a FBN compared to African Americans that are non FBN members. As previously indicated, in this study we focused on the CHN as a faith-based network.

Hypothesis 2: Among African American inpatients, CHN members that reside in neighborhoods with low SES are less likely to be readmitted than those that are non-CHN members residing in low SES neighborhoods.

CHAPTER 3

METHODS

Design

The MLH Model

Methodist LeBonheur Healthcare (MLH) is located in Memphis, Tennessee. MLH consists of five hospitals with over 1,000 beds and controls 47% of the local market. The population in the Memphis community is 63.3% African American. Memphis also has a large indigent and elderly population, which along with racial/ethnic disparities, has created challenges for the local healthcare delivery system. Increasing costs associated with treating a large indigent, minority, and elderly population of patients prompted MLH to establish a faith-based CHN that attempts to monitor the care of at-risk member patients throughout the continuum of care.

CHN is a partnership among MLH, congregations, and other relevant community assets designed to address health issues by increasing the congregations' ability to care for its members and the surrounding community. The CHN Model focuses on a congregational health network of approximately 500 member churches, which are distributed throughout the city of Memphis and surrounding areas (Figure 1). African American clergy in Memphis have significant social capital and status, especially among the underserved. Through the partnership, MLH and congregations have established a health network that begins in the congregation, moves into the hospital and back out into the care of the congregational community. The initiative represents a movement away from the

traditional clinical model of care to a faith-based community model. A key strategy of MLH's faith-based initiative is its focus on mapping community religious health assets as an aid to providing a holistic environment for more effective care (Cutts et al., 2011).

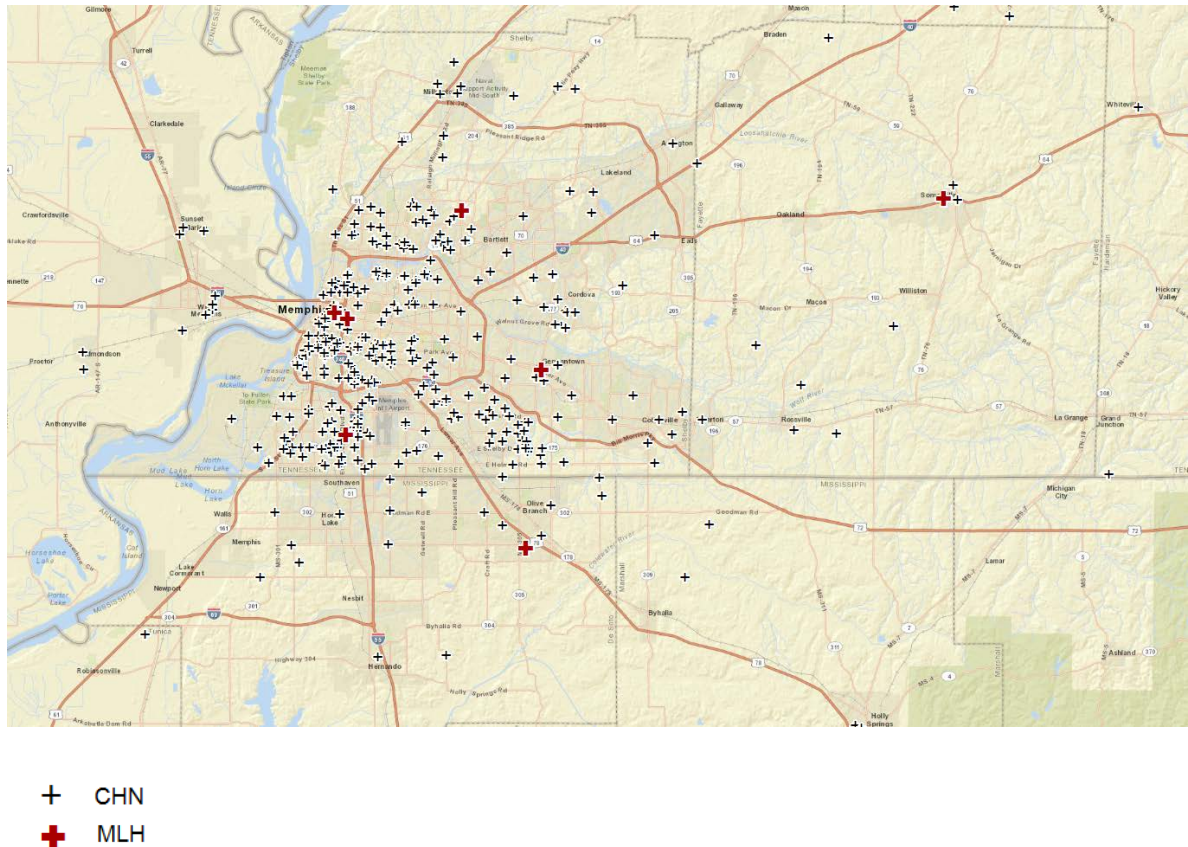


Figure 1. CHN congregation distribution and MLH hospital locations.

CHN enters into partnership with congregations without regard to religious traditions of the partnering congregations. The partnership addresses congregational health in the areas of (a) clergy, (b) spouse health, (c) education, (d) intervention, (e) prevention, (f) treatment, and (g) aftercare. The standard for CHN's partnering with a congregation is their use of MLH for healthcare. Congregations are expected to enter into a covenant

agreement with CHN. The beginning of the partnership is with the clergy leader and his/her buy-in and ownership.

The CHN concept is based on the belief that factors affecting the health of a population can be found primarily outside of the hospital setting. Although all churches are invited to become a part of CHN, approximately 85% of participating congregations are African American. A supporting belief of CHN is that community assets can be utilized to complement formal clinical activity, and can address some of the contextual factors before and after hospitalization, that are considered critical to patient outcomes (Cutts et al., 2011). A primary goal of CHN is to utilize the resources of member congregations to navigate patients to an optimal point of care through health navigators employed by CHN, who in turn rely on church liaison volunteers for public health outreach.

Church Liaisons are members of their faith communities and are appointed by the congregational leader. They facilitate partnerships between their congregation and MLH. The number of liaisons at each church is discretionary and may be determined by the congregational leader. The Liaisons are exposed to a training class sponsored by MLH and scheduled by the hospital Navigator. The purpose of the training is to educate the Liaisons on how to coordinate the health needs of their congregational members. The training focuses on (a) working closely with MLH Navigators; (b) scheduling educational outreach for their congregation; (c) informing individuals of upcoming health related classes and events; and (d) providing aftercare support to congregational members following an illness or treatment of a condition. Upon completion of training, a certificate is issued and the Navigator then assists the liaison with congregational member registration. This aspect of the liaison's role is critical because all congregation members are asked to

complete a registration form. Following completion of a registration form, each member is subsequently given a membership card which is presented at the hospital upon request for care.

Finally, a key feature of CHN is the presence of ten Navigators who are employed by MLH and work within CHN. The role of the Navigator is not clinical but they do have knowledge of the community outside the hospital. They are required to establish working relationships with CHN member congregations to ensure that a seamless referral system is created and continuous care and monitoring is provided to CHN member patients throughout the care continuum. They are called upon to assist social work and case management with disposition issues, including identifying CHN patients who may be appropriate for home care. They are also called on to assist with interpretation of medical information for patients and family members. Navigators are expected to work evenings and weekends to engage congregations. They are assigned to congregations in the service area of their designated hospital site.

Navigators can facilitate improved health care access and quality for underserved populations through advocacy and care coordination, as well as address underlying issues related to distrust in providers and the health system that often lead to avoidance of health problems and non-compliance with treatment recommendations (Natale-Pereira et al., 2011). CHN Navigators work with liaisons of member congregations to identify MLH patients who could benefit from community-based support (Figure 2). They visit and follow-up with all patients in the hospital on a daily basis. They coordinate with the patient's congregation as appropriate for the patients care during their hospital stay. The communication process between the Navigator and church liaison can bridge the gap on

any needs that the patient has during hospitalization and during the transitional phase back home or to another care facility. The Navigator also works with members of the hospital team, and other key individuals such as relatives, congregational members or key caregivers to ensure that continuity of care is in place post-hospitalization. CHN Navigators document all visits and contacts related to the inpatient and transitional encounter. The goal of this process is to maintain engagement between the hospital care and care that will be needed upon the patient's discharge from the hospital. Ultimately, this process allows the Navigator and congregational liaison to facilitate movement of patients through the hospital and back into the care of a congregational community.

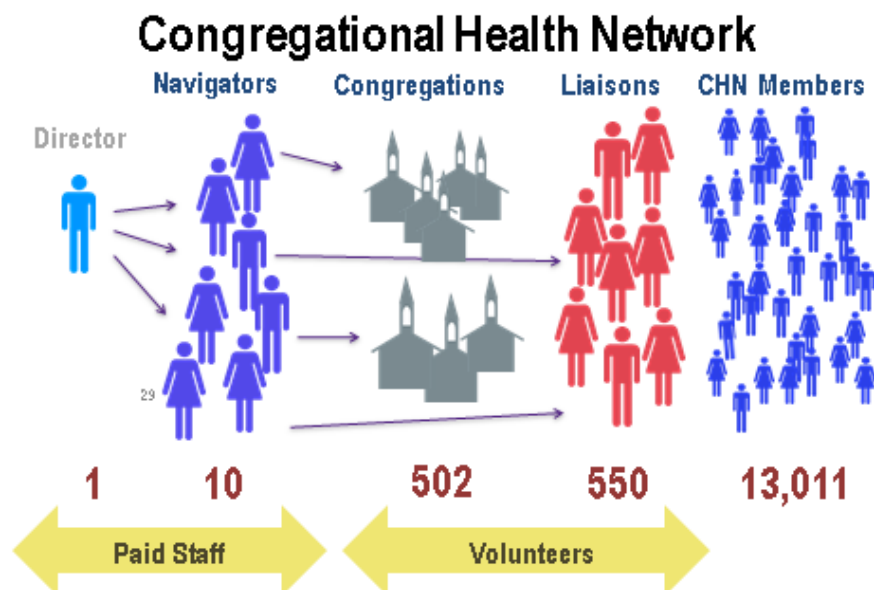


Figure 2. Key components of Congregational Health Network (CHN) 2012.

Data

The main data source is the inpatient data base of MLH in Memphis, Tennessee. Data were collected for each patient admission and stored utilizing electronic health records (EHR) technology. Data used in this study cover inpatient activity for each admission that occurred during years 2008 through 2012 at four of MLH's five adult acute-care hospitals; however, for each patient, only one admission (labeled the index admission) was used in the sample for this study – the methodology used to determine the index admission is described below under the heading **Outcome Variable**. Only 6 months of 2012 data were available, and subsequently used at the time of this study. In addition, median income information by ZIP code of patient residence was acquired from the U.S. Census Bureau's American Community Survey (ACS), which is data based on a 5-year estimate. The most recent year included in the ACS estimate at the time of this study was 2011. To address hypothesis 2, a dichotomous variable was introduced to split patients into two income groups. The poverty level (\$18,480), which was based on the U.S. Census Bureau's determination for a 3-person household with 2 adults in 2012, resulted in too small of a low income group. Therefore, a cutoff was chosen at \$31,000 for median household income per ZIP code. This cutoff was chosen because there was a natural break in the data at this point, as determined by visual analysis of the histogram (Figure 3), and it offered a large enough sample low income group (2,187 which is 61.9% of the full dataset) with a relatively low median income. The median ZIP code income was added as a demographic variable for each patient in this study since data on each patient's income was not available.

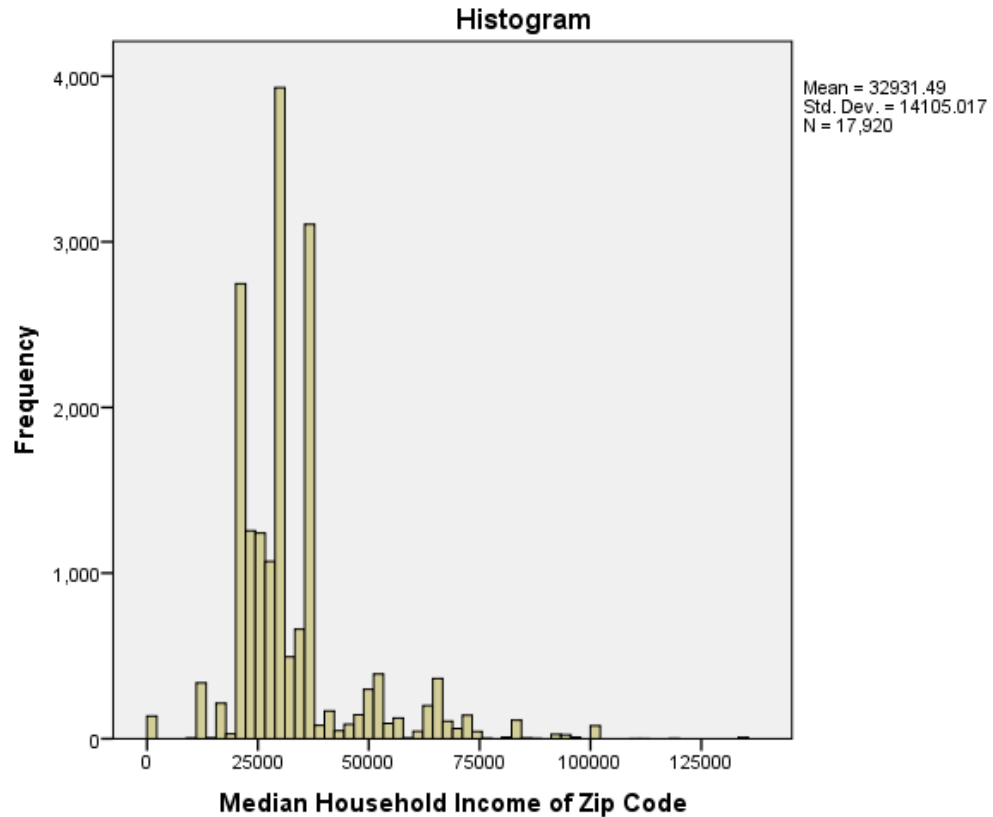


Figure 3. Frequency of median household income of ZIP code.

The sample used in the study consisted of inpatient admissions that met the following criteria: (a) African American, (b) age 65 and over, and (c) with Medicare insurance. Data came from the following hospitals within the MLH system; (a) MLH North Hospital, (b) MLH South Hospital, (c) MLH Germantown Hospital, and (d) MLH University Hospital. Inpatient admissions with the following chronic illnesses were also used to define a sub-sample for the study: (a) AMI, (b) CHF, (c) Diabetes Mellitus, and (d) Pneumonia. Demographic characteristics of the sample populations in this study are shown in Table 1 (for the full sample population) and in Table 2 for the sub-sample of chronic illness patients only.

Table 1

Demographics of Patient Dataset Containing All Illnesses (conditions)

Characteristic	CHN (<i>n</i> = 829)	Non-CHN (<i>n</i> = 17,091)	All patients (<i>n</i> = 17,932)
Gender			
Male	251 (30%)	6,434 (38%)	6,696 (37%)
Female	578 (70%)	10,657 (62%)	11,235 (63%)
Age: Mean (SD)	76.0 (7.9)	75.8 (8.1)	75.8 (8.1)
Median household income of ZIP code			
Median (Q3 – Q1)	\$30,744 (\$12,861)	\$30,744 (\$13,737)	\$30,744 (\$13,737))
Mean (SD)	\$32,499 (\$12,968)	\$32,952 (\$14,158)	\$32,931 (\$14,105)

Table 2

Demographics of Patient Dataset Containing Chronic Illnesses Only

Characteristic	CHN (<i>n</i> = 114)	Non-CHN (<i>n</i> = 3,388)	All patients (<i>n</i> = 3,502)
Gender			
Male	39 (34%)	1,332 (39%)	13,71 (39%)
Female	75 (66%)	2,056 (61%)	21,31 (61%)
Age: Mean (SD)	77.1 (8.5)	75.9 (8.0)	76.0 (8.0)
Median household income of ZIP code			
Median (Q3 – Q1)	\$30,744 (\$13,215)	\$30,744 (\$13,737)	\$30,744 (\$13,737)
Mean (S.D.)	\$31,677 (\$12,320)	\$32,897 (\$13,766)	\$32,858 (\$13,722)

Measures

Outcome variable. The outcome variable is whether or not a hospital re-admission occurred within 30-days after discharge of an index admission. An index admission is considered as the initial admission for an illness from which a subsequent admission occurs. For readmissions, the observation with the date of readmission was se-

lected for this study. Note that patients within the first 30 days of the study (January 2008) may have been a readmission (returning from an admission in December) but these patients are not included as readmissions in this study, and further, patients in the last month of the study (June 2012) may have been readmitted in July 2012 (for which no data were yet available), and therefore these readmissions would not be captured by this study. This study focuses on two sets of patients: (1) all conditions (illnesses) admitted to the hospitals, and (2) admissions for the following chronic illnesses: (a) AMI, (b) CHF, (c) Pneumonia, and (d) Diabetes Mellitus.

Predictor variables. The predictor variable of interest for hypotheses 1 and 2 is a dichotomous variable: (1) member of CHN, and (0) non-member of CHN. This data was captured upon admission in the admissions record.

Control variables. The following variables were used as control variables: (a) age, (b) gender, (c) socioeconomic status, (d) severity of illness, (e) facility fixed effects, and (f) chronic illness.

- Age is listed in the data set as "age" and is stated in chronological years.
- Gender is listed in the data set as sex whereas "M" = male and "F" = female. Sex was recoded for this analysis so that "1" = Female and "0" = Male.
- A proxy for SES was created and is represented by median household-income of each participant's ZIP code. A neighborhood poverty threshold of \$31,000 was used to identify admissions whose addresses are in ZIP

codes with lower SES. A dichotomous variable representing SES was created (“1” = group from low socioeconomic neighborhood; “0” = group from high socioeconomic neighborhood).

- Severity of Illness is listed in the data set as “APRSOI” and is a categorical variable with Severity levels 1 through 4. Severity of illness addresses the level of acuity of the admission (Table 3).
- Facility was listed in the data set as “Facility”. It represents the hospital to which the admission is credited. Facility was recoded to a dummy variable listing each hospital separately and University Hospital as the reference category.
- Each of the four chronic illnesses was identified using a three digit code taken from ICD-9-CM. Dummy variables were created to identify each of the four chronic conditions, with AMI as the reference category. The ICD-9-CM is an abbreviation for the International Classification of Diseases, 9th Revision, Clinical Modification which is the official system used in the United States to classify and assign codes to health conditions and related information.

Table 3

Severity of Illness Model

Severity of Illness	Secondary Diagnosis of Diabetes Mellitus	ICD-9-CM Code
1 = Minor	Uncomplicated Diabetes	250.0
2 = Moderate	Diabetes with Renal Manifestation	250.4
3 = Major	Diabetes with Ketoacidosis	250.1
4 = Severe	Diabetes with Hyperosmolar Coma	250.2

Data Analysis

The focus of this investigation was to determine whether CHN participation lowers the likelihood of hospital re-admission among African American members when compared to African American non-members. Univariate, bivariate, and multivariate statistics were calculated using PASW/SPSS statistical software, version 20. The primary focus of this study was following four chronic illnesses: (a) AMI, (b) CHF, (c) Pneumonia, and (d) Diabetes Mellitus. However, an analysis was also performed to examine the research question as well as hypotheses based on all illnesses among African American CHN and non-CHN inpatient admissions, age 65 years and over, during the period of 2008-2012.

Bivariate procedures. Total readmissions for CHN and non-CHN participants. A cross-tabulation followed by a chi-square test of independence was performed in order to examine bivariate relations between hospital readmissions (outcome variable) and CHN or Non-CHN membership, which is the predictor variable.

Multivariable Procedures. A logistic regression model was utilized to examine the association between the predictor and the hospital readmissions outcome variable, controlling for potential confounders (listed above under **Control Variables**). A logistic regression model was used because of its appropriateness for dichotomous dependent variables as it addresses the violation of normality assumptions due to a non-linear dependent variable.

CHAPTER 4

RESULTS

Introduction

The purpose of this study was to examine the association between CHN membership and hospital readmissions. The research question was as follows:

1. What impact does a CHN have on hospital re-admissions of its participating African American members when compared to African American non-members?

A review of the literature revealed that numerous studies have been conducted to explore the association between the African American faith-based culture and healthcare outcomes. This study focused specifically on the relationship between a faith-based initiative and hospital readmissions. Research shows that hospital readmissions can be a key contributor to escalating healthcare costs and are an indicator of a lower quality of care. This study provided insight that will complement the initiatives that have been undertaken by CMS, which addresses reducing causes of hospital readmissions and subsequently reducing the overall cost of healthcare. This chapter examines results of the analysis used to answer the research question as well as hypotheses. The analysis using all illnesses is reviewed in the next section, followed by an analysis of the aforementioned four chronic illnesses.

Analysis of All Illnesses

This section examines the effect of the predictor and control variables on the outcome variable when all illnesses are considered. The same model of tests and analyses was used to review data from all illnesses during the same time frame as the primary study. Following is a listing of descriptive statistics.

Univariate/ Descriptive Statistics

Descriptive statistics for (a) Readmission based on all illnesses, (b) the various MLH inpatient facilities, (c) Severity of Illness, (d) Gender, (e) CHN member vs. Non-CHN members, (f) median household income of patient's ZIP code, and (g) age of patients are presented in Table 4. Following is further elaboration of each category of descriptives. Frequencies and percentages are included for categorical variables and mean and standard deviations are presented for continuous variables.

MLH facilities. The four facilities that make up the adult acute care hospitals of MLH are (a) South Hospital, (b) North Hospital, (c) Germantown Hospital, and (d) University Hospital. University Hospital had the highest number of CHN admissions with 9,940 and Germantown Hospital had the lowest number of admissions with 1,891.

Total Readmissions (CHN and Non-CHN). The total number of admissions in the study is 17,932.

Severity of Illness. Severity of Illness is listed as an ordinal measure consisting of levels 1 through 4 with 4 representing the highest level of severity (Table 3). The highest percent of admissions is 36.4% and is represented by the 3rd level of severity. Level 2 severity is second highest in admissions at 34.4%. Level 4 has the lowest percentage of participation with 14.2%.

Gender. Females represent 62.7% of admissions while males represent 37.3%.

Total Admissions (CHN and Non-CHN admissions). The frequency of CHN admissions is 829 which represent 4.6% of total admissions. The frequency of Non-CHN admissions is 17,103, which is 95.4% of total admissions.

Median Household Income. The mean median household income by ZIP code is \$32,931. The maximum household income is \$133,840. The standard deviation is \$14,105. The median (Q3- Q1) is \$13,737 (Table 1).

Age. The mean age of patients is 75.8 years. The minimum age for the study was set at 65 years. The maximum age of patients in the study is 111 years. The standard deviation is 8.11 years.

Table 4

*Descriptive Statistics for African American Hospital Admissions at MLH (2008-2012)
Using all Illnesses*

Characteristic	Frequency/Mean	Percent/SD
Admissions ($n = 17,932$)		
CHN	829	4.6
Non-CHN	17,103	95.4
MLHS Facilities		
Germantown	1,891	10.5
North	2,542	14.2
South	3,559	19.8
University	9,940	55.4
Severity of Illness		
Level 1	2,674	14.9
Level 2	6,171	34.4
Level 3	6,533	36.4
Level 4	2,550	14.2
Gender		
Female	11,235	62.7
Male	6,696	37.3
Median (SD) household income of ZIP code	\$32,931	\$14,105
Age (Mean/SD)	75.77	8.11

Bivariate Analysis Using All Conditions

Cross-Tabulation. A cross-tabulation followed by chi-square test was performed to test the association between CHN and Non-CHN and Readmissions (Table 5). Results indicated that the percentage of readmissions in the CHN group was 28.1% and the percentage of readmissions in the non-CHN group was 23.5%. The chi-square statistic was 9.5 with 1 degree of freedom and a p -value of 0.002.

Table 5

<i>CHN Cross-tabulation and Chi-square Results using All Illnesses</i>			
Member Status	Readmission	P-Value	df
CHN	233 (28.1%)	0.002	1
Non-CHN	4,011 (23.5%)		

A 2x2 chi-square analysis was also performed on CHN status vs. readmissions using a dataset of all conditions, low income admissions. The percentage of readmissions in the CHN group was 28.1% and the percentage of readmissions in the non-CHN group was 23.1%. The chi-square statistic was 5.068 with 1 degree of freedom and a *p*-value of 0.024.

Multivariate Analysis

Results of the logistic regression model are shown in Table 6.

CHN Participation.

Hypothesis 1: African American inpatients that are CHN members are less likely to be readmitted compared to African American inpatients that are not CHN members.

The hypothesis was not supported. According to results of the Logistic Regression Analysis for the relationship between CHN membership and hospital readmissions (Table 6), members of CHN when compared to non-members have 32% higher odds of being readmitted within 30-days of an index admission ($p < 0.001$).

CHN Participation and Socioeconomic Status.

Hypothesis 2: Among African American inpatients, CHN members that reside in neighborhoods with low SES are less likely to be readmitted than those that are non-CHN members residing in low SES neighborhoods.

The hypothesis was not supported. A logistic regression analysis was also performed to examine the association between CHN status and readmissions using a dataset of all conditions and low income neighborhood admissions only (results not shown). According to results of the analysis, CHN members, when compared to non-members, have 27% higher odds of being readmitted within 30-days of an index admission. The p -value was 0.017 and therefore significant at the $p < 0.05$ level. The results indicate that CHN members have higher odds of being readmitted than non-CHN members, which is opposite the effect stated by the alternative hypothesis.

Control Variables

Following is an analysis of the control variables that were included in the model (Table 6).

Gender. According to results of this analysis, when compared to males, females have 1% higher odds of being readmitted within 30 days of an index admission. The p -value was 0.769 which is not significant at the $p < 0.05$ level.

Age. According to results of the study, for each year increase in age, participants have 2% higher odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 and therefore significant at the $p < 0.05$ level.

Low Income Neighborhood. When compared to patients in higher income ZIP codes, those in low income ZIP codes have 7% lower odds of being readmitted. The p -value was 0.06 and therefore not significant at the $p < 0.05$ level.

Severity of Illness. Severity of illness is ranked 1 through 4, with 4 representing the highest level of acuity (Table 3). According to results of the study, for each increase level of severity, patients have 33% higher odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 and therefore significant at the $p < 0.05$ level.

Table 6

Logistic Regression Analysis for the Relationship between CHN Membership and Hospital Readmission (Based on all Illnesses)

Variables	OR	β	SE	Sig.	95% CI for OR	
					Lower	Upper
CHN	1.32	.28	.08	.001	1.122	1.543
Gender	1.01	.01	.04	.769	.939	1.089
Age	1.02	.02	.00	<.001	1.012	1.021
Low Income Neighborhood	.93	-.07	.04	.060	.863	1.003
Severity of Illness	1.33	.28	.02	<.001	1.276	1.381
Diabetes ²	.72	-.33	.13	.010	.562	.926
CHF ²	1.47	.38	.07	<.001	1.279	1.684
Pneumonia ²	.89	-.12	.12	.317	.711	1.117
AMI ²	.32	-1.13	.15	<.001	.243	.428
South ¹	.60	-.52	.05	<.001	.541	.657
North ¹	.69	-.37	.06	<.001	.621	.771
Germantown ¹	.48	-.73	.07	<.001	.420	.553
Constant	.06	-2.88	.18	<.001		

Note. ¹Reference Category = University Hospital; ²Reference Category = All Conditions

Chronic Illnesses. Chronic Illnesses of interest in this study consists of four categories based on ICD-9-CM 2011 classification of diseases. They are (a) Diabetes (b) Pneumonia (c) CHF, and (d) AMI. All conditions (all illnesses) used as the reference category in the analysis. With the exception of Diabetes, the aforementioned diseases have been targeted by CMS as core measures. The result of this study shows that compared to all other conditions:

- Diabetes has 28% lower odds of being readmitted within 30-days of an index admission. The p -value was 0.010 which is statistically significant at $p < 0.05$ level
- CHF has 47% higher odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 which is statistically significant at $p < 0.05$ level
- Pneumonia has 11% lower odds of being readmitted within 30-days of an index admission. The p -value was 0.317 which is not statistically significant at $p < 0.05$ level
- AMI has 68% lower odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 which is statistically significant at $p < 0.05$ level.

Facility. Data from four MLHS adult acute care hospitals was used in the study. University Hospital is in an urban setting and North, South, and Germantown hospitals are in sub-urban settings. University Hospital was used as the reference category. Therefore, when compared to University Hospital:

- Patients at South have 40% lower odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 which is statistically significant at $p < 0.05$ level.
- Patients at North have 31% lower odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 which is statistically significant at $p < 0.05$ level.
- Patients at Germantown have 52% lower odds of being readmitted within 30-days of an index admission. The p -value was < 0.001 which is statistically significant at $p < 0.05$ level.

Analysis of Chronic Illnesses

This section represents the primary focus of the study as it examines the effect of the predictor and control variables on the outcome variable when four chronic illnesses are considered. The dataset used for this portion of the study consists of four chronic illnesses only. The same model of tests and analyses was used to review data from all illnesses during the same time frame. Following is a list of descriptives.

Univariate Analysis

Descriptive statistics. Descriptive statistics for (a) Readmission based on 4 chronic diseases, (b) the various MLH inpatient facilities, (c) Severity of Illness, (d) Gender, (e) CHN members vs. Non-CHN members, (f) Median household income of patient's ZIP code, and (g) Age of patients are reviewed and presented in Table 7. Following is further elaboration of each category of descriptives.

MLH Facilities. University Hospital had the highest number of CHN admissions with 1,794 and Germantown Hospital had the fewest number of admissions with 322.

Chronic Illnesses. The four chronic illnesses that were included in this study are (a) AMI, (b) CHF, (c) Diabetes, and (e) Pneumonia. All four illnesses were well represented in the study with CHF having a slightly higher frequency than the remaining three illnesses.

Severity of Illness. Severity of Illness is listed as an ordinal measure consisting of levels 1 through 4, with 4 representing the highest level of severity (Table 1). The highest percent of participants is 42.8% and is represented by the 3rd level of severity. Level 2 severity is second highest in participants at 29.3%. Level 1 has the lowest percentage of participation with 8.7%.

Readmissions (CHN and non-CHN). The total number of admissions is 3,502.

Gender. Females represent 61% of participants while males represent 39%.

Total Admissions (CHN and Non-CHN admissions). The frequency of CHN admissions is 114, which represent 3.3% of total admissions. The frequency of non-CHN admissions is represented by 3,388, which is 96.7% of total admissions

Median Household Income. The mean median house-hold income by ZIP code is \$32,857. The maximum household income is \$133,840 and the minimum is \$8,992. The standard deviation is \$13,721. The median (Q3 – Q1) is \$13,737 (Table 2).

Age. The mean age of patients is 76 years. The minimum age for the study was set at 65 years. Age 65 years was used because it is the age that individuals become eligible for Medicare healthcare insurance coverage. The maximum age of patients in the study is 104 years. The standard deviation is 8.0.

Table 7

<i>Descriptive Statistics for African American Hospital Admissions at MLH (2008-2012)</i>		
Characteristic	Frequency/Mean	Percent/SD
Admissions (<i>n</i> = 3,502)		
CHN	114	3.3
Non-CHN	3,388	96.7
MLHS Facilities		
Germantown	322	9.2
North	562	16
South	824	23.5
University	1,794	51.2
Chronic Illnesses		
AMI	818	23.4
CHF	1,167	33.3
Diabetes	728	20.8
Pneumonia	789	22.5
Severity of Illness		
Level 1	306	8.7
Level 2	1,026	29.3
Level 3	1,498	42.8
Level 4	672	19.2
Gender		
Female	2,131	60.9
Male	1,371	39.1
Median (SD) house-hold Income of ZIP code	\$32,857	\$13,721
Age (Mean/S.D.)	75.96	8.014

Bivariate Analysis

Cross-Tabulation. A cross-tabulation followed by chi-square test was performed to test the association between CHN and Non-CHN and Readmissions (Table 8). Results show that the percentage of readmissions in the CHN group was 4.4% and the percentage of readmissions in the non-CHN group was 7.2%. The chi-square statistic was 1.301 with 1 degree of freedom and a p -value of 0.254, which is not significant at the $p < 0.05$ level. The results of the chi-square analysis indicate that the percentage of readmissions within 30-days of an index admission is lower for patients who participate in a CHN vs. patients who do not participate in a CHN; however, it is not statistically significantly lower.

Table 8

<i>CHN Cross-tabulation and Chi-square Results using Chronic Illnesses</i>			
Member Status	Readmission	P-Value	df
CHN	5 (4.4%)	0.254	1
Non-CHN	243 (7.2%)		

A 2x2 chi-square analysis was also performed on CHN status vs. readmissions using a dataset of Chronic Illnesses, low income admissions. The percentage of readmissions in the CHN group was 4.9% and the percentage of readmissions in the non-CHN group was 7.3%. The chi-square statistic was .700 with 1 degree of freedom and a p -value of 0.403, which is not significant at the $p < 0.05$ level.

Multivariate Analysis

Results of the logistic regression model are shown in Table 9.

CHN Participation.

Hypothesis 1: African American inpatients that are CHN members are less likely to be readmitted compared to African American inpatients that are not CHN members.

The hypothesis was not supported. According to test results, CHN members when compared to non-members have 45% lower odds of being readmitted within 30-days (Table 9). However, the p -value was 0.201 and therefore not significant at the $p < 0.05$ level. The small number of CHN members is likely a contributing factor to the outcome.

CHN Participation and socioeconomic status.

Hypothesis 2: Among African American inpatients, CHN members that reside in neighborhoods with low SES are less likely to be readmitted than those that are non-CHN members residing in low SES neighborhoods.

The hypothesis was not supported. A logistic regression analysis was also performed to examine the association between CHN status and readmissions using a dataset of chronic illnesses and low income neighborhood admissions only (results not shown). According to results of the analysis, CHN members, when compared to non-members, have 41% lower odds of being readmitted within 30-days of an index admission. The results indicate that CHN members in low income neighborhoods have lower odds of being

readmitted than non-CHN members in low income neighborhoods. However, the p -value was 0.308 and therefore not significant at the $p < 0.05$ level.

Table 9

Logistic Regression Analysis for the Relationship between Congregational Health Network Membership and Hospital Readmission (Based on Chronic Illnesses)

Variables	OR	β	SE	Sig.	95% CI for OR	
					Lower	Upper
CHN	.55	-.60	.47	.201	.222	1.372
Gender	.90	-.11	.14	.427	.686	1.173
Age	.99	-.01	.01	.145	.970	1.004
Low Income Neighborhood	1.04	.04	.15	.767	.786	1.387
Severity of Illness	1.25	.22	.08	.005	1.069	1.465
Diabetes ²	1.84	.61	.23	.007	1.178	2.880
CHF ²	2.63	.97	.20	.000	1.780	3.872
Pneumonia ²	1.35	.30	.23	.201	.854	2.118
South ¹	1.01	.01	.16	.974	.730	1.386
North ¹	.85	-.16	.20	.429	.575	1.265
Germantown ¹	.92	-.08	.25	.741	.566	1.499
Constant	.07	-2.72	.72	.000		

Note. ¹Reference Category: University Hospital; ²Reference Category: AMI

Control Variables

Following are results of effects of the control variables on the outcome variable (Table 9).

Gender. According to results of the study, when compared to males, females have 10% lower odds of being readmitted within 30 days of an index admission. The p -value was 0.427, which is not significant at the $p < 0.05$ level.

Age. According to results of the study, for each year increase in age, participants have 1% lower odds of being readmitted within 30-days of an index admission. The p -value was 0.145, which is not significant at the $p < 0.05$ level.

Low Income Neighborhood. When compared to patients in high income ZIP codes, those in low income ZIP codes have 4% higher odds of being readmitted within 30 days of an index admission. The p -value was 0.767 and therefore not significant at the $p < 0.05$ level.

Severity of Illness. Severity of illness is ranked 1 through 4, with 4 representing the highest level of severity (Table 3). According to results of the study, for each increase level of severity, participants have 25% higher odds of being readmitted within 30-days of an index admission. The p -value was 0.005, which is statistically significant at $p < 0.05$ level.

Chronic Illnesses. Chronic Illnesses in this study consists of four categories based on ICD-9-CM 2011 classification of diseases. They are (a) Diabetes (b) Pneumonia (c) CHF, and (d) AMI. AMI was used as the reference category in the analysis. The result of this study shows that compared to AMI:

- Diabetes has 84% higher odds of being readmitted within 30-days of an index admission. The p -value was 0.007, which is statistically significant at $p < 0.05$ level

- CHF has 163% higher odds of being readmitted within 30-days of an index admission. The p -value was <0.001 , which is statistically significant at $p < 0.05$ level
- Pneumonia has 35% higher odds of being readmitted within 30-days of an index admission. The p -value was 0.201, which is not statistically significant at $p < 0.05$ level

Facility. Data from four MLHS adult acute care hospitals was used in the study. University Hospital is in an urban setting and North, South, and Germantown hospitals are in sub-urban settings. University Hospital was used as the reference category. Therefore, when compared to University Hospital:

- Patients at South have 1% higher odds of being readmitted within 30-days of an index admission. The p -value was .974 and therefore not significant at the $p < 0.05$ level.
- Patients at North have 15% lower odds of being readmitted within 30-days of an index admission. The p -value was .429 and therefore not significant at the $p < 0.05$ level.
- Patients at Germantown have 8% lower odds of being readmitted within 30-days of an index admission. The p -value was .741 and therefore not significant at the $p < 0.05$ level.

Summary

This study examined the effect of a faith-based initiative on hospital readmissions within 30-days of an index admission. The study was centered on African Americans age 65 years and older who experienced at least one admission to MLH during the years 2008 through 2012. The primary focus was on four chronic illnesses, three of which have been targeted by CMS as opportunities for reducing the overall cost of healthcare.

A logistic regression model was used to test the hypothesis of a relationship between participation in a faith-based initiative and hospital readmissions within 30 days and the socioeconomic status of African Americans and hospital readmissions within 30 days. Participation in a CHN did indicate lower odds of being readmitted for the four chronic illnesses of interest but higher admissions were indicated for CHN members when all conditions were included in the analysis. Neither of the two hypotheses was supported.

In addition to the interaction variable, several control variables were also included in the model. Outcomes from the predictor variable as well as the control variables along with additional interpretation of findings and discussion of management and policy implications will be covered in the following chapter.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Introduction

The goal of this chapter is to further elaborate on findings and results presented in the previous chapter and discuss the managerial and policy implications of these findings as well as limitations of the study. The purpose of this study was to examine if participation in a faith-based initiative is associated with hospital readmissions within 30-days of an index admission. Data from MLH was used to capture hospital admissions and subsequent readmissions during the period of 2008-2012. Socioeconomic data was collected by using median household income according to the U.S. Census Bureau's American Community Survey. CHN participation and SES were the primary predictor variables used in the study. There were also several control variables included in the research model such as (a) severity of illness, (b) type of chronic illness, (c) age, (d) gender, and (e) SES; some of which revealed significant outcomes.

Conclusions and Implications

The research question for this study was:

1. What impact does a CHN have on hospital re-admissions of its participating African American members when compared to African American non-members?

This study investigated the effect of a faith-based initiative on hospital readmissions. Four and a half years of data from MLH/CHN and median income data from the

U.S. Census Bureau's American Community Survey was used in the study. The study was limited to African Americans age 65 years and older. Predictor variables and control variables were used to show effect on the outcome variable. A logistic regression model along with bivariate analysis was used for data analysis purposes.

Hypothesis 1 was tested using a logistic regression model. Results indicate that among inpatients admitted for four chronic conditions, the likelihood of readmission for CHN members is not significantly different than that of non-members (at $p < 0.05$). Our findings are contrary to those of prior studies. For example, Vest et al. (2010) found that patients with higher levels of social support, such as that provided by the church, are less likely to experience preventable readmissions. One limitation of our study was the relatively small number of CHN readmissions, which hampered the sample size to detect statistical significant difference between CHN members and non-CHN members.

Hypothesis 2 was also tested using a logistic regression model. Results indicate that among inpatients admitted for four chronic conditions and residing in low socioeconomic neighborhoods, the likelihood of readmission of CHN members is not significantly different than that of non-CHN members at the $p < 0.05$ level.

The statistical significance of multiple control variables in the logistic regression model showed mixed support and partial consistency with the literature. Severity of illness, which did show a significant outcome indicated that with each level increase of severity, patients have 26% higher odds of being readmitted within 30-days. According to Kim et al. (2010), risks for an unscheduled readmission consistently increased as chronic conditions in patients increased. Among the four chronic illnesses addressed in this study, when compared to AMI, CHF showed the highest level of significance and 163% higher

odds of being readmitted within 30-days. According to Krumholz et al. (1997), CHF is the most common discharge diagnosis of Medicare beneficiaries. This assertion is supported by this study. Krumholz et al. further states that CHF is the only major cardiovascular condition that is increasing in incidence and prevalence. Diabetes also showed significance in readmission rate when compared to AMI. The study shows that patients with diabetes have 83% higher odds of being readmitted within 30-days. According to Kim et al. (2010) in a study of 124,867 discharged diabetes patients 50 years of age and older, 26% were readmitted within 0 to 3 months and 87% of those readmissions were unscheduled. This information would be useful to policy makers and healthcare leaders in making decisions regarding the allocation of resources to improve outcomes in these patients.

In an effort to review outcomes for CHN and non-CHN admissions using a larger sample size than the four chronic illnesses, an analysis was performed on a database using the same time frame 2008-2012, which included all of the illnesses that resulted in an admission and subsequent readmission. The increase in sample size revealed additional significant outcomes in the predictor and control variables. Hypothesis 1 was not supported by the logistic regression model. It is of interest that the analyses indicated an opposite effect of the alternative hypothesis and the outcome was significant. Hypothesis 2 was not supported by the logistic regression model. While the *p*-value was not significant, the outcome was also in opposite direction of the alternative hypothesis.

Control variables in the larger sample size revealed some outcomes of interest. Age shows the reverse outcome, which was shown in the smaller chronic illness analysis. Increase in age indicated an increase in odds of readmission. In the larger sample size, facility was significant. With University Hospital as the reference category, all other fa-

cilities showed lower odds of readmission. Germantown hospital, which has the higher neighborhood income ZIP code, indicated the lowest odds of readmission. This outcome is supported by Joynt et al. (2011), who suggest that disparities are related to race as well as to the site where care was provided. Joynt et al. further conclude that hospitals that provide care to a higher proportion of African Americans are more likely to provide lower quality of care than those that provide care to higher proportions of White patients.

Although the study did not show that CHN membership has a significant association with hospital readmissions within 30 days of an index admission, it did indicate that certain characteristics of the population of interest are associated with higher odds of readmission at a significant level. Healthcare leaders and policy makers can utilize information from this study to assist with designing programs that allows them to reach large numbers of potential patients who reside in communities and who are considered to be vulnerable due to the high incidence and prevalence of chronic illnesses.

Contributions of the Study

Although there were several studies identified that researched a relationship between specific health related programs and involvement with faith-based or church related participants, few actually researched a direct association between a network of providers and chronic disease outcomes such as hospital readmissions. This study addresses a void in the literature pertaining to a healthcare provider organization's efforts to address the challenges of rising healthcare costs by designing a comprehensive process to reduce unnecessary hospital readmissions. The analysis and findings will provide insight into dilemmas faced by policy makers on how to design policy that would be conducive to re-

ducing healthcare costs and improving quality. Healthcare executives and governing bodies should also benefit from the results of this study as they strategically design their goals and objectives to reduce costs and improve quality.

Limitations of the Study

The study had some limitations. First of all, it was limited to only those congregations that were members of MLH/CHN. Another limitation is that the median income data is an aggregation by ZIP code and any inferences made toward individual participants could lead to ecological fallacy. The study sample size was limited to CHN patients that are African American, 65 years and older, and have Medicare health insurance. And finally, because members of CHN are not randomly selected, selection bias was likely introduced into the study.

Directions for Future Research

This study revealed a large volume of research on faith-based activities. Much of it, however, was situated in a single location and usually addressed one or two chronic conditions. The opportunity exists to research a large volume of faith-based initiatives and track a broader array of chronic conditions and outcomes. There is also opportunity to pursue studies with large sample sizes which would generate greater statistical power and reduce opportunities for type II errors. Many of the studies encountered during this research process were qualitative; therefore, an opportunity exists to do more research on this topic using empirical data. An opportunity exists to do in-depth longitudinal studies that reveal greater insight into information across the spectrum of faith-based initiatives

as it relates to healthcare disparities, minorities, social equity, and access. An opportunity also exists to examine the factors that may lead to differential performance among faith-based initiatives aimed at reducing health disparities. Finally, if managers and policy makers are to rely on this type of research for making evidence-based decisions, there must be greater emphasis placed on studies that generate large sample sizes, a collection of quantitative data, and the focus should be centered on research questions that assist with resolving today's healthcare cost and quality dilemmas.

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APPENDIX

INSTITUTIONAL REVIEW BOARD APPROVAL FORM AND REVISION

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on January 24, 2017. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

Principal Investigator: WEBB, JOSEPH
Co-Investigator(s):
Protocol Number: **X121130002**
Protocol Title: *Effect of a Faith-Based Initiative on Hospital Readmissions*

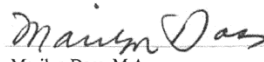
The IRB reviewed and approved the above named project on 12-21-12. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 12-21-12

Date IRB Approval Issued: 12-21-12

HIPAA Waiver Approved?: Yes


Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

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Project Revision/Amendment Form



Form version: June 26, 2012

In MS Word, click in the white boxes and type your text; double-click checkboxes to check/uncheck.

- Federal regulations require IRB approval before implementing proposed changes. See Section 14 of the IRB Guidebook for Investigators for additional information.
- Change means any change, in content or form, to the protocol, consent form, or any supportive materials (such as the investigator's Brochure, questionnaires, surveys, advertisements, etc.). See Item 4 for more examples.

1. Today's Date 4/30/2013

APR 30 2013

2. Principal Investigator (PI)

Name (with degree)	Joseph Webb, DSc	Blazer ID	webbj
Department	Health Services Admin	Division (if applicable)	
Office Address		Office Phone	(901) 359-3130
E-mail	webbj@uab.edu	Fax Number	(901) 398-2533
Contact person who should receive copies of IRB correspondence (Optional)			
Name		E-Mail	
Phone		Fax Number	
Office Address (if different from PI)			

3. UAB IRB Protocol Identification

3.a. Protocol Number	121130002
3.b. Protocol Title	Effect of a Faith-Based Initiative on Hospital Readmissions
3.c. Current Status of Protocol—Check ONE box at left; provide numbers and dates where applicable	
<input type="checkbox"/> Study has not yet begun	No participants, data, or specimens have been entered.
<input checked="" type="checkbox"/> In progress, open to accrual	Number of participants, data, or specimens entered:
<input type="checkbox"/> Enrollment temporarily suspended by sponsor	
<input type="checkbox"/> Closed to accrual, but procedures continue as defined in the protocol (therapy, intervention, follow-up visits, etc.)	
Number of participants receiving interventions:	
Number of participants in long-term follow-up only:	
<input type="checkbox"/> Closed to accrual, and only data analysis continues	
Date closed:	Total number of participants entered:

4. Types of Change

Check all types of change that apply, and describe the changes in Item 5.c. or 5.d. as applicable. To help avoid delay in IRB review, please ensure that you provide the required materials and/or information for each type of change checked.

<input checked="" type="checkbox"/> Protocol revision (change in the IRB-approved protocol)
In Item 5.c., if applicable, provide sponsor's protocol version number, amendment number, update number, etc.
<input type="checkbox"/> Protocol amendment (addition to the IRB-approved protocol)
In Item 5.c., if applicable, provide funding application document from sponsor, as well as sponsor's protocol version number, amendment number, update number, etc.
<input type="checkbox"/> Add or remove personnel
In Item 5.c., include name, title/degree, department/division, institutional affiliation, and role(s) in research, and address whether new personnel have any conflict of interest. See "Change in Principal Investigator" in the IRB Guidebook if the principal investigator is being changed.
<input type="checkbox"/> Add graduate student(s) or postdoctoral fellow(s) working toward thesis, dissertation, or publication
In Item 5.c., (a) identify these individuals by name; (b) provide the working title of the thesis, dissertation, or publication; and (c) indicate whether or not the student's analysis differs in any way from the purpose of the research described in the IRB-approved HSP (e.g., a secondary analysis of data obtained under this HSP).
<input type="checkbox"/> Change in source of funding; change or add funding
In Item 5.c., describe the change or addition in detail, include the applicable OSP proposal number(s), and provide a copy of the application as funded (or as submitted to the sponsor if pending). Note that some changes in funding may require a new IRB application.
<input type="checkbox"/> Add or remove performance sites
In Item 5.c., identify the site and location, and describe the research-related procedures performed there. If adding site(s), attach notification of permission or IRB approval to perform research there. Also include copy of subcontract, if applicable. If this protocol includes acting as the Coordinating Center for a study, attach IRB approval from any non-UAB site added.

<input type="checkbox"/>	Add or change a genetic component or storage of samples and/or data component—this could include data submissions for Genome-Wide Association Studies (GWAS) To assist you in revising or preparing your submission, please see the IRB Guidebook for Investigators or call the IRB office at 934-3789.
<input type="checkbox"/>	Suspend, re-open, or permanently close protocol to accrual of individuals, data, or samples (IRB approval to remain active) In Item 5.c., indicate the action, provide applicable dates and reasons for action; attach supporting documentation.
<input type="checkbox"/>	Report being forwarded to IRB (e.g., DSMB, sponsor or other monitor) In Item 5.c., include date and source of report, summarize findings, and indicate any recommendations.
<input type="checkbox"/>	Revise or amend consent, assent form(s) Complete Item 5.d.
<input type="checkbox"/>	Addendum (new) consent form Complete Item 5.d.
<input type="checkbox"/>	Add or revise recruitment materials Complete Item 5.d.
<input type="checkbox"/>	Other (e.g., investigator brochure) Indicate the type of change in the space below, and provide details in Item 5.c. or 5.d. as applicable. Include a copy of all affected documents, with revisions highlighted as applicable.
► Modification/change in the selected year(s) from which data is used in the study.	
5. Description and Rationale In Item 5.a. and 5.b. check Yes or No and see instructions for Yes responses. In Item 5.c. and 5.d. describe—and explain the reason for—the change(s) noted in Item 4.	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5.a. Are any of the participants enrolled as normal, healthy controls? If yes, describe in detail in Item 5.c. how this change will affect those participants.
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5.b. Does the change affect subject participation, such as procedures, risks, costs, location of services, etc.? If yes, FAP-designated units complete a FAP submission and send to fap@uab.edu . Identify the FAP-designated unit in Item 5.c. For more details on the UAB FAP, see www.uab.edu/cto .
5.c. Protocol Changes: In the space below, briefly describe—and explain the reason for—all change(s) to the protocol. ► The original scope of data used in the study was January through December of 2011. The requested change and subsequent revision (if approved) will include data from January of 2008 through June 30, of 2012. The purpose for making the change is to increase the sample size of participants so that the study will have adequate power and increased opportunity for showing a significant outcome.	
5.d. Consent and Recruitment Changes: In the space below, (a) describe all changes to IRB-approved forms or recruitment materials and the reasons for them; (b) describe the reasons for the addition of any materials (e.g., addendum consent, recruitment); and (c) indicate either how and when you will re-consent enrolled participants or why re-consenting is not necessary (not applicable for recruitment materials). Also, indicate the number of forms changed or added. For new forms, provide 1 copy. For revised documents, provide 3 copies: • a copy of the currently approved document (showing the IRB approval stamp, if applicable) • a revised copy highlighting all proposed changes with "tracked" changes • a revised copy for the IRB approval stamp.	

Signature of Principal Investigator: 

Date: 4/30/13

FOR IRB USE ONLY

☐ Received & Noted ☒ Approved Expedited* ☐ To Convened IRB

Signature (Chair, Vice-Chair, Designee) Martin Daz Date 5-1-13

DOLA 12/21/12

Change to Expedited Category Y / N / NA

*No change to IRB's previous determination of approval criteria at 45 CFR 46.111 or 21 CFR 56.111