

AN EXAMINATION OF THE USE OF ENDOSCOPY SCREENING TESTS FOR
COLORECTAL CANCER AMONG AFRICAN AMERICAN MEDICARE
BENEFICIARIES IN THE NORTHWEST REGION OF LOUISIANA

A DISSERTATION
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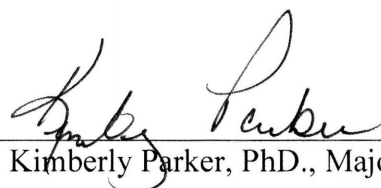
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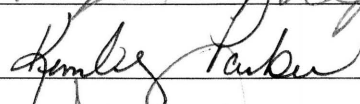

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To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Stephanie Holden entitled "An Examination of the use of Endoscopy Screening Tests for Colorectal Cancer among African American Medicare Beneficiaries in the Northwest Region of Louisiana." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.


Kimberly Parker, PhD., Major Professor

We have read this dissertation and recommend its acceptance:




Department Chair

Accepted:



Dean of the Graduate School

DEDICATION

In memory of my mother, Theresa Holden, who instilled a passion for learning at an early age. Her support was unwavering throughout my academic journey and her spirit was the motivating source for the research.

With sincere gratitude for my father, Jimmy Holden; sister, Nelwyn and cousin, Joan; who were my cheering section and foot soldiers when needed. And to my siblings, niece, nephews, cousins and friends for the many years of encouragement.

To my oldest and dearest friends, Shirley, Betty and Serena, who have been supportive and by my side for many years, near and far.

And, in memory of my friend, Mimi, who kept me grounded and spoke of this day of completion many years ago.

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With sincere gratitude, I thank the pastors, congregation and communities of Sabine and Natchitoches parishes. Because of their efforts, the research study was made possible. Many thanks to the TWU staff, especially Ms. Bonnie King, for constructive criticism with caring hands throughout the daunting IRB process. And Michan Chowritmootoo, for her practical suggestions on the final product. Lastly, thanks and God bless to my Health Studies classmates, hang in there and enjoy the journey to PhD.

ABSTRACT

STEPHANIE HOLDEN

AN EXAMINATION OF THE USE OF ENDOSCOPY SCREENING TESTS FOR COLORECTAL CANCER AMONG AFRICAN AMERICAN MEDICARE BENEFICIARIES IN THE NORTHWEST REGION OF LOUISIANA

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African Americans (AA) are more likely to be diagnosed and die from late-stage colorectal cancer (CRC) than other US population groups (ACS, 2011a). This specific disparity persists even though CRC deaths can be reduced by as much as 60% through screening (CDC, 2011c). Health or CRC disparities are not new phenomena, but the causes and determinants can be quite complex among AA population groups throughout the US.

The health of African Americans typically lags behind their white counterparts both nationally and in Louisiana. From 2003 - 2007, the highest CRC incidence rate for AA was seen in the state of Louisiana (Hsieh et al., 2010). The National Cancer Institute (2010) reported all states had achieved the *Healthy People 2010* objective of 50% compliance for CRC screening, but Louisiana had the lowest reported screening rate of 52.6% using endoscopy studies.

Aggregated national and state health data can be problematic in isolating cause-effect relationships and health determinants. Using a parish-level unit of analysis, this research study sought to examine endoscopy CRC screening compliance among AA

Medicare beneficiaries with fee-for-service health coverage and examine relationships with factors that may predict or mediate screening behaviors. Isolated to two neighboring parishes in northwest Louisiana, Sabine and Natchitoches parishes, primary data collection was launched from African American churches.

The dependent variable was CRC screening compliance and primary independent variables were age, gender, self-reported prior CRC knowledge and physician recommendation. Independent sample t-testing was employed to analyze inter-parish and combined sample CRC screening rates, and whether CRC screening compliance was associated with age, gender, self-reported prior CRC knowledge and physician recommendation. The results showed age and gender were not associated with CRC screening compliance using endoscopy studies, at $\alpha = 0.05$. However, self-reported prior CRC knowledge and physician recommendation were associated with CRC screening compliance. Further logistic regression analysis showed participants with a minimum prior CRC knowledge score of 3 were 18.5 times more likely to be in compliance using endoscopy. This research study demonstrated how crucial isolating health and community data for a specific population subgroup and location can become in efforts to eliminate health disparities.

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CHAPTER I

INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC) (2010a), cancer is the second leading cause of death in the United States (US), but the leading cause of death for individuals in the 45 to 64 age group. The American Cancer Society (ACS) (2010), noted that from the early 1980s to 2006, the overall incidence and age-adjusted death rates of colorectal cancer (CRC) ranked third in males and females, with lung cancer the highest in both genders, prostate cancer second in males and breast cancer second in females. Health disparities including cancer disparities are well documented throughout research studies with many precipitated by a host of determinants and mediating factors such as lifestyles, health behaviors, socioeconomic status (SES) and geographic locales. Cancer disparities are most notably identified among minority population groups, especially African Americans (AA).

With a growing concern of increasing CRC among African Americans, the American College of Gastroenterology (ACG) updated its recommendation for CRC screening in 2009 (Rex et al., 2009). A new and salient recommendation specifically addressed CRC screening in AA. For the average at-risk population, CRC screening should begin at 50 years of age; however the revised recommended minimum age for AA was lowered to age 45 years (ACG, 2011). In concert with the new recommendation, colonoscopy was noted as the premier preferred CRC prevention screening test. As a

highly preventable cancer through early detection and preventive screening, efforts to tackle CRC disparities among African American communities should be strategically planned and crafted with a community-driven focus in order to maximize sustainable screening compliance thereby reducing or eliminating such disparities one community at a time.

Statement of the Purpose

Goals to reduce and eliminate health disparities in the United States have framed our nation's *Healthy People* initiatives for the past two decades as well as the current *Healthy People 2020* agenda (U.S. Department of Health and Human Services [DHHS], 2011a). Efforts to tackle specific disparities have lead to significant gains in recent years. The National Cancer Institute (NCI) (2010) reported all states had achieved the *Healthy People 2010* objective of at least 50% compliance for CRC screening in adults age 50 and above. However, at that time, Louisiana had the lowest reported screening rate of 52.6% using endoscopy studies; colonoscopy or sigmoidoscopy. Albeit a notable *Healthy People* achievement, nearly 22 million adults in the US still lack screenings for CRC (CDC, 2010b). Data reporting for CRC screening are often aggregated with limited ability to isolate specific population groups or geographic locales.

Leading the charge to promote CRC screening is the consensus among leading health agencies, including the CDC (2009). Deaths due to CRC can be significantly reduced if average risk adults 50 years and above comply with screening recommendations. A *Healthy People 2010* objective was to reduce the death rate of

colorectal cancer from 20.9 to 13.7 per 100,000 (DHHS, 2007). Based upon current CDC (2010a) age-adjusted death rates from CRC, achievement of this objective seems highly unlikely for AA.

In 2007, AA had the highest incidence of CRC at 53.1 per 100,000 as compared to the US incidence rate for all races of 45.5 and more startling was the incidence rate for African American males at 62.0 per 100,000 (CDC, 2010a). The highest incidence rate for AA was seen in Louisiana at 63.4 per 100,000. Age-adjusted death rates were equally higher in AA, at a national rate of 23.4 per 100,000 compared to all races at 16.7 and even higher for AA in Louisiana at 25.4 per 100,000. From 2002 to 2006, not surprisingly, colon cancer was the second leading cause of cancer deaths in Louisiana with the highest average annual incidence rates seen in AA residing in the northwest region of the state (Louisiana Department of Health and Hospitals [LDHH], 2009).

A common barrier to access and utilization of preventive health services and screenings is health insurance. Due to the availability of federally subsidize health insurance, elderly population groups are typically highly insured through Medicare health insurance. But according to the 2008 LDHH report card, elderly AA residing in Louisiana suffered from the highest percentage of poor health and chronic health problems. Additionally, Louisiana Medicare expenditure per beneficiary far exceeded the US average.

The purpose of this research was to examine CRC screening compliance using endoscopy procedures-colonoscopy or sigmoidoscopy-among African American

Medicare beneficiaries in two neighboring parishes in northwest Louisiana. Nine parishes in this area compose Region 7 of the Louisiana Office of Public Health (LDHH, 2008). While there is extensive research data confirming colorectal cancer and screening disparities among Medicare eligible African Americans, there is minimal research that targets African Americans in the deep- south and specifically drilled-down to the parish-level in Louisiana.

The two parishes under investigation are Sabine and Natchitoches. These two parishes reflect the diversity in parish-level demographics such as population and racial composition in the northwest region which can also be seen throughout the 64 parishes in Louisiana. According to the U.S. Census Bureau (2010), Sabine parish has a population of about 24,000 whereas AA make-up 16.6% of the population and Natchitoches parish has a population of about 39,000, whereas AA make-up 41.4%. Roughly 17% and 13% of the populations are ≥ 65 years in Sabine and Natchitoches parish, respectively. The median household income is comparable in both parishes, in the low \$30,000. In Natchitoches parish, the percentage of the population living below poverty is higher at nearly 27% relative to 19% in Sabine parish.

General Medicare eligibility requirements for all individuals include a threshold age of 65 years or at any age coverage extend to individuals with certain disabilities or end-stage renal disease (Centers for Medicare and Medicaid Services [CMS], 2009). This research study sampled AA Medicare beneficiaries age 65 years and above. Individual and parish-level variables examined CRC screening and knowledge thereof,

physician density, endoscopy provider capacity and possible barriers to endoscopy screening tests. These parish-level variables offered a glimpse into the healthcare infrastructure, affording snapshots of possible inter-relationships, differences or homogeneity between the communities.

Research Questions

The purpose of this research was to examine CRC screening compliance using endoscopy studies among African American Medicare beneficiaries in two parishes in northwest Louisiana; Sabine and Natchitoches. In an effort to characterize the parishes, individual and parish-level descriptive measures were examined. Such measures included demographic and socioeconomic indices, number of physicians and providers offering endoscopy services. Parish-level variables provided community snapshots in order to assess similarities or differences between the communities and target populations.

Primary research questions:

- Among African American Medicare beneficiaries in Sabine and Natchitoches parishes, what are the percentages of CRC screening compliance using endoscopy studies?
- In Sabine and Natchitoches parishes, what are the number of physicians or physician density in primary care, internal medicine and gastro-intestinal?
- In Sabine and Natchitoches parishes, what are the parish capacities for providers of endoscopy services?

- What are the demographic and/or socioeconomic characteristics of the target populations in Sabine and Natchitoches parishes and do such characteristics mediate barriers or predict screening behaviors using endoscopy screening?

Hypotheses

Comparison analyses were used to examine CRC screening compliance using endoscopy studies with demographic characteristics, knowledge of CRC and primary care capacities in the communities. The following hypotheses were tested: H_0 = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, age and gender are not associated with CRC screening compliance using endoscopy studies, at $\alpha = 0.05$ and H_0 = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, self-reported prior knowledge of CRC and physician recommendation are not associated with CRC screening compliance using endoscopy studies at $\alpha = 0.05$.

The pinnacle goal of any research study should be the subsequent practicality of its implications and recommendations. Overall findings can be utilized to enhance the health of the target population through CRC screening health promotions. As such, a concurrent goal was to capture a broad snapshot of the target populations and communities in this specific geographic region. The resultant findings are poised to generate foundational social epidemiological data for future program planning or further research.

Delimitations

The research delimitations were primarily circumscribed by race, age, health insurance coverage and geographic region. The delimitations include:

1. African Americans
2. Medicare beneficiaries ≥ 65 years with fee-for-service coverage
3. Residents of Sabine and Natchitoches parish, Louisiana

Limitations

Primary data was collected using survey items adapted from the Medicare Current Beneficiary survey (MCBS) to examine screening compliance, demographic and socioeconomic factors. The study limitations include:

1. Accuracy of memory recall
2. Cluster sampling method
3. Ability to generalize findings beyond the geographic region

Assumptions

In addition to primary data collection, secondary data from professional and health agencies were utilized, to include the American Medical Association, Louisiana Department of Health and Hospitals, and Centers for Disease Control and Prevention.

The study assumptions include:

1. Accuracy of self-reported data
2. Reliability of survey instrument
3. Secondary data integrity and accuracy

Definition of Terms

African Americans (AA): Plural. Refers to collective population group or individuals that identifies their race as Black or African American.

Colorectal cancer (CRC): Cancer of the colon or rectum and used interchangeably with colon cancer.

Endoscopy: Medical specialty in which the physician utilizes a scope to internally examine the gastro-intestinal tract.

Colonoscopy: An endoscopy medical procedure whereas the doctor inserts flexible tube, with camera/video capabilities, through the anus and visualize/examine the entire colon and rectum.

Sigmoidoscopy: An endoscopy medical procedure similar to colonoscopy whereas the doctor inserts flexible tube, with camera/video capabilities, through the anus and visualize/examine the distal colon area, commonly the rectum and sigmoid colon areas.

Fecal occult blood test (FOBT): A test whereas stool samples are placed on testing material and chemically treated to detect the presence of blood.

Colorectal screening compliance: Utilizing medical test for screening or non-diagnostic purpose. Compliance is based upon the U.S. Preventive Services Task Force recommendations; for average-risk individuals starting at age 50 years, sigmoidoscopy every 5 years or colonoscopy every 10 years or fecal occult blood test annually. Compliance reported as screening rate percentages.

Medicare beneficiary: Refers to individuals with Medicare coverage that are at least age 65 years. Enrollment in Part A-hospital and Part B-physician/outpatient fee-for-service coverage.

Physician density: Total number of primary care physicians per 10,000 residents.

Primary care physicians: Collectively, physicians practicing in either of the following areas: primary care, family medicine, general practice or internal medicine.

Importance of Study

AA are more likely to be diagnosed with late-stage CRC and die from CRC than any other population group (ACS, 2011a). Factors contributing to increase risk of CRC and factors that contribute to low compliance in CRC screening can be complex, broad and elusive. As a highly preventable cancer with the aid of endoscopy studies for prevention and detection, outcomes from this research aimed to elucidate screening compliance and possible barriers to endoscopy screening in a specific geographic area. Findings can benefit local medical practices, patient education and health education programs. Such practices may include physician reminders or recommendations to their patients about the benefits of CRC screenings. Health or patient education programs could be tailored to address barriers to CRC screening. Additionally, as a state and region with many small to midsize parishes, knowledge gained of the collective availability of primary care physicians and CRC screening providers or lack thereof, can not only transcend race, but offers foundational data for area healthcare providers or facilities seeking to expand services or secure funding for community outreach services

for screening purposes. Ananthakrishnan, Hoffmann and Saeian (2009) research at the county-level demonstrated a positive correlation between physician density and CRC stage of diagnosis, whereas counties providing greater access to primary care providers, more specifically gastro-intestinal specialist, had lower reported incidence of later stage CRC diagnoses.

Familiarity with key health indices and the social ecological framework of target communities are critical for effective health education programs. Increased efforts to deliver customized health promotion or intervention programs on the community-parish level are plausible and straightforward solutions to reaching individuals at increased health risk or plagued by persistent disparities and barriers to access.

CHAPTER II

LITERATURE REVIEW

Health disparities are not new phenomena, but the causes, effects and impact have proven to be persistent and complex among African American population groups.

Annually, cancer claims many lives in the US and African Americans are more likely to be diagnosed and die from late stage cancers (ACS, 2011a). The CDC (2011c) suggests six in every ten deaths due to colorectal cancer can be prevented through the utilization of recommended screening tests, with endoscopy as the preferred screening tool to detect and prevent colorectal cancer. Low or non-compliance in cancer screening test is often linked to race or ethnicity, SES, accessibility, usual source of care and lack of health insurance.

In 2008, Louisiana led the nation in the lowest compliance rate for CRC endoscopy screening (NCI, 2010). Throughout the state, many parishes are considered rural with high or persistent poverty and designated as medical underserved areas. Minority population groups in rural settings are often disadvantaged in terms of socioeconomic status, accessibility to health centers and a usual source of care. At the national, state and some parish levels in Louisiana, incident and death rates from CRC among AA are higher when compared to the rates among other population groups. While African Americans in Louisiana, rural and metropolitan, experience the highest levels of poverty, the availability of Medicare health insurance affords elderly African Americans

insurance coverage for CRC screening tests (U.S. Department of Agriculture [USDA], 2011).

Because most CRC screening compliance data are representative of national or state population samples, isolating and cross-referencing CRC with screening compliance data for rural or select geographic regions is quite elusive. Louisiana parish-level CRC screening compliance data is not currently available, even in public health regions with higher incidents of CRC and even among African American Medicare beneficiaries, who are nationally surveyed annually for utilization of preventive services.

Cancer

According to ACS (2011a), 1 in every 4 deaths in the US is cancer related, making it the second leading cause of death in the US. In 2011, an estimated 1.5 million new cancer cases will be diagnosed and nearly 572,000 individuals will die from cancer. In the US, the leading types of cancer deaths are lung, prostate, breast and colorectal, respectively (ACS, 2011b).

The average cost per person to treat cancer is the highest among the top five costliest health conditions (Agency for Healthcare Research and Quality [AHRQ], 2011a). In 2010, the overall cost to treat cancer topped nearly \$265 billion. Preventive screening measures are viable means to end not only cancer disparities but many health disparities. In its 2009 report, Trust for America's Health estimated that an investment of \$10 per person per year in prevention programs or services could save nearly \$16 billion annually within five years. The World Health Organization (WHO) (2011) noted that the

causes of cancers carry a certain genetic weight, as such, not all cancers can be prevented or eliminated solely based on screening or modification of lifestyles. All cancer screening tests are designed for early detection. But, endoscopy tests for CRC screening are capable of detection and prevention by removing suspicious or precancerous abnormalities.

Colorectal Cancer

The ACS (2011c) estimates in 2011, roughly 140,000 individuals will be diagnosed with CRC and nearly 50,000 will die. Cancer of the colon or rectum is collectively termed colorectal cancer. Approximately 70% of CRC arises from the colon and about 30% in the rectum (Carson, 2009). The complex disease etiology and physiological pathways of colorectal cancer are beyond the scope of this research, but basic anatomical categorization, disease sequence and staging of colorectal cancer are presented to fully explore how CRC deaths can be preventable through the use of endoscopy.

As part of the large intestine, the colon is a large muscular tube approximately 5 feet in length that lies along the peripheral of the abdominal cavity (ACS, 2011c). Anatomically, the colonic segments include the ascending colon which begins in the right lower quadrant, transverse colon, descending colon which is positioned along the left side and the s-shaped sigmoid colon (See Appendix A). The rectum continues from the sigmoid colon. The hepatic flexure lies inferior to the liver and connects the ascending

and transverse colons. The splenic flexure lies inferior to the spleen and connects the transverse and descending colon.

ACS (2011c) defines cancer as out of control cellular growth. The most common disease pathway of CRC begins with colon polyps, which are growths or lesions protruding from the mucosal lining of the colon or rectal (Pearlman, 2008). The main classifications of colonic polyps are adenoma, hyperplastic and inflammatory (Eshghi, Fatemi, Hashem, Aldulaimi & Khodadoostan, 2011). Adenomas are pre-cancerous benign polyps that can later become cancerous and are the most common cause of CRC (See Appendix A).

Pearlman (2008) stated a 10mm adenoma can take as long as 10 years before becoming problematic or advance to malignant status. ACS (2011c) reports 96% of all CRCs result from adenoma malignancies called adenocarcinomas and it could take up to 15 years for adenomas to advance to a neoplastic stage. The majority of colonic polyps could be adenomas with a malignant potential, yet only a small percentage tend to become malignant (Eshghi et al., 2011). ACG (2011) concurs there is a positive association between adenoma size and likelihood of malignancy.

Other classifications of non-neoplastic or non-cancerous polyps are hyperplastic and inflammatory (Eshghi et al., 2011). Inflammatory polyps are often associated with a condition called irritable bowel syndrome (IBS). Hyperplastic or inflammatory polyps are not considered precursors to cancer, but could be associated with a greater risk for adenomatous polyps (ACS, 2011a). Speak et al. (2011) conducted research to examine

the likelihood of hyperplastic polyps transforming to adenomas in individuals with a family history of CRC. The researchers found no increase risk, yet recommended longitudinal studies to better assess CRC risk among this population group.

Location of colon polyps or neoplastic lesions may also play a role in continual risk or development of CRC, thus become a factor in best screening test. The proximal and distal colon are commonly cited in the literature when describing locations of CRC polyps. The defining anatomy that separates the proximal and distal colon is the splenic flexure (Lin, Gerson, Soon, Schembre, & Kozarek, 2005). The proximal colon includes the ascending and transverse colon; the distal colon includes the descending, sigmoid and rectum (Berhane & Denning, 2009). Lin et al. examined the risk of malignancy in the proximal colon with known distal hyperplastic polyps. The researchers noted an overall intermediate risk of proximal colon neoplasia in symptomatic individuals with distal hyperplastic polyps relative to individuals with distal adenomas. In a study of $\geq 11,000$ patients, Berhane and Denning also found a subtle relationship between proximal and distal colonic abnormalities. Whereas patients with sizable distal adenomas had a higher risk of proximal neoplasia, which were found using colonoscopy. In agreement with Lin et al., Berhane and Denning did not find a risk association between distal hyperplastic polyps and proximal neoplasia.

Clinically, CRC is commonly staged using the recently updated 7th edition TNM (tumor-node-metastasis) classification system by the American Joint Commission on Cancer and International Union for Cancer Control (Edge & Compton, 2010). Cancer

staging codifies disease extent, prognosis and standard modes of treatment. Stages range from 0 to IV with increasing invasiveness, probability of recurrence and mortality (Carlson, 2009). Descriptively, CRC is commonly staged using NCI- Surveillance, Epidemiology and End Results (SEER) system (ACS, 2011c). In situ, local, regional or distant stages describe the extent of spread, metastasis, or the invasiveness of the cancer. As such, biopsies resulting from screening tests play a pivotal role in early diagnosis and prescribing the best treatment option for long-term survival.

Cancer Screening Recommendations

Cancer screening recommendations and tests are not new tools in the healthcare arsenal of preventive services. However, utilization, compliance and adoption of screening tests are known to vary throughout the US and among population groups. According to the CDC (2010b), mammography screening rates for breast cancers vary geographically, with national compliance rates ranging from about 70% to slightly above 90%. Screening disparities are also seen in southern US as well as with the uninsured population. In the 2008 Behavior Risk Factor Surveillance System (BRFSS) survey, mammography screening within the previous two-years was significantly lower among the uninsured at 56% relative to 84% in the insured population group (CDC, 2010b). From the 2002 Medicare Current Beneficiary survey, Koya, Chen, Smith and Moran (2011) reported a 52% mammography screening compliance rate among Medicare beneficiaries. A declining trend was noted with this population group of female Medicare beneficiaries. Also significant variability in screening compliance was seen

among different races and educational level, with minorities and women with lower educational levels reporting lower screening rates.

Pap testing for cervical cancer appears to be more widely adopted throughout the US. According to a 2008 national survey, the utilization or receipt of Pap testing was greater than 90% among the women surveyed (Hawkins, Cooper, Saraiya, Gelb, & Polonec, 2011). Although lung and prostate cancers claim many lives annually and are the top leading cause of cancer deaths, there are no concrete screening recommendations. This is understandable, because within the medical and health communities there seem to be no clear consensus regarding effective screening strategies for these cancers. The CDC (2011b) strongly advocates a process of informed decision making and a shared decision making process between males and their physicians regarding the best approach to prostate screening.

CRC Screening Recommendations

The most commonly referenced screening guidelines for CRC are based upon the 2008 recommendations outlined by the United States Preventive Services Task Force (USPSTF). Starting at age 50 thru 75 years, either fecal occult blood test (FOBT) annually, colonoscopy every 10 years or sigmoidoscopy every 5 years are recommended for screening purposes (USPSTF, 2008). Also, USPSTF recommends colonoscopy for diagnostic follow-up to positive or suspicious findings results from either FOBT or sigmoidoscopy. The USPSTF does not recommend routine CRC screening for individuals over the age of 75 years. In a retrospective study of elderly African

Americans, Smoot et al. (2009) found the frequency of CRC found using colonoscopy increased based upon risk status and symptoms. The researchers recommend against routine screening for average-risk elderly patients that are asymptomatic. Singhal et al. (2010) concur with this study, but cautioned that asymptomatic elderly AA may require special screening considerations. In a sample of minority elderly patients, average age of 80 years, AA had the highest rate of adenomas. Among asymptomatic patients, the overall finding of advanced adenomas among was 16.1%. These studies seem to support the USPSTF stance that over the age of 75 years, CRC screenings should be considered on an individual basis but particular attention should be noted in elderly AA patients.

A FOBT is a non-invasive test used to detect blood in the stool by analyzing stool samples smeared on chemically treated material; sigmoidoscopy and colonoscopy are invasive procedures whereas the physician inserts a flexible endoscope, which has video capability to view the colon (USPSTF, 2008). A sigmoidoscopy typically visualizes the rectum and distal colon and colonoscopy visualizes the entire colon and rectum. Endoscopy instrumentation also has the ability to remove polyps or lesions (ACG, 2011).

The CDC (2010b) supports the USPSTF recommendations, but recommends earlier or more frequent CRC screening for individuals at higher risk. High risk includes individuals with a family history of CRC, history of inflammatory bowel syndrome or genetic predisposition to CRC. The CDC also reports that African Americans have the highest mortality rate from CRC.

As stated earlier, the American College of Gastroenterology expanded upon USPSTF and CDC's recommendations for CRC screening (ACG, 2011). Notable distinctions were the lower minimum screening age for African Americans at 45 years, and the categorization of CRC screening tests into prevention and detection. According to Rex et al. (2009), the ACG outlined preferred screening tests separately for detection and prevention. The ACG preferred detection test is a fecal occult based test called the fecal immunochemical test (FIT). The FIT is reported to have higher sensitivity than the traditional FOBT, doubling the detection of advanced lesions over the FOBT. Colonoscopy and sigmoidoscopy are categorized as prevention tests with colonoscopy every 10 years as the preferred prevention test. Rex et al. noted prevention tests should be recommended first and detection tests should be used as an alternative for individuals that decide against prevention tests.

The subtle differences in CRC screening recommendations are not indicative of dissent among the organizations, but support a more informed or evolving decision approach for certain individuals or population groups based upon current data, statistics and clinical information. After a review of past CRC trends and using mathematical modeling to predict future trends, Edwards et al. (2010) concluded that CRC screening had a positive impact on incidence and mortality rates. The researchers suggested more collaborative interventions designed to enhance screening for early detection and prevention will further reduce the incidence and mortality rates of CRC.

In its preventive services guide, CMS (2011) states patients diagnosed with early stage CRC are often asymptomatic. As a slow growing cancer that present minimal or no symptoms during its early stage, screening using endoscopy, especially colonoscopy, can obviate or continue to drive CRC incidence and mortality rates downward. Ayanian (2010) stated by 2000, there were noticeable declines in CRC incidence and mortality rates, 22% and 26% respectively. From 2003 to 2007, the CDC (2011c) attributed 50% improvement in CRC incidence and mortality rates to ongoing uptake of CRC screening. The remaining percentages were ascribed to modifiable risk reduction measures and improved treatments for CRC.

African American Health Disparities

Research consistently document health disparities along a continuum of health issues and stratified by a host of determinants such as race, ethnicity, age, socioeconomic factors and geographic locations. Research studies and data from African American population groups often reveal higher incidence and death rates from what could be considered preventable diseases and health conditions. According to the CDC (2007), key health disparities affecting African Americans include infant mortality, cancer, cardiovascular disease, HIV/AIDS, diabetes and low immunization rates. Surprisingly, awareness of such health disparities within minority population groups is not as prevalent. In a study conducted by Benz, Espinosa, Welsh and Fontes (2011), 46% of AA were unaware of HIV/AIDS disparities between AA and whites. Only 17% of all individuals surveyed were aware of cancer disparities between AA and whites.

The CDC-National Center for Health Statistics (2010a) reported, from 2004 to 2006, AA had the highest mortality and age-adjusted death rates among the major population groups. Accompanying data also reported that while the life expectancy gap in the US has narrowed between whites and AA, African Americans still have the lowest life expectancy at birth among all population groups at 73.2 years. Additionally, socioeconomic data reported AA as having the lowest median income and highest levels of poverty (U.S. Census Bureau, 2010). Health disparities are commonly reported research findings, but their complex causations have proven to be quite persistent, leading to stagnation toward a better health status for minority population groups in the United States.

Byrd, Fletcher and Menifield (2007) reported minority elders will compose nearly 50% of the elderly population by 2050 and they suffer from unique age-related health disparities. Lower income and limited access to quality care can lead to lower quality healthcare and low utilization of medical technology. Age and cultural norms could facilitate poor patient-physician communication and mistrust between patients and healthcare providers.

Woolf and Braveman (2011) emphasized the intricate network of influences on health disparities brought about by political, social and environmental determinants. Key socioeconomic indicators that are consistently documented that negatively influence the health status of communities are income, poverty level and educational attainment. With a precedent setting recession not seen since the depression era, the authors reported from

2005 to 2009, average net worth fell for both AA and whites, yet whites still had significantly higher net worth at \$113,149 versus \$5,677 for AA. Community infrastructures in low-income areas can impact individuals' ability to achieve consistent levels of physical activity and sustain social networks. Also the prevalence of fast food outlets and limited access to quality foods can precipitate poor dietary habits. Woolf and Braveman concluded the best effort in tackling health disparities should address not only individual behaviors, but also the social, environmental infrastructures and the policies that govern them. Earlier writings by Williams and Jackson (2005) even hinted at the degree in which societal and environmental factors could exacerbate health disparities by race. Years later, while disparities have declined many racial health disparities still exist.

DHHS (2011b) recently published a rather comprehensive plan designed to address racial and ethnic health disparities, entitled *A Nation Free of Disparities in Health and Health Care*. This plan is aligned with *Healthy People 2020* goals and provisions from the Affordable Care Act. As an actionable plan, *A Nation Free of Disparities in Health and Health Care* encompasses the network of pathways suggested by Woolf and Braveman (2011) as sources or facilitators of persistent health disparities. DHHS states this is the first ever combined national plan that will tackle health disparities from multiple pathways, including strengthening its own departmental infrastructure, programs and workforce.

Cancer among African Americans

Similarly to other health disparities, cancer disparities persist and shorten the lives of many individuals. While cancer is the second leading cause of death among all US population groups, AA have the highest mortality and lowest survival rates for most cancers (McKenzie, Pinger, & Kotecki, 2008). In 2011, nearly 170,000 new cancer cases will be diagnosed in African Americans and nearly 65,000 will die (ACS, 2011a). Research by Hayat, Howlader, Reichman and Edwards (2007), reported that deaths due to cancers had indeed declined, however AA consistently had the highest mortality rates for most cancer sites and the highest incidences of colon and prostate cancers. The ACS (2008) reported a decline in cancer disparities among AA; however, the incidence rates remains 35% higher in African American males and 18% higher in African American females when compared to whites for all cancer sites. More recently, Edwards et al. (2010) confirmed that for all cancer sites combined, African American males had the highest incidence rates. ACS (2011a) reported in 2007, the cancer death rate for AA was 216.3 per 100,000 and 177.1 per 100,000 for whites.

CRC among African Americans

African Americans are more likely to be diagnosed and die from CRC than any other US population groups (ACS, 2011a). In 2011, as estimated 16,650 new cases of CRC will be diagnosed in African Americans and nearly 7000 CRC deaths will occur. The ACS reported from 2003 to 2007, AA had an astounding 45% higher CRC mortality rate than whites. Both Edwards et al. (2010) and ACS (2011c) confirmed racial and

gender disparities in CRC mortality rates, with CRC as the second and third leading cause of cancer deaths in African American females and males, respectively.

Through their research, Dimou, Syrigos and Saif (2009) found that AA were more likely to be diagnosed with CRC starting in the proximal or right-sided colon whereas whites were diagnosed more often with distal or left-sided CRC. Additionally, rectal cancer was found to be more common in whites than AA. The authors noted a barium enema x-ray test was more common for CRC screening among AA and sigmoidoscopy was the likely endoscopy screening option. As noted earlier, sigmoidoscopy examines the distal colon via an endoscope advanced to the lower colon area and barium enema tests utilize x-ray images to visualize the entire colon (NIH, 2010).

Mitchell et al. (2009) compared CRC diagnostic characteristics among AA and whites by analyzing tumor registry data, from 1988 to 2000 at a large university healthcare system, with CRC data from the national SEER data repository. African Americans were found to have more advanced stage CRC and the tumor locations were more often in the proximal colon. Rectal cancers were more likely seen in whites, yet in earlier stages.

Laiyemo et al. (2010) analyzed and reported results from an ongoing screening program entitled Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial. Using colonoscopy, the risks associated with proximal and distal adenomas were fairly comparable in AA and whites, but the risk of advanced adenomas in the proximal colon was higher among AA. Singhal et al. (2010) research study of CRC screening using colonoscopy in 501 elderly minority patients, with 76% AA, found the highest detection

of adenomas among AA. Most notable was that 66.2% of advanced adenomas found in AA patients were located in the proximal colon. The implications of these findings support colonoscopy or examining the entire colon as the best definitive CRC screening strategy, especially among AA.

Factors that are often linked to higher CRC incidence and mortality rates in AA go beyond race and include genetic, environmental, dietary, lifestyle, SES, lack of health insurance and access or utilization of CRC screening tests. Ayanian (2010) surmised that the biologic or genetic influences of CRC among AA could in part explain some disparities, but screening or lack thereof greatly influences disparities, either positive or negative. Thus, tackling CRC disparities by tackling CRC screening disparities can be the critical and essential factor for sustaining the continual decline and eventual elimination of CRC disparities, especially among AA. As such, equally important are the factors that also influence CRC screening compliance.

Colorectal Cancer Screening

The National Institutes of Health (2010) acknowledged the inability of some national CRC screening surveys to distinguish endoscopy screening tests and dissect various population or subpopulation groups, which can compromise the quality of CRC screening rates. With such aggregated data, implications for different population groups can be misinterpreted. In a report published in 2011, the CDC confirmed the overall incidence and mortality rates of CRC were trending downward and CRC screening rates were increasing, yet AA still lagged behind their white counterparts, but by how much in

any given subpopulation group or geographic area, especially rural, was problematic and difficult to quantify. The report also stated CRC screening rates had significantly improved, with colonoscopy saving the lives of about 7000 individuals in 2005, but could have prevented 14,000 deaths (CDC, 2011c).

African Americans

National results from the 2008 BRFSS survey reflected a narrowing gap between AA and whites in CRC screening rates, albeit the specific endoscopy screening test received was not truly identified (CDC, 2011d). The overall screening rate using either FOBT or endoscopy was 62.9% for AA and 66.2% for whites. Lower screening rates were also associated with lower levels of education, income and poverty. The study limitations included the survey item that combined the screening options and possibly over or under-estimation of screening rates. The ACS (2011a) reported national CRC screening rates using the 2008 National Health Interview Survey (NHIS). While this survey separates FOBT and endoscopy screening options, it too does not separate sigmoidoscopy and colonoscopy. Results from this survey reported a 47.3% screening rate for AA and 52.7% for whites using endoscopy.

Chen, Basch and Yamada (2010b) retrospectively analyzed data from the 2003 Health Information National Trends Survey (HINTS) that was created by NCI. First used in 2003, the 2003 and 2005 survey distinctly assess utilization of the three CRC screening options; FOBT, colonoscopy and sigmoidoscopy (NCI, n.d.). The HINTS targeted population was designed to be a national representative sample, but the final sample

group was not. The researchers noted the low number of AA participants as a study limitation and AA were least likely to report receipt of a colonoscopy.

Results from the 2010 BRFSS documented a national CRC screening rate of 65.3% using endoscopy (CDC, n.d.). The median screening rate for whites was 67.2 % and 63.7% for AA, indication of the continual increase in receipt of CRC screening test. The data also reflected direct association of screening rates using endoscopy with education and income levels; the screening rate increased as education and income increased.

Morrow, Dallo and Julka (2010) conducted a meta-analysis research study of community-based CRC screening programs and found no significant racial disparities in screening rates. The population samples consisted mainly of low-income minority population groups; as such, race, ethnicity and SES could have been inherently controlled in the study design. The researchers noted community-based screening programs do capture better quality screening rates for specific CRC screening tests.

Khankari et al. (2007) found a baseline 11.5% CRC screening rate in a CRC screening intervention study conducted at a community health center serving a low-income minority population. African Americans represented 51.7% of the population sample. At baseline, the physician recommendation rate was quite low at 31.6%. The intervention program consisted of physician reminder mailings, culturally competent training for the physicians and implementation of a patient tracking system. The

researchers concluded the program led to a significant improvement in CRC screening compliance to nearly 28% and physician recommendations to nearly 93%.

Reiter and Linnan (2011) examined cancer screening data from a community-based survey of 1,123 African American females in North Carolina. Variables included screening rates for CRC, cervical and breast cancer. The highest compliance was for the Pap test used to detect cervical cancer. For CRC, of the 180 women at least age 50 years, 64% reported receipt of a CRC screening test; nearly 14% FOBT, 30% endoscopy and 21% both. The survey instrument combined sigmoidoscopy and colonoscopy screening options. The top barriers to screening were lack of knowledge of which test to use and when to seek testing. Reiter and Linnan also noted lack of physician recommendation was reported by 51% of the participants as a barrier to screening as well.

James, Daley and Griener (2011) conducted focus group sessions and interviews with a small sample of AA to examine the relationship between CRC knowledge and screening compliance. Knowledge assessment was based upon unstructured text themes coded from the focus groups or interviews. The researchers concluded low levels of CRC knowledge, with 65.7% of the participants having had received a CRC screening test; 38% FOBT, 21% sigmoidoscopy and 36% colonoscopy. Blumenthal, Smith, Majett and Alema-Mensah (2010) conducted a community-based participatory research study using an educational intervention program aimed to examine CRC knowledge and screening rates. Using an AA sample numbering 369, while the findings indicated CRC knowledge increased as a result of the intervention, the CRC screening rates were modest

at six month follow-up. The highest screening rate of 33.9% was reported for the group education cohort and lowest screening rate of 17.7% in the control group. The researchers noted a high attrition rate among the participants and a somewhat disappointing screening rate among the participants completing the entire group education program.

A critical limitation of national population-based sample data is the inability to narrow or accurately extrapolate to the smaller levels of analyses beyond select metro/micro statistical areas (MSA). Many research studies examining CRC screening rates among select population groups, utilizing the different screening options and conducted in various geographic areas often report wide variations in CRC screening disparities based upon race and other socio-demographic variables. Studies between and among different racial or ethnic populations groups are better able to adjust or weigh certain variables and isolate barriers or predictors of screening behaviors.

Medicare Beneficiaries

Non-adherence to recommended screening and preventive health services is often associated with cost and health insurance coverage. In 1998, average risk Medicare beneficiaries received initial coverage for CRC preventive screening using FOBT and sigmoidoscopy (Fenton et al., 2008). For high risk individuals, coverage for sigmoidoscopy was every 4 years and colonoscopy was covered every 2 years (Mobley et al., 2010). High risk designations include family history of CRC and prior diagnosis of familial polyposis. Average risk designation included asymptomatic and no family

history of CRC. In 2001, universal coverage was extended to include colonoscopy every 10 years for average risk beneficiaries. Medicare coverage was at 80% reimbursement rate, meaning 20% out-of-pocket expense (Doubeni et al. 2010). According to DHHS (2011b), the Affordable Care Act will extend coverage for preventive cancer screening tests to 100% reimbursement with no out-of-pocket expense.

Annually, CMS examine the utilization of cancer screening tests among Medicare beneficiaries using the Medicare Current Beneficiary Survey and claims data (CMS, 2010a). Initiated in the early 1990s, the MCBS continuously surveys a national representative sample of Medicare beneficiaries annually for such measures as health status, use of healthcare services, medical expenditures and supplemental coverage (CMS, 2010b). MCBS components consist of Access to Care and Cost and Use files. While the two survey components are designed as complimentary to capture utilization and overall expenditure for healthcare services, the questionnaire data and samples are slightly different. According to CMS, the Access to Care sample includes the “always enrolled” beneficiaries and Cost and Use sample includes the “ever enrolled” beneficiaries. Additionally, the Cost and Use survey dataset captures more detail cost and utilization. The Access to Care-Health Status and Functioning questions target specific questions addressing utilization of cancer prevention tests, such as pap smears for cervical cancer, prostate-specific antigen for prostate cancer and sigmoidoscopy or colonoscopy for CRC. The Access to Care section includes specific CRC survey items that address screening behaviors using FOBT, sigmoidoscopy and colonoscopy (Doubeni et

al. 2010). Currently, the MCBS assesses two categories; FOBT and endoscopy screening for CRC, it does not separate sigmoidoscopy and colonoscopy options (CMS, 2010a).

In a population-based study of Medicare beneficiaries using MCBS data, Doubeni et al. (2010) noted fluctuation in the gap between AA and whites for CRC screening rates prior to and after coverage was extended to include colonoscopy as a screening option. The screening options were examined separately. Over a six-year period representing pre and post-colonoscopy coverage, the authors reported an initial increase in the colonoscopy screening rates for AA and then a subsequent slow-down relative to whites, resulting in a wider gap between AA and whites. Doubeni et al. concluded there were more rapid CRC screening adoption among whites after coverage was extended to include colonoscopy and among all racial groups, an increase in CRC screening using colonoscopy was identified. Concurrent declines in FOBT and sigmoidoscopy screening were also seen among all races. The researchers noted colonoscopy as a preferred screening option and a possible future barrier for CRC screening using colonoscopy could be provider capacity. Fenton et al. (2008) earlier study of Medicare beneficiaries using claims data, reported nearly identical results as the Doubeni et al. study, with increase utilization of colonoscopy screening, higher rates in whites, and a decline using FOBT and sigmoidoscopy.

Mobley et al. (2010) examined a large sample of fee-for-service (FFS) Medicare beneficiaries compiled from SEER registries of 11 states, including Louisiana. The study examined predictors and CRC endoscopy screening trends from 2000 to 2005. Screening

disparities between AA and whites fluctuated in several states, but remained consistent throughout the time period in Louisiana. In Utah and Michigan, CRC screening using endoscopy was more likely in AA than whites. Also noted was the likelihood of endoscopy screening was significantly lower among lower income beneficiaries. The researchers concluded that national population-based sample data can overlook geographic influences on CRC screening rates and factors that impact screening.

Geographic Considerations

Williams and Braboy (2005) suggested the overall health status of individuals is intimately related to where a person lives, works and plays; suggesting a strong correlation between health, community and environmental factors. Research that can link the social and environmental ecosystems to the health status of the surrounding communities in which they encompasses can isolate distinct health disparity concerns. While extensive national studies were found confirming CRC and CRC screening disparities among AA, there were limited research studies that isolated and combined rural, elderly minority health and CRC screening disparities in southern geographic locations, specifically in the state of Louisiana.

Probst, Bellinger, Walsemann, Hardin and Glover (2011) cross-referenced and analyzed comprehensive datasets from the National Center for Health Statistics to examine death and premature death rates in whites and AA in urban and rural areas. Premature death was defined as death before age 65 years. Of the 3356 rural AA respondents, nearly 96% resided in the south and 52% of this group reported educational

attainment less than high school. The researchers found the highest mortality risk (OR=1.62) and premature mortality rate (11.4%) among rural AA. Another notably point worthy of mentioning is Tseng et al. (2009) also reported AA were highly concentrated in the southern US.

Jha, Orav and Epstein (2011) examined comprehensive national hospital datasets in an effort to categorize hospitals as best or worst based upon specific quality markers and to determine which hospitals are more likely to treat minority population groups. Datasets were retrieved from Medicare Provider Analysis and Review (MedPAR), Medicare Beneficiary files, Medicare Impact files, American Hospital Association and Agency for Healthcare Research and Quality surveys. A composite quality performance score was calculated using the standard Medicare Hospital Compare processes for core measures. Results showed a higher concentration of low quality hospitals were located in the south and treated higher percentages of elderly AA than better performing hospitals located in the northeast, which treated a relative lower percentage of elderly AA. Similar findings were also noted in the low-income Medicaid population group, receiving higher percentages of care at lower quality hospitals.

In 2005, the NCI - Center to Reduce Cancer Health Disparities launched efforts to tackle racial, ethnic and geographic concerns with cancer disparities throughout the US (NCI, 2009). Geographic specific cancer control network programs were established to serve specific population groups. The most proximal network to Louisiana targeting African Americans and colorectal cancer is in the state of Alabama. University of

Alabama Birmingham (UAB) established the Deep South Network for Cancer Control to specifically target breast, cervical and colorectal cancer in African Americans living in rural Alabama and along the Mississippi delta (UAB, 2010). Of the twenty-five cancer network programs none are located in Louisiana.

Medicare Beneficiaries

Hadley, Waidmann, Zuckerman and Berenson (2011) examined Medicare spending and overall health among Medicare beneficiaries. The researchers concluded that higher spending over a 3-year period was associated with better health status, but caution against generalization of such aggregated data sources. In an earlier study, these same researchers explored geographic variations in Medicare spending (Zuckerman, Waidmann, Berenson & Hadley, 2010). Highlighted as a key explanatory factor of geographic differences in spending were beneficiaries' social and environmental infrastructures as it related to their overall health.

Geographic disparities were seen in up-to-date CRC testing among Medicare beneficiaries in eight states throughout the US (Semrad, Tancredi, Baldwin, Green & Fenton, 2011). Using Medicare claims data, Semrad et al. found significant differences in up-to-date CRC testing between AA and whites in Georgia and northern California areas. Significant differences were also found between Asian/Pacific Islanders and whites. CRC testing status was not identified for a specific testing option or whether for screening or diagnostic purposes.

In a study of Medicare beneficiaries, Schenck, Klabunde, and Davis (2006) compared overall CRC screening compliance in AA and whites in North and South Carolina and found lower compliance among AA. Interestingly, among the individuals that were in compliance, there was equivalent utilization of endoscopy screening between AA and whites, particularly the use of colonoscopy. Tseng et al. (2009) examined CRC knowledge and screening using FOBT, sigmoidoscopy, colonoscopy and barium enema tests among a largely AA sample, about 84%, in Alabama. Colorectal cancer knowledge was not significantly associated with race, but was lower in Medicaid and Medicare beneficiaries; hence low-income and the elderly. Using regression analyses, the odds ratio for AA, as compared to whites, receiving colonoscopy screening was the lowest at 0.14 relative to the other screening options.

Louisiana

The state of Louisiana is composed of 64 parishes and 7 designated administrative public health regions (LDHH, 2011a) (See Appendix B). Nearly all of the parishes are designated as health professional shortage areas (See Appendix B). According to the 2009 BRFSS, key Louisiana health indices fell short when compared to the same US indices. Nearly 21% of Louisianans reported fair or poor overall health which was higher than the nearly 15% nationwide. More staggering was that nearly 27% of AA in Louisiana reported fair or poor health.

Various national and state reports often reveal poorer health indices and outcomes for the state of Louisiana. According to the United Health Foundation (2010) state health

ranking, Louisiana ranked 49th in overall health and 48th in cancer deaths, thereby making it the “second least healthy state” in the US. In its 2009 Health Report Card, the Louisiana Department of Health and Hospitals noted its low health ranking and cited issues of persistent poverty and low income as factors that impact the health status of the citizenry. Recall earlier, Mobley et al. (2010) reported persistent CRC screening disparities between AA and whites in Louisiana. The findings of this 11-state study, using 2003 data, showed Louisiana as having the highest percentage of poverty.

In 2007, the highest parish-level death rates were seen in parishes in the northeast and northwest regions (LDHH, 2009). Morehouse parish in northeast Louisiana had a death rate of 14.1 per 100,000 and Bienville parish in the northwest had a rate of 14.0 per 100,000. In 2009, the highest percentage, 29.2%, of uninsured adult’s age 18 to 64 years was seen in the northwest region (LDHH, 2011a). Additionally, the highest percentage of individuals reporting not having a usual source of health care or primary care provider was seen in the northwest region at 24.4%. While collectively these measures are not indicative of any specific geographic health determinants, they support the need for isolating more regional or parish-level factors that may or may not influence the health status of the community members.

In 2007, AA had the highest national incidence of CRC at 53.1 per 100,000 as compared to the incidence rate for all races of 45.5 and more startling was the incidence rate for African American males at 62.0 per 100,000 (CDC, 2010a). Population groups and subgroups in Louisiana typically fair less in health status than their national

counterparts (Hsieh et al., 2010). As such, the highest CRC incidence rate for AA was seen in the state of Louisiana at 63.4 per 100,000. Age-adjusted CRC death rates were equally higher in AA, at a national rate of 23.4 per 100,000 relative to all races at 16.7 and even higher for AA in Louisiana at 25.4 per 100,000. Hsieh et al. (2010) reported from 2003-2007, Louisiana ranked number one in cancer mortality rates among African American males and number nine among African American females.

Medicare expenditure per beneficiary compiled by CMS (2011b) reported Louisiana far exceeded the national average. From 1991-2004, Louisiana had the highest national spending per beneficiary at \$8,659. As mentioned earlier, research by Hadley, Waidmann, Zuckerman and Berenson (2011) suggested higher Medicare spending correlated with better health status among beneficiaries, even though the results could not be generalizable due to the low number of African American participants. In 2007, even though Medicare spending was higher in Louisiana than neighboring states, elderly African Americans reportedly suffer from the highest percentage of poor health and chronic health problems (LDHH, 2008).

African American Health, CRC and Screening in Louisiana

The percentage of African Americans residents in Louisiana far exceeds the national average. According to the US Census Bureau (2010), the state of Louisiana has a large African Americans population, roughly 32% statewide and roughly 1 in 5 Louisianan over age 65 years is African American. In many parishes, AA make-up an even larger percentage of the population.

The Louisiana Office of Public Health publishes individual parish health profiles that are designed to document health issues and socio-demographic characteristics unique to each parish (LDHH, 2011b). At this time, the most current publication year is 2005. Much of the profile contains the same narrative information along with parish-specific data. Parish level CRC death rates are provided, but parish level CRC screening rates are not available. The state CRC screening rate is reported for each parish.

The 2009 LDHH report stated cancer was the second leading cause of death, with African Americans at higher risk than whites. Trend data from 2002-2006 revealed CRC was the second leading cause of cancer deaths and geographic disparities in CRC deaths for African American males and females were noted in the northwest region of the state, where death rates were the highest. Historic CRC mortality trends gleaned from the national SEER cancer registries graphically display such geographic and racial disparities (NCI, 2010) (Appendix C).

The current 2010 AHRQ National Healthcare Quality report, segmented by individual states, ranked Louisiana 46 in CRC deaths, with a state rate of 19.5 deaths per 100,000 per year as compared to a cumulative all-state average of 16.8 (AHRQ, 2011b). Louisiana overall performance measure for clinical preventive services was designated as weak when compared to other states. Utilization of cancer screening preventive services using colonoscopy was 53.2% with a designated worse than the all-state average of 64.2%.

The National Cancer Institute (2010) reported similar statewide CRC screening compliance of 53.6% using endoscopy. Recent results from the national 2010 BRFSS documented an increasing statewide CRC screening rate for Louisiana of 60.8% using endoscopy (CDC, n.d.). The Louisiana screening rates for whites was 64.0 % and 53.4% for AA, however both were lower than national screening rates for the respective racial group.

In Lincoln parish Louisiana, which is in the northeast public health region and neighboring the target geographic region; Proctor and Williams (2007) assessed the health of AA, but not exclusive to any age group. The researchers administered health surveys and one survey item revealed 52.5% of the African American males and 53.2% females had never been screened for CRC.

Health disparities and their associated facilitators can be as diverse as the individuals and communities affected by them. With approximately 22 million individuals lacking CRC screening and nearly 60% reduction in CRC deaths achievable through screening, efforts to screen the hardest hit communities should be priority in the elimination of health disparities (CDC, 2011c).

CHAPTER III

METHODOLOGY

The key objectives of the survey-based research was to collect and analyze primary data on colon cancer screening compliance among African American Medicare beneficiaries in Sabine and Natchitoches parishes Louisiana, and compare such compliance with demographic factors, statewide compliance data and the communities' availability of healthcare providers. Currently there is only aggregate statewide CRC screening data for Louisiana and data from the population-based Medicare Current Beneficiary Survey are non-specific at the state level. The survey instrument was similar to the MCBS yet captured compliance data specific to race at the parish-level and additional descriptive demographics of the sample. Quantitative in approach, the research methodology offered an opportunity to capture rich data on the parish-level. Depoy and Gitlin (2005) note datasets captured from survey-based research can be used for multiple statistical testing and uncover inter and/or intra relationships between the variables. Secondary data were retrieved from professional and health agencies that included American Medical Association (AMA), LDHH and CDC for the number of primary care physicians and state CRC screening rate.

Population and Sample

The geographic area was isolated into two parishes in northwest Louisiana, Sabine and Natchitoches parishes. Geographically, the two parishes are directly adjacent

and lie within the same public health sector, Region 7 (See Appendix B). These parishes reflect the diversity in parish-level demographics such as population and racial composition in the northwest region that can also be seen throughout the 64 parishes in Louisiana. The targeted population was African American Medicare beneficiaries, with minimal age of 65 years and resided in Sabine or Natchitoches parish Louisiana. Census data from 2010 reported African Americans composed 16.6% of Sabine parish and 41.4% of Natchitoches parish populations. The required Medicare beneficiary status of participants was minimum age of 65 years, fee-for-service coverage and community member, which excluded institutionalized individuals or residents of long-term care facilities such as nursing homes.

In 2010, the total number of all races of Medicare enrollees for Sabine and Natchitoches parishes with either Part A-hospital or Part B-physician/outpatient fee-for-service coverage was 8670 (CMS, 2011c). This value included community and institutionalized Medicare beneficiaries. According to the latest CMS (2011d) nursing home report, 6.6% of Louisiana residents 65 years and older had at least one nursing home stay. Based upon these percentages and census data, the targeted population was estimated to be 2000 to 2500 individuals.

Cluster sampling was narrowed to African American churches located in the two parishes. Leedy and Ormrod (2005) stated successive sampling from within a large area or cluster can be most efficient in obtaining a random sample subset when the population is spread over a large geographic area. Church locations were randomly selected and

three locations consented and signed approval to be data collection sites. The churches were located in or near the parish-seat in each parish. Faith-based health education research studies or programs emanating from the church are not uncommon. Tseng et al. (2009) noted the pivotal role churches have played in advocating health issues within the communities they serve, especially African American centers of worship. Watson et al. (2003) suggested a participatory study design or input from religious leaders for faith-based health education research or programs. The recruitment and data collection processes were indeed finalized in collaboration with the church pastors.

Protection of Human Participants

Upon receipt of signed approval letters from the participating churches, an application for expedited and full review of the research study was submitted to Texas Woman's University Institutional Review Board (IRB). IRB approval was subsequently granted in October 2011 (Appendix D). As detailed in the IRB application, the research study design incorporated steps to minimize risks to confidentiality and anonymity of the participants. A consent to participate in research (Appendix E), survey instrument (Appendix F) and recruitment flyer (Appendix G) were drafted and accompanied the IRB application.

Data Collection Procedures

Data needed for the research study included primary and secondary data. Secondary data were retrieved from websites hosted by AMA, LDHH and CDC. The AMA website offered public access to member and non-member physicians and their

practice locations. The LDHH website offered similar public use data for physicians licensed to practice in the state of Louisiana. Each database was searchable by towns and zip codes. The statewide endoscopy CRC screening rate was accessed from CDC's 2010 BRFSS data. For primary data collection, a total of three churches were used to recruit and distribute an anonymous survey instrument. One church was located in Natchitoches parish and two churches were located in Sabine parish.

In collaborations with the church pastors, a date and time was selected for the data collection among the congregations and community members. A recruitment flyer was provided to each church at least two weeks prior to the survey date. The church name, survey date and time was noted on the recruitment flyer along with contact information of the Principal Investigator (PI). While the option was not exercised, potential volunteers were able to contact the PI prior to the survey date to ask questions, either via phone or email. The recruitment methodology and introduction prior to distributing the surveys were consistent at each location.

Completion of the survey constituted informed consent on behalf of the participant. On the scheduled survey date and at each location, a survey introduction script was read. The consent to participate in research form was distributed and reviewed. As an anonymous survey, signed consent was not required. Individuals agreeing to participate were provided a survey instrument. There were two options for completing and returning the survey. The survey could be completed immediately and placed in a drop-box or at home and mailed later in a self-addressed stamped envelope

that was provided. Additionally, individuals who requested surveys for family or friends not in attendance, were provided self-addressed stamped envelopes. Participants were reminded not to include return address on the envelope, this statement was also noted on the survey instrument. No mailed surveys were received with a return address. Follow-up reminders to mail survey were announced during subsequent church services by the pastors.

Instrumentation

Primary data was collected using survey items adapted from the Medicare Current Beneficiary survey (MCBS) to examine screening compliance. In an effort to characterize the sample, demographic and socioeconomic data were also collected. As such, the survey instrument consisted of two sections; demographics and 14-research questions. Information was sought for parish of residence, gender, age, insurance status, household income and education attainment. No personable identifiable data was collected. Prior knowledge of colon cancer was assessed using a 5-point scale. Survey items assessing CRC screening awareness, physician recommendation and screening compliance were “yes”, “no” responses. The screening procedures of sigmoidoscopy and colonoscopy were assessed separately.

The MCBS has undergone revisions, but questions from the 2005 survey version were adapted to fit to suit the research questions (CMS, 2005). Initiated in the early 1990s, the MCBS continuously surveys Medicare beneficiaries to assess such measures as health status, use of services, medical expenditures and supplemental coverage (CMS,

2010a). The MCBS datasets represent a population-based sample, and typically includes approximately 12,000 participants. MCBS datasets consist of Access to Care, and Cost and Use files. The Access to Care-Health Status and Functioning community survey includes specific questions addressing beneficiaries' utilization of cancer prevention tests, including sigmoidoscopy or colonoscopy for CRC. A limiting factor of the MCBS is it does not separate sigmoidoscopy and colonoscopy procedures; however the survey instrument adapted for this research separated question-items relating to CRC screening utilizing sigmoidoscopy and colonoscopy.

The key advantage in the design of the MCBS is that survey responses are cross-referenced with beneficiaries' administrative claim files, which can confirm or contradict responses based upon actual records of healthcare services. An exhaustive literature search attesting to reliability and/or validity measures of the MCBS was conducted, yet no publications or information were located. Electronic communications with the research contracting division of CMS, the Research Data Center, also revealed there were no existing data or general information regarding reliability of the MCBS (E. Mann, personal communication, Jan. 19, 2012). While instrumentation reliability was stated as an assumption in Chapter I, the survey instrument was reviewed by a primary care physician (K. Allen, personal communication, September 2011), doctoral-level nurse (D. Logan, personal communication, October 2011) and committee chair (K. Parker, personal communication, August 2011) for content validity. There were no pilot tests prior to the study, but the survey instrument and consent were IRB approved.

Data Analysis

Descriptive statistics using percentages and frequency distributions were used to capture the demographic and socioeconomic profile of the sample, healthcare providership, awareness of CRC and screening rates. Physician density was defined as the total number of primary care, family medicine, general practice and internal medicine physicians per 10,000 population. Neither parish had a physician specialist in gastrointestinal medicine. Similarly, endoscopy service capacity was defined as the number of site locations offering colonoscopy or sigmoidoscopy services.

T-testing analyzed associations between multiple independent variables and the dependent variable, CRC screening status. Independent variables included self-reported prior colon cancer knowledge, gender, age and physician recommendation. The prior colon cancer knowledge score was coded using a 5-point scale, with 1 representing no prior knowledge and 5 representing the highest knowledge. Follow-up logistic regressions were calculated to examine the predictive strength of prior CRC knowledge and physician recommendation on CRC screening compliance.

Initially the dependent variable CRC screening status consisted of 3- groups; screened using colonoscopy, screened using sigmoidoscopy or never screened. While descriptive statistics were calculated across the three groups, due to the small number of sigmoidoscopy cases, the groups were eventually collapsed to consist of; screened using endoscopy and never screened.

Using secondary data from CDC's BRFSS 2010 results, Chi-squared goodness of fit tests assessed the observed CRC screening rates with the 2010 Louisiana statewide rate for African Americans to determine normality of the sample groups. SPSS's PASW (Predictive Analytics SoftWare) version 18 was used for data analyses.

Summary

The central research methodology consisted of primary data collection using cluster sampling at three African American churches in Sabine and Natchitoches parishes Louisiana. A consent form and survey instrument was created. The survey was anonymous and required no personal identifiable data. Survey items were adapted from the MCBS. After IRB approval, survey dates were selected and recruitment flyers were posted at each location. The survey was administered and distributed on the scheduled dates. Surveys were available for congregants and community members. Participants had options to complete the survey immediately and place in drop-box or return via mail using self-addressed stamped envelope. Consent forms, surveys and self-addressed stamped envelopes were provided to individuals and participants who requested for family members or friends not in attendance. As a result of primary data collection, datasets were captured for multiple variables. Secondary data for the number of primary care physicians in the two parishes and the current Louisiana endoscopy CRC screening rate were obtained via public use databases from AMA, LDHH and CDC.

CHAPTER IV

RESULTS

As a quantitative study, the primary research questions sought to examine CRC screening rates using endoscopy testing among African American Medicare beneficiaries in Sabine and Natchitoches parish Louisiana, awareness of CRC and assess the communities' healthcare capacities. Additionally, the sample screening rates were compared to the statewide screening rate. While the targeted population was fairly homogeneous, demographic and socioeconomic variables were collected to examine potential associations between such variables and CRC screening compliance.

Demographics

Eighty-seven completed surveys were returned. Ten surveys were ineligible; five did not meet minimum age requirement and five did not have fee-for service Medicare coverage. The resultant sample size was 77 surveys; 27 from Natchitoches parish and 50 from Sabine parish (Table 1). There were slightly more female participants at 51.95% and the average age was 73.31 years. The age range was 65 to 83 years with approximately 50% in the 70 to 79 age group.

The majority of the sample had at least a high school education with household income ranging from \$5000 to \$25,000 annually (Table 2). Nearly 55% had only Medicare fee-for-service coverage and 27% were dual enrollees, Medicare and Medicaid.

Table 1
Demographic Variables

	n	%
Parish		
Sabine	50	64.94
Natchitoches	27	35.06
Gender		
Male	37	48.05
Female	40	51.95
Age		
65-69 years	21	27.27
70-74 years	23	29.87
75-79 years	23	29.87
80-84 years	10	12.99

Table 2
Socioeconomic Variables

	n	%
Income		
< 5k	1	1.30
5-15k	34	44.16
15-25k	34	44.16
25-35k	5	6.49
35-50k	2	2.60
> 75k	1	1.30
Education		
k-8	1	1.30
Some high school	16	20.78
High school graduate	50	64.94
Some college	9	11.69
College graduate	1	1.30
Insurance status		
Medicare only	42	54.55
+ Medicaid	21	27.27
+ private insurance	14	18.18

Descriptive Statistics

The majority of the sample, roughly 70%, had heard of colonoscopy, but on a 5-point scale, with 1 representing no prior colon cancer knowledge score, the mean (M) knowledge score was relatively low at 2.81 for the entire sample (Table 3). Further segmentation of the knowledge score based on 3 groups of screening status is demonstrated in Table 5. Unawareness of sigmoidoscopy was pervasive, with less than 20% of the sample having heard of sigmoidoscopy. This was confirmed by being the most common question during review of the consent to participate. Nearly the entire sample reported no known risk of colon cancer. The rates of physician recommendation varied between the parishes. Approximately 70% of the Natchitoches parish sample and 46.0% of Sabine parish sample reported having received physician recommendations for CRC screening. As noted in Table 3, overall physician recommendation for CRC screening was 54.55%. But only 35.71% of participants who received recommendations had been screened using endoscopy.

Both parishes are designated as health profession shortage area (HPSA), including a shortage of primary care physicians (see Appendix C). The total number of primary care and internal medicine physicians practicing in Sabine and Natchitoches parishes was 7 and 15, respectively. Using 2011 census estimates, physician density was calculated as a unit rate per 10,000 residents. Physician density for Sabine parish was 2.89 per 10,000 and 3.79 per 10,000 residents for Natchitoches parish (Table 4). Additionally, Sabine parish had one facility and Natchitoches parish had two facilities

offering endoscopy services. Each parish had one acute care hospital with endoscopy services and Natchitoches parish had one ambulatory surgery center.

Table 3
CRC and Screening Awareness

	n	%
Prior knowledge	M =2.81	
Heard of colonoscopy	54	70.13
Heard of sigmoidoscopy	15	19.48
Physician recommendation	42	54.55
Sabine(N=50)	23	46.0
Natchitoches(N=27)	19	70.37
Yes screen	15	35.71
No screen	27	64.29

Table 4
Healthcare Capacity

	n	
Physician density		
Sabine	7	2.89/10,000
Natchitoches	15	3.79/10,000
Endoscopy providers		
Sabine	1	
Natchitoches	2	

Table 5
Screening Status-3 Groups vs. Select Variables

Variable	Screen-colonoscopy	Screen-sigmoidoscopy	Never screen
Total sample	30(38.96%)	3(3.9%)	44(57.14%)
Prior colon cancer knowledge	M=4.2	M=4.0	M=1.77
Male(n=37)	19	1	17
Female(n=40)	11	2	27
Income <15k	10	2	20
>15k	20	1	24
Education <HS graduate	2	3	12
>HS graduate	28	-	32
Age 65-69 yrs(n=21)	7	-	14
70-74 yrs(n=23)	9	-	14
75-79 yrs(n=24)	10	-	13
80-84 yrs(n=9)	4	3	3

In Table 5, the screening status was grouped as; screened using colonoscopy, screened using sigmoidoscopy and never screened. Screening status and compliance is according to adherence to CRC screening recommendations as set forth by the U.S. Preventive Services Task Force. All participants reporting CRC screening using either endoscopy test were in compliance based upon the guidelines; screened within 10 years using colonoscopy and within 5 years using the sigmoidoscopy option. Expectedly, the

mean score for prior knowledge of colon cancer (4.1) in the screened group was significantly higher than in the never screened group (1.77).

The number of participants screened using sigmoidoscopy was minimal, at 3 participants (3.9%). As such, screening status was subsequently collapsed to simply represent an overall endoscopy screening rate; either screened (42.86%) or never screened (57.14%). Table 6 displays the endoscopy screening rates, reported as percentages, for the key study variables used to examine the primary research questions. Also noted in Table 6, females lacked screening at a much higher rate than males. While non-compliance was fairly equally dispersed by age, education and income; screening rates did increase with age groups (33.33%, 39.13%, 43.48%, 70.00%).

Table 6
Screening Status-2 Groups vs. Select Variables

Variable		Screened-endoscopy	Never screened-endoscopy
Total sample(n=77)		42.86%	57.14%
Gender	Male(n=37)	54.05%	45.95%
	Female(n=40)	32.50%	67.50%
Age	65-69 yrs(n=21)	33.33%	66.67%
	70-74 yrs(n=23)	39.13%	60.87%
	75-79 yrs(n=23)	43.48%	56.52%
	80-84 yrs(n=10)	70.00%	30.00%
Prior CRC knowledge		M=4.18	M=1.77

The endoscopy CRC screening rates were 59.26% and 34% for Natchitoches and Sabine parishes, respectively (Table 7). The combined sample screening rate was 42.86%; hence 57.14% of the total sample lacked CRC screening using any type of endoscopy testing. Figure 1 graphically depicts the variability between the parish and combine screening rates.

In 2010, the Louisiana statewide endoscopy CRC screening rate for African Americans ≥ 50 years was 53.4%, which fell between the sample screening rates for the two parishes (Table 8). The Natchitoches parish sampling group had the highest endoscopy CRC screening rate when compared to the sample data and the statewide data. Due to the difference in the lower minimum age in the statewide sample, caution was noted in statistical analysis between the sample and state CRC screening rates. Figure 2 depicts the screening rates across the different sampling groups.

Table 7
CRC Screening Rates

	n	%
Sabine	17	34.0
Natchitoches	16	59.26
Combine	33	42.86

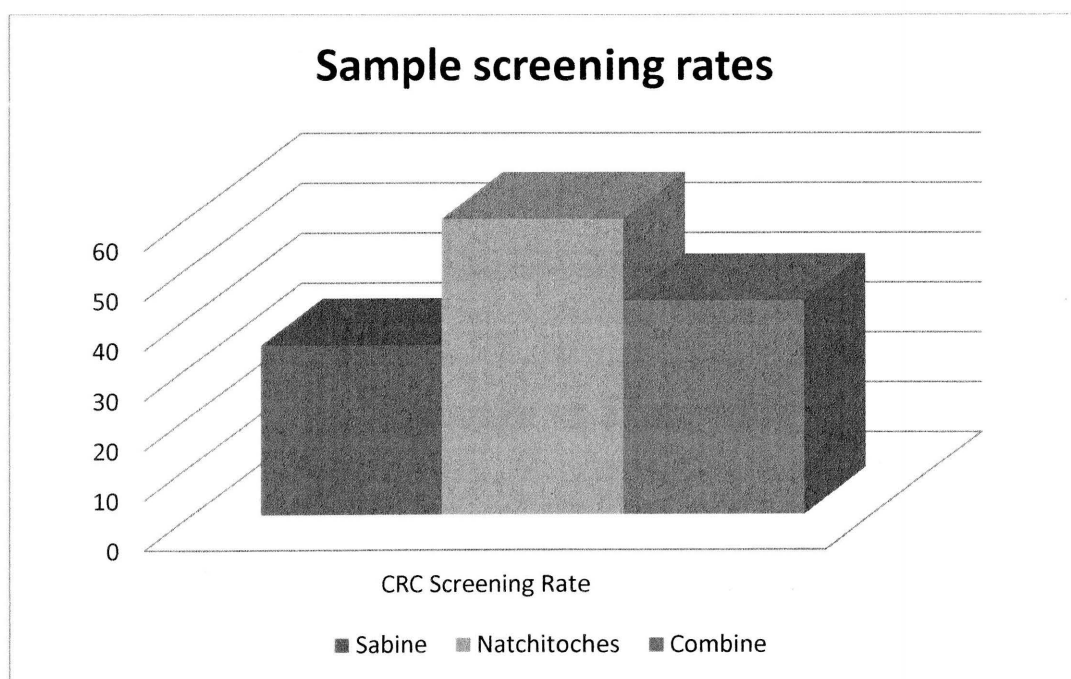


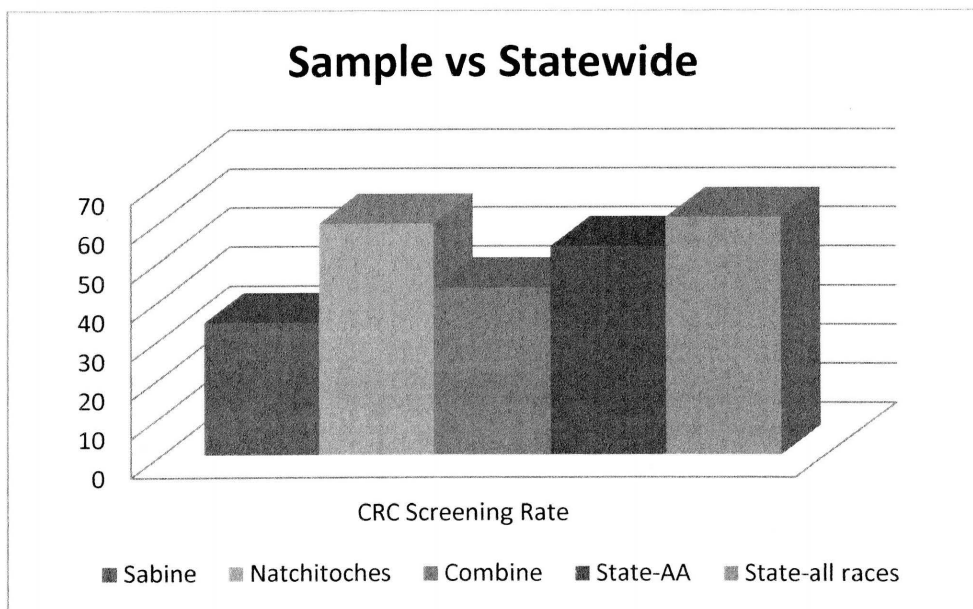
Figure 1. Sample CRC screening rates.

Table 8

Louisiana Residents 50+Yrs Who Ever had a Sigmoidoscopy or Colonoscopy

Race		Yes	No
All races	%	60.8%	39.2
	CI	(59.1-62.5)	(37.5-40.9)
	n	2805	1683
White	%	64.0	36.0
	CI	(62.1-66.0)	(34.0-37.9)
	n	2139	1153
Black	%	53.4	46.6
	CI	(49.5-57.2)	(42.8-50.5)
	n	535	425

Source: 2010 BRFSS CRC screening rate-Louisiana

*Figure 2. Sample vs. statewide CRC screening rates.*

Sample Statistics

Descriptive statistics using frequencies and percentages provided detailed community profiles and assessments of CRC screening rates for the study sample. The resultant outcomes captured rich information to answer the primary research questions. Additional statistical analyses were conducted to explore relationships and differences between different independent or grouping variables and address the null hypotheses.

Hypotheses Testing

The null hypothesis H_0 = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, age and gender are not associated with CRC screening compliance using endoscopy studies, at $\alpha = 0.05$, was tested using independent sample t-tests. As noted in Table 9 there was no statistical significant difference in CRC screening compliance for males and females; $t(75) = 1.93$, $p = .06$, 2-tailed. Also shown in Table 10, there was no statistical significant difference in endoscopy screening compliance based upon age; $t(75) = 1.51$, $p = .135$. Thus the null hypothesis was not rejected.

Table 9

Independent Sample t-test: CRC Screening and Gender

Gender		N	Mean	Std. Deviation	Std. Error Mean
Screened	Male	37	.54	.505	.083
	Female	40	.33	.474	.075
		t	df	Sig. (2-tailed)	
		1.93	75	.06	

Table 10

Independent Sample t-test: CRC Screening and Age

Screen w/Endoscopy		N	Mean	Std. Deviation	Std. Error Mean
Age	Yes	33	74.36	5.798	1.009
	No	44	72.52	4.878	.735
		t	df	Sig. (2-tailed)	
		1.511	75	.135	

The null hypothesis H_0 = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, self-reported prior knowledge of CRC and physician recommendation are not associated with CRC screening compliance using endoscopy studies at $\alpha = 0.05$ was also tested using independent sample t-tests. Statistical significant difference was found in self-reported prior CRC knowledge scores for the screened group ($M=4.18$, $SD=0.727$) and never screened group ($M=1.77$, $SD=0.803$). The independent sample t-test result was $t(75) = 13.56$, $p=0.0$ (Table 11). The eta squared effect size was calculated at .0133, which indicated prior knowledge had some, but not a sizable effect on whether an individual had been screened. Statistical significant difference was also revealed between physician recommendation and screening compliance (Table 12). T-test result was $t(75) = 6.162$, $p=0.0$. Not surprising, the eta squared effect size was the same at 0.0133, indicating physician recommendations did have some effect on CRC screening compliance, but accounted for only 1.33% variability. Based upon these findings, the null hypothesis was rejected.

Table 11

Independent Sample t-test: CRC Screening and Prior CRC Knowledge

Screen w/Endoscopy		N	Mean	Std. Deviation	Std. Error Mean
CC Knowledge	Yes	33	4.18	.727	.127
	No	44	1.77	.803	.121
		t	df	Sig. (2-tailed)	
		13.561	75	.000	

Table 12

Independent Sample t-test: CRC Screening and Physician Recommendation

Screen w/Endoscopy		N	Mean	Std. Deviation	Std. Error Mean
Phy Recommendation	Yes	33	.88	.331	.058
	No	44	.30	.462	.070
		t	df	Sig. (2-tailed)	
		6.162	75	.000	

To determine the extent of predictability for screening compliance, physician recommendation and prior CRC knowledge were examined using logistic regression modeling. For modeling purposes, prior knowledge scores were collapsed to two groups; 1-2 and 3-5. As shown in Table 13, physician recommendation (OR=.156) was not a predictor, but prior knowledge (OR=18.52) was a predictor. Participants with minimum knowledge score of 3 were 18.5 times more likely to be in compliance using endoscopy.

Table 13
Logistic Regression

Predictor variable	OR(odds ratio)	95% CI
Prior CRC knowledge	18.52	4.25-80.76
Physician recommendation	.156	.02-1.54

Due to the large percent differences noted earlier in inter-parish screening rates, another t-test was performed to examine inter-parish differences. Expectedly, as shown in Table 15, there was a statistical significant difference in CRC screening compliance between the two parishes: $t(75) = -2.18$, $p=0.03$.

Table 14
Independent Sample t-test: CRC Screening and Parish

Screen w/Endoscopy	N	Mean	Std. Deviation	Std. Error Mean
Sabine	50	.34	.479	.068
Natchitoches	27	.59	.501	.096
		t	df	Sig. (2-tailed)
		-2.18	75	.033

The ability to generalize findings is largely determined by whether the sample is representative of the population. Chi-square goodness of fit tests were performed to examine observed CRC screening rates with expected screening rates using the 2010 statewide screening rate for African Americans. While the population included individuals starting at 50 years, Chi-square results across the sampling groups suggested each sampling groups can be considered representative random samples from the population. As such, findings could be generalized with noted differences in minimal age. Chi-square results are shown in Table 15-17; $\chi^2_{\text{sample}} = .433$, $\chi^2_{\text{Sabine}} = 3.19$ and $\chi^2_{\text{Natchitoches}} = 1.74$.

Table 15

Chi-square Goodness of Fit-Sample vs. Statewide

	Observed N	Expected N	Residual
0.0	44	41.1	2.9
1.0	33	35.9	-2.9
Total	77		
Chi-square	.433		
df	1		
Asymp Sig.	.510		

Table 16

Chi-square Goodness of Fit-Sabine Parish vs. Statewide

	Observed N	Expected N	Residual
0.0	33	26.7	6.3
1.0	17	23.3	-6.3
Total	50		
Chi-square	3.190		
df	1		
Asymp Sig.	.075		

Table 17

Chi-square Goodness of Fit-Natchitoches Parish vs. Statewide

	Observed N	Expected N	Residual
0.0	11	14.4	3.4
1.0	16	12.6	-3.4
Total	27		
Chi-square	1.739		
df	1		
Asymp Sig.	.187		

Summary

Primary data collection using an anonymous survey provided rich data points for the targeted sampling group; demographic data points as well as research-specific data relating to CRC screening. As a result, descriptive statistics provided a detailed community snapshot revealing a fairly homogenous sample of African American Medicare beneficiaries. Expectedly, there were no statistical significant differences found in endoscopy CRC screening compliance when compared to the demographic variables of age and gender. However, there were statistical significant differences relating to self-reported CRC knowledge and physician recommendation. Follow-up logistic regression demonstrated prior CRC knowledge was the greatest predictor of screening compliance.

As a combined sample, the overall endoscopy CRC screening rate was comparable to the 2010 statewide screening rate for African Americans. Yet there were significant differences at the parish-level and a positive correlation between the parish-level screening rates, physician recommendation and physician density for each parish. The implications of these findings are provided in the proceeding chapter.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

CRC screening compliance is typically reported as a statewide or national rate aggregate and combines endoscopy screening as colonoscopy or sigmoidoscopy. Due to its limited visualization scope, CRC screening using sigmoidoscopy has diminished in recent years and colonoscopy has become the recommended endoscopy option. This study aimed to isolate CRC screening compliance and related determinants on a more finite geographic scale by collecting parish-level data about the sampling groups as well as the healthcare capacities. Additionally, the study sought to segment screening status by the specific endoscopy procedure; colonoscopy and sigmoidoscopy.

Summary

Designed as an observational research study, the key purposes of the research were to examine CRC screening compliance using endoscopy testing among African American Medicare beneficiaries in two neighboring parishes in northwest Louisiana and to assess variables that may impact screening compliance. Furthermore, the inter-parish CRC screening rates were compared as well as comparisons made with statewide CRC screening rate. Cluster sampling was conducted from three African American churches within or near the parish-seats of Sabine and Natchitoches parish. Eligible participants were non-institutionalized African American 65 years of age or older with fee-for-service Medicare coverage. Demographic, socioeconomic and research-specific variables were

captured using an anonymous survey instrument adapted from the MCBS. The key dependent variable was CRC screening status and independent variables included age, gender, prior CRC knowledge and physician recommendation. Data for the statewide CRC screening rate and number of primary care physicians were retrieved from secondary sources.

Conclusion

The primary research questions were designed to quantify CRC screening rates using endoscopy testing, primary care physician capacity, endoscopy capacity, and which demographic and/or socioeconomic variables that may serve as barriers or predictors of screening compliance. Secondary data from the 2010 BRFSS reported the Louisiana statewide endoscopy CRC screening rate for African Americans at least age 50 years was 53.4%.

Research Question #1

The first research question asked, what are the percentages of CRC screening compliance using endoscopy studies among African American Medicare beneficiaries in Sabine and Natchitoches parishes? For the combined sample group from Sabine and Natchitoches parishes, the endoscopy CRC screening rate was 42.86%. Only 3.9% of the screened group utilized sigmoidoscopy testing. As such, the subsequent screening rate was collapsed to simply endoscopy testing; sigmoidoscopy or colonoscopy. The endoscopy CRC screening rate for Sabine parish was 34% and the screening rate for Natchitoches parish was 59.26%.

Statistical significant difference was found in the inter-parish CRC screening rates, but the observed screening frequencies across the three sampling groups; Sabine, Natchitoches and combined, were not significantly difference from the 2010 statewide CRC screening rate of 53.4% for African Americans.

Research Question #2

The second research question asked, what are the number of physicians or physician density in primary care, internal medicine and gastro-intestinal in Sabine and Natchitoches parishes? Using secondary data from AMA, LDHH and cross-referring or confirming via phone with local physician practices and hospitals, the total number of primary care and internal medicine physicians was seven for Sabine parish and 15 for Natchitoches parish. Using 2010 census estimates, the resultant physician density was 2.89 per 10,000 residents for Sabine parish and 3.79 per 10,000 residents for Natchitoches parish. No gastro-intestinal physician had a practice resident in either parish. There was a positive correlation with physician density and CRC screening rates.

Research Question #3

The third research question asked, what are the parish capacities for providers of endoscopy services in Sabine and Natchitoches parishes? Each parish had one acute care hospital that provided endoscopy services. Natchitoches had one ambulatory surgery center that offered endoscopy services. Due to the low, but similar endoscopy provider capacity in both parishes, no association or conclusion was determined as to its impact on CRC screening compliance.

Research Question #4

The final research question asked, what are the demographic and/or socioeconomic characteristics of the target populations in Sabine and Natchitoches parishes and do such characteristics mediate barriers or predict screening behaviors using endoscopy screening? Demographic and socioeconomic indices revealed a fairly homogenous sample of AA Medicare beneficiaries. Gender segmentation was nearly symmetrical, with 48.05% males and 51.95% females. The average age was 73.31 years. With four age categories; 65-69, 70-74, 75-79 and 80-84 years; roughly 30% of the sample was represented in each of the three lower age groups. The majority of the sample, 88.32%, had income from \$5,000 to \$15,000 annually and roughly 65% were high school graduates. While the CRC screening rate was higher among males and increased with age groups, screening compliance was not distinctly difference with education and income groups. As detailed in the proceeding section, statistical testing was performed to assess the extent of association between age, gender and CRC screening compliance.

Hypotheses

Two null hypotheses were tested. $H_{0(1)}$ = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, age and gender are not associated with CRC screening compliance using endoscopy studies, at $\alpha = 0.05$. And, $H_{0(2)}$ = Among African American Medicare beneficiaries in Sabine and Natchitoches parishes in northwest Louisiana, self-reported prior knowledge of CRC and

physician recommendation are not associated with CRC screening compliance using endoscopy studies at $\alpha = 0.05$. As shown in Table 18 and using independent sample t-tests, there were no statistical significant differences found in endoscopy CRC screening compliance based upon age and gender. However, statistical significant differences were found between self-reported prior CRC knowledge scores and physician recommendation, and CRC screening compliance. An eta squared effect size was calculated for both independent variables. Prior CRC knowledge and physician recommendation did not appear to have a sizable influence on whether an individual was in compliance with CRC screening. However, follow-up logistic regression revealed self-reported prior CRC knowledge was the greatest predictor of CRC screening.

Table 18
Hypotheses Testing

Hypothesis	Conclusion
H ₀₍₁₎	Not rejected
H ₀₍₂₎	Rejected

Discussion and Implications

For the past few decades, the subject of health disparities has gained national attention among leading federal health agencies and health advocacy groups, and has been the focus of numerous research studies. The inaugural 2000 *Healthy People* initiative sought to reduce health disparities; goals in 2010 and 2020 were designed to eliminate health disparities. Such disparities can be arguably viewed as critical drivers in the development and support of recent health care reform legislation.

Oftentimes minority population groups are the focus of health disparities. McKenzie, Pinger, and Kotecki (2008) noted African Americans have the highest mortality and lowest survival rates for most cancers. African Americans are more likely to be diagnosed and die from late-stage CRC than any of the other major US population groups (ACS, 2011a). This specific disparity persists even though CDC (2011c) states that colorectal cancer deaths can be reduced by as much as 60% through CRC screening.

Healthy People 2000, 2010 and 2020 included objectives to reduce CRC deaths and increase CRC screening (DHHS, 2012). Final data for *Healthy People* 2010 documented significant gains with national achievement of the endoscopy CRC screening objective of at least 50%, but the state of Louisiana had one of the lowest state screening rates. Williams and Braboy (2005) suggested health disparities have strong ties to where individuals live. The 2010 BRFSS revealed significant gains in statewide CRC screening for Louisiana, with a statewide rate increasing to 60.8%; however, the same sample reported a lower statewide CRC screening rate of 53.4% for African Americans. Undoubtedly whether Louisiana or national, CRC and low CRC screening rates among African Americans are identified health disparities.

The consensus seems to be fairly unanimous among leading health and advocacy agencies regarding the decline in cancer incidence and mortality, and increase in utilization of screening tests. As early as 2008, the American Cancer Society noted a decline in cancer disparities among African Americans, however for all cancer sites; the incidence rate was still 35% higher in African American males and 18% higher in

African American females when compared to whites. At this time, the most poignant question is not “how much” progress has been accomplished, but how best to isolate and target specific areas or communities in order to maintain continual and sustainable inroads toward elimination of health disparities, including CRC and CRC screening disparities among African Americans.

The implications of this research study directly support and link the critical role health education can play in addressing a specific health disparity within a targeted population group, isolated to a specific geographic locale. Deliberate planning for health education programs begins with confirmation of the health issue, knowledge of the health determinants and assessment of the ecologic framework of the targeted population. The research study was designed not only to assess parish-level CRC screening rates, but to capture a detail picture of potential determinants that may have influenced CRC screening compliance. Aggregated state or national data can be problematic in isolating determinants of health disparities, especially in rural settings.

Between sampling groups that were somewhat similar, CRC screening rates revealed inter-parish differences in screening compliances with simultaneous differences in the rate of physician recommendations for CRC screening. Lower screening rates and lack of physician recommendations were greater in Sabine parish, thus the findings support the need for health education promotions that target primary care physicians in order to increase CRC screening recommendations to their patients, especially African Americans 50 years of age or older. A more sustainable health promotion effort could be

advocating a Medicare policy initiative that mandates reminders to physicians to make screening recommendations. Options for reminder alerts could be easily implemented and housed within electronic health information systems, patient databases or patient charts. Physician density was also correlated with CRC screening compliance and the region has longstanding designation as a HPSA.

Health education programs designed in collaboration with church or community leaders to promote active communication between patients and healthcare providers could encourage individuals to become more active participants in their healthcare decisions and not solely rely on physician recommendations. Johnson, Roter, Powe, and Cooper (2004) conducted a study and found that physician-patient communications were less engaging with African Americans patients than white patients. Ashton et al. (2003) reported that even with established access to health care, the decision process regarding the utilization of medical procedures can be negatively impacted by the patient-physician relationship. The authors suggested poor communication between the physician and patient can lead to lower utilization of medical procedures by African Americans. Health education programs targeting patient communication skills could lead to greater adoption of CRC screening as well as long-term sustainable compliance.

Frequent responses in the never screened sample group were never heard of the test, no physician recommendation, test not needed and not at risk for cancer. Prior CRC knowledge was found to be the greatest predictor of screening compliance. Thus, the most salient implication supported the need for health education programs or promotions

that raise awareness of CRC and the importance of CRC screening compliance. Health education campaigns and/or material that include culturally appropriate content could be made available and distributed through churches, community organizations or physician offices.

Recommendations

African Americans make-up about 32% of the population in Louisiana and many parishes consist of significantly higher percentages of African Americans. According to the 2009 Louisiana Health Report Card, from 2002-2006, the highest CRC incidence rates for African American males and females were seen in the northwest region. The research findings isolated geographic-specific CRC screening rates, determinants of CRC screening compliance and revealed a broad variation in screening compliance between two adjacent parishes in the northwest region of Louisiana.

The following recommendations can build upon or compliment the research findings. Recommendations include using similar target samples to examine parish-level CRC screening compliance in other regions for comparative studies and retrospective analyses of Medicare claims data to confirm the parish-specific CRC screening rates. The research results support the most salient recommendation, which is the need for health education programs to raise awareness of CRC and promote CRC screening compliance among African Americans and to promote physician recommendations for CRC screening among primary care physicians.

Research outcomes often paint a bleak picture for the health of African American population groups, resulting in what appears to be insurmountable health disparity data. Health disparities among different populations have been brought to the forefront and become a common bipartisan theme among our nation's political leaders. With such heightened national awareness, the health care reform movement, inter and intra-governmental cooperation and resources; the present time is possibly the most opportune time in the US for tackling persistent health disparities among the hardest hit population groups and advance more rapidly toward the elimination of health disparities.

The Centers for Disease Control and Prevention (2008) reported African Americans as having the highest age-adjusted death rate, lowest life expectancy and highest infant mortality rate among all population groups. These key health indices suggested collectively African Americans could be considered the least healthy US population group. According to the United Health Foundation (2010) state health ranking, Louisiana was the "second least healthy state" in the US. Since the inception of the *Healthy People* agendas, undeniable gains have been made toward critical health disparities, including geographic disparities. However, increased efforts and strategies are needed to isolate and overcome lagging health disparities in hardest hit populations or subgroups, especially African Americans. A country or nation is only as healthy as its least healthy population group.

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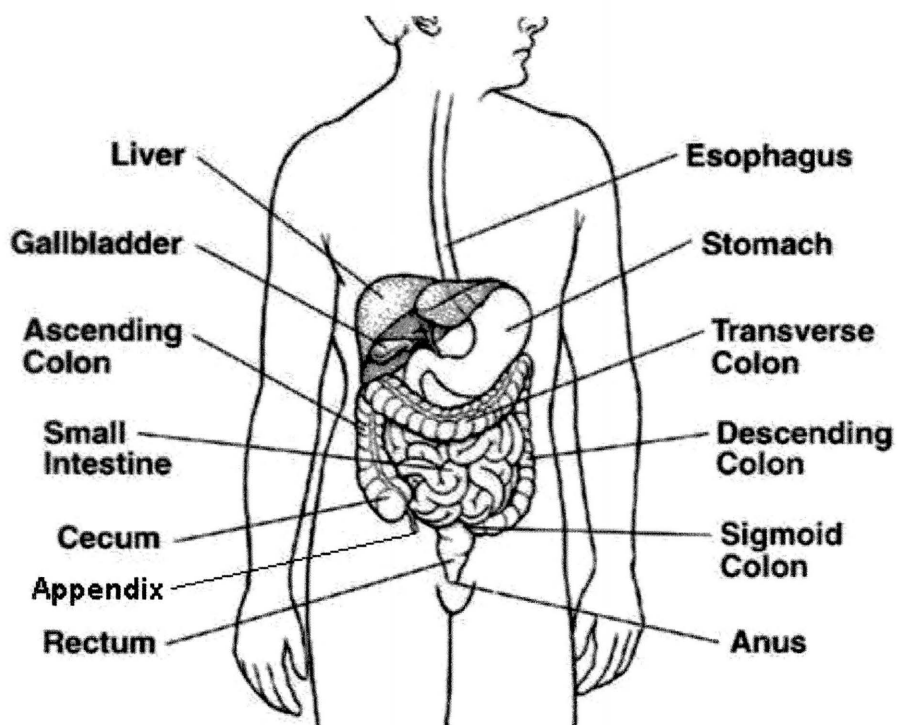
Zuckerman, S., Waidmann, T., Berenson, R., & Hadley, J. (2010). Clarifying sources of geographic differences in Medicare spending. *New England Journal of Medicine*, 363(1), 54-62.

APPENDIX A

Colon Anatomy and Pathology

Figure A1

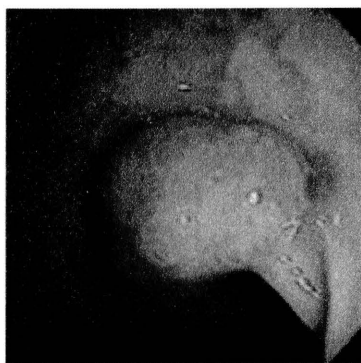
Colon anatomy



Source: National Cancer Institute (NCI)

Figure A2

Colon polyp



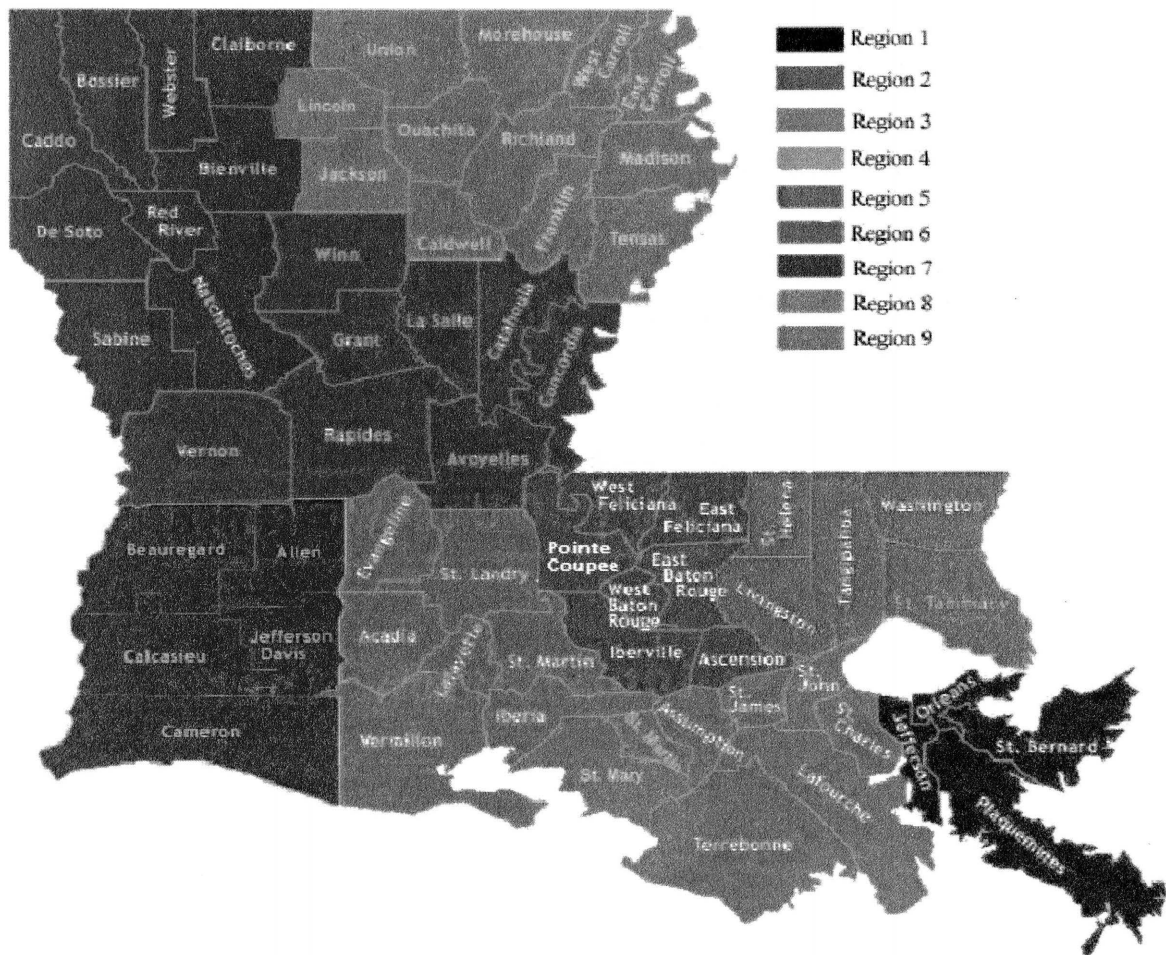
Source: American College of Gastroenterology (ACG)

APPENDIX B

Louisiana Administrative Public Health Regions and HPSA

Figure B1

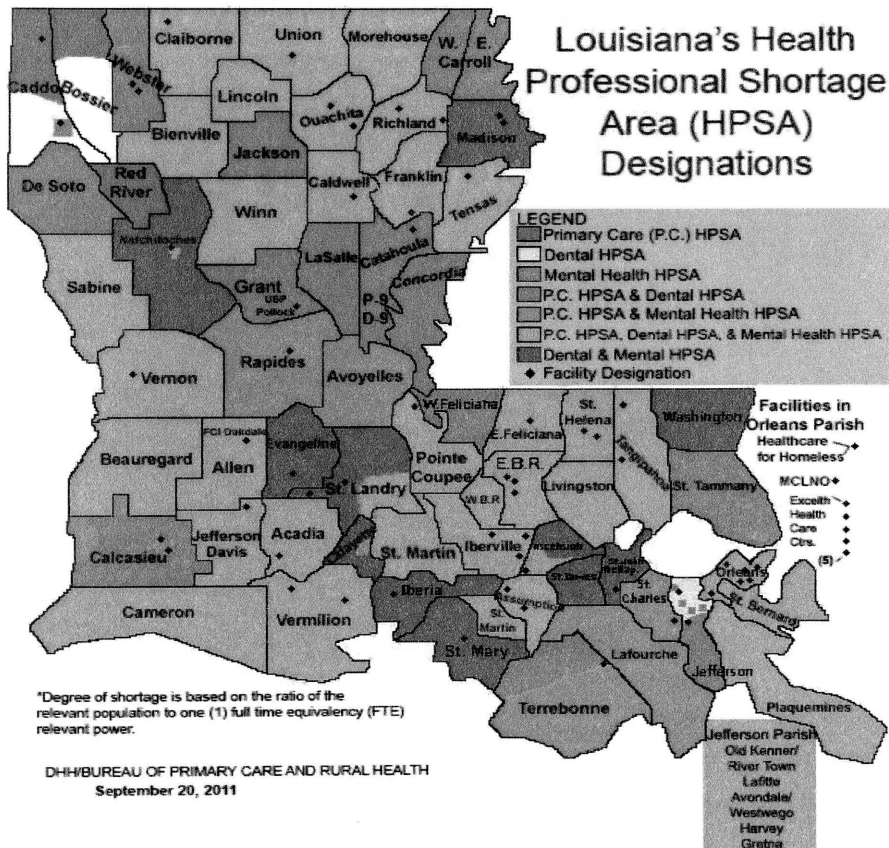
Administrative Public Health Regions



Source: Louisiana Department of Health and Hospitals (LDHH)

Figure B2

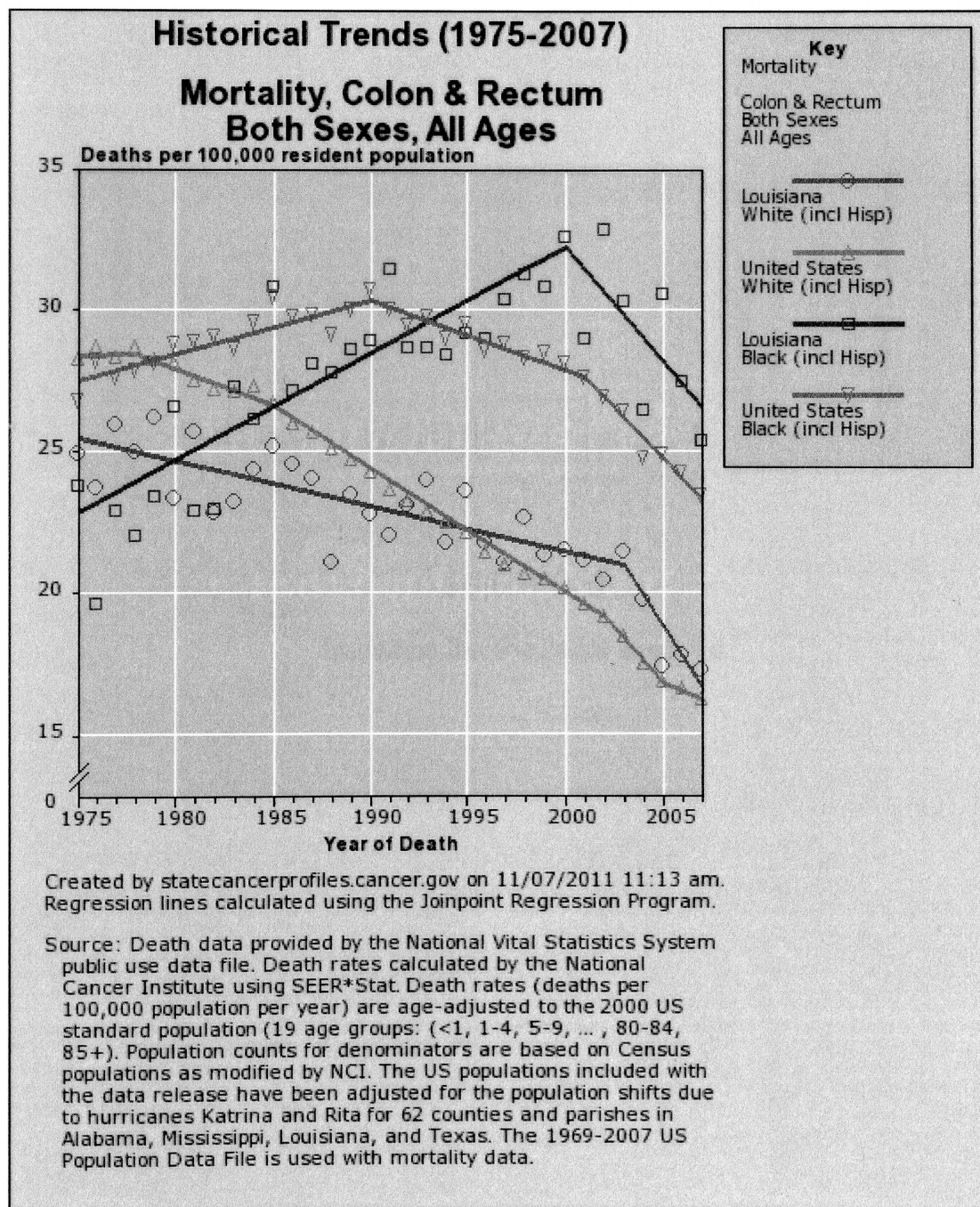
Health Professional Shortage Area (HPSA)



Source: Louisiana Department of Health and Hospitals (LDHH)

APPENDIX C
CRC Mortality Trends

CRC Mortality Trends



Source: National Cancer Institute-Cancer Profile-Louisiana vs. United States

APPENDIX D

Institution Review Board Approval



Institutional Review Board

Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
email: IRB@twu.edu

October 14, 2011

Ms. Stephanie Holden
4470 Prairie Lane
Grand Prairie, TX 75052

Dear Ms. Holden:

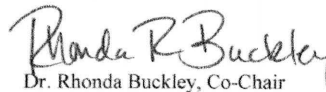
Re: *An Examination of the Use of Endoscopy Screening Tests for Colorectal Cancer Among African American Medicare Beneficiaries in the Northwest Region of Louisiana (Protocol #:*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the annual/final report is enclosed. A final report must be filed with the Institutional Review Board at the completion of the study. Because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the IRB is not

This approval is valid one year from October 14, 2011. Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

Sincerely,


Dr. Rhonda Buckley, Co-Chair
Institutional Review Board - Denton

enc.

cc. Dr. Gay James, Department of Health Studies
Dr. Kimberly Parker, Department of Health Studies
Graduate School

APPENDIX E

Consent to Participate in Research

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Title of research: An examination of the use of endoscopy screening tests for colorectal cancer among African American Medicare beneficiaries in the northwest region of Louisiana

Investigator: Stephanie Holden.....sholden@twu.edu 832/723-4134
Advisor: Kimberly Parker, PhD.....kparker6@twu.edu 940/898-2899

Purpose of the Research

You are being asked to participate in this research study to examine the use of colonoscopy or sigmoidoscopy medical tests for colon cancer screening. A colonoscopy is a test where the doctor inserts a tube with a small camera and looks at the inside of the entire colon. A sigmoidoscopy is a similar test, but the tube is not inserted as far. This test only looks at the lower part of the colon called the sigmoid colon. Either test is recommended for colon cancer screening. Colonoscopy screening tests are recommended every 10 years starting at 50 years old and sigmoidoscopy screening tests are recommended every 5 years.

This research is being done to examine whether African Americans who live in Sabine and Natchitoches parishes and have Medicare insurance know about these tests and whether you have ever had one of these tests.

You are asked to participate because you are an African American resident of either Sabine or Natchitoches parish; you are at least age 65 years and have Medicare insurance.

Description of Procedure

As a participant in this study you will be asked to complete a survey. The first part of the survey asks for information about your age, parish of residence, family income, education and health insurance coverage. The second part of the survey has 14-questions asking about colon cancer and whether you have had a colonoscopy or sigmoidoscopy screening tests. The survey is short and can be finished in about 15 minutes. Please answer as truthfully as possible. If you have questions about the survey, feel free to ask or call me at the number or email address above. The survey can be completed now and placed in the drop-box or returned later using a self-addressed stamped envelope. If you mail the survey, do not write your return address.

Potential Risks

No personal information that can identify you is needed, neither your name nor address are needed. Other information about parish of residence, age, education, income and insurance coverage are needed, but no name.

There is minimal risk to loss of confidentiality of information. Confidentiality will be protected to the extent that is allowed by law. All surveys will be secured in a locked file cabinet and destroyed within three years after the research. The results of the study may be reported in scientific magazines or journals but no identifying information will be included about a single individual.

The research will try to prevent any problems that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Also, if you send emails to ask questions, there is a potential risk of loss of confidentiality in all emails, downloading, and internet transactions.

Participation and Benefits

Your participation in this study is completely anonymous and voluntary. You may withdraw from the study at any time without penalty. There are no financial or direct benefits for participation in this study.

The findings from the study will advance the knowledge of colon cancer screening in this part of Louisiana. If you would like to know the results of this study, copies of the results will be provided to the location you received the survey within six months of completing the study.

Questions Regarding the Study

If you have any questions about the research study you may contact the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

The return of your completed survey constitutes your informed consent to act as a participant in this research.

Background:

The Centers for Disease Control and Prevention (CDC) reports that cancer is the 2nd leading cause of death in the United States. The American Cancer Society reports that deaths caused by cancers have slowly decreased, but African Americans consistently have the highest rates of colon cancer.

The CDC also reports colon cancer deaths can be reduced by almost 60% if starting at age 50, adults get regular tests for colon cancer.

The recommended screening tests for colon cancer are called fecal occult blood test, colonoscopy and sigmoidoscopy. A fecal occult blood test is used to detect blood in the stool. A colonoscopy is a test that can see inside the entire colon using a small video camera. The doctor inserts the tube, looks at the colon on a small TV screen and pictures can be taken. A sigmoidoscopy is a similar test, but the tube is not inserted as far. The sigmoidoscopy test looks at the lower colon area called the sigmoid colon. Starting at age 50, fecal occult blood tests are recommended every year, colonoscopy screening tests are recommended every 10 years and sigmoidoscopy screening tests are recommended every 5 years.

This research is examining the use of colon cancer screening tests using colonoscopy or sigmoidoscopy among African Americans who have Medicare insurance and live in Sabine and Natchitoches parishes.

Please complete both sections of the survey.

No name or personal identifiable information is needed.

Your responses will be anonymous.

APPENDIX F

Data Collection Instrument: Research Survey

The return of your completed survey constitutes your informed consent to act as a participant in this research.

Section I: Demographics

Which parish do you live?

- ☐ Sabine parish
☐ Natchitoches parish

What is your gender?

- ☐ Male
☐ Female

How old are you? _____ years old.

How would you describe your race?

- ☐ African American/Black
☐ Caucasian/ White
☐ Asian/Asian American/Pacific Islander
☐ Other, please note all races _____

Insurance status: check all that apply

- ☐ Medicare –Fee for service
☐ Medicare -HMO Managed care plan (Advantage,etc.)

☐ Medicaid
☐ Private

Including yourself, how many people live in the house with you?
_____ people

What is your annual household income (combined income of all members of your household)?

- ☐ under \$5000/yr
☐ \$5001 - \$15,000/yr
☐ \$15,001 - \$25,000/yr
☐ \$25,001 - \$35,000/yr
☐ \$35,001 - \$50,000/yr
☐ \$50,001 - \$75,000/yr
☐ over \$75,000/yr

What is the highest level of school that you have completed?

- ☐ K-8th Grade

_____ Some high school
_____ High school graduate or GED
_____ Some college/ vocational school
_____ College graduate _____ Post-graduate degree or courses

Section II

- **1. Prior to this survey, how would you describe your knowledge of colon cancer? On a scale of 1-5, how would you describe your knowledge, with 1 being no knowledge and 5 being the highest? Circle below.**

1 2 3 4 5

- **2. Has your doctor or healthcare provider ever told you that you were at high risk for colon cancer?**

_____ Yes. _____ No

_____ If yes, check all that apply

_____ Family history of colon cancer

_____ History of colon polyps

_____ History of colon cancer

- **3. Have you heard of colonoscopy prior to this research survey?**

_____ Yes

_____ No

- **4. Have you heard of sigmoidoscopy prior to this research survey?**

_____ Yes

_____ No

- **5. Has your doctor ever recommended a colonoscopy?**

_____ Yes. If yes, at what age when recommended? _____

_____ No

- **6. Has your doctor ever recommended a sigmoidoscopy?**

_____ Yes. If yes, at what age when recommended? _____

_____ No

- **7. Have you ever had a colonoscopy?**

_____ Yes. If yes, at what age? _____

_____ No

➤ **8. Have you ever had a sigmoidoscopy?**

_____ Yes. If yes, at what age? _____
_____ No

➤ **9. If you had a colonoscopy or sigmoidoscopy, what were the reason(s)? (Check all that apply)**

_____ Routine screening
_____ Family history of colorectal or colon cancer
_____ Having problems, describe _____
_____ Other _____

➤ **10. When was your most recent colonoscopy done?**

_____ Less than 1 year ago _____ Don't Know
_____ Between 1-2 years ago _____ Never had a colonoscopy
_____ Between 2-3 years ago
_____ Between 3-5 years ago
_____ 5 or more years ago

➤ **11. When was your most recent sigmoidoscopy done?**

_____ Less than 1 year ago _____ Don't Know
_____ Between 1-2 years ago _____ Never had a sigmoidoscopy
_____ Between 2-3 years ago
_____ Between 3-5 years ago
_____ 5 or more years ago

➤ **12. If you have never had a colonoscopy, please check the best reason(s).**

(Check all that apply)

_____ I have had a colonoscopy
_____ Difficulty getting appointment
_____ Appointment is scheduled/due soon
_____ Colonoscopy was scheduled, but didn't make it due to illness
_____ Cost of test/insurance doesn't pay
_____ Afraid of results/don't want to know
_____ Could get cancer anyway/test is useless
_____ Don't like test/pain/discomfort
_____ Inconvenient/hard to get to location
_____ Haven't scheduled/missed/forgot it

☐ Wasn't needed/no need/nothing wrong
☐ Not at risk for cancer
☐ Other reason _____

➤ **13. If you have never had a sigmoidoscopy, please check the best reason(s). (Check all that apply)**

☐ I have had a sigmoidoscopy
☐ Difficulty getting appointment
☐ Appointment is scheduled/due soon
☐ Sigmoidoscopy was scheduled, but didn't make it due to illness
☐ Cost of test/insurance doesn't pay
☐ Afraid of results/don't want to know
☐ Could get cancer anyway/test is useless
☐ Don't like test/pain/discomfort
☐ Inconvenient/hard to get to location
☐ Haven't scheduled/missed/forgot it
☐ Wasn't needed/no need/nothing wrong
☐ Not at risk for cancer
☐ Other reason _____

➤ **14. If you had a colonoscopy or sigmoidoscopy, who or how was the procedure paid? (Check all that apply)**

☐ Medicare
☐ Medicaid
☐ Private insurance
☐ Self-pay
☐ Co-pay, amount _____ %
☐ Other, please describe _____

Thank you for your participation.

Please place survey in drop-box or mail in self-addressed stamped envelope.

If mail, do not write your address on the envelope

APPENDIX G
Recruitment Flier

*Volunteers Needed for African American Research Study**

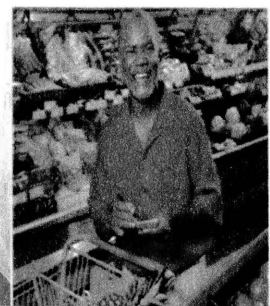
**IF YOU HAVE
MEDICARE
INSURANCE**

**AT LEAST 65
YEARS OLD
&
LIVE IN
SABINE
OR
NATCHITOCHES
PARISH**

For additional information,
contact Stephanie Holden,
832-723-4134,
sholden@mail.twu.edu

**HAVE YOU EVER
HEARD OF
OR
HAD A
COLONOSCOPY?**

**COMPLETE AN
*ANONYMOUS SURVEY**



Church Name

Date XX/X/11

Time 00pm

**There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions
Texas Woman's University**