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The Influence of Social Determinants on Late Stage Breast Cancer and the Impact of the National Breast and Cervical Cancer Program on Late Stage Breast Cancer Diagnosis

Melody L. Fortune

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THE INFLUENCE OF SOCIAL DETERMINANTS ON LATE STAGE BREAST
CANCER AND THE IMPACT OF THE NATIONAL BREAST AND
CERVICAL CANCER PROGRAM ON LATE STAGE BREAST
CANCER DIAGNOSIS

By

Melody Fortune

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Public Policy and Administration
in the Department of Political Science and Public Administration

Mississippi State, Mississippi

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This dissertation research focused on breast cancer and social determinants that have been shown to influence the outcomes of this devastating disease. Although heart disease is the leading cause of death for women, more women feel that they will die from breast cancer. Breast cancer is the most common diagnosed cancer in women exacting an emotional and economic hardship for many women. There are no known causes of breast cancer, but there are certain genetic and social factors that pre-dispose women to this disease. Also, diagnosis at later stages of disease has been shown to have adverse outcomes for many.

This research examined the effects that social determinants had on breast cancer stage of diagnosis. The social determinants researched to examine their influence on breast cancer outcomes were race, geographical location, health insurance, and income. Also, this research examined the influence of Public Health Law, 101-354, enacted to decrease health disparity from breast and cervical cancer for minorities and medically underserved women had on breast cancer diagnosis for women enrolled in the Mississippi

Breast and Cervical Cancer Program. Complimentary to PHL 101-354, Public Health Law 106-354, the Breast and Cervical Cancer Treatment Act, was enacted giving states the option of providing health insurance through Medicaid for eligible women with a diagnosis of cancer of the breast or cervix, including precancerous conditions, for treatment services.

The results of this study revealed that race and health insurance were the two major factors that negatively impacted stages of breast cancer diagnoses. Although hypothesized, geographical location and income did not significantly affect late stage breast cancer rates.

Key words: breast cancer, social determinants, early stage, late stage

DEDICATION

This dissertation is dedicated to my parents, the late Jeanetta Jones Fortune, who always urged us to complete what we started and to my father, Oscar DePriest Fortune, who provided inspirational and financial support in this endeavor. Also, I am dedicating this body of work to my siblings; Deborah, Dwight, and Dinah who keep me grounded and are always there for moral support and intellectual stimulation.

I am deeply indebted to my friends, some of whom would talk to me on my weekly drive from Starkville until I made it safely home, thanks Sherry and Chandra. I am also indebted to all of my friends who stood by me, commiserated with me, but would never let me quit. Thanks Pat for being a surrogate mother after my mother passed by keeping me encouraged. Thanks Callop for ensuring that I kept my street smarts as I pursued higher education. Thanks Carolyn, Adriane, Darcel, Sheila G., and Genese for always being there.

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CHAPTER I
INTRODUCTION

“Every social injustice is not only cruel, but it is economic waste.”

-William Feather

“To unequal privileges among members of the same society the spirit of our nation, is with one accord, adverse.”

-Thomas Jefferson

Jefferson and Feather both suggested in the above referenced quotes that there should be equal rights for all members of society. However, history has demonstrated that certain population groups have been treated unfairly, thus impacting not only their economic standing in society, but also their health care outcomes and health disparate conditions. The historical aspect of inequity in the health care system has often been echoed by African Americans in their distrust of the medical system, with some of its grounding in the Tuskegee Experiment. There is also substantial documentation on racism as a mechanism for not allowing minorities in medical schools. The Washington Post documented July 10, 2008, that the American Medical Association, the country's largest medical association, issued a formal apology for the antipathy and various other transgressions against African American physicians for decades. Economic disenfranchisement, marginalization, distrust of the medical community, and limited and/or lack of minority medical providers are major contributing factors to disparate

health care conditions. However, the problem with health disparities is not a novice notion, Dr. Dee Baldwin posits that health disparities have been a constant factor in American Society since the early 19th and 20th centuries, when perceptions and ideologies influenced society and the health care system (Thomas 2006).

Several studies have shown, including recently commissioned by the Joint Center of Political and Economic Studies; that minorities face health disparity from their birth with higher levels of infant mortality, higher rates of illnesses from many chronic diseases, to premature deaths (JCPES 2009). Lower socioeconomic status (SES) and racial inequities have impacted the health status of underprivileged individuals in this country. It is important to note that even though race is a predictor of health outcomes, individuals of lower SES suffer disproportionately from adverse health issues regardless of race (Chen 2006, Cummings 2007, Smith 2007, and Simon 2008). Many problems associated with health care disparity have been attributed to lack of resources for preventive and screening services; residing in blighted communities; lack of referral by health care providers; cultural biases, and lack of social networks (Cummings 2007 and Huie et al. 2003). The inequity and inequality that confront and affect certain ethnic groups and minorities affect healthcare and health costs that are shouldered by individuals, communities, health care organizations, employers, governmental agencies, including Medicare and Medicaid (Johnson 2004). Minorities and lower-income people often go to emergency rooms for preventive type services that could easily be treated at a primary care provider site and often the bills that amass are left unpaid and are often written off by the hospital, thus creating another burden for taxpayers. Not only do policy makers have a crucial role in providing adequate health care funding for vulnerable population groups, but health care workers, advocates, and practitioners have a critical

role helping to reshape the mindset of medically disadvantaged individuals to focus on prevention.

The topic of health disparity has been widely debated and has become a national research issue. Additionally, the impact that social indicators, such as poverty, access to health care, health care coverage, prestige, social connectedness, and education have had on poor health outcomes is well documented (Chen 2006, Cummings 2007, and Huie et al. 2003). Disparities in health have also been viewed from the unequal distribution of resources and one's position in the social structure (HHS 1984). However, the problem with health disparity is not new to the public health debate. For more than thirty years, the Office of Health and Human Services has documented the economic and individual costs of health care disparity on African Americans and other minorities. In January 1984, Secretary of Health and Human Services, Margaret M. Heckler, noted that, "there was a continuing disparity in the burden of death and illness experienced by Blacks and other minority Americans as compared with our nation's population as a whole, (HHS 1984)."

Currently, policy makers in the United States find themselves at a crucial point, faced with the knowledge that there is a need to take care of the most precious resource: citizens with their varying health care needs with scarce resources. However, in the current economic climate in the United States the financial costs that are associated with tackling the health care issue have been cause for concern. Conversely, the costs that are associated with inadequate health are continuing to add to this country's financial woes and could be an impetus for change. There is a growing economic divide between the upper and lower classes in this country with a shrinking middle class. Unfortunately, individuals who are of lower socio-economic status are medically disadvantaged and are

the ones who are mostly affected by inadequate health care coverage and increased morbidity and mortality rates. Data suggest that the medically disadvantaged suffer disproportionately from adverse health outcomes and premature deaths. However, the economic impact of inadequate health care costs on American society cannot be overlooked as the United States spends more than 17% of its gross domestic product on health care and that spending continues to escalate.

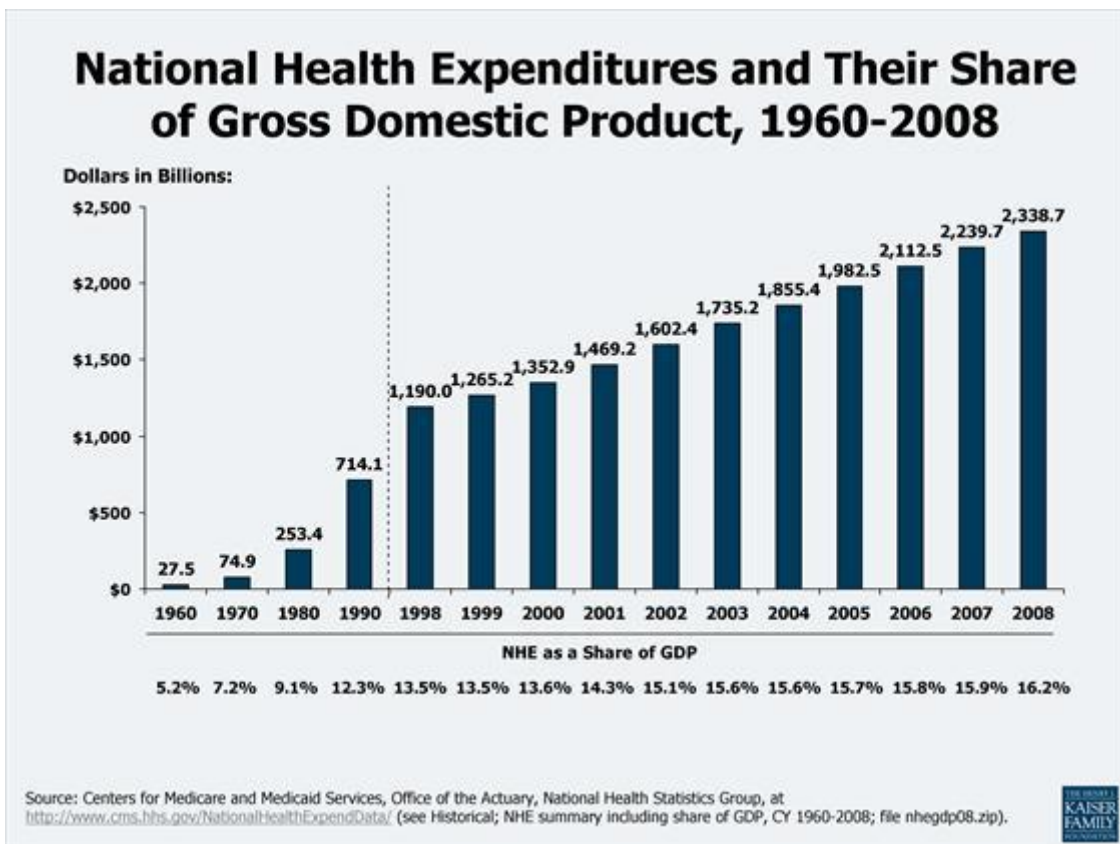


Figure 1 National Health Expenditures and Their Share of Gross Domestic Product, 1960-2008

Even though the United States spends more money on health care than any other industrialized nation, the health outcomes in this country are poorer than many other countries (HJKF 2004). Gerard Anderson, et al. documented that “the higher level of

spending in the United States is primarily attributable to two factors: the higher gross domestic product (GDP) per capita in the United States and the much higher prices that Americans pay for health care services, (2004).”

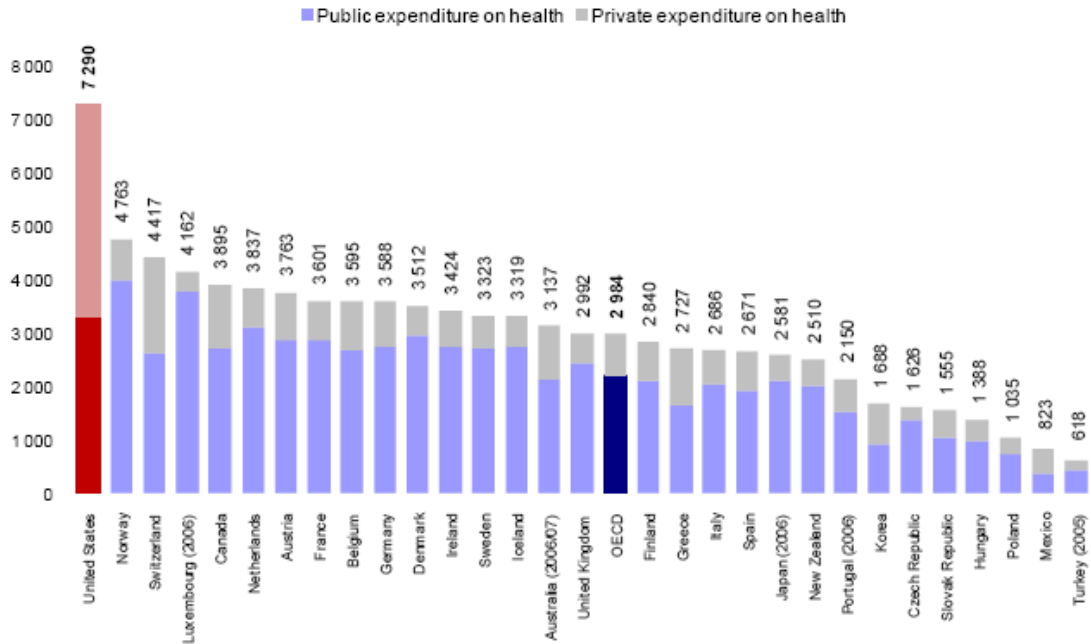


Figure 2 Total health expenditure per capita, public and private, 2007

Source: Kaiser Foundation reported source as Organisation for Economic Co-operation and Development, *OECD Health Data 2009*, Copyright OECD 2009, <http://www.oecd.org/health/healthdata>.

There have been efforts in this country to address the lack of health insurance for many Americans. In the mid 1910s experts endorsed compulsory public social insurance, with 10 states establishing commissions to review public social insurance and 15 states introduced health insurance legislation (Hader). However, in the mid 1960s President Lyndon Johnson initiated his “War on Poverty” and expanded some of the social programs that former President Roosevelt instituted.

In 1965, one of the expansions of social programs was the formation of health care coverage for elderly Americans, commonly known as Medicare, which was created under Title 18 of the Social Security Act. In 1972 the Medicare program was expanded to individuals under the age of 65 who had permanent disabilities (HKF 2004). According to the Kaiser Foundation, there are about 43 million individuals who are covered by Medicare. If Americans and their spouses are eligible for Social Security payment and have made payroll tax contributions for ten or more years, they are eligible for Medicare Part A, beginning at age 65. According to the Kaiser Foundation, in 2006, expenditures for Medicare benefits were anticipated to be about \$374 billion.

Another expansion of health care coverage for certain populations of lower income Americans began in 1965, Medicaid. Congress expanded limited health care coverage even more in 1990 with passage of the Breast and Cervical Cancer Mortality Act (Public Law 101-354), which authorized the Centers for Disease Control and Prevention (CDC) to establish the National Breast and Cervical Cancer Early Detection Program (NBCCEDP). This Congressionally appropriated health care coverage was the result of concerns by many citizens and public interest groups. Two of the major interest groups involved with the passage of the law were the American Cancer Society and the Susan G. Komen for the Cure.

After the passage of Public Law 101-354, the NBCCEDP was created in 1990 as the first national cancer screening and early detection program in the United States. According to the CDC, the NBCCEDP is a nationwide comprehensive public health program that provides access for the uninsured and medically underserved women to screening services for the early detection of breast and cervical cancer. With the establishment of this program it was recognized that there was a disproportionate amount

of women in certain ethnic, racial groups, and medically underserved who do not receive adequate screening services, thus widening the disparity gap for certain chronic diseases. The passage of PL 101-354 was an attempt to address the health care disparity regarding breast and cervical cancer in the United States by providing screening tests, diagnostic services, and treatment referrals for medically underserved women. The CDC enters into cooperative agreements with all 50 states, the District of Columbia 5 U. S. territories, and 12 Native American tribes to provide access to breast and cervical cancer screening services (CDC). There is a major health disparity gap in Mississippi for women in breast and cervical cancer mortality rates. Breast cancer mortality data from 2004-2008 document African American women died at a higher age-adjusted rate 31.0 compared to their white counterparts at 21.5. Cervical cancer mortality data from 2004-2008 document African American women died at a higher age-adjusted rate 7.1 compared to their white counterparts at 2.6. Mississippi was one of the last states to enter into a cooperative agreement with the CDC to begin these services. The NBCCEDP requires that grantees match \$1 for every \$3 that is awarded and Mississippi did not provide matching funds until 1998 (CDC).

However, the widespread poverty in this state, the shortage of health care professionals, and the number of Mississippians who do not have health care coverage translates into negative health care outcomes for many of its citizens. Mississippi has not begun to explore the need for health care coverage for its citizens, although it should because of the various negative health indicators: leading the nation in infant mortality rates (10.74 MS, 6.86 US); leading the nation in cardiovascular disease (306.8 MS, 211.1 US); ranking fourth nationally in cancer rates (208.4 MS, 188.5 US); and premature death and disability from various chronic illnesses. Additionally, the financial burden of caring

for those diagnosed with chronic diseases imposes is startling and could provide an impetus for revamping the health care system. The CDC reports that chronic diseases such as, heart disease, stroke, cancer, and diabetes are the most prevalent, costly, and preventable causes of death (2008). One of the more costly treatments is that of cancer. The CDC estimates that in 2005, cancer will cost the United States about \$210 billion, including almost \$136 billion from lost productivity. This research focus will be on breast cancer, which it is estimated that almost 7 billion dollars will be spent on this particular disease (CDC 2005). Additionally, Campbell et al. estimated that the lifetime per patient cost for treating breast cancer in the United States ranged from \$20,000-\$100,000. They also noted that multiple studies documented that increased cost were associated with later stages of breast cancer diagnosis (2009).

Data demonstrate that African American women in Mississippi diagnosed with breast cancer are diagnosed at later stages: Regional Stage 33.7% African American, 28.3% white and Distant Stage 7.3% African American, 4.7% white (MS Cancer Registry). Also, African American women in Mississippi from 2004-2008 died from breast cancer at a higher age-adjusted rate of 31.0 compared to 21.5 for white women. Additionally, African American women in Mississippi from 2004-2008 died from cervical cancer at a higher age-adjusted rate of 7.1 compared to 2.6 for white women. The purpose of this study is to examine the impact that race, income, socio-geographical location, and health care coverage have on late stage breast cancer diagnosis. Also, data will be further analyzed to determine if women enrolled in the Mississippi Breast and Cervical Cancer Program (BCCP) presented with late stage breast cancer at the time of diagnosis during a ten year timeframe of 1999-2008. Much of the literature read documented that regular mammography usages impact stage of breast cancer diagnosis.

A regression model will be analyzed to determine which independent variables, such as; race, income, and health care coverage are the better predictors for late stage breast cancer diagnoses using incidence data housed at the Mississippi Cancer Registry (MCR). Also, data generated from the number of women screened in the NBCCEDP funded screening programs will be analyzed to determine if women who have been diagnosed with breast cancer are at later stages of diagnosis.

Statement of the Problem

The CDC estimates that in 2005, cancer will cost the United States about \$210 billion annually, including almost \$136 billion from lost productivity. Also, it is estimated that almost \$7 billion will be spent on breast cancer (CDC 2006). Cancer drug costs are escalating with new and promising drugs being introduced regularly. Screening tests are recommended for the early detection of certain diseases, yet there still remains a disparate group of people who do not adhere to recommended screening intervals. Often a disproportionate share of African American women is diagnosed with late stage breast cancer when disease prognosis is worst. The CDC espouses that a mammogram every one to two years can reduce the risk of dying from breast cancer 20-25 percent for women over the age of forty or older (CDC 2006). Since Mississippi's health indicators are far worse than most states in the country: leading the nation in infant mortality rates (10.74 MS, 6.86 US); leading the nation in cardiovascular disease (306.8 MS, 211.1 US); ranking fourth nationally in cancer rates (208.4 MS, 188.5 US); and premature death and disability from various chronic illnesses, this study will show that a state-based program aimed at impacting cancer rates reduces death rates for women in Mississippi.

The CDC reported that in 2006, latest available data, 191,410 women were diagnosed with breast cancer and 40,820 women died from breast cancer (CDC 2006). The economic impact, coupled with the emotional and physical effect that breast cancer exact on women, is monumental. Although there has been a decline in breast cancer rates nationally, certain ethnic and racial groups continue to have worse outcomes, are diagnosed at later stages of disease, and have increased mortality rates. Several studies exist that examine social and economic factors relating to breast cancer, however there is a gap in the literature for studies that focus on Mississippi (DeVoe et al. 2007, Fitzpatrick et al. 2004, May et al. 1997, and Shavers et al. 2002). Although data show that adhering to recommended screening guidelines for breast cancer significantly impact breast cancer rates, Mississippi continues to have low mammography screening rates (CDC 2010, Jencks et al. 2000, and Randolph et al. 2002). A press release issued from the CDC in 2010 documented that Mississippi was one of three states with the lowest mammography screening prevalence; Nevada 72%, Mississippi 72%, and Idaho 73% (CDC 2010). The significance of this research is to gain valuable insight that could be beneficial in decreasing the morbidity and mortality rates from breast cancer in Mississippi and examine how a healthcare policy influences outcomes for breast cancer suffers in Mississippi.

Research Questions

There are five questions that will provide the guidance for this study:

1. Is there a significant difference in late stage breast cancer for African American women as compared to white women in Mississippi?

2. Is there a significant difference in late stage breast cancer for women with health insurance as compared to women without health insurance in Mississippi?
3. Is there a significant difference in late stage breast cancer for women who live in rural areas versus those who live in urban areas in Mississippi?
4. Is there a significant difference in late stage breast cancer for women of lower SES versus those of higher SES in Mississippi?
5. Has the Mississippi Breast and Cervical Cancer Program significantly affected late stage breast cancer in Mississippi?

Need for the Study

There is a need for the study to analyze those social determinants that have been shown to influence stages of breast cancer diagnosis. Also, the study is needed to analyze whether a public policy, PL 101-354, has been effective in reducing later stages of diseases in breast cancer rates. Although a Mississippi case study is not generalizable to the entire population, findings from this study could have broad implications in public health in trying to address health disparity issues.

Limitations of the Study

One of the limitations of this study in analyzing the effectiveness of a public health policy in the descriptive analysis is that there are intervening variables, other than the BCCP, that could affect the outcomes. The BCCP is limited to women who are in the lower income bracket and Mississippi receives funding from the CDC to provide services to a little more than 11% of the eligible population (7,000/61,099 eligible). The NBCCEDP stipulates the highest eligible income cannot exceed 250% of the Federal

Poverty Level. Also, another limitation for this study is that all lower income women will not be included in this state, data analyzed are only for a subset of the eligible women in Mississippi. Data for Mississippi will be analyzed to determine whether a public health policy aimed at impacting morbidity and mortality rates due to breast and cervical cancer has been effective by comparing change over a period of time Fiscal Years 1999-2008 (July 1-June 30).

Another limitation of this study is that cancer data do not capture income and educational attainment, which affects generalizability. Since the MCR dataset lacks specific economic information, zip code level data will be United States Census Bureau data regarding per capita income. One of the limitations to the ecological data approach is that interpretation of the data is susceptible to ecological fallacies (Clayton 1993, Firebaugh 1978, and Greenland et al. 1989).

A limitation of this study is using Mississippi as a case study, which affects generalizability. But, there is a great need to focus solely on Mississippi. In the review of literature no articles were found that utilized Mississippi data, providing a gap in the literature. Also, Mississippi is one of three states with the lowest adherence to recommended mammography screening. Mississippi has the worst health outcomes of all states and is listed as the least healthy state in which to reside. Factors that were used to determine state rankings according to the Henry J. Kaiser Foundation were health care, obesity, diabetes, smoking, drinking, health disparities, and death from cardiovascular disease and cancer. According to the Henry J. Kaiser Foundation there were several health status indicators in which Mississippi had the worst outcomes: Mississippi had the highest number of teen birth rates per 1,000 females (65.7 MS, 41.5 US); highest percentage of overweight/obese children (44.4% MS, 31.6% US); highest child mortality

rate per 100,000 children (34 MS, 19 US); highest percentage of overweight/obese adults (67.8% MS, 60.8% US) (HJK 2010).

Summary

In summary, health disparities exist for certain ethnic and racial groups that influence their health outcomes. Some social determinants have been documented as causing many of the problems with health disparities. Mississippi continues to rank 50th for the healthiest states in the United States. Also, in the review of literature no articles were found that utilized Mississippi data, providing a gap in the literature. Health disparities negatively impact Mississippians and research is needed to document the ill effects. According to Jack et al., “Understanding the effects of basic societal organization on health outcomes is essential for reducing health disparities in the state. Research on social inequalities in health and their causes may expand our knowledge about the impact of these social differences on the health outcomes of Mississippians,” (2009).

CHAPTER II

REVIEW OF LITERATURE

Breast cancer is the most common cause of cancer death in women and the economic, psychological, and social tolls that it exacts on women in this country are causes for major concern. Although, cardiovascular disease is the number one cause of death for both races, more women fear that they will be diagnosed with breast cancer (Norman et al. and Robertson 2000). An article by Ann Robertson documented that a report from a major teaching hospital in Toronto, Canada found that more women believe that the number one cause of death is breast cancer. She further noted that the fear was so pervasive, that it was not a matter of “if” they were to be diagnosed with breast cancer, but rather “when” they would be diagnosed (2000). Similarly, an article by Paul Norman and Kate Brain that looked at an extended health belief model for the prediction of breast self-exams, found that women scored high on the *Breast Cancer Worries* scale, indicating high breast cancer worries (2005). While nationally there has been a decline in breast cancer death rates, mortality rates for African American women have not seen the same level of decrease from this devastating disease at an age adjusted rate of 32.8 per 100,000 population compared to 23.3 for their white counterparts (CDC). The chart listed below demonstrates the disparity that exists in breast cancer mortality rates. Even though race, ethnicity, and educational attainment have been proven to affect the health disparity gap; geographical location has also been a predictor of adverse health outcomes (Flora et al.

2004 and Calle et al. 1993). Women who live in rural areas tend to present with advanced stages of breast cancer.

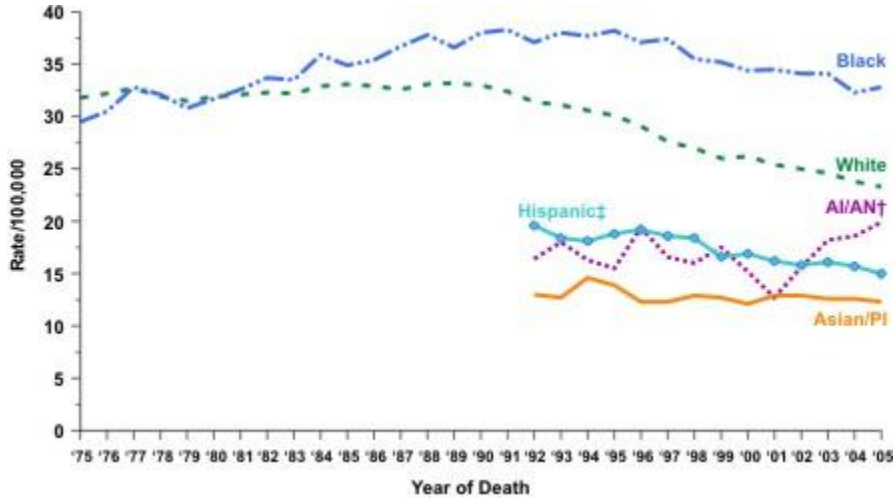


Figure 3 Female Breast Cancer U. S. Death Rates by Race and Ethnicity, 1975-2005

Source: Mortality source: U.S. Mortality Files, National Center for Health Statistics, CDC.

*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population (19 age groups - Census P25-1130).

A major reason to study factors affecting stage of diagnosis of breast cancer is stage at diagnosis impacts prognosis, quality of life issues, and treatment options. According to the American Cancer Society, when a woman is diagnosed with localized breast cancer, she has a 98% 5-year survival rate; at regional disease, the survival rate drops to 81% and at distant or late stage, the survival rate drops significantly to 26%. The dramatic decrease in expected 5-year survival rate has major implications for public health, with emphasis being placed on the importance of early detection, a reduction in years of potential life loss, and the financial costs associated with late stage of disease diagnoses. Since there are so many unknowns about breast cancer, the best predictor of survival rates is stage of diagnosis. If women are diagnosed at an earlier state, primarily

through regular mammography usage, they have a better prognosis for survival of this chronic disease (Farley and Flannery 1989). When breast cancer is diagnosed at an earlier stage, a woman has a nine out of ten times survival rate.

Even though there are payment sources available that reimburse breast cancer screening, diagnosis, and treatment services, breast cancer still remains the third leading cause of death for white women nationwide and the second leading cause of death for African American women nationwide. Medicare, Medicaid, the NBCCEDP, and most private health insurances will pay for a woman to have a breast cancer screening. However, there still remains a high number of late stage diagnoses of this disease, especially in certain population groups. Claims data from the Centers for Medicare and Medicaid Services (CMS 2006) have shown that even though Medicare reimburses mammogram costs for women 40 and older, the majority of enrollees did not access mammography screening at the recommended levels; 2005 for mammography was 37.9% and 38.3% in 2006 (CMS 2006). Furthermore, data have demonstrated minimizing financial barriers associated with mammography screenings did not ensure compliance rates among certain population groups, more specifically among African American women (Katz et al. 2000 and O'Malley et al. 2001), thus widening the health disparity gap.

Health Care Disparity

Health disparity has been and continues to be a major public health policy issue. Interestingly, an official definition for health disparity was not developed until September 1999, in response to a White House Initiative. "The National Institutes of Health (NIH), under the direction of then-director Dr. Harold Varmus, convened an NIH-wide working

group, charged with developing a strategic plan for reducing health disparities. That group developed the first NIH definition of ‘health disparities’:

‘Health disparities are differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States,’ (NCI, Aug. 2009).

The passage of Public Law 106-525, the Minority Health and Health Disparities Research and Education Act of 2000, formalized health disparity, providing a legal definition. The legal definition of health disparate populations is “a population where there is a significant disparity in the overall rate of disease incidence, prevalence, morbidity, mortality, or survival rates in the population as compared to the health status of the general population,” (2000). Health disparate issues are more prevalent in certain ethnic and minority populations living in rural areas, those of lower socioeconomic status, and women (Chen, et al. 2006). Individuals with lower socio-economic status tend to have poorer health outcomes, tend to be uninsured or under insured, reside in substandard housing, and have limited access to health care providers.

There have been much debate and discussion regarding health disparity which is reflective in *Healthy People 2010*, a product of a national planning session that serves as a barometer to determine objectives for a healthier society (HP 2010). One of the goals of Healthy People 2010 is to eliminate health disparity. This health care document acknowledged that disparity exists for various demographic groups in this country based on; gender, race and ethnicity, income and education, disability, geographic location, and sexual orientation. Minorities have disproportionately higher morbidity and mortality rates for most chronic diseases. National data demonstrate a marked difference in mortality rates from breast and cervical cancers for African American women as

compared to their white counterparts. The overall age adjusted mortality rate for breast cancer for 1999-2005 was 25.4 per 100,000 population compared to 33.9 for African American. The overall age adjusted mortality rate for cervical cancer for 1999-2005 was 2.6 per 100,000 population compared to 4.9 for African American (CDC/Wonder 2008). According to the CDC, African Americans are more likely to die of cancer than people of any other racial or ethnic group, at an age-adjusted rate of 224.1 per 100,000 population rate compared to 182.7 for whites, 111.1 for Asian/Pacific Islanders, 125.1 for American Indians/Alaska Natives, and 123.8 for Hispanics.

The National Cancer Institute (NCI) reports that even though whites experience higher incidence rates from breast cancer, African Americans experience higher death rates. The CDC reported in 2005, African American women died of breast cancer at an age-adjusted rate of 32.8 per 100,000 population compared to 23.3 for whites, 12.2 for Asian/Pacific Islanders, 15.3 for American Indians/Alaska Natives, and 15.1 for Hispanics (CDC 2005). Knowledge of these disparities and other data are the impetus for targeting certain population groups to bridge that gap that exists for breast and cervical cancer morbidity and mortality rates. The Behavioral Risk Factor Surveillance System (BRFSS) documents differences in mammography screening rates for whites and nonwhites, ultimately affecting breast cancer outcomes. The data below reflect the number of women aged 40 and above who reported that they had mammogram within the past two years. Data were shown to reflect race and educational attainment. The data for income were not placed on the table due to no reported changes for the reported years: Each reported year, the data remained the same for those whose reported income was less than \$15,000 at 58.2%; \$15,000-24,999 at 63.2%; \$25,000-34,999 at 65.8%; \$35,000-49,999 at 72.1%; and \$50,000+ at 77.9%. It is important to note that the racial gap has

narrowed for women who reported having had a mammogram within the past two year over the time period reflected in the table. The Mississippi Breast and Cervical Cancer Program began in 1998 and the BRFSS data reflect a significant difference in reported mammography rates from 1998 to 2006 possibly demonstrating the impact that health insurance has on accessing screening for breast cancer.

Table 1 Mississippi Behavioral Risk Factor Surveillance System women aged 40 and above who had mammogram in past 2 years

Year:	White	Black	Less than H.S.	H.S. or G.E.D	Some post-H.S.	College Graduate
1998	68.0	59.4	51.9	63.6	71.5	79.6
2000	69.9	64.8	52.9	71.5	69.4	77.7
2002	70.2	62.1	60.9	60.4	73.2	79.9
2004	67.9	62.8	56.7	63.6	69.6	76.4
2006	68.4	65.5	58.8	65.5	70.5	76.3

Source: the Mississippi State Department of Health, Behavioral Risk Factor Surveillance System

Social Determinants that Influence Late Stage Breast Cancer

Even though there have been many advances in medical technology, diagnoses, and treatment options, certain population groups continue to have higher prevalence of chronic diseases and are dying prematurely at a much higher rate. Much of the literature document that there are social factors that greatly influence health outcomes. Many of the sociological factors that Verba and Nie documented that are beneficial in predicting voting outcomes and behaviors are the same factors that predict health care outcomes, with the exception of health insurance. Individuals who have higher incomes, more education, have more social connectedness have better health outcomes and are more likely to avail themselves to preventive health screenings than those who are poor, uneducated, and in the minority. Fitzpatrick et al., 2004 noted that the primary reason that

non-elderly Americans have disparate health conditions is because of lack of health insurance.

African Americans suffer from chronic diseases and often have higher mortality rates than many other racial and ethnic groups. A study from John Hopkins University found that African Americans have the overall highest cancer incidence and mortality rated among all racial and ethnic groups in the United States. The study also found that African Americans die from hypertension-related diseases at a rate five times higher than whites and higher incidences of and mortality from other chronic diseases. The study further noted that when looking at risk factors and health behaviors that impact these chronic diseases (such as smoking, obesity, sedentary lifestyles, lack of health insurance, etc.) there were racial differences in health status and outcomes that adversely affected African Americans. Their findings demonstrated that “23% of non-elderly African Americans are uninsured, compared to 12.7% of whites. African Americans also more frequently report poor access to health care than whites and are less likely to have a physician who is a regular source of medical care,” (Shavers et al. 2002).

Health disparity does not cease for marginalized population groups once they have health insurance. A review of the literature documented that for Medicare recipients, disparity continues to exist among that group of people. Virnig et al. found that of all the measures they researched, African Americans who were enrolled in the Medicare+ Choice, received lower quality care than their white counterparts. Virnig et al. found that “Blacks with diabetes were less likely than whites were to have an annual eye exam or to have HbA1C testing. Blacks were also less likely to have an ambulatory preventive care visit in the measurement year,” (2002). They also documented that African American women were less likely to receive a mammogram than white women. Even though they

acknowledged the limitations of their study, they recognized that their findings tended to mirror the findings of other researchers related to racial variations in quality of care among Medicare recipients.

Similarly, Dailey et al. found that older African American women who were located in Connecticut reported racial discrimination when adhering to screening mammography guidelines. Dailey et al. conducted a prospective study of 1,451 women between the ages of 40-79 who received a mammogram at one of the five urban hospitals in Connecticut between the years of 1996-1998. Their findings noted that 42% of African American women and 10% of white women reported lifetime racial discrimination (Dailey et al. 2007). Even though the findings are subjective in nature because it is self reported and subject to self-interpretation, it supports previously reviewed literature on disparity issues for minorities. However, it is important to note that a small percentage of white women reported discrimination.

On a somewhat different approach to discrimination, Randolph et al. found that age discrimination was a factor explaining why older women did not receive mammography screening. The authors acknowledged that as women age, they are at a higher risk for developing breast cancer, but there is inconsistency in screening guidelines for older women. Their study examined data from SEER registries for 1995 and 1996 and was linked to Medicare data for women 69 years of age and older. Their findings suggested that mammography screening was still a beneficial tool for older women and that age should not be a discriminatory exclusion tool for not referring women to have screening mammograms (2002).

Even though much of the data reviewed relate to breast cancer, due to the focus of this dissertation, there is consistency in other disparities that continue to exist in health

care. Authors David Williams and Toni Rucker documented that although strides have been made in health care disparities, which have impacted health outcomes, African Americans continue to have higher morbidity and mortality rates. They recommended that there should be more trained medical professionals and enhanced recruitment efforts to attract more minorities. They also argued for a more comprehensive approach to lessening racial disparities in health care, similar to Medicare's Disparity Elimination component on cultural competence for health care providers (2000).

Kate Traynor espoused that while health care has improved for Medicare recipients, things could be significantly better. She cited some modest health gains with Medicare patients, but there were pervasive problems that still existed with this group of individuals; such as, lack of preventive screening, wrong medications prescribed, and "preventable adverse events and complications in hospitals," (2005). Similarly, Jencks et al. noted optimal opportunities via adherence to recommended screening tests to improve health care for Medicare recipients and urged a partnership with all the stakeholders. They reviewed Medicare data regarding acute myocardial infarction, heart failure, stroke, treatment of pneumonia, prevention of pneumonia, breast cancer, and diabetes (2000). Also, Schneider et al. found that African Americans who were Medicare recipients received poorer health care than their white counterparts (2002).

The review of the literature demonstrates that health disparities exist among Medicare beneficiaries. The disparity gap tended to be more prevalent among racial and ethnic groups. However, some of the data found health disparities based on age and location. Health care disparity is not new nor has it been ignored, yet the gap persists and widening in some areas. Healthy People 2010 and Rural Healthy People 2010 both discussed the need for disparity elimination to improve overall health outcomes. The

CDC has taken strides in developing policies that seek to eliminate health disparity. The data also demonstrated that cultural competence is needed for health care providers who see Medicare beneficiaries. The gap can be narrowed, but there must be more information gained on which factors are more influential in determining health outcomes. Social determinants have been shown to impact late stage breast cancer diagnosis and this dissertation will look at five of them and their influence: race; lack of health insurance; cultural beliefs; socio-demographics; and income levels to determine which has a greater influence on late stage breast cancer diagnosis.

African American women are more likely to be diagnosed at later stages of breast cancer compared to white women.

The CDC reports from 1998 through 2002, the average annual death rate per 100,000 people for all cancers combined was 190.9 for African Americans, 161.9 for white Americans, 107.4 for Hispanics, 114.5 for American Indians/Alaska Natives, and 96.6 for Asians/Pacific Islanders. The NCI reports that even though whites experience higher incidence rates from breast cancer, African Americans experience higher death rates. Those statistics are mirrored in Mississippi. Breast cancer is the third leading cause of death for white women nationwide and the second leading causes of death for African American women nationwide. In Mississippi in 2003-2007, breast cancer incidence total cases were 10,407, yielding an age-adjusted rate of 130.55 per 100,000 population. It is by far the leading type of cancer incidence in women. The age-adjusted rate in white women, 129.63, was slightly lower than in black women, 130.50, however the difference was not statistically significant. Even though, African American women have a slightly higher incidence rate, they have a markedly higher mortality rate for breast cancer. In Mississippi, over the period 2004-2008, there were a total of 2,099 women who died of

breast cancer yielding an age-adjusted rate of 25.1. Of the 2,099, the age-adjusted rate for white women was 21.5 and 33.3 per 100,000 population for non-white, with the age-adjusted rate for non-white women exceeding the national average rate of 23.4 for 2006. The data suggest that African American women present at a younger age with more advanced disease and have lower rates of compliance with the screening guidelines for mammography and CBE. An article published in the *International Journal of Surgery* found that African American women were 1.5 to 2.2 more times likely to die from breast cancer, even though the incidence rates are higher for white women. The authors posit that the disparity is due in part to more African American women being diagnosed with breast cancer before menopause and that surgery to remove the tumor may pose a higher risk of stimulating cancer growth.

Women who lack health insurance and are diagnosed with breast cancer, will more likely have advanced stages of disease at diagnosis.

In 2007, there were reportedly 45.7 million individuals in this country who were uninsured. As the unemployment rates continues to rise, so will the number of uninsured, forcing policy makers to tackle the issue of some semblance of universal health care coverage. Health care coverage is a predictor of health care outcomes. The American Cancer Society documents that, “a lack of health insurance is associated with lower survival rates among breast cancer patients,” (ACS 2007). Women are significantly more likely to lack have health insurance than men. A survey conducted by the Kaiser Foundation documented that not having health insurance has many adverse effects, which included; “lower receipt of preventive services, higher rates of bankruptcy, and even higher rates of mortality,” (HJK 2004). Lacking or insufficient health insurance is defined as not having private health insurance, Medicaid, or Medicare. Additionally, those

women who have health insurance with deductibles over \$5,000 or insurance that does not cover preventive screening are considered underinsured for the purposes of this study.

Data have consistently documented that the lack of health insurance impacts health care outcomes (DeVoe et al. 2007, Fitzpatrick et al. 2004, and May et al. 1997). Even though the United States is one of the most industrialized countries in the world and spends more money on health care than any other nation there is still a breakdown in the American health care system, with U. S. health outcomes not at the level as many other industrialized countries. The lack of adequate health insurance has been a major deterrent for people accessing the health care system. The literature has demonstrated that individuals who do not have health insurance or their coverage is inadequate have a tendency to delay or not take advantage of early detection and diagnosis services for the prevention or delaying the onset of many chronic illnesses. When some individuals are faced with a choice of paying for a preventive health service versus taking care of their basic physiological needs as characterized by Maslow (food, clothing, shelter, etc.) they opt to take care of their basic needs. A study conducted by Richard G. Roetzheim, et al. found that people who lacked having health insurance or were covered by Medicaid were more likely to be diagnosed with late stage cancer at diverse sites (Roetzheim et al. 1999).

A disparity exists among racial and ethnic groups in health insurance coverage among minority women, Latinos, and African American women as compared to white women. Some of the data tend to suggest that a larger proportion of African American women receive Medicaid coverage. However, Medicaid coverage is limited in some cases, such as the Medicaid Waiver for Family Planning Services. Much of the literature documented that lack of health insurance is one of the major causes for delayed health

care and lack of preventive care, including cancer screening. Mammography costs are escalating and pose a barrier for low income women, increasing the disparity gap that exists between African American and white women in breast cancer morbidity and mortality rates. The American Cancer Society documented a decrease in breast cancer mortality rates among white women; while their African American counterparts have not seen a reduction in their rates (ACS). The literature addresses the disparity that exists in breast cancer mortality rates among white women and minority women demonstrates that some type of interventions are needed to lessen the gap.

African American women are more likely to be influenced by cultural factors that impact late stage breast cancer as compared to white women.

A significant body of previous research focused on the impact of race and socioeconomic status on breast cancer outcomes. However, several studies examined the influence of cultural and communal factors on breast cancer outcomes. McCarthy et al., a retrospective cohort study that looked at Medicare recipients in Connecticut, metropolitan Atlanta, Georgia, and Seattle-Puget Sound, Washington documented that older African American women were more likely to not have mammograms and to be diagnosed at late stage breast cancer than their white counterpart. Even though it was hypothesized that not having health insurance impacted stage of diagnosis, the study by McCarthy et al. found that the lack of health insurance was unable to explain the disparity that existed with those women. Findings from their study indicate that there are other cultural factors that influence an African American woman's decision to not have regular mammography usage, even when a pay source is available (1998). The authors further suggested that the lack of health insurance contributed to the racial disparity difference noted in late stage breast cancer diagnosis.

Similarly, Lannin et al. conducted a case-control study of breast cancer patients at the University Medical Center of Eastern Carolina from 1985-1992 and found that more African American women diagnosed with breast cancer presented at late stage. However, their research documented that socioeconomic factors did not sufficiently explain the disparity between the races and looked at the influence of cultural belief and attitudes shared by African American women. They found strong patterns of psychosocial and cultural belief influences on late stage breast cancer diagnosis (1998). They also found that never being married was linked to late stage breast cancer diagnosis among African American women and they hypothesized that perhaps lack of financial and social support by a spouse could be contributing factors. Other cultural factors shared by African American women that seemed associated with late stage breast cancer diagnosis fell into the following categories; health care utilization, folk beliefs, fundamentalist religious beliefs, relationships with men, perceived risk or fatalism, belief in various treatments for breast cancer, and breast cancer knowledge.

Authors, Mandelblatt et al. found that African American women who were older, unmarried, in the lowest income and education groups and who used the public hospital system were more likely to have late stage breast cancer diagnosis compared to white women ages 40 to 44, in the highest income and education groups, using a non-public hospital. Additionally, Mandelblatt, et al. found the following factors to be associated late stage breast cancer diagnosis: menopausal age, Black race, low education, and public hospital use (1991).

Many of the studies regarding mammography screening and self efficacy have used the Health Belief Model (HBM) to assess women's health beliefs. This model has been used to examine the psychosocial issues regarding women's beliefs about

preventive services for breast cancer and other health related behaviors. The Health Belief Model centers on internal and external locus of control and the influences of health behaviors on outcome measures. The major variables of the HBM are as follows: Perceived Threat, consisting of two parts Perceived Susceptibility and Perceived Severity; Perceived Benefits; Perceived Barriers; Cues to Action; Other Variables; and Self Efficacy. Champion et al. utilized the Health Belief Model and found that increased fear and decreased barriers affected adherence to mammography screening behavior among African American women (2008).

Women in rural areas, who are diagnosed with breast cancer, are more likely to have advanced stages of disease at diagnosis versus those in urban areas.

There is a marked difference in rural and urban health care that encompasses more than geographical location or space. Individuals living in rural areas face different challenges than those who reside in urban areas. The pastoral view of the good life for rural Americans is not as rosy as some may think, especially regarding the health care system. According to Cornelia Flora and Jan Flora, “Rural residents are more likely than people in urban areas to engage in behaviors that can harm their health because of their level of self efficacy (confidence in their ability to take action) is often low,” (2004). Additionally, Flora et al. posit that if individuals do not perceive a need to improve their lifestyles they are more likely to engage in risky behaviors. These authors also argue that in rural areas it is more difficult to gain access to healthcare, both preventive and curative.

The health care disparity faced by individuals living in rural areas forced Congress to take a more thorough look at the problem. According to the United States Department of Health and Human Services (HRSA) the Office of Rural Health Policy

(ORHP) was authorized by Congress in December 1987. The ORHP was charged by Congress to inform and advise the Department of Health and Human Services on matters affecting rural hospitals and health care, coordinating activities within the department that relate to rural health care, and to maintain a national information clearinghouse. The ORHP collaborates with all levels of government and the private sector to seek solutions to rural health care problems.

Individuals living in rural areas are faced with a range of problems when accessing the health care system. Rural Americans often have a lower literacy level, which manifests in lower health literacy; lower socioeconomic status; and are generally older, and as people age their risks for developing cancer increases. There is primarily no uniform transit system for individuals who reside in rural area and health facilities are sparsely located and fewer health care providers pose barriers as well. According to Healthy People 2010, about 25 percent of the population in the United States resides in rural areas. According to the Rural Healthy People 2010, some of the distinctive cultural, social, economic, and geographic characteristics which define rural America place rural populations at a greater risk for a myriad of diseases and health disorders. Rural Americans tend to indulge in more risky behaviors that impact chronic diseases such as cancer; smoking, sedentary lifestyles, alcohol consumption, and diets higher in fat. A review by the North Carolina Rural Health Research Program at UNC, Chapel Hill found that rural cancer patients were diagnosed at later stages of disease, that higher proportions of rural cancer cases were unstaged at diagnosis, and that rural patients were at a more advanced stage of illness when referred to home health care agencies compared to their urban counterparts.

These authors also argue that in rural areas it is more difficult to gain access to preventive and curative health care. The use of the emergency room by low income individuals for health matters that could have been performed in physicians' offices has been documented, which impacts the costs for health care. Individuals living in rural areas are faced with various problems when attempting to access the health care system that are quite different from individuals residing in urban areas. Lack of transportation, lower use of preventive screening services, lack of regular exercise and lack of safety belt use are often barriers to health care for individuals who reside in rural areas and health facilities are sparsely located and fewer health care providers pose barriers as well.

Additionally, some of the authors reviewed for this dissertation acknowledged that some of the more recent studies have begun to look at the impact of socio-demographics on breast cancer outcomes (Chen et al., Cummings, Farley et al., Heck et al., Huie et al., Simon et al., and Smith). An article by Anne Hubbell found that Mexican American women in rural areas have a lower chance of surviving breast cancer than any other racial or ethnic population. Other authors documented that individuals in rural areas have disparate outcomes in health care, making this a viable research topic (Flora et al. 2004 and Calle et al. 1993).

Women diagnosed with breast cancer, who have lower income levels, are more likely to have advanced stages at diagnosis compared to those with higher income levels.

Poverty is a social determinant that affects the outcomes of many chronic illnesses, including cancer. Authors, Huie et al. noted, "Material disadvantages remains a pressing social and political issue in the United States, not only because it shapes the daily life chances and experiences of individuals, but also because it leads directly to premature mortality," (2003). It has been hypothesized that lower socioeconomic status is

a stronger predictive indicator for adverse health outcomes than race (Lantz 2006).

Poverty tends to have many negative effects on healthcare outcomes, including breast cancer. Farley and Flannery found in Connecticut that, “[b]oth White and Black women in lower SES census tracts were more likely than race matched women in higher SES census tracts to have later-stage disease at the time of breast cancer diagnosis” (1989).

Individuals who have lower income oftentimes do not receive health screenings at the recommended intervals, thus affecting stages of diagnoses (Katz et al. 2000 and O’Malley et al. 2001). Low income individuals tend to suffer disproportionately from many chronic diseases, including breast cancer and have much worse health outcomes (Smith 2007). Yet, the question that remains is why. Findings from several articles suggest that socioeconomic status have vast reaching tentacles that have affected health outcomes. Individuals who have low income tend to reside in blighted areas and do not have the social connectedness or social network to be aware of resources that could affect their health outcomes (Huie et al. 2003 and Verba et al. 2003). Also, it has been hypothesized that low income individuals have systematically been disenfranchised by the health care community, which has created a mistrust of the medical community (Huie et al. 2003 and Verba et al. 2003).

Although African American women, women of lower SES, and those who lack health insurance are diagnosed at later stages of breast cancer impacting higher mortality rates due to breast cancer, breast cancer is more often detected in white women who have higher levels of income. The data demonstrate that more often these women receive preventive screenings, thus detecting breast cancer more often and in the earlier stages when it is more treatable with better prognosis. Also, data demonstrate that women who have lower SES do not adhere to recommended screening intervals as recommended by

their health care providers compared to women with higher levels of income (Calle et al.). Additionally, economic status tends to correlate with educational attainment. Therefore, women who have higher educational attainment are more aware of the need for preventive screenings and have access to screening providers which positively impact their health outcomes.

The National Breast and Cervical Cancer Mortality Act

Women enrolled in the National Breast and Cervical Cancer Early Detection Program are more likely to be diagnosed with late stage breast cancer:

The NBCCEDP was authorized by Congress via the Breast and Cervical Cancer Mortality Prevention Act of 1990 (Public Health Law 101-354) due to the incessant pleas of women, female-dominated national organizations, the American Cancer Society and other advocacy groups about the importance of early detection and screening for breast and cervical cancer. The Breast and Cervical Cancer Mortality Prevention Act of 1990 passed by Congress allocated funding via the CDC for the provision of breast and cervical screening services for medically underserved women, including women who are older, have low incomes, and minorities.

The program was designed to provide breast and cervical cancer screening programs for women whose income did not exceed 250% of the Federal Poverty Level. There has been and still remains a health disparity in breast cancer outcomes for certain minority populations, the uninsured, low income and women living in rural areas. The passage of PL 101-354 was designed to help ensure that the health needs of a vulnerable population were addressed, by reducing the burden of breast and cervical cancer nationally. Even though the Act has federally-mandated provisions, states may vary on

their implementation of the program. President George Bush acknowledged the impact that the NBCCEDP has had on breast cancer by signing the reauthorization of the Act in April 2007. During the signing of the reauthorization bill, he referenced First Lady Laura Bush's mother and her diagnosis of breast cancer. According to President Bush, funds from the Act will provide more than 700,000 screenings for uninsured and low-income women (White House news release, 2007). Funds were allocated to the CDC primarily to lower morbidity and mortality rates associated with breast and cervical breast cancer. A need to detect and treat breast cancer early was the impetus for Public Health Law 101-354, which established the NBCCEDP.

The Act allows for the Director of the Centers CDC to make cooperative agreements available to every state in the country, several territories and some Native American Tribes through a competitive review process. While every state will be funded, states compete for their funding allocations based on measures established by the CDC. Each funded entity is required to have a non-federal match, which could be cash or in-kind contributions. The match requirement is a 3 to 1 match, for every three dollars the federal government awards, the state has to match with a dollar. The funded states cannot exceed the Medicare rate of reimbursement for services covered. An interesting aspect of the NBCCEDP is that its implementation varies from state to state. However, there are some consistent features to the NBCCEDP which are required by the CDC, but states have some latitude in their interpretation of those established policies. One of the requirements that has concerned some states has been the 60/40 requirement. Congress mandated that at least 60% of the funds that a state receives must be used for direct patient services and no more than 40% is to be used for administration costs. The impetus for this measure was to ensure that needy women actually receive the majority of funds

appropriated by Congress to the CDC for allocations to the states, territories, and tribes. However, some states that contribute little or no cash for their match requirement sometimes find it difficult to meet the 60/40 requirement. Due to the concerns of some states, Congress revisited the 60/40 requirement and as of February 2007, a waiver exempting the 60/40 requirement could be requested by those states, which would allow the approved states to spend less than 60% of their funds on direct patient services. However, approval by the CDC is required for approval of the waiver. It is also important to note that the Breast and Cervical Cancer Mortality Prevention Act of 1990, is the payer of last resort, if other funds are available to pay for a service, those funds are to be used.

One of the salient features of this Act is that it affords women the opportunity to receive a clinical breast exam, mammogram, and other diagnostic procedures at no cost to them, impacting morbidity and mortality rates due to breast cancer. It is also important to note that even though Congress passed the Act in 1990, every state did not begin screening at that time. Some states were not able to produce the non-federal match required, Mississippi being one of those states. Mississippi was one of the last states providing breast and cervical cancer screening, beginning in 1998, because the state legislature would not appropriate the dollar match required and there was no in-kind contributions at the time to request the needed funding from the CDC.

To ensure the necessary treatment modalities, which further expanded a payment source for women diagnosed with breast cancer, Congress passed the Breast and Cervical Cancer Prevention and Treatment Act of 2000. Former President Bill Clinton signed the Treatment Act prior to him leaving office on October 24, 2000, which allowed states the option of providing Medicaid coverage for women who had been diagnosed with breast, cervical cancer, or precancerous lesions of the cervix through the NBCCEDP (CDC

2007). The legislation authorized by Congress and signed by President Clinton not only expanded the available pay sources for women diagnosed with breast cancer, but ensured a reduction in the mortality and morbidity rates due to cancer.

The NBCCEDP seeks to reduce morbidity and mortality rates caused by breast and cervical cancers and attempts to bridge the disparity gap. Early detection is the best protection for women against breast and cervical cancers. Providing screening services statewide, the NBCCEDP is promoting and protecting the health of women throughout the country. According to the CDC more than three million women have been served since the inception of the program. The chart listed below shows the number of women who have received services from the NBCCEDP from 2003-2008 (CDC 2009).

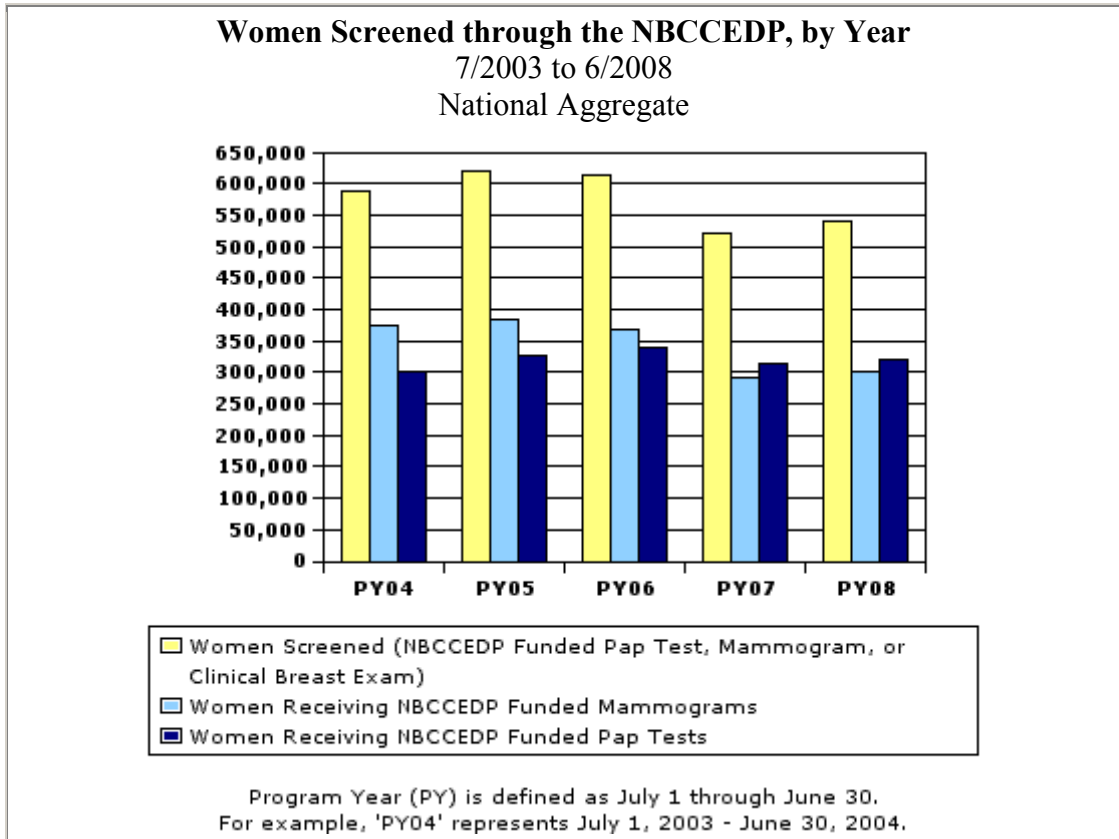


Figure 4 Screening Totals by Year

National data suggests that life expectancy for all Americans has improved in recent years. However, not all Americans are benefiting equally. National data demonstrate a marked difference in incidence, prevalence, mortality rates, survival, and treatment modalities from breast and cervical cancers for African American as compared to their white counterparts. According to the CDC, African Americans are more likely to die of cancer than people of any other racial or ethnic group.

Even though there are dollars appropriated by Congress to fund each state, several territories and some tribes, many of the women who qualify for the program do not receive assistance, due in part to limited program funding, lack of resources, knowledge, and access to providers. It is widely known that there are not enough funds to cover the eligible women who so desperately need assistance, but passage of PL 101-354 is a step in the right direction. Mississippi receives funds to cover about a tenth of the eligible population in the state. The passage of PL 101-354 and subsequent passage of the Breast and Cervical Cancer Treatment Act further demonstrates that health insurance is something that is needed in this country. Even though there has been a reduction in breast cancer mortality nationally, minority women still are dying at a disproportionate rate. A study recently published from the University of Michigan documented that African American women are more likely to have a more aggressive, less treatable form of breast cancer compared to their white counterparts. The data, along with documented studies, amplify the need for increased awareness and increased screening rates among all population groups to greatly impact breast cancer and stage of diagnosis.

Theoretical Framework



Figure 5 The Socio-Ecological Model

The literature clearly demonstrated that there are some known social determinants that affect late stage breast cancer outcomes; such as race, income, educational attainment, health care coverage, and geographical location, urban versus rural. However, the major question that remains: given the known social determinants that adversely affect health outcomes, why do health disparities in this chronic illness continue to exist? The Socio-Ecological Model acknowledges that there are various facets that influence human behavior, thus impacting health behavior. The various levels of influence that are tenets of the Socio-Ecological Model are intrapersonal, interpersonal, organizational or environmental, community, and policy with interdependency among each level (CDC). The individual level identifies biological and personal factors that influence health outcomes; age, education, race, income, and health coverage. The next level includes relationships and social connectedness that impact health behavior ultimately impacting health outcomes. The community level looks at the impact of settings such as; schools, neighborhoods, and workplaces where social relationships develop that can impact beliefs and behaviors. The societal level looks at broader factors that impact social and cultural norms that help to maintain economic and social inequalities between groups such as; health, economic, educational, and social policies (CDC). Tenets of the Socio-

Ecological Model were evidenced in the grassroots efforts that were effective for the passage of the Breast and Cervical Cancer Mortality Act. Individuals who had been directly or indirectly affected by cancer, grassroots organizations, and national organizations collaborated for the passage of legislation for the early detection of breast and cervical cancer. The major impetus for the Breast and Cervical Cancer Mortality Act was to reduce breast and cervical cancer disparity rates that exist for minority, elderly, and uninsured women in this country.

Social determinants that have been shown to impact stages of breast cancer diagnosis, as well as morbidity and mortality rates due to breast cancer, are evidenced in the Socio-Ecological Model. Therefore, the Socio-Ecological Model provides the theoretical basis to understanding why simply addressing social determinants will not change health outcomes for some populations. The data demonstrate that race, age, lower education attainment, lower income, and lack of health coverage adversely influenced late stage breast cancer.

Similarly, the same variables (race, age, lower educational attainment, lower income, and lack of health care coverage) are identified in the SES model as negatively influencing health outcomes (NCI, ACS 2007, HJK 2004). Verbie and Nie clearly demonstrated that individuals with lower SES do not have the social connectedness that those with higher SES have which impacts their health outcomes. The literature documented that many of the facets of the Socio-Ecological Model have an effect on health outcomes.

The SES model looks at the impact of a person's social status; educational attainment, employment, and income on various outcomes. Some theorists have expanded the SES model to take into account the influence that race and social

connectedness have on health behavior (Link and Phelan 1995). Variables in the SES model have been shown to impact various facets of a person's life, such as participation in politics, adherence to health recommendations, health disparities, etc. M. N. Oliver posits that "A theoretical framework that accounts for social class is needed in order to better understand how racial health inequalities are established and maintained," (2008).

There is a significant body of literature that document differences in health outcomes for individuals who are minority, have limited educational attainment, have limited resources, little or no social connectedness, or reside in rural areas (Chen et al., Cummings, Farley et al., Heck et al., Huie et al., Simon et al., and Smith). Oliver posits, "Due to this shift in political and economic (funding) focus, the socio-economic status (SES) construct became the mainstream framework for discussing population health, and it is the dominant theoretical framework for the study of racial and ethnic health disparities today," (2008). Also, these individuals are more likely to have lower incomes and not have health care coverage (DeVoe et al. 2007 and Fitzpatrick et al. 2004). Individuals who reside in urban areas tend to have higher rates of employment and have health care coverage, with better access to health care providers, compared to those who reside in rural areas with limited access to health care providers and often have lower income levels (Flora et al.).

The SES theoretical framework has often been used by Verbie and Nie to predict voting behavior in political science. Many of the basic constructs offered by Verbie and Nie will be used as a research guideline for identifying the influence of social determinants on health disparity as they relate to late stage breast cancer diagnosis. There is a body of literature that documents the role of SES in health outcomes yet SES studies have not fully explained health disparities (Huie et al. 2003 and Verba et al. 2003). Even

when some of the facets of SES are addressed, such as screening programs for disadvantaged populations, a disconnect exists in translating targeted health messages into behavioral changes for certain populations (Katz et al. 2000). There are many studies on the role of SES and health disparity, yet many of them have not been able to predict the impact that SES have on individuals accessing preventive screenings, changing health behaviors, and increasing health knowledge (Katz et al. 2000 and O'Malley et al. 2001). If Verbie and Nie are able to utilize SES to predict voting behavior, health practitioners and policy makers may be able to utilize SES to predict the impact that health behaviors have on health disparities.

Similarly to Verbie and Nie, Phelan and Link utilize the SES theoretical framework to look at the disparate issues in controlling chronic diseases and mortality rates which are attributed to health care inequities. Phelan and Link found that health disparity has continued to endure despite efforts in the public health community to address certain social determinants that are thought to impact adverse health outcomes. They argue that, "socioeconomic status is a 'fundamental cause' of mortality disparities- that socioeconomic status embodies an array of resources, such as money, knowledge, prestige, power, and social connections, that protect health no matter what mechanisms are relevant at any time," (2004). Link and Phelan argue that individualized risk factors must be conceptualized to examine those factors that put individuals at risk for chronic disease.

There is a considerable body of literature that documents the link between morbidity and mortality rates with lower socioeconomic status, minority and ethnic groups, lower educational attainment, and socio-demographics (Heck et al. 1997, Nazroo 2003, Smith 2007, and Williams et al. 2000). With all of the advances in the medical

community that have been effective in reducing mortality and morbidity rates, there still remains a major health care disparity for certain population groups. Minorities and other marginalized groups have often been shown to suffer the most from health care disparity (Virnig 2002 and Chen et al. 2006). The question that remains to be answered is with all of the health research that has been conducted, all of the funds that have been allocated, why do certain population groups continue to suffer disproportionately regarding their health when compared to others? More specific to this study: why are more African American women diagnosed with late stage breast cancer with subsequently higher mortality rates?

Death and disease from chronic illnesses are major public health issues that not only have individualized impact, but economic and moral significance for society as well. Certain populations groups adhere to preventive health messages and alter lifestyle and screening behaviors that ultimately have an influence on health care outcomes. Conversely, other segments of the populations either do not have the necessary resources, are sometimes unaware of these messages, or do not have the necessary skills to integrate the changes into their lives that could delay premature death from many chronic illnesses.

There are many disease avoidance messages such as: do not smoke, limit alcohol intake, develop proper eating habits, exercise, reduce stress and negative life events, use condoms, and receive recommended screenings etc. that the public health community advocates to reduce negative health outcomes. However, the messages seem to resonate more with individuals from higher SES, higher educational attainment, and certain racial groups. Katz, et al. found that there have been substantial increases in mammography screening, but women of low SES are less likely to receive the recommended screening (2000). The NBCCEDP provides mammography screening and early detection of breast

cancer for women who are of low SES. Findings from this dissertation will seek to determine if a significant number of women who are eligible for the NBCCEDP actually utilize these services.

Additionally, Phelan and Link look at the role of social policy and its effect on health care disparity and inequality. Their theory has been tested in Canada, where there is universal health care coverage. They found that even though individuals have health care coverage, which is thought to be a major negative predictive variable for health care disparity and a protective variable for positive health outcomes, there were still inequities in health outcomes in Canada. Although there is universal health care coverage in Canada, African American women were still diagnosed at later stages of diseases for breast cancer and had higher mortality due to breast cancer. Findings from the study that looked at the relationship between SES and health in Canada and the United States indicated that, “redistributive social policies and lower levels of economic inequality may buffer the health effects of resource deprivation,” (Willson 2009). Based on the findings of Willson, higher SES seems to be a protective variable in health care outcomes. Similarly, Kimbro et al., noted that based on various studies, there is a positive relationship between SES and health at all levels of the social hierarchy (2008). Phelan and Link argue that as advances in medical technology and emerging health information arise, individuals who have higher educational attainment, higher socioeconomic status, more prestige, and social connections use their advantages to modify health behaviors and influence outcomes, furthering the disparity gap that persists (2004).

In trying to understand and contextualize social determinants that influence health outcomes, it is necessary to examine the social and culture factors that tend to influence health outcomes. Although, lack of health care coverage is one of the social determinants

that negatively impact health outcome, some individuals who have health care coverage do not receive preventive screenings at the recommended levels (Virnig et al. 2002 and Schneider et al. 2002). In the NBCCEDP, where breast and cervical screening and diagnostic services are covered and referral for treatment services are offered at no cost to the patients, there are still individuals who have been diagnosed with a malignancy who opt not to receive the recommended treatment. Although Medicare reimburses for mammograms and Pap tests, there are a significant number of individuals who do not take advantage of those services, with Mississippi having the lowest utilization rates, which could partially be explained by the lower rates of health insurance in this state. The national rate for mammography is 38.9% of women compared to only 33% of women in Mississippi; the national rate for Pap tests is 10.2%, compared to only 9.9% in Mississippi (CMS). These statistics further indicate that health care coverage alone is not adequate to influence health screening behavior, suggesting that there are other fundamental reasons as to why some people will not take advantage of screening services that could reduce their risks and minimize their consequences of diseases.

The SES Theoretical constructs suggest that individuals with the financial means, social connectedness, power, and prestige often are aware of screening, diagnostic, and treatment modalities alter health behaviors accordingly, thereby decreasing their morbidity and mortality rates. People with higher SES often take advantage of the most current methods of treatment for breast cancer and alter those risk factors that put them in a negative predictive risk for development and progression of the disease. Data from the Behavioral Risk Factor Surveillance System (BRFSS) show that African American women 40 and over who had a mammogram within the past two years have a slightly higher rate of 69.9% as compared to 69.1% for white women (CDC 2009). The BRFSS is

a telephone self-reported health behavior data collection system utilized in all fifty states with a weighted percentage to population characteristics. Also, according to the 2008 BRFSS, race was not a statistically significant predictor of mammography utilization. However for women 40 years of age and older, the data demonstrate that as women's income and education increased so did their compliance with mammography screening.

Summary

In summary, the review of literature demonstrated that some social determinants influence adherence to screening recommendations, morbidity, and mortality rates as they relate to breast cancer. The review of literature also provided theoretical frameworks that were shown to impact late stage breast cancer diagnoses, Socio-Ecological Model and SES. This current study added another dimension to SES theories by analyzing the effect that a program aimed at reducing disparity by addressing one of the components of SES theories, health coverage, and inadvertently addressing two other components, race and lower SES had on late stage breast cancer diagnoses.

CHAPTER III
PUBLIC HEALTH POLICY

Overview

This research will seek to determine whether a public health policy that provided for the establishment of the National Breast and Cervical Cancer Early Detection Program, Public Law 101-354, had a significant influence on stages of breast cancer diagnoses for women enrolled in the breast and cervical cancer screening program. Utilizing some of the variables in the Socio-Ecological Model, this research will seek to determine if addressing a social factor variable [health coverage] has a positive or negative effect on late stage breast cancer diagnosis.

The health policy chapter will be organized according to the following sections: National Breast and Cervical Cancer Early Detection Program, National Breast and Cervical Cancer Early Detection Program Treatment Act, Mississippi Breast and Cervical Cancer Program, and Summary.

National Breast and Cervical Cancer Early Detection Program (NBCCEDP)

The NBCCEDP was authorized by Congress via the Breast and Cervical Cancer Mortality Prevention Act of 1990 (Public Health Law 101-354) due partially to the advocacy of CDC's national partners; female dominated national organizations, the American Cancer Society and other groups (NBCCEDP National Report). The Breast and Cervical Cancer Mortality Prevention Act of 1990 passed by Congress provided breast and cervical screening services for medically underserved women, to include those who

are older, have low incomes, and minorities. There has been and still remains a health care disparity in breast cancer outcomes for certain minority populations, the uninsured, low income and women living in rural areas. The passage of the Act was an action to help ensure that the disparity gap is lessened, thus reducing the burden of breast and cervical cancer nationally.

The Act considers low income up to an allowable rate of 250% of the federal poverty level. However, states have the flexibility of setting the allowable rate for their state, as long as it does not exceed 250% of the federal poverty level. According to the CDC, “Programs adopt operational models unique to their state, territory, or tribal organization public health infrastructure and are often influenced by legislative constraints,” (2010). Funds were allocated to the Centers for Disease Control and Prevention primarily to impact morbidity and mortality rates associated with breast and cervical breast cancer. However, for the purpose of this dissertation, the attention will be directed toward the impact of a pay source of breast cancer outcomes on women screened in Mississippi. Also, this dissertation will analyze whether women in Mississippi are being diagnosed at earlier stages of breast cancer as a result of the cooperative agreement between the CDC and the Mississippi State Department of Health.

The Act allows for the Director of the Centers for Control and Prevention (CDC) to make cooperative agreements available to every state in the country, the District of Columbia, 5 U. S. territories, and 12 Native American Tribes through a competitive review process. Every state will be funded; however the level of funding is somewhat competitive. Each funded entity is required to have a non-federal match, which could be cash or in-kind contributions. The match requirement is a 3 to 1 match, with three dollars

from the federal government matched by one dollar from the. The funded states cannot exceed the Medicare rate of reimbursement for services covered.

In Mississippi, screening providers are asked to accept the 80% allowable charges under Medicare reimbursement and not bill the patient for the 20% that Medicare charges to their patients. The amount that the patients are not billed is used as an in-kind contribution. An interesting aspect of the NBCCEDP is that certain policies vary from state to state. There are some consistent features, most of which are required by the CDC, but states have some flexibility in their interpretation of those established policies. The CDC notes, “[t]he latitude extended to grantees by CDC in how women are prioritized for screening and diagnostic services using federal funds is intended to contribute to existing efficiencies at individual state, territorial, and tribal sites,” (2010). One of the requirements that has been a source of concern for some of the states has been the 60/40 requirement. Congress mandated that at least 60% of the funds that a state receives must be used for direct patient services. This measure helps to ensure that needy women are actually receiving the lion’s share of the funds appropriated by the CDC. However, some states that receive little or no cash contributions from other funding sources for their match requirement sometimes find it difficult to meet the 60/40 requirement, which was the basis for the 60/40 waiver instituted February 2007, that requires approval by the CDC.

Not only does program implementation vary, funding is inequitable. Anecdotally, some had theorized that many of the initial states that started screening were funded at a higher level than states that began screening later. However, an unofficial survey conducted by the Louisiana screening program demonstrated that many of the southeastern states were funded considerably lower per available woman than other

states. Available women are referred to as those who are at least 250% below the poverty level, are uninsured, and emphasis placed on women between the ages of 40-64.

NBCCEDP Treatment Act

To ensure the necessary treatment modalities, which further expanded a payment source for women diagnosed with breast cancer, Congress passed the Breast and Cervical Cancer Prevention and Treatment Act of 2000, Public Law 106-354. The Act states, “To amend Title XIX of the Social Security Act to provide medical assistance for certain women screened and found to have breast or cervical cancer under a federal screening program, to amend the Public Health Service Act and the Federal Food, Drug, and Cosmetic Act with respect to surveillance and information concerning the relationship between cervical cancer and the human papillomavirus (HPV), and for other purposes,” (CDC 2000). The Treatment Act was signed into law October 24, 2000, which affords states the option of providing full Medicaid coverage for women who had been diagnosed with breast, cervical cancer, or precancerous lesions of the cervix through the NBCCEDP (CDC 2007). The legislation authorized by Congress and signed by President Clinton not only expanded the available payment sources for women diagnosed with breast cancer, it essentially expanded Medicaid’s eligibility requirement.

Prior to the passage of the Treatment Act, many program directors from various parts of the country had begun to hear horror stories about women being detected with breast and/or cervical cancer in the screening program, but had no means to pay for treatment once there was a cancer diagnosis. Many of these stories were related to Congress which greatly impacted their interest and subsequently influenced their decision to pass the Treatment Act of 2000. Additionally, the Susan G. Komen Foundation has

been lobbying Congress to revisit the Treatment Act and require all states to further expand their coverage provisions to Option Three.

When Congress passed the Treatment Act, states had three options to choose for Medicaid coverage. Option One states, “Women are considered screened under the CDC program if their clinical services were provided all or in part by CDC Title XV grantees are those entities receiving funds under a cooperative agreement with CDC to support activities related to the National Breast and Cervical Cancer Early Detection Program” (Div. of Medicaid 2001). Option Two states, “Women who are screened under a state Breast and Cervical Cancer Early Detection Program in which their particular clinical service was not paid for by the CDC Title XV funds, but the service was rendered by a provider and/or an entity funded at least in part by CDC Title XV funds, and the service was within the scope of a grant, sub-grant or contract under that state program and the CDC Title XV grantee has elected to include such screening activities by that provider as screening activities pursuant to CDC Title XV” (Div. of Medicaid, 2001). Option Three states, “Women who are screened by any other provider and/or entity and the CDC Title XV grantee has elected to include screening activities by that provider as screening activities pursuant to CDC Title XV. For example, if a family planning or community health center provides breast or cervical cancer screening or diagnostic services to low-income women, but does not receive funds from the CDC Title XV grantee to support these services, the CDC Title XV grantee would have the option of including these providers’ screening activities as part of their overall screening program. The CDC Title XV grantee may require any provider deemed part of the overall screening program to follow program guidelines” (Div. of Medicaid 2001). The Komen Foundation advocated

for all states to adopt Option Three, thereby broadening the impact that the Treatment Act could have on breast and cervical cancer nationally.

Mississippi Breast and Cervical Cancer Program (BCCP)

The BCCP began in July 1998 in the West Central Public Health District, encompassing Claiborne, Copiah, Hinds, Sharkey/Issaquena, Madison, Rankin, Simpson, Warren, and Yazoo counties. The central aim of the Mississippi Breast and Cervical Cancer Early Detection Program was to address the screening needs of those women at highest risk. The high risk categories for Mississippi are defined as women are uninsured, underinsured (insurance does not cover screening exams for breast and cervical cancer), medically underserved, poor, minority, and elderly. Additionally, these women are more likely to have advanced disease at the time of presentation, reflecting differences in access to screening and care, and fear about cancer or being screened for cancer (Chen et al., Cummings, Farley et al., Heck et al., Huie et al., Simon et al., and Smith).

With funding from the Centers for Disease Control and Prevention (CDC), and matching non-federal funds, the Mississippi State Department of Health (MSDH) has implemented a plan which makes available early detection for breast and cervical cancer services statewide. Pap exam screening services at MSDH clinics, Community Health Centers (CHC) and private providers are available to uninsured women 18 years of age and older. Mammography screening is available through contracted providers to uninsured women 50 years of age and older (MSDH 1999).

Summary

Chapter III summarized a public health policy that was enacted to reduce morbidity and mortality rates due to breast and cervical cancer. The NBCCEDP was enacted in 1990 via Public Law 101-354, which provided for breast and cervical cancer screening for hundreds of thousands of women, followed by the NBCCEDP Treatment Act, Public Law 106-354 in 2000, which provided for treatment services for women diagnosed with malignant or pre-malignant conditions of the breast and/or cervix. Data will be analyzed for this study to determine whether women in Mississippi who were screened in the BCCP have been positively impacted by the enactment of this legislation by detecting breast cancer at an early stage, when it is more successfully treated.

CHAPTER IV

METHODS

Overview

The purpose of this study is to investigate the influence that social determinants have on stage of breast cancer diagnoses. Social determinants such as lack of health coverage, lower educational attainment, race, lower income levels, and geographical location are not merely proxies for risk factors, but are essential to understanding health disparities (Cummings 2007). Although there have been policies aimed at reducing health disparities, the disparities still persist. This research will focus on four of the factors that have demonstrated an influence on stages of breast cancer diagnoses [race, income, lack of health insurance, and geographical location].

Additionally, this research will seek to determine whether a public health policy that provided for the establishment of the NBCCEDP, Public Law 101-354, had a significant effect on stages of breast cancer diagnoses for women enrolled in the Mississippi program. Utilizing some of the variables in the Socio-Ecological Model, this research will seek to determine if addressing a social factor variable [health coverage] has a positive or negative effect on late stage breast cancer diagnosis.

The methods chapter will be organized according to the following sections: Hypotheses, Research Design, Analysis, Data Collection, Model I, Model I Study Population, Model I Study Design, Model I Operationalization of Measures, Descriptive Policy Analysis, and Summary.

Hypotheses

Theories on Socioeconomic Status have been useful in identifying and documenting social determinants that influence health disparities. However, health disparities continue to exist. Although there have been many health policies implemented that were intended to reduce health disparities, they have not been successful in totally alleviating them. Individuals in minority populations continue to be diagnosed at more advanced stages of diseases, subsequently dying prematurely. The question that persists is whether social differences noted in certain populations can substantially explain health disparities? According to Katz et al. (2000), even when preventive screenings are available, certain ethnic and racial groups do not adhere to the recommended intervals. Similarly, McCarthy et al. (1998) found that some individuals with adequate health insurance do not adhere to recommended preventive screenings.

To affect change and impact health disparity, a multilateral approach must be utilized, including individual responsibility, effective social support, available resources, and policies aimed at addressing social ills as demonstrated in the Socio-Ecological Model. The Socio-Ecological Model acknowledges that there are various facets that influence human behavior, thus impacting health outcomes. The various levels of influence that are tenets of the Socio-Ecological Model are intrapersonal, interpersonal, organizational or environmental, community, and policy with interdependency among each level (CDC).

Model I developed for this dissertation will analyze the influence of social determinants; race, income, health coverage, and geographical location on breast cancer stage of diagnoses for women in Mississippi. Lack of health coverage is one of the social determinants that has been shown to influence disparate health outcomes.

The Descriptive Policy Analysis in this study will analyze the effect that addressing one of the social determinants, health care coverage, has on breast cancer stage of diagnoses for those women who are enrolled in the BCCP. The NBCCEDP was established to narrow the disparity gap among minorities and poor women in breast and cervical cancer morbidity and mortality rates (CDC). This study will analyze the influence of providing a source of health coverage for women in Mississippi, via the NBCCEDP, had on the stage of breast cancer diagnoses for women enrolled in the program. This study will seek to answer five questions:

1. Is there a significant difference in the proportion of African American women diagnosed with late stage breast cancer compared to white women in Mississippi?
2. Is there a significant difference in the proportion of women with health insurance diagnosed with late stage breast cancer compared to women without health insurance in Mississippi?
3. Is there a significant difference in the proportion of women who live in rural areas diagnosed with late stage breast cancer versus those who live in urban areas in Mississippi?
4. Is there a significant difference in the proportion of late stage breast cancer for women of lower SES versus those of higher SES in Mississippi diagnosed with late stage breast cancer?
5. Has the Mississippi Breast and Cervical Cancer Program significantly affected late stage breast cancer?

Four of the five research questions relate to the influence of social determinants and the fifth question relates to the effectiveness of a public health policy. The

NBCCEDP has been in existence for 20 years and the disparity gap in mortality and morbidity rates due to both breast and cervical cancer has persisted nationally and in this state. Mississippi has been providing breast and cervical screening services for more than 13 years. Therefore, the question persists, has a public policy intended to affect breast and cervical cancer morbidity and mortality rates been effective? Based upon the literature, and to gauge the effectiveness of the enactment of the Breast and Cervical Cancer Mortality Act, the following hypotheses will be examined.

H₁: There will be a positive relationship between women of lower SES and late stage breast cancer in Mississippi.

H₂: There will be a negative relationship between women with health care coverage and late stage breast cancer in Mississippi.

H₃: There will be a positive relationship between African American women and late stage breast cancer in Mississippi.

H₄: There will be a decrease in the proportion of late stage breast cancer diagnoses in Mississippi after the inception of the BCCP for those enrolled in the BCCP.

Research Design

The research design for this study is non-experimental due to the lack of control groups or experimental groups' involvement utilized in the analyses. The design for this study is defined by Fraenkel and Wallen (2003) as an explanatory correlational study and attempts to explain the relationship that exists between race, health care coverage, geographical location, and income on stage of disease for breast cancer diagnoses. Also, the study attempts to explain the influence that the BCCP has had on stage of breast cancer diagnoses.

Analysis

The estimate of the BCCP eligible population for Mississippi has been determined by the CDC, which were 61,099. The sources of the population estimates are U. S. Census Bureau, Current Population Survey, 2002-2004 Annual Social and Economic Supplements, (CDC 2006). Chi-square will be used to determine if there is a statistically significant difference in late stage breast cancer diagnoses in the eligible population before and after the enactment of the policy. The Wilcoxon matched-pairs signed-rank test is the methodology that will be used to analyze data to determine the effect that the BCCP has had on stage of breast cancer diagnosis for women enrolled in the program. Similar to the paired t-test, the Wilcoxon signed-rank test involves comparison of difference between measures, but can be used when assumptions that underlie the t-test cannot be satisfied. Demographically, the study population will be similar; medically underserved, primarily ages 40-64, uninsured, however, the same women may not be enrolled in the program each year. Data will be beneficial in determining the effectiveness of a health policy aimed at not only impacting morbidity and mortality rates due to breast and cervical cancer, but also impacting health care disparity.

Data Collection

Secondary data for this study will be obtained from the BCCP and the MCR databases, both funded by the CDC. The study does not involve research on human subjects, therefore the study is exempt from full Institutional Review Board (IRB) review. Communication with Christine Williams, IRB Compliance Administrator, Mississippi State University on IRB Study #11-109: “The Influence of Social Determinants on Late Stage Breast Cancer and the Impact of the National Breast and Cervical Cancer Program on Late Stage Breast Cancer Diagnosis” (Williams 2011). The

IRB application was reviewed and approved via administrative review on 4/12/2011, in accordance with 45 CFR 46.101 (b)(4). Also, IRB approvals were received from the MCR on 5/26/11, and the Mississippi State Department of Health, protocol #082911 on 9/6/11.

Independent Variables

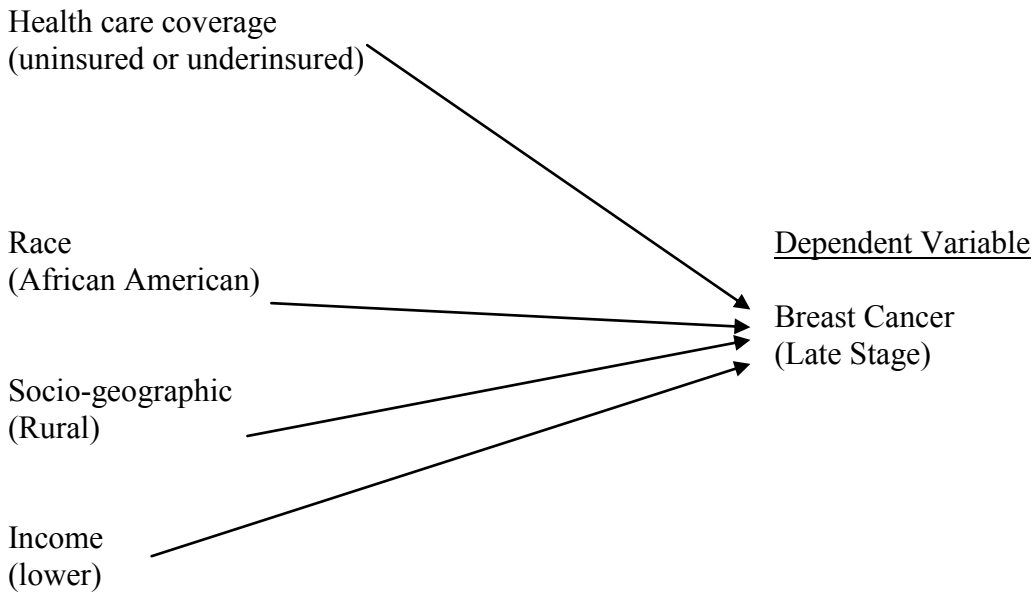


Figure 6 Research Model

Model I Study Population

The study sample is statewide consisting of all women in Mississippi who were diagnosed with breast cancer in each state that are reported to the Cancer Registries in 2008. The MCR collects and house cancer morbidity data for all individuals who are diagnosed and reported to have any type of cancer (CDC). The rationale for utilizing 2008 data is to ensure completed reportable data. The data collected are categorized by race, age, health coverage, and county of diagnosis. However, income and rural versus urban data are not captured.

This study will employ an ecological approach to substitute income and poverty level data for a proxy measure of individual income based on where the person lived. According to Firebaugh, aggregate data is used to make inference about individuals because appropriate individual-level data are often unavailable (1978). Similarly, other social scientists have employed ecological analysis (Cummins 2004, Korff et al. 1992, and Morgenstern 1982). The Ecological Study's unit of analysis is the zip code of women diagnosed with breast cancer as opposed to the individual, since the Cancer Registries do not collect individual data on income and location. One of the limitations to the ecological data approach is that interpretation of the data is susceptible to ecological fallacies (Clayton 1993, Firebaugh 1978, and Greenland et al. 1989). Utilizing this type of methodological approach makes the assumption that everyone who lives in a certain zip code would have a certain income, which this researcher posits, could easily be a false assumption. Additionally, since the MCR does not collect data as urban or rural, zip code data for each woman in Mississippi diagnosed with breast cancer in 2008 will be coded as metropolitan (primary flow within an Urbanized Area), micropolitan (primary flow within an Urban Cluster of 10,000 to 49,999), small town (primary flow within a small Urban Cluster of 2,500 to 9,999), and rural (primary flow to a tract outside of a UA or UC [including self]), as defined by the Rural Health Research Center (2005). Zip code-level variable estimates used to measure the effect of income, limits this researcher's ability to capture individualized income effects on late stage breast cancer diagnosis.

Study Design

The study design utilized in Model I will seek to answer questions employing a quantitative, comparative analysis. Model I of this research will be analyzed using

bivariate analyses and multivariate regression analyses with stage of breast cancer diagnosis as the dependent variable. Breast cancer stages of diagnosis were dichotomized as Local, Stage 0, and Stage 1 as early stage versus Regional and Distant stages or in some cases Stage III and Stage IV as late stage. This study will analyze data for 2008, the most current and complete data set. Model I regression analysis will explore the predictive impact that demographic variables (race, income, geographic location, and health care coverage) have on stage of breast cancer diagnosis. The secondary data utilized for this study to measure late stage breast cancer diagnosis will come from the MCR. Each hospital collects and reports cancer morbidity data to the MCR, which is reported to the CDC. Some of the limitations in the study will be the reporting mechanisms for each hospital for stages of cancer diseases; however, for consistency, stage breast cancer diagnoses are dichotomized to early and late stages.

Operationalization of Variables

The dependent variable for Model I is stage of breast cancer diagnosis. Stages of breast cancer diagnosis were dichotomized as late and early stages.

There are multiple independent variables including health care coverage, race, income, and demographical location (urban or rural). The variable health care coverage will be defined as yes, having health care coverage or no, not having health care coverage. Women who have Medicare, Medicaid, or any health insurance will be considered by this researcher as having health care coverage.

The race variable is nominal and the codes that are used by the Cancer Registry will be used for the analysis; White non-Hispanic will be coded as 0, Black non-Hispanic

will be coded as 1. Other races and unknown make up less than one percent of the overall total. Hence only White and Black data were analyzed. The data source is the MCR.

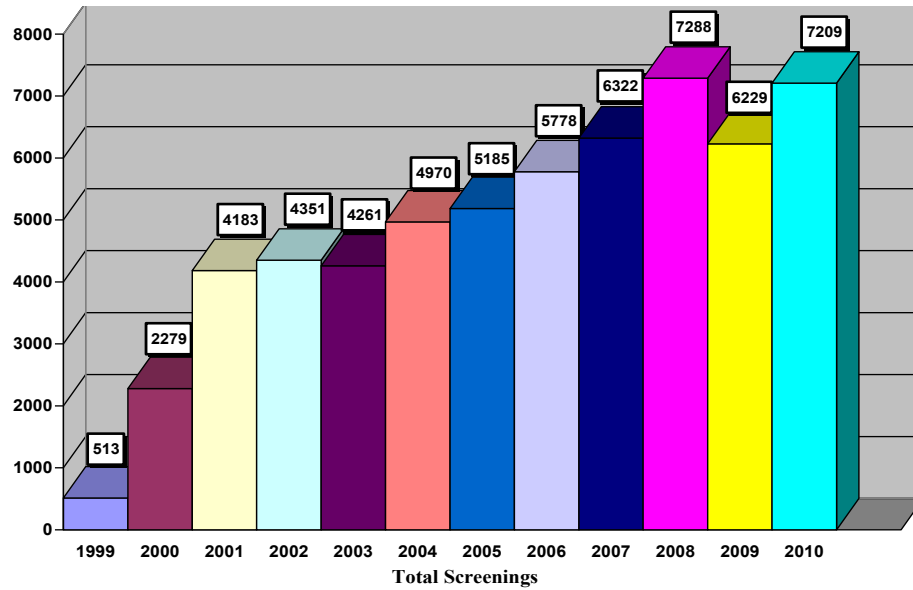
Income is not collected by the MCR, therefore the Census Bureau zip code per capita income data will be a proxy variable for poverty indicators. The coding for the data will be: (1 = 0-\$15,000; 2=\$15,001-\$20,000; 3=\$20,001-\$25,000; 4=\$25,001-\$30,000; 5=\$30,001-or more).

The MCR collects geographical data via patient addresses. Zip code data will be analyzed, utilizing the Rural Health Research Center aggregation of data into the four category classification. The Rural Health Research Center classification of zip code data will be used to determine whether the geographical location of the woman diagnosed is either urban, large rural, small rural, or isolated in each county. Once the data are aggregated, the coding will be (1 = urban, 2 = large rural, 3 = small town, and 4 = rural).

Descriptive Program Analysis

The Breast and Cervical Cancer Mortality Prevention Act of 1990 passed by Congress provided breast and cervical screening services for medically underserved women, to include those who are older, have low incomes, and minorities. The passage of PL 101-354 was designed to help ensure that the health needs of a vulnerable population were addressed, by reducing the burden of breast and cervical cancer nationally. Mississippi was one of the last states to initiate the screening program in 1998 due to the inability to provide needed matching funding. When the program began in 1998, about 513 women were screened in the BCCP to an increase of about 7,209 women screened in Fiscal Year 2010 (July 1, 2009-June 30, 2010) as of May 2, 2011. Figure 7 document the

number of women who have been screened in the program from the inception to the most complete fiscal year as indicated below:



Note: Number of Screened Indicates that all initial, annual, and repeat tests paid with NBCCEDP Funds is defined as July 1 through June 30.
Source: Data in the Cancer and Screening and Tracking System (CaST) by 05/02/11

Figure 7 Mississippi Breast and Cervical Cancer Program, Number of Women Screened 1999-2010

The BCCP began in 1998 and the BRFSS data reflect a significant difference in reported mammography rates from 1995 to 2008, as indicated below:

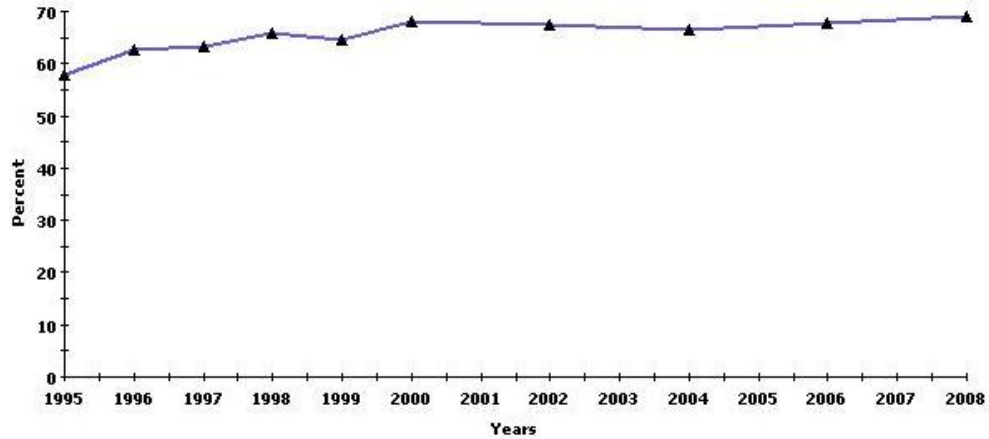


Figure 8 Mammograms within 2 years, age 40+, Mississippi – All Available Years, Response = Yes

Table 2 Mississippi Behavioral Risk Factor Surveillance System women aged 40 and above who had mammogram in past 2 years from 1995 to 2008

Mississippi			
Year:	%	CI	n
1995	57.9	(53.4-62.4)	346
1996	62.6	(58.4-66.8)	385
1997	63.4	(59.1-67.7)	397
1998	65.8	(62.3-69.3)	562
1999	64.6	(60.9-68.3)	497
2000	68.1	(64.6-71.6)	568
2002	67.6	(65.1-70.1)	1239
2004	66.4	(64.2-68.6)	1593
2006	67.8	(65.9-69.7)	2068
2008	69.0	(67.1-70.8)	2932

Source: CDC. % = Weighted Percentage, CI = Confidence Interval, n = Cell Size (Numerator). Use caution in interpreting cell sizes less than 50.

The data from the BCCP is a microcosm or subset of women diagnosed with breast cancer for Mississippi, yet it will provide valuable insight as to whether a screening program that targets minorities and the medically underserved is beneficial in impacting breast cancer stages of disease at diagnosis. Women in Mississippi whose incomes do not exceed 250% of the Federal Poverty Level are the eligible population for the focus of the analysis. Women can either be uninsured or underinsured, and between the ages of 40-64. The researcher defines underinsured for this study as those women whose health care coverage does not cover preventive screening tests. The study population for this analysis will be women screened and diagnosed with breast cancer in the BCCP in Mississippi. Data will be analyzed for women who were reported to have been diagnosed with Regional and Distant Stages of breast cancer or Stage III and Stage IV breast cancer in the Mississippi Breast and Cervical Cancer Program.

Based on the review of the literature, it was documented that race and income have an impact on health outcomes, including breast cancer morbidity and mortality rates (Heck et al. 1997, Nazroo 2003, Smith 2007, and Williams et al. 2000). The basic premise of the NBCCEDP was to impact breast and cervical cancer morbidity and mortality rates by providing education, screening, and diagnosis of breast and cervical cancer earlier when it is more easily treated with higher success rates to women with lower income levels and minorities. Therefore, the descriptive program analysis will explore the impact that a national screening and early detection program has had on stages of breast cancer diagnosis and whether it has been effective in achieving its intended goal for women enrolled in the Mississippi program. Data will be analyzed for this study for the BCCP for Fiscal Years 1999-2008 (June 30-July 1) to explore the effectiveness of a policy aimed at reducing breast and cervical cancer morbidity and

mortality rates for women enrolled in the program. The comparison will test the hypothesis that there is a decrease in the percentage of late stage breast cancer after the enactment of the BCCP for the women screened in the program.

Summary

Chapter III summarized the Hypotheses, Research Design, Analysis, Data Collection, Model I, Model I Study Population, Model I Study Design, Model I Operationalization of Measures, and Descriptive Policy Analysis. The research design was non-experimental and the model was based on the hypotheses and questions presented.

The data have shown that increased screening is effective in detecting breast cancer at an earlier rate, thus reducing mortality rates from breast cancer (Farley and Flannery, 1989). The NBCCEDP has been in existence for twenty years, targeting minorities and the medically underserved. Analyzing data from the BCCP will be beneficial in determining whether the program has been effective in detecting breast cancer at an early stage in Mississippi, when it is more successfully treated.

CHAPTER V

DATA ANALYSIS AND REPORTING OF FINDINGS

Introduction

The purpose of this study was to examine the influence that social determinants had on stage of breast cancer diagnosis in Mississippi. Also, this study examined the impact of the Mississippi Breast and Cervical Cancer Program on stage of breast cancer diagnosis. Incidence cases of breast cancer in women (n=2,099) occurring in 2008 and reported to the MCR (MCR) were analyzed for this study. Additionally, breast cancer cases diagnosed in the BCCP for Fiscal Years 1999-2008 were analyzed. Analyses of breast cancer incidence data ascertained from the CMCR for this study demonstrated that income, race, and health care coverage were associated with stage of breast cancer diagnoses. However, geographic location was not significant to stage of breast cancer diagnoses in this study. The impetus for this study was the following research questions:

1. Is there a significant difference in the proportion of African American women diagnosed with late stage breast cancer compared to white women in Mississippi?
2. Is there a significant difference in the proportion of women with health insurance diagnosed with late stage breast cancer compared to women without health insurance in Mississippi?

3. Is there a significant difference in the proportion of women who live in rural areas diagnosed with late stage breast cancer versus those who live in urban areas in Mississippi?
4. Is there a significant difference in the proportion of late stage breast cancer for women of lower SES versus those of higher SES in Mississippi diagnosed with late stage breast cancer?
5. Has the Mississippi Breast and Cervical Cancer Program significantly affected late stage breast cancer?

Data Analysis and Findings

Study Population

Study subjects for Model I (See Chapter IV) consisted of the women diagnosed with breast cancer contained in the MCR (n = 2,099). Data on race, health care coverage, and zip code location are available in the MCR. Income data are not ascertained by the Cancer Registry. Therefore in this study U.S. Census Bureau per capita income in 1999 (dollars) data for zip code designations were used as a proxy variable for income to examine the relationship of income to stage of breast cancer diagnosis.

Data to assess the influence of a public health program implemented to impact breast and cervical cancer disparities were obtained from the Mississippi's program records for women diagnosed with breast cancer. Data were analyzed utilizing a longitudinal approach for ten years, from the inception of the program through 2008 for women enrolled in the BCCP.

Data Analysis for Model I

Analyses of breast cancer incidence data using Model I typology sought to determine whether certain social determinants of health (race, income, geographical location, and insurance coverage) impacted stage of disease for women who had been diagnosed with breast cancer in Mississippi. Data from the literature review demonstrated that women diagnosed with later stages of breast cancer disease tend to be African American, have lower income, uninsured, and resided in the rural areas (Heck et al. 1997, Nazroo 2003, Smith 2007, and Williams et al. 2000). Data analyzed for this study for Mississippi women diagnosed with breast cancer were obtained from the MCR (n = 2,099). Missing and unknown data were excluded in the different data analyses.

Table 3 Race and Rurality

Variable	White	Black
Urban	39%	43%
Large Rural	27%	36%
Small Town	23%	10%
Rural	11%	11%
Total/N Size	100% (1399)	100% (685)

Source: 2008 MCR data

Chi Square <.001***

Gamma=-.136

Table 3 shows the relationship between race and where individuals resided. Geographical location was defined using the Rural Health Research Center is the Rural-Urban Commuting Area Codes (RUCA's). The results indicated that of the women diagnosed with breast cancer in Mississippi that a large portion of African Americans resided in urban areas (43%). Similarly, a large portion of whites resided in the urban area (39%). The newer term large rural or micropolitan are urban clusters of 10,000-49,999 population. A significant number of African Americans reside in the large rural

area compared to whites (36% to 27%). Only 21% of African Americans in Mississippi reside in small towns and rural areas as compared to 34% of whites.

There appears to be a small difference in racial distribution in urban areas. However, the major differences are noted in large rural with a larger proportion of African American and small towns with a larger proportion of whites. No significant difference is seen in racial distribution in rural areas. The findings indicate that the distribution of race among the study population is significantly different by geographic location (Chi Square $<.001^{***}$). The gamma value $-.136$ reveals a weak to moderate relationship between the two variables.

Table 4 Race and Income

Variable	White	Black
Under \$15,000	43%	63%
\$15,0001-20,000	38%	31%
\$20,001-25,000	12%	3%
\$25,001-30,000	4%	1%
\$30,000+	3%	2%
Total/N Size	100% (1387)	100% (676)

Source: 2008 MCR data

Chi Square $<.001^{***}$

Gamma= $-.396$

Table 4 shows the relationship between race and income. As predicted, African Americans in Mississippi have lower per capita incomes as compared to white (63% to 43%). Interestingly, the income gap is narrowed between whites and African Americans at the highest per capita income level; whites at 3% and African Americans at 2%. Also, the data demonstrate a significant difference in per capita income for whites (12%) and African Americans (3%) between \$20,001-25,000.

There appears to be a significant difference in economic distribution for African America and white women in the lowest per capita income of <\$15,000. Yet, the economic gap narrows for incomes of \$15,001-\$20,000. The economic distribution gap widens again for incomes of \$20,001-\$25,000. However, the economic gap begins to narrow again for incomes of \$25,001-\$30,000 and narrows even more for incomes > than \$30,000. The findings indicate that the distribution of income among the study population is significantly different by racial categories (Chi Square <.001***). The gamma value of -.396 reveals a moderate relationship between the two variables.

Table 5 Race and Insurance

Variable	White	Black
Not Insured	3%	6%
Private Insurance	42%	39%
Medicaid	5%	15%
Medicare	49%	38%
Govt Insurance	1%	2%
Total/ N Size	100% (1359)	100% (656)

Source: 2008 MCR data
Chi Square <.001***

Table 5 illustrates the relationship between race and insurance. African Americans in Mississippi are twice as likely as whites to not have insurance; whites 3% to African Americans 6%. African Americans are three times more likely to have Medicaid coverage compared to whites, with 5% of whites and 15% of African Americans having Medicaid coverage. Although it has been suspected that health insurance not only impacts a person's ability to access health care, but also the type of care that individuals receive, this study did not focus on disparity in health care treatment, but rather on stage of cancer diagnosis.

There appears to be major differences in health care coverage among the races for women in Mississippi diagnosed with breast cancer. The major differences are noted with a larger proportion of African American either uninsured or Medicaid insured. There is a notable variance for the Medicare insured, but it could be attributed to the difference in age distribution for those women in the study population. The findings indicate that health care coverage among the study population is significantly different by racial categories (Chi Square $<.001^{***}$).

Table 6 Race and Stage of Diagnosis

Variable	White	Black
Early Stage	70%	56%
Late Stage	30%	44%
Total/ N Size	100% (1362)	100% (660)

Source: 2008 MCR data

Chi Square $<.001^{***}$

Gamma=.297

Table 6 presents the relationship between race and stage of breast cancer diagnosis. The results indicate that 44% of African Americans in Mississippi are diagnosed at later stage of diseases compared to only 30% of whites. The findings from this study support the hypothesis that there is a positive relationship between African American women and late stage breast cancer in Mississippi.

There appears to be significant differences in stage of breast cancer diagnosis among racial groups in Mississippi. White women are diagnosed at earlier stages of disease than their African American counterparts. The findings indicate that stage of breast cancer diagnosis in the study population is significantly different by race (Chi Square $<.001^{***}$). The gamma value of .297 reveals a moderate relationship between the two variables.

Table 7 Rurality and Stage of Diagnosis

Variable	Urban	Large Rural	Small Town	Rural
Early Stage	64%	65%	67%	63%
Late Stage	36%	35%	33%	37%
Total/ N Size	100% (808)	100% (620)	100% (381)	100% (228)

Source: 2008 MCR data

Chi Square >.05

Gamma=-.029

Table 7 shows the relationship between rurality and stage of breast cancer diagnosis. There appears to be small differences in stage of breast cancer diagnoses regardless of geographic location for the study population. The results indicate that 37% of rural residents in Mississippi are diagnosed at later stage of diseases compared to a comparable 36% of urban residents. Although, the literature review suggested that individuals who resided in rural areas had worse health outcomes, that association was not observed in this study. In this study, findings demonstrate that the residence of a woman diagnosed with breast cancer did not impact the stage of their disease.

The nearly nonexistent gamma value of -.029 reveals almost no relationship between the two variables in my sample and the statistically insignificant Chi Square value indicates a minute relationship between the two variables.

Table 8 Income and Stage of Diagnosis

Variable	Under \$15,000	\$15,001-20,000	\$20,001-25,000	\$25,001-30,000	Over \$30,000
Early Stage	63%	65%	67%	69%	73%
Late Stage	37%	35%	33%	31%	27%
Total/ N Size	100% (992)	100% (718)	100% (181)	100% (70)	100% (55)

Source: 2008 MCR data

Chi Square >.05

Gamma=-.065

Table 8 illustrates the relationship between income and stage of breast cancer diagnosis. The results of this study indicate that income levels were not a negative indicator for breast cancer diagnoses. There was a slightly larger proportion of higher income women receiving an early stage diagnosis of the disease, but the difference was not statistically significant. The findings from the study somewhat supports the hypothesis that there is a positive relationship between women of lower SES and late stage breast cancer in Mississippi, but the differences are not statistically significant. As incomes increase, the proportion of women diagnosed at late stage breast cancer decreases, but the increase is slight.

The findings indicate that at the lower income level late stage breast cancer is diagnosed at 37% as compared to the highest level of income late stage breast cancer is diagnosed at 27%, but the variance is not statistically significant (Chi Square >.05). Also, the gamma value of -.065 reveals a weak relationship between the two variables.

Table 9 Health Care Coverage and Stage of Diagnosis

Variable	Not Insured	Private Insurance	Medicaid	Medicare	Govt Insurance
Early Stage	46%	66%	52%	68%	61%
Late Stage	54%	34%	48%	32%	39%
Total/ N Size	100% (74)	100% (829)	100% (164)	100% (900)	100% (36)

Source: 2008 MCR data
Chi Square <.001***

Table 9 shows the relationship between health care coverage and stage of breast cancer diagnosis. The results of this study indicate that a significantly larger proportion of women who were not insured were diagnosed at later stages of disease (54% at late stage to 46% for early stage). Also, the findings from this study demonstrate that Medicaid as a

health care coverage only slightly improves stages of later disease diagnoses (48% at late stage to 52% for early stage compared to women without health insurance). Findings from this study support the null hypothesis that there is a negative relationship between women with health care coverage and late stage breast cancer in Mississippi. The findings further indicate that stage of breast cancer diagnosis in the study population is significantly associated with health care coverage (Chi Square <.001***).

Multivariate Tables

Multivariate relationships between predicted variables and stage of breast cancer diagnoses were examined by multiple logistic regressions. Multiple regression analyses were utilized to identify the best combination of predictive variables (independent variables) that would influence the dependent variable. Tables 10 thru 13 are multivariate tables that assess the relationships between race and stage of diagnosis while controlling for place of residency.

Table 10 Race and Stage of Diagnosis (Urban Residents)

Variable	White	Black
Early Stage	71%	52%
Late Stage	29%	48%
Total	100% (521)	100% (280)

Source: 2008 MCR data

Chi Square<.001***

Gamma=.383

Table 10 demonstrates the relationships of race and stage of breast cancer diagnosis, controlling for individuals who reside in urban areas of Mississippi. Findings from other studies demonstrated that individuals who resided in rural areas were more likely to be diagnosed with later stages of breast cancer (Flora and Flora 2004). When

controlling for urban location, a significant larger proportion of African American women were diagnosed with later stages of breast cancer than white women (48% AA to 29%W).

When controlling for women who reside in urban areas of Mississippi, the findings indicate that stage of breast cancer diagnosis is significantly influenced by race (Chi Square <.001***). The gamma value of .383 reveals a moderate relationship between race and stage of breast cancer diagnosis, when controlling for women who live in urban areas.

Table 11 Race and Stage of Diagnosis (Large Rural Residents)

Variable	White	Black
Early Stage	69%	58%
Late Stage	31%	42%
Total	100% (373)	100% (244)

Source: 2008 MCR data

Chi Square<.01**

Gamma=.248

Table 11 illustrates the relationships of race and stage of breast cancer diagnosis, controlling for individuals who reside in large rural areas of Mississippi. Large rural areas are sometimes referred to as micropolitan (primary flow within an Urban Cluster of 10,000 to 49,999). When controlling for large rural location, a significant larger proportion of African American women continued to be diagnosed with later stages of breast cancer analysis shows (42% AA to 31%W), but the disparity lessened compared to women living in urban areas of Mississippi.

When controlling for women who reside in large rural areas of Mississippi, the findings indicate that stage of breast cancer diagnosis is statistically influenced by race (Chi Square <.01**). The gamma value of .248 reveals a moderate relationship between

race and stage of breast cancer diagnosis, when controlling for women who live in large rural areas.

Table 12 Race and Stage of Diagnosis (Small Town Residents)

Variable	White	Black
Early Stage	71%	59%
Late Stage	29%	41%
Total	100% (313)	100% (65)

Source: 2008 MCR data
 Chi Square<.05*
 Gamma=.261

Table 12 shows the relationships of race and stage of breast cancer diagnosis, controlling for individuals who reside in small towns in Mississippi. When controlling for small town location, a significant proportion of African American women compared to white women were diagnosed with later stages of breast cancer (41% AA to 29%W).

The findings indicate that stage of breast cancer diagnosis is influenced by race, controlling for women who live in small towns in Mississippi (Chi Square < .05*). The gamma value of .261 reveals a moderate relationship between race and stage of breast cancer diagnosis, controlling for women who live in small towns.

Table 13 Race and Stage of Diagnosis (Rural Residents)

Variable	White	Black
Early Stage	65%	59%
Late Stage	35%	41%
Total	100% (155)	100% (71)

Source: 2008 MCR data
 Chi Square>.05
 Gamma=.127

Table 13 demonstrates the relationships of race and stage of breast cancer diagnosis, controlling for individuals who reside in rural areas in Mississippi. When controlling for rural location, a significant proportion of African American women were diagnosed with later stages of breast cancer than white women (41% AA to 35%W). However, the difference was not statistically significant (Chi Square >.05).

Overall, tables 10-13 demonstrated that a significant proportion of African American women were diagnosed at later stages of disease than white women in Mississippi regardless of geographical location. Conversely, Flora and Flora found that individuals who reside in rural areas have worst health outcomes, the largest disparity gap was seen in African American women who resided in the urban areas in Mississippi (2004). Other studies demonstrated that the lack of health insurance was a major contributing factor to negative health outcomes (Dailey et al. 2007, Fitzpatrick et al. 2004, Shavers et al. 2002, and Virnig et al. 2002).

Tables 14 thru 18 examined multivariate determinants to assess the relationships between race and stage of diagnosis while controlling for type of health care coverage.

Table 14 Race and Stage of Diagnosis (No Insurance)

Variable	White	Black
Early Stage	51%	39%
Late Stage	49%	61%
Total	100% (35)	100% (38)

Source: 2008 MCR data

Chi Square>.05

Gamma=.238

Table 14 presents the relationship of race and stage of breast cancer diagnosis, controlling for individuals who lacked insurance coverage in Mississippi. When controlling for no insurance, a significant larger proportion of African American women

with no health insurance were diagnosed at later stages of breast cancer than white women (61% AA to 49%W) in Mississippi. However the difference is not statistically significant (Chi Square > .05).

Table 15 Race and Stage of Diagnosis (Private Insurance)

Variable	White	Black
Early Stage	69%	59%
Late Stage	31%	41%
Total	100% (569)	100% (252)

Source: 2008 MCR data

Chi Square<.01**

Gamma=.229

Table 15 shows the relationships of race and stage of breast cancer diagnosis, controlling for individuals who have private insurance in Mississippi. When controlling for having private insurance, the disparity between the races lessens slightly, but a significant proportion of African American women with private health insurance were diagnosed at later stages of breast cancer than white women (41% AA to 31%W) in Mississippi.

When controlling for women who had private insurance in Mississippi, the findings indicate that stage of breast cancer diagnosis is significantly influenced by race (Chi Square <.01**). The gamma value of .229 reveals a moderate relationship between race and stage of breast cancer diagnosis, when controlling for women who have health insurance.

Table 16 Race and Stage of Diagnosis (Medicaid)

Variable	White	Black
Early Stage	61%	46%
Late Stage	39%	54%
Total	100% (64)	100% (99)

Source: 2008 MCR data

Chi Square<.05*

Gamma=.285

Table 16 demonstrates the relationship between race and stage of breast cancer diagnosis, controlling for individuals who were Medicaid insured. When controlling for Medicaid coverage, a significant larger proportion of African American were diagnosed at later stages of breast cancer than white women (54% AA to 39%W) in Mississippi.

The findings from this study indicate that when controlling for Medicaid, stage of breast cancer diagnosis is influenced by race (Chi Square <.05*). The gamma value of .285 reveals a moderate relationship between race and stage of breast cancer diagnosis, when controlling for women with Medicaid as their health insurance.

Table 17 Race and Stage of Diagnosis (Medicare)

Variable	White	Black
Early Stage	72%	48%
Late Stage	28%	52%
Total	100% (654)	100% (244)

Source: 2008 MCR data

Chi Square<.001***

Gamma=.291

Table 17 illustrates the relationship between race and stage of breast cancer diagnosis, controlling for individuals who had Medicare as their health insurance in Mississippi. When controlling for Medicare, a significant larger proportion of African

American women were diagnosed at later stages of breast cancer than white women (52% AA to 28%W) in Mississippi.

When controlling for women who had Medicare in Mississippi, the findings indicate that stage of breast cancer diagnosis is significantly influenced by race (Chi Square $<.001^{***}$). The gamma value of .291 reveals a moderate relationship between race and stage of breast cancer diagnosis, when controlling for women who have Medicare at their health insurance.

Table 18 Race and Stage of Diagnosis (Government Insurance)

Variable	White	Black
Early Stage	62%	58%
Late Stage	38%	42%
Total	100% (21)	100% (12)

Source: 2008 MCR data

Chi Square $>.05$

Gamma = .071

Table 18 demonstrates the relationship between race and stage of breast cancer diagnosis, controlling for individuals who had other forms of governmental insurance in Mississippi. Although, Medicare and Medicaid are governmental forms of health coverage they were analyzed separately. Other forms of governmental health coverage were teased out separately and consisted of TRICARE, Military, Veterans Affairs, and Indian/Public Health Service. When controlling for health care coverage, African American women with governmental insurance tended to be diagnosed at later stages of breast cancer as compared to whites (42% AA to 38%W) in Mississippi. However, the differences were not statistically significant (Chi Square $> .05$ level).

Overall, a significant proportion of African American women in Mississippi are diagnosed as later stages of breast cancer disease regardless of their health care coverage

compared to whites. Focusing on health insurance status, 61% of African American women were without health insurance and 54% of African American women with Medicaid coverage were diagnosed at late stage breast cancer. Findings from Ward et al. demonstrated that patients with Medicaid did not get health care due to cost, delayed care due to cost, or did not get prescription drugs due to cost as compared to privately insured patients (2008). Also, individuals with Medicaid tend to have the same health seeking behavior as individuals with no insurance.

The largest racial disparity in stage of breast cancer diagnosis observed when controlling for health care coverage was among women who had Medicare coverage. Although, Medicaid and Medicare are both governmental programs that provide health coverage the population base for the two are starkly contrasted. Medicaid coverage is designed for poor people who meet the eligibility criteria, whereas Medicare coverage is designed for the elderly and eligible disabled populations regardless of income levels. Medicaid is associated with other social determinants that have been shown to negatively impact health outcomes; race, income, and level of education (Giacovelli et al. 2008, Hadley 2007, and Halpern et al. 2008).

Data Analysis for the Breast and Cervical Cancer Program

The BCCP data were analyzed to determine the effectiveness of a public health policy that was implemented to influence breast and cervical cancer outcomes by providing a health care coverage for medically underserved women. Data analyzed for this study for the BCCP consisted of the women diagnosed with breast cancer in the program over a 10 year period. Women in the BCCP vary in race, but they are similar in that they are medically underserved, uninsured or lacking adequate health care coverage,

and have incomes not exceeding 250% of the Federal Poverty Level. Analysis of BCCP data sought to answer the fifth research question: Has the Mississippi Breast and Cervical Cancer Program significantly affected late stage breast cancer?

Table 19 BCCP overall screening numbers and percentages

FY	N	BI	%BI	Wh	%Wh	Other	%Other	Unk	%Unk
1999	513	409	79.7%	101	19.7%	3	0.6%	0	0.00%
2000	2279	1512	66.3%	742	32.6%	24	1.1%	1	0.00%
2001	4183	2627	62.8%	1501	35.9%	55	1.3%	0	0.00%
2002	4351	2584	59.4%	1710	39.3%	56	1.3%	1	0.00%
2003	4261	2729	64.0%	1480	34.7%	43	1.0%	9	0.21%
2004	4970	3169	74.4%	1745	35.1%	38	0.8%	18	0.36%
2005	5185	3272	63.1%	1865	36.0%	23	0.4%	25	0.48%
2006	5778	3712	64.2%	1970	34.1%	51	0.9%	44	0.76%
2007	6322	4051	64.1%	2169	34.3%	47	0.7%	55	0.87%
2008	7288	4671	64.1%	2473	33.9%	88	1.2%	56	0.77%

Source: BCCP

Note: percentages total 100% across each row

Table 19 provides a longitudinal view of women enrolled in the BCCP over a period of 10 years since the inception of the program in Mississippi. The program began providing breast and cervical screening services July 1998, fiscal year 1999 (7/1/98-6/30/99). Each fiscal year begins July of the preceding year and ends June 30, of the following year. Data demonstrate over a 10 year period the number of women enrolled in the program increased by about 14.5 times. About two thirds of the recipients receiving breast and cervical cancer screening services by the BCCP are African American and about one third are white. Between one to two percent of the total population provided services by the BCCP are other races or race unknown.

Table 20 BCCP overall breast cancer diagnoses

FY	N	br ca dx	%	Bl	Wh	Unk	Asian	Early Stage	Late Stage	Unstaged
1999	513	4	0.780%	2	2	0	0	3	1	0
2000	2279	12	0.527%	10	2	0	0	5	6	1
2001	4183	26	0.622%	16	10	0	0	18	8	0
2002	4351	38	0.873%	21	17	0	0	26	12	0
2003	4261	45	1.056%	26	19	0	0	26	19	0
2004	4970	52	1.046%	26	26	0	0	25	27	0
2005	5185	61	1.176%	37	24	0	0	28	33	0
2006	5778	65	1.125%	38	26	1	0	21	44	0
2007	6322	63	0.997%	35	28	0	0	28	35	0
2008	7288	77	1.057%	36	40	0	1	33	44	0

Source: BCCP

Notes: FY = Fiscal Year

N = total number of women screened in the BCCP

br ca dx = breast cancer diagnosed

% = percentage of women screened in the BCCP diagnosed with breast cancer

Table 20 presents a longitudinal view of women enrolled in the Breast and Cervical Cancer Program over a period of 10 years since the inception of the program in Mississippi until 2008 who are diagnosed with breast cancer. Data demonstrate over a 10 year period the actual number of women enrolled in the program diagnosed with breast cancer has increased in correlation with the increase in screening numbers. Yet, the percentage has not varied considerably. As evidenced by the data, increased screening rates yield increased breast cancer rates.

Table 21 BCCP stages of breast cancer diagnoses

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
N	4	12*	26	38	45	52	61	65	63	77
ES	3	5	18	26	26	25	28	21	28	33
LS	1	6	8	12	19	27	33	44	35	44
%LS	25	50	31	32	42	52	54	68	56	57

*One unstaged

Source: BCCP

Notes: N = total number of breast cancer diagnosed

ES = Early Stage

LS = Late Stage

Table 21 demonstrates a longitudinal view of women enrolled in the Breast and Cervical Cancer Program over a period of 10 years since the inception of the program until 2008 in Mississippi who are diagnosed with breast cancer. Data demonstrate over a 10 year period the number of women enrolled in the program diagnosed with breast cancer are being diagnosed at later stages of disease, thus refuting the hypothesis that there will be a decrease in the proportion of late stage breast cancer diagnoses in Mississippi after the inception of the BCCP for those enrolled in the BCCP. Although beyond the scope of this dissertation, future research is needed to identify reasons for the increasing population of women in the BCCP diagnosed with late stage breast cancer in Mississippi.

Discussion

The basic premise underlying this study was whether there were social determinants that influenced stages of breast cancer diagnosis. There are no known causes of breast cancer, what is known are risk factors that increase a person's likelihood of being diagnosed with the disease. While these factors can only predict those most at risk, many individuals are diagnosed with none of the known risk factors identified. Although there has been a decline in breast cancer rates nationally, many minority populations have not seen the same level of decline. Therefore, researchers are faced with the challenge of trying to determine why African American women are not only being diagnosed and ultimately dying from breast cancer at a higher rate than their white counterparts, but why are they being diagnosed at later stages of disease.

Diagnosis at later stages of breast cancer disease negatively impacts outcomes. According to the American Cancer Society, when a woman is diagnosed with localized

breast cancer (early stage), she has a 98% 5-year survival rate; at regional disease, the survival rate drops to 81% and at distant or late stage, the survival rate drops significantly to 26%. Similarly, in a study of cancer stage of diagnosis for 12 cancer sites, Halpern et al. found that advanced-stage diagnosis led to increased morbidity, decreased quality of life and survival, and often increased costs (2008). Since there are no known causes of breast cancer, early detection has been shown to benefit the treatment of the disease. Early detection is primarily advocated from a three-prong approach; monthly self breast exams, yearly clinical exams, and annual mammograms after age 40 (ACS). Therefore, it would behoove women to adhere to recommended screening intervals so that if necessary, they could be diagnosed at an early stage of disease. The literature documented that many minority women do not adhere to the recommended mammography screening intervals (CDC 2010, Jencks et al. 2000, and Randolph et al. 2002).

Additionally, literature reviewed suggested that there are social determinants that have been shown to impact disparate health outcomes such as poverty, access to health care, health care coverage, prestige, social connectedness, and education (Chen 2006, Cummings 2007, and Huie et al. 2003). Further, Chen found that health disparate issues are more prevalent in certain ethnic and minority populations living in rural areas, and women (2006). Based upon literature reviewed, this study sought to examine which social determinants were impacting breast cancer outcomes in Mississippi.

Data analyzed for this study demonstrated that there were two major factors that significantly impacted whether women in Mississippi were being diagnosed at later stages of diseases; race and insurance status. These findings confirm earlier studies which found that individuals without health insurance or who had Medicaid coverage were at

increased risk of presenting with advanced-stage cancers (Chen et al., 2007; Fedora et al., 2010; Halpern et al., 2008). In addition, Halpern et al., found that that ethnic minorities had substantially increased risk of presenting with advanced-staged cancers at time of diagnosis (2008). Race is primarily a surrogate for many of the ills that are often correlated with disparate health outcomes such as income, educational attainment, and health insurance coverage. Yet, there is a gap in the literature to determine if African American's genetics adversely impact health outcomes or whether the disparity is due to socio-economic factors that are associated with race. More African Americans in Mississippi have lower educational attainment, have inadequate health care coverage, and lower incomes, which appears to greatly impact disparate health outcomes.

Bivariate analyses were conducted to examine the relationships between race and geographical location, race and income, race and health insurance, and race and stage of diagnosis. The findings revealed what was suspected for Mississippians; more African Americans lived in urban areas, had lower incomes, had less health insurance coverage, and were diagnosed at later stages of breast cancer disease. Additional bivariate analyses were conducted to examine the relationships between geographical location and stage of breast cancer diagnosis, income and stage of breast cancer diagnosis, and health care coverage and stage of breast cancer diagnosis.

All of the findings, but one supported the literature reviewed that race, income, and health insurance influenced late stage breast cancer diagnosis. However, only race and health insurance directly affected late stage diagnosis in analyses for this dissertation study. Two of the research questions were not supported; rural and urban locations had only a 1% difference in stage of diagnosis. The influence of income on stage of breast cancer diagnosis was not statistically significant.

Multivariate analyses controlling for location of residence also found that a larger proportion of African Americans were diagnosed with later stages of disease in Mississippi compared to whites. However, the greatest variance was noted for individuals who resided in urban areas in the state. Literature reviewed noted that individuals who resided in rural areas were diagnosed with later stages of breast cancer, but this study found the least variance among women who resided in rural Mississippi. The data demonstrated that regardless of where women lived in Mississippi, race continued to be a predictor of later stages of breast cancer diagnosis. Geographical location was not found to be significantly associated with stages of breast cancer diagnoses.

Multivariate analyses controlling for health insurance coverage found that significantly larger population of African American women in Mississippi were diagnosed at later stages of breast cancer than their white counterparts. An interesting aspect of this study found little variance between women with Medicaid coverage and those with no health insurance for later stages of breast cancer diagnoses. For women without health insurance, 49% of whites and 61% of African American were diagnosed at later stages of breast cancer. For women with Medicaid coverage, 39% of whites and 54% of African American were diagnosed with later stages of breast cancer disease. What the data analyses do not relate is whether women who were Medicaid insured and diagnosed with breast cancer may have become qualified once they are diagnosed with a dire medical condition or as a result of the Breast and Cancer Prevention and Treatment Act enacted February 2000. Regardless of their category of Medicaid eligibility, their incomes would classify them as poor.

Additionally, often Medicaid recipients and those uninsured, exhibit similar health seeking behaviors. Ward et al. found that Medicaid-insured patients were more

likely to delay or not seek health care due to cost similar to uninsured patients (2008). Similarly, Giacobelli et al. found that uninsured were less likely to use preventive services, less likely to fill prescriptions, and ultimately had worse health outcomes in a study that focused on insurance status and outcomes of vascular disease (2008).

Findings for Medicare-insured women for stages of breast cancer diagnosis were similar to women who had private insurance for stages of breast cancer diagnoses. White women with Medicare coverage fared slightly better than White women with private insurance for later stages of breast cancer diagnoses (28% Medicare vs 31% private insured). Medicare is primarily a health insurance program for individuals who are at a certain age, in contrast to low-income criteria of eligibility for Medicaid. Therefore, many of these women may not exhibit the same behavior as Medicaid insured women. More than likely, these women with Medicare coverage are adhering to recommended screening intervals as well.

Data analyzed from the Breast and Cervical Cancer Program, enacted to reduce disparity to breast and cervical cancer rates, found that there has not been a reduction in late stages of breast cancer diagnoses. This finding refutes the research question and the hypothesis that the Mississippi Breast and Cervical Cancer Program significantly affected late stage breast cancer. Findings from this study demonstrated that more women were diagnosed with breast cancer as a result of increased screenings. But, women in the BCCP continued to be diagnosed at later stages of breast cancer diseases. One possible explanation is that the program targets poor and African American women in Mississippi, who often do not adhere to recommended screening intervals; thus, oftentimes presenting at medical facilities with advanced medical conditions.

CHAPTER VI

CONCLUSION

Breast cancer is the most common cancer diagnosed in women in this country. Although, heart disease is the leading cause of death for women, more women fear that they will die of breast cancer than any other disease. Also, cancer treatment costs are spiraling and causing great financial woes for many people (Campbell et al. 2009 and CDC 2005). There are still no known causes of breast cancer. There are identified genetic and societal risk factors that predispose a woman to the disease, yet many women who are diagnosed do not have any of the known risk factors. Having a better knowledge about this devastating disease will impact morbidity and mortality rates associated with breast cancer.

The economic and psychological effects that a cancer diagnosis has on individuals are devastating. The American Cancer Society states that when cancers are detected early, survivorship rates greatly increase. Yet, there are some cancers that often are not detected early due to the lack of screening mechanisms. However, the lack of a screening tool is not an impediment for the detection of breast cancer. Adherence to recommended mammography screening has been shown to greatly reduce breast cancer rates. Yet, certain minority groups, especially African Americans, continue to be disparately affected by breast cancer.

The purpose of this study was to examine the influence that social determinants had on stage of breast cancer diagnosis in Mississippi. Also, this study examined the

impact of the Mississippi Breast and Cervical Cancer Program on stage of breast cancer diagnosis. Incidence data of breast cancer in women that occurred in 2008 and were reported to the MCR were analyzed for this study. The results of these analyses demonstrated that African American women in Mississippi were disproportionately affected by this disease. Also, breast cancer cases diagnosed in the BCCP from 1999-2008 were analyzed to determine the impact that a public health policy designed to reduce disparity actually had on breast cancer outcomes in Mississippi. The findings from the analyses of the BCCP demonstrated that women screened in Mississippi were diagnosed at later stages of disease, when their outcomes are worse.

Analyses of the incidence data housed in the CMCR found that race and lack of health insurance significantly impacted stage of breast cancer diagnoses. Also, the analyses demonstrated that women with Medicaid coverage did not fare much better than women without health insurance. One recommendation for future studies is that researchers should take into consideration that race is primarily a surrogate for those social determinants that have been shown to impact many disparate health conditions. An individual cannot alter the genetic factor of race, but some of the disparate health outcomes that appear to be associated with race may be behavioral or socio-economically based and can be addressed, which could impact health outcomes.

Recommendations for future studies regarding Medicaid coverage and health outcomes should consider that the data could not be analyzed to determine when a woman is initially enrolled for Medicaid coverage. Halpern et al. stated that “a more advanced-stage of cancer at diagnosis does not distinguish between patients who become eligible for Medicaid coverage because of their cancer diagnosis from those who were covered by Medicaid before diagnosis,” (2008). Therefore, additional studies are needed

to determine whether women were solely eligible for Medicaid coverage due to poverty or whether it was a result of their breast cancer diagnosis to gain insight into the disparity that was noted with breast cancer outcomes who were Medicaid-insured. Future studies would need to analyze insurance data to determine at what time interval in the progression or before the onset of the disease was a person insured to have a better understanding of the influence of health coverage on health outcomes. As an example, some women were placed on Medicaid as a result of the Breast and Cervical Cancer Treatment Act, which also could have affected their health outcomes. Program data show that many of the women in the Breast and Cervical Cancer Program had not adhered to recommended screening intervals nor adhered to recommended follow up which affects stage of breast cancer diagnosis, which also could have affected their health outcomes.

Analysis of data generated in the BCCP demonstrated that disparity associated with disadvantaged populations continued to persist even when health care coverage existed. Researchers in future studies, when analyzing BCCP data, should analyze the health seeking behaviors of the screened populations. Also, a qualitative approach could gain a better knowledge of self-efficacy and the beliefs of women enrolled in the BCCP.

If public health researchers want to truly impact disparate health outcomes, specific attention must be given to those who suffer disproportionately. However, a cursory analysis will not be sufficient. Quantitative analysis provides critical insight, but, qualitative analyses; such as surveys, focus groups, one on one interviewing with well written open-ended questions would be more advantageous to garner information from women who are unequally affected. Future research will build on these quantitative analyses that provide important research questions to explore in qualitative studies of African American women with breast cancer.

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