BREAST CANCER, CULTURAL BELIEFS AND RURAL WOMEN: RACIAL AND AGE DIFFERENCES IN INTENTIONS TO SEEK CARE

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by

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Abstract

This study investigated the influences of an array of socioeconomic, health care utilization, breast cancer awareness and cultural belief factors on rural women's intentions to seek breast health care if they were to detect a breast lump. The underlying conceptual schema was an ecological perspective that provided a framework for the multiple levels of predisposing, reinforcing and enabling influences on women's perceptions about breast cancer and subsequent decision-making.

A secondary analysis of survey data was conducted from a random sample of 853 White and African women aged 18 to 99 years residing in two counties in rural eastern North Carolina. Bivariate analyses revealed that older African American women, compared to their younger and White counterparts, were the least likely to know or worry about breast cancer and its risks, or to talk to their physicians about the need for screening, or to have been screened, and more likely to subscribe to cultural beliefs that were barriers to seeking breast health care. Yet, older African American women were more predisposed to pursuing health care and physician recommendations than the other subgroups.

A multi-stage, multivariate logistic regression analysis revealed that socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs influenced intentions, but could not account for racial and age differences. Findings indicated that past screening behavior predicts future screening intention, prior use of the health care system predicts future use if a health problem is detected, breast cancer cultural beliefs that are consistent with mainstream medical knowledge reinforce the use of medical care

and screening, and physician communication about breast cancer risk and religious beliefs about God's role in curing cancer are highly influential on women's intentions to watch the lump for changes and to pray.

Findings highlight the need for public health programs that incorporate information related to women's use of the medical system and their cultural beliefs about breast cancer. Provider-oriented interventions should focus on the relevance of these beliefs for optimal health care and the importance of early detection. Study findings also justify advocacy for community partnerships that promote breast cancer screening for at-risk women.

TABLE OF CONTENTS

Page

Page

LIST OF TABLES

Page

LIST OF FIGURES

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CHAPTER 1

Introduction

Social work has long been involved in public health promotion in the United States since the settlement house movement championed by Jane Addams and the evolution of social work practice in medical settings guided by Ida Cannon. In those early days, social workers were concerned with a host of individual, community, and environmental public health issues such as infectious diseases, sanitation, nutrition, and maternal and infant mortality (Caputi, 1978; Moroney, 1995). As the twentieth century has unfolded, social workers have increasingly participated as members of multidisciplinary public health teams, jointly implementing health promotion and disease prevention programs targeted at contemporary health-related social conditions such as teenage pregnancy and acquired immune deficiency syndrome (AIDS), and chronic diseases such as Alzheimer's disease and cancer (Moroney, 1995).

The initial and continued presence of social workers in public health is attributable to the inextricable link between health problems, social conditions, and individual behaviors that can lead to and perpetuate disease. The responses of individuals to illness and treatment, and whether they return to full functioning or adapt to limitations, are as much dependent on psychological, social, cultural, and environmental circumstances as they are on biological processes (Ross, 1995). This person and environment interaction in the context of health fits well within the context of social work. The profession's commitment to social justice and advocacy for underserved and culturally diverse populations,

its grounding in ecosystems theory that emphasizes the person and environment interaction, and its emphasis on individual- and community-level intervention approaches, prepares social workers for practice in public health. Social workers interested in public health practice can be readily equipped to assess the health needs of target populations, to identify the psychological, cultural, and environmental conditions that are associated with health problems, to plan and evaluate interventions targeted at eliminating, reducing, or preventing health problems, and to enhance community capacity to deal with health problems in an equitable and culturally-sensitive manner (Wilkinson, Rounds, & Copeland, 2000).

This study was about a health problem that is a growing area of public health research and is gaining prominence within public health social work; that is, the racial and age inequities in breast cancer screening and mortality rates among women. Breast cancer is a public health concern because it is the most commonly diagnosed cancer after skin cancer and the second leading cause of cancer-related deaths among women in the United States (Division of Cancer Prevention and Control, 1996). According to the American Cancer Society, about 175,000 newly diagnosed cases of invasive breast cancer and 40,000 additional cases of *in situ* (localized) breast cancer were expected for 1999 while more than 43,000 women were expected to lose their lives to this disease during this same year (American Cancer Society, 1999).

This public health concern is particularly salient because for the past twenty-five years the incidence and mortality trends of this disease have not remained steady nor have their impact been uniformly shared by all women. Although breast cancer incidence rates for all women increase with age, with

incidence rates being highest among White women, mortality rates are highest among older African American women (American Cancer Society, 1999; Miller, Ries, Hankey, Kosary, & Edwards, 1993). In fact, older African American women carry the greatest burden of breast cancer (American Cancer Society, 1999; Earp, Altpeter, Mayne, Viadro, & O'Malley, 1995; Lannin et al., 1998).

The trends in race and age inequities in breast cancer mortality are even more disturbing when studies have demonstrated that mammography and clinical breast examination can be an effective means for reducing breast cancer mortality for all women. These studies suggest as much as a 40% reduction in mortality among women aged 50 years and over (Earp et al., 1995; Miller et al., 1993; Urban, Anderson, & Peacock, 1994). Yet, estimates of breast cancer screening utilization consistently show that participation is lowest among older and African American women (Fletcher et al., 1993; U.S. Department of Health and Human Services, 1991; Urban et al., 1994).

The causes of the differential trends in breast cancer incidence and mortality are difficult to interpret. Evidence suggests that the trends reflect the combined effects of breast cancer risk, screening usage, and treatment effectiveness (Chevarley & White, 1997). Prior research has investigated a variety of predictive factors that account for, or are associated with, women's decisions about screening usage. These studies have examined socioeconomic factors and, to a lesser extent, psychological, and cultural variables, including: race and ethnicity, insurance coverage or income, educational attainment and health knowledge, having regular medical care, physician referrals for screening, religious practices and beliefs, and perceptions and attitudes about breast cancer (Breen & Kessler, 1994; Burack, Gimotty, Stengle, Warbasse, & Moncrease,

1993; King, Rimer, Seay, Balshem, & Engstrom, 1994; Lannin et al., 1998; Michielutte, Dignan, & Smith, 1999; O'Malley, Earp, & Harris, 1997; Rimer, 1992; Scott Collins et al., 1999; Zapka, Stoddard, Maul, & Costanza, 1991). Study findings generally suggest that older and minority women, without adequate insurance coverage, with no regular source of medical care, who are less educated, who live in medically underserved areas, and who report strong religious values, attitudes and beliefs about health care and specifically breast cancer, are less likely than their counterparts to obtain breast cancer screening and thus, are at greater risk (Ashing-Giwa, 1999; Lannin et al., 1998; Mitchell, 2000; Skinner, Strecher, & Hospers, 1994). In response to these findings, public health social workers and others have urged the development of culturally-sensitive, community-based outreach and educational screening programs that are tailored to the pertinent socioeconomic, psychological, interpersonal, and cultural factors of high-risk women (Altpeter, Earp, & Schopler, 1998; Earp et al., 1997; Michielutte et al., 1999; Skinner et al., 1998).

Public health social workers can play a key role in mounting customized breast cancer screening programs at multiple levels of intervention. At the policy and services delivery level, they can coordinate the formulation and evaluation of health policy and services that can address gaps in access to breast cancer screening and treatment. At the community level, social workers can promote partnerships among organizations and citizens' groups to foster community awareness of the inequities of breast health care and screening, and encourage investment in health promotion local programming. At the individual level, social workers can help to enhance cultural competence among health care service providers and community advocates by designing and demonstrating methods

for tailoring health promotion interventions that advocate for and "speak to" women at risk (Altpeter et al., 1998; Bracht, 1995).

However, designing and implementing successful health promotion policies and program intervention strategies require careful assessments of the salient issues, needs, and motivations experienced by a targeted group. This study was motivated by the desire to help fill what has been called the "dearth of research" in the understanding of socioeconomic, psychological, cultural, and environmental factors that impact African American women's breast cancer screening practices (Ashing-Giwa, 1999). Its specific focus was aimed at providing public health social workers with further insights about the factors underlying age and racial differences in breast cancer screening as they exist in a high-risk population -- asymptomatic White and African American women living in a rural, medically underserved region in eastern North Carolina. Further, this study's research design was conceptualized to provide insights into a *de novo* area of research in breast cancer screening -- factors that affect an array of women's behavioral *intentions* rather than their reported screening *behaviors*. This study posited that with respect to breast cancer screening, women's intentions are the crucial intermediary link, or "proximal" step, between their knowledge, attitudes, and beliefs about breast cancer and the "distal" outcome of their actual screening behaviors. The condition "if you detected a breast lump" was embedded within the survey item construction that explored intentions in order to create a more compelling circumstance under which women could contemplate what they thought they would do.

This study also has the potential to inform and shape intervention strategies that address broader economic concerns in health care. The current

era of health care delivery in the United States has encompassed an increased focus on social and environmental determinants of diseases and on disease prevention and health promotion (Volland, Berkman, Stein, & Vaghy, 1999). Health care research has demonstrated that disease prevention and health promotion interventions not only contribute to a higher quality of life and lower utilization of medical resources, but when targeted at at-risk populations, they can be highly cost effective (Russell, 1993). Findings from this study are intended to be useful in tailoring empirically-based, culturally-sensitive health promotion and disease prevention programs that address the intentions of a specific population of women at risk for breast cancer mortality, facilitating those women who intend to pursue initial and routine breast cancer screening, and encouraging and supporting those women who are wavering or disinclined to obtain screening. Such health promotion and disease prevention programs have the potential to save lives and considerably reduce medical costs for women and the health care system.

This study used baseline data that were collected during 1996 and 1997 as part of a two-county research project in rural, eastern North Carolina where African Americans constitute more than one-third of the population. Data analyzed were from a sample of 853 White and African American women ages 18 to 99 years who were interviewed in their homes by trained interviewers. The administered survey explored health, psychological, cultural, and environmental factors related to the respondents': general health care history and practices, religious views and practices, knowledge and beliefs about breast cancer and its treatment, and breast cancer screening utilization and intentions. Detailed socioeconomic information was also collected to assess sample characteristics

and to provide background information thought to influence factors affecting intentions if a breast lump were detected. The next two sections of this chapter provide the background and further rationale for the study as well as the statement of the problem.

Background and Rationale

The fluctuations and disparities in breast cancer incidence and mortality rates have been tracked during the past three decades, providing the public with both promising and troubling news. In an examination of national breast cancer trends among all women in the United States for the period 1973 to 1992, the Centers for Disease Control (CDC) analyzed national incidence data from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program and death certificate data from the CDC's National Center for Health Statistics (Division of Cancer Prevention and Control, 1996). Their findings revealed that overall incidence rates for invasive breast cancer increased by 34% among women from 1973 to 1987, but stabilized during the period of 1988 to 1992[1]. Specifically, the incidence rate in 1973 was 82.5 cases per 100,000 women and in 1992, 110.6 per 100,000 women. While incidence rates rose and then stabilized, breast cancer mortality rates remained stable between 1973 to 1987, and decreased between 1988 to 1992 (Division of Cancer Prevention and Control, 1996).

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[1]About 1% of the breast cancer incidence and mortality occurs in men. For 1999, about 1,300 cases of breast cancer and 400 deaths among males were expected (American Cancer Society, 1999). The remainder of the breast cancer statistics provided will pertain only to women.

The more recent stabilization of overall breast cancer incidence and mortality rates is encouraging, however, these rates mask troubling and persistent differences by age and race. Women aged 50 years and older account for 77% of all new cases of breast cancer and 84% of all breast cancer deaths (American Cancer Society, 1999). In 1999, the incidence rates for breast cancer was only 1.3 cases per 100,000 for women aged 20 to 24 years of age, but a stunning 483.3 cases per 100,000 for women aged 75 to 79 years (American Cancer Society, 1999). The incidence of invasive breast cancer among women aged 65 years and older was twice that among those aged 35 to 44 years (Coleman & Feuer, 1992), and the mortality rate was approximately three times higher among women aged 65 years than for women aged 35 to 64 years (Ries et al., 1994). Between 1988 and 1992, incidence rates increased directly with age until age 75 to 79 years for White women and age 80 to 84 for African Americans. Although breast cancer incidence rates for Whites and African Americans were similar for women aged 45 years and younger, the rates were higher for Whites than African Americans after that age (Division of Cancer Prevention and Control, 1996).

The U.S. National Center for Chronic Disease Prevention collects data about health behaviors from all 50 states in order to monitor trends and changes in the prevalence of behavioral risk factors within state populations. Called the "Behavioral Risk Factor Surveillance System" (BRFSS), this national survey mechanism entails telephone interviews of civilian, non-institutionalized individuals aged 18 years and older. BRFSS data from 1973 to 1992 revealed that race-specific rates adjusted by age were dramatically different and unfavorable for African American women. While the age-adjusted breast cancer

incidence rates among all women and Whites increased 34% (from 84.3 cases to 113.1 cases per 100,000 women), the rate among African American women increased 47% (from 68.7 cases to 101.0 cases per 100,000 women) (Division of Cancer Prevention and Control, 1996; Kosary, Ries, & Miller, 1995).

Even though the overall incidence rate of breast cancer was found to be higher among White women, the BRFSS survey revealed that proportionally more African Americans died of the disease. Between 1988 and 1992, the overall ratio of African American to White breast cancer death rates was 1.2, with higher rates occurring among African American women under the age of 70 years. During the same period, the breast cancer mortality rate for White women decreased 6% (from 27.5 cases to 26.0 cases per 100,000 women), but increased 3% (from 30.4 cases to 31.2 cases per 100,000) for African American women (Kosary et al., 1995).

In a study examining the period between 1990 and 1996, the American Cancer Society found that these racial disparities persisted. The breast cancer incidence rate among White women was found to be 14% higher than it was for African American women (113.2 cases versus 99.3 cases per 100,000 women), but the mortality rate was 22% higher for African American women (31.4 cases versus 25.7 cases per 100,000 women) (American Cancer Society, 1999).

Given that mortality rates lag at least five to ten years behind changes in breast cancer risk, screening or treatment (Chevarley & White, 1997), it is not known for certain what caused the stabilization of overall incidence and mortality rates during the 1980s. The leveling of the incidence rate may be related to increased use of breast cancer screening methods, particularly mammography and clinical breast examination (American Cancer Society, 1999; U.S. Preventive

Services Task Force, 1996). Similarly, the decrease in breast cancer mortality rates for White women during 1989 to 1992 and again during 1990 to 1996 may reflect a combination of factors, including earlier diagnosis, more effective chemotherapeutic agents, and other treatment improvements among women in this group (American Cancer Society, 1999; U.S. Preventive Services Task Force, 1996).

Although the differential trends are not fully understood, three major contributing factors have been observed with respect to the racial gap in breast cancer mortality (Blendon, Aiken, Freeman, & Corey, 1989; Chevarley & White, 1997; Earp et al., 1995; Lannin et al., 1998). First, compared to their White counterparts, African American women of all ages in the United States are less likely to undergo breast cancer screening. Second, they are more likely to be diagnosed with breast cancer at a later stage. Third, African American women are more likely to delay seeking treatment for breast problems.

During the period between 1980 and 1988, National Center for Health Statistics data revealed that African American women had lower use of mammography and were less likely than White women to have had clinical breast examinations (Chevarley & White, 1997). In a recently updated analysis of urban versus rural health disparities in health care including cancer screening, Slifkin and colleagues found that asymptomatic rural women were less likely than their urban counterparts to have received clinical breast examination. These investigators also found that among Medicare enrollees, older, rural African American women were significantly less likely than older, rural White women to receive mammograms. Further, they found a greater difference in screening rates between rural African Americans and their urban counterparts and

concluded that older, rural African American women were the most at-risk for not obtaining breast cancer screening even when screening costs were covered by Medicare (Slifkin, Goldsmith, & Ricketts, 2000).

The specific causes of the lower rates of screening among asymptomatic African American women are not known. Prior research suggests that differences by race in the rates of screening and stage of disease at diagnosis reflect differences in socioeconomic status and area of residence that, in turn, influence access to and use of medical care (Chevarley & White, 1997; Freeman & Wasfie, 1989; Katz & Hofer, 1994; Mandelblatt, Andrews, Kerner, Zauber, & Burnett, 1991; Slifkin et al., 2000; Urban et al., 1994; Wells & Horm, 1992). Other studies examining psychosocial aspects of breast cancer screening among asymptomatic racial groups found that low income and rural African American women often misunderstood or were fearful of or embarrassed by these procedures (Earp et al., 1995; Michielutte et al., 1999; Skinner et al., 1998; Tessaro, Eng, & Smith, 1994).

These research findings coupled with the experience of community health promotion projects underscore the perspective that in order to have a significant impact on breast cancer screening rates particularly among asymptomatic older and African American women, universal access afforded by health care insurance and insurance reform is necessary, but not enough. Efforts to promote breast cancer screening must also be accompanied by culturally-sensitive measures that address women's values, beliefs, and fears and educate them about the disease and the importance of screening (Ashing-Giwa, 1999; Baquet & Ringen, 1986; Chevarley & White, 1997; Earp et al., 1995; Young, Ries, & Pollack, 1984). Therefore, it is essential that the impact of socioeconomic

barriers be explored in the broader context of other psychological, cultural and environmental influences on women's screening intentions.

However, few studies to date have focused in any depth on the role that socioeconomic, psychological, interpersonal, cultural and environmental factors play in decision-making by asymptomatic, older, rural, and African American women about obtaining or delaying breast cancer screening (Ashing-Giwa, 1999). Recent research in eastern North Carolina on the related topic of late-stage presentation of breast cancer among rural, predominately low-income, African American women found two distinct but complementary causes that underlie women's delay to seek treatment: (1) the lack of breast cancer screening through clinical breast examination and mammography; and (2) patient-initiated delay caused by "aberrant" cultural and psychosocial attitudes and beliefs (Lannin et al., 1998; Mathews, Lannin, & Mitchell, 1994). "Aberrant," in this context, means those beliefs and attitudes that do not recognize, or comply with, standard medical regimens for breast cancer treatment. These investigators found that "aberrant" beliefs influenced recognition and evaluation of symptoms as well as decisions about appropriate treatment actions (Mathews et al., 1994).

Using data from the same population, Lannin and colleagues (1998) assessed the relative contributions of race, socioeconomic, and cultural factors to late-stage breast cancer presentation. When socioeconomic variables were included with race in a predictive model, the odds ratio (i.e., the probability expressed as a ratio) for advanced disease in African Americans compared to Whites dropped from 3.0 to 1.8. However, when cultural factors were added together with race and socioeconomic factors to the model, the odds ratio decreased to 1.2 and was no longer statistically significant. The investigators

concluded that neither socioeconomic factors nor cultural factors alone could entirely explain the influence of race, but that both factors together could account totally for the observed effect (Lannin et al., 1998; Mathews et al., 1994). The findings of Lannin and colleagues further build on the argument of breast cancer screening promotion advocates that socioeconomic reform alone will not eliminate the racial gap in screening behaviors and stage of diagnosis unless it is accompanied by efforts to encourage breast cancer screening that are consistent with the underlying cultural beliefs and attitudes of the population. Further, Lannin and colleagues postulated that cultural beliefs and attitudes of rural African American women, in contrast to race or socioeconomic variables such as income, may be amenable to modification if health promotion messages are tailored to be sensitive to, respectful of, and work within the context of those cultural beliefs (Lannin et al., 1998).

In 1995, this hypothesis formed the basis of a successful proposal by this same team of researchers to the U.S. Department of Defense for a four-year (1996-2000), cancer-control project that specifically targets investigation of the underlying causes of advanced stage breast cancer found in the prior study among women who were patients at the ECU Leo Jenkins Cancer Center in eastern North Carolina. Titled "Culturally Based Intervention for Breast Cancer in Rural African Americans," the study is funded by the U.S. Army Material and Research Command and is located at the East Carolina University (ECU) in Greenville, North Carolina (Lannin, Mathews & Mitchell, 1996). The multidisciplinary investigative team includes: Donald Lannin, M.D., of the ECU Department of Surgery and Director of the ECU Leo W. Jenkins Cancer Center; Holly Mathews, Ph.D., of the ECU Department of Anthropology; and James

Mitchell, Ph.D., of the ECU Departments of Sociology and Family Medicine. In order to understand factors affecting screening behaviors of asymptomatic African American women, the ECU study focuses on women in the general population living in two counties in eastern rural North Carolina: Wilson and Pitt Counties. The general population was sampled in order to make comparisons between White and African American women.

To provide cross-sectional data about the ECU study population and to establish baseline measurement of screening behaviors of the cohort prior to the implementation of the planned intervention, a total of 1,046 women (430 African American, 563 White, 53 Other/Unknown) aged 18 years and older were interviewed in their homes using an 80-item questionnaire during 1996 and 1997. A follow-up post-intervention survey is scheduled at the end of the year 2000 and beginning of year 2001 to determine the incremental effect of the intervention over the secular trend (the change that occurs naturally over time within a population).

A particular strength of the ECU study sample is that the age range of respondents and the oversampling of African American women permit identification of significant age and racial differences when investigating predictive factors and outcome variables. In addition to information about age and race, the baseline (pre-intervention) questionnaire includes an array of items that addressed socioeconomic, health care utilization, and psychosocial factors including cultural beliefs. The Encyclopedia of Social Work characterizes psychosocial factors as individual level needs, coping capacities, interpersonal relationships, stressors, cultural background, and environmental resources (Goldstein, 1995). The Social Work Dictionary further defines culture as the

"customs, habits, skills, technology, arts, values, ideology, science, and religious and political behaviors of a group of people in a specific time period" (Barker, 1995, p. 55).

Consistent with these definitions and the variable classification used by the ECU investigative team, general psychosocial factors in this doctoral study encompassed women's knowledge about breast cancer and breast cancer risk, and their perceived susceptibility and exposure to the disease. Specific cultural factors entailed women's religious practices and values, and women's folk and religious beliefs pertaining to breast cancer and the efficacy of treatment. Socioeconomic factors included age, race, income, marital status, education, employment, and health care access variables. In addition to items pertaining to women's general health perceptions and health care utilization factors, specific breast health care utilization factors included physician discussion about breast cancer risks and screening, as well as past screening practices.

Statement of the Problem

This doctoral research was an exploratory and descriptive study that involved a secondary analysis of the ECU project baseline survey data collected in 1996 and 1997. The overall aims of this study were three-fold:

(1) to establish whether, in the hypothetical circumstance of detecting a breast lump, behavioral intentions varied by race and age among asymptomatic women living in a rural region;

(2) to construct viable measures of cultural beliefs about breast cancer and its treatment; and

(3) to investigate whether racial and age differences in intentions of this population are associated with other socioeconomic, health care utilization, breast cancer awareness, and breast cancer cultural belief factors.

As illustrated in Figure 1, this study explored the impact of four groups of factors -- socioeconomic characteristics, breast health care utilization, breast cancer awareness, and breast cancer cultural beliefs -- on behavioral intentions if a breast lump were detected. These variables were introduced in stages into a multivariate model to predict behavioral intentions, after first examining the impact of age and race on behavioral intentions. As will be noted in Chapter 3, additional socioeconomic, health care, breast cancer awareness and breast cancer cultural belief variables were examined to aid interpretation of the findings and for development of composite measures that were incorporated into the multivariate predictive model of this study as illustrated in Figure 1.

Chapter 2 of this dissertation provides an expanded summary of the epidemiology of breast cancer, from national and North Carolina-specific perspectives, and presents findings from prior studies that tested breast cancer screening promotion interventions in North Carolina. This chapter also includes a discussion of the theoretical foundation and conceptual framework of this study. Chapter 3 describes the research design, sampling strategy, measurement of independent and dependent variables, and steps of the data analysis. It ends with an overview of the socioeconomic characteristics of the study sample. Chapter 4 presents the findings of the bivariate and multivariate data analyses that were conducted. Chapter 5 provides an interpretation of the study findings and a summary of the study limitations. The chapter concludes

with a discussion of the implications of this exploratory and descriptive study for ongoing social work research related to breast cancer screening promotion, for evidence-based public health social work practice, and for social work education aimed at improving the health care of underserved and at-risk populations.

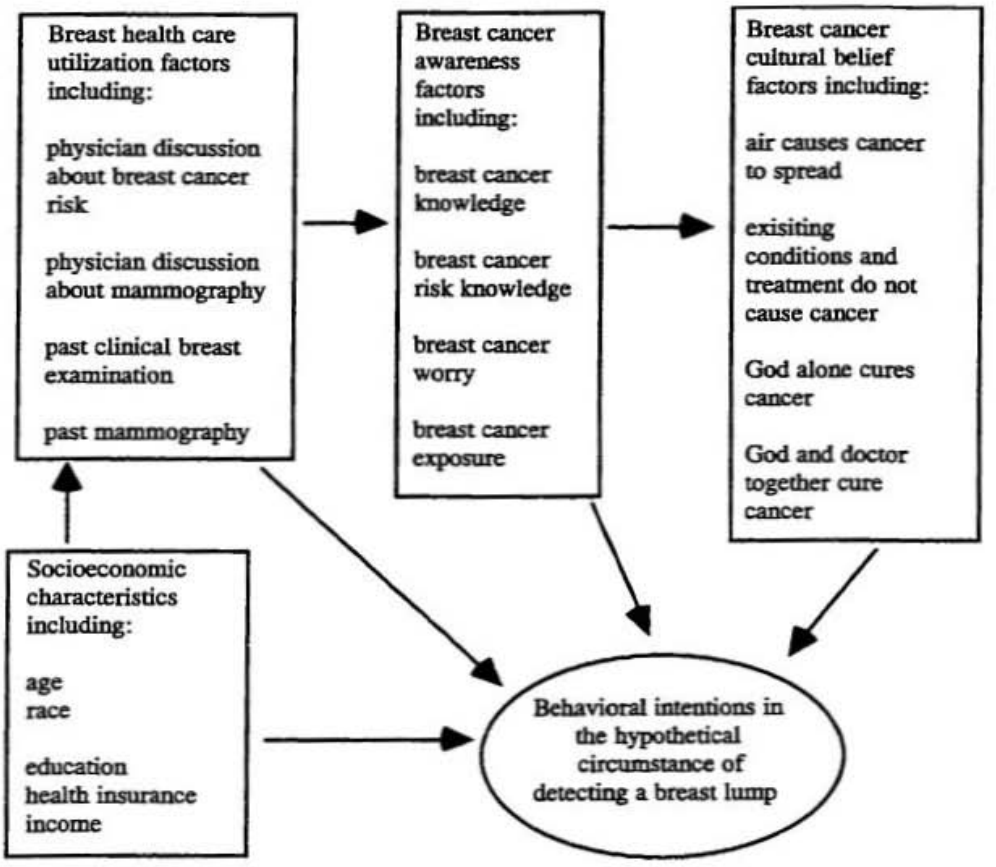

Figure 1. Schema of Indicators of Behavioral Intentions

CHAPTER 2

Literature Review

This chapter builds on the purpose of, and rationale for the study as discussed in Chapter 1, and presents the theoretical framework of the research design. The chapter is divided into three major sections. The first section is an expanded discussion of the epidemiology of breast cancer incidence, mortality, stage of diagnosis, and screening rates in the United States and in North Carolina, with particular attention to age and racial differences. The second section reports research findings of studies in North Carolina that assessed varying constellations of socioeconomic, psychological, interpersonal, and cultural factors associated with breast cancer screening and treatment among African American women. The third section presents the conceptual framework for the study.

Epidemiology of Breast Cancer: United States and North Carolina

As noted in Chapter 1, the single most important risk factor for the development of breast cancer is age. Breast cancer incidence increases with age. About 80% of new cases occur in women aged 50 years and over, and almost half of all newly diagnosed breast cancers occur in women aged 65 years and older (American Cancer Society, 1999; Caplan, 1997; Wanebo et al., 1997). About half of breast cancer deaths occur in women aged 65 years and older (Stewart & Foster, 1989).

Race is also a major factor in breast cancer incidence. Nationally, the incidence of breast cancer is higher among White women than African American women at every age (American Cancer Society, 1999). Yet, the higher breast cancer incidence rates among White women do not forebode higher morality rates among this racial group. On the contrary, in 1991, the overall death rate from breast cancer was 20% higher for African American than for White women in the United States, and 25% higher for African American women in North Carolina (Lesserman et al., 1993). Not only is the breast cancer death rate higher, but the gap in mortality rates between White and African American women is widening. Between 1974 and 1991, age-adjusted breast cancer mortality rose 20% among African Americans but less than 1% among Whites. From 1989 to 1993, mortality rates among White women fell about 6% while the mortality rate rose by about 1% among African American women (Earp et al., 1995). In North Carolina, during 1992 to 1996, the average age-adjusted breast cancer mortality rate was 40% higher among African American women than White women (32.5 versus 23.2 deaths per 100,000 persons) (Centers for Disease Control, 1997).

In order to predict the prognosis, or probability of survival, of women with detected breast cancer, a "staging" system is used to determine the extent to which the cancer has spread (American Cancer Society, 1999). The staging system encompasses three types of information, including: (1) the cancer tumor size; (2) whether the cancer has spread to lymph nodes and whether these nodes are fixed to other structures under the arm; and (3) whether the cancer is localized or has metastasized (spread) to other body organs or to lymph nodes

not adjacent to the breast. Stages are labeled 0 through IV; the lower the number, the less the cancer has spread.

The five-year survival rate is approximately 98% for breast cancers found in the early, localized stages of disease (i.e., Stages 0 and I) (American Cancer Society, 1999). Yet, a higher percentage of African American women are not diagnosed until the disease has already spread to the more advanced stages (i.e., Stages III and IV). Nationally, between 1983 and 1987, among those White women who were diagnosed with breast cancer, 53% had early stage breast cancer, while only 43% of newly diagnosed African American women presented with early stage disease (Miller et al., 1993). In 1990 in North Carolina, 67% of White women presented at an earlier stage, compared to 55% of African American women (Lesserman et al., 1993).

Late-stage presentation has been found to be associated with income status. Nationally, during the last decade, the mortality rate from breast cancer was found to be as much as 25% higher among lower socioeconomic status women than higher socioeconomic status women (Earp et al., 1995). Researchers in North Carolina who identified similar gaps in stage at diagnosis between African American and White women found that the differences were even more pronounced among rural women who, in large part, were found to have low-income status (O'Malley et al., 1997).

Some of the differences in stage of diagnosis can also be accounted for by differences in breast cancer screening rates. Clinical breast examination conducted by a nurse or physician and mammography have been demonstrated to be the two most effective breast cancer screening methods (Centers for Disease Control, 1994; Kerlikowske, Grady, Rubin, Sandrock, & Ernster, 1995;

White, Urban, & Taylor, 1993). Breast self-examination is a third companion method of screening, but since studies have shown its relatively limited utility for early detection of disease (Michielutte et al., 1999), it is not included as a screening behavior variable of interest in this study.

Although there have been ongoing debates over the age at which women should begin regular mammography screening, the National Cancer Institute Information Service and the American Cancer Society recommend annual clinical breast examination for all asymptomatic women, regardless of age. Bi-annual mammography is recommended for asymptomatic women between the ages of 40 and 49 years, and annual mammography is recommended for women aged 50 years and older (American Cancer Society, 1999; National Cancer Institute Information Service, 2000).

Rates of clinical breast examination reported by the Behavioral Risk Factors Surveillance System (BRFSS) indicate varying levels of compliance with recommended breast cancer screening guidelines, with younger women aged 40 years and older being much more likely than women aged 50 years and older to be in compliance. As shown in Figure 2, in both 1994 and 1995 in the United States, 82% of women aged 40 years or older reported ever having a clinical breast examination (CBE) (Powell-Griner & Anderson, 1997) (note: numbers are rounded). In 1994, state percentages ranged from 82.5% to 94.8% (median: 89.7%) and in 1995, state percentages varied from 82.1% to 95.5% (median: 89.9%). However, national clinical breast examination rates among women aged 50 years and older were considerably lower during that same period, despite the national guidelines recommending annual clinical breast examination for this age group. In 1994 and 1995, only 61% of women aged 50 years and older reported

that they had had a clinical breast examination in the past two years. In 1994, the state percentages ranged from 63.8% to 83.6% (median: 73.6%) and in 1995, the percentages ranged from 61.2% to 83.8% (median: 73.8%) (Powell-Griner & Anderson, 1997).

Higher rates of clinical breast examination, but similar differences in age-related patterns were also noted in the BRFSS data reported in North Carolina. Also shown in Figure 2, of women aged 40 years and older, 91.2% reported having had a clinical breast examination in 1994, and 91.4% had the exam in 1995. By contrast, in 1994, 76.9% of women aged 50 years or older reported having had a clinical breast examination within the past two years and in 1995, somewhat fewer women (74.9%) reported having had one in the past two years.

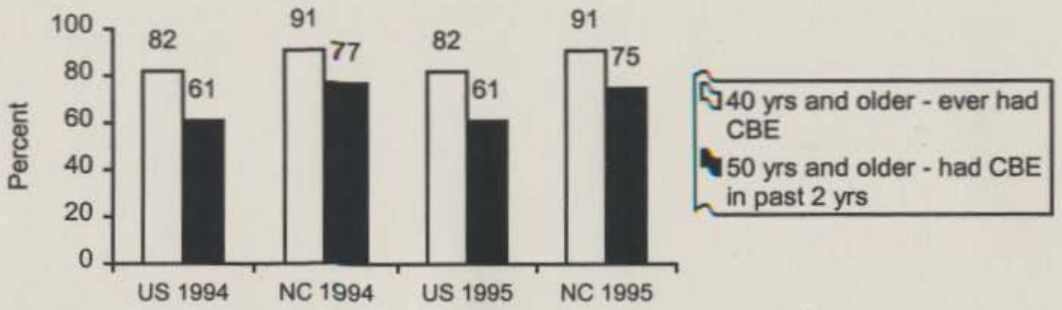

Figure 2. Percentage of Reported Clinical Breast Examinations by Age: U.S. and N.C., 1994 and 1995

The BRFSS-reported rates of mammography reveal even less compliance to the recommended guidelines for this screening method, both in the United States overall and in North Carolina. As shown in Figure 3, in 1994, the median of all state percentages of women aged 40 years or older who reported ever having had a mammogram was 79.6% (range: 69.7% to 86.7%) (Note: numbers

are rounded). In 1995, the national median for mammography rates for this age group was 81.8% (range: 72.4% to 90.4%). In 1994, 67.5% of women aged 50 years or older reported that they had had a mammogram in the past 2 years (range: 54.2% to 81.3%). In 1995, the rate increased slightly to 69.2% (range: 53.9% to 81.3%). In 1994 in North Carolina, 80% of women aged 40 years and older reported ever having had a mammogram, while in 1995, 81% of this age group reported ever having one. By contrast, in 1994, only 67.5% of North Carolina women aged 50 years and older reported having had a mammogram in the past two years, and 66.8% reported one in 1995 (Powell-Griner & Anderson, 1997).

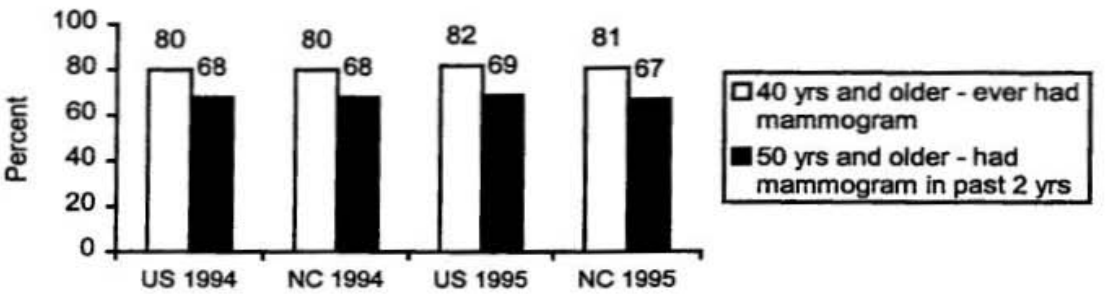

Figure 3. Median Percentage of Reported Mammograms by Age: U.S. and N.C., 1994 and 1995

As shown in Figure 4, 1994 BRFSS data indicate that the median percentage of women aged 40 years of age and older who received both a clinical breast examination and a mammogram was 75.1% (range: 63.7% to 82.9%) (Note: numbers are rounded). In 1995, the median percentage for this age increased slightly to 77.2% (range: 66.4% to 86.5%). However, the combined use of mammography and clinical breast examination in the previous 2

years among women 50 years of age and older was considerably less, varying from as low as 48.4% to 76.0% (median: 62.1%) in 1994 and 1995, from 47.5% to 75.7% (median: 61.5%).

Also shown in Figure 4, in North Carolina, similar age and pattern differences in the combined use of screening were noted in the BRFSS data, with older women reporting less compliance with guidelines over the two-year period. Specifically, 76.6% of women aged 40 years and older reported having had both screenings in 1994; this rate remained steady at 76.9% in 1995. Of women 50 years of age and older, the levels dropped almost negligibly from 62.4% in 1994 to 61.7% in 1995 (Powell-Griner & Anderson, 1997).

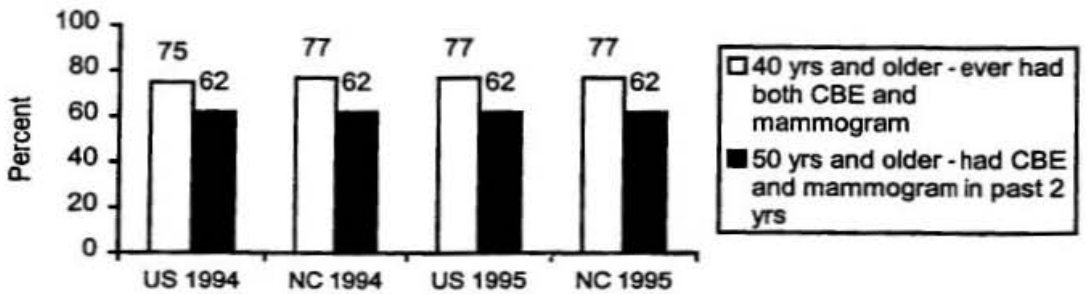

Figure 4. Median Percentage of Reported Combined Receipt of Clinical Breast Examinations and Mammograms by Age: U.S. and N.C., 1994 and 1995

In 1998, The Commonwealth Fund conducted a five-year follow-up telephone survey on women's health issues to one conducted in 1993, using a random sample of 2,850 women with an oversampling of African American and other minority women (Scott Collins et al., 1999). The trends that emerged mirrored those of earlier national studies. Overall rates of receipt of clinical breast examinations and mammography reflected lack of compliance with

nationally recommended screening guidelines and these rates remained virtually unchanged in five years. Rates of clinical breast examinations held steady at 66% in both 1993 and 1998, while the rate of mammograms increased slightly from 55% to 61% during that period.

As shown in Figure 5, The Commonwealth Fund study also revealed that by region, women in the South were less likely than the population as a whole to report clinical breast examinations (CBE) during the past year (63% versus 66%), and less likely to report having had a mammogram in the last year (56% versus 61%). Women with incomes of $16,000 or less were also less likely than all other income groups and the population as a whole to report receipt of a clinical breast examination (56% versus 66%) or a mammogram (49% versus 61%). Women ages 65 years and older were less likely than women aged 45 to 64 years to have had a clinical breast examination (52% versus 62%) or a mammogram (54% versus 68%) during the past year.

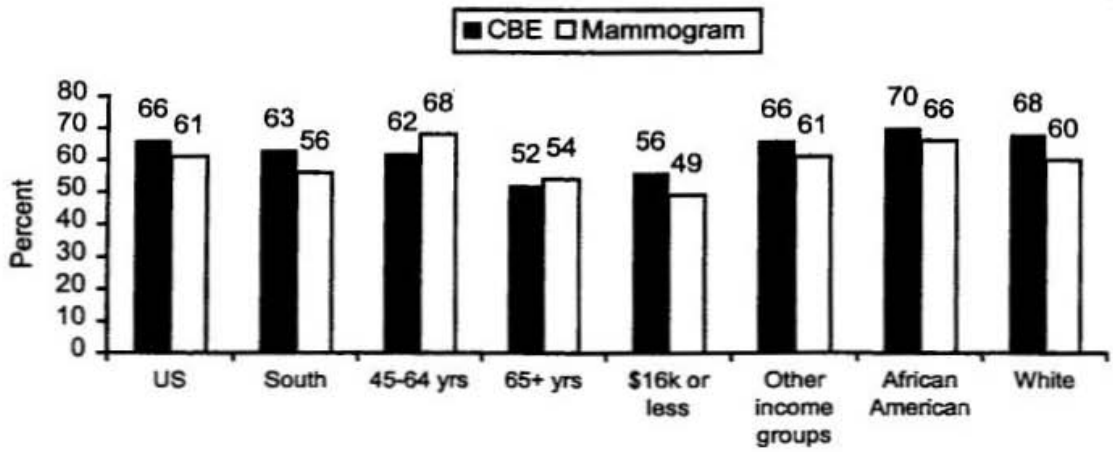

Figure 5. Percentage of Women Reporting Breast Cancer Screening in the U.S., 1998

However, when examining rates of clinical breast examination and mammography by race, The Fund survey findings differed from other national studies. As compared to White women, African American women reported higher rates of clinical breast examinations (70% versus 68%) and mammography (66% versus 60%) during the past year. Despite the encouraging news of finding improving screening among African American women, The Commonwealth Fund cautioned that breast cancer screening rates among all women were neither in compliance with nationally-recommended screening guidelines nor did they meet the target goals for preventive screening of the Healthy People 2000 national health program (Scott Collins et al., 1999).

In summary, these data demonstrate that breast cancer is a particular threat to older women and African American women, many of whom are low-income. Women in this group are less likely, compared to their younger and White counterparts, to seek breast cancer screening or to seek it at recommended intervals. Underscreening among asymptomatic, older, and African American rural women increases their vulnerability to late-stage diagnosis and thus to breast cancer mortality. How to promote breast cancer screening among this at-risk population is a particularly challenging question for public health social workers who are interested in, and advocate for health promotion and disease prevention at both individual and community levels. The next section provides an overview of studies in North Carolina that implemented and tested health promotion community intervention methods designed to increase breast cancer screening among this at-risk group of women.

Summary of Prior Breast Cancer Screening Intervention Studies in North Carolina

Because lower rates of breast cancer screening have been observed among low-income women, past public policy pertaining to breast cancer screening has been built upon the assumption that if financial barriers could be overcome, then screening rates among these women would improve. In 1991 and 1992, three demonstration projects targeted at increasing funding for breast cancer screening for asymptomatic low-income women were initiated in North Carolina. The three projects included: (1) state legislation that mandated all insurance companies within North Carolina to cover screening mammograms; (2) federal legislation that mandated Medicare also to provide at least limited coverage for screening mammography; and (3) a large grant from the National Centers for Disease Control (CDC) to allow North Carolina county health departments to administer free screening and diagnostic mammograms for low income women who were not covered by other forms of private or public health insurance.

Up to 1996, the ECU team of Lannin, Mitchell, and Mathews tracked the impact of these financial programs on women in Pitt County in eastern North Carolina. They found that, despite the very significant improvements in coverage, the number of mammograms among asymptomatic African American women in Pitt County increased only slightly since 1989 (Lannin, Mathews, & Mitchell, 1996). These results raised questions about the salience of insurance coverage or other methods of financial support as being key barriers to breast cancer screening. Similar to conclusions drawn from studies of other populations

and regions, Lannin and colleagues concluded that financial coverage was not the driving factor that motivates older and African American women in rural eastern North Carolina to obtain screening.

Other breast cancer screening promotion projects in North Carolina provided further evidence that reluctance to pursue breast cancer screening stems from more than financial barriers. During 1994 and 1995, two breast cancer screening days were offered in Pitt County and a free breast cancer screening week was held in New Hanover County. The results in both counties were similar. Despite the fact that the screenings were heavily advertised in the African American community, the turnout by this targeted group of women was disappointing. The majority of the participants were middle-class, White women who reported that they had already planned to be screened and were taking advantage of the cost savings (Lannin et al, 1996). Apparently free screenings coupled with heavy advertising were not adequate techniques to promote participation by asymptomatic women who are not contemplating breast health care, particularly African American women.

About the same time that community-based pilot projects featuring free screening and improved insurance coverage were being tested, other pilot projects investigating new techniques of community education targeted at at-risk women were also implemented in North Carolina. Between 1987 and 1991, an East Carolina University (ECU) team of investigators, in collaboration with investigators from the University of North Carolina at Chapel Hill and the Wilmington, North Carolina Area Health Education Center (AHEC), received a large National Institutes of Health (NIH) grant to perform an intervention to increase breast cancer screening among asymptomatic older women in rural

eastern North Carolina (Fletcher et al., 1993). Using a quasi-experimental design, New Hanover County was designated as the experimental county which received the intervention and Pitt County was the control county where no intervention was performed. Extensive data on all aspects of breast cancer diagnosis were collected in both counties before and after the intervention.

The intervention strategy in New Hanover County was to target both women and their providers. The intervention targeted at women was a multi-media public relations campaign to promote mammography and breast cancer screening among the general public. The physician intervention incorporated a variety of professional education activities to increase physicians' knowledge and abilities regarding breast cancer screening. At face value, the intervention was successful; the percentage of women over age 50 years who reported receiving a mammogram in the previous year increased from 35% to 55% in the experimental county, while rates rose only from 30% to 40% in the control county. However, the increase in screening rates was less for African American women than for White women, both overall and in most demographic subgroups. Further, the intervention unintentionally widened the racial gap in breast cancer screening from 11% to 17%. The research team concluded that the community-wide, media approach was too broad, and that a customized intervention was needed that encompassed carefully tailored screening messages targeted at disadvantaged women, including African Americans, the elderly, the poor, and the less-educated (Fletcher et al., 1993).

Investigators continued to explore factors that influenced at-risk women in the region, not only those women of the general population who were asymptomatic, but also those with diagnosed breast cancer. In 1988, an ECU

team of investigators received a five-year American Cancer Society (ACS) grant to study psychosocial factors, which influence the stage of presentation of breast cancer patients of all ages (Lannin, Mathews, & Mitchell, 1988). The team interviewed over 600 breast cancer patients, 400 age- and race-matched women as controls, and 300 confidants of breast cancer patients. A number of cultural factors were identified which were associated with late-stage disease. The relationships between these factors and race and socioeconomic status were explored. Race, income, marital status, insurance status, and whether the patient stated that money or transportation was a barrier were all found to have a highly significant impact on late-stage presentation. However, age and education were not found to have a significant impact.

When the above variables were incorporated into a multivariate logistic regression model, income and race were both highly correlated with late-stage presentation. Marital status, education, insurance status, age, and the patient-reported barriers dropped out as predictive factors in the model. This finding suggested that financial status and race are both independent predictors of late-stage presentation. Other investigators have found that both of these predictors were important, but they concluded that underlying socioeconomic barriers accounted for the association of race with stage of presentation of disease (Freeman & Wasfie, 1989; Gordon, Crowe, Brumberg, & Berger, 1992; Mandelblatt et al., 1991). In contrast, the ACS study showed that even when all measurable socioeconomic factors are controlled, including income, race was still an important predictor of late-stage presentation.

To examine why race remained a significant predictor of screening usage, the ACS study identified a large number of cultural attitudes and beliefs about

cancer that are widely prevalent in North Carolina and directly related to late-stage presentation of disease. The cultural beliefs were more prevalent in some demographic and socioeconomic subgroups of the population. For example, most of the medically-related folk beliefs such as "air increases the growth of a cancer tumor", fundamentalist religious beliefs that medical care is not needed as "God will take care of all health problems", and beliefs in alternative therapies, were strongest among African American women, the elderly, and those with low incomes and low education. In contrast, the correct responses to breast cancer knowledge items, beliefs in standard therapies, having a regular doctor, and the belief in the effectiveness of surgery were strongest among White women and in upper socioeconomic groups (Lannin et al., 1998).

An important question is whether the cultural beliefs of older, disadvantaged, and African American women that were identified in the ACS study are actually the *cause* of their presentation of advanced breast cancer, or whether these beliefs are *associated* with underlying causal factors. To try to understand the reasoning and factors that actually influenced behavior, open-ended interviews were conducted with patients after the formal structured interview was completed. Several factors emerged from the interview data that were considered to be most likely to cause late-stage breast cancer presentation. These included: (1) a religious view that medical treatment is not necessary because God will take care of health problems (fundamentalism); (2) a reluctance to let the patient's husband or male partner know about a breast problem; (3) a belief that "what will be, will be" (fatalism); (4) a belief that a biopsy should be avoided because air will get to the tumor and it will spread; (5) a belief that breast tumors are normal, that they move around, and that they are not

serious unless they hurt; and (6) a belief in alternative treatments rather than surgery as the most effective therapeutic modality. Women without a regular medical provider were also more likely to present with late-stage breast cancer. Using multivariate regression analyses, the investigators found that the effect of race on late-stage presentation was no longer significant when these cultural beliefs were added as predictive factors with socioeconomic characteristics. Thus, these findings suggested that race was a proxy measure that can be fully accounted for, not by financial status, but by underlying cultural beliefs and socioeconomic factors (Lannin et al., 1998).

Two recent North Carolina studies extended the relevance of the ECU study findings by elaborating on the variety of factors that influence breast cancer screening behaviors of asymptomatic rural, older, and African American women. The first study was of a clinic population of 719 women aged 60 years and older who resided in seven rural and urban counties in the central piedmont of North Carolina. Investigators found that low income and education, lack of or minimal health insurance coverage, the absence of physician referral, lack of symptoms and low perceived susceptibility, and lack of knowledge of the disease of breast cancer or the efficacy of screening, all contributed to lower screening rates (Michielutte et al., 1999).

The second study is the North Carolina Breast Cancer Screening Program, which is an eight-year (1992-2000) panel study testing community based interventions targeted at older, African American women in ten eastern counties (Earp et al., 1995). The North Carolina Breast Cancer Screening Program conducted household surveys of a random sample of 1,000 White women and 1,000 African American women in three waves of data collection of

approximately two-year intervals in order to measure the success of the implemented interventions. Baseline survey findings revealed that while a physician's recommendation for mammography was the most important predictor of women's receipt of mammography, women's perceived susceptibility to breast cancer and having had a family history of breast cancer were also significant factors (Tropman, 1998; Tropman, Earp, O'Malley, & Ricketts, 1999).

The investigators from both study teams posited that a diverse number of socioeconomic, psychological, and cultural factors were significant predictors of women's screening behaviors and that many of these factors (e.g., low perceived susceptibility, lack of knowledge about screening) could be amenable to change. Further, they urged the implementation of multi-level interventions that stress community education about the disease, emphasize realistic assessment of one's personal risk, and include empowerment of women to discuss breast cancer and screening with their physicians (Michielutte et al., 1999; Tropman, 1998; Tropman et al., 1999). The conceptual framework underpinning this type of multi-level strategy is embedded in an ecological perspective, which focuses on the inter-related components and contexts of the environment in which women live. These contexts include the general condition of women's health, their health care access and use, their health care providers and the broader system of health care delivery and access, and the influences of women's social networks and of community norms. This ecological perspective served as the overarching conceptual framework of this research study. It is described next.

Theoretical Framework

The conceptual framework for this study entailed the PRECEDE Model of health promotion, the Health Belief Model, and action theory concepts, all encompassed within the broader ecological or "Ecosystems" perspective. The Ecosystems perspective (Meyer, 1995) stresses the interconnectedness between people and their environments, whether those connections are positive, negative or neutral. Briefly, this perspective encompasses the concepts of ecology and general systems theory (Germain & Gitterman, 1995; Meyer, 1995). Ecology focuses on the adaptive fit between individuals and their environment and the means by which individuals successfully cope and thus survive within their environment. General systems theory posits that individuals and their environment are bound together in a dynamic system of interactions. Within this ecosystem, continuous and multi-layered, give-and-take processes of interactions and patterned relationships occur.

The ecosystem can be represented pictorially through an "ecomap" that portrays the relevant, interconnected variables and their boundaries. Social work interventions can be directed at various layers of the environmental relationships or at various points of their interactions within the ecomap. Given the multi-leveled nature of the ecological perspective that assures attention to individuals, their families and communities, and social and cultural norms, this framework values and raises awareness of cultural sensitivity and ultimately, can serve to enhance culturally-competent practice (Freeman, Franklin, Fong, Shaffer, & Timberlake, 1998).

Applied to this study, the broadest layer or context within the ecomap is the women's environment -- in this study, the rural environment. A rural area is

defined as having no town greater than 50,000 in population and the preponderance of towns averaging 2,500 residents (Davenport & Davenport, 1995). In addition to low-density populations, rural environments, such as the one under study, are often characterized by poverty, minimal health care resources, and lack of accessibility to available resources. Each of these disadvantaging characteristics can have direct or indirect impact on the health care decisions and health behaviors of rural women.

In addition, environmental or cultural factors influence health perceptions and behaviors. Juliá argues that "culture exerts its most fundamental and far-reaching influence through the methods individuals employ to understand and respond to illness" (1996, p. x). Hence, families and communities exert normative and social influences on a woman's health beliefs and health action decisions and these influences comprise additional layers of the ecosystem. Other environmental pressures, such as institutional barriers that impede actions that a woman takes, can arise from the health care system itself. These pressures and influences are further elaborated upon in the PRECEDE model of health promotion.

Building upon and modifying the Behavioral Model of health care utilization first proposed by Andersen (1968), the PRECEDE Model of health promotion categorizes multiple normative and environmental influences on health behavior into three categories: *predisposing, enabling,* and *reinforcing* factors (Green & Kreuter, 1991). The first letter of each category of factors constitutes the "PRE" of PRECEDE. These three sets of factors fit well within the overarching ecosystems framework in that they underscore a multi-stage, multi-

level approach to changing a woman's health-related behaviors and the living conditions and health care surrounding her.

Predisposing factors are primarily psychological in dimension, providing the motivation and rationale that are antecedent to behavior and change (Green & Kreuter, 1991). Predisposing factors include the individual's general and health-specific knowledge, health awareness, attitudes, beliefs, values and perceptions about disease and treatment, the sense of self-efficacy for regulating one's health and environment, and the actual skills the individual possesses to manage personal health and navigate the health care system. A variety of sociodemographic factors, such as race, age, and residential location (i.e., urban, rural), also constitute predisposing factors, but these characteristics serve primarily as a mechanism for segmenting populations for purposes of identifying unique subgroup characteristics and tailoring health promotion interventions (Green & Kreuter, 1991).

Within the context of breast cancer screening, predisposing factors include a woman's perceptions of breast cancer symptoms and her knowledge of their seriousness, her beliefs about her personal susceptibility to breast cancer, and her folk or religious beliefs about the curability of cancer (Michielutte et al., 1999; Powe, 1995). Perceptions of screening risks and benefits are also important predisposing factors because perceived susceptibility to breast cancer and perceived efficacy of mammography have both been associated with an increased use of mammography (Rimer, Trock, Lerman, King, & Engstrom, 1991).

Reinforcing factors include the positive (rewarding) and negative (deterring) feedback a person receives from others to pursue, continue, or cease

a health behavior. Thus, reinforcing factors include social support or pressures, peer influences and role-modeling, and feedback from health care providers (Green & Kreuter, 1991). In the context of breast cancer screening, reinforcing factors include a woman's past exposure to, and experiences with, cancer among her family and friends, encouragement for screening decisions from family and friends, discussions with health care providers about risks and the need for screening, as well as role modeling of compliance with screening protocols provided by relevant peer group members (Earp et al., 1995).

Reinforcing factors also include the social norms of the wider community concerning breast cancer screening behaviors. For example, health promotion endorsed from the pulpits of African American churches that subscribes to mainstream medical models, rather than "fundamentalist" or "fatalistic" religious views that breast cancer is a punishment or must be left in God's hands, would constitute a reinforcing factor. It should be stressed that "fundamentalism" and "fatalism" are not intended as judgmental terms. Rather, these terms refer to the widespread religious views of residents in this region who belong to Pentecostal churches that promote the belief that the Bible is unerring and should be understood literally, and that the scriptures instruct that one's fate is fixed (Mathews et al., 1994). The common church appellation in the region, "Full Gospel Church," reflects this strict adherence to the literal interpretation of the entire scriptures. Observed to be associated with this viewpoint is the belief that God both causes and cures disease as a punishment or reward for one's behavior and religious practices (Mathews et al., 1994).

Enabling factors are antecedents that facilitate health behaviors and are primarily related to systemic conditions. Enabling factors include institutional

policies governing health care delivery; the availability, accessibility and proximity of health care within the community; community resources that enhance the capacity of individuals to use health care such as the availability of transportation and child care; and personal resources such as income, and health insurance.

Within the context of breast cancer screening, enabling factors are manifested in the availability and accessibility of mammography centers or mammography mobile vans, physicians' attitudes about preventive services and their referral practices for screening, the existence and proximity of breast cancer screening programs, as well as the adequacy of medical insurance or special funds to pay for mammograms for women with incomes below the poverty level (Earp et al., 1995; Michielutte et al., 1999; Powe, 1995).

Within the context of predisposing, reinforcing and enabling factors, a woman formulates intentions and makes decisions about breast health care based on her perceptions of the severity or threat of breast cancer, and she acts according to her assessment of her ability, or self-efficacy, to handle that threat. The Health Belief Model (Rosenstock, 1974) provides the framework for understanding the decision-making dynamic that occurs at the individual level of the ecosystem.

The Health Belief Model suggests that changes in health-related behavior are based on several factors: (1) how *susceptible* a woman believes she is to a health threat ("How likely am I to get breast cancer?"), (2) how *severe* a woman considers the health threat to be ("How bad would having breast cancer be?"), (3) what she *perceives as barriers and costs* of taking action to reduce the threat (e.g., lack of insurance or the need-to-pay out-of-pocket for a mammogram, lack of transportation to the mammography center), and (4) what she *perceives as*

benefits of taking such an action (e.g., the reassurance she is healthy or the belief that early detection will improve her chances of survival) (Rosenstock, 1974). Beliefs about susceptibility and severity of health threats, and perceptions of barriers and benefits to taking health actions are influenced by predisposing, enabling, and reinforcing factors in a dynamic interplay that can fluctuate over time and changing conditions.

Ashing-Giwa (1999) has argued that the health behavior models described here, and others commonly used as the conceptual bases for the design of many breast cancer screening programs have not been adequately tested with African American women. She criticizes these models for emphasizing compliance with mainstream medical values and practices while ignoring the larger socio-cultural context of African American women's lives. She argues that these models fail to address the unique health socialization factors that may counter an African American woman's concept of self-efficacy over her health. In particular, Ashing-Giwa stresses the need for examining the role of religion and spirituality as part of the health socialization process among African American populations. An African American woman's sense of personal control may well be subordinated to her relatively stronger conviction that God is in control and that her health status is a direct result of God's assessment of her intrinsic goodness or conduct (Ashing-Giwa, 1999). This study was designed with the specific purpose of examining and comparing the role of religious beliefs as potential predisposing cultural factors that influence the health care decisions of White and African American women.

While the PRECEDE and Health Belief models provide the theoretical guide for identifying the factors, or predictor variables, associated with women's

behaviors related to their breast health care, action theories provided the conceptual underpinning for the conceptualization of the dependent variable, that is, behavioral intentions. As noted in Chapter 1, this study represents a departure from many prior studies that focused on rates of clinical breast examinations and mammograms as the outcomes of interest when examining factors affecting women's screening behaviors. The reconceptualization of the dependent variable from screening behaviors to behavioral intentions was based on two theories about action. Action theory principle posits that intentionality precedes and therefore directs actions (Argyris, Putnam, & Smith, 1985; Mele, 1997; Schutz, 1967). This theory emphasizes both the values that motivate individual behavior and the meanings that individuals attach to their actions (Goldman, 1970; LePore & McLaughlin, 1985). Building on these concepts, the Theory of Reasoned Action holds that the last step in the predisposing process before actual action is the formulation of a behavioral intention that, in turn, is influenced by intrinsic and extrinsic factors (Fishbein & Azjen, 1975; Azjen & Fishbein, 1980). Beliefs, values and behavioral intentions are influenced by supportive or deterring normative influences within the individual's social group (Fishbein & Azjen, 1975). Thus, as applied to breast cancer screening, a woman's values, beliefs and social influences pertaining to perceptions about breast cancer and the efficacy of its treatment shape her motivations and intentions to take action if a breast lump were detected.

There is also an empirical basis for focusing on behavioral intentions as the key variables of the study. Findings from a study of female health maintenance organization members ages 40 years and older found a significant correlation between mammography behavior and intentions ($\underline{r} = .50$, $\underline{p} < 0.001$)

(Montano & Taplin, 1991). A later study of White and minority female hospital employees ages 50 years and older also revealed significant correlations between mammography intentions and mammography (r = .39, p < 0.001), as well as clinical breast examination intentions and clinical breast examinations (r = .47, p < 0.001) (Friedman, Woodruff, Lane, Weinberg, Cooper, & Webb, 1995). In addition, a study of inner city ambulatory clinic White and minority women patients between the ages of 50 and 69 years found a significant correlation between mammography intention and past mammography behavior (r = .32, p < 0.05)(Montano & Thompson, Taylor, & Mahlock, 1997). These and other studies have also demonstrated that a variety of independent variables, such as attitudes and beliefs about mammography, support by providers and one's social network, the accessibility of mammograms, and select sociodemographic characteristics, are predictive of *both* screening intentions and screening behaviors, further supporting the theorized linkage between intention and action (Montano & Taplin, 1991; Friedman et al., 1995; Montano & Thompson, Taylor, & Mahlock, 1997; Allen, Sorensen, Stoddard, Colditz & Peterson, 1998).

The shift in outcome measure from actual action to intention for action was also based on two practical considerations, one of which is particularly significant to the rural region in which the study data was collected. First, many mammography centers in eastern North Carolina do not permit women to initiate the screening process by requesting a mammogram, but rather require a physician referral. Second, clinical breast examinations must be conducted by a physician or nurse. Hence, using measures of rates of receipt of mammography and clinical breast examination are as much a reflection of health care accessibility and protocols and an assessment of physician or nurse initiative and

behavior as they are a reflection of women's volition and ability to act. Consequently, designating intentionality as the dependent measure more aptly places the focus directly on women's discretion to identify and select among alternative courses of action. Further, by focusing on women's intentionality following detection of a breast lump, the research design of the study is strengthened by the logical and proximal connection of this dependent variable to the independent variables that include women's health perceptions and the predisposing, reinforcing, and enabling factors within her environment.

As illustrated in Figure 6, the conceptual framework of this study combines elements of action theory and the PRECEDE and Health Belief Models within the overarching Ecosystem perspective. This conceptual framework was designed to encompass the socio-cultural aspects of women's lives, and thus assure attention to the religious views that influence the health socialization of women.

At the heart of the model is the individual woman and her views about her susceptibility of getting breast cancer and the perceived threat of dying from the disease. In the context of these views, she weighs the benefits and barriers of obtaining screening, with consideration to financial and emotional costs to herself and her significant others, as well as her perception of her overall risk for getting breast cancer. Her decision-making, in turn, leads to the formulation of her behavioral intentions.

The middle layer of the model are the predisposing, reinforcing, and enabling factors that influence a women's intentions to pursue health care screening or treatment. These include: religious and cultural views about breast cancer; exposure to the disease and reinforcement from others such as family, friends and health care providers to pursue screening; health care system

conditions including availability, accessibility and affordability of services; and societal norms including the cultural beliefs and social norms about breast cancer and the value of breast cancer screening. The outermost part of the circle encompasses the interactive environment that surrounds the woman as she balances these intrinsic and extrinsic influences on her intentions and decisions to obtain breast cancer screening and treatment services.

This conceptual framework provided the structure for identifying and selecting the variables relevant to predicting women's intentions to seek breast cancer screening in the hypothetical circumstance of detecting a breast lump. The socioeconomic variables examined in the study constituted predisposing and enabling factors. Health care utilization variables reflected reinforcing factors identified in prior studies. Breast cancer awareness variables that have been examined in prior research were selected to operationalize predisposing, reinforcing and perceived susceptibility factors. Finally, because of the dearth of knowledge about cultural effects on breast cancer screening, a cluster of newly created breast cancer cultural belief variables were selected as additional predisposing factors. Extensive details about the variables examined in this study are discussed in the next chapter.

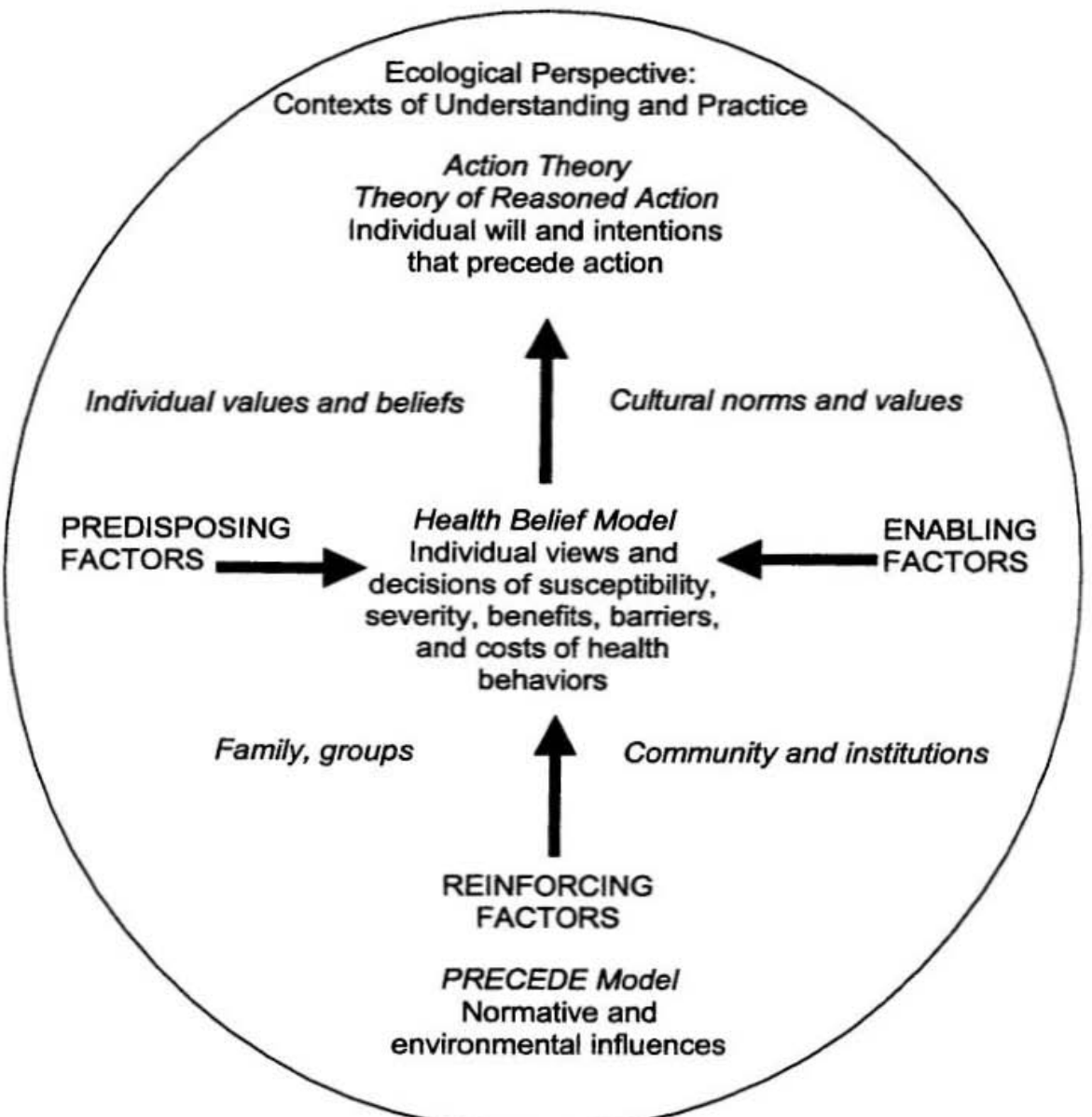

Figure 6. Conceptual Framework for the Study: The Interplay of the PRECEDE and Health Belief Models with Action Theories within the Ecological Perspective

CHAPTER 3

Methods

This study is a secondary analysis of baseline data from a four-year cancer-control project that is investigating the underlying psychological and cultural factors that contribute to the lack of breast cancer screening White and African American women in rural, eastern North Carolina. Titled "Culturally Based Intervention for Breast Cancer in Rural African Americans," the project was funded by the U.S. Army Material and Research Command and is currently based at the East Carolina University (ECU) in Greenville, North Carolina (Lannin et al., 1996). Since no other analysis of the ECU baseline dataset has been conducted, this study was non-duplicative. In fact, this original analysis represents a new area of research concerning socioeconomic, breast health care utilization, breast cancer awareness, and breast cancer cultural belief factors that impact the breast cancer screening intentions of asymptomatic, rural women, with specific attention to age and racial differences. The broad age range of respondents (18 to 99 years) and the oversampling of African American women permitted identification of these differences when investigating predictive factors and outcome variables in a five-stage, multi-variate logistic regression model.

The purpose of this chapter is to describe the components and procedures used to address the aims of this study as identified in Chapter 1. This chapter includes: the overview of the research questions, a discussion of the study design, a description of the setting, sampling methodology, measurement of the

variables, and an outline of the steps of the data analysis. This chapter ends with a profile of the socioeconomic characteristics of the study sample.

Research Questions

As described in Chapter 1, the overall aims of this exploratory and descriptive study were three-fold: (1) to establish whether, in the hypothetical circumstance of detecting a breast lump, behavioral intentions varied by race and age among asymptomatic women living in a rural region; (2) to construct viable measures of cultural beliefs about breast cancer and its treatment; and (3) to investigate whether racial and age differences in intentions of this population are associated with other socioeconomic, breast health care utilization, breast cancer awareness, and breast cancer cultural belief factors. The key research questions that were derived from these aims included:

1. Do the psychometric properties of the composite measures of women's cultural beliefs about breast cancer and its treatment support their use in bivariate and multivariate analysis for asymptomatic women living in rural eastern North Carolina?

2. When controlling for age and race, do other socioeconomic characteristics (i.e., education, insurance, income) have an effect on behavioral intentions in the hypothetical circumstance of detecting a breast lump?

3. Do breast health care utilization factors (i.e., physician discussion about breast cancer risk or mammography, having had a prior clinical breast examination or mammogram) have an effect on behavioral intentions when controlling for age, race, and other socioeconomic characteristics?

4. Do breast cancer awareness factors (i.e., breast cancer knowledge, breast cancer risk knowledge, breast cancer worry, exposure to breast cancer) have an effect on behavioral intentions when controlling for age, race, other socioeconomic characteristics, and breast health care utilization factors?

5. Do cultural beliefs about breast cancer and its treatment (i.e., air causes cancer to spread, existing conditions and treatments do not cause cancer, God alone cures cancer, God and doctors cure cancer, doctors alone cure cancer) have an effect on behavioral intentions when controlling for age, race, other socioeconomic characteristics, breast health care utilization, and breast cancer awareness factors?

6. With respect to behavioral intentions if a breast lump were found, are there patterns of significant differences in age, race, other socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer among asymptomatic women in rural eastern North Carolina?

Study Design

This study was designed to be exploratory and descriptive. Limited research exists that explores the psychosocial factors, and particularly the cultural beliefs, that influence the intentions of asymptomatic rural women to seek breast cancer screening, how these factors interrelate, and whether these factors can account for racial and age differences in screening. There is also a dearth of quantitative instruments that contain comprehensive measures of the cultural beliefs about breast cancer of asymptomatic women or that address their screening intentions. The exploratory and descriptive approach was selected because broadly speaking, it emphasizes preliminary examinations of associations between independent and dependent variables, such as the association of cultural beliefs with behavioral intentions. In addition, this study design accommodates testing of newly-created measurement approaches such as those used to identify cultural beliefs about breast cancer and its treatment (Neuman, 1997).

As shown in Table 1, this study examined a total of 7 socioeconomic variables, 8 general health and breast health care utilization variables, 38 items that reflected breast cancer awareness, and 31 items about religious practices and breast cancer cultural belief variables. This large pool of items was reduced to 18 variables that were arrayed within the four predictive factors, presented in Figure 1 in Chapter 1, that were incorporated into the multivariate model conducted in the last step of the analysis.

There were three reasons for the reduction of the larger pool of items into the smaller set of variables. First, a review of the findings from the empirical literature suggested that certain variables within a category would be more

Table 1

Study Variables

Total Pool of Study Variables	Variables in the Multistage, Multivariate Predictive Model of Behavioral Intentions
Race	*Race*
African American	African American
White	White
Age	*Age*
18 - 39 years	18 - 39 years
40 - 49 years	40 - 49 years
50 - 64 years	50 - 64 years
65 years and older	65 years and older
Other Socioeconomic Characteristics	*Other Socioeconomic Characteristics*
Education	Education
Insurance	Insurance
Income	Income
Marital status	
Employment status	
General Health Care Utilization	
Proclivity for seeking medical care	
Last time doctor seen	
Unable to see doctor because of cost	
Breast Health Care Utilization	*Breast Health Care Utilization*
Physician discussion about breast cancer risk	Physician discussion about breast cancer risk
Physician discussion about mammography	Physician discussion about mammography
Had clinical breast examination	Had clinical breast examination
Had mammogram	Had mammogram
Reason for last mammogram	
Breast Cancer Awareness	*Breast Cancer Awareness*
Breast cancer knowledge (17 items - See Table 6)	Breast cancer knowledge (summed score)
Breast cancer risk knowledge (13 items - See Table 7)	Breast cancer risk knowledge (summed score)
Perception of overall breast cancer risk Perception of lifetime risk Perception of comparative risk Worry about getting breast cancer	Breast cancer worry (summed score)
Breast cancer exposure Being told one has a breast lump Having had a biopsy Knowing someone with breast cancer Having a family history of breast cancer	Breast cancer exposure (summed score)
Religious Practices	
Church attendance	
Level of religiosity	
Reliance on religion	
Breast Cancer Cultural Beliefs	*Breast Cancer Cultural Beliefs*
Belief that God alone cures cancer	Belief that God alone cures cancer
Belief that God and doctors cure cancer	Belief that God and doctors cure cancer
Belief that doctors alone cure cancer	Belief that doctors alone cure cancer
Folk and religious views about breast cancer and its treatment (25 items - See Table 9)	Air spreads cancer (factor 1) Other conditions/treatments do not cause cancer (factor 2)

salient to the prediction of screening intentions. For example, within the category of socioeconomic characteristics, income and education have been demonstrated to be more salient predictors of behaviors than marital and employment status. Second, several items representing similar constructs were pooled together to form logical composite variables. For example, the correct responses for all of the items that measured breast cancer knowledge were summed to produce an overall score for each respondent. Third, the sample size requirements for the multivariate logistic regression analysis that constituted the last step of the study analysis placed constraints on the number of predictor variables that could be included. Although not used in the multivariate predictive model, analysis of the other variables in the larger pool was nevertheless useful in the descriptive analysis of the study population profile and in providing context for the interpretation of the multivariate findings.

As shown in Table 1, the final 18 predictor variables reflected both single-item and composite-item constructs. These variables were grouped and added incrementally into the five-stage, multivariate logistic regression model. The first stage established the baseline of the model; that is, the focus on racial and age differences. Hence, the two variables in Stage 1 were:

- age
- race

Because little research exists that establishes the salient factors that predict women's breast cancer screening intentions, variables added to each subsequent stage of the model were selected on the basis of the strength of their relative influence on screening behaviors as found in prior studies and their relevance within the conceptual framework of the study. Thus, Stage 2 variables

encompassed other socioeconomic characteristics, apart from age and race, known to be strongly predictive predisposing and enabling factors on screening behavior. These variables included:

- education
- income
- insurance

Stage 3 encompassed breast health care utilization factors also reported to have a strong association with women's screening behaviors. These reinforcing factors are reflected in women's past experiences with their physicians and with breast cancer screening. Specifically, this group of variables included whether the woman had ever:

- discussed breast cancer with her physician;
- discussed mammography with her physician;
- had a clinical breast examination; and
- had a mammogram.

The fourth stage of independent variables added to the model focused on women's breast cancer awareness. Stage 4 variables encompassed composite measures of a woman's breast cancer knowledge, her perceptions of her susceptibility to breast cancer, and her exposure and worry about the disease. (Note: the construction of all composite variables are described later in this chapter, in the Measures section.) These predisposing and reinforcing factors have received somewhat less attention in the research literature, particularly among rural, older, and African American women. The Stage 4 variables included:

- knowledge about the disease of breast cancer;

- knowledge about breast cancer risks;
- exposure to breast cancer; and
- worry about breast cancer risk.

The fifth and final cluster of independent variables focused on an area that has received the least amount of attention in breast cancer screening research; that is, the predisposing cultural beliefs (religious and folk) about breast cancer and its treatment of women. These variables, which also included single-item and composite measures, were selected based on their saliency in prior studies by the ECU investigative team of women with late-stage breast disease (Lannin et al., 1998; Mathews et al., 1994) and because of their potential relationship to the health socialization of African American women (Ashing-Giwa, 1999). The breast cancer cultural beliefs added in Stage 5 including the beliefs that:

- air causes cancer to spread;
- pre-existing health conditions or treatments cause cancer;
- God alone will cure cancer;
- God and doctors cure cancer together; and
- doctors alone cure cancer.

With respect to the dependent variable, four behavioral intentions were derived from an analysis of eight answer choices posed to women. The survey item that explored women's behavioral intentions in the hypothetical circumstance of detecting a breast lump is described in detail later in this chapter. The hypothetical circumstance of "detecting a breast lump" was incorporated into the item construction, consistent with survey design practices that emphasize grounding the content of questions within the respondent's life experience, or a situation that can be related to (Rossi, Wright, & Anderson,

1983), and stimulating the respondent's interest level in the content of the question (Sheatsley, 1983). The four intentions that were selected as the dependent outcomes of the study represent intentions for different courses of action, including:

(1) see a doctor for a clinical breast examination;

(2) get a mammogram;

(3) watch the lump for changes; and

(4) pray.

The effects of the predictor variables on these four intentions were measured in four separate analyses. As laid out above, a key interest in this study was the exploration of the impact of age and racial differences on rural women's behavioral intentions. As described below, the capacity to make these comparisons was made possible by the setting and sampling methodology of the ECU study.

Setting and Sampling Methodology

The ECU study employs a quasi-experimental design that includes community-based and provider-specific educational interventions that have been implemented in Pitt County where the ECU campus is located. Nearby Wilson County serves as the comparison. These two counties were chosen because key sociodemographic characteristics for the study are similar in each county (i.e., population composition and income levels). According to 1990 data from the North Carolina State Center for Health Statistics, both counties are also typical of many rural areas in the southeastern United States: the largest community in each county has about 50,000 residents; the population of the two

counties are about one-third African American (Pitt - 33%; Wilson - 37%); and each county has a high proportion of people living in poverty (Pitt - 22%; Wilson - 20%).

The sampling methodology used by the ECU team yielded a representative cross section of each county's population. The samples were selected in two stages using a methodology that will be summarized here but has been detailed in the literature by the investigators (Mitchell, 1995; Mitchell, Mathews, & Griffin, 1997).

First, a sampling frame (list of women eligible to be interviewed) was developed by sending trained house-to-house interviewers into randomly chosen census blocks within the county to identify women within the target age range (≥18 years). Then, census blocks containing women in the target age range (aged 18 years and older) were chosen and arrayed by number of women per block to ensure geographic variability. Next, the requisite number of census blocks was selected systematically with a random start. For example, when 30 blocks were needed, based upon the average number of women in each block and a total of 900 blocks in the county, the first block was selected randomly from the first 30 blocks and thereafter, each 30th block following the block that was initially chosen.

The number of blocks selected was determined using the 1990 census block data available at the time through the Institute for Research in the Social Sciences, University of North Carolina at Chapel Hill. Copies of maps showing the boundaries of the blocks were obtained from the state library in Raleigh. The house-to-house interviewers recorded information necessary to contact each

eligible woman and to obtain verbal consent to be interviewed. Of the women identified through the household census, 8% refused to participate in the study.

Following the development of the sampling frame, 500 women in each county were selected randomly from the list to be interviewed. The cohort size of 500 was derived from sample size and power considerations. These considerations were based on the hypothesis that following the intervention there would be a 10 to 20 percentage point change in the prevalence of those beliefs and attitudes thought to be associated with late stage presentation. A pre- to post-intervention change from 10 to 20 percent can be detected with random samples of 500 women per county, assuming a 2-tailed test at the 5 percent level with 80 percent power and a 20 percent loss in the cohort from baseline to the follow-up survey. As a contingency for respondent refusals and for having to eliminate women initially interviewed, but then found to be ineligible for the study, the population was over-sampled by about 10% or 50 women.

The sample cohort received a letter and a telephone call (if they had a telephone) from the investigative team informing them of their selection and of the identity of the interviewer who would be contacting them to arrange an interview. Of the women who had agreed to participate in the study during the census phase of the selection process, 7% refused to be interviewed. Refusals or those unable to be contacted were replaced randomly from the eligible women remaining in the sampling frame. A total of 1,046 African American and White women aged 18 years and older participated in the baseline interviews. Interviewers were trained to conduct the in-home interviews in an all-day training session. Interviewers and respondents were matched by race and county of residence.

For inclusion in the study reported here, women were asymptomatic of breast cancer and thus subject to nationally recommended breast cancer screening guidelines (American Cancer Society, 1999). Women with breast disease who were undergoing diagnostic workup or treatment would have been eliminated from the study population; however, no women in the cohort met this criteria. The sample population of 1,046 was reduced to 993 to eliminate the 24 women who were not White or African American and the 29 women who did not disclose their race. In order to meet the statistical requirements for the multi-stage logistic regression model used for the multivariate analysis of the dependent variables, those respondents with missing values for any of the four dependent variables (screening intentions) were also eliminated, further reducing the sample from 993 to 853 respondents.

Measures

Items analyzed for this study were taken from the 80-item survey instrument that was developed by the ECU investigative team. The team developed the survey items relying heavily upon in-depth qualitative interview data and quantitative data from administered surveys gathered from breast cancer patients, their confidants and a community-dwelling sample of asymptomatic women matched with patients by age and race. Additionally, the team used other commonly accepted sources for content development, including: prior surveys, the literature, and consultation with experts (Sheatsley, 1983).

Many of the questions on the survey instrument were taken from two instruments previously developed by the ECU investigative team and other instruments developed by other research collaborators conducting parallel

studies with similar populations in the same region. Collectively, these instruments addressed the following two sets of variables thought to affect late-stage presentation and screening: (1) psychosocial factors including cultural beliefs; and (2) breast cancer screening and symptom recognition behavior. The psychological, interpersonal, and cultural belief items were expanded from an instrument used by the ECU team in a prior study funded by the American Cancer Society, drawing from focus group interviews with women. Questions that addressed the frequency of breast cancer screening and breast cancer symptom recognition questions were taken primarily from the survey instruments used in the New Hanover/Pitt County study (Fletcher et al., 1993) and from the North Carolina Breast Cancer Screening Program (Earp et al., 1995) described in Chapter 2. (See Appendix B for the survey instrument used for this study.)

The total pool of survey items examined in this study arrayed into four groups: socioeconomic characteristics, general health and breast health care utilization variables, breast cancer awareness variables, and religious practices and breast cancer cultural belief variables. A detailed description of their measurement follows.

Socioeconomic Characteristics

A total of seven items were analyzed to provide descriptive information about the study sample. Six of the seven socioeconomic variables (i.e., race, marital status, education, income, employment status, and health insurance) were categorical measures. Originally collected and coded as a continuous variable, age was recoded into four groups to be consistent with the categories of recommended screening guidelines as outlined in Chapter 2; that is, clinical

breast examination for women aged 18-39 years; clinical breast examination and bi-annual mammography screening for women aged 40-49 years; clinical breast examination and annual mammography for women over the age of 50 years. In order to study cohort effects, the group of women aged 50 years and older were divided into 50 to 64 years and 65 years and older. There were two additional reasons why women aged 65 years and older were treated as a separate group: (1) this is the standard age for retirement and the age of eligibility to obtain Medicare; and (2) the literature suggests that this age group, as compared to younger women, is least likely to obtain mammography or clinical breast examination (American Cancer Society, 1999; Earp et al., 1995; Skinner et al., 1998). By creating a separate category for this at-risk group, pertinent age comparisons could be readily made and salient age effects could be more easily detected.

About one out of six respondents (16.6% or 142) either refused to indicate their household income level or said, "don't know". To recover this missing data, a median income value was imputed by analyzing income distribution by race. The median annual income of White women was between $25,000 and $49,999 and for African American women, between $8,000 and $11,999. All missing values for each group of women were adjusted to these respective values. Education, income and health insurance were retained as predictor variables and controls for the final analyses in the multi-stage logistic regression model; marital status and employment status were not included.

General Health and Breast Health Care Utilization Variables

A total of eight items were analyzed within this grouping. Of the three general health-related items, two were measured categorically (i.e., proclivity for seeking medical care, last time doctor seen) and the third, (i.e., unable to see doctor because of cost) was measured as a dichotomous (yes-no) response.

Three of the five breast health care utilization items were measured categorically (i.e., last clinical breast examination, last mammogram, reason for last mammogram). The remaining two items (i.e., talked with doctor about breast cancer risk, talked with doctor about mammography) were dichotomous (yes-no) measures. Five of these eight general health and breast health care utilization items were retained for the final analyses; "usual reason for seeing a doctor", "last time doctor seen", and "reason for last mammogram" were eliminated from the final multi-stage, multivariate logistic regression model.

Breast Cancer Awareness Variables

A total of 37 items were selected as indicators of breast cancer awareness. These, in turn, were distilled into composite measures to form four predictor variables (knowledge about breast cancer, knowledge of breast cancer risk, exposure to breast cancer, worry about breast cancer) for the multivariate model.

A total of 17 true-false items explored different aspects of women's knowledge about breast cancer. These items were recoded so that the correct answer, determined by conformity to the current literature, was set to the value "1", and incorrect, "don't know" and missing answers were recoded to the value

"0". Composite scores were then summed for each respondent such that a score of "17" indicated that the respondent answered all items correctly.

A total of 13 yes-no items constituted the measurement of women's knowledge about breast cancer risks. Again, correct responses conformed to the risks identified in the current literature that were derived from clinical experience or epidemiological study. These items were recoded such that the value "1" represented the correct answer and the value "0" was incorrect, uncertain or missing. Responses across the 13 items were summed to provide a composite measure; thus, a score of 13 would mean the respondent answered all items correctly.

The four breast cancer exposure items (i.e., being told one has a breast lump, having had a breast biopsy, knowing someone with breast cancer and having a family history) were measured categorically (yes, no, not sure/don't know). Family history was explored by asking women, "How many of your blood relatives have had breast cancer? How about your: mother, sister(s), daughter(s), grandmother(s), aunt(s), or cousin(s)?" Answer choices included yes, no, don't know, and if yes, the number who had had breast cancer. The answers were recoded such that the value "1" represented having any relative with breast cancer, and the value "0" represented all other responses.

A dichotomous, composite personal exposure score was constructed using the four items above in order to assess whether, rather than how widely, women had been exposed to breast cancer either through personal experience or through their social networks. Answers were recoded such that the value "1" represented an affirmative response to any type of exposure, and the value "0" was assigned for those respondents who had no exposure at all to breast cancer.

Three items were selected as indicators of perceived susceptibility or worry about breast cancer. Responses to the three items were collected using Likert response patterns. The respective questions were: "How likely do you think it is that you will get breast cancer in your lifetime? Do you think it is: very unlikely, somewhat unlikely, somewhat likely, very likely"; "Compared to most women your age, what do you think the chances are that you will get breast cancer some day? Much lower, somewhat lower, somewhat higher, much higher"; and "Overall, how worried are you that you might get breast cancer some day? Would you say that you are: not worried at all, somewhat worried, very worried." Worry about breast cancer risk was measured by adding the responses to the above three items such that scores ranged from a low of 3 to a high of 11.

Religious Practices and Breast Cancer Cultural Belief Variables

There were a total of 31 items selected as indicators of cultural practices and beliefs about breast cancer. Three categorical items were used to measure religiosity among respondents, including: (1) church attendance, ("Do you attend church: on a regular basis, occasionally, only for a special event or on holidays, you don't attend church?"); (2) level of religiosity, ("Do you consider yourself to be: deeply religious, somewhat religious, not at all religious, against religion?"); and (3) reliance on religion, ("During difficult times, do you rely on your religion: a great deal, somewhat, not very much, not at all?"). To obtain an overall measure of religiosity, the three items were summed to form an index with a range of possible scores from 3 to 13 with higher scores representing higher levels of religiosity. Given the high levels of religiosity among the women, and the

homogeneity found across age groups and race (M = 11.35, SD = 1.82), this variable was not included as a predictor variable in the final logistic regression analyses.

To explore their religious views about breast cancer treatment, women were asked to select the best answer to the question: "If I get breast cancer: (1) God alone would cure it without help from doctors; (2) God might work through doctors to cure it; (3) God would work through doctors to cure it; (4) Doctors would cure it with help from God; or (5) Doctors alone will cure it. " Because answer choices 2 through 4 are closely similar, these choices were condensed into one response. The resulting three responses became: "God alone will cure cancer", God and doctors will cure cancer", and "doctors alone will cure cancer". These responses were coded such that "1" represented "yes" and "0" meant that the woman did not select it as a response.

Responses to the 25 items measuring women's cultural beliefs about breast cancer were recorded on a five-point Likert scale. Answer choices ranged from "strongly agree (SA), agree somewhat (AS), not sure, disagree somewhat (DS) and strongly disagree (SD)". Principal components analysis, using 1.0 as prior communality estimates, was conducted to investigate the psychometric properties of these items. This method was selected because it identifies the underlying structure among related items and attempts to explain their inter-relationship through a smaller number of underlying constructs that, in turn, can be incorporated more feasibly into a regression model (Hatcher, 1994).

The principal axis method was used to extract factors from the 25 breast cancer belief items, and this was followed first by varimax and then, oblique rotation to identify construct subdimensions. According to Kim and Mueller

(1978), when identification of theoretically meaningful subdimensions is the primary concern, the choice of method of rotation (e.g., orthogonal or oblique) is of little concern. Consistent with Hatcher's (1994) suggestion for exploratory analyses, items with factor loadings equal to or greater than .40 were retained as viable indicators of a construct. Comparing the results of both rotations, the oblique rotation results provided the most clearly defined rotated factor solutions that met the .40 coefficient standard. Alpha coefficient estimates were also computed to determine the internal consistency of items that loaded on each factor.

Although three factors emerged with eigenvalues greater than one, only the first two factors displayed a scree test and conceptual unity with sufficient internal reliability. Therefore, the first two components were retained; these combined accounted for 42% of the total variance. The breast cancer cultural belief items and their corresponding factor loadings on these two factors are presented in Table 2.

Four items loaded on the first factor. This factor explained 29.0% of the variation of responses with an internal reliability of .78. All of these items shared a common theme that was labeled "air spreads cancer". The distribution of responses on these items suggests that the greater proportion of women were inclined to either agree somewhat or strongly agree with the cultural belief that air causes cancer to spread. This factor was incorporated into the final multi-stage, multivariate logistic regression model.

Five items grouped into a second factor that accounted for 13% of the variation among the items with an internal reliability of .69. Each of these items centered around a theme of the impact of other health conditions or treatments

Table 2

Principal Components Analysis of Cultural Beliefs about Breast Cancer

	Rotated Factor Loadings	
Breast Cancer Belief Item:	**Factor 1** **Air Spreads Cancer**	**Factor 2** **Other Conditions and Treatments Cause Cancer**
If a cancer is cut open in surgery, it will not grow faster	-.67	.05
If air gets to a cancer during surgery, the cancer will grow faster	-.82	-09
Air getting to a cancer during surgery will not make it spread	-.82	-.02
If air gets in the place where the doctor cuts, the cancer will kill you	-.63	-.23
A person with high blood is more likely to get cancer than a person with normal blood	.034	.70
Vaccinations weaken the immune system which can lead to cancer	.13	.71
Antibiotics weaken the immune system which can lead to cancer	.11	.63
People get cancer when they are tired and their resistance is down	-.14	.63
People with thin blood are more likely to get cancer	.13	.58
Eigenvalue	3.77	1.69
Alpha	0.78	0.69
Percent Variance Explained	29.0%	13.0%

on breast cancer, including: high blood (local colloquialism for high blood pressure), vaccinations, antibiotics, low resistance, and thin blood (local colloquialism for anemia). The distribution of responses on these items suggests that a large proportion of women were inclined to strongly or somewhat disagree that other conditions or treatments caused breast cancer. Hence, the second factor was labeled "conditions or treatments do not cause cancer", and it was also incorporated into the final multivariate model.

Dependent Variables: Behavioral Intentions

The measurement of the women's intentions following detection of a breast lump was also derived from a principal components analysis of the eight answer choices to a single item. In this item, women were asked: "If you found a lump or knot in your breast would you: (1) wait to see if it becomes painful, (2) get a mammogram, (3) see a doctor for a breast exam, (4) wait to see if the lump or knot gets bigger, (5) ask a close friend or relative for advice, (6) pray to God about it, (7) watch it every day for a while to see if it changes, or (8) leave it alone." Answer choices were scaled as "very likely - 1, somewhat likely - 2, (don't know - 3), and not likely - 4." To capture those women who reported unequivocal intentions to take a particular action, responses were recoded into dichotomous categories with "very likely" = "1" and all other responses = "0".

Analysis was conducted to determine women's intention preferences among the eight answer choices if they were to detect a breast lump. As seen on Figure 7, the clear majority of respondents reported that they would "not wait" but would intend to be proactive, including seeking medical attention. In order of the most frequently selected responses, women would "most likely": see a doctor

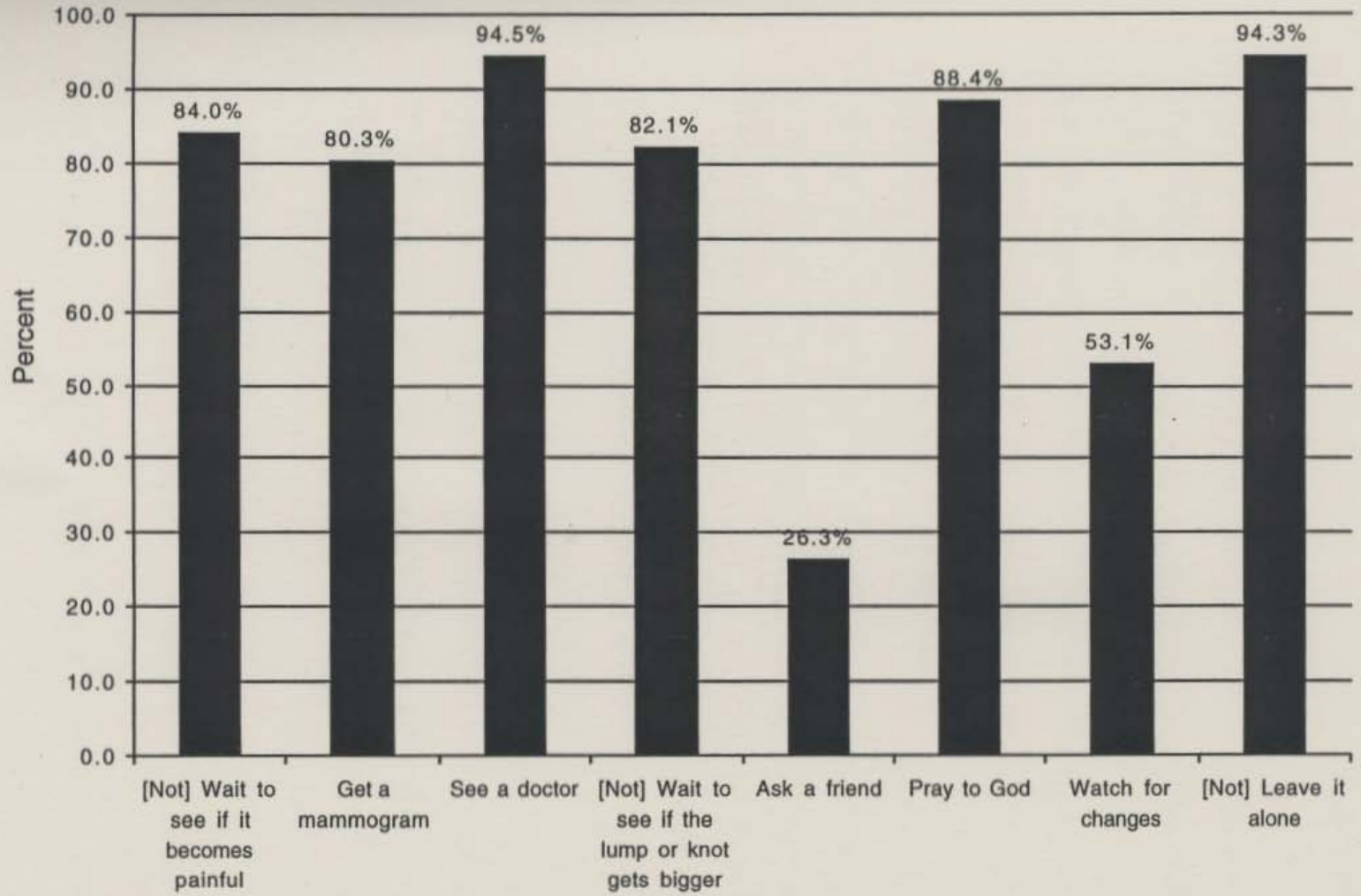

Figure 7. Women's Intentions if a Breast Lump were Detected: Percentage of Very Likely Responses (N = 853)

(94.5%; [not] leave it alone (94.3%); and pray to God (88.4%). "Not waiting for a change in the lump" also emerged as a strong theme: 84.0% of respondents would not wait to see if the lump became painful; and 82.1% would not wait until it became larger. Almost as many women (80.3%) would get a mammogram. At the same time, while most women reported that they would seek medical care, 53.1% also reported being very likely to "watch it every day for a while to see if it changes". "Asking a friend" was the intention chosen least by women (26.3%).

Women were then asked to select which of the eight breast lump actions would be their first action. Two choices were selected by the majority of women while the remaining responses were selected by 4% or less of the women. About half of the women (55.7% or 475) said that seeing a doctor would be the most important action and about one in four women (28.6% or 244) selected praying as most important.

Principal components factor analysis failed to produce rotated factor loadings which is not surprising, given the skewed distribution of the responses and the limited number of items tested. Nevertheless, the analysis of the frequencies of responses of the eight answer choices, coupled with women's indications of which action they would take first, suggested a trend toward four preferred intentions when a breast lump is found: (1) see a doctor; (2) get a mammogram; (3) watch the lump for changes; and (4) pray. Bivariate analysis revealed that the intentions to see a doctor and to get a mammogram were the most highly correlated ($r = .42$, $p = .01$), followed by the intentions to get a mammogram and to pray ($r = .23$, $p < .01$); the intentions to see a doctor and to pray ($r = .17$, $p < .01$); and to watch the lump for changes and to pray ($r = .17$, $p < .01$). Although the correlation between the intentions to see a doctor and to get

a mammogram may reflect an underlying intention "to seek medical care", these two variables were retained as separate outcomes because they were considered to represent markedly different breast health care preferences with potentially different predictive determinants. The sample's pervasive religiosity and strong preferences for waiting and watching in the presence of general and breast health problems justified selection of these two additional outcomes.

Steps of the Data Analysis

In order to achieve the aims of the study, the data analysis encompassed two phases: (1) a descriptive analysis of the socioeconomic, general health and breast health care utilization, breast cancer awareness, and religious practices and breast cancer cultural belief variables; and (2) a multivariate analysis of the socioeconomic, breast health care utilization, breast cancer awareness, and breast cancer cultural belief variables presented in Figure 1 in Chapter 1, examining their relationships as well as their impact on screening intentions. The two phases of the analysis entailed the following steps:

1. Descriptive statistics available through the Statistical Package for Social Sciences (SPSS) (Norusis, 1999) were used to describe the sample. The distribution of each independent variable was examined statistically by looking at central tendency and variability.
2. Principal components analysis was conducted to explore the psychometric properties of the breast cancer cultural belief items and the item pertaining to women's screening intentions if a breast lump was detected.
3. Bivariate analyses, including Chi-square, independent samples t-tests, and analysis of variance, were used for comparison of the distributions of

independent variables (e.g., socioeconomic characteristics, general health-related variables, breast health care utilization, breast cancer screening awareness, and religious practices and cultural beliefs about breast cancer, by age category and race.

4. A multivariate, multi-stage logistic regression analysis (Long, 1997) was used to measure the main effects of race, age, other socioeconomic characteristics, breast health care utilization variables, breast cancer awareness, and breast cancer cultural beliefs variables on the dependent variables. Adjustments were made in the measurement of some of the socioeconomic variables used in the model. Race was coded as a dummy variable with African American set as the reference category (equal to 1). Similarly, insurance was recoded into a dummy variable with having some form of public or private insurance as the reference category (equal to 1).

Assessment of variables in stages permits examination of their effects both singly and in combination as additional variables are added to the prediction equation. As more variables are added in each stage, *spurious effects* can be assessed (e.g., whether a control variable accounts for a previous relationship between two or more variables). For example, a variable may have a significant effect on one of the intentions in Stage 2 but that effect diminishes with the addition of a variable with a significant effect in Stage 3. The effect in Stage 2 would thus be said to be spurious. In a related fashion, a variable in Stage 2 that did not have a significant effect becomes significant in Stage 3, with the addition of additional variables to the prediction equation. In this case, the Stage 2

variable's effect is *conditional*, or contingent upon the additional variable(s). Interpretations of this kind are described in Lazarsfeld and Rosenberg (1955,1968).

Logistic regression analyses has been recommended for exploratory studies such as this one because this statistical method enables the examination of whether and how well a preliminary model fits the data. The analysis produces estimates of the likelihood or probability of actual category membership on the dependent variable (Long, 1997; Menard, 1995). As applied to this study, this statistical approach was selected to identify the characteristics of a woman that increase the odds of her reporting a particular breast cancer screening intention.

Model building in logistic regression analysis begins by establishing a tentative solution for the maximum likelihood of parameter estimates. Within each successive stage of entering variables, the SPSS statistical program revises and improves the model until the change in the likelihood function is negligible. The change in the measure of the maximum likelihood function is assessed for each successive iteration of the model in order to determine whether the goodness of fit is stronger than the previous stage, and whether this value is significant ($p < .05$).

It has been recommended that the standard criterion for statistical significance as noted above ($p < .05$) be relaxed and set to .10 or as high as .20 when in an exploratory study like this one, where one is less interested in testing an *a priori* hypothesis and more interested in assessing the effect of variables not measured before (Menard, 1995). Essentially, reduction in the significance level

provides allowance for some measurement error which is particularly important when investigating new variables of interest (e.g., cultural beliefs) on instruments that have not been widely validated. Relaxing the significance level also allows for the identification of plausible predictors and decreases the potential of failing to find relationships or trends between the independent variables and the dependent variables. Hence, a minimum significance level of $p < .10$ was set for the multivariate logistic regression analyses in order to detect potentially salient predictors of women's intentions to seek breast cancer screening.

Concern for adequacy of sample size required to compute the maximum likelihood estimates and resulting significant tests within the logistic regression approach warranted limiting the number of predictor variables to 18. Clear specifications of sample size requirements for logistic regressions analyses are not available in the literature, but rather, standards vary among statistical method theorists. Overall study samples of over 500 cases have been suggested as adequate (Long, 1997), but with respect to predictor variables, somewhere between 10 observations (Long, 1997; Norman & Streiner, 1998) to 50 observations (Wright, 1997) for each variable is recommended. In this study, the standard for a higher number of cases per predictor variable was adopted in an attempt to reduce potential measurement error, particularly in light of the large number of variables that were under review and the reduced significance level.

In order to test that the assumptions underlying the logistic regression model had been met, the standard protocol for diagnostics was conducted using tests for multicollinearity, leverage, influence, and Studentized residuals (Hosmer & Lemeshow, 1989; Long, 1997; Menard, 1995). Multicollinearity assesses the extent to which variability in an independent variable is explained by that of other

independent variables (Norusis, 1999). The circumstance where independent variables are highly correlated to each other brings into question whether they represent nonredundant, non-overlapping constructs. High multicollinearity suggests duplication in measurement of the same theoretically construct and thus confounds the logistic regression model. Ideally, variables should be highly correlated with the outcome variable, but not highly correlated with other predictor variables. High correlation values have been defined as over .80 (Licht, 1995) and as high as .90 (Tabachnik & Fidell, 1996).

Tests for multicollinearity of the independent variables, using the Pearson product moment correlation statistic, produced no correlations exceeding Licht's top range value of .80; significant correlations ranged between .01 to -.72. The variables "God alone will cure cancer" and "God and doctors will cure cancer" were the most strongly correlated but in an inverse relationship ($r = -.72$). The range of significant correlations between the independent and outcome variables was modest (see doctor: $r = .07$ to $.11$, $p < .01$; get mammogram: $r = .07$ to $.22$, $p < .01$; watch: $r = .07$ to $.17$, $p < .01$; pray: $r = .08$ to $.24$, $p < .01$).

Leverage, influence, and Studentized residuals are diagnostics that ascertain whether there is a systematic tendency of the logistic regression coefficients to be too high or too low, compared to true values, and whether the standard errors of the logistic regression coefficients are too high relative to the coefficient values (Menard, 1995). Those cases that are significantly outside the normal distribution of the responses are identified and the extent of their influence on the model is assessed.

The logistic regression diagnostics did not detect distribution irregularities caused by outliers in three of the four models; thus statistical significance was

confirmed for intentions to get a mammogram, to watch the breast lump, and to pray. There were 27 outliers detected in the model for seeing a doctor if a breast lump was found. Subsequent sensitivity testing of that model was conducted by removing the 27 extreme outliers to determine whether invalid statistical inferences about the significance of the logistic regression coefficients in the model had been made. However, eliminating the 27 cases produced near-comparable results to the original model of relevant predictor variables. Race (African American), knowledge of risk, and the beliefs that air causes cancer to spread and that other conditions and treatments can cause cancer remained in the model; however, having had a mammogram also emerged as a significant factor ($p < .05$), while age was no longer significant.

Sample Description

The socioeconomic characteristics of the 853 study subjects are summarized in Table 3. Ages ranged from 18 to 99 years with an average age of 49.8 years. The four age categories were not evenly distributed; the greatest proportion of women were in the youngest and oldest age groupings. There were 288 (33.8%) women aged 18-39 years; 161 (18.9%) women aged 40-49 years; 176 (20.6%) women aged 50-64 years and 228 (26.7%) women aged 65 or more years.

For the overall group, slightly more than half of the respondents (481 or 56.4%) were White. More respondents were married (450 or 52.8%) than single, and nearly three-quarters of the respondents (73.6% or 628) had earned at least a high school or graduate equivalent diploma (GED). Slightly more than half of the respondents (439 or 51.5%) reported that they were self-employed or

Table 3

Socioeconomic Characteristics of Study Subjects (N = 853)

Variable	M	%	n
*Age Range = 18 to 99 years	49.8 (s.d. = 18.46)		
Race			
White		56.7%	(481)
African American		43.6%	(372)
*†Marital status:			
Married		52.8%	(450)
Never Married		17.9%	(153)
Divorced, Separated, Widowed		29.3%	(250)
*†Education:			
Less Than High School Diploma or GED		26.4%	(225)
High School Diploma or GED		25.1%	(214)
Some Education After High School		23.9%	(204)
College Degree		18.4%	(157)
Graduate Degree		6.2%	(53)
*†Income:			
under $5,000		9.4%	(80)
Between $5,000 and $7,999		8.8%	(75)
Between $8,000 and $11,999		6.0%	(51)
Between $12,000 and $15,999		6.3%	(54)
Between $16,000 and $24,999		10.4%	(89)
Between $25,000 and $49,999		24.0%	(205)
Over $50,000		18.4%	(157)
Don't Know or Refused		16.6%	(142)
†Employment:[a]			
Full-time		36.0%	(306)
Part-time		11.5%	(98)
Self-employed		4.1%	(35)
Not employed		48.4%	(412)
Have Health Insurance:		48.5%	(414)
*†Medicare		26.1%	(223)
†VA or CHAMPUS		1.8%	(15)
*†Medicaid		14.0%	(119)
†HMO or Managed Care Plan		18.4%	(157)
Don't Know		1.3%	(11)
*†No Insurance		12.0%	(102)

*denotes significant differences by race
†denotes significant differences by age category
[a]N = 851

employed full- or part-time. The imputed median household income level was between $25,000 and $49,999; but nearly a third of the women (30.5% or 260) reported incomes of less than $16,000. The majority of women (86.8%) also reported having some form of government insurance (Medicaid, Medicare, VA, CHAMPUS) or private health insurance (Blue Cross Blue Shield, an HMO).

As indicated in Table 3, socioeconomic characteristics were analyzed for racial and age differences. Significant differences were found between the four age categories by race ($X^2 = 17.41$, $p < .000$). There were higher proportions of White women than African American women in the oldest age category. In the age category 50 to 64 years, there were 101 (57%) White women versus 75 (43%) African American women and, in the 65 years and above age category, there were 152 (67%) Whites versus 76 (33%) African Americans. Of the total group of 372 African American women, 59.4% were less than 50 years of age as compared to 47.4% of White women.

There were significant differences by race and age categories among the other socioeconomic variables. In contrast to their African American counterparts, White women were significantly more likely to be married ($X^2 = 114.11$, $p < .000$); have higher education levels ($X^2 = 135.45$, $p < .000$); and higher household incomes ($X^2 = 165.39$, $p < .000$). There were no significant differences by race in employment status. African American women were somewhat less likely than White women to have private insurance ($X^2 = 97.7$, $p < .000$), or to be on Medicare ($X^2 = 8.22$, $p < .01$); but they were more likely to be on Medicaid ($X^2 = 60.72$, $p < .000$) or to have no insurance at all ($X^2 = 13.89$, $p < .000$).

With respect to age, older women over the age of 40 years were significantly more likely than women aged 18 to 39 years to be married (X^2 = 396.88, $p < .000$), but they were also less educated (X^2 = 133.40, $p < .000$), had lower incomes (X^2 = 81.79, $p < .000$); and were less likely to be working full or part-time (X^2 = 280.33, $p < .000$). Although they were more likely to be employed, younger women aged 18 to 39 years and 40 to 49 years were significantly less likely than the other age groups to have private insurance (X^2 = 9.50, $p < .05$) and more likely to be uninsured (X^2 = 40.06, $p < .000$). However, if insured, they were more likely to be on Medicaid (X^2 = 21.21, $p < .000$), or to be a member of an HMO (X^2 = 50.22, $p < .000$). As expected, women 65 years and older were significantly more likely to be on Medicare (X^2 = 555.75 $p < .000$). Women 50 to 64 years comprised over half of the women (53.3%) on VA or CHAMPUS were (X^2 = 11.42, $p < .01$). There were no significant differences by age or race among women who did not know what insurance they had.

In summary, these data mirror the characteristics of women commonly found in the region (Altpeter et al., 1998; Lannin et al., 1998; Tropman et al., 1999). Hence, this study sample was considered to be representative of the population of rural North Carolina women who live in the eastern part of the state. The next chapter presents the findings from the bivariate analysis of the independent variables described in this chapter and also presents the findings from the multi-stage, multivariate predictive model designed to address the research questions.

CHAPTER 4

Results

In this chapter, the study findings are presented in two major sections: descriptive results and multivariate results. The descriptive results section presents a profile of the variables pertaining to general health and breast health care utilization, breast cancer awareness, and religious practices and cultural belief about breast cancer of the women in the study sample.

The second section of this chapter begins with a description of the profile of women's behavioral intentions if they were to find a breast lump. Using the conceptual schema in Figure 1 in Chapter 1 as the guiding framework and addressing the research questions presented at the beginning of Chapter 3, this chapter concludes with the findings of the multi-stage, multivariate logistic regression analysis of the effects of age, race, and other socioeconomic characteristics, breast health care utilization, breast cancer awareness, and breast cancer cultural beliefs on women's intentions in the hypothetical circumstance of detecting a breast lump. Chapter 5 will present the interpretation of the findings, the limitations of the study, and the implications of the findings for social work research, practice and education.

Descriptive Results: Profile of Study Sample

Briefly reviewing the socioeconomic characteristics of the study sample presented in Chapter 3, the women ranged in age from 18 to 99 years, with an average age of 49.8 years. The sample was approximately evenly divided by race. Older women and African American women in the sample had lower

education and lower incomes, while younger women were more likely to be employed, yet also more likely to be uninsured. Adding to the analysis of the socioeconomic characteristics of the study sample, this section of the chapter begins with a detailed description of the respondents' general health and breast health care profile. Findings are presented for the total sample followed by comparisons by race and age category.

General Health-related Variables

Although they were not selected as predictor variables in the multivariate model, several general health care-related variables were explored to provide a more detailed description of the respondents' health care use that, in turn, was used as context for the interpretation of the multivariate findings. These are featured in Table 4. The majority of women (82.0% or 699) reported having a doctor they thought of as their own. This finding suggests that access to, and use of, physician care are not barriers for most of the women in this population. However, having a medical doctor does not guarantee seeking medical care when a woman has a health problem nor does it reflect the quality of the care received. Despite the high percentage of women reporting some type of insurance coverage and having a regular medical doctor, well over half of the respondents (61.0% or 520) reported that when they are worried about their health or they think something is wrong, they would either: (1) wait rather than going to see the doctor; (2) make their decision to see a doctor

Table 4

General Health-Related Characteristics of Study Subjects (N = 853)

Variable	%	n
*†Have Regular Doctor[a]	82.0%	(699)
*Usual Reason for Going to Doctor		
as soon as something wrong	39.1%	(333)
wait a while and try taking care of problem	43.4%	(370)
wait a while and do nothing	10.0%	(85)
don't usually go to the doctor	1.8%	(15)
depends on problem	5.8%	(49)
*†Last Time Doctor Seen		
within the past six months	68.0%	(381)
within past year	22.0%	(123)
within past two years	6.8%	(38)
within past five years	3.2%	(18)
(did not report seeing doctor)	34.3%	(293)
†Unable to See Doctor Because of Cost	10.1%	(86)

*denotes significant differences by race
†denotes significant differences by age category
[a]N = 851

based on the problem; or (3) not go to the doctor at all. When asked, "When was the last time you went to see a doctor," a third of the women (34.3% or 293) had not seen a doctor in more than five years, but conversely, of the 560 women who had been to the doctor within the past five years, 68.1% (or 381) had been within the past six months. Apparently, the lack of regular visits to the doctor were not due to costs. Only a small group of women (10.1% or 86) reported that they did not go to the doctor or get medical care because they could not afford it. In summary, the majority of women in this sample did not report barriers to physician access, yet they also did not report regular use of medical care, nor a proclivity to visit physicians as soon as a problem was detected.

Significant differences by race were noted in two of these general health-related characteristics. African American women were somewhat less likely than White women to report a doctor of their own ($\underline{X}^2 = 21.77$, $\underline{p} < .000$). Yet, compared to Whites, African American women were significantly more likely to report going to the doctor when they were worried about their health while White women were more inclined to wait (respectively, 51.7% versus 48.3%, $\underline{X}^2 = 21.19$, $\underline{p} < .000$). There were no racial differences among women who had been to the doctor within the past year or among women reporting that they were unable to see the doctor because of cost.

Differences by age category were noted for three of the general health-related characteristics. Women aged 50 to 64 years and aged 65 years and older were significantly more likely than younger women to have a doctor of their own ($X^2 = 36.93$, $p < .000$). With respect to the usual reasons women would go to the doctor, there were no significant differences among age groups, but older women aged 65 years and older were more likely to have been to the doctor within the past six months ($X^2 = 30.74$, $p < .000$). A significant proportion of younger women aged 18 to 39 years (46.5%) were more likely to report that they did not go to the doctor because of cost ($X^2 = 16.00$, $p < .001$), which is consistent with the reported lower rates of insurance coverage within this age group.

Breast Health Care Utilization

Five items were examined under the category of breast health care utilization, including: last clinical breast examination, last mammogram, reason for last mammogram, physician discussion about breast cancer risk, and physician discussion about mammography. Summary findings from the analysis of these items are reported in Table 5.

Nearly all of the women (97.1%) reported having at least one clinical breast examination in their lifetime. About three out of four women (71.9% or 613) reported having had a clinical breast examination within the past year; an additional 11.0% (94) of women reported having had this examination within the past two years. Of the small group of women (25) who reported never having a clinical breast examination, about half (10) of

Table 5

Breast Cancer Screening Behaviors, Primary Reason for Mammography Utilization, and Discussion with Physician (N = 853)

Variable	%	n
*†Last clinical breast examination		
more than three years ago	10.0%	85
within past three years	4.2%	36
within past two years	11.0%	94
within the past year	71.9%	613
never	2.9%	25
*†Last mammogram		
never	39.7%	339
more than three years ago	6.3%	54
within past three years	3.0%	26
within past two years	11.4%	97
within the past year	39.5%	337
*†Main Reason for Last Mammogram:[a]		
your doctor or nurse recommended it	66.9%	343
thought you might have a breast problem	5.8%	30
worried about your chances of getting breast cancer	2.3%	12
it is recommended for women of your age to have one	19.1%	98
someone other than your doctor or nurse encouraged you	1.4%	7
saw a program on TV	.2%	1
heard a talk at church or club	—	—
younger relative encouraged me to do it	—	—
other	4.3%	22
*†Physician discussion about breast cancer risk	54.5%	465
*†Physician discussion about mammography	57.0%	486

*denotes significant differences by race
†denotes significant differences by age category
[a]N = 513

this group were aged 18 to 39 years and about half (12) were aged 65 years or older.

Significant differences by race and age category in reported receipt of clinical breast examination were found. White women were more likely than African Americans to report having had a clinical breast examination in the last year (85.3% versus 79.9%, $\underline{X}^2 = 10.48$, $\underline{p} < .05$). Younger women, aged 18 to 39 years, were more likely than their older counterparts to have had a clinical breast examination in the past year ($\underline{X}^2 = 23.15$, $\underline{p} < .05$), while older women aged 65 years and older were more likely to have had a clinical breast examination within the past three years, more than three years, or never.

Less than two-thirds of the total group of women in the sample (60.3% or 514) had ever had a mammogram. This finding was somewhat anticipated for the group as a whole because the guidelines for mammography screening of asymptomatic women recommend that routine screening not commence until age 40. Thus, not surprisingly, the majority (69.6% or 236) of the 339 respondents who had not had a mammogram were under the age of 40 years. Of women who reported having had a mammogram, only half, or 50.8% (434), had one within the last year or two years. Of this group, the majority were women at greatest risk for breast cancer: 35.5% (154) were women aged 65 years and older and 32.7% (142) were women aged 50 to 64 years.

While age was a significant factor in mammography utilization with younger women being least likely to have ever had a mammogram (X^2 = 360.69, $p < .000$), race was also a significant factor. African American women were proportionally more likely than their White counterparts to never have had a mammogram (54.0% versus 46.0%), and they were also proportionally less likely than Whites to have had a mammogram in the past one to two years (respectively, 41.4% versus 58.2%, $X^2 = 28.91$, $p < .000$).

Of the 513 women who responded to the question, "What was the main reason you decided to have your last mammogram?", the majority (66.9% or 343) reported a physician recommendation. About one out of five women (19.1% or 98) reported that they had a mammogram because it was generally recommended for women their age. While both racial groups reported physician recommendation as their primary reason for obtaining a mammogram, African American women were slightly more likely than White women to give this reason ($X^2 = 16.86$, $p < .01$). With respect to age differences, women aged 65 years and older were more likely than their younger counterparts to specify physician recommendation as their primary reason for getting a mammogram, while women aged 50 to 64 years were more likely than those in other age groups to cite the age-qualifying recommendation of the national cancer groups ($X^2 = 46.38$, $p < .000$).

More than half of the women reported that they had talked to their physician about their risk for breast cancer (54.5% or 465) or about mammography (57.0% or 486). Significant differences were noted by race and age category. Despite selecting physician recommendation as the primary reason for pursuing mammography, African American women were less likely than White women to have discussed either breast cancer risk ($X^2 = 8.31$, $p < .01$) or mammography with their physician ($X^2 = 54.52$, $p < .000$). The youngest and oldest age groups were significantly less likely to talk with their physicians about breast cancer risk ($X^2 = 26.80$, $p < .000$). Only about half of women aged 18 to 39 years and women aged 65 years and older had had such a discussion, compared to two-thirds of women in the 40 to 49 years and 50 to 64 years age categories. Expectedly, the majority (53.4%) of younger women aged 18 to 39 years had not discussed mammography with their physician, whereas the majority of women in all three other age groups reported having such a discussion (40 to 49 years - 64.0%; 50 to 64 years - 75%; 65 years and older - 69.7%; $X^2 = 115.30$, $p < .000$).

Breast Cancer Awareness

As reported in Chapter 3, a total of 37 items were grouped into four composite measures of breast cancer awareness. These four composite measures included: knowledge of breast cancer, knowledge of breast cancer risk, personal exposure to breast cancer, and worry about breast cancer. Summary findings of the analyses of these variables are presented in Tables 6, 7 and 8.

Table 6 shows the 17 true-false breast cancer knowledge items listed in order of the percentage of correct responses. Responses were judged to be correct or incorrect based upon the medical literature and verified by an oncological surgeon on the study team. Overall, women were knowledgeable about breast cancer. More than 80% of the respondents answered 10 out of the 17 items correctly and the mean score was 13.60 (SD = 2.17). The distribution of correct responses reveals that knowledge of cancer detection and, to a lesser extent, cancer consequences was widespread. Well over 90% of the women correctly identified different aspects of cancer detection, and over 70% correctly identified aspects of cancer treatment and treatment consequences.
The clear majority of respondents knew that cancer is not "catchable", but that breast cancer could be fatal if left untreated. Women knew that breast cancer could be cured if found early and that if a woman detects a lump, it is not too late to get treatment. Respondents were also knowledgeable about recommended screening guidelines for women over 50 years and the role of chemotherapy and mastectomy in breast cancer treatment. Conversely, most respondents (87.1%) did not know that "more than half of the patients treated by radiation or chemotherapy *never* experience nausea or vomiting" [emphasis added] (true), and about one-third (34.5%) did not know that "breast cancer is *not* the most common type of cancer in women" [emphasis added] (false), or that "if a breast cancer is operated on, it can be stopped from getting any bigger" (true).

Differences were found by race and age category in breast cancer knowledge mean scores. The mean scores of African American women were

Table 6

Number and Percentage of Correct Responses to Breast Cancer Knowledge Items (N = 853)

Item	n	%
A cancer in the breast that is not treated can lead to death (T)	830	97.3%
You can catch cancer from other people (F)	825	96.7%
If a woman finds a knot or lump, it is better to do nothing because by then it will be too late (F)	825	96.7%
A breast cancer can be cured if it is found early (T)	819	96.0%
If untreated, breast cancer will spread to other parts of the body (T)	814	95.4%
Women ages 50 and over should have a mammogram every year (T)	800	93.8%
As long as a knot or lump doesn't hurt, then it's not cancer (F)	779	91.3%
Chemotherapy is the use of drugs to kill cancerous cells (T)	743	87.1%
Mastectomy is removing the breast where cancer is found (T)	706	83.1%
The rate at which breast cancers grow is pretty much the same for everyone who gets breast cancer (F)	689	80.8%
Lumpectomy is a type of surgery for breast cancer in which the cancer itself but not the whole breast is removed (T)	656	76.9%
If a woman finds a knot or lump, the worst that can happen is surgery (F)	646	75.7%
About one out of every 8 women in the US will develop breast cancer at some point in her lifetime (T)	626	73.4%
Women who get breast cancer lose their breasts (F)	622	72.9%
Breast cancer is not the most common type of cancer in women (F)	550	64.5%
If a breast cancer is operated on, it can be stopped from getting any bigger (T)	550	64.5%
More than half of the patients treated by radiation or chemotherapy never experience nausea or vomiting (T)	103	12.1%

significantly lower than those for White women (12.63 versus 14.32; t = -11.81, df = 851, $p < .000$). One-way analysis of variance revealed significant knowledge differences among the four age groups (F = 18.98, $p < .000$). Women aged 65 years and older were less knowledgeable about breast cancer than women in all three of the younger age groups (M = 12.69 versus aged 18 to 39 years, M = 13.97; aged 40 to 49 years, M = 13.81; and aged 50 to 64 years, M = 13.80.)

The rank ordering of the correct responses to 13 yes-no items used to measure breast cancer risk factors are presented in Table 7. In contrast to their mean scores for knowledge of the disease of breast cancer, women knew comparatively little about breast cancer risks. The range of breast cancer risk scores was 3 to 12; the mean was 6.42 (SD = 1.69).

Women's knowledge, or lack of knowledge, about breast cancer risks arrayed into distinct subdimensions. The clear majority of women knew that a family or personal history of breast cancer are risk factors. They also knew that breast-feeding is not a risk. At least half of the women knew whether dietary practices (e.g., drinking caffeinated beverages and eating a high fat diet) contribute to breast cancer risk. However, large numbers of respondents incorrectly answered eight items that were related to women's developmental history (age at having children, age of onset of menarche, age of menopause) or the impact of hormone replacement therapy, smoking, or other breast conditions on breast cancer risk.

As in the case of the breast cancer knowledge scores, differences in knowledge of breast cancer risks were found by race and age category. Again, African American women had lower mean scores than White women (M = 5.93 versus M = 6.80; t = -7.86, df = 844.76, $p < .000$). There were significant but

Table 7

Number and Percentage of Correct Responses to Breast Cancer Risk Knowledge Items (N = 853)

Item	n	%
having a family history of breast cancer **(yes)**	804	94.3%
having had breast cancer before **(yes)**	783	91.8%
breast feeding your children **(no)**	767	89.9%
drinking more than two caffeinated beverages a day **(no)**	651	76.3%
eating a high fat diet **(yes)**	473	55.5%
being on hormone replacement therapy (HRT) after menopause **(yes)**	372	43.6%
getting a bump or bruise to the breast **(no)**	356	41.7%
having fibrocystic disease **(no)**	351	41.1%
heavy smoking **(no)**	269	31.5%
having your first child later in life, say after age 35 **(yes)**	191	22.4%
going through menopause late in life, after age 55 **(yes)**	171	20.0%
never having children **(yes)**	163	19.1%
getting your period early, say before age 12 **(yes)**	125	14.7%

small differences among women aged 65 years and older and the 18 to 39 years and 50 to 64 years age groups ($F = 6.88$, $p < .000$). Women aged 65 years scored slightly lower than their younger counterparts (aged 18-39 years - $M = 6.69$; aged 40-49 years - $M = 6.43$; and aged 50-64 years - $M = 6.52$; aged 65 years and older - $M = 6.03$.)

A woman's exposure to breast cancer was analyzed in four ways: (1) being told she had a breast lump; (2) having had a breast biopsy; (3) having a family member with breast cancer; and (4) knowing someone personally who had breast cancer. Results are presented in Table 8. About one in ten women (91 or 10.7%) responded affirmatively to the question, "Has any doctor ever told you that you had a lump or tumor in your breast?" There were no significant differences by age category, but consistent with national breast cancer incidence trends demonstrating higher incidence rates among White women, White women in this sample were significantly more likely than African Americans to report having been told they had a breast lump ($X^2 = 19.49$, $p. < .000$). An even smaller group (46 or 5.4%) reported that they had a biopsy; none of these cases turned out to be cancer. There were no significant differences by race, but again, consistent with national breast cancer incidence trends being highest in older women, women aged 65 years and older accounted for 43.5% of the 46 women who had had breast biopsies ($X^2 = 14.04$, $p < .01$).

With respect to family history, a total of 254 women (29.8%) had at least one family member who had breast cancer. There were no significant differences by age category, but White women were slightly more likely than African Americans to report having family members who had breast cancer ($X^2 = 4.32$, $p < .05$).

Table 8

Percentage of Women Reporting Breast Cancer Exposure and Worry
(N = 853)

Item	M	%	n
*†Personal Exposure to Breast Cancer		73.5%	627
*ever been told you had a lump or tumor in your breast[a]		10.7%	91
†ever had a breast biopsy[b]		5.4%	46
*have family history of breast cancer		29.8%	254
*†known someone with breast cancer		68.5%	584
*†Worry about Breast Cancer Risk range = 3 to 11	5.46 (s.d. = 1.76)		
*†likelihood of getting breast cancer in lifetime			
very unlikely		30.5%	260
somewhat unlikely		39.4%	336
somewhat likely		25.8%	220
very likely		4.3%	37
*†compared to same age women, likelihood of getting breast cancer			
much lower		29.3%	250
somewhat lower		51.3%	438
somewhat higher		17.6%	150
much higher		1.8%	15
†worry about getting breast cancer some day			
not at all worried		53.1%	453
somewhat worried		43.6%	372
very worried		3.3%	28

*denotes significant differences by race
†denotes significant differences by age category
[a]N = 852
[b]N = 851

The majority of women (68.5% or 584) answered affirmatively to the question, "Have you ever known someone personally who had breast cancer?" White women ($X^2 = 63.64$, $p < .000$) and women aged 65 years and older ($X^2 = 27.29$, $p < .000$) were significantly more likely than their racial or younger counterparts to know someone personally who had breast cancer.

A dichotomous, composite score was constructed using the four items above to measure the absence or presence of breast cancer exposure. Nearly three-quarters of women (73.5% or 627) reported exposure to breast cancer. Significant differences were noted by race and age category for this composite measure. White women ($X^2 = 55.67$, $p < .000$) and women aged 65 years and older ($X^2 = 22.81$, $p < .000$) were more likely to have been exposed to breast cancer than African American and younger women.

Views about personal susceptibility, or worries about breast cancer, were explored from three perspectives: (1) a woman's perception of the likelihood she will get breast cancer; (2) her assessment of her risk of getting breast cancer relative to other women her age; and (3) how worried she was about getting breast cancer some day. Responses were analyzed for the total group and by race and age. Results are presented also in Table 8.

The majority of women were not worried about their lifetime risk for getting breast cancer. A total of 69.9% of all women reported that it was somewhat or very unlikely that they would get breast cancer in their lifetimes. Small, but significant differences were found by race ($X^2 = 22.59$, $p < .000$), with a higher proportion of African American women than White women (71.7% versus 68.4%) believing that they were somewhat or very unlikely to get breast cancer. Significant differences by age category were also found ($X^2 = 46.34$, $p < .000$).

Despite the widely-published evidence of the increased risk that accompanies advancing age, a substantially higher proportion of women aged 65 years and older, compared to any of the other age groups, reported that they believed they were very unlikely or somewhat unlikely to get breast cancer in their lifetime (65 years and older - 82.9%; 18 to 39 years - 64.3%; 40 to 49 years - 61.4%; 50 to 64 years - 69.9%)

The majority of respondents (80.7%) perceived their chances of getting breast cancer some day to be somewhat or much lower than other women their age. Again, significant differences were found by race and age category and in the same pattern as above. African American women perceived their risk to be lower than did their White counterparts (83.3% versus 78.6%, $X^2 = 11.28$, $p < .01$) and a significantly higher proportion of women aged 65 years and older ($X^2 = 39.78$, $p < .000$) considered their chances of getting breast cancer to be lower than the other age groups (87.7% of women aged 65 years and older versus 77.4% of women aged 18 to 39 years; 74.5% of women aged 40 to 49 years; and 82.4% of women aged 50 to 64 years).

Slightly more than half of the respondents (53.1%) reported being "not worried at all" about getting breast cancer some day. There were no significant differences by race, but women aged 65 years and older again were significantly more likely than their younger counterparts to report not being worried at all ($X^2 = 52.65$, $p < .000$).

With a possible index score range of 3 to 11, the mean score for perceived susceptibility or worry about breast cancer was moderate ($M = 5.46$, $SD = 1.76$). Mean differences were noted by race and age category. The mean scores of White women were slightly higher than African American women (5.61 versus

5.27, t = -2.80, df 851, $p < .01$). One-way analysis of variance revealed that the mean scores of older women aged 65 and older (M = 4.76) were significantly lower than all of the other age groups (18 to 39 years - M = 5.89; 40 to 49 years- M = 5.72; 50 to 64 years - M = 5.43; F = 20.24, $p < .000$).

In summary, the rural women in this sample were generally knowledgeable about breast cancer, but less informed about breast cancer risks. The most at-risk group of women for breast cancer mortality, older women and African American women, were the least knowledgeable about the disease and its risks. Older and White women, as compared to their younger and African American counterparts, were more likely to be exposed to breast cancer, yet younger, rather than older women, were more likely to be worried about getting the disease.

Religious Practices and Cultural Beliefs about Breast Cancer

To provide a context for understanding the potential impact of religion and religious practices on women's cultural beliefs about breast cancer and breast cancer treatment, the general level of religiosity in the study population was examined. Three items were examined to explore women's religious practices and views: church attendance, self-rated religiosity, and reliance on religion. Overall, women reported strong religious practices: more than half of respondents (56.8% or 484) reported that they attended church regularly, nearly half of women (47.7% or 407) reported being very religious, and 65.7% (560) of women reported relying "a great deal" on religion during difficult times.

Of the 815 responses, the mean religiosity index score was 11.35 (range = 4 to 13, SD =1.82), indicating high levels of religiosity. More than one-third (38.5%) of the respondents scored at the top of the range while only 4.2% (34) of respondents had mean scores of 7 or less. Statistically significant but minimal effects by race and age category were noted in the religiosity index scores. The mean scores of African American women were slightly higher than their White counterparts (11.53 versus 11.23, $t = 2.34$, $df = 813$, $p < .05$) and older women aged 65 years and above scored somewhat higher ($F = 18.70$, $p < .000$) than all other age groups ($M = 12.01$ for women aged 65 years and older versus women aged 18 to 39 years - $M = 10.86$; women 40 to 49 years - $M = 11.12$; and women 50 to 64 years - $M = 11.49$).

One item captured women's views about religion and breast cancer treatment. Despite their high levels of religiosity, only 29 of 853 respondents selected "God alone would cure breast cancer without the help of doctors." Significant differences were noted by race. Nearly all (99%) of the White women, as opposed to 93.5% of the African American women, rejected the belief that God alone will cure breast cancer ($X^2 = 18.71$, $p < .000$). A total of 799 (93.7%) women selected the response, "God and doctors will cure cancer". There were no significant differences by race. Only 25 women selected the response "doctors alone would cure cancer." There were significant differences by race for this response ($X^2 = 10.47$, $p < .001$). Almost all of the African American women (99.2%) rejected this answer choice as compared to 95.4% of the White women.

There were no significant differences by age category for any of the three answer choices.

Table 9 presents the 25 items that explored women's cultural beliefs about breast cancer. There were only three items for which a strong consensus emerged among the women: 89.9% strongly disagreed with the statement that "someone can give you cancer by putting a root [or spell] on you"; 87.2% strongly disagreed that "if a person has cancer, there is no sense trying to do anything about it"; and 80.0% strongly disagreed that "it is better to die whole than to let a doctor cut on your body."

There were five more items for which there was consensus by at least one-half to two-thirds of the women: 69.7% strongly disagreed that "luck plays a big part in determining who gets cancer"; 61.0% strongly disagreed that "if you keep thinking you have cancer, you will probably get it"; 53.4% strongly disagreed that "negative feelings can cause cancer"; 52.5% strongly disagreed that vaccinations weaken the immune system which can lead to cancer; and 51.6% strongly disagreed that "herbal remedies are more effective than medicines against cancer."

As reported in Chapter 3, principal components analysis of the 25 breast cancer cultural belief items resulted in the emergence of two factors: Factor 1 - air spreads cancer and Factor 2 - health conditions or treatments do not cause cancer. As seen in Table 2, four breast cancer cultural belief items loaded onto

Table 9

Distribution of Breast Cancer Cultural Beliefs (N = 853)

Item	Frequency/ (Percentage)				
	SA	AS	Not Sure	DS	SD
1. If a cancer is cut open in surgery, it will not grow faster	144 (16.9%)	185 (21.7%)	56 (6.6%)	273 (32.0%)	195 (22.9%)
2. Negative feelings can cause cancer[a]	40 (4.7%)	102 (12.0%)	72 (8.5%)	175 (20.5%)	463 (54.3%)
3. If a person has cancer, there is no sense trying to do anything about it	7 (0.8%)	9 (1.1%)	7 (0.8%)	86 (10.1%)	744 (87.2%)
4. People who take good care of themselves usually don't get cancer[b]	41 (4.8%)	139 16.4%)	52 (6.1%)	262 (30.8%)	356 (41.9%)
5. A person with high blood is more likely to get cancer than a person with normal blood	32 (3.8%)	110 (12.9%)	165 (19.3%)	276 (32.4%)	270 (31.7%)
6. Vaccinations weaken the immune system which can lead to cancer	15 (1.8%)	60 (7.0%)	137 (16.1%)	193 (22.6%)	448 (52.5%)
7. Luck plays a big part in determining who gets cancer[a]	23 (2.7%)	103 (12.1%)	15 (1.8%)	117 (13.7%)	594 (69.7%)
8. It is better to die whole than to let a doctor cut on your body	33 (3.9%)	26 (3.0%)	20 (2.3%)	92 (10.8%)	682 (80.0%)
9. Chemotherapy and radiation work better than alternative therapies to treat cancer	336 (39.4%)	272 (31.9%)	88 (10.3%)	106 (12.4%)	51 (6.0%)
10. If air gets to a cancer during surgery, the cancer will not grow faster	203 (23.8%)	175 (20.5%)	62 (7.3%)	242 (28.4%)	171 (20.0%)

Table 9 (continued)

Distribution of Breast Cancer Cultural Beliefs (N = 853)

Item	Frequency/ (Percentage)				
	SA	AS	Not Sure	DS	SD
11. Cancer is not caused by dirty blood[c]	306 (36.0%)	133 (15.6%)	145 (17.0%)	114 (13.4%)	153 (18.0%)
12. Doctors and health professionals are the ones I would trust most to decide how to treat cancer[c]	595 (69.9%)	199 (23.4%)	9 (1.1%)	28 (3.3%)	20 (2.4%)
13. Antibiotics weaken the immune system which can lead to cancer	25 (2.9%)	77 (9.0%)	130 (15.2%)	233 (27.3%)	388 (45.5%)
14. Someone can give you cancer by putting a root on you	1 (0.1%)	9 (1.1%)	30 (3.5%)	46 (5.4%)	767 (89.9%)
15. People get cancer when they are tired and their resistance is down	23 (2.7%)	117 (13.7%)	75 (8.8%)	218 (25.6%)	420 (49.2%)
16. Visualizing you body attacking cancer cells will not help to cure the disease	212 (24.9%)	146 (17.1%)	109 (12.8%)	229 (26.8%)	157 (18.4%)
17. Air getting to a cancer during surgery will not make it spread	185 (21.7%)	119 (14.0%)	66 (7.7%)	263 (30.8%)	220 (25.8%)
18. If you keep thinking you have cancer, you will probably get it	33 (3.9%)	109 (12.8%)	22 (2.6%)	169 (19.8%)	520 (61.0%)
19. Herbal remedies are more effective than medicines against cancer[c]	21 (2.5%)	69 (8.1%)	94 (11.0%)	228 (26.8%)	439 (51.6%)
20. Doctors experiment with people by cutting on their cancers	105 (12.3%)	254 (29.8%)	22 2.6%)	174 (20.4%)	298 (34.9%)

Table 9 (continued)

Distribution of Breast Cancer Cultural Beliefs (N = 853)

Item	Frequency/ (Percentage)				
	SA	AS	Not Sure	DS	SD
21. People with thin blood are more likely to get cancer	15 (1.8%)	55 (6.4%)	175 (20.5%)	221 (25.9%)	387 (45.4%)
22. Nothing works to cure cancer so that it never comes back[a]	148 (17.4%)	191 (22.4%)	52 (6.1%)	172 (20.2%)	289 (33.9%)
23. Positive feelings can help cure cancer	253 (29.7%)	342 (40.1%)	63 (7.4%)	88 10.3%)	107 (12.5%)
24. No matter what I do, if I am going to get cancer, I will get it	242 (28.4%)	269 (31.5%)	13 (1.5%)	146 (17.1%)	183 (21.5%)
25. If air gets in the place where the doctor cuts, the cancer will not kill you	378 (44.3%)	191 (22.4%)	56 (6.6%)	159 (18.6%)	69 (8.1%)

[a]N = 852
[b]N = 850
[c]N = 851

each of the factors. In order to analyze whether significant differences existed by race and age category, the items that loaded on each factor were summed into a composite measure and categorical means were compared. With a composite score range of 4 to 20, the mean score for Factor 1 - air spreads cancer was 11.72 (SD = 4.54). The range for Factor 2 - health conditions or treatments do not cause cancer was 7 to 25 with a mean of 20.56 (SD = 3.49). Mean differences were noted by race and age for both factors. For Factor 1 - air spreads cancer, the mean scores of African American women were significantly higher than for White women (13.64 versus 10.23, $t = 11.71$, $df = 851$, $p < .000$). With respect to age category, the mean scores of younger women aged 18 to 39 years were significantly lower than the other three age groups ($F = 6.685$, $p < .000$). These findings indicate that African American and older women more strongly subscribe to the folk belief that air can cause cancer to grow or spread than their White and younger counterparts.

For Factor 2 - health conditions or treatments do not cause cancer, the composite mean score of White women was significantly higher than for African American women (21.12 versus 19.83, $t = -5.402$, $df = 730.245$, $p < .000$). Women aged 40 to 49 years were significantly more likely than women aged 65 years and older to have higher mean scores on this factor ($F = 4.847$, $p < .01$). This finding indicates that stated in the contrary, African American and older women are more likely to be in the minority of women who believe that health conditions or treatments can lead to cancer.

In summary, while women were generally knowledgeable about the disease of breast cancer, many of them reported the folk belief that air spreads cancer. Misinformed cultural beliefs about breast cancer appeared to be more prevalent among older African American women than other women.

Multivariate Results: Prediction of Women's Intentions with Detection of a Breast Lump

This section begins with an analysis by race and age of the dependent variable, women's behavioral intentions when faced with the hypothetical situation of finding a breast lump. As described in Chapter 3, for the item measuring women's intentions, respondents assessed the likelihood of pursuing eight different courses of action. A total of four intention preferences were identified from the pool of eight choices: (1) see a doctor; (2) get a mammogram; (3) watch the lump for changes; and (4) pray. The remainder of this section will answer 2 through 6 of the research questions outlined in Chapter 3. It will describe the results of the multivariate analyses conducted to evaluate the effects of the predictive factors on these four intentions.

Dependent Variable: Women's Intentions with a Detection of a Breast Lump

Small but significant differences by race and age category were found for intentions if a breast lump were found. African Americans were more likely than their White counterparts to watch the lump for changes ($X^2 = 21.81$, $p < .000$); more likely to pray about it ($X^2 = 26.48$, $p < .000$); and less likely to get a mammogram ($X^2 = 9.67$, $p < .02$). There were no significant differences by race for seeing a doctor.

Significant differences by age category were found for intentions if a breast lump were detected. Women aged 50 to 64 years and aged 65 years and older were significantly more likely than younger women to pray ($X^2 = 18.34$, $p < .03$). Women aged 50 to 64 years were more likely than the other age groups to get a mammogram ($X^2 = 44.21$, $p < .000$). There were no significant differences by age category in intentions to see a doctor or to watch the lump for changes.

Multivariate Results: Analysis of Factors that Predict Intentions if a Breast Lump is Detected

The results of the multi-stage prediction of the four different self-reported intentions if a breast lump were detected are featured in Tables 10 through 13. The stages of analysis are consistent with research questions 2 through 6 posed at the beginning of Chapter 3.

For each of the four intentions, the prediction began with the assessment of the main effects of women's race and age category. The oldest age category,

65 years and older, was set as the reference group; thus, significant findings were in comparison to this age group. In the second stage, the effects of race and age were controlled, and the main effects of additional socioeconomic characteristics, including education, insurance and income, were evaluated. The third stage controlled the variables introduced previously, and introduced the effects of breast health care utilization indicators into the prediction equation. These indicators included: physician discussion about breast cancer risk; physician discussion about mammography; having had a prior clinical breast examination; and having had a prior mammogram. In stage four, the variables introduced previously were controlled and multiple indicators of breast cancer awareness were added to the prediction, including knowledge about breast cancer, knowledge about breast cancer risks, breast cancer worry and breast cancer exposure. Finally, stage five controlled all of the previous measures and added cultural beliefs about breast cancer to the prediction, including the belief that air spreads cancer, the belief that other conditions or treatments do not cause cancer to spread, the belief that God alone will cure cancer and the belief that God and doctors will cure cancer. The belief that doctors alone will cure cancer was selected as the referent group because most women did not express this view; thus, significant findings were in comparison to this cultural belief.

The discussion below features, for each intention, the examination of the effects of variables, categories of variables, and each stage of the predictive model. With logistic regression analysis, the effects of variables are represented by odds ratios (OR), calculated as the antilog of the logistic coefficient (Kahn, 1983), with 90% confidence intervals (90% CI), appropriate in exploratory research.

Intention to See a Doctor

Odds ratios describing the effects of variables included as predictors in Table 10 show that in Stage 1, age but not race was significant for women's intention to see a doctor if a breast lump were detected. Women aged 40 to 49 years were less likely than women aged 65 years and older to express this intention (OR [odds ratio] = 0.44, 90% CI [confidence interval] = 0.22, 0.89).

In Stage 2 of the prediction, education, insurance, and income were added as additional socioeconomic controls. The deterring effect of the age category 40 to 49 years was slightly increased with the main effects of the additional variables (OR = 0.40, 90% CI = 0.18, 0.98). Having health insurance coverage emerged as a significant predictor (OR = 2.14, 90% CI = 1.14, 4.02). The lower odds ratio for age suggests that its deterring effect for women aged 40 to 49 years compared to women aged 65 years and older is conditional to having some form of health insurance.

The main effect of age persisted in Stage 3, which added the main effects of indicators of breast health care utilization. When the additional variables were added, the previous deterring effect of age category 40 to 49 years was further increased (OR = 0.36, 90% CI = 0.16, 0.83). The effect of health insurance coverage may have been spurious as it dropped out of the equation for this stage and the remainder of the stages of the model. No indicators of breast health care utilization emerged as significant predictors of the intention to see a doctor.

Stage 4 expanded the predictive model with the inclusion of the main effects of breast cancer awareness indicators on the intention to see a doctor. The odds ratios in the fourth column in Table 10 show that the significant main effect of age remained with women aged 40 to 49 years being less likely than

Table 10

Multistage Logistic Regression Analysis Predicting Intention to See Doctor if Breast Lump Detected (N = 853)

Variables	Stage 1 OR and 90% CI[a]	Stage 2 OR and 90% CI	Stage 3 OR and 90% CI	Stage 4 OR and 90% CI	Stage 5 OR and 90% CI
Race[b]	1.05 (0.63, 1.73)	1.59 (0.85, 2.95)	1.68 (0.90, 3.15)	1.74 (0.90, 3.36)	2.08 (1.04, 4.14)‡
Age[c]:					
18 - 39 years	0.68 (0.35, 1.34)	0.60 (0.28, 1.28)	0.89 (0.37, 2.14)	0.91 (0.37, 2.26)	0.96 (0.38, 2.44)
40 - 49 years	0.44 (0.22, 0.89)‡	0.40 (0.18, 0.98)‡	0.36 (0.16, 0.83)*	0.37 (0.16, 0.89)‡	0.38 (0.16, 0.92)‡
50 - 64 years	1.96 (0.73, 5.27)	1.79 (0.64, 5.00)	1.35 (0.47, 3.85)	1.26 (0.44, 3.67)	1.39 (0.48, 4.05)
Other Socioeconomic Characteristics					
Education		1.17 (0.93, 1.47)	1.14 (0.90, 1.43)	1.06 (0.83, 1.35)	0.98 (0.76, 1.26)
Insurance		2.14 (1.14, 4.02)*	1.58 (0.82, 3.05)	1.55 (0.80, 3.03)	1.50 (0.76, 2.95)
Income		1.09 (0.92, 1.29)	1.07 (0.91, 1.27)	1.08 (0.91,1.28)	1.07 (0.90, 1.28)
Breast Health Care Utilization					
Physician discussion about breast cancer risk			1.25 (0.68, 2.31)	1.31 (0.70, 2.46)	1.28 (0.68, 2.41)
Physician discussion about mammography			1.24 (0.63, 2.47)	1.31 (0.66, 2.61)	1.32 (0.65, 2.67)
Had clinical breast examination			2.54 (0.97, 6.63)	2.30 (0.87, 6.06)	2.09 (0.77, 5.67)
Had mammogram			1.97 (0.97, 3.98)	2.24 (1.07, 4.68)‡	2.30 (1.09, 4.86)‡
Breast Cancer Awareness					
Breast cancer knowledge				1.00 (0.87, 1.15)	0.94 (0.81, 1.09)
Breast cancer risk knowledge				1.26 (1.04, 1.51)*	1.23 (1.02, 1.50)‡
Breast cancer worry				0.95 (0.82, 1.11)	0.95 (0.82, 1.11)
Breast cancer exposure				0.44 (0.21, 0.92)‡	0.40 (0.19, 0.85)*
Breast Cancer Cultural Beliefs					
Air spreads cancer					0.91 (0.84, 0.98)*
Conditions and treatments do not cause cancer					1.09 (1.01, 1.18)‡
God alone cures cancer[d]					1.99 (0.40, 9.95)
God and doctors cure cancer					2.91 (0.91, 9.35)
Chi-square	9.16	18.468	28.538	36.608	48.809
significance	p < .10	p < .01	p < 01	p <.01	p < .001
degrees of freedom	4	7	11	15	19
Likelihood ratio		9.308	10.07	8.07	12.201
significance		p < .05	p < .05	p < .10	p < .025

[a]odds ratios and 90% confidence levels for odds ratios (in parentheses), ‡p < .10, * p < .05, ** p < .01, *** p < .001, **** p < .000, ns = not significant

[b]White = 0; African American = 1 [c]reference group = ≥ 65 years, [d]reference group = Doctors alone cure cancer

women aged 65 years and older to see a doctor (OR = 0.37, 90% CI = 0.16, 0.89). A breast health care indicator, having had a prior mammogram, emerged as a significant predictor (OR = 2.24, 1.07, 4.68), suggesting that its relevance to the intention to seeing a doctor is conditional upon breast cancer awareness. Of the breast cancer awareness indicators, knowledge about breast cancer risk somewhat increased the likelihood of seeing a doctor (OR = 1.26, 90% CI = 1.04, 1.51), but exposure to breast cancer was a deterrent (OR = 0.44, 90% CI = 0.21, 0.92). The fourth stage of the model suggests that women who had had a mammogram and were knowledgeable about breast cancer risk, but less exposed to breast cancer were more likely to report the intention to see a doctor.

Stage 5 added women's cultural beliefs about breast cancer to the prediction of their intention to see a doctor. Race emerged as a significant predictor, with African American women being twice as likely as Whites to see a doctor (OR = 2.08, 90% CI = 1.04, 4.14). The main effect of age category persisted essentially unchanged (OR = 0.38, 90% CI = 0.16, 0.92). The main effect of having had a prior mammogram (OR = 2.30, 90% CI = 1.09, 4.86) and of breast cancer exposure (OR = 0.40, 90% CI = 0.19, 0.85) slightly increased, while the main effect of knowledge of breast cancer risks (OR = 1.23, 90% CI = 1.02, 1.50) was slightly reduced. The salience of cultural beliefs on their intentions to see a doctor for African American women appears to have been conditional upon the main effects of two of those beliefs. The belief that air spreads cancer was a slight deterrent for seeing a doctor (OR = 0.91, 90% CI = 0.84, 0.98), while the belief that conditions and treatments do not cause cancer (OR = 1.09, 90% CI = 1.01, 1.18) slightly increased the likelihood of seeing a doctor. The odds ratios in Stage 5 suggest that African American not in the age

group of 40-49 years, who have had a prior mammogram, were knowledgeable about breast risk but have been less exposed to breast cancer, and do not believe that air causes cancer to spread or that conditions or treatments cause cancer, were more likely to report the intention that they would see a doctor.

Given the exploratory nature of this research, the findings shown in Table 10 suggest that age, race, other socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer have some impact on women's intention to see a doctor. The chi-square values show that the predictive effectiveness of the model improved incrementally with the addition of each stage of the predictor variables to the equation. The last column of odds ratios in Table 10, highlighting the effects of cultural beliefs about breast cancer, suggests that such beliefs are only slightly important for women's intentions to see a doctor.

Intention to Get a Mammogram

The odds ratios shown in Table 11 indicate that race and age were significant predictors for women's intention to get a mammogram if a breast lump were detected. African American women (OR = 1.55, 90% CI = 1.15, 2.09) and women aged 50 to 64 years (OR = 2.77, 90% CI 1.64, 4.65), as compared to White women and women aged 65 years and older, are more likely to express this intention. Conversely, women aged 18 to 39 years were less likely than women aged 65 years and older to report the intention to get a mammogram (OR = 0.70, 90% CI = 0.49, 0.99).

In Stage 2 of the prediction, the significant effects of race increased somewhat (OR = 1.68, 90% CI = 1.16, 2.43), and women in the age category 50

Table 11

Multistage Logistic Regression Analysis Predicting Intention to Get a Mammogram if Breast Lump Detected (N = 853)

Variables	Stage 1 OR and 90% CI[a]	Stage 2 OR and 90% CI	Stage 3 OR and 90% CI	Stage 4 OR and 90% CI	Stage 5 OR and 90% CI
Race[b]	1.55 (1.15, 2.09)*	1.68 (1.16, 2.43)*	1.91 (1.31, 2.79)**	2.10 (1.41, 3.11)**	2.08 (1.39, 3.10)**
Age[c]:					
18 - 39 years	0.70 (0.49, 0.99)‡	0.70 (0.47, 1.05)	1.63 (0.99, 2.67)	1.43 (0.85, 2.40)	1.40 (0.83, 2.36)
40 - 49 years	1.14 (0.72,1.72)	1.18 (0.73, 1.92)	1.30 (0.79, 2.15)	1.19 (0.71, 1.99)	1.21 (0.72, 2.03)
50 - 64 years	2.77 (1.64, 4.65)**	2.87 (1.67, 4.92)**	2.57 (1.48, 4.46)**	2.36 (1.35, 4.13)*	2.42 (1.38, 4.23)**
Other Socioeconomic Characteristics					
Education		1.07 (0.94, 1.22)	1.04 (0.91, 1.19)	1.01 (0.87, 1.16)	1.00 (0.87, 1.16)
Insurance		1.73 (1.12, 2.66)*	1.36 (0.87, 2.14)	1.38 (0.87, 2.16)	1.35 (0.86, 2.13)
Income		0.98 (0.89, 1.09)	0.96 (0.87, 1.06)	0.95 (0.85, 1.06)	0.95 (0.86, 1.06)
Breast Health Care Utilization					
Physician discussion about breast cancer risk			0.82 (0.58,1.16)	0.79 (0.56, 1.12)	0.79 (0.55, 1.12)
Physician discussion about mammography			1.43 (0.96, 2.13)	1.45 (0.97, 2.16)	1.40 (0.94, 2.09)
Had clinical breast examination			1.21 (0.58, 2.54)	1.15 (0.55, 2.43)	1.22 (0.57, 2.58)
Had mammogram			3.11 (2.03, 4.77)****	3.11 (2.00, 4.83)****	3.07 (1.97, 4.78)****
Breast Cancer Awareness					
Breast cancer knowledge				1.07 (0.98, 1.16)	1.06 (0.98, 1.16)
Breast cancer risk knowledge				1.02 (0.93, 1.13)	1.02 (0.92, 1.13)
Breast cancer worry				1.04 (0.95, 1.14)	1.04 (0.95, 1.15)
Breast cancer exposure				0.75 (0.46, 1.22)	0.76 (0.47, 1.23)
Breast Cancer Cultural Beliefs					
Air spreads cancer					0.98 (0.94, 1.02)
Conditions and treatments do not cause cancer					0.99 (0.95, 1.04)
God alone cures cancer[d]					2.38 (0.76, 7.46)
God and doctors cure cancer					2.06 (0.98, 4.34)
Chi-square	30.789	36.601	66.630	69.997	73.009
significance	p < .000	p < .000	p < .000	p <.000	p < .000
degrees of freedom	4	7	11	15	19
Likelihood ratio		5.812	30.029	3.37	3.01
significance		ns	p < .0005	ns	ns

[a]odds ratios and 90% confidence levels for odds ratios (in parentheses), ‡p < .10, * p < .05, ** p < .01, *** p < .001, **** p < .000, ns = not significant

[b]White = 0; African American = 1 [c]reference group = ≥ 65 years, [d]reference group = Doctors alone cure cancer

to 64 years were nearly three times more likely than their older counterparts to intend to get a mammogram (OR = 2.87, 90% CI = 1.67, 4.92). The main (and inverse) effect of those women aged 18 to 39 years, compared to women aged 65 years and older, disappeared, while having health insurance coverage emerged as a significant predictor (OR = 1.73, 90% CI = 1.12, 2.66). This finding suggests that when health insurance coverage is taken into account, differences between women in the youngest and oldest age groups in intentions to get a mammogram disappear.

The main effect of race increased in Stage 3 (OR = 1.91, 90% CI = 1.31, 2.79). When the breast health care utilization variables were added, the effect of the age category 50 to 64 years was reduced somewhat (OR = 2.57, 90% CI = 1.48, 4.46). The only indicator of breast health care utilization that emerged as a significant predictor of the intention to get a mammogram was whether a woman had a mammogram. Women who had had a prior mammogram were three times more likely to express the intention to get another mammogram (OR = 3.11, 90% CI = 2.03, 4.77). The effect of health insurance coverage diminished from the previous stage.

The odds ratios for Stage 4 in Table 11 show that with the inclusion of the main effects of breast cancer awareness, the main effects of race increased somewhat (OR = 2.10, 90% CI = 1.41, 3.11). The effect of being in the age group of 50 to 64 years as compared to 65 years of age or older was reduced somewhat (OR = 2.36, 90% CI = 1.35, 4.13), while having had a mammogram (OR = 3.11, 90% CI = 2.00, 4.83) remained constant as a predictor of the intention to get a mammogram. No breast cancer awareness indicators were statistically significant in this stage.

When cultural beliefs were added in Stage 5, the odds ratios for the significant predictors in the prior stages remained essentially the same. African American women (OR = 2.08, 90% CI = 1.39, 3.10), aged 50 to 64 years as compared to women aged 65 years and older (OR = 2.42, 90% CI = 1.38, 4.23), who had had a prior mammogram (OR = 3.07, 90% CI = 1.97, 4.78) were more likely to report the intention to get a mammogram. Breast cancer cultural beliefs did not appear to have a significant impact on this intention.

The findings shown in Table 11 suggests that age, race, other socioeconomic characteristics, and breast health care utilization indicators have impact on women's intentions to get a mammogram if a breast lump were detected. The chi-square values show that the predictive effectiveness of the model was improved only in Stage 3, highlighting the effect of having had a prior mammogram as the most important predictor for the intention of getting another mammogram when a breast abnormality is discovered.

Intention to Watch the Lump for Changes

The odds ratios describing the effects of variables included as predictors in Table 12 show that race, but not age, was significant for women's intention to watch for changes if a breast lump were detected. African American women were almost two times more likely than White women to express this intention (OR = 1.88, 90% CI = 1.49, 2.38).

In Stage 2 of the prediction, the significant effect of race remained, but was somewhat diminished with the main effects of the socioeconomic characteristics. Having health insurance coverage emerged as a significant predictor (OR = 1.48, 90% CI = 1.03, 2.13). The odds ratios in Stage 2 suggest

Table 12

Multistage Logistic Regression Analysis Predicting Intention to Watch if Breast Lump Detected (N = 853)

Variables	Stage 1 OR and 90% CI[a]	Stage 2 OR and 90% CI	Stage 3 OR and 90% CI	Stage 4 OR and 90% CI	Stage 5 OR and 90% CI
Race[b]	1.88 (1.49, 2.38)****	1.62 (1.22, 2.16)**	1.59 (1.19, 2.13)**	1.61 (1.18,2.18)*	1.46 (1.07,2.00)*
Age[c]:					
18 - 39 years	1.28 (0.95, 1.73)	1.54 (1.11, 2.16)*	1.23 (0.83, 1.84)	1.09 (0.72, 1.67)	1.10 (0.72, 1.69)
40 - 49 years	1.13 (0.80, 1.59)	1.39 (0.95, 2.03)	1.28 (0.87, 1.88)	1.17 (0.79, 1.74)	1.16 (0.77, 1.73)
50 - 64 years	1.36 (0.97, 1.90)	1.57 (1.10, 2.24)*	1.48 (1.03, 2.13)‡	1.46 (1.00, 2.11)‡	1.46 (1.01, 2.13)‡
Other Socioeconomic Characteristics					
Education		0.94 (0.84, 1.04)	0.93 (0.84, 1.03)	0.95 (0.85, 1.06)	0.98 (0.88, 1.10)
Insurance		1.48 (1.03, 2.13)‡	1.44 (0.99, 2.09)	1.45 (1.00, 2.12)	1.43 (0.98, 2.09)
Income		0.95 (0.88, 1.03)	0.96 (0.88, 1.04)	0.96 (0.88, 1.04)	0.97 (0.89, 1.05)
Breast Health Care Utilization					
Physician discussion about breast cancer risk			1.47 (1.11, 1.93)*	1.48 (1.12, 1.96)*	1.51 (1.14, 2.00)*
Physician discussion about mammography			0.93 (0.68, 1.27)	0.91 (0.67, 1.25)	0.87 (0.63, 1.19)
Had clinical breast examination			1.71 (0.83, 3.52)	1.81 (0.87, 3.75)	1.90 (0.91, 3.96)
Had mammogram			0.71 (0.51, 0.99)‡	0.66 (0.46, 0.93)*	0.63 (0.44, 0.89)*
Breast Cancer Awareness					
Breast cancer knowledge				0.96 (0.90, 1.03)	0.96 (0.90, 1.03)
Breast cancer risk knowledge				0.98 (0.91, 1.06)	1.00 (0.92, 1.08)
Breast cancer worry				1.11 (1.03, 1.19)*	1.10 (1.03, 1.19)*
Breast cancer exposure				1.43 (0.99, 2.08)	1.48 (1.02, 2.16)‡
Breast Cancer Cultural Beliefs					
Air spreads cancer					1.04 (1.00, 1.07)‡
Conditions and treatments do not cause cancer					1.01 (0.97, 1.05)
God alone cures cancer[d]					3.71 (1.26, 10.91)*
God and doctors cure cancer					4.10 (1.75, 9.61)**
Chi-square	24.467	29.538	38.442	48.361	61.635
significance	p < .000	p <.000	p <.000	p <.000	p <.000
degrees of freedom	4	7	11	15	19
Likelihood ratio		5.071	8.90	9.919	13.274
significance		ns	p < .10	p < .05	p < .01

[a]odds ratios and 90% confidence levels for odds ratios (in parentheses), ‡p < .10, * p < .05, ** p < .01, *** p < .001, **** p < .000, ns = not significant

[b]White = 0; African American = 1 [c]reference group = ≥ 65 years, [d]reference group = Doctors alone cure cancer

that, when health insurance coverage was taken into account, two of the age categories also emerged as significant predictors of the intention to watch. Specifically, women aged 18 to 39 years (OR 1.54. 90% CI = 1.11, 2.16) and aged 50 to 64 years (OR = 1.57, 90% CI = 1.10, 2.24) were more likely than women aged 65 and over to watch the lump for changes, suggesting that the effect of age on this intention was conditional upon having health insurance coverage.

The main effect of race persisted in Stage 3 (OR = 1.59, 90% CI = 1.19, 2.13). When the breast health care utilization variables were added, the effect of the age category 50 to 64 years was reduced (OR = 1.48, 90% CI = 1.03, 2.13), and the previous effects of the age category 18 to 39 years and health insurance coverage disappeared. Indicators of breast health care utilization that emerged as significant predictors of the intention to watch the lump for changes were physician discussion about breast cancer risk and whether women had a mammogram. These variables seem to have accounted for the effects of health insurance coverage and the age category of 18 to 39 years in the previous stage. The odds ratios indicate that women reporting that their physicians had discussed their risk for breast cancer with them were about one and one-half times (OR = 1.47, 90% CI = 1.11, 1.93) more likely than other women to watch a breast lump. Having had a mammogram emerged as a significant predictor, but it reduced the intention to watch a breast lump (OR = 0.71, 90% CI = 0.51, 0.99).

The odds ratios for Stage 4 in Table 12 show that with the inclusion of the main effects of breast cancer awareness, the significant main effects of race (OR = 1.61, 90% CI = 1.18, 2.18), age category 50 to 64 years (OR = 1.46, 90% CI = 1.00, 2.11), and physician discussion about breast cancer risk (OR = 1.48, 90%

CI = 1.12, 1.96) remained essentially constant from the prior stage. The main effect of having had a mammogram became an even stronger deterrent to the intention to watch the lump for changes (OR = 0.66, 90% CI = 0.46, 0.93). Of the breast cancer awareness indicators, women who expressed worry about breast cancer were slightly more likely to report the intention to watch the lump for changes (OR = 1.11, 90% CI = 1.03, 1.19).

Stage 5 added women's cultural beliefs about breast cancer to the prediction of their intention to watch a breast lump for changes. The odds ratios suggest that African American women (OR = 1.46, 90% CI = 1.07, 2.00), aged 50 to 64 years (OR = 1.46, 90% CI = 1.01, 2.13) as compared to women aged 65 years and older, whose physicians had discussed their risk of breast cancer with them (OR = 1.51, 90% CI = 1.14, 2.00) and had not had a mammogram (OR = 0.63, 90% CI = 0.44, 0.89) were more likely to report that they would watch the breast lump. Heightened worry appears to have played a slight role in the intention to watch the lump for changes (OR = 1.10, 90% CI = 1.03, 1.19) as did breast cancer exposure (OR = 1.48, 90% CI = 1.02, 2.16). The salience of breast cancer cultural beliefs for African American women for their health behavior was highlighted by the strong main effects of the belief that God alone will cure cancer (OR = 3.71, 90% CI = 1.26, 10.91) and the belief that God and doctors will cure cancer (OR = 4.10, 90% CI = 1.75, 9.61). The direction of the odds ratios indicated that women who adhere to these beliefs, and to a lesser extent, the belief that air causes cancer to spread (OR = 1.04, 90% CI = 1.00, 1.07), were significantly more likely than others to intend to watch the breast lump for changes.

The findings in Table 12 suggest that age, race, select socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer have some impact on women's intention to watch a breast lump for changes. The chi-square values show that the predictive effectiveness of the model improved incrementally with the addition of the Stage 3, 4 and 5 predictor variables to the equation. The last column of odds ratios in Table 12, highlighting the effects of cultural beliefs about breast cancer, suggests that such beliefs are important for women's intentions.

Intention to pray

The results for the intention to pray if a breast lump were detected are shown in Table 13. The odds ratios show that race and age were strong significant predictors for women's intention to pray. African American women were four times more likely than White women to express this intention (OR = 4.00, 90% CI = 2.59, 6.19). However, age was inversely related to the reported intention to pray. As compared to women aged 65 years and older, younger women 18 to 39 years (OR = 0.29, 90% CI = 0.17, 0.49) and women aged 40 to 49 years (OR = 0.30, 90% CI = 0.17, 0.55) reported being less likely to intend to pray.

In Stage 2 of the prediction, with the addition of socioeconomic predictors, the significant effect of race remained nearly constant (OR = 3.91, 90% CI = 2.34, 6.56), while the effects of both younger age categories (respectively, OR = 0.36, 90% CI = 0.20, 0.63 and OR = 0.35, 90% CI = 0.18, 0.66) were slightly decreased. Less education emerged as a significant predictor of prayer (OR = 0.77, 90% CI = 0.65, 0.91). The odds ratios in Stage 2 suggest that higher

Table 13

Multistage Logistic Regression Analysis Predicting Intention to Pray if Breast Lump Detected (N = 853)

Variables	Stage 1 OR and 90% CI[a]	Stage 2 OR and 90% CI	Stage 3 OR and 90% CI	Stage 4 OR and 90% CI	Stage 5 OR and 90% CI
Race[b]	4.00 (2.59, 6.19)****	3.91 (2.34, 6.56)****	4.45 (2.64, 7.50)****	4.45 (2.57, 7.70)****	4.03 (2.24, 7.23)***
Age[c]:					
18 - 39 years	0.29 (0.17, 0.49)***	0.36 (0.20, 0.63)**	0.52 (0.26, 1.04)	0.52 (0.25, 1.06)	0.45 (0.21, 0.97)‡
40 - 49 years	0.30 (0.17, 0.55)***	0.35 (0.18, 0.66)**	0.32 (0.17, 0.62)**	0.31 (0.16, 0.61)**	0.27 (0.13, 0.55)**
50 - 64 years	0.59 (0.31, 1.10)	0.62 (0.32, 1.19)	0.49 (0.25, 0.97)‡	0.48 (0.24, 0.95)‡	0.47 (0.23, 0.97)‡
Other Socioeconomic Characteristics					
Education		0.77 (0.65, 0.91)*	0.74 (0.63, 0.88)**	0.78 (0.65, 0.94)*	0.82 (0.67, 1.00)
Insurance		1.49 (0.86, 2.56)	1.12 (0.63, 1.97)	1.11 (0.62, 1.97)	0.97 (0.52, 1.80)
Income		1.12 (0.98, 1.27)	1.09 (0.96, 1.25)	1.09 (0.95, 1.24)	1.10 (0.96, 1.27)
Breast Health Care Utilization					
Physician discussion about breast cancer risk			1.85 (1.20, 2.87)*	1.78 (1.14, 2.77)*	2.04 (1.27, 3.30)*
Physician discussion about mammography			1.54 (0.93, 2.56)	1.60 (0.96, 2.66)	1.24 (0.72, 2.14)
Had clinical breast examination			0.99 (0.36, 2.73)	1.04 (0.37, 2.91)	1.38 (0.50, 3.85)
Had mammogram			1.43 (0.81, 2.51)	1.50 (0.83, 2.68)	1.34 (0.72, 2.49)
Breast Cancer Awareness					
Breast cancer knowledge				1.07 (0.95, 1.20)	1.07 (0.95, 1.21)
Breast cancer risk knowledge				0.84 (0.74, 0.94)*	0.84 (0.74, 0.96)*
Breast cancer worry				1.05 (0.94, 1.18)	1.05 (0.93, 1.18)
Breast cancer exposure				0.86 (0.50, 1.53)	0.39 (0.50, 1.73)
Breast Cancer Cultural Beliefs					
Air spreads cancer					1.01 (0.96, 1.07)
Conditions and treatments do not cause cancer					1.02 (0.96, 1.09)
God alone cures cancer[d]					22.26 (4.68, 105.84)**
God and doctors cure cancer					25.67 (10.34, 63.78)****
Chi-square	47.845	55.697	73.192	80.964	126.306
significance	p < .000	p <.000	p <.000	p <.000	p <.000
degrees of freedom	4	7	11	15	19
Likelihood ratio		7.85	17.495	7.772	45.342
significance		p < .05	p < .005	ns	p < .0005

[a]odds ratios and 90% confidence levels for odds ratios (in parentheses), ‡p < .10, * p < .05, ** p < .01, *** p < .001, **** p < .000, ns = not significant
[b]White = 0; African American = 1 [c]reference group = ≥ 65 years, [d]reference group = Doctors alone cure cancer

levels of education are a deterring influence on the intention to pray particularly among younger and White women.

The main effect of race increased in Stage 3 (OR = 4.45, 90% CI = 2.64, 7.50). When the breast health care utilization variables were added, the effect of the age category 40 to 49 years remained about the same (OR = 0.32, 90% CI = 0.17, 0.62), while the effect of the age category 50 to 64 years emerged (OR = 0.49, 90% CI = 0.25, 0.97). The previous effect of the age category 18 to 39 years disappeared suggesting that differences between this age group and their older counterparts in the previous stage were spurious, and accounted for by physician discussion about breast cancer risk. Education remained as a deterring factor to prayer (OR = 0.74, 90% CI = 0.63, 0.88). The sole indicator of breast health care utilization that emerged as a significant predictor of the intention to pray was physician discussion about breast cancer risk. The odds ratio indicates that women who reported that their physicians had discussed their risk for breast cancer were nearly two times more likely than other women to pray (OR = 1.85, 90% CI = 1.20, 1.87) than women who had not discussed breast cancer risks with their physicians.

The odds ratios for Stage 4 in Table 13 show that with the inclusion of the main effects of breast cancer awareness, the significant main effects of race (OR = 4.45, 90% CI = 2.57, 7.70), age category (respectively, OR = 0.31, 90% CI = 0.16, 0.61 and OR = 0.48, 90% CI = 0.24, 0.95), and education (OR = 0.78, 90% CI = 0.65, 0.94) remained essentially the same as in the prior stage while the effect of physician discussion about breast cancer risk was slightly reduced (OR = 1.78, 90% CI = 1.14, 2.77) . Of the breast cancer awareness indicators,

women who were knowledgeable about breast cancer risk were somewhat less likely to report the intention to pray (OR = 0.84, 90% CI = 0.74, 0.94).

Stage 5 added women's cultural beliefs about breast cancer to the prediction of their intention to pray. The effect of race was somewhat reduced but remained as a strong predictor of prayer (OR = 4.03, 90% CI = 2.24, 7.23). The effect of being aged 18 to 39 years of age re-emerged as a significant, but inverse predictor of the intention to pray, as compared to women aged 65 years and older (OR = 0.45, 90% 0.21, 0.97) while the other two age categories also remained as significant deterring predictors (respectively, OR = 0.27, 90% CI = 0.13, 0.55 and OR = 0.47, 90% CI = 0.23, 0.97). The effect of physician discussion about breast cancer risk slightly increased to two-fold (OR = 2.04, 90% CI = 1.27, 3.30), while knowledge of breast cancer risk appeared to remain unchanged as a slight deterrent to prayer (OR = 0.84, 90% CI = 0.74, 0.96). The expected, but nevertheless stunning, salience of breast cancer cultural beliefs for African American women on their intention to pray was highlighted by the main effects of the belief that God alone will cure cancer (OR = 22.26, 90% CI = 4.68, 105.84) and the belief that God and doctors will cure cancer (OR = 25.67, 90% CI = 10.34, 63.78).

The findings shown in Table 13 suggest that age, race, select socioeconomic characteristics, breast health care utilization, breast cancer awareness and, most definitively, cultural beliefs about breast cancer have impact on women's intention to pray if a breast lump were detected. The chi-square values show that the predictive effectiveness of the model improved incrementally with the addition of the Stage 2, 3, and 5 predictor variables to the equation. The last column of odds ratios in Table 12, clearly accentuates that

cultural beliefs about breast cancer are highly predictive factors in women's intentions to pray.

Table 14 presents the summary findings of the main effects of race, age, other socioeconomic characteristics, breast health care utilization, breast cancer awareness and breast cancer cultural beliefs on women's behavioral intentions if they detected a breast lump. The shaded boxes contain the stage of the model with the largest chi-square values and strongest significance levels. For the intentions to see a doctor, watch the lump for changes, and to pray, the fifth stage was the strongest predictive stage. For the intention to get a mammogram, the third stage was the strongest stage of the predictive model. The next chapter discusses the interpretation of these findings, the study limitations, and the implications of the study for ongoing social work research, public health social work practice, and for education of social workers interested in addressing the health issues of rural and aging populations, as well as the equities in health care that exist for underserved and at-risk populations.

Table 14

Multivariate Logistic Regression Analysis: Main Effects of Race, Age, Socioeconomic Characteristics, Breast Health Care Utilization, Breast Cancer Awareness, and Breast Cancer Cultural Beliefs on Behavioral Intentions*

Stage and Variables Added	Intention to See a Doctor	Intention to Get a Mammogram	Intention to Watch The Lump for Changes	Intention to Pray
1 - Race and Age • race • age	o age (40 - 49 yrs)	o African American • age (18-39 yrs, 50-64 yrs)	• African American	• African American • age (18-39 yrs, 40-49 yrs)
2 - Socioeconomic Characteristics • education • health insurance • income	• age (40 - 49 yrs) • health insurance	• African American • age (50-64 yrs) • health insurance	• African American • age (18-39 yrs, 50-64 yrs) • health insurance	• African American • age (18-39 yrs, 40-49 yrs) • education
3 - Breast Health Care Utilization • physician discussion about breast cancer risk • physician discussion about mammography • had prior CBE • had prior mammogram	• age (40-49 yrs)	• African American • age (50-64 yrs) • had prior mammogram	• African American • age (50-64 yrs) • physician discussion about breast cancer risk • had prior mammogram	• African American • age (40-49 yrs, 50-64 yrs) • education • physician discussion about breast cancer risk
• - Breast Cancer Awareness • b.c. knowledge • b.c. risk knowledge • breast cancer worry • breast cancer exposure	• age (40 - 49 yrs) • had mammogram • breast cancer risk knowledge • breast cancer exposure	• African American • age (50-64 yrs) • had prior mammogram	• African American • age (50-64 yrs) • physician discussion about breast cancer risk • had prior mammogram • breast cancer worry	• African American • age (40-49 yrs, 50-64 yrs) • education • physician discussion about breast cancer risk • breast cancer risk knowledge
5 - Breast Cancer Cultural Beliefs • belief that air spreads cancer • belief that conditions/treatments do not • belief that God alone cures cancer • belief that God and doctors cure cancer	• African American • age (40-49 years) • had prior mammogram • breast cancer risk knowledge • breast cancer exposure • belief that air spreads cancer • belief that conditions/treatments do not cause cancer	• African American • age (50-64 yrs) • had prior mammogram	• African American • age (50-64 yrs) • physician discussion about breast cancer risk • had prior mammogram • breast cancer worry • breast cancer exposure • belief that air spreads cancer • belief that God alone will cure cancer • belief that God and doctors will cure cancer	• African American • age (18-39 yrs, 40-49 yrs, 50-64 yrs) • physician discussion about breast cancer risk • breast cancer risk knowledge • belief that God alone will cure cancer • belief that God and doctors will cure cancer

* predictive effectiveness of the model strongest for the stage in the shaded box

CHAPTER 5

Discussion, Study Limitations, and Implications

As noted in Chapter 1, this study was motivated by the desire to add to the understanding of the factors underlying age and racial differences in breast cancer screening as they exist in a high-risk population. Further, this study's research design was conceptualized to provide insights into a *de novo* area of research in breast cancer screening behaviors – factors that affect women's behavioral *intentions*, rather than women's actual pursuit of breast cancer screening. The exploration of behavioral intentions more aptly places the focus on women's decision-making process, rather than on the screening decisions and behaviors of their health care providers. As reported in Chapter 4, many new insights were uncovered in this study that can potentially aid public health social workers to tailor empirically-based, age- and culturally-sensitive health promotion and disease prevention programs that address rural women's intentions to pursue initial and routine breast cancer screening.

To examine these new insights and their implications, this chapter is divided into three sections. It begins with a discussion of the interpretation of the significant and newly-discovered relationships with respect to the major categories of the predictor variables. The results of the analysis of the multi-stage, multivariate predictive models are also discussed, including a summary of those cross-cutting factors that emerged as salient in predicting women's intentions to seek care if a breast lump were detected. The second section describes the limitations inherent within the methods and methodological

approach used in this exploratory study. The final section presents a discussion of the implications of this investigation for future efforts in social work research, public health practice, and education of social workers interested in community health interventions.

Discussion

The overall conceptual schema of this study was an ecological perspective that entailed multiple levels of components and contexts of the lives of rural women, including their health care and health care providers, their social networks, and their environment. The framework for this study also encompassed the PRECEDE and Health Belief Models as well as Action Theory principles and the Theory of Reasoned Action. The PRECEDE and Health Belief Models provided a more detailed framework for conceptualizing how predisposing, reinforcing and enabling factors are operationalized and influence women's health behavior and how perceptions of breast cancer susceptibility affect a woman's decision-making and intentions about pursuing health care. The main tenets of Action Theory and the Theory of Reasoned Action are that action is meaningful and voluntary behavior, motivated by a woman's values and goals and normative influences. Hence, a woman's intentions, if they were to detect a breast lump, are further shaped by her values about breast cancer and the efficacy of its treatment, as well as the meaning she and her social group place on follow-up actions (i.e., see a doctor, get a mammogram, watch the lump for changes, or pray).

A particular strength of the ecosystems perspective and the PRECEDE model is their attention to normative influences. Because the influence of cultural

beliefs about breast cancer on women's behavioral intentions has received relatively limited attention in prior studies, this indicator was of particular interest in this study. The conceptual framework thus assured that a focus on cultural factors would be integral to the analysis.

This study was descriptive and exploratory by design, charting new territory about the role of specific predictive indicators of women's behavioral intentions if they were to detect a breast lump. These indicators included: age, race, other socioeconomic characteristics, breast health care utilization, breast cancer awareness and, an under-explored area of study, breast cancer cultural beliefs factors. Even the dependent variable, behavioral intention following hypothetical detection of a breast lump, represented a departure from the more traditional emphasis on measuring rates of clinical breast examinations and mammograms as the outcome measures. The exploratory design was selected because while some of the variables of interest represented relatively simple constructs that can be measured in a straightforward way (e.g., age, income, health insurance coverage), other variables were more difficult to assess given their complexity (e.g., breast cancer worry, cultural beliefs about breast cancer). Exploratory studies permit *de novo* examination of variables of interest that have been under-studied or not studied at all. Although exploratory studies generally do not produce definitive results, they provide preliminary findings that help to determine the feasibility of, and directions for, undertaking further study (Rubin & Babbie, 1993).

General findings from this study are that select socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer had an effect on the behavioral intentions of

asymptomatic, rural women in the hypothetical circumstance of detecting a breast lump. Racial and age differences could not be fully accounted for by these factors. As will be described in the Limitations section, the inability to fully explain racial and age differences may be attributable, in part, to measurement inadequacy. In addition, there may well be other salient determinants of screening intentions that were overlooked in this study that have been found to be pertinent in prior studies, such as the role of specific kinds of social support (Friedman et al., 1995), transportation accessibility (Montano et al., 1997), and patterns of other positive health promoting behaviors (Montano & Taplin, 1991).

In terms of sample subgroupings by age and race, older African American women, compared to their White and younger counterparts, emerged as the most at-risk group for being the least knowledgeable about breast cancer and breast cancer risks, the least likely to perceive themselves as being at risk for breast cancer, the least likely to discuss breast cancer risks or mammography with their physicians, the least likely to have obtained breast cancer screening, the most likely to report the beliefs that air spreads cancer and that co-existing conditions and treatments can also cause cancer, and the most likely to express strong religious views about the central role of God in curing cancer.

Yet, findings also suggest that older African American women were predisposed to pursuing health care and the recommendations of their health care providers. While over half of the women reported that they would rather wait than take action to see a doctor if they were worried about a health problem, older African American women were the most likely to report that they would go to see a doctor and that a physician referral was the primary reason they would get a mammogram. Further, older African American women were also

consistently more likely to report the intention to take action in the specific circumstance of detecting a breast lump whether that action would be seeing a doctor, getting a mammogram, watching the lump for changes, or praying.

A more detailed discussion of the study findings is presented below in relation to the major premises of the study's conceptual framework and with a focus on racial and age differences. The first section discusses key findings from the bivariate analyses of the predictor variables and the second section discusses the factors and trends identified from the multivariate analyses.

Socioeconomic Characteristics, Breast Health Care Utilization, Breast Cancer Awareness, and Breast Cancer Cultural Belief Factors among Rural Women

The distribution of health insurance coverage, education, and income among women in this study sample mirrored findings from prior studies conducted in the region (Lannin et al., 1998). African American and older women had lower incomes and were less educated. African American and younger women were less likely to have private insurance or more likely to have no insurance at all. However, consistent with the findings of other investigators (Earp et al., 1995; Lannin et al., 1998; Michielutte et al., 1999), the influence of these variables does not appear to be as relevant as other health care and psychosocial factors. As revealed by the findings in the multivariate analyses reported in the last chapter, the role of the socioeconomic factors on women's intentions disappeared as more salient breast health care, breast cancer awareness, and cultural belief indicators were added. It may be that the socioeconomic characteristics contribute indirectly to women's intentions. For

example, lack of education, may underlie a predisposition to be less knowledgeable about breast cancer and its risks that, in turn, leads to a women's lack of worry about getting the disease and, ultimately, contributes to her being less likely to intend to take action if a breast lump were detected.

Breast health care utilization is related to women's perceptions about, use of, and access to, general health care. Hence, general health care access constitutes an enabling factor in the PRECEDE model of health promotion and is described here to provide a context for understanding breast health care utilization among the study sample. In this medically underserved region, there is not the array of medical care choices (e.g., allied health care services, access to computer-assisted patient information programs) available in metropolitan areas; hence, seeing a primary care doctor is the main vehicle by which women obtain their health care. General health care access was not a major barrier for the majority of women in this study; however, differences in access by race and age emerged indicating that younger and White women were less likely to use the medical system than their older and African American counterparts. The majority of women had health insurance coverage, but while African American women were slightly less likely to report a regular doctor of their own, younger women (ages 18 to 39 years) were least likely to have health insurance coverage, least likely to have visited a doctor in the last year, and most likely to cite cost as a barrier to seeing a doctor. Despite the general availability and access to health care, White women were more inclined to be circumspect about seeing a doctor in the presence of health problem, preferring to wait and see if the problem goes away, or to take care of it on their own. These findings underscore the need for health promotion and disease prevention programs to

address the barriers that prevent young rural women from entering the health care system and White rural women from delaying diagnosis and treatment if these programs are to be effective in encouraging routine breast cancer screening and timely follow-up when a breast problem is detected.

In terms of breast health care utilization, the rates of self-reported clinical breast examination and mammography screenings were comparable to those found in prior studies where older age and race (African American) were predictive factors for lower rates of screening and physician recommendation was strongly predictive of higher rates of mammography screening (Fletcher et al., 1993; Lannin et al., 1998; Michielutte et al., 1999; Mor, Pacala, & Rakowski, 1992). Racial differences in reported discussions with physicians about breast cancer risk and about mammography also mirrored prior findings (Michielutte et al., 1999; Mor et al., 1992; Stein, Fox, & Murata, 1991). African American women were less likely than Whites to report discussions with their doctors; and more troubling, women aged 65 years and older who are most at risk for breast cancer were less likely than their younger counterparts to report talking to their doctors about risk and the importance of screening. Yet, African American and older women were more likely than others to report compliance with physician recommendation for mammography.

These results corroborate findings from prior studies in North Carolina that found that health promotion programs would be remiss if they did not include educational programming targeted at reinforcing factors, specifically communication between women and their health care providers (Tropman, 1998; Tropman et al., 1999). From the perspective of the ecosystems framework, community-based prevention program efforts should be multi-level, targeted at

women and their physicians. Efforts directed at women should have the goal of empowering them to prompt their physicians about breast cancer screening. In addition, provider-focused intervention efforts should remind physicians about breast cancer screening guidelines and, particularly, raise their awareness of the importance of conducting discussions with women about breast cancer risks and about the influence of their screening referrals on women's intentions to obtain mammography.

Patterns of age and race differences also emerged within breast cancer awareness factors that were consistent with prior findings (Michielutte et al., 1999; Skinner et al., 1998; Tropman et al., 1999). African American women, aged 65 years and older, were less knowledgeable about the disease of breast cancer and breast cancer risks. Lack of knowledge about the disease, coupled with strong religious beliefs, may have further contributed to their lower perceived risk of susceptibility to the disease and their lack of worry about getting breast cancer. These findings present a complicated dilemma that needs to be addressed within breast cancer outreach and educational programming, particularly for older African American women. On one hand, outreach educational messages need to be tailored to educate older women that they are at greater risk for breast cancer and hence, need to follow recommended screening protocols. However, at the same time, educational messages about risks must be conveyed in such a way as not to "scare" women that they are in imminent danger of contracting the disease or, if diagnosed, dying from it. Given the high levels of religiosity found among these women, messages that are crafted with a balance of

facts about breast cancer risk coupled with the importance, and appropriate use, of seeking comfort and augmentation of medical care through prayer may more aptly "speak" to them in a culturally-sensitive way.

With respect to cultural beliefs about breast cancer, the majority of women in this study did not express misinformed folk beliefs or fatalistic views about breast cancer, nor did they report preferences for alternative therapies over mainstream medical care. Nevertheless, as many as one-third to almost one-half of the women did report beliefs that included medical myths about breast cancer, superstitions about how one gets a disease, or how a disease can be treated. The factor analysis of cultural beliefs about breast cancer indicated that a substantial number of older African American women believed that air exposure during surgery accelerates cancer tumor growth, while White and younger women more strongly expressed the belief that other conditions and treatments to do not cause cancer. These findings suggest that certain cultural (folk) beliefs about breast cancer may contribute to the lack of screening or compliance with treatment among rural women, and, thus, medical care and public health screening promotion programs should be alert to assessing women's beliefs about the disease and the efficacy of treatment.

With respect to the effect of religiosity, the clear majority of women reported strong religious practices, including the reliance on religious conviction to cope with life's difficulties. Specifically, the clear majority of women reported the belief that God and doctors work together to cure cancer but when the fundamentalist view of God alone curing cancer was reported, it was expressed predominately by a small percentage (< 7%) of African American women of all

ages. These findings suggest that most women in this region, regardless of race and age, perceive breast cancer treatment and God's role in treatment as inter-related. These findings further provide evidence for unique cultural characteristics of this rural population and specifically underscore the need for attending to folk and religious cultural beliefs when designing public health screening promotion and educational outreach programs that are intended to be salient for this group.

Intentions to Act After Detecting a Breast Lump

As seen in Figure 7 in Chapter 3, respondents not only expressed strong ideas about what they would intend to do, but there also seemed to be considerable consensus for all but one of the intentions (ask a friend). Rates of "very likely" responses ranged from 53.1% to 94.5% for each of the other seven intentions. Further, respondents expressed a strong likelihood for multiple intention choices, suggesting that they would intend to simultaneously pursue more than one course of action. While nearly half of the respondents reported that seeing a doctor would be their first action if they were to detect a breast lump, nearly one out of three women reported that prayer would be their first action. This finding also suggests that praying was perceived as an equally important and possibly complementary action with seeking medical care, particularly among older and African American women. The intention to pray may also have been coupled with women's reports that they would not wait to see if the breast lump became painful or if it changed; that is, prayer may have been perceived as a separate, proactive course of action, not in the action domain of "waiting" or "watching".

Given the low significance levels of the independent variables in the predictive model for the intention to see a doctor if a breast lump were detected, findings are, at best, tentative. Being 40 to 49 years of age, as compared to women aged 65 years and older, appeared to have been a consistent deterrent to seeking physician care, possibly because women in this age group were more likely to be working (and, thus, not be able to leave work to go to the doctor) and less likely to have health insurance coverage. Yet, this speculation was not supported when the predictor variables were added in subsequent stages of the model. While age 40 to 49 years remained as a deterring effect on the intention to see a doctor, the positive effect of health insurance coverage was eliminated by the effects of having had a prior mammogram, being knowledgeable about breast cancer risk, having no or little exposure to breast cancer, and not subscribing to the beliefs that air spreads cancer or that conditions and treatments cause cancer. Race emerged in the final stage of that analysis, conditional upon the addition of the cultural factors. Hence, age, race, and the utilization of breast cancer screening, coupled with mainstream medical knowledge and beliefs about the disease of breast cancer, appear to be more salient predictors of women's intentions to see a doctor, than are other socioeconomic characteristics, breast cancer worries, or religious views about the efficacy of treatment.

The findings from the predictive model for the intention to get a mammogram, revealed that having had a prior mammogram was the most salient reinforcing predictor for the intention to get a mammogram if a breast lump were detected. Nevertheless, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer did have impact. Racial

differences were accentuated by the addition of these predictor variables while age differences between women aged 50 to 64 years and 65 years and older were somewhat reduced. These findings suggest that encouraging women to undergo their first mammogram may be the most significant enhancement of the likelihood that they will obtain future mammograms. Further, these findings suggest that African American women could more readily be persuaded to seek mammography through health promotion educational efforts that increase their breast cancer risk awareness and address their cultural beliefs about the disease and its treatment.

In reviewing the outcomes of the multivariate predictive models for the intentions to see a doctor and to get a mammogram, findings suggested three underlying themes. First, past screening behavior predicts future screening behavior. Second, women who enter and use the health care system intend to use it again when they detect a health problem. Third, cultural beliefs about breast cancer that are consistent with mainstream medical knowledge reinforce the use of medical care and screening. Hence, community-based public health breast cancer screening promotion programs targeted at this group of women would be more effective in increasing screening rates if they aimed at attracting and retaining women into the medical system. The seemingly contradictory findings that older African American women are more likely to hold non-traditional beliefs about breast cancer (e.g., air spreads cancer), but are more likely to report the intention to see a physician or to get a mammogram if they were to detect a breast lump, suggests that they are silent about these views when they see their physicians. As will be discussed later in implications for social work practice, these findings underscore the importance of physicians communicating

with their women patients about their beliefs about breast cancer and breast cancer treatment.

With respect to the factors that promote the intention to watch for changes if a breast lump were detected, one might intuitively expect that lower levels of education and having no health insurance coverage would be salient. However, these variables had little to no effect on the intention to watch the lump for changes, as compared to the effects of physician discussion about breast cancer risk, not having had a prior mammogram, breast cancer worry and exposure, and particularly the religious beliefs that God alone, or God and doctors will cure cancer. It may be that having gained insights about breast cancer risk through discussion with a physician, and being worried about and exposed to breast cancer, combine to serve as factors that sensitize women to watch the breast lump for changes. In addition, believing that God will have a role in one's cure gives women comfort and support so they are capable of watching the lump for changes. As noted above, if a woman had had a prior mammogram, she may well have decided not to watch the lump but, rather, to take a more expedient course of action to seek medical care.

Given the high levels of religiosity among all women in the study sample, one might have expected that race and age would not be salient predictive factors on the intention to pray if a breast lump were detected. However, being African American was indeed highly significant for predicting this intention, while being younger than age 65 years was a consistent deterrent. Clearly, in the circumstance of detecting a breast lump, older women and, particularly, African American women would be most likely to rely on their faith to cope. Physician discussion of breast cancer was a strong predictor of prayer, suggesting that

women who became knowledgeable about their risks for breast cancer would understand the implications of the detection of a breast lump and thus be sensitized to using prayer as a means to cope with the fear of the diagnosis and the process of treatment. Yet, in contradiction, findings revealed that breast cancer risk knowledge exerted a small deterrence to prayer. Interpretation of this contradiction is difficult, particularly in light of the fact that the addition of the cultural beliefs about God's role in treatment in the last stage of the multivariate predictive model did not alter the inverse effects of breast cancer risk knowledge on the intention to pray. It may be that knowledge of breast cancer risk is associated with higher levels of education, which in turn, was a deterrent to prayer. Hence, there may be an inter-relationship between overall educational level and breast cancer risk knowledge, and these factors together may prompt women away from prayer and toward other courses of action.

As shown in Table 15, there were patterns of cross-cutting and unique influences among the predictive factors that influenced behavioral intentions in the hypothetical circumstance of detecting a breast lump. Race was found to be a predictive factor in at least one stage across all four intentions, suggesting that it is not a proxy for the other predictor indicators. The effect of race was conditional only for the intention to see a doctor when its influence emerged after the cultural belief variables were added. While African American women, compared to White women, were two times more likely to see a doctor or get a mammogram, they also were four times more likely to pray and significantly more likely to watch the lump. These intentions are consistent with the health-related characteristics finding that African American women were also more likely to see a doctor if they had a health problem. It is not clear whether African American

women are indeed more likely to seek out medical care in the circumstance of detecting a breast lump or if the finding is an artifact of the administered survey situation. The responses of African American women may have been the result of their giving what they perceived to be socially desirable responses to the interviewers.

Table 15

Summary of Significant Predictors of Behavioral Intentions if a Breast Lump were Detected

Stage and Variables	Intention to See a Doctor	Intention to Get a Mammogram	Intention to Watch the Lump for Changes	Intention to Pray
1 age race	 yes yes	 yes yes	 yes yes	 yes yes
2 socioeconomic characteristics	yes	yes	yes	yes
3 breast health care utilization	yes	yes	yes	yes
4 breast cancer awareness	yes	no	yes	yes
5 breast cancer cultural beliefs	yes	no	yes	yes

Age was also a cross-cutting factor in at least one of the stages in the multivariate model for predicting intentions after finding a breast lump, but the age category that had a significant effect varied considerably across intention type. Women aged 50 to 64 years were at least two times more likely than women aged 65 years and older to get a mammogram, one and one-half times more likely to watch the lump, and half as likely to pray. Women 40 to 49 years were two-thirds less likely than women aged 65 years and older to see a doctor

and three-quarters less likely to pray. Women aged 65 years and older were more inclined to perceive prayer as a significant action in coping with a breast lump, a response that makes them distinct from other age groups.

Aside from race and age, different patterns of predictors emerged with each type of intention. Two predisposing breast cancer awareness and cultural belief indicators, including knowledge of breast cancer risks and the belief that conditions and treatments do not cause cancer, moderately elevated the likelihood of seeing a doctor. The belief that air causes cancer to spread was a small deterrent. These findings further support the argument raised earlier that women who are misinformed about breast cancer are less likely to aggressively pursue discovered breast abnormalities through pursuit of mainstream medical treatment. Hence, public health screening promotion programs should encompass health education messages that correct women's erroneously held beliefs about breast cancer risks.

By contrast, no predisposing breast cancer awareness or breast cancer cultural beliefs predicted getting a mammogram. In comparison, breast health care utilization, breast cancer awareness and cultural beliefs about breast cancer, rather than past screening behavior, were significant predictive factors for intentions to watch the lump and to pray. For both intentions, physician discussion about breast cancer risk enhanced the likelihood of watching or praying. It is not entirely clear what these findings mean given the limitations of the measures and the inability to discern whether women are planning to conduct simultaneous actions of watching, praying, and seeking medical care after detecting a breast lump. It may be that women who have discussed breast cancer risk have a heightened sensitivity to the consequences of the disease and

hence, along with seeking medical care, are more inclined to watch to see whether the lump changes, and to pray to God for comfort or for assistance with treatment. Perhaps, as suggested by Ashing-Giwa (1999), health socialization is different for rural African American women than for White women. Prayer may be the way an African American woman assumes personal responsibility for assisting in her cure, rather than attributing total responsibility for her cure to physicians and the greater health care system. Other explanations are possible. According to previous analysis of narrative information from African American women with late-stage breast cancers (Mathews et al., 1994), breast lumps or knots are normal and, if left alone, they come and go. The women in that study indicated, "lumps that aren't bothering you are best left alone." Perhaps, women delay seeing a doctor because they are "letting nature take its course" and are praying for the tumor to disappear. To be mindful of the divergent roles of religiosity in the health care decision-making, future research is needed to more precisely measure and understand how different dimensions of religiosity interact with different dimensions of health problems.

The cultural beliefs that God alone cures cancer or that God and doctors work together to cure cancer increased the likelihood of watching the lump three-fold. These beliefs were expected but, nevertheless, extraordinarily strong predictive factors of the intention to pray. The association of cultural beliefs in God's role in breast cancer treatment and the intention to pray if a breast lump is detected is logical; that is, women with strong beliefs in God's role in treatment would be expected to pray. What is difficult to interpret is the role of these religious beliefs in watching the lump. As noted above, it may be that women find solace in praying to God while they watch the lump to see if it changes.

They may find comfort in believing that God and their doctors can manage any changes in the breast lump, and, thus, the likelihood of their recovery from the disease will be assured. However, it may also be that some women believe getting cancer is the result of having sinned, and, therefore, prayer is a means to ask for forgiveness and a cure. Regardless of the speculation, what is clear is that there are a significant group of asymptomatic, rural women who will watch the lump or pray as a result of detecting a breast lump. Thus, the role of their religious beliefs will need to be addressed as a major, if not central, part of their coping and treatment process.

From a statistical perspective, the model for the intention to get a mammogram was the strongest predictive model; all variables that emerged at each stage of this model were significant at the .05 or more stringent probability levels. Hence, findings from this model are stated with more confidence. By comparison, the findings from the models for the other intentions are qualified because they encompassed numerous predictors that emerged at the less stringent .10 significance level. Thus, this exploratory study should be viewed as presenting potential trends rather than conclusive findings. Further, the modest correlations between the independent and dependent variables as reported in Chapter 3 suggest that a limited amount of the variance in intentions can be explained by the selected predictor factors. More study is needed to examine the salience of these and other predictive factors. Nevertheless, the preceding analyses show progress in developing measures of cultural belief constructs of theoretical importance in understanding breast cancer screening intentions and in enhancing breast cancer screening promotion interventions.

Study Limitations

All survey studies collecting responses from human subjects inevitably encompass two major sources of limitations and error: the study subjects and the instrumentation. The accuracy of the collected data is dependent on at least five overall factors related to the study subjects, including their: (1) understanding of the questions; (2) acceptance of the premises upon which the questions are based; (3) willingness to answer the questions; (4) willingness to reveal true opinions, attitudes, and/or beliefs; and (5) ability to relate to questions when the questions focus on levels of understanding or certain types of experiences (Sheatsley, 1983). The behaviors respondents report may be particularly influenced by social desirability; that is, by the socially acceptable cues they perceive in questions they are asked and by their perception of what is considered appropriate health behavior (Rossi et al., 1983).

As noted earlier, there is some question as to why older African American women in this study reported the intention to see a doctor or get a mammogram even though they reported lower rates of obtaining mammograms and expressed seemingly contradictory views that air spreads cancer. It may be that since "seeing a doctor" and "getting a mammogram" were at the top of the list of possible response choices read by the interviewers, the older African American women felt implicitly prompted, or thought it would be "socially desirable" to the interviewers, to respond affirmatively to these two mainstream medical care choices. To remove the potential for leading or biasing answers, women should be asked open-ended questions about what they would do if they found a breast lump and in what manner would they take actions (linear versus concurrent).

The survey instrument and its use for collecting information about attitude and belief factors is the second area that poses limitations. Three instrument limitations, that are common in survey research (Rubin & Babbie, 1993), may have been factors to varying degrees in this study. First, although many of the items on the survey were designed using typical item development strategies and then pretested in prior studies, the items pertaining to cultural beliefs were not standardized through normative procedures. The finding across all four models that race predicted intention even when cultural factors were added to the analysis suggests that there were unmeasured aspects of race in this study. This finding may be attributable, in part, to the inadequacy of the cultural belief measures. However, while the validity and reliability of the cultural belief measures were limited, this problem is not unique to this exploratory study. To date, a review of the research literature reveals that measures of breast cancer screening beliefs and attitudes have yet to be included in national surveys (e.g., the National Health Interview Survey) with samples large enough to permit psychometric assessment of their internal reliability.

A second limitation is that quantitatively analyzed survey data can seldom deal with contextual influences affecting the way respondents feel, cope and act at the time of an interview. Women's views and attitudes about breast cancer may fluctuate as their life circumstances change. For example, major influences in a woman's social environment, such as loss of a close family member or friend, changing her regular provider, or having a new minister join the parish, may significantly alter her perceptions of breast cancer risk or worry, religious views about disease and God's role in cures, or affect what intentions she might have if she detected a breast lump.

Third, and finally, the use of self-reported as opposed to objectively observed survey data is not completely reliable for reflecting past or future action. The respondents' reports of their screening utilization behaviors are dependent upon their ability to recall past actions. For example, although women's self-reported mammography use, especially during the past two years has been demonstrated to be reasonably accurate (Degnan et al., 1992; Zapka et al., 1991), little is known about the accuracy of women's reports about their medical provider's performance of clinical breast examination, or about their recollection of these examinations, or their conversations with physicians about breast cancer risks and screening.

Likewise, obtaining accurate information about true intentions is difficult. Past experience in survey research indicates that people can be poor predictors of their own behavior because of their changing circumstances, the potential impact of a wide range of intervening situational variables on their lives, and their inability to relate to a hypothetically proposed situation (Sheatsley, 1983). However, marketing research has demonstrated that intentions to act can be more readily and accurately determined by increasing the respondent's interest level (Sheatsley, 1983). This issue was addressed by adding the condition "if you found a breast lump" within the items pertaining to screening intentions to intensify the hypothetical circumstances and, thus, make the situation of more interest and more compelling to the respondents.

The statistical methods used also entailed some limitations. Many of the independent variables and all of the dependent variables were collapsed into dichotomous categories for purposes of creating membership categories (e.g., have medical insurance, do not have medical insurance; after finding a breast

lump, would be very likely to see a doctor, would not be likely to see a doctor). While useful in detecting the presence or absence of certain characteristics, this data categorization reduces the richness of interpretation and may have eliminated the ability to detect nuances or subdimensions particularly in the findings. In addition, the use of the principal components method was unsuccessful in delineating clear subdimensions within the women's intentions if they detected a breast lump. Sources of error when using this statistical technique could be attributed to two issues: error in measurement (unreliability) and individual effects (Anderson, Basilevsky, & Hum, 1983). The size of the item samples, particularly for women's intentions if they had a breast lump, was inadequate to obtain factors that met factor loading criteria, simple structure and sufficient internal reliability. The small number of outlier responses to breast lump intentions also limited the ability to form factors.

However, the methods of this study were strengthened by the rigorous sampling procedures outlined in Chapter 3, the use of many pre-tested survey items in prior research, and the careful selection and training of interviewers matched to the respondents by age and race. Despite the limitations cited above, this exploratory study represents a new area of research that furthers the understanding of the impact of socioeconomic, breast health care utilization, breast cancer awareness, and breast cancer cultural beliefs on women's intentions to seek screening or take other actions in the circumstance of detecting a breast lump. This study also has detected potential contributions of newly-developed breast cancer cultural belief measures that influence the intentions of asymptomatic rural women to seek screening.

Implications

The findings from this study have important implications for ongoing social work research that examines psychological, interpersonal, and cultural factors related to breast cancer screening, public health social work practice, and social work education pertaining to public health practice and health care of rural or older populations. Each of these areas is addressed below.

Implications for Social Work Research

The aim of social work research is "not to produce knowledge for knowledge's sake, but to provide the practical knowledge that social workers need to solve the problems they confront day in and day out" (Rubin & Babbie, 1993, page xxi.) Consistent with this objective, this exploratory study was motivated, in part, by the desire to reduce the inequitable burden of breast cancer mortality among older rural African American women by exploring the factors that affect their intentions to seek screening. Findings from this study clearly emphasize the need for ongoing research that will provide useful information for public health social workers to more carefully tailor their breast health promotion and outreach efforts to the needs of this at-risk group.

Overall, ongoing social work research in breast cancer screening should aim to: provide evidence for age- and race-appropriate health promotion and disease prevention programs designed to enhance knowledge about the risks for breast cancer, increase access to and the appropriate use of health care services, and promote the active participation of women as partners in their health care. Specific study is needed to understand the psychometric properties of at-risk middle-aged and older women's cultural beliefs about breast cancer,

including risks and the benefits of screening. There is also a need for further research that assesses the effects of cultural beliefs about breast cancer. Studies should examine the interaction of cultural beliefs with age and race on having a regular health care provider and communicating with that provider about the risk of breast cancer, requesting and receiving a clinical breast examination, and requesting or complying with a physician-initiated referral for screening mammography.

As noted earlier in this chapter, measures of women's cultural beliefs and knowledge about breast cancer are under-developed, and their direct and indirect effects on screening are not clearly understood. Only 42% of the variation in women's cultural beliefs about breast cancer could be accounted for by the two factors that emerged. Future methodologically-oriented research should seek to improve the measurement of women's beliefs and knowledge about breast cancer to assess their effects on pursuit of breast cancer screening at the appropriate interval and on response to self-discovered breast problems.

For example, religious views constituted cultural factors that had an effect upon several of the intentions. The findings suggest that women who are older and also African American are more likely to incorporate faith within decision-making about breast cancer screening and treatment. However, given the limited measurement of the role of faith in treatment in this study, a comprehensive and confident understanding of the relevance of religious faith for screening intentions specifically of older African American women, or women in general, cannot be claimed. Nor are these findings sufficiently comprehensive to inform fully the development of screening interventions that promote belief in faith and treatment that can be communicated clearly and in cooperation with the religious

community. Older persons, in particular, in this region are religious, or they espouse strong faith in God. However, because there was virtually little variability among the age categories of the study subjects, religiosity could not be studied as predictive factor. In order to create variability in religiosity among respondents, additional study is needed for measurement of the belief in religious intervention in illness, including belief in the effectiveness of religious "curing ceremonies" and in religious miracles. Additional survey items are also needed that better define religious faith and cancer treatment and religious faith in lieu of cancer treatment. Such studies would help to provide the comprehensive understanding of the role of religiosity on perceptions of breast cancer of women in the region.

Because findings from this study suggest that beliefs about breast cancer have racial dimensions, different measures may be needed for African American and White women. To better understand the interaction of faith and treatment, future research efforts might include separate focus group interviews of African American and White women aged 40 and over. Participants could help pre-test newly designed survey questions by obtaining their opinions and comments about question or statement wording as well as the exhaustiveness of multi-item measures. Potential items for their review and comment might include, "a curing ceremony in church would help doctors cure my breast cancer," or "both strong religious faith and medical treatment are necessary to cure breast cancer." Suggested items to augment the belief of faith in lieu of treatment might be, "medicine and surgery cannot cure breast cancer, only strong religious faith can cure it," or "only religious faith, and not medical treatment, can cure breast cancer."

Focus group discussions could also be used to enhance the study of breast cancer beliefs. The belief that air getting at cancer causes it to spread is intriguing, and it illustrates that gaining a better understanding of women's beliefs about breast cancer and its treatment may well be an iterative process. Previous research (Lannin et al., 1998) found that two beliefs significantly predicted late-stage presentation of breast cancer: the beliefs that exposing cancer tumors to air and "cutting on" them during surgery causes the tumors to spread. It seems clear that the belief about air and cutting on tumors is part of a larger concern about the effectiveness of surgery that, in turn, is grounded in perceptions of the physical properties of breast lumps and cancer tumors themselves. Focus group discussions could, thus, aid in exploring the nature of these perceptions.

The analysis by Mathews (1994) of narrative information from African-American women with late-stage breast cancers uncovered the beliefs that an injury to the breast or blood impurities (or fatigue) can cause a lump to "take root" or "take on a life of its own." This characterization of breast lumps has implications for women's views of surgery and their thoughts about the efficacy of surgery and the removal of lumps or breast masses that are not perceived as "bothersome." Views of the efficacy of surgery, in turn, may well influence whether women value screening. Again, discussion with women in the focus groups may help to define this subdimension further by soliciting agreement or disagreement with such items as, "it's better to leave a breast cancer tumor alone than to risk surgery to remove it," "cutting a breast lump in surgery can change it into cancer," "women with breast cancer are more likely to die if they have surgery than if they don't have it," "a breast lump should be taken out only if it

changes into cancer," or "the body ought to be left whole, not cut on with surgery to remove tumors or lumps."

Finally, further research is also needed to assess the main and interactive effects of race and age on women's intentions when a breast lump is detected, and, particularly, to understand the dynamics underlying women's intentions to pray and to watch the lump. Although women's beliefs and attitudes about mammography, their risk for cancer, and the effectiveness of treatment are probably pertinent to their motivation to discuss their concerns with their physician, no studies were found in the literature that provide detailed measures of these dynamics.

In summary, while this exploratory study advances the understanding of rural asymptomatic women's perceptions about breast cancer and its treatment, and the factors that affect women's intentions when they find a breast lump, it is but one step in the continuing series of needed research studies.

Implications for Social Work Practice

From an ecosystems framework, this study has clear implications for public health social work practice at the levels of institutional health care policy planning, advocacy in health promotion among the provider community, and health promotion programs targeted at women. Findings from the study also have implications for social work direct practice and for the creation of targeted educational messages.

As a general aim, social work efforts in planning health care should be systematic and focused on assuring that the health needs of individuals are met and that available resources are used efficiently and effectively (Barker, 1995). A

goal of health care policy reform in the U.S., as outlined in the Healthy People 2000, is to provide universal access to preventive health screening measures. A specific objective is to increase to 60% the percentage of women aged 50 years and older who receive mammography and clinical breast examination during the prior two years (objective 16.11) (U.S. Public Health Service, 1990, p. 428-429). Thus, since early detection and appropriate treatment are essential to reducing the burden of breast cancer in the United States (Division of Cancer Prevention and Control, 1996), social workers should be advocating for health-care policies that ensure that every woman at risk for breast cancer receives regular breast cancer screening, prompt follow-up, and assurance that all clinical breast examinations and mammograms meet nationally recommended clinical protocols or federal quality standards.

Over the past 20 years, much progress has been made in better understanding the value of breast cancer screening and in understanding the prompting women need to ask their physicians to recommend screening and to initiate referrals. However, more concerted effort is needed to achieve optimal participation of women in the health care system. This study and prior research suggest that physician recommendation and referral are the most important precursors to obtaining breast cancer screening particularly among low-income and African American women (Smith & Haynes, 1992; Tropman, 1998; Tropman et al., 1999; Zapka et al., 1991). In North Carolina, the primary mechanism for getting a mammogram is to be referred by one's physician. Two recent studies in the state have further endorsed this view and have emphasized the importance of interventions that target both women and their physicians as a means to

increase mammography referrals and screening rates (Michielutte et al., 1999; Tropman et al., 1999).

However, to date, community-based interventions have been primarily women-centered, aimed to increase mammography by educating women about the procedure, removing or minimizing economic barriers, and easing the process of obtaining mammograms at imaging centers. Few community intervention projects have focused on methods to bring rural women into contact with physicians in order to create opportunities in which the importance of mammography can be discussed and a mammography referral can be made. The findings from this study underscore that physician discussion about breast cancer risk is a reinforcing factor, particularly with older and African American rural women. Further, these findings point to the need for training of physicians to include discussion about breast cancer as an integral part of a woman's health care and a tool to enhance her compliance with nationally recommended breast cancer screening guidelines. Crucial to this region, interventions should be designed to train physicians to be aware of, and sensitive to, women's lack of knowledge of breast cancer risks and the potential for their having misguided cultural beliefs about the disease (e.g., the belief that air spreads cancer). Physicians must also be trained to respect, communicate about, and work with women's religious views about the role of God and mainstream medicine in treating breast cancer. Such physician training is crucial in order to be successful with older African American women in promoting compliance with regular screening and compliance with follow-up if a breast problem is found.

In addition to policy-level and provider-oriented interventions, this study also has major implications for public health social workers who design

community health promotion and disease prevention programming in breast health care targeted at women. In the context of the cost-cutting objectives of managed health care and governmental efforts to contain Medicaid and Medicare expenditures, prevention programming has the opportunity to demonstrate its cost-effective value in eliminating or reducing medical problems that lead to major cost outlays. Schinke (1997) comments that social workers, unlike other health professionals are uniquely positioned and well-informed to demonstrate the value of health promotion and disease prevention services because of their involvement in the entire range of activities prevention programming entails, including planning, delivery, and evaluation. However, to build effective prevention programs, he argues that social workers must also draw from a strong knowledge base of theory and from empirical evidence and clinical wisdom, have a clearly defined target population, encompass the values and needs that mirror the environment of that population, and have a rational plan of action that focuses on specific problems, and specific outcomes that can be measured (Schinke, 1997).

It is hoped that findings from this study will provide such grist for social workers planning health promotion and disease prevention programs by identifying the salient determinants of rural, asymptomatic women's intentions, following detection of a breast problem. In an environment of cost containment and limited fiscal resources, these findings help to justify the priority for implementing health promotion and disease prevention programs that target the most at-risk women in the region, older African American women. From the ecological perspective, these findings also provide insights about key players in a woman's environment who are most crucial to her intentions to seek screening;

that is, physicians and clergy. These findings justify breast cancer prevention programming goals promoting community partnerships among physician practices and churches that can address as a mutual goal, the overall increase of breast cancer screening for all women in the community and the elimination of the inequity of breast cancer mortality among older African American women. In particular, these findings highlight the need for reinforcing messages conveyed by physicians and clergy that can address women's anxieties, lack of accurate information about the disease and its risks, and medical myths about treatment.

In addition to affirming the need for educational interventions that target women and their physicians, the study findings also emphasize the need for social work health promotion interventions that respect and attend to women's folk and religious beliefs about breast cancer treatment. Findings from this study clearly underscore that to be effective in addressing rural breast health issues, social workers themselves must be sensitized to the prevailing cultural views of the target population. For example, study findings reveal the widespread folk belief among women that air getting at cancer can cause it to spread and, among some women, that other health conditions lead to breast cancer. These views will need to be addressed through the use of carefully tailored educational messages and perhaps through the social worker's recruitment and use of indigenous peer role models and community-based lay health advisors to educate women about breast cancer and the importance of screening.

Social workers must also be willing to discuss religious views, particularly as they pertain to perceptions of breast cancer and breast cancer treatment. Findings from this study revealed that older women and African American women perceive God as an integral part of their breast cancer treatment. Thus, to be

effective with women in this population, social workers must support women who see prayer as an enhancement of treatment and a spiritual comfort. Further, social workers must be willing to craft educational messages that incorporate faith as a legitimate coping factor and essential component of sharing responsibility for one's treatment (Ashing-Giwa, 1999; Cnaan, 1997).

Public health social work practitioners must also acknowledge lay and religious organizations as potential resources that can support and reinforce women's utilization of breast health care. In a legal and policy environment that separates church from state, social work practitioners may have to make ideological compromises with religious allies. However, these allies can, in turn, help promote the message that early detection through regular screening and medical treatment is part of God's will for women's cure from breast cancer. Efficiency of services and clients' best interests, perpetual goals of social work practice, cannot be achieved unless social workers are willing to soften or eliminate the church/state separation mandate and share their turf with religious organizations and the clergy (Cnaan, 1997).

Finally, these findings can also provide useful data for customizing educational and outreach health promotion messages that can be targeted selectively at women based on their age and race. For example, breast cancer educational messages should target the worry that many younger rural women have about their risks for breast cancer and also assist them in where to access the medical system when they are uninsured. Messages should also be targeted at the reluctance of White women to seek medical care when they have a health problem and to inform African American women about breast cancer risks. Further, this study underscores the need for health promotion and disease

prevention programs that complement or modify prevailing religious beliefs about breast cancer and breast cancer treatment, augment gaps in knowledge about the disease, as well as the nationally-recommended screening intervals, and about the role physicians can play in increasing breast cancer screening. At the very least, if the goal of health promotion programs is to persuade women to be regular users of health care and breast cancer screening services, then efforts should be targeted at appealing to women to enter the health care system and to have initial screenings.

Implications for Social Work Education

This study has major implications for educating social workers to be effective practitioners and program planners in health care and particularly, in public health. As noted earlier, to be successful, social workers must be sensitive to racial and age influences and particularly aware of the myriad of factors that influence rural women. Findings from this study demonstrate that women understand and react to the disease of breast cancer differently by virtue of their age, race, other socioeconomic characteristics, breast health care utilization, breast cancer awareness, and cultural beliefs about breast cancer.

For example, younger women under the age of 40 years, as compared to their older counterparts over the age 65 years, are more knowledgeable about the risks for, and nature of, the disease of breast cancer, but their worry about getting the disease is greater. With respect to religious beliefs, older women are more likely than other age groups to hold strong beliefs that prayer is a significant part of coping with breast health problems. Hence, in order to assist women of varying ages with their breast health care needs, social workers must have a

thorough understanding of how age and race influence women's perception of breast cancer and the efficacy of treatment. Social work curricula in health care practice must therefore include information about the health care practices, health awareness, and cultural characteristics of women that serve as predisposing, reinforcing and enabling factors and how these factors affect women's health and disease perceptions and use of the health care system. Education in social work practice in health care should also include the impact of rural environments and rural folklore on perceptions of the causes of, and risks and cures for disease, and how these perspectives influence women's health care intentions and utilization.

It is well documented that most countries all over the world are experiencing an increase in the proportion and absolute size of their older adult populations (Hooyman & Kiyak, 1999). North Carolina is the third most rapidly growing retirement state, and it is anticipated that by the year 2030, the population of older adults over the age of 65 in the state will increase from 12% to nearly 25%, with the most rapid growth occurring among minority groups (N.C. Division of Aging, 1999). The increasing proportion of the elderly in the population, thus, emphasizes the need for social work curricula focusing on the aging process and, more specifically, on cultural and gerontological issues in health care, particularly as they apply to older women. Specific goals of such curricula would be to provide students with a deeper understanding of the health issues of older women, the context in which older women live, and the service systems with which they interact. Through such training students would become equipped with new strategies to respond to and advocate for the needs of this rapidly growing population.

To be effective in public health programming that targets disease prevention and health promotion, social work students need training and practical experience in all phases of the program planning, implementation and evaluation cycle of community intervention efforts. Unfortunately, coursework in health promotion and disease prevention services planning is not a Council of Social Work Education (CSWE) standard; hence, there is a dearth of courses in this area across the schools of social work in the U.S (Schinke, 1997). Coursework, practica, and research projects that provide training and experience in planning, delivery of service, and program evaluation should be made available to students interested in addressing health promotion and disease prevention issues. Such coursework should also include health education and health communications training aimed at underserved populations. For example, in the case of developing public health programs that reduce the equitable burden of breast cancer among older women and African American women, social workers should be trained to create specific "cancer communications" strategies aimed at attracting women into the health care system, addressing women's worries or beliefs about breast cancer that are barriers to their compliance with screening protocols and treatment, and acknowledging and incorporating the role of women's religious values in their ways of coping with disease.

In contrast to social work's smaller role in health promotion and disease prevention programming in health care, the profession has a long history of community organization practices that have addressed health issues (Bracht, 1995). Organizing social action through locality development and building community competence have been a long tradition. Social workers interested in health promotion should be trained in the "art" and "science" of community

organization to engage diverse groups including health care policy-makers, health care providers, community leaders and advocates, the clergy, and the women themselves (Altpeter et al., 1998). Social workers should also be trained in community development models that empower women as consumers as well as communities as service providers. As part of this training, social workers should learn how to use multiple strategies of institutionalizing health promotion program goals. The strategies they should learn include: developing "program champions" who can influence breast cancer screening and treatment policies; working with multiple subsystems including physician practices, mammography centers, and health clinics that serve older women; and creating an organizational niche within the health care system that firmly establishes an accessible, affordable and available system of breast health care for all women (Goodman & Steckler, 1989).

As a component of their training in community development, social workers should be educated about the range of participatory action research approaches and methods that can be used. Participatory action research is a hybrid of practice and research strategies that has been demonstrated to be a highly effective means for forging and sustaining collective empowerment and social transformation among a diverse array of community participants (Altpeter, Schopler, Galinsky, & Pennell, 1999), including communities attempting to address breast cancer screening issues among older women in rural communities (Altpeter et al., 1998). There are numerous participatory research approaches that span the continuum from individual-level, to program-focused, to community-centered efforts to promote social change, all of which have the potential to empower individuals and the community to address inequities in

access to and use of breast health care. Social work practice and research curricula should incorporate training on how this research approach can be implemented in a collaborative, democratic way, such that the researcher together with women, their health care providers and the health care system can assess the need for, and progress of, breast cancer screening promotion programs.

Because health problems, such as breast cancer, have interdisciplinary components, students should also be encouraged through their internships to conduct participatory action research projects as members of interdisciplinary teams. The findings from this study make clear that women's perceptions of breast cancer have medical, social, and religious ramifications that, in turn, could be addressed through medicine, nursing, health education, social work, and theology. The aim of such collaborative projects could be to study how to promote breast cancer screening among at-risk women, with students assigned to identify ways to tailor their collective efforts to "speak" to at-risk target populations. Through this process, students could become familiar with and appreciate the contributions each profession can make to enhance public health interventions that are intended to improve the lives of women.

The training and value base of the social work profession positions it well for developing sensitive and relevant breast cancer prevention and screening promotion programs. It is hoped, as we begin the new millennium, a new wave of social workers will be trained to, and will take up, the challenge of crafting public health programs that are evidence-based and, thus, carefully tailored to meet the needs of at-risk populations.

Summary

Despite the good intentions of community-based programs targeting at-risk women throughout the United States, the disparities in breast cancer mortality and screening rates have not been eliminated. Much work is needed to find ways to effectively address the burdens of breast cancer that are carried by women in specific regions in the country. The results of this study represent *de novo* research and provide new insights into the factors that influence the intentions of asymptomatic women living in rural North Carolina. Although the findings from this study cannot be generalized to all women representing all cultures and all regions of the United States, they do contribute to the social work knowledge base that can be incorporated into public health screening promotion programming and education strategies and can provide the foundation for further social work research in the area of breast cancer screening.

While the profession has a long tradition of practice with women diagnosed with breast cancer, it is hoped that this study will prompt social workers in health care to chart a new course of interest in health programming that promotes screening and early detection of the disease. Professionals who are trained to work with multiple networks that target women, their physicians, their churches, and other community networks, as well as the broader health care system, are crucial to addressing the inequities in breast cancer mortality and screening rates particularly among rural older and African American women. With their training in ecological perspectives, individual behavioral models and action theory, social workers can be key in designing and implementing comprehensive breast cancer screening promotion programs that promote individual change among women. And equally as important, social workers can

be key in fostering institutional change that can create enduring community-based partnerships and programs that ultimately can eliminate the gap in breast cancer mortality and screening that exist among at-risk, rural women.

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APPENDICIES

Appendix A

Human Investigation Approval

Memorial
University of Newfoundland

School of Social Work

Ms. Mary Altpeter,
224 Oxford Hills Drive
Chapel Hill, North Carolina
U.S.A., 27514

Oct 21, 1999

Dear Ms. Altpeter:

Re: Assessing the effects of cultural beliefs and psychosocial factors on symptom recognition and perceptions of breast cancer treatment effectiveness and screening decisions: Differences between rural, asymptomatic White and African American women

At our meeting on Oct 20, 1999, the Human Subjects Review Committee of the School of Social Work reviewed your protocol concerning this very worthwhile project. Our review concludes that your proposal is acceptable and you have our approval to proceed with your research.

Please inform us if your research methodology is further changed in any way. Extensive revisions might require re-submission for ethical review.

Best wishes in this very important work!

Yours truly,

Janice E. Parsons
Assistant Professor
Chair
Human Subjects Review Committee

cc: Dr. Joan Pennell, Research Supervisor

Appendix B

Breast Cancer Project Time-1 Survey
Leo W. Jenkins Cancer Center
East Carolina University

28307

Breast Cancer Project
Time-1 Survey
Leo W. Jenkins Cancer Center
East Carolina University

Subject ID# ☐☐☐☐ Interview Date ☐☐ / ☐☐ / ☐☐ Interviewer ☐☐

Last Name (same as on census forms) ☐☐☐☐☐☐☐☐☐☐☐☐

First Name ☐☐☐☐☐☐☐☐☐☐

Mailing Address: _____
(with town and zip code) _____
_____

Street Address (if different): _____
_____
_____

Social Security # ☐☐☐ - ☐☐ - ☐☐☐☐

ACCESS TO HEALTH CARE: *Let's begin by talking about some of the health-care services that you may use.*

1. Is there a particular place that you usually go to if you want to see someone about your health?
   O Yes O No **(SKIP to #3)** O S.C. (don't know)

2. What kind of place do you usually go to? Is it a doctor's office, a hospital, a clinic, or some other place?
   {INTER: Don't read choices. Probe for the one place they go most often, the usual place.}

   O Doctor's office (either one-person practice or group)
   O Hospital emergency room
   O Hospital walk-in or outpatient clinic
   O Private clinic, not part of medical school
   O Medical school clinic
   O Public health department clinic
   O Community (rural, neighborhood) health center
   O Military facility
   O Other **(write R's exact words)** _____
   O Don't go to only one place

28307

3. Do you have a doctor that you think of as your own doctor? One that you see for most of your health needs?
   O Yes O No **(SKIP to 9)** O S.C. (don't see an MD) **(SKIP to 9)**

4. What type of doctor is he/she? **{INTER: Hand R. Card #1. Fill in correct circle below.}**
   O a family doctor
   O a general internist
   O an OB/GYN **(SKIP to #10)**
   O a specialist
   O or some other type of doctor
   O S.C. (don't know) **(SKIP to #9)**

5. Is your doctor a man or a woman? O Man O Woman O S.C. (don't see the same doctor each time)

6. Would you please tell me his/her name (or the name of the practice)?

7. When was the last time that you went to see this doctor? Was it:
   O Within the past six months O Within the past year O Within the past two years O Within the past five years

ID# _____

8. Has this doctor ever done any of the following things:

- talk with you about your risk of breast cancer - - - - - - - - - - - O Yes O No O S.C. (not sure)
- examine your breasts for knots or lumps - - - - - - - - - - - - - O Yes O No O S.C. (not sure)
- ask you whether you examine your own breasts for lumps/knots - - - O Yes O No O S.C. (not sure)
- show you how to examine your own breasts for lumps/knots - - - - - O Yes O No O S.C. (not sure)
- show you a breast model - - - - - - - - - - - - - - - - - - - O Yes O No O S.C. (not sure)
- talk with you about mammography - - - - - - - - - - - - - - - O Yes O No O S.C. (not sure)
- recommend that you get a mammogram - - - - - - - - - - - - - - O Yes O No O S.C. (not sure)
- actually make an appointment or give you a referral for a mammogram O Yes O No O S.C. (not sure)
- ask if your mother or grandmother had breast cancer - - - - - - - O Yes O No O S.C. (not sure)
- give you any written information, like a pamphlet, on breast cancer, breast self-exam or mammography O Yes O No O S.C. (not sure)
- ask you to share information about breast cancer with your older female relatives O Yes O No O S.C. (not sure)

9. Do you see an obstetrician/gynecologist (ob/gyn)?

O Yes, regularly
O Yes, sometimes
O No, I did in the past, but not now **(SKIP to 14)**
O No, never **(SKIP to 14)**

10. Is your gynecologist a man or a woman?

O Woman O Man O (S.C. don't see the same doctor each time)

11. Would you please tell me his/her name? (Or the name of the practice)

12. When was the last time that you went to see this doctor? Was it:

O Within the past six months O Within the past year O Within the past two years O Within the past five years

ID# _____

13. Has this doctor ever done any of the following things:

– talk with you about your risk of breast cancer - - - - - - - - - -	O Yes	O No	O S.C. (not sure)
– examine your breasts for knots or lumps - - - - - - - - - - - -	O Yes	O No	O S.C. (not sure)
– ask you whether you examine your own breasts for lumps/knots - - -	O Yes	O No	O S.C. (not sure)
– show you how to examine your own breasts for lumps/knots - - - - -	O Yes	O No	O S.C. (not sure)
– show you a breast model - - - - - - - - - - - - - - - - -	O Yes	O No	O S.C. (not sure)
– talk with you about mammography - - - - - - - - - - - - - -	O Yes	O No	O S.C. (not sure)
– recommend that you get a mammogram - - - - - - - - - - - -	O Yes	O No	O S.C. (not sure)
– actually make an appointment or give you a referral for a mammogram	O Yes	O No	O S.C. (not sure)
– ask if your mother or grandmother had breast cancer - - - - - - -	O Yes	O No	O S.C. (not sure)
– give you any written information, like a pamphlet, on breast cancer, breast self-exam or mammography	O Yes	O No	O S.C. (not sure)
– ask you to share information about breast cancer with your older female relatives	O Yes	O No	O S.C. (not sure)

14. In the past few years have you been to any of the following health care providers or centers:

{INTER: Read each type of provider and fill in the circle each time the R. says YES.}

O Chiropractor
O Acupuncturist
O Herbalist
O Health food store
O Religious healer
O Root doctor
O Biofeedback center
O Fortune teller or psychic
O Self-help group
O Hypnotist
O Massage therapist
O Commercial weight loss program
O Homeopath
O Other **(write R's exact words)**

_____

_____

Now, let's talk about your own health.

15. Some people go to the doctor right away, whenever they're worried about their health. Others put off going even when they have a serious problem. Do you usually:

O go to the doctor as soon as you think something is wrong
O wait a while and try taking care of the problem yourself
O wait a while and do nothing to see if it will go away
O or do you usually not go to the doctor at all
O (S.C. depends on the type of problem)

Screening. ***Now let's talk about the things that you may have done to protect yourself against breast cancer.***

16. Has a doctor or other medical professional ever shown you how to examine your breasts for knots or lumps?

O Yes O No O (S.C. not sure)

17. Have you ever felt your own breasts in the way a doctor or nurse does to check for knots or lumps?

O Yes O No **(SKIP to 18)** O (S.C. not sure)

IF YES, do you check your own breasts:

O Every day
O Several times a week
O Several times a month
O Once a month
O A few times a year
O Almost never

{INTER: SKIP to #19 if R. answered YES to #17 and indicated a time interval above.}

18. Why don't you check your own breasts?

{INTER: Fill in all that apply.}

O You don't know how

O You are embarrassed to do it

O You're not really worried about knots or lumps

O You don't think you would be able to feel a lump if there were one

O You would rather not know if there is a problem

O You lack privacy to do it regularly

O You are too young to start doing it now

O You are too old to have to worry about that now

O You forget

O Other **(write R's exact words)** _____

28307

19. When did a doctor or nurse last examine your breast? Was it:

O More than 3 years ago O Within the past 3 years O Within the past 2 years O Within the past year O Never

20. A mammogram is a picture of the breast tissue made by compressing the breast while the picture, a type of x-ray, is taken. Have you ever heard of a mammogram?

O Yes O No O (S.C. Not sure)

21. Have you ever had a mammogram?

O Yes (**SKIP to 23**) O No O (S.C. Not sure)

22. Why do you think that you haven't had one?

_____

_____

_____

_____

(Write R's exact words--then skip to 27)

23. Was your last mammogram:

O More than 3 years ago O Within the past 3 years O Within the past 2 years O Within the past year

24. What was the main reason you decided to have your last mammogram?

O Your doctor or nurse recommended it

O You thought you might have a breast problem

O You were worried about your chances of getting breast cancer

O It is recommended for women of your age to have one

O Someone other than your doctor or nurse encouraged you to do it

O Saw a program on TV

O Heard a talk at church or club

O Younger relative encouraged me to do it

O Other **(write R's exact words)** _____

28307

25. Have you ever had a mammogram that showed that something was wrong with your breasts?

O Yes O No **(SKIP to 27)** O (S.C. not sure)

26. Did you have a biopsy of your breast to find out what was wrong on the mammogram?

O Yes **(SKIP to 29)** O No O (S.C. not sure)

27. Has any doctor ever told you that you had a lump or tumor in your breast?

{INTER: If R. says that she thinks she has one now, be sure at the end of the interview to recommend that she sees a doctor/nurse.}

O Yes O No O (S.C. not sure)

28. Have you ever had a breast biopsy?

O Yes O No **(SKIP to 32)** O (S.C. not sure)

29. How many breast biopsies have you had? ☐☐

30. Did any of them turn out to be cancer?

O Yes O No **(SKIP to 32)** O (S.C. not sure)

31. Thank you for answering my questions up to now. Some of them may have been hard for you. Would you be willing to tell me more about how your breast cancer was first found and about any doctor or hospital visit you had afterwards? **{INTER: If R. has had breast cancer (answered YES to #30), interview ends after answering #31. SKIP to CONCLUSION, p.28}**

32. Have you ever had any problem with your breasts that you decided to wait to see a doctor or nurse about?

O Yes O No

IF YES, can you tell me more about the problem and what you did?
(Write R's exact words.)

_____
_____
_____
_____
_____

Perceived Risk. *Now let's talk about how worried you are about your risk for developing breast cancer.*

33. How likely do you think it is that you will get breast cancer in your lifetime? Do you think it is:

O Very unlikely O Somewhat unlikely O Somewhat likely O Very likely

34. Compared to most women your age, what do you think the chances are that you will get breast cancer someday? Do you think your chances are:

O Much lower O Somewhat lower O Somewhat higher O Much higher

35. Overall, how worried are you that you might get breast cancer someday? Would you say that you are:

O Not worried at all O Somewhat worried O Very worried

36. How old were you when you had your first menstrual period? Were you:

O younger than 12 O age 12-13 O age 14 or older

37. Have you given birth to any children (count only children born alive):

O Yes O No **(SKIP to 39)**

38. How old were you when you had your first live birth (count only your first child born alive):

O Younger than 20 O Between 20-24 years old O Between 25-29 years old O 30 years or older

ID# _____

Family History. ***Now I would like to ask you a few questions about any of your blood relatives who have had an actual diagnosis of breast cancer. Remember, we are talking about your blood relatives only and not people who are adoptive relatives or who are related to you only by marriage.***

39. How many of your blood relatives have had breast cancer? How about your:

a. Mother	O Yes	O No	O Don't know	
b. Sister(s)	O Yes	O No	O Don't know	☐☐ # positive
c. Daughter(s)	O Yes	O No	O Don't know	☐☐ # positive
d. Grandmother(s)	O Yes	O No	O Don't know	☐☐ # positive
e. Aunt(s)	O Yes	O No	O Don't know	☐☐ # positive
f. Cousin(s)	O Yes	O No	O Don't know	☐☐ # positive

BREAST CANCER OPINIONS.

40. Next I would like to ask you some questions about what you know or have heard about breast cancer. I am interested in what your opinion is about whether these statements are true or false.

	True	False	(S.C. don't know)
1. Breast cancer is <u>not</u> the most common type of cancer in women.- - - - - -	O	O	O
2. Mastectomy is removing the breast where cancer is found.- - - - - - - - - -	O	O	O
3. If a woman finds a knot or lump, it is better to do nothing because by then it will be too late.	O	O	O
4. About 1 out of every 8 women in the U.S. will develop breast cancer at some point in her lifetime.	O	O	O

ID# _____

	True	False	(S.C. don't know)
5. You can catch cancer from other people.- - - - - - - - - - - - - - -	O	O	O
6. The rate at which breast cancers grow is pretty much the same for everyone who gets breast cancer.	O	O	O
7. A cancer in the breast that is not treated can lead to death.- - - - - - - - -	O	O	O
8. Lumpectomy is a type of surgery for breast cancer in which the cancer itself but not the whole breast is removed.	O	O	O
9. As long as a knot or lump doesn't hurt, then it is not cancer.- - - - - - - -	O	O	O
10. Chemotherapy is the use of drugs to kill cancerous cells.- - - - - - - - - -	O	O	O
11. Breast cancer <u>does not</u> run in families.- - - - - - - - - - - - - - - - - - -	O	O	O
12. A breast cancer can be cured if it is found early.- - - - - - - - - - - - - -	O	O	O
13. African-Americans with breast cancer are more than twice as likely to die from the disease than are white Americans with breast cancer.	O	O	O
14. If a breast cancer is operated on, it can be stopped from getting any bigger.	O	O	O
15. More than half of the patients treated by radiation or chemotherapy <u>never</u> experience nausea or vomiting.	O	O	O
16. Women ages 50 and over should have a mammogram every year.- - - - - -	O	O	O
17. If a woman finds a knot or lump, the worst that can happen is surgery.- - - -	O	O	O
18. Finding a mass in the breast is not as serious as finding a knot or lump.- - -	O	O	O
19. Women who get breast cancer lose their breasts.- - - - - - - - - - - - -	O	O	O
20. If untreated, breast cancer will spread to other parts of the body.- - - - - -	O	O	O

BREAST LUMP ACTIONS. ***We are also trying to find out what women would do if they found a lump or knot in their breasts. How likely would you be to do these things?*** **{INTER: Hand R. Card #2.}**

41. If you found a lump or knot in your breast would you:

	Very likely	Somewhat Likely	(S.C. Don't know)	Not likely
a. Wait to see if it becomes painful	O	O	O	O
b. Get a mammogram	O	O	O	O
c. See a doctor for a breast exam	O	O	O	O
d. Wait to see if the lump or knot gets bigger	O	O	O	O
e. Ask a close friend or relative for advice	O	O	O	O
f. Pray to God about it	O	O	O	O
g. Watch it every day for a while to see if it changes	O	O	O	O
h. Leave it alone	O	O	O	O

42. Now I'd like to know which of the actions above you think are most important. Which of these would you do first, second, and third? **{INTER: Refer R. to Card #2 and enter letter of choice.}**

1st action	2nd action	3rd action
A O	A O	A O
B O	B O	B O
C O	C O	C O
D O	D O	D O
E O	E O	E O
F O	F O	F O
G O	G O	G O
H O	H O	H O

Subject ID# | | | | |

29235

43. Risk Factors. ***Women believe that different things increase their risk of getting breast cancer. Please tell me whether you think these things increase your risk for developing breast cancer. Answer each with yes or no.***

{INTER: read each item as follows:

How about *_____; Would you say it increases your risk for developing breast cancer or not?}

ITEM:	Yes	No	(S.C.) (Uncertain)
*Getting your period early, say before age 12?	O	O	O
*Eating a high fat diet?	O	O	O
*Drinking more than 2 alcoholic drinks a day?	O	O	O
*Having breast implants?	O	O	O
*Having a family history of breast cancer?	O	O	O
*Taking birth control pills?	O	O	O
*Having fibrocystic disease?	O	O	O
*Heavy smoking?	O	O	O
*Getting a bump or a bruise to the breast?	O	O	O
*Breastfeeding your children?	O	O	O
*Never having children?	O	O	O
*Going through menopause late in life, after age 55?	O	O	O
*Having had breast cancer before?	O	O	O
*Drinking more than two caffeinated beverages a day?	O	O	O
*Being on hormone replacement therapy (HRT) after menopause?	O	O	O
*Having your first child later in life, say after age 35?	O	O	O
*Gaining 20 or more pounds after age 18?	O	O	O

Stages of Change. ***These may seem similar to other questions that you have already answered, but they are a little different. I want you to think about what you yourself think or would be likely to do as I ask you these questions.***

{INTER: Read all answers in the set and fill in the circle of the <u>one</u> answer that R. thinks comes closest to what she believes or would be likely to do.}

{INTER: Show R. card #3.}

44. If I get breast cancer:

- O God alone would cure it without help from doctors.
- O God might work through doctors to cure it.
- O God would work through doctors to cure it.
- O Doctors would cure it with help from God.
- O Doctors alone would cure it.

45. If I had surgery for breast cancer:

- O Air getting to the cancer would make it spread faster.
- O Air getting to the cancer might make it spread faster.
- O Air getting to the cancer would probably not make it spread faster.
- O Air getting to the cancer would not cause it to spread faster.

46. If I get breast cancer:

O I would not tell the man in my life about it.

O I am not sure if I would tell the man in my life about it.

O I would most likely tell the man in my life about it.

O I would definitely tell the man in my life about it.

47. Some women think that mammograms help to find breast cancer, while other women do not. What is <u>your</u> opinion about mammograms? Do you think that:

O Mammograms do not help in finding breast cancer.

O Mammograms might help in finding breast cancer.

O If I were concerned about breast cancer, I would get a mammogram.

O I would definitely get a mammogram every year after age 50.

48. If I found a lump or knot in my breast that did not bother me, I would:

O Leave it alone and do nothing.

O I might or might not go to a doctor.

O I would probably go to a doctor.

O I would go to the doctor immediately.

49. If I had surgery for breast cancer:

O Cutting on the cancer would make it spread faster.

O Cutting on the cancer might make it spread faster.

O Cutting on the cancer would probably not make it spread faster.

O Cutting on the cancer would not cause it to spread faster.

29235

RELATIONSHIPS. ***Now I would like to ask you a few questions about the people you have known and have around you to talk with and help you with health problems.***

50. Have you ever known someone personally who had breast cancer?

O Yes O No (**SKIP to 51**) O (S.C. Not sure)

IF YES, what do you most remember about that person and her experiences?

{INTER: Record R's responses exactly.}

51. If you had a serious health problem, what one person, other than your doctor or God, would you turn to first for advice?

{INTER: Be sure to record the relationship to the person in the box i.e. sister, mother, husband, male friend. Be as specific as possible.}

Name: _____

Relationship

52. Now I would like to ask you if you agree or disagree with some statements about relationships between women and men and breast cancer. There are no right or wrong answers. We are interested in your opinions about these statements that others have made. Please answer agree or disagree as I read each statement.

	Agree	Disagree	(S.C. Not sure)
a. Most men would want to know if the woman in their lives developed breast cancer.	O	O	O
b. Dealing with breast cancer is a woman's problem and the man in her life doesn't need to be concerned with it.	O	O	O
c. Men are not as good as women at coping with serious illness.	O	O	O
d. A man would probably leave a woman if he knew that she had to have her breast removed.	O	O	O
e. A woman is more likely to get support from her female friends or relatives when she is seriously ill than from the man in her life.	O	O	O
f. If a woman has breast cancer, she should tell the man in her life.	O	O	O
g. Women who have surgery for breast cancer are no longer attractive to men.	O	O	O
h. A man should help the woman in his life with her health problems.	O	O	O
i. A man would probably not stay with a woman if he knew that she had breast cancer.	O	O	O

29235

BELIEFS ABOUT CANCER.

53. These next items are some of the things different women have told us they believe about cancer. We are interested in your opinions. Please tell us if you strongly agree, agree somewhat, disagree somewhat or strongly disagree with the following statements. Remember, there are no right or wrong answers- we just want your opinion. **{INTER: hand R. Card #4.}**

	SA	AS	(S.C.) (Not Sure)	DS	SD
If a cancer is cut open in surgery, it will not grow faster.- - - - - - - -	O	O	O	O	O
Negative feelings can cause cancer.- - - - - - - - - - - - - - - - - -	O	O	O	O	O
If a person has cancer, there is no sense trying to do anything about it.- - - -	O	O	O	O	O
People who take good care of themselves usually don't get cancer.- - - - - - -	O	O	O	O	O
A person with high blood is more likely to get cancer than a person with normal blood.	O	O	O	O	O
Vaccinations weaken the immune system which can lead to cancer.- - - - - -	O	O	O	O	O
Luck plays a big part in determining who gets cancer.- - - - - - - - - -	O	O	O	O	O
It is better to die whole than to let a doctor cut on your body.- - - - - - -	O	O	O	O	O
Chemotherapy and radiation work better than alternative therapies to treat cancer.	O	O	O	O	O
If air gets to a cancer during surgery, the cancer will grow faster.- - - - - -	O	O	O	O	O
Cancer is <u>not</u> caused by dirty blood.- - - - - - - - - - - - - - - - - -	O	O	O	O	O
Doctors and health professionals are the ones I would trust most to decide how to treat cancer.	O	O	O	O	O
Antibiotics weaken the immune system which can lead to cancer.- - - - - - -	O	O	O	O	O
Someone can give you cancer by putting a root on you.- - - - - - - - - -	O	O	O	O	O

(QUESTION 53 CONTINUED)

	SA	AS	(S.C.) (Not Sure)	DS	SD
People get cancer when they are tired and their resistance is down.- - - - -	O	O	O	O	O
Visualizing your body attacking cancer cells will <u>not</u> help to cure the disease.- -	O	O	O	O	O
Air getting to a cancer during surgery will <u>not</u> make it spread.- - - - - - - -	O	O	O	O	O
If you keep thinking you have cancer, you will probably get it.- - - - - -	O	O	O	O	O
Herbal remedies are more effective than medicines against cancer.- - - - - -	O	O	O	O	O
Doctors experiment with people by cutting on their cancers.- - - - - - - -	O	O	O	O	O
People with thin blood are more likely to get cancer.- - - - - - - - - - - -	O	O	O	O	O
Nothing works to cure cancer so that it never comes back.- - - - - - - - -	O	O	O	O	O
Positive feelings can help cure cancer.- - - - - - - - - - - - - - - - -	O	O	O	O	O
No matter what I do, if I am going to get cancer, I will get it.- - - - - - - -	O	O	O	O	O
If air gets in the place where the doctor cuts, then the cancer will kill you.- - -	O	O	O	O	O

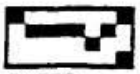
29235

INFORMATION ABOUT BREAST CANCER.

I want to ask you a few questions about any information you may have heard or seen about breast cancer <u>within the past year</u>. Please tell me <u>yes</u> or <u>no</u> for each of the following:

54. Within the past year, have you:

	Yes	No	(S.C.) (Not Sure)
Seen a television program or commercial about breast cancer?- - - - - - - -	O	O	O
Read about breast cancer in a magazine?- - - - - - - - - - - - - - - - -	O	O	O
Heard a radio program or commercial about breast cancer?- - - - - - - - -	O	O	O
Read about breast cancer in the newspaper?- - - - - - - - - - - - - - - -	O	O	O
Been to a <u>church</u> program on breast cancer or mammography?- - - - - - - - -	O	O	O
Been to a program at a <u>club or civic group</u> on breast cancer or mammography?- -	O	O	O
Been to a program on breast cancer or mammography <u>at work</u>?- - - - - - - -	O	O	O
Seen a pamphlet about breast cancer or mammography?- - - - - - - - - - -	O	O	O
Seen a video about breast cancer or mammography?- - - - - - - - - - - - -	O	O	O
Participated in any local American Cancer Society activities like Relay for Life?	O	O	O
Picked up information about breast cancer at a health fair?- - - - - - - - -	O	O	O



31236

RELIGIOSITY. Many people rely on religion when they are ill. I would like to ask you a few questions about your religious beliefs. Again, there are no right or wrong answers - we are interested in what you think about religion and health.

55. Do you attend church:

- O On a regular basis
- O Occasionally
- O Only for special events or on holidays
- O You don't attend church **(SKIP to 57)**

56. Please tell me the name of the church that you attend and where is it located?

Church Name

Church Street Address

Church town

Church State

57. Do you consider yourself to be:

- O Deeply religious
- O Somewhat religious
- O Slightly religious
- O Not at all religious **(SKIP to 60)**
- O Against religion **(SKIP to 60)**

Subject ID#

31236

58. During difficult times, do you rely on your religion:

O A great deal O Somewhat O Not very much O Not at all

59. For the next question, please tell me if you agree or disagree with each statement.

If you were told that you had breast cancer, would you believe that:

	Agree	(S.C. undecided)	Disagree
God would work through the doctors and nurses to cure your cancer.	O	O	O
You would trust more in God to cure your cancer than medical treatment.	O	O	O
You would refuse medical treatment and trust only in God to cure your cancer.	O	O	O
Only a religious miracle could cure your cancer, not medical treatment.	O	O	O
Your cancer would be because you had sinned against God.	O	O	O
It would be your responsibility to pray every day that God would cure your cancer.	O	O	O
The strength of your own faith in God would determine if your cancer was cured.	O	O	O
Your prayer alone would do nothing to cure your cancer.	O	O	O
You would want your church members to come to the hospital to pray with you.	O	O	O
Your church members praying in church would help to cure your cancer.	O	O	O
There would be a special ceremony for you in your church to cure your cancer.	O	O	O
You would not tell anyone in your church about your cancer.	O	O	O
You would not ask people in church to pray for you.	O	O	O

DEMOGRAPHICS: *I just have a few final questions to ask you about your background.*

60. What is your ethnic group or race? Would you say it is:

O African-American O Asian O Hispanic O Native American (American Indian) O White O Mixed O Other

61. What was your age on your last birthday and what is your date of birth? ☐☐ ☐☐ ☐☐ ☐☐

62. How much schooling have you completed?

O Did not go to school
O Less than 4th grade
O 4th-8th grade
O Some high school
O High school degree/GED
O Some education after high school
O College degree
O Graduate degree

63. Are you presently enrolled in school?

O Yes O No, out temporarily O No

64. Are you: O Single, never married O Married? O Separated? O Divorced? O Widowed?

If currently married, for how many years? ☐☐

{INTER: Fill in all that apply.}

65. Who lives with you now?

- O No one, lives alone
- O Husband/ male partner
- O Female partner
- O Mother/stepmother
- O Father/stepfather
- O Sister(s)
- O Brother(s)
- O Son(s)
- O Daughter(s)
- O Other(s)

.66. Including yourself, how many people live in your household? [ ][ ]

67. How many years have you lived in this community? [ ][ ]

68. Have you ever lived anywhere other than eastern NC? O Yes O No

If Yes, where did you live the longest? [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] (City, Town) [ ][ ] (State)

For how many years? [ ][ ]

69. Do you have a telephone? O Yes O No

If Yes, what is the number? ([ ][ ][ ]) [ ][ ][ ] - [ ][ ][ ][ ]

If No, is there a number where you can be reached? ([ ][ ][ ]) [ ][ ][ ] - [ ][ ][ ][ ]

31236

DEMOGRAPHICS--EMPLOYMENT/INSURANCE STATUS: ***I just have a few more questions to ask you. These are about your employment status and the resources you have available to pay for medical treatments. This information will help us know whether some people have trouble getting the health care they need.***

70. At this time are you:

- O working for pay full time **[SKIP to 72]**
- O working for pay part-time **[SKIP to 72]**
- O self-employed **[SKIP to 72]**
- O not working for pay

71. Are you:

- O retired from paid employment
- O laid off from a job temporarily
- O unemployed with disability
- O unemployed but don't have disability
- O a student
- O or have you ALWAYS been a homemaker and not worked for pay **[SKIP to 73]**

72. What is/was your job called?

31236

HEALTH INSURANCE, OTHER BENEFITS

73. What kind of health insurance do you have? Is it:

[INTER: Hand R. card #5. If two types of insurance are mentioned, fill in both. Fill in all that apply.]

O Insurance through a private company like Blue Cross

O Medicare

O The VA or CHAMPUS

O Medicaid

O An HMO or managed care plan

O Don't know **[SKIP to 75]**

O Don't have any type of health insurance **[SKIP to 75]**

74. Did you have health insurance last year for:

O the whole year O or part of the year O (S.C. not sure)

75. At any time in the last year did you not go to the doctor or get medical care because you could not afford it?

O Yes O No

FAMILY INCOME

76. Please look at this card. **{INTER: Hand R. Card #6.}** Tell me the number that comes closest to your total family income last year. I mean the total for all the people who lived in your home last year, before taxes. Be sure to count all types of money, from wages and salaries of all family members, Social Security, retirement or unemployment benefits, help from relatives and so on. Let me remind you that this information, like all your answers, will be kept completely confidential.

- O 1-under $5,000
- O 2-between $5,000 and 7,999
- O 3-between $8,000 and 11,999
- O 4-between $12,000 and 15,999
- O 5-between $16,000 and 24,999
- O 6-between $25,000 and 49,999
- O 7-over $50,000
- O 8-(S.C. don't know)
- O 9-(S.C. refused to answer)

77. How many people did this income support last year? # of people supported ☐☐

78. We plan to do these interviews again later. In case you move before then, please give us the names, addresses, and phone numbers of two people who would know how to reach you.

1. contact last name

contact first name

contact address

contact city

contact state

contact zip code -

contact telephone number

( ) -

2. contact last name

contact first name

contact address

contact city

contact state

contact zip code -

contact telephone number

( ) -

31236

HEALTH STATISTICS.

79. What is your height? ☐ ft. ☐☐ inches

80. What is your weight? ☐☐☐ lbs.

CONCLUSION

Thank you so much for taking time to talk with me today. Those are all the questions I have for you. Is there anything you would like to ask me about this project?

{INTER: RECOMMEND STRONGLY THAT THE R. SEE A DOCTOR/NURSE IF SHE HAS A LUMP OR KNOT NOW IN HER BREAST. (#27)}

Are there any comments you would like to add?

_____

_____

_____

TO THE INTERVIEWER:

Please be sure to check over the entire interview to make sure that all questions are answered and that the answers are clearly marked. Also be sure that there are no stray marks on the interview anywhere and that you have filled in the ID# at the bottom of each page.