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Breast Cancer Screening Interventions in Selected Counties Across US Regions

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Abstract

Objectives—To determine the types of, and the populations targeted by interventions implemented to increase breast cancer screening rates in counties with large African American populations across different US regions.

Methods—A brief questionnaire was administered by e-mail to county representatives from 33 states from October 2008 through March 2009. Responses were obtained from 33% of 203 targeted counties.

Results—Most counties (>80%) reported interventions for African American women and for women with low income. Women were exposed to different kinds of interventions depending on where they lived. Most counties in the Northeast (93%), Southwest (82%) and Midwest (100%) implemented interventions that provided free or low cost mammograms. Counties in the Southeast (83%) were more likely to report education interventions. Counties from the Southwest reported using a variety of interventions to encourage breast cancer screening.

Conclusion—In this selected group of counties, different types of interventions were used to increase breast cancer screening in minority and disadvantaged women. Interventions implemented were similar to those shown in the literature to be effective in increasing screening rates in specific populations. Future research should examine the use of screening interventions in a larger sample of US counties.

Keywords

Breast Cancer Screening; Interventions; Evidence-based Interventions; Disparities

Introduction

The American Cancer Society estimates that there will be about 192,370 new cases of invasive breast cancer and 40,170 breast cancer deaths in 2009 [1]. Breast cancer does not affect all women equally. For example, while it is the second leading cause of death for both White and African American women [2], the breast cancer mortality rate for African American women is higher than that of White women [3–4]. Adequate breast cancer screening allows for early detection and treatment of breast cancer and, therefore, leads to better chances of survival [5–6]. The American Cancer Society (ACS) recommends annual mammography and clinical breast examination for women 40 years or older [7]. Strategies for encouraging screening are necessary to control cancer morbidity and mortality in US communities, especially among women who traditionally have been disadvantaged and less likely to receive such preventive measure. African American women, for example, may still be at risk of receiving inadequate screening, i.e., start screening late or not receive mammograms consistently at recommended time intervals [8].

A number of interventions have been found to be effective in increasing breast cancer screening rate [9–13]. The Centers for Disease Control's (CDC) Guide to Community Preventive Services recommended several interventions for use in US communities based on evidence of effectiveness [13]. These included small media interventions, one on one education, provision of client incentives, and reduction of structural barriers or out of pocket costs. Mass media, group education and reminders, on the contrary, did not have enough evidence of effectiveness [13]. The effectiveness of these interventions varies depending on women targeted. For example, for African American and Hispanic women education interventions delivered by community health advisors were found to be effective in increasing breast cancer screening rates compared to education delivered through printed materials [14]. The use of mobile vans and cost vouchers were the most effective interventions for low income women compared to mailed letters or telephone reminders [11]. It is reasonable to expect that communities adopt the most effective interventions for the populations they target. Moreover, women of the same race/ethnicity may differ culturally and socially depending on where they live [15]. Thus, there may exist geographic variation in the types of interventions adopted for the same racial/ethnic or disadvantaged group of women.

The objective of this paper is to present data from a survey conducted in selected US counties across US regions to determine what type of interventions were implemented since 2001 to increase breast cancer screening rates. In particular, we examined the differences in types of interventions and the populations targeted. The survey was conducted as part of a larger investigation into differences among counties that have low breast cancer mortality rates and no disparities for African American and White older women, and counties with high mortality rates and disparities [16]. The subjects of our study were counties with a high number of breast cancer deaths in older African American women, a population for whom disparities in breast cancer mortality have worsened since the early 1990's [17], and for whom there may be disparities in the use of breast cancer screening.

Materials and Methods

The Institutional Review Board of the University of Alabama at Birmingham approved the study. We conducted a survey of counties selected based on the highest numbers of breast cancer deaths in African American women 65 years of age and older; i.e., counties with large African American older populations and potentially with a high need to increase efforts to reduce mortality and morbidity.

A brief questionnaire was developed to collect information on breast cancer screening interventions implemented since the year 2001. Information was collected on the targeted populations and the types of intervention implemented (Appendix). The questionnaire was developed based on the characteristics of interventions for which there was published literature in the period from 2000 to 2008. We adopted the classification used in the CDC's Community Guide [13] to group interventions as those that used client reminders, small media, mass media, group and one on one education, or those that reduced structural barriers or provided client incentives. Client reminders interventions included reminders to women overdue for screening or postcards sent on 50th birthday. Small media included printed materials, video or DVD materials. Mass media interventions included mass media campaigns (TV, newspapers, radio) and internet delivered interventions. Group education included education with lay health workers, with health professionals, with cancer survivors, and in various settings such as beauty salons, church, and clinics. One on one education interventions included telephone (cell or landline phones) or in person counseling. Interventions that reduced structural barriers included providing mobile mammography van and work site education and/or screening. Finally, client incentives included providing a free or low cost mammography delivered using coupons, special screening days, and similar programs. We further asked whether interventions contained culturally appropriate messages and whether the messages were tailored to participating women.

Potential respondents were identified from the Cancer Control P.L.A.N.E.T website (<http://cancercontrolplanet.cancer.gov/>). This site provides information to design, implement, and evaluate evidence-based cancer control programs. It also provides contact information of Program Partners, that is, individuals who can work together to create and implement cancer control plans in their communities. These include state, territorial or tribal contacts from the CDC's National Comprehensive Cancer Control Program (NCCCP), state contacts from the Commission on Cancer (CoC), and regional staff from the ACS. These organizations share the goals of reducing cancer incidence and mortality, and enhance quality of life for cancer survivors.

The survey was administered by e-mail from October 2008 through March 31, 2009. Data were collected in two phases. In the first phase, the survey was administered to state contacts. Reminders were sent twice to those respondents from whom responses were not received. In the second phase, the questionnaire was administered to regional contacts. We received responses from 15 states on 67 counties (33.0 % of the 203 targeted for this study). The states from which information was received were from five regions: Southeast (Alabama, Delaware, Georgia, Kentucky, and Tennessee), Southwest (Arkansas, Louisiana,) Midwest (Indiana, Kansas, and Missouri), West (Michigan, Minnesota, and Washington), and Northeast (New York, Pennsylvania). We also collected data from the 2000 Census to compare characteristics of counties for which we received information and counties from which we did not. These characteristics were population race/ethnicity and age, proportion of population living below the federal poverty line, and per capita income.

The data from the survey were summarized based on the region of the US where respondent counties were located (Northeast, Southeast, Southwest, Midwest, and West), the reported race/ethnicity of the populations targeted by the interventions (White, African American, Hispanic, Native American, and Asian), and the types of interventions. Frequency distribution and cross tabulations were performed.

Results

In the 67 respondent counties almost 30% of the population was African American and about 23% were women 40 years old and older (Table 1). In addition, 14% of the population

lived below the poverty line, and the average per capita income was about \$21,000 (Table 1). These counties did not differ significantly from those for which we received no response to our survey, except that respondent counties had a lower proportion of Hispanics compared to non-respondent counties (Table 1). About 37% of respondent counties were located in the Southeast, 20.6% in the Northeast, 25% in the Southwest, 5.8% in West and 11.7% in the Midwest of the US (Table 2).

Most of the counties in the Northeast (93%) reported having implemented interventions targeted at minorities and disadvantaged women (Table 2). In the Southeast, 83% reported interventions also targeted at African Americans and low income women, but fewer (41.7%) targeted at Hispanics, Native Americans, Asians, and uninsured women (Table 2). Similarly, in the Southwestern, Western and Midwestern region more than 80% of counties reported interventions targeted to African American, low income, and uninsured women. The Midwestern counties reported no interventions for senior women (Table 2).

Table 3 describes breast cancer screening interventions reported in the different US regions. Almost 93% of counties from the Northeast region reported client incentive interventions, in particular offering free or low cost mammography, and more than 70% reported the use of mammography vans. Among Southeastern counties, more than 83% reported group education interventions that used lay health workers, and more than 70% reported interventions delivered one on one (Table 3). Fewer than 50% of Southeastern counties reported interventions that reduced structural barriers or provided incentives to screening (Table 3).

In the Southwest, counties reported a wider variety of intervention types. More than 82% reported interventions that reduced structural barriers or provided client incentives. Moreover, the same proportion reported group education interventions with lay health workers and health professionals in settings such as church, clinics or other, or in person one on one counseling (Table 3). These interventions also used culturally appropriate messages tailored to each woman (Table 3).

In the Western region, all of the counties reported in person one on one counseling, and 75% reported group education interventions with lay health workers and worksite education with or without screening (Table 3). In addition, these counties reported using culturally appropriate messages (Table 3). The most frequent intervention in Midwest counties were low cost or free mammography (100%) and printed materials (75%) (Table 3). As in counties from the Northeast and the Southeast, fewer than 30% of counties in the Midwest reported using culturally appropriate messages or messages tailored to women's needs.

Discussion

Information is lacking on whether interventions that have been demonstrated to improve breast cancer screening are used in US communities and, thus, on whether women are exposed to them. We conducted a survey to identify the types of interventions implemented since 2001. We found that, in a group of counties with large African American populations, most reported interventions for African American women and for women with low income. However, women were exposed to different kinds of interventions depending on where they lived. Most counties in the Northeast, Southwest and Midwest implemented interventions that provided free or low cost mammograms. Fifty percent or less of counties in the Southeast and Southwest reported these types of interventions and were more likely to report education interventions instead. Counties from the Southwest reported using a variety of interventions to encourage breast cancer screening.

Different types of interventions have been found to be more or less effective in increasing breast cancer screening rates. The review of effectiveness studies conducted to support recommendations of the CDC Guide to Community Preventive Services found that the proportion of participants receiving mammography screening increased by 18% when reducing structural barriers (e.g. distance to screening locations or language); by 12% when reducing screening costs; by 14% when sending client reminders (e.g., letters, postcards, and phone calls); and by 7% when using small media campaigns (e.g. postcards, newsletters, and brochures) [13]. However, the effectiveness of these interventions may not be the same across diverse populations that face different challenges in obtaining screening.

A metanalysis of intervention studies that targeted minority or older women, women with low education or low income, or those living in rural areas found that using interventions that reduced structural barriers or provided client incentives combined with individual directed strategies (telephone, one on one counseling, reminders) were effective in increasing mammography rates by 27% compared to no or minimal intervention [18]. The same interventions combined with provider directed interventions, instead, increased mammography rates by 20% [18]. Most of the Northeastern counties in our survey reported using client incentives for minority and disadvantaged populations. However, most southeastern counties, where a large share of the African American population resides, reported using group education interventions with lay health workers and one on one counseling. These types of interventions have also been found effective in the targeted populations. For example, in their randomized controlled trial conducted in rural Alabama, Powell and colleagues found that group education and home visits by lay health educators increased breast cancer screening rates by 8.1% compared to no intervention [19].

The Southwest and Western regions of the US house large Hispanic and Asian populations. In these populations, culturally tailored interventions and interventions with lay health workers have been reported to be effective in increasing breast cancer screening rates [20–21]. Sauaia and colleagues reported that personalized education delivered by “promotoras” (peer counselors/lay health advocates) were effective in increasing screening in Hispanic women compared to printed materials [20]. An intervention including a culturally tailored video for Asian-American women significantly increased intention to get screened, knowledge, perceived risk of breast cancer and perceived benefits of breast cancer screening [22]. Similarly, a culturally and linguistically tailored group education for Asian American women improved their knowledge, attitude, and behavioral intention for screening [23–25]. In line with the results of these studies, we found that most counties from the Western US region reported personal or group education with lay health workers, and the use of culturally tailored messages.

In the Midwest, we found that responding counties reported free or low cost access to mammography, printed material and mass media campaign more than other types of interventions. This region not only has a large Hispanic population, but also a large Native American population for which culturally tailored group interventions were found to be effective [26]. Therefore, the use of printed materials and media campaigns may not be the evidence based method most appropriate for increasing screening rates in this region. However, even these types of interventions have demonstrated some effectiveness. Baron and colleagues found that small media campaigns increased screening rates by 7% [10].

The results of this study should be considered in the light of some limitations. First, our results may not be generalizable to all counties in a region. We only targeted counties with large African American populations; thus, in a true random sample of US counties, for example, we may find different proportions of counties that implemented interventions for African American or other disadvantaged women. In addition, the response rate was low at

33% and counties that responded may have been those that had implemented interventions in the study period; these may have been more likely to respond to our survey than those that did not implement such interventions. Moreover, the information requested may not have been readily available to potential responders who often had to obtain it from other local contacts. Therefore, counties with numerous programs in place may have been less likely to participate as they may have faced additional barriers to providing the requested information. In addition, due to limited resources we solicited responses only twice from potential responders and that may also have affected the response rate.

Second, to limit respondent burden, the questionnaire was kept brief and limited to collect information on some types of interventions. Respondents may have had information on other types of interventions that they did not report (although we provided the option to insert additional information). We did not ask about each intervention specifically or how many interventions were implemented in each county. Therefore, it may be possible that a county reported one intervention that included all components listed in the questionnaire form.

In conclusion, in this limited survey of selected US counties, we found that different types of interventions were used to increase breast cancer screening rates depending on where a woman lives, and that these interventions were among those shown in the literature to be effective in specific populations. Research is needed to collect information from a larger and more representative sample of counties, to assess the proportion of women exposed to such interventions, and ultimately to assess whether these interventions can contribute to reducing health disparities locally and nationwide.

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Table 1

Comparison of respondents and non-respondents county by population race, age, poverty and per capita income

	Respondents (n=67)	Non respondents (n=135)	P value
Total Population	37,580,155	105,401,754	
Population			
Race/ethnicity (%)			
African Americans	29.9	15.14	0.09
Hispanics	9.82	42.33	0.00*
Native Americans	0.54	0.56	0.13
Asian	4.38	4.52	0.27
Population Age (%)			
40–64 year old females	15.43	13.17	0.21
65 year and older females	7.40	5.80	0.39
Individuals living below the poverty line (%)	14.18	11.80	0.14
Income (\$)			
Per capita income	21,106	21,547	0.66

*
p<0.05

Number of counties (%) reporting breast cancer screening interventions for different target populations, by region of the US. Interventions implemented in 67 US counties since 2001

Table 2

Target population	Northeast Counties N=14	Southeast Counties N=24	Southwest Counties N=17	Western Counties N =4	Midwest Counties N=8
African Americans	92.9	83.3	82.4	100.0	100.0
Hispanics	92.9	41.7	82.4	75.0	62.5
Native Americans	64.3	41.7	0	75.0	62.5
Asians	92.9	41.7	47.1	100.0	62.5
Low Income	92.9	83.3	82.4	100.0	100.0
Uninsured	92.9	41.7	82.4	100.0	100.0
Senior/Elderly	92.9	66.7	82.4	50.0	0
Others	35.7	0	35.3	25.0	25.0

The cells do not add up to 100 as each county had more than one target population.

The cells with value 0 indicate that counties did not report interventions targeted to the specific population

Table 3

Number of counties (%) reporting breast cancer screening interventions of different types, by region of the US. Interventions implemented in 67 US counties since 2001

Types of Interventions	Northeast Counties N=14	Southeast Counties	Southwest Counties N=17	Western Counties N =4	Midwest Counties N=8
Client Reminders					
Reminders to women overdue for screening	28.6	8.3	35.3	25.0	25.0
Postcard sent on 50 th birthday	0	12.5	0	50.0	0
Small Media					
Printed materials	28.6	25.0	82.4	50.0	75.0
Video or DVD materials	0	8.3	47.1	50.0	0
Mass Media					
Media campaign (TV, newspapers, radio)	28.6	12.5	35.3	50.0	62.5
Internet delivered intervention	0	4.2	0	25.0	0
Group Education					
Education with lay health workers	28.6	83.3	82.4	75.0	25.0
Education with health professionals	28.6	41.7	82.4	25.0	25.0
Education with cancer survivors	28.6	29.2	64.7	0	25.0
Group education in beauty salons	0	0	0	0	0
Group education in church	28.6	25.0	82.4	50.0	25.0
Group interventions in clinics	0	8.3	82.4	25.0	0
Group interventions in other settings	28.6	25.0	82.4	75.0	0
One on One Education					
Telephone one on one counseling	28.6	50.0	35.3	50.0	0
In person one on one counseling	28.6	70.8	82.4	100.0	0
Cell phone delivered intervention	0	0	0	50.0	0
Reducing Structural Barriers					
Mobile mammography van	71.4	41.7	82.4	50.0	37.5
Work site education and/or screening	28.6	54.2	82.4	75.0	25.0

Types of Interventions	Northeast Counties N=14	Southeast Counties N=24	Southwest Counties N=17	Western Counties N=4	Midwest Counties N=8
Client Incentives					
Free or low cost access to mammography (coupons, special screening days, etc)	92.9	41.7	82.4	50.0	100.0
Additional characteristics					
Culturally appropriate messages	28.6	12.5	82.4	75.0	25.0
Intervention tailored to each woman	28.6	4.2	82.4	50.0	0

Are you aware of any programs to increase rates of mammography screening that have been implemented since 2001?			
Statewide Programs			
Name of program	Starting year	Contact person	Email address and phone #
Countywide Programs			
Name of program	Starting year	Contact person	Email address and phone #

Survey of Breast Cancer Screening Programs	
Overall how would you characterize the programs in your state and in these counties:	
Focus on any Special Populations (Select all that apply)	
African American	Native Americans
Hispanic/Latino	Asians
Low-Income	Seniors/Elderly
Uninsured	Other (Please specify)
Type of program (Select all that apply)	
Education with lay health workers (community health workers, community health advisors, etc)	Reminders to women overdue for screening
Education with health professionals	Postcard sent on 50 th birthday
Education with cancer survivors	Printed materials
Group education in church	Video or DVD materials
Group education in beauty salons	Internet delivered intervention
Group interventions in clinics	Cell phone delivered intervention
Group interventions in other settings	Media campaign (TV, newspapers, radio)
	Work site education and/or screening
Telephone one on one counseling	

Survey of Breast Cancer Screening Programs	
In person one on one counseling	Free or low cost access to mammography (coupons, special screening days, etc)
Culturally appropriate messages	Mobile mammography van
Intervention tailored to each woman	
other component: please specify	

The cells do not add up to 100 as each county had more than one intervention implemented

The cells with value 0 indicate that counties did not report implementing the specific intervention