

UNCLASSIFIED

AD NUMBER
ADB255427
NEW LIMITATION CHANGE
TO Approved for public release, distribution unlimited
FROM Distribution authorized to U.S. Gov't. agencies only; Proprietary Info.; Sep 99. Other requests shall be referred to US Army Medical Research and Materiel Comd., Fort Detrick, MD 21702-5012.
AUTHORITY
USAMRMC ltr, 23 Aug 2001

THIS PAGE IS UNCLASSIFIED

AD _____

Award Number: DAMD17-96-1-6271

TITLE: An Intervention Study on Screening for Breast Cancer
Among Single African-American Women Aged 65 and Older

PRINCIPAL INVESTIGATOR: Kangmin Zhu, M.D., Ph.D.

CONTRACTING ORGANIZATION: Meharry Medical College
Nashville, Tennessee 37208

REPORT DATE: September 1999

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Distribution authorized to U.S. Government agencies only (proprietary information, Sep 99). Other requests for this document shall be referred to U.S. Army Medical Research and Materiel Command, 504 Scott Street, Fort Detrick, Maryland 21702-5012.

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.

DTIC QUALITY INSPECTED 4

20000703 048

NOTICE

USING GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA INCLUDED IN THIS DOCUMENT FOR ANY PURPOSE OTHER THAN GOVERNMENT PROCUREMENT DOES NOT IN ANY WAY OBLIGATE THE U.S. GOVERNMENT. THE FACT THAT THE GOVERNMENT FORMULATED OR SUPPLIED THE DRAWINGS, SPECIFICATIONS, OR OTHER DATA DOES NOT LICENSE THE HOLDER OR ANY OTHER PERSON OR CORPORATION; OR CONVEY ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY RELATE TO THEM.

LIMITED RIGHTS LEGEND

Award Number: DAMD17-96-1-6271
Organization: Meharry Medical Center

Those portions of the technical data contained in this report marked as limited rights data shall not, without the written permission of the above contractor, be (a) released or disclosed outside the government, (b) used by the Government for manufacture or, in the case of computer software documentation, for preparing the same or similar computer software, or (c) used by a party other than the Government, except that the Government may release or disclose technical data to persons outside the Government, or permit the use of technical data by such persons, if (i) such release, disclosure, or use is necessary for emergency repair or overhaul or (ii) is a release or disclosure of technical data (other than detailed manufacturing or process data) to, or use of such data by, a foreign government that is in the interest of the Government and is required for evaluational or informational purposes, provided in either case that such release, disclosure or use is made subject to a prohibition that the person to whom the data is released or disclosed may not further use, release or disclose such data, and the contractor or subcontractor or subcontractor asserting the restriction is notified of such release, disclosure or use. This legend, together with the indications of the portions of this data which are subject to such limitations, shall be included on any reproduction hereof which includes any part of the portions subject to such limitations.

THIS TECHNICAL REPORT HAS BEEN REVIEWED AND IS APPROVED FOR PUBLICATION.

James H. Clark, Jr.
6/24/00

REPORT DOCUMENTATION PAGEForm Approved
OMB No. 074-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 1999		3. REPORT TYPE AND DATES COVERED Annual (1 Sep 98 -31 Aug 99)	
4. TITLE AND SUBTITLE An Intervention Study on Screening for Breast Cancer Among Single African-American Women Aged 65 and Older				5. FUNDING NUMBERS DAMD17-96-1-6271	
6. AUTHOR(S) Kangmin Zhu, M.D., Ph.D.					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Meharry Medical College Nashville, Tennessee 37208 E-MAIL: zhukak75@ccvax.mmc.edu				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012				10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Distribution authorized to U.S. Government agencies only (proprietary information, Sep 99). Other requests for this document shall be referred to U.S. Army Medical Research and Materiel Command, 504 Scott Street, Fort Detrick, Maryland 21702-5012.				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 Words) This is our third annual report regarding our intervention study that aims to improve the breast screening behavior among single African-American women ages 65 and older. During the period, we (1) finished post-intervention interviews, (2) conducted most follow-up interviews, and (3) entered post-intervention interview data and are entering follow-up interview data. We also finished and submitted two manuscripts based on our pre-intervention data. The intervention program will be evaluated as soon as the collection and editing of data are completed.					
14. SUBJECT TERMS Breast Cancer African-American women, breast screening, intervention, mammography				15. NUMBER OF PAGES 56	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Limited		

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102

FOREWORD

Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the U.S. Army.

___ Where copyrighted material is quoted, permission has been obtained to use such material.

___ Where material from documents designated for limited distribution is quoted, permission has been obtained to use the material.

___ Citations of commercial organizations and trade names in this report do not constitute an official Department of Army endorsement or approval of the products or services of these organizations.

N/A In conducting research using animals, the investigator(s) adhered to the "Guide for the Care and Use of Laboratory Animals," prepared by the Committee on Care and use of Laboratory Animals of the Institute of Laboratory Resources, national Research Council (NIH Publication No. 86-23, Revised 1985).

X For the protection of human subjects, the investigator(s) adhered to policies of applicable Federal Law 45 CFR 46.

N/A In conducting research utilizing recombinant DNA technology, the investigator(s) adhered to current guidelines promulgated by the National Institutes of Health.

N/A In the conduct of research utilizing recombinant DNA, the investigator(s) adhered to the NIH Guidelines for Research Involving Recombinant DNA Molecules.

N/A In the conduct of research involving hazardous organisms, the investigator(s) adhered to the CDC-NIH Guide for Biosafety in Microbiological and Biomedical Laboratories.

Kaufman-Liu

PI - Signature

9/23/99

Date

TABLE OF CONTENTS

01. Cover page	
02. SF 298	2
03. Foreword	3
04. Table of contents	4
05. Introduction.	5
06. Body	5-11
07. Key research accomplishments	11
08. Reportable outcomes	11
09. Conclusions	12
10. Appendices	13-55

INTRODUCTION

This is our third annual report regarding our intervention study that aims to increase breast screening among single (windowed, divorced, separated or never-married) African-American women ages 65 and older. To evaluate the intervention program, we need to conduct pre-intervention, post-intervention and follow-up interviews. During the past year, we were supposed to finish post-intervention interviews and start follow-up interviews. The success in completing these interviews is essential for future evaluation of the intervention program. Therefore, the past year was critical for the completion of the project.

BODY

According to the Statement of Work, the following should be completed or started at the end of the third year: (1) having finished in-person interviews at post-intervention, (2) having started follow-up interviews, (3) following-up women who moved out of the public housing complexes, and (4) having entered or being entering data from post-intervention and follow-up interviews. We have completed the work as scheduled. In addition, we have written and submitted two manuscripts resulting from the study.

1. Post-intervention interviews

In the past year, we continued conducting post-intervention interviews. Table 1 lists the final statistics including the number of women eligible for post-intervention interviews, the

number of deaths, the number of refusals, the number of women who were lost to the project, and the number of completed interviews.

We were supposed to interview 325 women who had had the pre-intervention interviews and therefore were eligible for post-intervention interviews. When we visited them, eleven women had died and 3 refused to participate despite their original consent to have all interviews. Twenty-three women moved out of the public housing complexes and were unable to locate within the time frame for the post-intervention interviews. As a result, the total number of post-intervention interviews completed was 288 (88.6% of eligible women).

Five housing complexes (J.C. Napier Homes, Hadley Park Towers, Tony Sudekum Homes, Andrew Jackson Courts, Vine Hill-Knowles) belong to the control group. Out of 163 women in the control group, 142 (87.1%) were interviewed. The completed interviews were 146 (90.1%) out of 162 women in the intervention group (John Henry Hale, Cheatham Place, Preston Taylor Homes, I.W. Gernert Homes, Edgefield Manor). Therefore, the overall participation rates for the post-intervention interviews were not substantially different between the intervention group and the control group.

Table 1. The numbers of eligible women, deaths, losses to the study, refusals, and completed interviews according to complex for post-intervention interviews

Housing Complex	# of eligible women	Deaths	Lost to the study	Refusals	Completed interviews
Hadley Towers	46	2	4	0	40
J.C. Napier Court	37	1	2	1	33
Tony Sudekum Homes	12	0	0	0	12
Cheatham Place	30	0	4	0	26
Preston Taylor Homes	22	2	1	0	19
John Henry Hale Homes	23	0	1	0	22
Andrew Jackson Court	60	2	7	1	50
I.W. Gernert	66	2	1	1	62
Edgefield Manor	21	2	2	0	17
Vine Hill-Knowles	8	0	2	0	6
Total	325	11	23	3	288

2. Follow-up interviews

In the past year, we were also supposed to start follow-up interviews with one-year interval from post-intervention interviews. Up to September 12, 1999, one hundred and seventy-nine of 288 women who had a post-intervention interview and therefore were eligible for follow-up interviews have been interviewed. Table 2 lists the number of eligible women, the number of deaths, the number of refusals, the number of women who were lost to the project, the number of completed interviews, and the number of remaining homes for visit, according to the complex. Due to the old age of the study population, 15 out of 199 women we visited died during the period. Up to now, we have been able to follow all eligible women who were alive. However, four women refused to have a follow-up interview. The current rate of follow-up interviews is 90%.

Table 2. The numbers of eligible women, deaths, losses to the study, refusals, and completed/remaining interviews, according to complex for follow-up interviews, as to September 12, 1999

Housing Complex	# of eligible women	Deaths	Loss to the study or unable to be interviewed	Refusals	Completed interviews	Remaining interviews
Hadley Towers	41	4	0	0	30	7
J.C. Napier Court	33	5	0	0	21	7
Tony Sudekum Homes	12	3	0	0	5	4
Cheatham Place	26	1	0	0	17	8
Preston Taylor Homes	19	0	1*	1	15	2
John Henry Hale Homes	22	0	0	0	16	6
Andrew Jackson Court	50	1	0	2	26	22
I.W. Gernert	62	1	0	1	44	16
Edgefield Manor	17	0	0	0	5	12
Vine Hill-Knowles	6	0	0	0	0	6
Total	288	15	1	4	179	89

*, in coma.

3. Follow-up of women who were lost to the study

Attrition is a potential problem for a prospective follow-up study. When we conducted post-intervention interviews, some women, who had a pre-intervention interview and therefore were eligible for a post-intervention interview, had moved out of the housing complexes to such as nursing homes and homes of children or relatives. This was particularly a problem for Andrew Jackson Court complex in which renovation had been started for some apartments and residents in the apartments had to move. We had made our great effort to relocate the women who moved. However, within the time frame for post-intervention interviews, some women were unable to be relocated and were therefore lost to the project, especially for Andrew Jackson Court complex. The attrition rate due to the loss to follow-up was about 7% for post-intervention interviews.

Some women who had a post-intervention interview moved out of the housing complexes before follow-up interviews. Up to now, however, we have successfully found and interviewed all these women for follow-up measurements.

4. Data entry and editing

Data from post-intervention interviews have been entered and those from follow-up interviews are being entered as the project is going on. Data cleaning and editing has been initiated recently for post-intervention data and will be performed for follow-up data after data collection is completed.

5. Submitted manuscripts

During the past year, we wrote two manuscripts based on our pre-intervention data (see appendices). One manuscript, entitled “recruiting elderly African-American women in cancer prevention and control studies: a multifaceted approach and its effectiveness”, discusses our strategies in enrolling African-American study subjects. The other manuscript, “mammography screening in single older African-American women: a study of related factors”, focuses on factors related to the use of mammography. These manuscripts have been submitted for publication.

KEY RESEARCH ACCOMPLISHMENTS

- Finished post-intervention interviews
- Conducted most follow-up interviews
- Entered or entering data from post-intervention and follow-up interviews

REPORTABLE OUTCOMES

- Manuscript on factors related to mammography use
- Manuscript on recruiting African-American women into cancer control research

CONCLUSIONS

In the past year, the project staff has finished work designated in the Statement of Work. We completed post-intervention interviews, with endeavors in following-up women who moved out of the study fields. We also have visited 199 women for follow-up interviews. The process for cleaning and editing post-intervention data has been initiated. Overall, the project has progressed well in the past year.

Currently, there are 89 women to visit. These women will be interviewed according to the time frame for post-intervention interviews. These interviews will be finished expectedly in a few months. Cleaning and editing of follow-up interview data will be implemented when all the data are collected. Once the data are cleaned and edited, we will be able to do data analysis to evaluate the effects of our intervention program on breast screening behavior among older single African-American women.

APPENDICES

1. Submitted manuscript "Recruiting Elderly African-American Women In Cancer Prevention And Control Studies: A Multifaceted Approach And Its Effectiveness"
2. Submitted manuscript "Mammography Screening In Single Older African-American Women: A Study Of Related Factors"

**RECRUITING ELDERLY AFRICAN-AMERICAN WOMEN IN CANCER PREVENTION
AND CONTROL STUDIES: A MULTIFACETED APPROACH AND ITS EFFECTIVENESS**

Kangmin Zhu MD, PhD; Sandra Hunter, BS; Louis J. Bernard, MD; Kathleen Payne-Wilks,
BS; Chanel L. Roland, BS; Robert S. Levine, MD

From Departments of Occupational and Preventive Medicine (K.Z., S.H., R.S.L., K.P., C.L.R.)
and Surgery (L.J.B.), Meharry Medical College, Nashville, TN

Address correspondence and request for reprints to Kangmin Zhu, Department of Occupational
and Preventive Medicine, School of Medicine, Meharry Medical College, 1005 D. B. Todd Jr.
Blvd., Nashville, TN 37208

Acknowledgements: This study was supported by grant DAMD17-96-1-6271 from the U.S.
Army Medical Research Acquisition Activity. The authors express their deep appreciation to
Ms. Peaches Manning and the study helpers for their invaluable support and help for the study.
The authors also thank Tina Cantrell for secretarial work.

Running title: Recruiting African-American women into research

UNPUBLISHED DATA THAT SHOULD BE PROTECTED

Barriers to engaging African Americans as research participants may be accentuated among older single African-American women partly because of financial, social, physical and cognitive factors. This article shows our multifaceted strategies and experiences in the recruitment of single African-American women aged 65 and older in a cancer prevention and control study. The study was conducted in ten public housing complexes in Nashville, Tennessee. Out of 367 eligible women, 325 participated in the study, a rate of 89%. The result suggests that a strategy, which targets the cultural, perceptive and cognitive characteristics of the population, was effective for increasing the enrollment of study subjects in this population. Since the single constitute 75% of African-American women aged 65 and older, and the incidence and mortality of cancer are especially high in elderly African-Americans, our experiences are encouraging for cancer prevention and control research in the population.

Key words: African-American women, elderly, participation, population studies, recruitment.

Incidence and mortality from many diseases are disproportionately high among African Americans. Because of these disparities, it is important to include African Americans in etiologic, pathologic and therapeutic studies. However, African Americans have been underrepresented as research participants. Researchers have observed that African Americans are less likely to participate in clinical trials that evaluate the efficacy and safety of treatment.¹⁻³ Participation may be further lowered when a study deals with preventive issues.

A number of barriers – socioeconomic, cognitive, historical and cultural- may impede the participation of African Americans in studies on disease prevention and control. For example, a substantial proportion of African Americans have low incomes, and facing day-to-day needs for food and shelter and thus less likely to take the prevention of disease as their priority.⁴ African Americans may also be more likely to believe that studies are only for those with disease.⁵ Lack of knowledge of the importance and benefits of research, mistrust of the medical care system, and ethnic differences between the researcher and potential subjects may also inhibit the participation of African Americans in studies.⁶⁻⁸ Low participation rates undermine both validity and generalizability of study results.

A few studies have explored different approaches to increasing the enrollment of African Americans in cancer prevention and control studies.^{4,9,10} In our intervention study, which aims to increase breast screening among single African-American women aged 65 and older, we also developed a recruitment strategy designed to address the potential barriers in the population. In this article, we present our strategy and its outcome.

MATERIALS AND METHODS

Study Population

This report is based on a community-based intervention study aiming to increase breast screening in older single African-American women. According to the study design, ten public housing complexes in Nashville, Tennessee, were selected and were randomly assigned to either intervention or control group (5 complexes in each group). An intervention program increasing breast screening knowledge, psychological health and support from significant others was provided for the intervention group. Pre-intervention, post-intervention and follow-up interviews were conducted at the first, second and third years of the study to evaluate the effect of the intervention program. Each interview lasted for about 25 minutes. A woman who agreed to have all three interviews and accept the intervention program (for the intervention group only) signed the consent form for participating in the study.

Public housing complexes are administered by the Metropolitan Development and Housing Agency (MDHA), Nashville, Tennessee. The primary purpose of developing public housing projects has been to provide decent, safe, and sanitary housing for low-income citizens. The range of average annual household incomes for the ten housing complexes in our study was \$5,192-\$7,439 in 1997. Study subjects were to be single African-American women aged 65 and older who lived in the public housing complexes and who did not have a history of breast cancer. "Single" was defined as divorced, widowed, separated in the past year, or never-married.

Recruitment of Study Subjects

To effectively recruit study subjects, it is important to define the characteristics of the study population and develop a recruitment strategy directed at the characteristics. African Americans differ from other groups in their culture, experiences and therefore attitudes towards participating in research as a study subject. To achieve a high participation rate of eligible women in the study, we developed a recruitment strategy including the following components that target the potential cultural, perceptive and cognitive barriers.

Using in-person communications by adopting door-to-door canvassing

In-person canvassing has been demonstrated to be the most effective way for the recruitment of women.¹² Face-to-face contacts by using research staff with the same cultural background may suggest cultural relevance of a study and increase the acceptability of the study by eligible people. In-person contacts may also enable research staff to specifically address an eligible woman's personal concerns. Morris et al. demonstrated that a high participation rate among African-Americans was greatly dependent upon personal contacts: there was a 41% increase in response after personal contacts, while the response rate was low after three mailings.¹³ Based on the lessons from previous studies and our considerations in reducing potential barriers more effectively, we adopted a strategy of door-to-door canvassing by which the research interviewer and a local study helper visited homes of potential subjects to introduce the study and obtain informed consent.

Increasing credibility of study by using a local spokesperson

To establish trust in the study population, a credible spokesperson from the target community is a very important aid for success in recruiting study subjects.⁹ Ideally, the spokesperson has a positive influence in the community, fully understands the study procedures, and supports the study. Within the MDHA system, the housing projects have a county resident association coordinator who administers and manages the public housing complexes and has frequent communications with the residents. It was the individual who became the spokesperson for the present study.

Before the study, research-team members had meetings with the resident association coordinator to discuss detailed procedures for recruiting study women. Through these meetings, we explained the study to and obtained both support and constructive input from the coordinator. The coordinator wrote a letter that indicated the importance of the study and called for eligible women to participate. With the letter and a letter from the principal investigator, the study helper and the research interviewer conducted door-to-door canvassing.

Considering cultural and ethnic sensitivity by using research staff with cultural consciousness

Due to some historical issues such as the Tuskegee Study,⁹ African Americans may feel exploited for research purposes and do not want to participate in studies. Such reluctance may be increased if the researcher and the potential subjects have different ethnic and cultural

characteristics.^{4,8} Previous studies have shown that study subjects may feel more comfortable when health educators share similar cultural patterns, values, and experience,¹⁴ and familiarity to and trust by the target population are key for gaining access to the target population.¹⁵ In this study, African Americans were well represented among research staff. They had input on the conduct of the project and conducted community outreach activities such as visiting potential subjects and interviewing the participants.

Increasing accessibility by obtaining help from local African-American residents

Safety concerns may be a cause for elderly African Americans' reluctance to participate in research.⁸ To relieve the safety concerns and reduce the possible distrust, we sought help from an African American woman who lived in the same housing complex as eligible women, and had an age as much as possible close to that of eligible women. The study helper from the complex could serve as a familiar face when the research staff-person visits identified homes, and might increase the participation rates because of women's greater belief when a woman from their housing complex is present. Safety for research staff-persons was another consideration to use a study helper.

The resident coordinator identified a woman for being a potential study helper from each complex. We talked to the woman about the study project, work procedures, responsibilities, and asked her willingness to help. An eligible woman who would work as a study helper subsequently worked among women in the complex where she resided.

Achieving good communications with study subjects by training research staff and introducing the study to women kindly, respectfully and clearly

Good and solid communication skills are critical for enrolling all human subjects, including African-Americans. Showing friendliness, compassion, warmth and concern usually increase acceptability by a woman. Such compassion and concern may be very much appreciated by disadvantaged women, especially older single African-American women, who have less familial and social support. Acceptance by a woman can in turn facilitate communications between the woman and research staff, which helps the woman's understanding of the study and study procedures. It has been known that African Americans may participate in research to reduce the risk of disease and to contribute to the well-being of their families and communities, and may refuse to participate because of misunderstanding the research.⁷ When accepted, the research interviewer can take the opportunity to clearly explain the study procedures and possible benefits to the study woman herself, her family members and next generations. The communications may reduce the woman's lack of comprehension of the significance of and procedures of a study and overcome some of the barriers to participation in a study. Therefore, we provided intensive training in building and maintaining the skills and morale of the research staff.

The training involved the skills for good communication with women, such as those in the interviewer's appearance, ways to approach women, introductory remarks, how to address women's concerns, ways to deal with difficult situations and so on. It also included interviewing/recording/editing skills, ways to introduce the study and the questionnaire, and

ways to define/clarify questions and answers. Compassion, concern and respect for eligible women, and appreciation for their help were addressed. To address concerns and answer general questions a woman may have, the research staff were also trained on the study procedures, study subjects' rights as a human being, and the basic knowledge of breast health.

Targeting perceptive barriers by providing monetary appreciation

To reduce perceptions of being treated as a guinea pig, free services and tokens of appreciation such as grocery store coupons and monetary or material incentives have been used in recruiting African Americans into studies.⁹⁻¹⁰ These incentives show study participants that their time and effort are recognized and appreciated. A study demonstrated that the incentives are appreciated by African Americans and other minorities -- they would be paid for their participation in a study.¹ Since cash can be of more use than material incentives and coupons confined to a specific store and, and therefore may be preferred,¹⁶ we give study participants \$25 for a completed interview as an appreciation for participating in our study, which was approved by the institutional review board of Meharry Medical College.

Being thoughtful of women by providing flexible time for an interview and making a repeated efforts to obtain consent

We recognized the possibility of a woman participating in a study may be influenced by her availability and mood at the time when she is approached. Therefore, we gave women freedom to choose the time for an interview. For an eligible woman who was willing to

participate and signed the consent form, an in-person interview was conducted immediately if she was available and chose to interview at that time. If a woman did not want an interview at that time, an appointment was scheduled at a more convenient time. At home visits, some women may be focusing on something such as watching TV or may be in a bad mood so that they do not want to be bothered and therefore simply say they do not want to participate. For these women, an additional home visit was done at a different time weeks later.

Figure 1 presents our recruitment strategies and procedures. In summary, MDHA provided a list of addresses of all residents ages 65 and older who lived in the housing complexes. Door-to-door canvassing was done to identify and recruit eligible women. Canvassing was conducted by a female study helper identified from the complex and a female research interviewer, both African Americans. With a letter from the resident association coordinator of MDHA and a letter from the principal investigator, the study helper and the research interviewer visited each address to identify eligible women. If a woman was eligible, the interviewer continued to introduce the study and its procedures, mentioned a monetary incentive of \$25 for a completed interview, addressed any concerns the woman might have, and obtained the woman's consent to participate in the study. After an eligible woman signed the consent form, an in-person interview was conducted or scheduled at a time that the woman felt would be convenient. An extra visit was made after several weeks to those who were not interested when initially approached.

RESULTS

Figure 2 shows the number of identified households, the number of eligible women (single African-American women aged 65 and older), and the number of eligible women who participated. There were eight hundred and twenty-nine addresses from the complexes identified as having residents aged 65 and older (including both males and females, and all ethnic groups). After excluding men, non-African-American women and African-American women who were married, there were three hundred, seventy-three households with an African-American woman who was divorced, separated, widowed or never-married. Six of the 373 single women had a history of breast cancer and were therefore ineligible for the study. Out of 367 eligible women, 325 (88.6%) participated in the study.

Table 1 shows the demographic characteristics of 325 participants in the study. About seventy percent of the participants were in the age range of 65-79. About sixty-five percent of the women were widowed, 23% were divorced or separated and 12 % were never-married. About eighty-nine percent of the women had an educational level of high school or lower and 98% had a household income of less than \$10,000. Most of the women were protestant (93.8%).

DISCUSSION

Older single African Americans may be a population that is least likely to participate in studies because of their cultural, socioeconomic, cognitive and psychological characteristics.

However, our recruitment program has been successful for the population. In a cancer prevention and control study conducted in a community comparable to ours, the participation rate of African-American women varied from 20% to 48%, depending upon different recruitment strategies.⁴ About 90% of eligible older single African-American women participated in our study. This participation rate was high, especially considering the characteristics of the population.

In-person contacts are an effective approach to recruit African Americans. In the study by Blumenthal et al.,⁴ while the participation rate was 20% when mailings and telephone calls were used, the rate was more than doubled when in-person canvassing was undertaken. In Ashing-Giwa's study,¹⁰ mailed letters and questionnaires were utilized. Despite that the target subjects were breast cancer survivors who had participated in a study before, and therefore were more willing to participate, the response rate was only 45% for African Americans. Our experience showed that in-person contacts provided women with an opportunity to ask questions and get answers. Moreover, the research staff could more clearly explain the study procedures and benefits in improving the health status of African-American women, directed at some potential barriers to participation. Through these in-person communications, the investigators achieved more support and comprehension from African Americans and therefore a high participation rate. Although in-person contacts require more time and effort due to frequent home visits, it may be worth the time for a higher participation rate and therefore the better quality of a study.

Effective in-person communications are based on cultural acceptability and good

communication skills. It has been known that the ethnic and cultural similarities between researchers and potential subjects increase recruitment success.^{4,17} All of our research staffers who directly contacted potential subjects were African-American women who shared the same cultural values. We felt that our African-American research staffers could think from the position of potential subjects, could have or obtain more knowledge of the women's beliefs and attitudes, and therefore could reduce, to a greater extent, some potential barriers to the subjects' participation. However, the positive effects of cultural acceptability are based on the investigator's considerateness and good communication skills. Without friendly and caring attitudes, investigators may not be accepted despite the ethnic and cultural compatibility. We felt that our research staffers, with their advantages in cultural harmony and training in communication skills, were successful in interacting with eligible women and contributed to the high participation rate in the study.

The use of local spokespersons and study helpers is important for the initial access to potential subjects. When a local study helper serving as a familiar face accompanied the research interviewer during door-to-door canvassing, it was easier to initiate the communication: a woman might not want to open the door when she saw, through the peephole on the door or window, the research interviewer as a stranger. The study helper also helped initiate communication between the research interviewer and the woman. The letter signed by the housing association coordinator as a local spokesperson and shown to the woman by the research interviewer enhanced the credibility of the study and further trust of potential subjects. The housing association coordinator and study helpers were very helpful in recruiting study subjects, suggesting the importance of strong affiliation and collaboration between the research

team and the community for cancer prevention and control studies.

Monetary appreciation plays a role in motivating eligible women to participate in studies.¹⁸ While some reward was given as recognition of and appreciation for the participant's effort and help, it also showed our respect to her. Money may be preferred to other incentives such as coupons or T-shirts because the study subjects can spend it for their personal prioritized needs. The amount of money should be deliberated. Underpayment may hurt the subjects' feelings by underestimating their value as a study participant. We felt that \$25 for an interview was a reasonable level for our study. The total cost would be only \$12,500 for a study enrolling 500 subjects. This is only a small portion of the budget for most population studies and hence is worth it for an improved study quality.

Conducting the interview at a time convenient for the study subjects and making a repeated home visit when needed were also useful for recruiting study subjects. This was especially feasible for our study because the majority of older women stayed at home, making it possible for us to visit them during the day. If the target population is of a younger age, the investigator may have to contact them in person in evenings or on weekends because they may work during the day. As long as the researcher can contact them in person, we believe that our multifaceted recruitment approach can also be effective in the enrollment of younger African Americans into a study since younger African-American women are more likely to participate in research than those ages 65 and older.⁸

REFERENCES

1. Robertson NL. Clinical trial participation: Viewpoints from racial/ethnic groups. *Cancer* 1994;74:2687-2691.
2. Gorelick PB, Richardson D, Hudson E, Perry C. Establishing a community network for recruitment of African Americans into a clinical trial. The African-American Antiplatelet Stroke Prevention Study (AAASPS) experience. *J Natl Med Assoc* 1996;88:701-704.
2. Harris Y, Gorelick PB, Samuels P, Bempong I. Why African Americans may not be participating in clinical trials. *J Natl Med Assoc* 1996;88:630-634.
4. Blumenthal DS, Sung J, Coates R, Williams J, Liff J. Recruitment and retention of subjects for a longitudinal cancer prevention study in an inner-city black community. *Health Serv Res* 1995;30:197-205.
5. Millon-Underwood S, Sanders E, Davis M. Determinants of participation in state-of-the-art cancer prevention, early detection/screening, and treatment trials among African-Americans. *Cancer Nurs* 1993;16:25-33.
6. Mouton CP, Harris S, Rovi S, Solorzano P, Johnson MS. Barriers to black women's participation in cancer clinical trials. *J Natl Med Assoc* 1997;89:721-727.

7. Gorelick PB, Harris Y, Burnett B, Bonecutter FJ. The recruitment triangle: reasons why African Americans enroll, refuse to enroll, or voluntarily withdraw from a clinical trial. An interim report from the African-American Antiplatelet Stroke Prevention Study (AAASPS). *J Natl Med Assoc* 1998;90:141-145.
8. Moorman PG, Newman B, Millikan RC, Tse CJ, Sandler DP. Participation rates in a case-control study: the impact of age, race, and race of interviewer. *Ann Epidemiol* 1999;9:188-195.
9. Paskett ED, DeGraffinreid C, Tatum CM, Margitic SE. The recruitment of African-Americans to cancer prevention and control studies. *Prev Med* 1996;25:547-553.
10. Ashing-Giwa K. The recruitment of breast cancer survivors into cancer control studies: a focus on African-American women. *J Natl Med Assoc* 1999;91:255-260.
11. Saluter AF, Brown RH, London PA, Scarr HA. Marital status and living arrangements: March 1993. In: U.S. Department of Commerce. *Current Population Reports*. P20-478. 1994.
12. Sung JC, Coates RJ, Williams JE, Leff JM, Greenberg RS, McGrady GA, Avery BY, Blumenthal DS. Cancer screening intervention among black women in inner-city Atlanta: design of a study. *Public Health Rep* 1992;107:381-388.

13. Morris MC, Colditz GA, Evans DA. Response to a mail nutritional survey in an older bi-racial community population. *Ann Epidemiol* 1998;8:342-346.
14. Erwin DO, Spatz TS, Turturro CL. Development of an African-American role model intervention to increase breast self-examination and mammography. *J Cancer Educ* 1992;7:311-319.
15. Dignan M, Sharp P, Blinson K, Michielutte R, Konen J, Bell R, Lane C. Development of a cervical cancer education program for native American women in North Carolina. *J Cancer Educ* 1994;9:235-242.
16. Marrett LD, Kreiger N, Dodds L, Hilditch S. The effect on response rates of offering a small incentive with a mailed questionnaire. *Ann Epidemiol* 1992;2:745-753.
17. Fitzgibbon ML, Prewitt TE, Blackman LR, Simon P, Luke A, Keys LC, Avellone ME, Singh V. Quantitative assessment of recruitment efforts for prevention trials in two diverse black populations. *Prev Med* 1998;27:838-845.
18. Gilbert E, Kreiger N. Improvement in cumulative response rates following implementation of a financial incentive. *Am J Epidemiol* 1998;148:97-99.

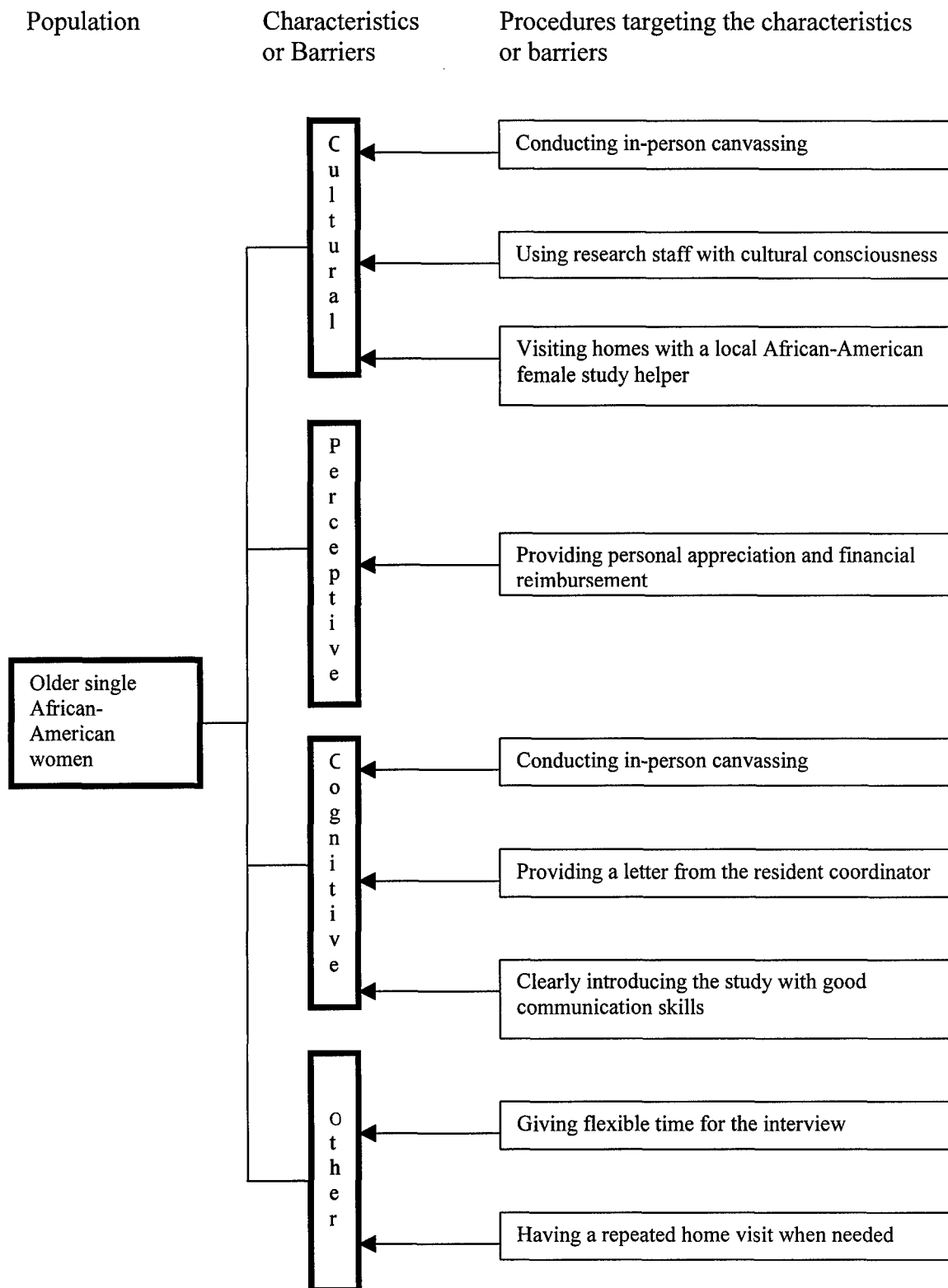


Figure 1. Characteristics of older single African-American women and procedures targeting the characteristics

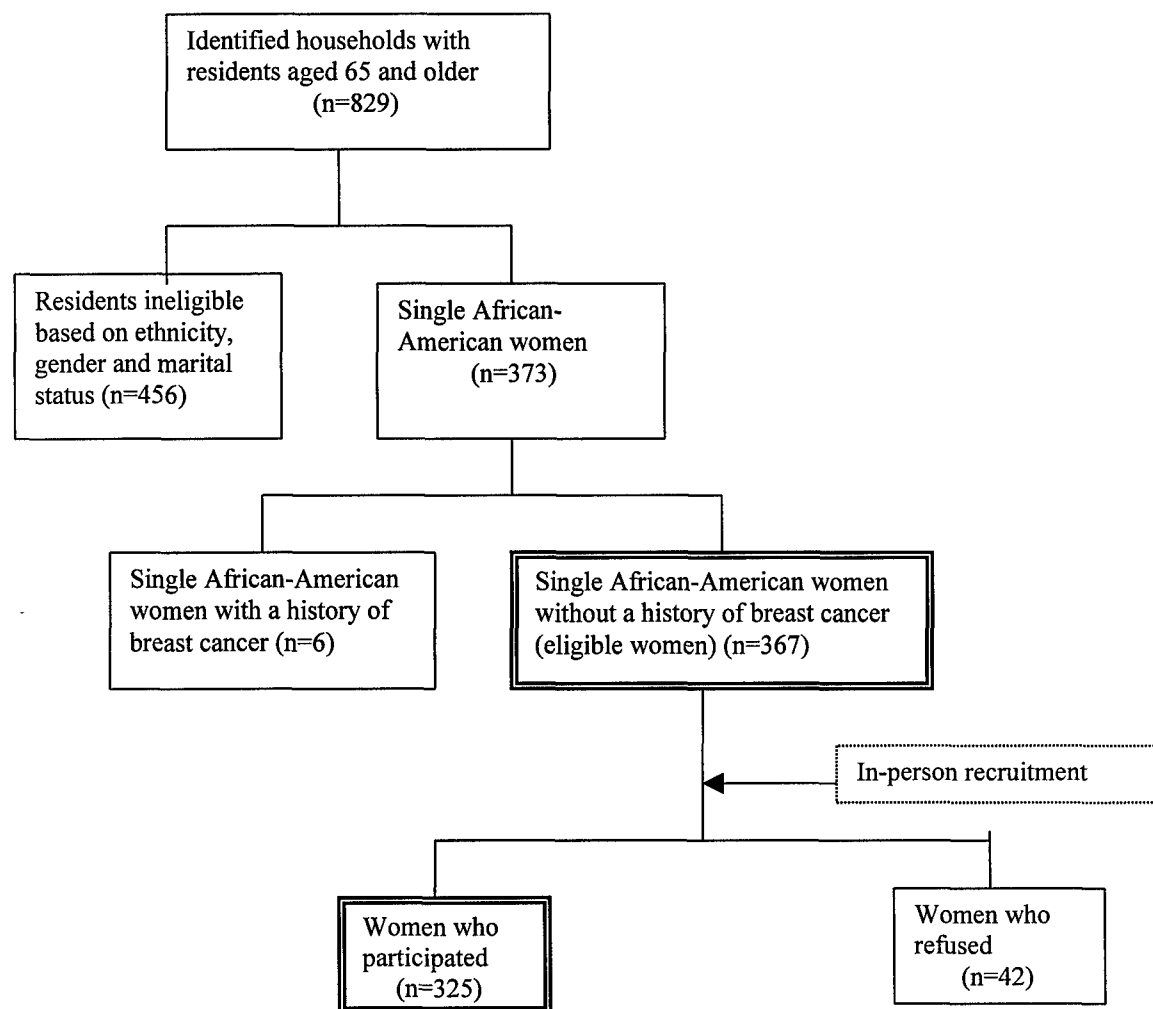


Figure 2. Identification and recruitment of eligible women

Table 1. Demographic characteristics of recruited older single African-American women, Nashville, Tennessee, 1997

Variable		Number of Participants	%
Age (year)	65-69	91	28.0
	70-74	79	24.3
	75-79	58	17.8
	80-84	54	16.6
	>=85	43	13.2
Marital status in past year	Separated	32	9.8
	Divorced	44	13.5
	Widowed	212	65.2
	Never married	37	11.4
Educational level	No schooling or elementary school	40	12.3
	Middle school	112	34.5
	High school	135	41.5
	Vocational or technical training school	12	3.7
	Some college	17	5.2
	College or higher	6	1.8
	Did not answer	3	0.9
Household income in past year	<\$5,000	176	54.2
	\$5,000-\$9,999	113	34.8
	\$10,000-\$14,999	7	2.2
	Did not answer	29	8.9
Religion	Protestant	303	93.2
	Catholic	2	0.6
	Latter Day Saint	2	0.6
	Other	15	4.6
	None	2	0.6
	Did not answer	1	0.3

MAMMOGRAPHY SCREENING IN SINGLE OLDER AFRICAN-AMERICAN WOMEN: A STUDY OF RELATED FACTORS

Kangmin Zhu MD, PhD; Sandra Hunter, BS; Louis J. Bernard, MD; Kathleen Payne-Wilks, BS; Chanel L. Roland, BS; Robert S. Levine, MD

Departments of Occupational and Preventive Medicine (K.Z., S.H., K.P., C.L.R., R.S.L.) and Surgery (L.J.B.), Meharry Medical College, Nashville, TN

Address correspondence and request for reprints to Kangmin Zhu, Department of Occupational and Preventive Medicine, School of Medicine, Meharry Medical College, 1005 D. B. Todd Jr. Blvd., Nashville, TN 37208; Telephone: 615-327-6150, Fax: 615-327-6131; E-mail: zhukak75@ccvax.mmc.edu

Running title: Factors Related to Mammography Screening

Abstract:

Objective: Using baseline data from an intervention study, we examined cognitive, psychological, social and medical care factors in relation to the use of a mammogram in the past year among single African-American women aged 65 and older.

Methods: Study subjects were 327 African-American women aged 65 and older who were divorced, widowed, separated or never-married and lived in ten public housing complexes in Nashville, Tennessee. In-person interviews were conducted to collect information on breast screening behavior, knowledge and attitude, social network and activities, emotional and psychological symptoms and signs, and medical care use.

Results: Compared with those who had not had a mammogram in the past year, women who had had a mammogram in the past year were three times more likely to have a regular doctor (95% confidence interval (CI) 2.1-7.4) and about eight times more likely to have a doctor's recommendation for a mammogram (95%CI 3.8-16.1). In addition, they were more likely to: (a). have attended an organization meeting or received educational materials on the knowledge of breast cancer; (b) agree that a woman needs a mammogram even though she has no breast problem; (c). agree that a woman can have breast cancer without having symptoms; (d). have living children and grandchildren; and (e). attend social activities more frequently. However, they worried more about the costs and radiation exposure associated with the procedure.

Conclusions: A doctor's recommendation may be the most important factor for women to have a mammogram. However, education on breast health and social networks may be influential on breast screening behavior of older single African-American women.

Key Words: African American, Attitude, Behavior, Breast Cancer, Knowledge, Mammography, Screening, Single Marital Status, Women

UNPUBLISHED DATA THAT SHOULD BE PROTECTED

Introduction

Breast cancer is the most common cancer and the second leading cause of cancer deaths among US women [1]. About one-half of the deaths from breast cancer occur in women older than 65 years [2-3]. Therefore, the problem of breast cancer is especially serious for older women. Although the effectiveness of breast cancer screening on decreasing mortality of the disease has been well demonstrated [4-5], regular breast cancer screening procedures are underused among older women [2, 6], especially older African-American women [7-9]. For older African-American women who are single, the risk of underusing breast cancer screening may be even higher because they may have less familial and social support, lower family income, and more psychological and behavioral obstacles.

Common barriers to breast screening include cognition-related, economy-related, social-support-related and medical care-related factors. Cognitive barriers include lack of knowledge, incorrect beliefs, and negative attitudes to breast screening. Studies have shown that women aged 65 years and over are less knowledgeable about their vulnerability to breast cancer [10] and their needs of breast screening [11]. African-American women with less use of screening also lack related knowledge [12]. Among older African-American women, those who felt fear of detection of cancer, and embarrassment or discomfort about the procedure were less likely to accept mammography [13]. Poverty is an economy-related barrier. A study among African-American women showed that women who had a household income less than \$10,000 were 20-30% less likely to have a mammogram, compared with those with a household income more than \$20,000 [14]. Although mammography screening are now covered by Medicare and Medicaid, economic disadvantage may still influence on the use of mammography [15]. Social support-related

barriers may also be important for older African-American women. The combination of aging, disease, and poverty common in this population may produce enmeshment of physical difficulties, limited social/familial activities and economic difficulty. Therefore, older women have less access to information sources about screening and have more difficulties getting to screening sites [2,16]. A survey of 1184 women ages 45-75 also showed that social interaction is associated with the ever use of mammography [17]. Lack of physician's recommendation is a major physician/medical care-related barrier. Women who did not have a physician's recommendation for a mammogram are much less likely to have one [18,19]. Fewer physicians' recommendations are obvious for older African-American women [2]: 65% of African-American women ages 70 and over were never recommended by a physician to have a mammogram, compared with 43% among white women in the same age group [14].

For single older African-American women, single marital status may bring about additional barriers to breast cancer screening in addition to the barriers related to older age and African ethnicity. This may be due to (1) lack of support and help from spouse in spirits and routine life, (2) fewer economic resources [20], (3) distress and depression because of loneliness due to loss of the spouse [21-22], and (4) less interactions with their social network [20] and less social support as a result of restricted physical mobility, loss of the spouse and the withdrawal from previous social relations. Therefore, older single African-American women may be less motivated, advised, and helped to seek mammography.

Although many barriers to breast screening have been described, profiles of barriers may differ depending upon cultural, psychological and physiological characteristics [23-28]. However, breast screening behavior among older single African-American women represents an important

gap in the peer reviewed literature. Using data from single African-American women aged 65 and older living in the public housing complexes, the present study examines cognitive, economic, social, psychological and medical-care factors in relation to the use of mammography in the population.

Materials and Methods

This study was conducted in public housing complexes administered by the Metropolitan Development and Housing Agency (MDHA), Nashville, Tennessee. The primary purpose of developing public housing projects has been to provide decent, safe, and sanitary housing for low-income citizens. The range of average annual household incomes for the ten housing complexes of this study was \$5,192-\$7,439 in 1997. Study subjects were single African-American women ages 65 and older who lived in the ten public housing complexes and who did not have a history of breast cancer. The single was defined as those who were divorced, widowed, separated and never-married in the past year of the study.

MDHA provided a list of addresses of all African-American ages 65 and older who lived in the housing complexes. Door-to-door canvassing was done to identify and recruit eligible women. Canvassing was conducted by a female study helper and a female research interviewer, both African-Americans. The study helper resided in public housing and was in the age close to study subjects. With a letter from the resident association coordinator of MDHA and a letter from the principal investigator, the study helper and the research interviewer visited each address to identify eligible women. If a woman was eligible, the interviewer further introduced the study and its procedures, mentioned a monetary incentive of \$25 for a completed interview, and obtained the

woman's consent to participate in the study. When an eligible woman signed the consent form, an in-person interview was conducted as soon as possible. If an individual at the address was not home at the visit, subsequent visits were made to identify the eligibility. Out of 364 eligible women, 324 participated in the study (89.0%).

In-person interviews were conducted for data collection. Information collected included: (1) Use of breast cancer screening procedures (clinical breast examination, mammography and breast self-examination), (2) demographic variables (age, ever married or lived-as-married status, marital status in the past year, educational level, household income, and religion preference), (3) social and familial factors (number of children, grandchildren, close relatives and close friends; frequency of telephone calling the children/grandchildren, relatives or friends, willingness of the children/grandchildren, relatives or friends to provide financial help or care when needed; frequency of attending social activities; going shopping and going to religious places), (4) medical care factors (having a medical insurance, a regular medical facility, and a regular doctor; distance between home and the regular medical facility; availability of transportation for visiting a doctor; seeing a doctor regularly; and the regular doctor's or other doctors' recommendations for a mammogram), (5) knowledge, attitudes and beliefs on breast health (usefulness of mammograms, need of a mammogram without a breast problem, possibility of having breast cancer without symptoms, curability of breast cancer if caught early, screening for breast cancer making women worry, treatment worse than the disease, spread of cancer by an operation, concerns on cost/radiation/discomfort due to mammography, fear of finding cancer, stopping having a mammogram due to the concerns, likelihood to get a mammogram next year, risk of getting breast cancer, information about breast health through media or from family members/relatives/friends, and meeting attended or educational materials received last year), (6) history of benign breast

disease and history of breast cancer in relatives (mother, daughter and sisters) and friends, and (7) emotional and psychological symptoms and signs (sad or blue, poor appetite, weight loss/gain, trouble falling asleep, sleeping too much, loss of energy, easily fatigue, feeling tired, loss of interest or pleasure, feeling guilty or down, feeling worthless, feeling lonely, irrational fear of illness, poor concentration, slowing of thinking, trouble making decisions, being unable to sit still, slowing down physically, and thoughts of ending life).

We compared women with a mammogram in the past year and those without. The frequency distribution for each factor was calculated and the variables with statistically significant differences between the two groups are presented in tables 2-7 below. To control for potential confounders by demographic variables, we used logistic regression to calculate odds ratio estimates and their 95% confidence intervals [29]. Some demographic variables (marital status in the past year, educational level, household income and religion) were not associated with the use of mammography in our data, probably because of small variations in the distribution or the lack of the effects. Therefore, we only adjusted for age and ever-married/lived-as-married status in the analysis. When communication with and support from children/grandchildren, relatives or friends were analyzed, however, an additional adjustment was made for the number of children/grandchildren, relatives or friends, respectively.

Results

Table 1 shows the demographic characteristics of women with and without a mammogram in the past year. Women who did not have a mammogram in the past year tended to be older and were more likely to be never married, compared with those who underwent such a procedure.

However, the two groups of women did not differ significantly in marital status, educational level, household income or religion preference.

The use of mammography in the past year is associated with ever use of the procedure and the use of other breast screening procedures (table 2). Women with a mammogram in the past year were more likely to be an ever user of the procedure, and more likely to have had a breast clinical examination or self-examination. While almost all women with a mammogram had ever heard about the procedure, 18% of women without a mammogram in the past year had never heard of it. The differences between the two groups were shown by the odds ratio estimates adjusted for age and ever-married/lived-as-married status.

Social and familial factors that may be related to the use of mammography are listed in table 3. Women with a mammogram in the past year were more likely to have children or grandchildren, attend social activities, and go to church, compared with those without a mammogram. However, they were less likely to have a child or grandchild living in the household. The two groups were not different in other social/familial factors including communications with and help from children/grandchildren, relatives and friends, although more relatives were considered to be definitely willing to help in the mammogram group.

As shown in Table 4, a doctor's recommendation for having a mammogram is strongly associated with use of mammography. After adjustment for age and ever-married status, women with a mammogram in the past year were about 6 and 4 times more likely to have their regular doctor's and some other doctors' advice on mammography, respectively, compared with those who did not have the procedure; they were also 3 times more likely to have a regular doctor, to see

a doctor regularly, and to visit a doctor more frequently. However, the distance from home to a regular medical facility did not affect the women's behavior on seeking a mammogram: those who got an examination actually seemed to live farther from the medical facility. Finally, more women with a mammogram in the past year had a health insurance.

Data concerning cognitive factors are presented in Table 5. More women with a mammogram in the past year agreed that: mammography is useful for early detection of breast cancer; a woman can have the disease without any symptoms; and a woman needs a mammogram before getting a breast problem. These women were less likely to stop having a mammogram due to concerns about the procedure, and more likely to get a mammogram in the next year. They were also more likely to get information about breast health through the media, organization meetings or distributed educational materials and the information made them more likely to get a breast examination. Less women with a mammogram thought that the risk of breast cancer is higher for women aged 65 and over, but few participants knew the correct answer, regardless of mammography status. More than 69% of all women believed that surgery can spread cancer, 74% thought that looking for breast cancer makes a woman worry and 49% thought that treatment of breast cancer is worse than the disease itself (data not shown).

History of breast cancer in the first-degree relatives and history of breast lumps were positively associated with the use of mammography in the past year (table 6). However, there were generally no significant and consistent differences in emotional and psychological symptoms and signs between women with and without the procedure (data not shown).

Discussion

This study was based on interviews and therefore information about the use of mammography might not be accurate due to the old age of our study subjects. However, the effects of this inaccuracy might not be material because we only asked the use in the past year. Furthermore, any such inaccuracies would result in the misclassification between women with and without a mammogram in the past year and thus only dilute rather than amplify the real differences in study factors between the two groups. Therefore, the associations with mammography use of the factors we identified would be actually stronger.

Demographic variables associated with increased risk of not having a mammogram in the past year included increasing age and never-married status in our single older African-American women. As shown in some previous studies, women aged 65 years and older used significantly less screening mammography, compared with younger women [11,31,32]. According to the 1987 National Health Interview Survey, the proportions of women who ever had a mammogram were 41-42%, 35% and 25% for the age of 40-64 years, 65-74 years, and 75 years and older, respectively [2,14]. This tendency was shown when mammography performed in the past year was used as a measure [31,32] and when each ethnic group was analyzed separately. Such age/mammogram relation was confirmed in single African-American women aged 65 and over in our study. Our study also found that women who did not have a mammogram were more likely to have never been married or lived as married, having been consistent with a previous study [15,32]. The results suggest that African-American women who were never-married or lived as married may be at highest risk of underusing mammography while older African-American women with other single marital statuses may be at higher risk compared with married counterparts. The

results may imply that there are more barriers for never-married/never-lived-as-married women, such as less intention to have a preventive care due to lack of children (see below).

The most important non-demographic factor for getting a mammogram seems physicians' recommendations in this study. A previous study showed that 60-75% of racial differences in mammography use were attributed to physician recommendation [35]. Our study did confirm the importance of physician recommendation for single older African-American women. Whether there are a usual source of care [36] and whether one visits a doctor for care [34] are also positively associated with the use of mammography, probably as a result of more physician's recommendations. However, the distance to the regular medical facility was not positively related to the use of mammography. This may imply that as long as a woman is determined to seek a mammogram, the distance may not be a factor to impede such behavior. Other access barriers such as cost and medical insurance were not very influential because almost all women had medical insurance and most insurance programs cover the cost for mammography now.

Possible barriers in knowledge, beliefs and attitude among African-American women include lack of knowledge of mammography, lack of knowledge of breast cancer and its treatment, lack of perceived vulnerability, and fear of abnormal results [13,37-39]. Our study demonstrated that older single African-American women with a mammogram in the past year were more likely to believe that (1) mammography is useful, (2) a woman can have breast cancer without any symptoms, (3) breast cancer can be cured if caught early. These women were more likely to have heard of breast cancer or breast examination. The results suggest that some knowledge, attitudes, and beliefs are predictors of mammography behavior and educational programs to increase knowledge on breast health are imperative for this population. For other measures such as

whether surgery spreads cancer, whether the risk is higher for women aged 65 and older, and whether treatment is worse than the disease itself, a high percentage of women both with and without a mammogram lacked sound knowledge and beliefs. Improvement in these aspects is also important.

The familial and social support network may be very important for older African-American women to get a breast examination because of their physical difficulties, economic difficulties and less access to information sources. Social network score, based on number of confidants, close friends and close relatives, frequency of contact with them, and church attendance, was positively associated with mammography use in older African-American women [7]. Another study found that significant others could positively influence an African-American woman's intention to have a mammogram [33]. Our study did not show the effects of the communications with and help from children/grandchildren, close relatives and close friends on an older single African-American woman's behavior in having a mammogram. However, the existence of living children and grandchildren and attending social or religious activities were related to the use of mammography whereas. The significance of living children or grandchildren may reflect the women's beliefs that their health status matters to their children or grandchildren [34]. The positive effects of attending social or religious activities found in our study may be related to more information sources.

Our results suggest several issues that may be important for future intervention programs targeting older single African-American women. First, a physician's recommendation is very influential probably because older African-American women display complete confidence in their doctor. The fact that about half of those without a mammogram did not get such a

recommendation suggest that physicians should be advised to pay attention to this population in the recommendation of mammography. Second, education or information specifically on breast health may be better delivered by children or grandchildren, because older single African-American women may seek preventive care for the sake of their children or grandchildren. Third, education on cognitive barriers should be an important component for future intervention programs in this population, because a high percentage of older single African-American women do not have basic knowledge, correct attitudes and beliefs on breast cancer and breast screening.

Single (widowed, divorced, separated and never-married) women constitute 75 percent of African-American women aged 65 and older [30] and breast screening is least used among older African-American women [7,8]. Therefore, targeting the barriers specific to this population will be significant for improving the use of mammography among older single African-American women and therefore important for improving the health status of older U.S. women as a whole.

Acknowledgements

This study was supported by grant DAMD17-96-1-6271 from the U.S. Army Medical Research Acquisition Activity. The authors express their appreciation to Ms. Peaches Manning and the study helpers for their invaluable support and help for the study. The authors also thank Yuan Gu for data entry and part of preliminary analysis and Tina Cantrell for secretary work.

References

1. American Cancer Society. Cancer Facts & Figures - 1995. Atlanta: American Cancer Society, Inc., 1995.
2. Rimer BK. Improving the use of cancer screening for older women. *Cancer* 1993;72:1084-7.
3. Dewar MA, Hall K, Perchalski J. Cervical cancer screening: past success and future challenge. *Primary Care* 1992;3:589-606.
4. Day NE. Screening for breast cancer. *Br Med Bull* 1991;47:400-15.
5. Glasziou PP. Meta-analysis adjusting for compliance: the example of screening for breast cancer. *J Clin Epidemiol* 1992;45:1251-6.
6. Smith RA, Haynes S. Barriers to screening for breast cancer. *Cancer* 1992;69:1968-78.
7. Kang SH, Bloom JR. Social support and cancer screening among older black Americans. *JNCI* 1993;85:737-42.
8. Roberson NL. Breast cancer screening in older black women. *Cancer* 1994;74:2034-41.
9. Preston JA, Scinto JD, Ni W, Wang Y, Galusha D, Schulz AF, Petrillo MK. Mammography underutilization among older women in Connecticut. *J Am Geriatr Soc* 1997;45:1310-4.
10. Rimer BK, Ross E, Cristinzio CS, King E. Older women's participation in breast screening. *J Gerontol* 1992;47:85-91.
11. Costanza ME. Breast cancer screening in older women: synopsis of a forum. *Cancer* 1992;69:1925-31.
12. Jepson C, Kessler LG, Portnoy B, Gibbs T. Black-white differences in cancer prevention knowledge and behavior. *Am J Public Health* 1991;81:501-4.
13. Burack RC, Liang J. The acceptance and completion of mammography by older black women. *Am J Public Health* 1989;79:721-6.
14. Ackermann SP, Brackbill RM, Bewerse BA, Sanderson LM. Cancer screening behaviors among U.S. women: breast cancer, 1987-1989, and cervical cancer, 1988-1989. *MMWR* 1992;41:17-34.
15. Martin LM, Wingo PA, Calle E, Heath C, Jr. Comparison of mammography and Pap test use from the 1987 and 1992 National Health Interview Surveys: Are we closing the gaps? *Am J Prev Med* 1996;12:82-90.
16. Costanza ME, D'Orsi CJ, Greene HL, Gaw VP, Karellas A, Zapka JG. Feasibility of universal screening mammography: lessons from a community intervention. *Arch Intern Med* 1991;151:1851-6.
17. Zapka JG, Stoddard AM, Costanza ME, . Breast cancer screening by mammography: utilization and associated factors. *Am J Public Health* 1989;79:1499-1502.
18. Grady KE, Lemkau JP, McVay JM, Reisine ST. The importance of physician encouragement in breast cancer screening of older women. *Prev Med* 1992;21:766-80.
19. Danigelis NL, Worden JK, Mickey RM. The importance of age as a context for understanding African-American women's mammography screening behavior. *Am J Prev Med* 1996;12:358-66.
20. Arens DA. Widowhood and well-being: an examination of sex differences within a causal model. *Int J Aging Hum Dev* 1982-83;15:27-40.
21. Porcino J. Psychological aspects of aging in women. *Women Health* 1985;10:115-22.
22. Chatters LM. Subjective well-being evaluations among older black Americans. *Psychol Aging* 1988;3:184-90.
23. Pearlman DN, Rakowski W, Ehrich B, Clark MA. Breast cancer screening practices among black, Hispanic, and white women: reassessing differences. *Am J Prev Med* 1996;12:327-37.

24. Glanz K, Resch N, Lerman C, Rimer BK. Black-white differences in factors influencing mammography use among employed female health maintenance organization members. *Ethn Health* 1996;1:207-20.
25. Womeodu RJ, Bailey JE. Barriers to cancer screening. *Med Clin North Am* 1996;80:115-33.
26. Taplin SH, Montano DE. Attitude, age, and participation in mammographic screening: a prospective analysis. *J Am Board Fam Pract* 1993;6:13-23.
27. Caplan LS, Wells BL, Haynes S. Breast cancer screening among older racial/ethnic minorities and whites: barriers to early detection. *J Gerontol* 1992;47:101-10.
28. Harper AP. Mammography utilization in the poor and medically underserved. *Cancer* 1993;72(4 Suppl):1478-82.
29. Hosmer DW Jr, Lemeshow S. Applied logistic regression. New York: John Wiley & Sons, 1989.
30. Saluter AF, Brown RH, London PA, Scarr HA. Marital status and living arrangements: March 1993. In: U.S. Department of Commerce. Current population Reports. P20-478. 1994.
31. Rimer BK. Interventions to increase breast screening: lifespan and ethnicity issues. *Cancer* 1994;74:323-8.
32. Calle EE, Flanders WD, Thun MJ, Martin LM. Demographic predictors of mammography and pap smear screening in US women. *Am J Public Health* 1993;83:53-60.
33. Burnett CB, Steakley CS, Tefft MC. Barriers to breast and cervical cancer screening in underserved women of the District of Columbia. *ONF* 1995;22:1551-7.
34. Danigelis NL, Roberson NL, Worden JK, Flynn BS, Dorwaldt AL, Ashley JA, Skelly JM, Mickey RM. Breast screening by African-American women: insights from a household survey and focus groups. *Am J Prev Med* 1995;11:311-7.
35. O'Malley MS, Earp JA, Harris RP. Race and mammography use in two North Carolina counties. *Am J Public Health* 1997;87:782-6.
36. Pearlman DN, Ehrich B, Rakowski W, Clark MA. Breast cancer screening practices among black, Hispanic, and white women: reassessing differences. *Am J Prev Med* 1996;12:327-37.
37. Coyne CA, Hohman K, Levinson A. Reaching special populations with breast and cervical cancer public education. *J Cancer Edu* 1992;7:293-303.
38. Bloom JR, Grazier K, Hodge F, Hayes WA. Factors affecting the use of screening mammography among African-American women. *Cancer Epidemiol Biomarker Prev* 1991;1:75-82.
39. Champion V, Menon U. Predicting mammography and breast self-examination in African American women. *Cancer Nurs* 1997;20:315-22.

Table 1. Demographic characteristics of older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)
Age (year)	65-69	36 (24.2)	53 (30.5)
	70-74	34 (22.8)	45 (25.9)
	75-79	22 (14.8)	36 (20.7)
	80-84	30 (20.1)	24 (13.8)
	>=85	27 (18.1)	16 (9.2)
Ever married or lived as married	No	20 (13.4)	14 (8.0)
	Yes	129 (86.6)	160 (92.0)
Marital status in past year	Separated	13 (8.7)	18 (10.3)
	Divorced	20 (13.4)	24 (13.8)
	Widowed	96 (64.4)	115 (66.1)
	Never married	20 (13.4)	17 (9.8)
Educational level	No schooling or elementary school	16 (10.8)	23 (13.4)
	Middle school	58 (39.2)	54 (31.4)
	High school	61 (41.2)	73 (42.4)
	Vocational or technical training school	3 (2.0)	9 (5.2)
	Some college	7 (4.7)	10 (5.8)
	College or higher	3 (2.0)	3 (1.7)
Household income in past year	<\$5,000	80 (59.3)	94 (59.1)
	\$5,000-\$9,999	52 (38.5)	61 (38.4)
	\$10,000-\$14,999	3 (2.2)	4 (2.5)
Religion	Protestant	142 (95.3)	160 (92.5)
	Catholic	1 (0.7)	1 (0.6)
	Latter Day Saint	1 (0.7)	1 (0.6)
	Other	5 (3.4)	9 (5.2)
	None	0 (0.0)	2 (1.2)

Table 2. Breast cancer screening procedures in older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Ever had a clinical Breast examination	No	35 (23.5)	4 (2.3)	Reference
	Yes	114 (76.5)	170 (97.7)	12.1(4.0-35.8)
Clinical breast examinations in the past year	None	60 (54.1)	5 (3.0)	Reference
	1 exam	31 (27.9)	106 (62.7)	45.3(16.4-125.2)
	2-12 exams	20 (18.0)	58 (34.3)	40.6 (13.5-121.7)
Ever heard of mammogram	No	27 (18.2)	3 (1.8)	Reference
	Yes	121 (81.8)	168 (98.2)	12.0(3.5-41.1)
Ever had a mammogram	No	75 (51.0)	0 (0.00)	Reference
	Yes	72 (49.0)	174 (100.0)	-
Breast self examinations	No	49 (33.1)	36 (20.8)	Reference
	Yes	99 (66.9)	137 (79.2)	1.8(1.1-3.1)

¹Odds ratios adjusted for age and ever-married/lived-as-married status; ² 95% confidence interval.
-, Approximately infinite.

Table 3. Social and familial factors in older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Number of children	None	63 (42.3)	42 (24.1)	Reference
	1-2	35 (23.5)	65 (37.4)	2.4(1.4-4.3)
	3-4	26 (17.4)	30 (17.2)	1.5(0.7-2.9)
	>=5	25 (16.8)	37 (21.3)	1.8(0.9-3.5)
Number of grand- children	None	54 (36.5)	42 (24.6)	Reference
	1-5	36 (24.3)	61 (35.7)	1.9(1.0-3.5)
	6-10	31 (20.9)	26 (15.2)	0.9(0.5-1.8)
	>=11	27 (18.2)	42 (24.6)	1.6(0.8-3.2)
Children or grand- children living in household	No	78 (80.4)	122 (91.0)	Reference
	Yes	19 (19.6)	12 (9.0)	0.4(0.2-.0.9)
Frequency of attending social activities in past year	None	87 (59.2)	75 (43.6)	Reference
	1-2 times/yr	15 (10.2)	17 (9.9)	1.3(0.6-2.8)
	3-6 times/yr	21 (14.3)	41 (23.8)	2.4(1.3-4.5)
	1-3 times/mon	24 (16.3)	39 (22.7)	1.8(1.0-3.3)
Frequency of going to religious places	None	27 (18.8)	20 (11.9)	Reference
	<1 month	18 (12.5)	10 (6.0)	0.7(0.3-1.8)
	1/month	15 (10.4)	12 (7.1)	0.9(0.3-2.5)
	1/bi-weekly	13 (9.0)	26 (15.5)	2.2(0.9-5.4)
	weekly	71 (49.3)	100 (59.5)	1.8(0.9-3.5)

¹Odds ratios adjusted for age and ever-married/lived-as-married status; ² 95% confidence interval.

Table 4. Medical care factors in older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Have a regular doctor	No	35 (23.8)	18 (10.3)	Reference
	Yes	112 (76.2)	156 (89.7)	2.7(1.4-5.0)
The regular doctor advised mammogram	No	57 (52.8)	23 (14.8)	Reference
	Yes	51 (47.2)	132 (85.2)	6.1(3.4-11.1)
See a doctor regularly	No	38 (25.5)	18 (10.4)	Reference
	Yes	111 (74.5)	155 (89.6)	2.8(1.5-5.2)
Any other doctors advised mammogram	No	95 (66.4)	58 (33.3)	Reference
	Yes	48 (33.6)	116 (66.7)	3.9(2.4-6.3)
Frequency of visiting a doctor in past 5 years	None or 1/year	23 (15.5)	4 (2.3)	Reference
	1-5 times/year	82 (55.4)	106 (60.9)	7.3(2.4-22.2)
	>=1-2 times/ month	41 (27.7)	59 (33.9)	7.8(2.5-24.6)
	Don't know	2 (1.4)	5 (2.9)	9.7(1.6-59.4)
Miles to usual Source of Medical care	<=1 mile	16 (12.0)	15 (9.3)	Reference
	2-3 miles	34 (25.6)	28 (17.3)	1.0(0.4-2.3)
	4-5 miles	38 (28.6)	41 (25.3)	1.2(0.5-2.8)
	6-7 miles	4 (3.0)	4 (2.5)	0.9(0.2-4.6)
	8-9 miles	16 (12.0)	47 (29.0)	3.8(1.5-9.6)
	10-20 miles	25 (18.8)	27 (16.7)	1.3(0.5-3.3)
Have medical Insurance	No	7 (4.7)	0 (0.0)	Reference
	Yes	141 (95.3)	172 (100.0)	-

¹Odds ratios adjusted for age and ever-married/lived-as-married status; ² 95% confidence interval; -, Approximately infinite.

Table 5. Knowledge, attitudes, and beliefs on breast health in older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Mammography is useful	Very useful	69 (46.3)	114 (65.5)	Reference
	Somewhat	27 (18.1)	32 (18.4)	0.7(0.4-1.3)
	Not very	13 (8.7)	6 (3.4)	0.3(0.1-0.8)
	Do not know	40 (26.8)	22 (12.6)	0.4(0.2-0.7)
A woman can have breast cancer without symptoms	Strongly agree	16 (10.7)	39 (22.4)	Reference
	Agree	67 (45.0)	95 (54.6)	0.6(0.3-1.2)
	Disagree	22 (14.8)	12 (6.9)	0.2(0.1-0.6)
	Strongly disagree	5 (3.4)	8 (4.6)	0.7(0.2-2.3)
	Do not know	39 (26.2)	20 (11.5)	0.2(0.1-0.5)
A woman does not need a mammogram unless she gets a breast problem	Strongly agree	22 (14.8)	20 (11.5)	Reference
	Agree	57 (38.3)	56 (32.2)	1.1(0.5-2.2)
	Disagree	49 (32.9)	68 (39.1)	1.3(0.6-2.7)
	Strongly disagree	7 (4.7)	21 (12.1)	2.6(0.9-7.5)
	Do not know	14 (9.4)	9 (5.2)	0.7(0.2-1.9)
Breast cancer can be cured if caught early enough	Strongly agree	25 (16.8)	45 (25.9)	Reference
	Agree	99 (66.4)	107 (61.5)	0.7(0.4-1.2)
	Disagree	9 (6.0)	10 (5.7)	0.6(0.2-1.8)
	Strongly disagree	1 (0.7)	1 (0.6)	0.6(0.0-9.7)
	Do not know	15 (10.1)	11 (6.3)	0.5(0.2-1.2)
Concerns on cost, radiation, discom- fort or fear of finding cancer stop having a mammogram	Yes	14 (9.8)	4 (2.3)	Reference
	No	129 (90.2)	169 (97.7)	0.2(0.1-0.6)
Other concerns stop having a mammogram	Yes	12 (8.3)	3 (1.7)	Reference
	No	132 (91.7)	171 (98.3)	0.2(0.1-0.7)

Table 5. continued

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Getting a mammogram next year	Very likely	32 (21.5)	121 (69.5)	Reference
	Somewhat	36 (24.2)	18 (10.3)	0.1(0.1-0.3)
	Not very	12 (8.1)	7 (4.0)	0.2(0.1-0.4)
	Not likely	50 (33.6)	15 (8.6)	0.1(0.0-0.2)
	Do not know	19 (12.8)	13 (7.5)	0.2(0.1-0.4)
Heard of breast examination in past year	No	42 (28.2)	33 (19.0)	Reference
	Yes	105 (70.5)	140 (80.5)	1.6(0.9-2.7)
	Not sure	2 (1.3)	1 (0.6)	0.6(0.1-6.7)
Attended a meeting or received materials on breast cancer in past year	No	131 (87.9)	127 (73.0)	Reference
	Yes	17 (11.4)	47 (27.0)	2.8(1.5-5.3)
	Not sure	1 (0.7)	0 (0.0)	0.0
Things you heard or got made you more likely to get a breast examination	No	96 (64.4)	61 (35.1)	Reference
	Yes	43 (28.9)	108 (62.1)	4.1(2.5-6.7)
	Not sure	10 (6.7)	5 (2.9)	0.9(0.3-2.7)
Who is more likely to get breast cancer	<65	16 (10.7)	20 (11.5)	Reference
	>65	12 (8.1)	6 (3.4)	0.4(0.1-1.3)
	Age makes no difference	97 (65.1)	137 (78.7)	0.9(0.4-1.9)
	Don't know	24 (16.1)	11 (6.3)	0.3(0.1-0.9)

¹Odds ratios adjusted for age and ever-married/lived-as-married status; ² 95% confidence interval.

Table 6. History of breast lumps and family history of breast cancer in older single African-American women with and without having had a mammogram in the past year, Nashville, Tennessee, 1997

Variable		Women without a mammogram in the past year (%)	Women with a mammogram in the past year (%)	OR ¹ (95%CI ²)
Ever had breast lumps	No	140 (94.6)	156 (90.2)	Reference
	Yes	8 (5.4)	17 (9.8)	1.8(0.8-4.4)
Breast cancer in 1 st degree relatives	No	120 (90.2)	122 (80.8)	Reference
	Yes	13 (9.8)	29 (19.2)	2.0(1.0-4.0)

¹Odds ratios adjusted for age and ever-married/lived-as-married status; ² 95% confidence interval.



DEPARTMENT OF THE ARMY
US ARMY MEDICAL RESEARCH AND MATERIEL COMMAND
504 SCOTT STREET
FORT DETRICK, MARYLAND 21702-5012

REPLY TO
ATTENTION OF:

MCMR-RMI-S (70-1y)

23 Aug 01

MEMORANDUM FOR Administrator, Defense Technical Information
Center (DTIC-OCA), 8725 John J. Kingman Road, Fort Belvoir,
VA 22060-6218


SUBJECT: Request Change in Distribution Statement

1. The U.S. Army Medical Research and Materiel Command has reexamined the need for the limitation assigned to the technical reports listed at enclosure. Request the limited distribution statement for these reports be changed to "Approved for public release; distribution unlimited." These reports should be released to the National Technical Information Service.

2. Point of contact for this request is Ms. Judy Pawlus at DSN 343-7322 or by e-mail at judy.pawlus@det.amedd.army.mil.

FOR THE COMMANDER:

Encl


PHYLLIS M. RINEHART
Deputy Chief of Staff for
Information Management

Reports to be Downgraded to Unlimited Distribution

ADB241560	ADB253628	ADB249654	ADB263448
ADB251657	ADB257757	ADB264967	ADB245021
ADB263525	ADB264736	ADB247697	ADB264544
ADB222448	ADB255427	ADB263453	ADB254454
ADB234468	ADB264757	ADB243646	
ADB249596	ADB232924	ADB263428	
ADB263270	ADB232927	ADB240500	
ADB231841	ADB245382	ADB253090	
ADB239007	ADB258158	ADB265236	
ADB263737	ADB264506	ADB264610	
ADB239263	ADB243027	ADB251613	
ADB251995	ADB233334	ADB237451	
ADB233106	ADB242926	ADB249671	
ADB262619	ADB262637	ADB262475	
ADB233111	ADB251649	ADB264579	
ADB240497	ADB264549	ADB244768	
ADB257618	ADB248354	ADB258553	
ADB240496	ADB258768	ADB244278	
ADB233747	ADB247842	ADB257305	
ADB240160	ADB264611	ADB245442	
ADB258646	ADB244931	ADB256780	
ADB264626	ADB263444	ADB264797	