Literature Review
and
Key Informant Assessment
of
Effective Strategies to
Increase Breast and Cervical Cancer Screening
in Women Aged 40-64

for
the Colorado Women's Cancer Control Initiative
at the
Colorado Department of Public Health and Environment

Nancy E. Spencer, MSPH
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Abstract

Introduction: Despite the existence of medical, public health and community efforts to increase breast and cervical cancer screening, many women in Colorado do not adhere to recommended screening guidelines. Several interventions have been used to increase screening, but many have not been formally evaluated and as a result, the effectiveness of these is unclear. Given additional but limited resources, effective and cost-effective interventions must be identified to reach those who have never been screened and those who are sub-optimally screened, including women aged 40-64, especially women aged 50-64, women of color, those with disabilities, lesbians, and hard to reach urban and rural women.

Methods: A review and evaluation of professional literature, scientific reports and documents was conducted to determine the evidence-based effectiveness of interventions to increase breast and cervical cancer screening; consultations were also held with key informants to identify their opinions about interventions; and findings were summarized with recommendations for local implementation.

Results: The combined evidence from systematic reviews suggests that for both breast and cervical cancer screening, reminders, invitations, education, access enhancing and multi-component interventions are effective. For breast cancer screening, sociologic-network-home visits and mass media alone have limited effectiveness; the use of educational materials alone is not effective. For cervical cancer screening, sociologic-network-home visits are also effective; educational materials alone have limited effectiveness; mass media alone is not effective. None of the systematic reviews and few primary studies included strategies specifically designed for lesbians or women with disabilities. Highlights of effective primary studies provide details on intervention planning, design, implementation and evaluation; these can be used to assist decision making and potential adoption. Key informants corroborated the overall evidence-based findings and emphasized that efforts can be enhanced through partnerships with local coalitions, community agencies and groups, and influential individuals.

Discussion and Recommendations: Strategies identified as effective are recommended for local implementation and should be used first; those with limited effectiveness should be used with caution; their use warrants justification and formal evaluation; ineffective strategies used alone should be avoided. Selection of strategies should also take into consideration population characteristics and preferences, the availability of expertise and resources, effectiveness and cost-effectiveness, and the feasibility of implementation. No matter which strategies are used, care should be taken to continue to work collaboratively with existing partners and coalitions and to develop relationships with important partners that are not yet involved. Areas for future exploration include identifying evaluations that had not yet been conducted at the time of this review; this would be especially important for identifying effective interventions for lesbians and women with disabilities. Next steps include assessing report results and in collaboration with others, translating the evidence into practice.

Summary of Effectiveness and Recommendations for Local Implementation

(See Methods for Literature Review-Definition of Effectiveness, Literature Search Results, and Discussion of Evidence-Based Findings and Recommendations for Local Implementation for additional detail on the development of these recommendations.)

Screening Type	**Strategies that are effective** **Recommended** **Use first**	**Strategies with limited effectiveness** **Use with caution** **Justify and evaluate**	**Strategies that are not effective** **Not recommended** **Do not use alone**
Breast	Reminders Invitations Education Access Enhancing Multi-Component	Sociologic-Network-Home Visits Mass Media	Educational Materials
Cervical	Reminders Invitations Education Sociologic-Network-Home Visits Access Enhancing Multi-Component	Educational Materials	Mass Media

Introduction

The Healthy People 2010 national objectives for women's health include increasing to 70% the proportion of women aged 40 years and older who have received a mammogram within the preceding 2 years (from the 1998 baseline measure of 67%), and increasing to 90% the proportion of women aged 18 years and older receiving a Pap test within the preceding 3 years (from the 1998 baseline measure of 79%) (U.S. DHHS, 2000). Progress had been made toward reaching these objectives, especially with mammography, as indicated by the 2000 National Health Interview Survey which reported that 70.1% of surveyed women $\geq$40 years of age had received a mammogram in the previous two years (Swan, 2003). Less progress has been made in Pap testing, as indicated in the same survey which estimated that 82.4% of women aged $\geq$25 (a smaller, older age group than that specified in the 2010 objective) had received a Pap test in the previous 3 years.

Since its inception in 1991, the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), which helps low-income, uninsured, and under-served women receive screening, and through its grantees, including the Colorado Women's Cancer Control Initiative (CWCCI), has contributed to reaching these goals. In the first five year period of 1991-1995, NBCCEDP supported 273,337 first round screening mammograms; during the second five year period the program supported 596,117; for Pap tests, the figures for the same time periods were 370,335 and 654,609 (CDC-NBCCEDP, 2005). In 2004 alone, 10,206 Colorado women were screened through CWCCI and its local health and community partners (CDPHE, 2005).

Despite the overall increases in screening, disparities in screening practices still exist within important subpopulations of women. U.S. women least likely to have had a mammogram in the past two years and those least likely to have had a Pap test in the past three years are those without health insurance, without a usual source of health care and women who immigrated to the U.S. within the past 10 years (Swan, 2003). Additional characteristics of under-utilizers include lower levels of education and income, having a chronic disability or being in the Latino(a), Asian or Native American population.

Diffusion of innovation theory suggests that when a new practice enters a population, it is communicated over time through its members, who exhibit a range of adopter characteristics including innovators, early adopters, early majority adopters, late majority adopters and laggards (Rogers, 1984). In Colorado, the reported percentage of 70% of women in compliance with mammography screening recommendations suggests that diffusion of innovation with regard to mammography use has reached all but the late majority adopters and laggards (Crane, 1998). This trend is also probably true for Pap test use. Characteristics of late majority adopters include pressure from peers, skepticism and caution; those of laggards include lack of opinion leadership, isolation, a point of reference in the past, suspicion of innovations, perception that the innovation-decision process is lengthy, and limited resources (Rogers, 1984). Interventions designed to address these characteristics and barriers will likely be necessary to improve cancer screening behavior in late majority adopter and laggard women.

The Transtheoretical model (TTM), which posits that behavior change is most likely to occur when process of change strategies are applied at the appropriate stage of change (i.e., pre-contemplation, contemplation, preparation, action, maintenance) (Prochaska, 1992), has been

used successfully for many health issues such as tobacco cessation. A recent systematic review of applying the TTM to cancer screening behavior found that using TTM-matched interventions for breast cancer screening is suggestive, but more evaluations need to be conducted (Spencer, 2005).

Recently, the passage of Colorado House Bill 1262 (the implementation of tobacco taxes for health-related purposes) will allow even more women, up to 7,500 more each year, to be screened through CWCCI (CDPHE, 2005). While additional resources are available, they must be applied in the most efficient way. To do this will require the identification of strategies that have proven to be effective. While several interventions are already used to increase screening, many have not been formally evaluated and as a result, the effectiveness of these is unclear.

Therefore, this analysis was conducted to identify effective inreach and outreach strategies to increase breast and cervical cancer screening in Colorado women aged 40-64, with an emphasis on women aged 50-64 and women of color, those with disabilities, lesbians, hard to reach women, those who have never been screened and those who are sub-optimally screened. The review was designed to be broad enough to identify effective strategies that may exist to increase the uptake of other types of preventive health screening, but that have applicability in the area of breast and cervical cancer screening. The specific goals were to 1) review and evaluate professional literature, scientific reports and documents, including systematic reviews and primary studies conducted to determine the effectiveness of interventions to increase breast and cervical cancer screening, 2) obtain opinions about intervention effectiveness from key informants and 3) summarize evidence-based findings with recommendations for local implementation.

Methods for Literature Review

Electronic Searches

The primary mechanism used to identify appropriate citations for review and inclusion was by searching PubMed. Within PubMed, Clinical Queries searches were also conducted to find citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences and guidelines. PubMed's e-mail service to receive updated results on saved searches was also used to maintain search currency.

Searches were also conducted using the Related Articles feature for promising citations identified in PubMed; by searching for additional citations of authors that predominated in the search results; and by reviewing secondary references, i.e., those listed in articles selected for review.

Electronic searches of the Cochrane Library (includes the Cochrane Database of Systematic Reviews [DSR], the Database of Abstracts of Reviews of Effectiveness [DARE] and the NHS Economic Evaluation Database [NHS EED]), available onsite at the University of Colorado at Denver and Health Sciences Center (UCDHSC) Denison Memorial Library, were conducted.

The following websites were also searched to identify additional (i.e., not duplicative) effective strategies that were not already identified through the methods listed above: Agency for Health Care Research and Quality (AHRQ) (www.ahrq.gov), American Cancer Society

(www.cancer.org), Cancer Control Planet (cancerplanet.cancer.gov), Google (www.google.com), Guide to Community Preventive Services (systematic reviews and evidence based recommendations) (www.thecommunityguide.org), National Cancer Institute (NCI) (www.nci.nih.gov) and NCI Research-Tested Intervention Programs (cancercontrol.cancer.gov/rtips). Results from all types of searches were documented.

Search Terms

The search terms listed below were used to ensure that the literature search most successfully, but efficiently, identified inreach and outreach strategies that are the most likely to increase breast and cervical cancer screening in women aged 40-64.

Medical Subject Heading (MeSH) terms: Breast neoplasms, cervix neoplasms, community health aides, community health planning, community-institutional relations (closest MeSH term to outreach), community networks, diffusion of innovation, disabled persons, health promotion, homosexuality-female, mammography, mass screening, persuasive communications, social networks, vaginal smears, workplace. Some of these terms were identified through a review of the MeSH terms used in promising articles.

Text words: Advertise, breast cancer, brief intervention, cervical cancer, direct mail, harm reduction, health worker outreach, improving access, incarcerated, inreach, jail, lesbian, outreach, outreach screening, Pap test, promote, promotora, navigation, recruitment, risk communication, screening, social marketing, STD clinic.

Methods to Obtain Full-Text Articles

Articles were obtained by downloading both free and pay per view online text, by making copies from the UCDHSC Denison Memorial Library print collection and by e-mailing authors for a reprint. Copies of all articles were provided to the CWCCI program.

Article Selection

Articles identified using the search strategy described above were considered for review if they were published from 1990-2005, in the English language, involved human subjects, were applicable to the U.S. health care system and were one of the following publication types: clinical trial, meta-analysis, practice guideline, randomized controlled trial, or review (see Appendix A for a glossary of research terms used in this literature review). Both review articles and primary studies needed to address increasing the uptake of breast, cervical or other types of preventive health screening in the population of interest (women aged 40-64, with an emphasis on women aged 50-64 and women of color, those with disabilities, lesbians, hard to reach women, those who have never been screened and those who are sub-optimally screened). Interventions used to encourage individuals to be screened were included (e.g., invitations, reminders, education, educational materials, sociologic-network-home visit, access-enhancing, mass media, multi-component; see Appendix B for the complete Definitions of Interventions). Systematic reviews and primary studies were excluded if they primarily targeted providers (e.g., physician education). Primary studies were included if they were experimental or quasi-experimental in design and reported on the outcomes of interest, screening by mammography or Pap test. Primary studies that reported pre- and post-intervention data on both intervention and control groups were considered of the highest quality but those that reported prospective follow-

up with or without a control group were also considered for review. Excluded from potential review were systematic reviews and primary studies that primarily focused on women ≥65 years of age or Medicare recipients, those that did not contain outcome data, reported only on clinical breast exam (CBE), breast self exam (BSE), process evaluation, client satisfaction or change in knowledge or attitude as the outcome measures, or only included descriptions of programs or results of focus groups. Also excluded were studies on the follow-up of abnormal mammogram or Pap test results and those that had low applicability within the U.S. health system.

The search strategy identified well over 300 articles for potential review and using the inclusion/exclusion criteria this number was further reduced. Because of the very large number of remaining articles and documents, focus was placed on systematic reviews, highlighting especially effective interventions (primary studies) identified within them, and including additional effective primary studies that were conducted after inclusion dates of the systematic reviews. An effort was additionally made to identify effective interventions for all populations and subpopulations of interest in Colorado. Meeting all criteria and included in the final review were 14 systematic reviews and 20 primary studies. All included citations are listed in the References section.

Data Abstraction

All included systematic reviews and primary studies were summarized using standard abstract sheets, specific to each type of article. Both included reference citation, health screening issue studied, type and purpose of study, inclusion and exclusion criteria, population characteristics, location(s), outcomes measured, analyses conducted, findings, discussion and recommendations, implications for implementation and additional comments. Systematic review abstracts also included the interventions examined, number of studies identified and components of the most effective interventions. Primary study abstracts also included intervention and control conditions, interventionists, assignment to intervention or control, recruitment and data collected.

Definition of Effectiveness

For this review, interventions showing positive results (i.e., increased screening significantly) as reported by more than 50% of systematic reviews were considered effective. Interventions showing positive results by exactly 50% of systematic reviews and/or showing negative results (i.e., did not significantly increase screening) by exactly 50% or more of systematic reviews were considered to have limited effectiveness. Interventions showing negative results as reported by more than 50% of systematic reviews were considered not effective.

Methods for Involving Key Informants

To identify local opinion on the usefulness of strategies for increasing breast and cervical cancer screening, consultations were held with key informants knowledgeable in the field of breast and cervical cancer screening or who were representatives of agencies providing other types of services for at risk women. The main questions for discussion were: What does/doesn't seem to work to get women already in care/not in care screened?; If you personally could do more to get women screened, what would you do or what would you recommend?; In your opinion, how well do specific interventions work (a listing of interventions used was provided)?; What other general recommendations would you have for recruiting and retaining more women into screening?; and What agencies or community groups serving women 40-64, especially those 50-

64, should breast and cervical cancer screening programs start working with to increase screening in these women? Appendix C lists the Discussion Points used to obtain the input, but discussions were flexible enough to be tailored toward the type of expertise the key informant had. CWCCI Coordinators across Colorado were identified by the CWCCI program manager and the independent contractor identified additional subject matter experts. Input was obtained through a very informal process which used a combination of phone, e-mail, fax and in person visits, based on the preferences of each key informant. Participants were asked to specify whether they wanted their individual comments to remain anonymous or connected with their name. Handwritten notes were taken during each interview and predominating themes and recommendations were later aggregated into a written summary of results.

Literature Search Results

Systematic reviews

Of the 14 systematic reviews included, 7 focused on breast cancer screening, 3 focused on cervical cancer screening and 4 included both; some included meta-analysis where possible. One (Ellis, 2003) was a review of existing systematic reviews. Another review (Task Force, 2001) consisted of U.S. Preventive Services Task Force recommendations for cancer screening interventions and rated the existing evidence as strong, sufficient or insufficient (not enough evidence existed to make a determination about effectiveness). Publication dates ranged from 1998-2003 and most primary studies contained in the reviews had been conducted in the U.S. or the United Kingdom, but several were conducted in Australia; other locations included Canada, Singapore, New Zealand and Taiwan. The systematic reviews included inreach and outreach studies with many of the target populations of interest in Colorado. Many reviews cited studies with women who were Caucasian, African-American, Latina, Asian or Native American. However, none of the systematic reviews focused on strategies specifically designed for rural women, lesbians or women with disabilities.

Interventions addressed by the systematic reviews included reminders, invitations, education, educational materials, sociologic-network-home visits, access-enhancing, mass media and combinations of approaches. Many systematic reviews used the terms “Reminder” and “Invitation” interchangeably and it was often difficult to tell which strategy was being described. However, since the two strategies differ in their targets and methods and in that reminders are typically used as an inreach strategy for those who are due or late for screening and invitations are typically used as an outreach strategy for inviting women from the general population for a first round screening, these results are reported separately.

The outcome measure used most often in the systematic reviews was screening by mammography or Pap test, either by self-report or by a review of medical, radiology or pathology records or medical claims. While each systematic review had a specific method for measuring effectiveness, most defined effectiveness as a statistically significant higher uptake of screening in the intervention group when compared to controls.

Results are listed below by intervention type for breast and cervical cancer screening separately. More detail on each systematic review can be found in Systematic Review Summaries (Appendix D) and in full-text copies of the articles.

Reminders

Breast cancer

Ten reviews examined reminders, including mailed letters or phone calls or a combination of the two. All 10 reported that patient reminders were effective in increasing attendance for screening. Four reviews (Ellis, 2003; Forbes, 2002; Sin, 1999; Wagner, 1998) found that appointments with reminder letters were more effective than reminders only; Sin and Ellis found that endorsement by the provider did not increase the uptake; Sin reported that phone counseling was more effective than a second reminder letter; Wagner found phone and mailed reminders to be equally effective.

One review contained a meta-analysis of cost data. Costs for follow-up letters to those who had previously received a letter with an appointment were $23.88 per woman screened, and $26.81 for those provided a follow-up phone call, but only $10.98 for follow-up letters to those who had received a letter without an appointment. One study found follow-up reminder costs for mail reminders and phone counseling to be $3.25 and $5.86, respectively.

Cervical cancer

Five reviews examined reminders, and all reported them to be effective. Ellis (2003) found that mailed letters increased the rate of screening but lower increases were noted in studies of lower socio-economic groups than in those looking at mixed populations. Forbes (2002) reported that reminder letters for those not overdue were effective in eight of nine studies; letters with fixed appointments were more effective than letters with open appointments, but there were mixed results when comparing phone with letter invitations (one favored letters and the other favored phone). Stone (2002) found that patient reminders consistently improved the outcome of cervical cancer screening. The Task Force (2001) recommended client reminders based on strong evidence. Yabroff (2003) found that reminders alone were effective, with phone reminders having the largest effect. They also found a phone call reminder from a health educator to be effective, but generic mailed educational information with reminders was not.

Invitations

Breast cancer

In the 10 reviews evaluating reminders, only one (Wagner, 1998) provided sufficient detail to separate out the effectiveness of invitations (i.e., direct mail) to community screenings. This review determined that invitations are effective. The effectiveness of invitations in non-U.S. studies that sampled from voter registration lists was extensively greater in intervention groups than in controls; the effect of this approach was also higher than the effects inside care settings in the U.S.

Cervical cancer

Only one review examined invitations and it reported positive results. Black (2002) found that invitation letters were effective; one study required a centralized registry to identify potential participants and the other study used direct mailing to women in intervention and control locations.

Education

Breast cancer

Seven reviews examined educational interventions, and all reported that educational interventions were effective. One review (Bonfill, 2001) reported that patient training (education) with direct reminders was effective. Jepson (2000) reported that three of five group education interventions for mammography and/or Pap test use yielded positive results. Two reviews (Stone, 2002; Ellis, 2003) reported that patient education was effective but did not describe the most effective components. One review (Task Force, 2001) determined that one-on-one education was effective but that there was insufficient evidence to be able to determine whether group education was effective. In two reviews (Yabroff, 1999; Yabroff, 2001) generic education was not effective but theory-based education was.

Cervical cancer

Five reviews examined educational interventions; three reported positive results; one reported mixed results and one reported no effect. Forbes (2002) showed that educational interventions were effective in five of six studies but it was difficult to determine which specific educational methods were more effective than others. In addition, this review found educational interventions using lay health workers for communities of color promising but reported that results may vary by ethnic group. Jepson (2000) found that group education was more effective than receiving printed materials. Stone (2002) reported education as effective but did not describe effective components. Ellis (2003) found patient education to be effective in one review and in one of three additional primary studies. Yabroff (2003) showed that using a generic educational strategy in an intervention targeting both patients and providers had no effect.

Educational Materials

Breast cancer

Six reviews examined educational materials interventions; only one reported positive results and another reported mixed results. The Task Force (2001) indicated that sufficient evidence existed to recommend the use of small media for increasing breast cancer screening. Ellis (2003) found in two studies that mailed materials, in combination with an invitation to screening were effective, but another intervention that used printed materials was not. Jepson (2000) found that printed materials had no effect in eight of nine mammography interventions; however, a videotape for low income Latina and African-American women shown in a waiting room was effective. In two studies, using general leaflet drops was not effective (Sin, 1999). Theory-based cognitive interventions (education) delivered statically such as by videotape were not effective (Yabroff, 1999; Yabroff, 2001).

Cervical cancer

Four reviews examined educational materials interventions and only one reported positive results; one reported mixed results and two reported no effect. Black (2002) reported improvements in Pap test use in one intervention using an educational video with Cambodian women; this intervention was delivered by lay health educators. Forbes (2002) reported that a video/slide presentation was effective, but that none of the printed materials studies showed any significant positive effect; two of them favored the control over the intervention. Ellis (2003) reported that in three studies within one review, print, audio visual and group education had no effect. Jepson (2000) showed that printed materials had no statistically significant effect in Pap

test interventions, but one educational video was effective, but a tape-slide presentation in the waiting area within a different study had no effect.

Sociologic-Network-Home Visits

Breast cancer

Eight reviews examined sociologic-network interventions, including home visits. Four reported positive results, one had mixed results and three reported no effect for these types of interventions. Direct contact interventions such as those using home visits by link workers, phone calls and counseling by peers were determined to be effective by Denhaerynck (2003). Ellis (2003) reported that patient-directed sociologic-network interventions such as those delivered through peers, friends, lay health advisors and media representations were effective. In both Yabroff reviews (1999 and 2001), sociologic interventions were effective when delivered as inreach or outreach and when delivered interactively, such as through peers, friends or lay health advisors. Jepson (2000) reported that 2 interventions for breast and cervical cancer combined showed positive results, but 4 of 5 home visit interventions for mammography uptake were not effective. Bonfill (2001) reported that two home visit studies showed no positive effect. Legler (2002) showed that social network interventions had an effect, but it did not reach statistical significance. In one review (Sin, 1999) none of five social network directed studies were effective.

Cervical cancer

Five reviews examined sociologic-network-home visit interventions and all reported positive results. Black (2002) found that interventions using lay health educators or community volunteers for individual or group approaches were effective. Forbes (2002) found that two face to face home education visit studies showed positive intervention effects and one of these was significant but there was no difference between groups receiving either community living skills education or cancer screening information from a community lay worker. Jepson (2000) reported that two home visit studies conducted by lay health educators for women of color for breast and cervical cancer combined and one for cervical cancer screening only showed positive results; home visits with a video were no more effective than home visits with a brochure. Stone (2002) identified that a key feature for increasing the effectiveness of interventions was using social influence (i.e., interventions delivered through valued members of a social group). Yabroff (2003) found most sociologic interventions, including those using lay health workers, to be effective.

Access-Enhancing

Breast cancer

Five reviews examined access-enhancing interventions and all reported that they were effective. All reviews within the Jepson review (Jepson, 2000) identified access-enhancing interventions to be effective, especially when used in combination with other interventions. Stone (2002) found that financial incentives, such as reducing or eliminating co-pays, to be the most effective of all strategies examined. Legler (2002) found the same results and cited several effective components including mobile mammography vans, vouchers for mammography, same-day appointments, sign-up followed by a same day mobile van, help with appointment scheduling, free mammograms, dependent care and help navigating through the health system. The Task Force (2001) found sufficient evidence to recommend both access-enhancing interventions and client

incentives (i.e., those that reduce client costs and structural barriers) for increasing breast cancer screening. Yabroff (1999) found that two interventions providing financial incentives increased screening.

Cervical cancer

Three reviews examined access-enhancing interventions and all reported that they were effective. Ellis (2003) found that removal of financial barriers was shown to be effective for cervical cancer screening in two studies of general preventive screenings. Forbes (2002) did not identify any access-enhancing interventions for increasing the uptake of initial screening but in a study of abnormal Pap tests, transportational incentives were effective. Stone (2002) found that across all screening services (including non-breast and cervical cancer screening), patient financial incentives were the most effective interventions.

Mass Media

Breast cancer

Four reviews examined the use of mass media alone; two reported positive results and two reported mixed results. Legler (2002) found mass media campaigns to have a positive effect. Yabroff (1999) reported that sociologic interventions delivered interactively that used media representations of appropriate screening behavior were effective. Ellis (2003) and Jepson (2000) both reported mixed results with one review showing a positive effect but the other showing stronger effects in community intervention towns than in media-promoting towns.

Cervical cancer

Three reviews examined the use of mass media alone and none reported positive results. Black (2002) found that only one of four mass media only interventions was effective; it targeted a sub-population with language-specific material. Ellis (2003) determined that media campaigns offered no positive effect in being up to date on cervical cancer screening tests. Yabroff (2003) found that the one study relying on mass media for presenting positive role models did not increase testing.

Multi-Component

Breast cancer

Seven reviews examined studies using multiple components and six reported positive results; one additional review initially reported no effect but recommended multi-component interventions in the discussion section. Ellis (2003) reported that in eight reviews, combinations had an increased effect; the strongest combinations were access-enhancing with individual directed and access-enhancing with system directed approaches. Legler (2002) found that multiple strategies were more effective than single ones but it was difficult to determine which combinations were the strongest. Stone (2002) found that a singularly effective intervention paired with another effective intervention yielded significantly positive results, but that two weak interventions combined did not yield any more positive results than when used alone. The Task Force (2001) recommended multi-component interventions for breast cancer screening based on strong evidence. Yabroff (2001) found that approaches that combine inreach and outreach to be effective, especially those using both outreach and theory-based educational components delivered interactively, and both patient and provider interventions (i.e., lay health educators, theory-based church based educational programs, reminders, mass media, visual prompts in

exam rooms, chart reminders). Sin (1999) found the single multi-component strategy showed no intervention effect (checking addresses of non-attenders and sending reminder letters), but recommended multi-strategy approaches for inner city populations.

Cervical cancer

Six reviews examined studies using multiple component interventions and all reported positive results. Black (2002) determined that all of the studies that used mass media campaigns with other strategies were effective. Ellis (2003) found several effective multi-component reminder programs (invitation letter from provider plus education, invitation letter plus follow-up with health educator, physician reminder plus individual invitation) but found mixed results with patient letter plus computer generated letter. Jepson (2000) found three of four combination interventions to be effective. Yabroff (2003) reported that two of three studies that used sociologic/behavioral/cognitive approaches showed significant positive effects; one used lay health workers, educational pamphlets and financial incentives. The Task Force (2001) recommended multi-component interventions for breast cancer screening based on strong evidence. As indicated above under breast cancer screening, Stone (2002) found that a singularly effective intervention paired with another effective intervention yielded significantly positive results, but that two weak interventions combined did not yield any more positive results than when used alone.

In summary, the combined evidence from systematic reviews suggests that for both breast and cervical cancer screening, reminders, invitations, education, access enhancing and multi-component interventions are effective. For breast cancer screening, sociologic-network-home visits and mass media alone have limited effectiveness; educational materials alone are not effective. For cervical cancer screening, sociologic-network-home visits are also effective; educational materials have limited effectiveness; mass media alone is not effective. Effective interventions were all more effective than either no intervention or usual care.

Results of Website Searches

Website searches identified very few evaluations not already identified through the primary search strategies. Appendix E shows the complete website search results. Searching the Agency for Health Care Research and Quality (AHRQ) (www.ahrq.gov) identified Evidence Report/Technology Assessment Number 79: Diffusion and Dissemination of Evidence-Based Cancer Control Initiatives (HHS, PHS, AHRQ), May 2003; this was included as one of the systematic reviews. Searching the Guide to Community Preventive Services (systematic reviews and evidence based recommendations) (www.thecommunityguide.org) identified the Task Force on Community Preventive Services' systematic review and recommendations for population based interventions designed to improve early detection and control of breast and cervical cancer; this document was also included as one of the systematic reviews.

Highlights of Effective Interventions

Highlights of the most effective interventions are the focus of this section. Included are effective primary studies referenced within systematic reviews and others identified through the original search strategy but that were published after the systematic reviews and feature one or more of the subpopulations of interest in Colorado. They are listed chronologically by publication date. Highlights of effective primary studies provide details on specific program and intervention

planning, design, implementation and evaluation; these can be used for decision making and potential adoption. As noted earlier, none of the systematic reviews included strategies specifically designed for rural women, lesbians or women with disabilities, however, the original search strategy identified a community program to increase mammography in a rural area and one pilot project to increase mammography in lesbians; these are both included in this section. All studies have an experimental or quasi-experimental design unless otherwise noted.

Results are grouped by type of recruitment method used. Inreach recruitment is used to target women who are currently in medical settings and Outreach recruitment is used to recruit women through community or population based efforts. This distinction was made to assist decision makers who plan and implement interventions based on recruitment method. More detail on each primary study can be found in the Primary Study Summaries (Appendix F) and in full-text copies of the articles.

Inreach

Financial Incentive and the Use of Mammography Among Latino(a) Migrants to the United States (Skaer, 1996)

This study, in nonprofit clinics serving migrant and low income residents in rural eastern Washington, was conducted to test the effect of fully subsidized mammograms on utilization in a predominantly never/under-using community that had previously identified cost as being a major barrier to use. Women were told by providers that they were due for mammography and given information about recommended screening guidelines, how to make an appointment, directions to the mammography facility and were given a voucher (in both English and Spanish) to obtain a free mammogram at the local mammography facility within 30 days. The study targeted Latinas who were foreign born, $\geq$40 years old, and without a history of breast cancer who had not obtained a mammogram within the past year or longer; the study included 80 intervention and control women. The average woman was 52.4 (40-76) years old, with a family income of $\leq$\$15k, residence in the U.S. of 16.7 years, 3.6 years of education; 72.5% were married and only 20% had insurance.

Women given a voucher for testing were more than 47 times more likely to obtain a mammogram than women who were not given one. This high rate of mammography is much higher than expected in a group of women of very low income and education (both factors typically associated with low mammography use).

This confirms women's self-report that cost is a major barrier to receiving mammography and that when financial barriers are removed, they will access the test. "First dollar coverage" can increase mammography screening rates in high risk populations and this approach should be given further economic analysis and policy consideration. The study did not address the issue of women outside care, and it is also unknown if other women would be as motivated to receive a mammogram if given the same financial incentive. This was a small study conducted over a short period of time with a small number of women, but results were overwhelmingly consistent and positive in this group of women for whom test cost was a barrier to use.

Enhancing Mammography Use in the Inner City. A Randomized Trial of Intensive Case Management (Weber, 1997)

This study in six primary care practices in inner city Rochester, New York was conducted to determine whether culturally sensitive case management by lay community health educators (CHE) would increase mammography in primary care practices already using a clinical information system and physician reminders. Women received a letter from their provider indicating they had not had a mammogram; the letter advised them to receive one, followed by usual care; they also received case management consisting of a second letter signed by a CHE and additional individually-tailored outreach efforts as needed (e.g., phone calls, home visits, system navigation, help with transportation, accompaniment to exams). The study targeted women who were between 52-77 years of age who had not had a mammogram in the past 2 years, but had visited 1 of the 6 medical practices at least once in the previous 2 years, as verified by a medical chart and information system review, with no prior history of breast cancer or mastectomy; the study included 337 intervention and control women. Women were of mean age 63, Caucasian (42%), African-American (36%), Latina (7%), 60% had had prior mammography, and most had insurance (61% including Medicare).

CHE group women had a significantly higher rate of mammography (25%) compared to usual care women (9.8%). The incremental cost per year of life saved for the CHE intervention was $11,591.

This study used a different cost-effectiveness (benefit) approach than others reporting on costs and the article includes details of the costs and assumptions used. The CHE intervention in this study was somewhat hybrid in that it used both inreach types of methods (recruitment with letters from inside a care setting) and population-based outreach methods (home visits, navigation).

Impact of Same-Day Screening Mammography Availability: Results of a Controlled Clinical Trial (Dolan, 1999)

This study in a medicine practice in Chicago was conducted to determine the effectiveness of same day mammogram availability on adherence to physician screening recommendations. Women were offered mammography immediately after their office visit; women not accepting same day service were given information about scheduling later. In a later phase of the study, women also received informational postcards about the same day testing 2 weeks before their scheduled appointments. The study targeted women $\geq$50 years old and included 920 intervention and control women. Most women were Caucasian (40%) or African-American (40%), not married, and not employed.

Significantly more intervention women (58%) than control women (42%) obtained a mammogram within 3 months; the results increased to 61% and 49% at 6 months; results were similar in the later phase. All women benefited from same day mammography except those who had had 3 or more mammograms in the past 5 years.

Same day mammography service increased mammogram rates, but advance notice did not appear to influence this. The intervention was beneficial to the women at highest risk for not receiving recommended screening mammograms (those $\geq$65, unemployed and with a history of

few mammograms). This was a large study with some methodological weaknesses that used a relatively simple intervention which was successful.

Keeping Mammography Referral Appointments: Motivation, Health Beliefs, and Access Barriers Experienced by Older Minority Women (Bernstein, 2000)
This process evaluation in the emergency department of a Boston hospital was conducted to explore influences on the willingness and ability of women ≥50 years old to keep mammography appointments, and to test the effectiveness of a peer-delivered intervention to increase mammography after removal of financial barriers and after appointments were scheduled. Older African-American and Central American female peers offered enrollment to women who were past due for mammography. Enrolled women received information about breast health and screening, an interactive discussion about their perceptions of making and keeping appointments, assistance in developing a personal plan for maintaining breast health, an assessment of readiness for mammography, and next day no cost appointments if requested. The study was targeted to women who had not had a mammogram within the last 24 months and included 151 intervention-only women (no controls). The design of this intervention was based on Roger's Motivational Theory, Miller's Motivational Interviewing Techniques, Prochaska and DiClemente's Transtheoretical Model, and Rollnick's Readiness to Change Model. Participants had a mean age of 61.6 (50-90), were African-American (70.8%), Latina (7.3%), had insurance (57%), and had not had a Pap test in the past 2 years (68%).

At baseline, they were mammography under-utilizers, but they reported few barriers to keeping appointments, i.e., fear of what might be found (46%), transportation (38%), cost (22%), and not wanting to know if they had breast cancer (24%). After the baseline interview but before appointment scheduling, participants scored 9.4 (on a scale of 0-10) in readiness for mammography. Within 3 months of receiving the intervention, 60% had a mammogram.

This intervention appeared to have provided women the opportunity to move from pre-contemplators and contemplators into actors. Much of the success could have been in its theory based and peer delivered approach coupled with the removal of financial and logistic barriers. This small but well intentioned study identified an effective inreach method to increase breast cancer screening in a setting where mammography under-users present themselves for other services.

The Safety Net: A Cost-Effective Approach to Improving Breast and Cervical Cancer Screening (Vogt, 2003)
This study in Portland, Oregon was conducted to assess the cost-effectiveness of 3 interventions to deliver breast and cervical cancer screening to women unscreened for ≥3 years (in the "safety net"). Women received either a letter/letter, letter/phone or phone/phone intervention. Both letters and phone call strategies informed women of their screening status and the importance of screening, and also offered appointments with a phone number for scheduling. The study targeted women who had been members of Northwest Kaiser Permanente (NWKP) for ≥3 continuous years and for the mammogram study were aged 40-70 or for the Pap test study were aged 18-70, and included 2,400 intervention and control women.

All interventions were more effective than usual care except for the letter only intervention for Pap tests. The rank order of effectiveness (least to most) was letter/letter, letter/phone and phone/phone; letter/phone and phone/phone were equally effective. The letter only intervention was successful, but the addition of the phone strategy further enhanced the effect. Phone contact brought into exam about half of the women in true need of screening.

For mammography, the letter/phone and phone/phone interventions both resulted in 1 additional test for $125; the result was $247 for the letter/letter intervention. For Pap tests, the letter/phone approach cost was $185, for phone/phone it was $305 and letter/letter was $1,117 per additional test.

Results showed that 1 initial letter resulted in getting the motivated women into testing at low cost. Phone calls that provided immediate access to scheduling increased testing in those who were initially more reluctant. However, the cheapest approach to implement (letter/letter) was the least cost-effective (i.e., but most expensive in terms of the net effects). Agencies should implement strategies based on the "net impact per dollar spent", which in this study was a letter followed by a phone call, even though it was not the least expensive to operate. This was a large study in an environment where a vast amount of information was already available on the target population; the report contains a detailed table showing costs for each study, which could be used to determine local applicability and feasibility.

A Cost-Effectiveness Comparison of Three Tailored Interventions to Increase Mammography Screening (Saywell, 2004)

This study in a hospital's general medicine clinic in St. Louis and 2 managed care organizations in Indianapolis was conducted to identify the relative cost-effectiveness of various combinations of a tailored physician print recommendation and tailored phone counseling by nurses on increasing adherence to mammography. Women received either tailored phone counseling, a tailored mailing or a combination of the two. A computerized-tailoring program was used to generate appropriate messages for each participant based on her individual perceived risk, benefits and barriers. The intervention was designed and implemented using the HBM and the TTM. The study targeted women with no history of breast cancer, no mammogram in 15 months, and aged 51 years or older and included 1,390 intervention and control women. Participants were mostly African-American (52.3%), of mean age 65.6, not working (70.5%), and with an income of $\leq$$15k (55.5%).

All 3 intervention groups were significantly more effective than controls. In the subsets of contemplators and women with a history of mammography, all 3 interventions were more effective than control; the combination was 2 times more effective. For non-contemplators and women without a prior history of mammography, none of the interventions was more effective than control. These results demonstrate that knowing individual patients' stage of readiness (e.g., by adding a question as part of a visit or survey) and having their mammography history could help providers better tailor interventions for pre-contemplators and historic under-utilizers.

Mean intervention costs for phone, mail and combination were $4.68, $4.14 and $9.38, respectively. Corresponding per capita costs of a 1% increase in the mammography rates were $0.50, $0.39 and $0.56. The mail intervention was the most cost-effective with 43.27%

adherence and a cost of $0.39 per 1% increase in the adherence rate. In the contemplator group, the combination approach was the most effective (57.22%, cost of $0.48), but the phone intervention was the most cost-effective at $0.28 (54.19%). In the group with prior mammograms, the combination was the most effective (53.00%, cost of $0.51), but the mail intervention was the most cost-effective at $0.32 (47.76%). Using intervention effectiveness alone, the combination strategy emerged as the most effective (49.38%); examining costs alone, the mail intervention was the most cost-effective ($4.14 per contact, $0.39 per capita per 1% increase in adherence). The best balance between effectiveness and cost in this setting would be to use the mail intervention (43.27% adherence, cost of $.039).

A previous study not summarized here (Champion, 2003), to increase mammography use in non-adherent (pre-contemplator and contemplator) older women, based on the HBM and TTM, was most effective for pre-contemplators, thus emphasizing the important contribution of using theory-based interventions. Through personal communication with the primary author, it was determined that a tool to determine susceptibility, benefits, barriers and stage of change (Champion, 1999) is available and authorized for local use and revision with proper citation.

This article contained a very detailed description of the costs and methods used to determine cost-effectiveness, and would, therefore, be very useful for programs and agencies in their decision making about implementing this intervention locally. Cost studies are not always comparable, so several should be reviewed to determine local applicability and feasibility.

Outreach

Effectiveness of Three Community Based Strategies to Promote Screening for Cervical Cancer (Byles, 1994)
This study in 3 postal regions of New South Wales, Australia (a rural locality of 1,000 women, a country town with 3,000 women and a major rural center with 100,000 women) was conducted to evaluate 3 methods of increasing the use of Pap test: television media (TV) only, TV with invitation to screening letter recruitment and TV with general practitioner (GP) capacity building. The study targeted women 18-70 years old on the electoral register; the TV ad focused on the subpopulation of women $\geq$50 years old; and it included 9 intervention and 3 control postal regions.

The TV alone intervention increased Pap use in the rural center 13.3% over expected attendance. The TV plus letter intervention increased attendance in 2 of 3 areas (52.7% in rural localities and 43.2% in rural centers). The TV plus GP intervention increased attendance in all 3 localities (50.2% in rural localities, 80.8% in country towns, 15.7% in rural centers). Observed attendance was higher for women aged 50-69 years and women who had not had a Pap test in the past 3 years.

This population based trial showed the impact that might occur if this were implemented as a public heath program. TV media alone is not likely to encourage screening in older women and those previously screened; TV plus letter should be targeted to older women, and TV plus GP recommendation seems to have the greatest potential for increasing screening in those previously

unscreened. This was a well done population based multi-strategy study that likely has implications for rural and other areas.

Personal Contact from Friends to Increase Mammography Usage (Calle, 1994)
This study in Florida was conducted to determine whether a phone intervention strategy of personal contacts between friends could significantly increase mammography use. Trained peer volunteers contacted, and re-contacted as necessary, acquaintances to encourage them to have a mammogram. The study targeted women >40 years old (emphasis on women >50), living in households separate from volunteers and included 594 intervention and control women. Most participants were Caucasian, just under 40% were African-American, 40 years of age or older, well educated and married.

There was a relative increase of 40% in mammography use in intervention women (49%) compared to control women (34%) and the effect was twice as high for women with an income of <$40k.

The demographics of the women participating in a study with this type of design are directly related to those of the volunteers who recruit them, because people tend to acquaint themselves with people of similar background. The recruitment method used, though not experimental, could be very useful for identifying appropriate target populations for an intervention. This intervention that used volunteer efforts to a large degree would be less costly than others that were more complex. This study called "Tell a Friend" was sponsored by the American Cancer Society; the model and materials are available for national use.

Effectiveness of Health Education to Increase Screening for Cervical Cancer Among Eastern-Band Cherokee Indian Women in North Carolina (Dignan, 1996)
This study in the Eastern Band tribal lands of North Carolina was conducted to evaluate knowledge, intentions and behavior for women who participated in the North Carolina Native American Cervical Cancer Prevention Project. Women were provided individualized in-home one on one instruction by Cherokee lay health educators (LHE) on cervical cancer and the benefits of early detection; information was presented orally and a videotape and printed materials were also used. At the first visit, the LHE assessed women's barriers to obtaining Pap test and then provided reinforcement and suggestions at the second visit. The study targeted women who were ≥18 years of age, living on tribal land, and officially enrolled members of the tribe and included 996 intervention and control women. Women were 18-44 years old, married or living with a partner, high school graduate, had an annual income of <$20k, and were primarily without insurance to pay for Pap tests. The program was developed using principles of social learning theory, the HBM, the Minority Health Communication Model, the Communication Behavior Change framework and PRECEDE.

Women who received the intervention were almost twice as likely to report having a Pap test in the past year and more likely to have answered all the knowledge questions correctly.

Adaptation to other settings would require high fidelity to the theoretic underpinnings of this program to ensure acceptability and success. This was a well designed theory-based study with a high participation rate that included almost an entire community of Cherokee women.

Community Education Programs to Promote Mammography Participation in Rural New York State (Flynn, 1997)
This multi-component study in rural New York State communities of <1,000 residents was conducted to estimate the proportion of women in communities served by a mobile mammography unit who were not receiving screening from any source and to evaluate educational programs to increase mammography use. Educational programs were delivered to women by natural opinion leaders, and were based on previous research and information from focus groups (on modifiable factors for influencing mammography). All households with women aged ≥35 received a direct mail package with information about the importance of early detection, screening guidelines, a risk profile questionnaire, van schedule and sliding fee information; primary care providers (PCP) were offered an office-based breast cancer screening educational program (screening guidelines, access to mammography, complete breast exam). The model was designed and implemented based on results of focus groups with women in both areas, PCP surveys on factors that inhibit women from screening, and principles of PRECEDE, social learning theory and diffusion of innovation theory. The study targeted women aged ≥35 and included 6 intervention and 7 control communities totaling 7,123 residents. Women had a median age of 33-35, had a median education of 12 years, and were mostly Caucasian.

More program women than control women received mammograms in the past 2 years (82% v. 72%), received mammograms in the past year (64% v. 60%), regularly (55% v. 51%) and ever (89% v. 80%). More program women reported receiving the mobile van mammography than control women (34% v. 10%); they also reported it took less time to receive the testing, including travel (in ≤1 hour) (29% v. 9%).

This program demonstrated that a combination of interventions (barrier reducing and educational programs for women and providers) can increase both mammography and mobile van use. This type of intervention may be especially helpful in rural areas because of the low availability of nearby mammography and the relatively cohesive social networks in existence there.

Effect of a Cancer Screening Intervention Conducted by Lay Health Workers Among Inner-City Women (Sung, 1997)
This study was conducted in Atlanta to determine if an in-home educational intervention conducted by lay health workers (LHW) could increase breast and cervical cancer screening adherence by low income inner city African-American women. Women received three in-home education sessions delivered by LHW; sessions included breast and cervical cancer, screening methods, videotape of exams with African-American actors, reproductive health, contraception, high risk sexual practices, and printed materials. The study targeted women at an inner city community health center, public and senior housing projects, inner city business settings, churches, and a health oriented self-help organization for African-American women; it included 321 intervention and control women. Most participants were 35-44, income ≤$15k, unmarried and under-utilizers of mammography and Pap tests.

There was a significant increase in mammography use (range 9.8%-12.4% using several analysis methods), but not in Pap test use.

The breast cancer screening portion of the intervention was most effective for the women it was intended to reach, those who were non-adherent at baseline. The cervical cancer screening portion of the intervention had no significant effect. There was a large loss to follow-up rate, but this is somewhat common in prevention research and also when recruiting people who typically seek health care only when symptoms are present. The sample used, however, is likely to be reflective of the population that health education and prevention are trying to reach. Using culturally appropriate interventions and LHW has significant potential, but reaching highly mobile persons on a sustained basis will require additional strategies.

Opening Pathways to Cancer Screening for Vietnamese-American Women: Lay Health Workers Hold a Key (Bird, 1998)

This study in San Francisco CA (experimental site) and Sacramento CA (control site) was conducted to determine whether rates of test recognition, receipt and maintenance of routine checkups and screening tests (CBE, mammograms, Pap tests) would be significantly greater in consumers in an experimental versus a comparison community. A combination of interventions was used including lay health worker (LHW) led group education sessions (importance of general prevention and visits for routine checkups, cervical cancer screening, breast cancer screening) and educational materials, both in the Vietnamese language, incentive contests and health fairs with medical screenings in conjunction with the annual Tet (new year). The study targeted Vietnamese women, ≥18 year of age, with the ability to understand Vietnamese and included 717 intervention and control women. Most women were aged 18-39, had <12 years education, were unemployed, ever married, below poverty level, and had insurance (most Medi-Cal).

There were significant increases in the intervention community, but not in the control community, in all of the outcome measures, including mammography (37%-55%) and Pap test (26%-45%). Women who had arrived in the U.S. most recently were the least likely to have had received any preventive services at baseline.

Indigenous LHW, with the cultural competence and sensitivity needed for the delivery of successful health education, were effective in promoting screening tests in Vietnamese women. A drawback to this type of program is that it is labor intensive and only reaches a limited number of participants, whereas, less intense strategies (e.g., electronic or printed materials) can reach more people but may have a smaller effect. This was a highly successful, well carried out study with high participation and low dropout rates.

Por La Vida Model Intervention Enhances Use of Cancer Screening Tests Among Latinas (Navarro, 1998)

This study in San Diego was conducted to assess the short term effect of the Por La Vida intervention (PLV) on breast and cervical cancer screening in Latinas. Consejeras (natural helpers) delivered small group sessions of 12 weeks duration on breast and cervical cancer, early detection, the importance of screening tests, nutrition, BSE and obtaining services. The study targeted women in the naturally occurring social networks of community-identified consejeras and included 512 intervention and control women. The program was developed using existing social linkship networks in the Latino community, principles of social learning theory, and culturally appropriate educational materials. Women averaged 34 years old (18-72) and were

typically low socioeconomic status, had a median income of $12k, family size of 5, were married full-time homemakers, born in Mexico, of low acculturation, and were without insurance (60%) and a regular health care provider (40%).

Mammography use for women ≥40 years of age was significantly higher for the intervention group than the control group (56.4% v. 43.6%); but non-significantly higher for Pap test (65.3% v. 61.1%). The percentage increases from pre- to post-test were three 3 times higher for mammography.

An advantage of PLV is that it used existing social networks within the community and consejeras who modeled healthy behavior among their peers, consistent with social learning theory and suggesting that similar admired models are most effective in enhancing behavior change. Critical to the success of this model were: design by and for the Latina community, using existing linkship networks and identified natural helpers, and the use of social learning theory principles; successful replication would likely require no less. Future projects should test the feasibility and replicability of this intervention in larger areas and with different populations, such as Latinas who are not primarily Mexican born, Latinas of other socioeconomic status and acculturation, and those in rural and broader mainstream settings.

Community-Based Interventions to Improve Breast and Cervical Cancer Screening: Results of the Forsyth County Cancer Screening (FoCaS) Project (Paskett, 1999)
This study in Winston-Salem (intervention community) and Greensboro (comparison community), North Carolina, was conducted to assess the effects of the FoCaS project on mammography and Pap test screening rates over time on older, low income minority women. The 2 year intervention had community focused (health fairs, church and other home and community based education by lay health educators [LHE], printed materials, mass media, targeted mailings with invitations to events) and clinic focused (provider training, visual prompts in exam rooms, educational games, posters and literature for waiting rooms) components. The program was developed using results from previous surveys, focus groups, input from the project's community advisory board, and principles of social learning theory, the HBM, PRECEDE/PROCEDE and the PENIII model and relied on a consortium of local community agencies which provided access to services and materials. The study targeted women aged ≥40, residing in low income housing and included 27 control and intervention housing communities and 1,929 intervention and control women. Most were aged 65-68, African-American, ever married, had been pregnant in the past, obtained regular exams, and had health insurance.

Mammography use increased significantly (18%) in the intervention city (31%-56%) compared with the comparison city (33%-40%). Pap test use also increased significantly (21%) in the intervention city (73%-87%) compared with the comparison city (67%-60%).

The relative contribution of each separate intervention used could not be measured, but this study showed the value of using multiple strategy and theory-based community interventions.

Effectiveness and Cost-Effectiveness of Multiple Outcalls to Promote Mammography Among Low-Income Women (Crane, 2000)

This multi-purpose study in Colorado was conducted to determine whether the proportion of women receiving a screening mammogram would be higher in a group of women receiving multiple outcalls compared to groups receiving a single call, an advance card (mailed invitation) plus single call, or no intervention; and to determine whether the stage of change in the multiple outcall group would be higher than that in the other groups; and to compare costs of the single and multiple outcall interventions. Single call included the provision of information on the locations of mammography facilities. The advance card and single outcall included a household invitational mailing for women >50 years old with a follow-up phone call. The multiple outcall included an assessment on mammography stage of change, interactive barriers counseling and repeat calls as necessary. The study targeted women who were >50 years of age, spoke English, and had no history or current symptoms of breast cancer and included 2,300 women. Women were 50-80+ years old and were primarily Caucasian. The study used direct marketing lists to identify low income and minority neighborhoods throughout Colorado and was designed using the TTM and motivational interviewing.

In the subset of non-adherent women at baseline, significantly more women in the multiple call group received a mammogram (27%) compared with the other groups (11-16%); those who received more than one call were significantly more likely to be adherent at follow-up (36.8%) than those that only received one call (11.4%).

There was a significant trend that as the intervention increased in intensity (i.e., more calls), fewer initially non-adherent women were in pre-contemplation and relapse and more were in contemplation, action and maintenance. At follow-up, the multiple call group had higher decisional balance scores (greater acceptance of the benefits of mammography) than the women in the other 2 groups.

Costs for delivering a program to 1,000 women where 40% are non-adherent at baseline are $5,768, 6,868 and $10,088 for single call, advance card plus call and multiple call interventions, respectively. Costs per participant changed (to adherent) are $288, $390 and $154. Corresponding costs per participant changed for a population that is 100% non-adherent (such as would be in a more targeted effort based on medical record information in a clinic setting rather than in a community setting) are $131, $177 and $90.

Results indicate that the single call with an advance card was successful for promoting repeat testing in women who were already adherent, and the multiple call approach was successful for initially non-adherent women. A combined approach using multiple calls for non-adherent women, followed by single calls for at the appropriate intervals for repeat testing may be useful. The multiple call intervention, while very labor intensive, was shown to be effective and the most cost-effective of the 3 methods studied. This was a well carried out complex and labor intensive study that would require adequate resources to replicate.

Promoting Breast and Cervical Cancer Screening at the Workplace: Results from the Woman to Woman Study (Allen, 2001)
This study in Massachusetts was conducted to evaluate the effectiveness of a peer delivered intervention conducted in worksites to increase adherence with breast and cervical cancer screening, in collaboration with a labor union (Service Employees International Union-SEIU). Over a 16 month period, peer health advisors (PHA) each delivered 6 small group discussion sessions and 2 worksite-wide campaigns (health fairs and speakers). This program was designed and implemented using social cognitive theory, the HBM and the TTM. The study targeted worksites with a minimum of 60 female employees aged ≥40, which had union representation within the workforce, and a worksite location within 1.5 hours of the study center; it included 26 intervention and control worksites and 3,132 intervention and control women.

Significant increases occurred in Pap testing, but not in mammography. This may have been because all women, not just under-utilizers, were targeted and although the aim was to attract lower paid service workers, most participants were already highly adherent to screening recommendations. Because of the association with unions, a high percentage of women had health insurance; this may limit generalizability to other settings where many women do not have insurance. Therefore, future interventions should be targeted to those women who have not previously been adequately reached by other efforts or to "pockets of prevalence" segments of the population at increased risk. Other settings (e.g., churches, housing developments) with lower baseline screening rates may be more appropriate targets.

This study of collaboration with existing employer/employee organizations made use of PHA. Worksites where many women may not have insurance or are underinsured might be more appropriate settings for this type of an intervention. Although the authors indicated that the intervention was theory-based, it was difficult to see that influence in it; enhancing the theoretical base might also improve results.

Improving Access to Mammograms through Community-Based Influenza Clinics. A Quasi-Experimental Study (Shenson, 2001)
This study in Litchfield County, Connecticut was conducted to determine whether offering women attending community influenza immunization clinics the opportunity for facilitated access to mammography would result in an increase in the number of mammograms performed over a 6 month period. Women in the intervention clinic sites were asked if a local radiology clinic of her choice could contact her to later schedule a mammogram; women without insurance or regular care providers were offered free mammography; and mammography facility staff contacted the participating women to schedule appointments. The study targeted women aged ≥50 who had not had a mammogram in the prior 12 months and included 284 intervention and control women in 4 intervention and 5 control sites.

Mammography use in the intervention clinics (35%) was significantly higher than that in the control clinics (15%), showing a very practical benefit of this approach.

This type of community collaboration between groups who may not be used to working with each other may be the most applicable where a large proportion of women receive influenza

immunization through community clinics; the strategy should also be evaluated within physician practices where many women routinely receive influenza immunizations.

Improving Cancer Screening Among Lesbians Over 50: Results of a Pilot Study (Dibble, 2003)

This process evaluation of a small pilot study in San Francisco was conducted to determine whether attending a lesbian-specific group educational intervention could improve cancer screening in lesbians older than 50. One-hour educational sessions were delivered to women by a lesbian family practice physician and included information about lesbian-specific cancer risks, screening, tests and current research findings and a 15 minute question and answer period. The study targeted lesbians responding to advertisements at one urban and one suburban gay, lesbian, bisexual, transgendered senior organization and included 40 intervention women (no controls). Women had a mean age of 60.2, were Caucasian (86%), single (61%), employed (56%) and well educated (15.5 years); 72% had a family history of cancer.

All women had had prior mammograms, but 6 (27%) had not had one in the past 2 years; post-intervention 2 of the 6 had received a mammogram. The 6 women had had only 29% of recommended mammograms; women with a recent mammogram had had 80% of recommended screenings. All women had had prior pelvic exams but 4 (18%) had not had one for 3 years or more; 1 of these received a pelvic exam after the intervention.

The small post-intervention response rate was low and 20% of non-responders indicated perceived lack of anonymity as the reason for not responding. This needs to be addressed in future studies, especially in areas considered less gay safe than San Francisco. Similar trials which could include other behavior change enhancing features such as a “screening coach” or other reminders, should be conducted in a larger more diverse population of lesbians aged $\geq$50. Adding theory-based components and processes to increase confidentiality and allay associated fears might improve future results.

A Community-Based Intervention to Increase Screening Mammography Among Disadvantaged Women at an Inner-City Drop-In Center (Heyding, 2005)

This process evaluation in Toronto was conducted to determine the effectiveness of a community based intervention to increase the use of mammography in clients of an inner city drop-in center with a high prevalence of mental illness and homelessness. Women visiting the center were offered free mammography services (3 held-open consecutive appointments) at nearby hospital, lunch before the appointment and accompaniment to appointments. The study targeted women 50-70 years old who were in attendance at the drop-in center and included 247 intervention women (no controls). The mean age of women at the drop-in center was 58; 63% had a psychiatric diagnosis, 15% had a substance abuse diagnosis, 32% were homeless or living in supportive housing, but most were insured under Canada’s universal health insurance system.

In the 7 years prior to the intervention, the average rate of annual mammography in the drop-in center was 4.7% (1.8%-8.1%); during the intervention period, the rate significantly increased to 29.2%.

This program increased the use of screening mammography in a population of women who were under-users of mammography and who additionally had several predisposing factors associated with under-use (mental illness, substance abuse, limited knowledge of preventive health measures, and lack of trust). The existing positive relationships between drop-in staff and the clients, lunch incentive, flexible scheduling and accompaniment to appointments likely contributed to the project's success. This was a practical intervention in a small subpopulation that made good use of existing resources and reached high risk women in a setting that they frequent. Not all drop-in centers have medical services and a medical record system, so the annual rates of screening would have to be determined using another method, or a different evaluation plan could be used.

Effect of Direct Mail as a Population-Based Strategy to Increase Mammography Use Among Low-Income Underinsured Women Ages 40 to 64 Years (Slater, 2005)

This study in Minnesota was conducted to test the effectiveness of two mailed interventions on increasing mammography use in women aged 40-64 who are eligible for free screening through Sage, the Minnesota NBCCEDP, and to assess the utility of the National Cancer Institute's (NCI) Consumer Health Profiles (database of health behavior, demographic, lifestyle and geographic data for audience segmentation) for targeting direct mail interventions to increase mammography use. Mail only (two mailers with a brief message about free mammography through the Minnesota health department, a prompt to call a toll free phone number for more information) and mail plus incentive (same mailers and $10 for completing a Sage mammogram within a year). Women calling in were assessed for free screening eligibility and encouraged to schedule appointments. Formative work for the mailers and incentives was comprehensive and took 2 years to complete. The study targeted women residing in low and high mammography rate clusters (MRC) as identified by the NCI database and included 145,467 intervention and control women.

After the intervention, 3.92% of intervention group women called; 32.27% were eligible for Sage screening and 75.04% of eligible callers scheduled appointments. Four times as many women in the Mail plus group called than in the Mail alone group even though the sample sizes were the same. In low MRC areas, screening rates were 1.68%, 2.02% and 2.72% for controls, Mail only and Mail plus (significantly different in Mail plus v. controls and Mail plus v. Mail only). More than 3 times more women in the low MRC were screened. In high MRC areas, screening rates were .56%, .78% and 1.24% with differences significant between all 3 comparisons.

The intervention effect was smaller than that reported in other studies, but most of the other studies were conducted outside the U.S. where they have national screening and recruitment programs. Inreach invitation/reminder studies are not directly comparable to this one, because they only include women who are known to be eligible and in need of mammography; a study like the present one cannot be aware of the target audience's income, insurance or screening status. Results may vary in other states, based on literacy and diversity of primary language, on the proportion of women who would be eligible for NBCCEDP or other free screening and the availability of an appointment scheduling system. This was a very well designed, innovative study that made good use of existing NCI data.

Key Informant Assessment

A total of 8 local key informants were willing to provide their assessment on methods to increase breast and cervical cancer screening in Colorado. One national key informant, knowledgeable about women with disabilities, also provided input. Appendix G identifies all participating Key Informants.

Among various types of inreach strategies, reminders, accurate print materials about screening and free screening programs, locally accessible services (including flexible clinic hours) and reduced costs for testing were viewed by key informants as most helpful. For outreach, accessible services and hours, reduced costs, direct mail, mass media within a multi-component campaign, and peer recruitment and education were viewed as most valuable. It is believed that combinations of interventions tailored to local areas and appropriate for target communities should be used; these can be enhanced through partnerships with local coalitions, community agencies and groups, and influential individuals. Incentives, such as gifts, retail coupons of money, were seen as having a limited effect because this type of effort is difficult to sustain financially; in addition, incentives send a mixed message, as successful completion of screening is the ideal incentive. As in the Highlights of Effective Interventions section above, the key informant input described below is grouped by type of recruitment method used, i.e., inreach or outreach.

For women already in care or connected with screening programs, key informants felt that reminders work well. Simply leaving it up to the individual is not likely to result in regular screening adherence. Postcards, on which all information is visible may be viewed more favorably and result in higher screening response rates, whereas letters with reminders inside envelopes could potentially instill fear and might result in lower screening rates. Follow-up phone calls to women who don't respond to mailings are viewed as necessary and helpful. Provider screening recommendations and referrals to CWCCI and displaying promotional print materials which include the local CWCCI hotline number help to increase screening. Case management, while more labor intensive than reminders, has been shown to increase screening adherence in some inreach settings within community health centers. To be accessible for women with disabilities, equipment needs to be easily used, appointments should be longer in duration, and staff should be willing to help women dress and undress and make transfers from chairs to exam equipment; in addition, appointment scheduling staff should allow women with disabilities to cancel and re-schedule appointments as needed because often times logistical, transposition and health problems make keeping an original appointment impossible. Having screenings available at the same time as the visit to the doctor's office and having transportation available would help increase screening in women with disabilities.

For women already connected to care or screening settings, sending no reminder at all, no follow-up for women not making appointments after the initial reminder, lack of provider referral for screening, and refusal to see women with disabilities because of their canceling appointments as necessary were considered as having little value. Additional simple and relatively inexpensive efforts that could be taken to increase screening in women already in care include having women self-address their own reminders (in their own handwriting) or having women screened through CWCCI publicize the services by word of mouth to their friends and family.

If key informants could personally do more to increase screening through inreach, they would hold promotional brown bag sessions at workplaces, businesses, churches and women's groups, and conduct trainings for health care staff to ensure physician recommendation for screening as a routine part of physician visits and be sure eligible women are referred for free screening. They would encourage providers to notify screened women of their test results by mail; this would provide positive reinforcement for repeat screening. Because long distances between women's homes and imaging centers in rural areas prevent women from receiving mammograms, key informants would encourage regional hospitals and imaging centers to expand mobile mammography to areas not currently being served

Direct one on one contact by culturally appropriate outreach workers who can reach women for both education (e.g., Platicas) and enrollment into screening are viewed positively; providing vouchers for transportation to screening enhances these efforts. Other access-enhancing strategies such expanding clinic hours to after work hours and Saturdays, and holding a variety of health screenings specific for migrant and seasonal workers have helped increase screening. Reminders from family members, friends and other agencies to make and keep appointments were also viewed as positive. As a complement to other program activities, having a local screening program listed in the phone book (e.g., under government or mammograms) and posting program information on the internet are useful, but may initially take some time to produce results.

Well-targeted print advertisements in local newspapers, Spanish language newspapers, church bulletins (especially in churches that provide clinical services for parishioners), and on placemats at restaurants in rural communities were viewed as being valuable. A local ad placed in a small weekly rural newspaper that serves as the primary source of information would likely have more impact than an ad placed in a large metropolitan newspaper that already contains an overwhelming amount of information. Placing the ads at appropriate times, such as during October (breast cancer prevention month), near Mother's Day (with a message about doing something good for yourself) or New Year's (as a resolution) was viewed as enhancing the success. Although no formal evaluation of ads has been conducted, it was observed that more phone calls to access screening were received during the times ads were in circulation and many fewer calls were received during times when budget constraints prohibited placement of ads. Bus ads were viewed as being of less value and typically more costly than newspaper ads. Regardless of type, ads should be simple and attention-getting but contain the CWCCI hotline number, contact information for local case managers and some mention that eligibility criteria exist.

Radio and TV were also viewed as more expensive, but if targeted well, can be useful; airings need to occur on stations and channels favored by the target populations, need to be in the appropriate language and aired during appropriate times. A particularly successful media strategy, though not promoting screening per se, was the Channel 9 Buddy Check program that reminds women to complete monthly BSE on the 9th of every month and to remind their friends as well.

Direct household mailings, some including coupons for CWCCI screening, have been tried in some of the smaller areas of Colorado, and they were viewed as having worked well based on the

number of calls subsequently received. It is also thought that they might be more successful in non-metro areas where residents may receive less junk mail.

Outreach mammography for lesbians during Pridefest was somewhat successful, but a social marketing campaign might be more attractive and result in increased screening, especially if tailored to the many unique social niches within the lesbian community.

There was mixed opinion about the success of health fairs in increasing screening. The statewide Channel 9 Health Fair was viewed positively where onsite screening is provided and where breast and cervical screening staff from local programs can conduct on-site eligibility screening and set up appointments while women are waiting for other screenings; the latter has worked with flu clinics as well. Distributing promotional materials at general health fairs was not seen as particularly useful.

Outreach strategies not viewed as valuable include one-time screenings in targeted areas, such as low income areas, because sustained efforts are required for continued adherence. Posters alone placed in settings that women frequent are probably not as successful as other methods, because they may be less personalized than what is needed to affect change in screening behavior. Educational presentations for general audiences are not viewed as successful. Multiple steps and phone calls required for eligibility screening and obtaining appointments work against efforts to increase screening; the number of steps should be kept to a minimum and agencies should triage phone calls quickly and offer appointments with short delays.

Potential outreach efforts to recruit more women into screening include expanding the availability of mobile mammography services, especially in rural areas and urban areas where transportation is a barrier, posting promotional information in women's restrooms of bars and clubs, and inserting promotional articles and information in electronic employer/employee newsletters.

If key informants could personally do more to increase screening through outreach, they would conduct more outreach to reach women who typically do not have insurance (e.g., artists, cosmetologists, service workers, housekeepers, temporary workers). Methods could include identifying individual influential women in these groups to begin to develop ideas on the most appropriate strategies to use, contacting workplaces to offer education or insert marketing materials into paychecks. Other efforts include developing volunteer speaker's bureaus, enlisting more local coalition members to volunteer for events and other screening activities, and including more breast and cervical cancer survivors in local coalitions, speaker's bureaus and other prevention and screening efforts.

A strong theme throughout the discussions with key informants was the need and benefit of working with existing coalitions and agencies and to continue to create and sustain partnerships. More partnerships need to be developed with organizations that offer services to women at highest risk of under-utilization, especially African-American women, women with disabilities, low income women and lesbians. Recruitment efforts should be tailored to the population to be reached, include peer encouragement and be culturally and racially/ethnically appropriate. Transportation and accessible exam equipment need to be available for women with disabilities.

Recruitment efforts also need to be tailored specifically to the area and to the unique characteristics of the geographic location.

Agencies and community groups serving women 40-64 (especially those 50-64) that breast and cervical cancer screening programs could start working with to increase screening in under-utilizers include gay/lesbian community centers (including those located on college campuses), mental health agencies, faith based organizations, job training and placement centers, health care providers serving low income communities, independent living centers, women's social groups and sororities, service clubs and auxiliaries, senior centers, homeless shelters and advocacy agencies, quilting organizations for older women, half-way houses and correctional facilities, substance abuse treatment agencies, and other places where women receive free services of any kind. Partnerships developed with organization and worksite staff or with influential women in these venues would be a first step in design and implementation of additional efforts.

Future areas for potential exploration include developing local resource directories for women to locate free screening services; holding focus groups with women who accessed CWCCI to identify what brought them in and with other groups of women who don't get screened to identify their barriers and preferences and what would work to bring them into screening; and developing a step by step client guide that details the procedures for testing (eligibility screening, test results, additional testing for abnormal results), follow-up (where to go next, how additional testing and exams will be paid for) and the effect an abnormal test or cancer diagnosis would have on future insurability.

As noted earlier, none of the systematic reviews included strategies for increasing breast and cervical cancer screening specifically designed for women with disabilities, however, the original search strategy identified articles describing barriers to mammography and Pap test services for women with disabilities. This led to the identification and inclusion of a key informant from the CDC Office on Disability and Health; she also indicated her willingness to be a future resource as well. She explained that there are no formal published evaluations of breast and cervical cancer screening programs for women with disabilities because there are so few screening programs that specifically serve these women. Two very good screening programs, however, are the Breast Health Access For Women with Disabilities in Berkeley, California (www.bhawd.org/sitefiles/index2.html) and the Count Us In program in North Carolina, to promote breast and cervical cancer screening in women with disabilities (www.aahd.us/research/BestPractices/singletrainingHCP.php?record=5); this project also has components for training lay health advisors and also students in the professional health care field; the extensive training resources used are listed on the website. The Health Resource Center for Women with Disabilities at the Rehabilitation Institute of Chicago (www.ric.org/community/womendc.php) has fully accessible state of the art medical services and also provides multiple educational and advocacy activities. The Women's Reproductive health Clinic at the University of Alabama at Birmingham (main.uab.edu/show.asp?durki=8970) provides accessible services and provider training to meet the needs of women with disabilities.

Issues surrounding the lower screening rates for women with functional limitations are often physical and attitudinal. Included among the many issues are their not realizing that they are at risk for these cancers; lack of accessible transportation and facilities, difficulties negotiating

exam and medical equipment; and limited physician knowledge regarding disability and how to conduct exams that accommodate women with disabilities (Thierry, 2000). Specific suggestions for beginning to address these issues in Colorado include education to help women with disabilities understand their risks, development of partnerships with entities advocating for and serving women with disabilities (e.g., Craig Hospital, the Colorado Cross-Disabilities Coalition, the Multiple Sclerosis Society, Colorado Independent Living Centers that provide peer support and employment opportunities for persons with disabilities [e.g., Atlantis-located in Denver, Center for Disabilities-located in Pueblo]; getting a better picture of the disability status of women being screened through CWCCI (e.g., by adding questions 15.1 [limitations on daily activities because of physical, mental or emotional problems] and 15.2 [health problem that requires the use of special equipment] from the 2005 BRFSS [or similar questions] to existing CWCCI screening/eligibility assessments); reflecting women with disabilities in educational materials (study currently underway to pilot test population-specific posters and tip sheets; these will be evaluated in terms of intent to test); and that before recruiting more women with disabilities for screening, ensuring that all contracted providers are competent in serving women with disabilities and have accommodating exam rooms and equipment (e.g., providing training, surveying/rating CWCCI mammography sites as to accessibility, including adjustable height exam tables-if an accessibilities rating tool does not currently exist, the Massachusetts Department of Public Health has an instrument). The Surgeon General's Call to Action to Improve the Health and Wellness of Persons with Disabilities (U.S. DHHS, 2005) provides additional general approaches. Appendix H lists additional resources for increasing screening in women with disabilities

Discussion of Evidence-Based Findings and Recommendations for Local Implementation

For inreach settings, reminders emerged as one of the most consistently effective strategies to increase screening, even in women without a prior history of testing and those less likely to be screened within recommended schedules. Even for the most motivated women who value adherence with recommendations, without reminders it is difficult to remember and stay on track with all recommended screenings when they each have a different schedule (e.g., mammography once a year, Pap test every three years, annual eye exam, colonoscopy every 5-10 years). Letter only reminders are effective, but the addition of a phone call enhances the effect; phone was more effective for those less likely to be screened. Reminders with appointments and those that are individually tailored are more effective than those without appointments. To be most effective, reminder systems should focus on those who rarely get screened and should use the most cost-effective means. Data systems should be improved to more easily identify these women and keep costs low. Reminders should be non-duplicative so that women are not receiving reminders from multiple sources, including providers, labs/imaging centers and public screening programs. Available cost data show that mailed reminders, whether initial or follow-up, are typically less costly than phone reminders. It should not be assumed that patient reminders are more cost-effective than other types of interventions such as lay outreach workers or public awareness campaigns; further studies need to be conducted to determine the relative cost-effectiveness of all interventions. If brief, simple interventions such as reminders are not already in place in most inreach settings, they should be added as first steps in increasing uptake of screening.

Another effective approach for inreach settings is a combination of mailed reminders and phone counseling, both tailored to stage of change. Although the combination approach was more effective than letter or phone alone, the one study providing cost data showed that the best balance between effectiveness and cost was to use tailored mail reminders alone rather than phone alone or the combination. The effectiveness and cost analysis results produced in this study setting may not be generalizable to all other settings, but authors showed that effectiveness and cost-effectiveness measures can both be useful in choosing interventions appropriate for varying target audiences.

Access-enhancing strategies identified as effective for inreach settings were the use of vouchers and free testing, making mammography appointments at the time of the office visit and making available same day and mobile mammography. Continuing to ensure that the medical community and qualifying female clientele at risk are aware of free screening programs will enhance access for women seeking routine or emergency care that are without or who have inadequate insurance. Same day testing does not need to be used indiscriminately but should be used on the highest risk women; targeting women with a history of fewer mammograms would be effective and would limit the burden on facilities that are not able to handle a large load of same day appointments. Expansion of mobile van mammography services should be considered by medical centers that serve rural populations.

Peer-delivered counseling and case management originating through inreach were also shown to be more effective than provider reminders only in increasing screening in inner city women of color overdue for mammography. While reminder systems are sufficient for some women, others with more pressing needs require more intensive efforts. To be most effective, these more labor intensive theory-based strategies should focus on historic under-utilizers unlikely to respond to reminders who are pre-contemplators and contemplators. The true denominator is all eligible women in the community, not just those already in care; therefore, this type of model may be appropriate in some larger community settings as well.

Educational interventions delivered interactively were determined to be effective for use in either inreach or outreach settings. Education in outreach settings, when delivered interactively through peers, friends or lay health advisors were shown to be effective, especially when targeted to specific communities of color (see expanded discussion on outreach below). To be most effective, educational interventions should be theory-based (using, e.g., the HBM, social learning theory, TTM). Educational materials alone should not be expected to increase screening rates and should only be used as a part of a multi-component strategy, but should be culturally appropriate and appealing to the target community. Workbooks for developing evidence-based and culturally appropriate cancer education print materials for use in educational interventions for African-American, Hispanic/Latina, Native American women and Lesbians/Women who partner with women can be found through the Susan G. Komen Breast Cancer Foundation website (www.komen.org).

Direct mail invitation was shown to be an effective outreach approach in increasing the uptake of breast and/or cervical cancer screening, both in the U.S. and in other countries. Contacting women (who may have less knowledge of cancer detection and prevention efforts) outside of provider systems through direct mail invitations resulted in a much higher effect than that in the

U.S. studies of reminders. Direct mail invitations to screening following the airing of a TV ad were more effective than the TV ad campaign alone. Direct mail, using monetary incentives and an enhanced mailing list that includes behavioral and lifestyle data, should be considered as a method to increase mammography use in low income underserved women. To be most effective, such a strategy would make use of existing pertinent demographic and epidemiologic data to best target recipients at highest risk. For the Minnesota NBCCEDP, this has become the primary recruitment strategy, since it is effective and is one of its lowest cost strategies. Personal communication with the author revealed that virtually all women receiving mammograms through this program also received Pap tests; and that a direct mail approach would have great potential for increasing both breast and cervical cancer screening in the same population, but that adapting this exclusively for cervical cancer would require more formative work. Formative work and pilot testing are critical aspects for the success of a direct mail program, so important that it will be the focus of a third manuscript by the same author; a second will focus on the cost-effectiveness.

Other effective strategies for outreach either target women through community groups and social networks or settings that they frequent, or reach them through larger scale multi-component efforts. All effective outreach strategies used theory-based methods; most addressed barriers to screening and also included access-enhancing features. It was reported that communities of color may be more responsive to smaller culturally relevant group interventions than broader based approaches. Access-enhancing strategies are also likely to be highly critical for increasing screening in diverse communities of women, including recent immigrants, and should be used to complement individual and other community directed strategies.

Lessons learned from effective outreach interventions that target women through communities and social networks are that while reminders are effective in inreach settings, culturally appropriate sociological strategies are likely to be required to reach women not reached through traditional clinic settings; the use of multiple behavioral theories allow for a study design that is appropriately tailored for the target audience; cultural competency and sensitivity are necessary for the delivery of community-specific interventions; lay health educators are valuable in promoting screening, especially with populations with unique cultural features; design by and for the community is critical; using existing social networks for recruitment can enhance efforts because those at highest risk, including their socially similar acquaintances are reached; and high drop-out rates in some communities and reaching highly mobile persons on a sustained basis require additional effort. Though no cost data were provided, one author suggested that outreach strategies targeted to the larger community may be more effective than those that target specific women, because they have the potential to reach more women, but this would hold only if the general community contained large numbers of women who had not ever or recently been screened. Since access-enhancing and multi-component strategies emerged as much more consistently effective than education alone, education should not be the first intervention chosen for implementation.

Interventions within existing venues for at risk women that offer barriers assessment, eligibility screening and short-delay appointments for testing are probably less costly and labor intensive than other population based strategies that require more labor for recruitment and intervention. This approach is also consistent with the notion that once a woman decides to have a test, the

immediate availability of it prompts adherence. This type of intervention should target women who have not yet been reached by other efforts and are at high risk for under-utilization (e.g., the target populations already identified, those within low mammography rate clusters, women in geographic and demographic segments characterized as having breast and cervical cancers diagnosed at late stages and women having inadequate insurance and regular use of primary care). Appropriate targets might also include community agencies serving at risk women. This type of outreach effort seems especially appropriate because of cost-efficiencies, opportunities for enlisting additional support from the community and because it would likely reach late adopters, laggards, and women in pre-contemplation and contemplation.

Multi-component approaches to increasing screening were consistently effective. Lessons learned from effective multi-component strategies include that the use of focus groups and their results in program design likely enhance outcomes; inner city populations and their perceived barriers to screening are not homogeneous, therefore, single strategies are not likely to be sufficient and multi-strategy approaches are needed; they are likely to be especially helpful in rural areas because of the relatively cohesive social networks in existence there; the expansion of mobile van mammography services should be considered by medical centers that serve rural populations with access problems; and mass media, including advertising, is most useful when combined with other efforts, as it may provide an initial cue to action, but individually tailored interventions more directly affect behavior.

The lack of evaluations for increasing screening in lesbians and women with disabilities identifies an opportunity to enter into stronger collaborations with agencies that serve these women who are under-served for breast and cervical cancer screening. As indicated previously, only one pilot study evaluating breast and cervical cancer screening outcome after a lesbian-specific educational program was identified. Personal communication with the study's author indicated that the pilot study did not eventually result in a larger evaluation as hoped and she knew of no other similar studies. She, however, offered to be of future assistance if a local organization were to obtain funding to conduct such a study. After corresponding with her, another internet search was conducted which identified a potential resource to explore in the future: Seattle & King County Public Health in Washington State's Health information for lesbian and bisexual women (www.metrokc.gov/health/glbt/lbwomen.htm), which also includes lesbian-specific breast and cervical cancer risk information and a link to the Washington Breast and Cervical Health Program.

Strategies identified in the Literature Search Results as effective are recommended for local implementation and should be used first; for both breast and cervical cancer screening, this includes reminders, invitations, education, access enhancing and multi-component interventions. For cervical cancer screening, sociologic-network-home visits are also recommended. Interventions with limited effectiveness should be used with caution; and their use warrants justification and formal evaluation. For breast cancer screening, this includes sociologic-network-home visits and mass media alone and for cervical cancer screening, this includes the use of educational materials alone. Ineffective strategies used alone cannot be recommended and should be avoided; for breast cancer screening this includes the use of educational materials alone and for cervical cancer screening this includes the use of mass media alone.

No matter which strategies are used, care should be taken to continue to work collaboratively with existing partners and coalitions and to develop relationships with important partners that are not yet involved. All recruitment strategies should be accompanied with easy to use eligibility screening, timely booking of appointments and health care providers who are competent to serve a diverse population of women.

A limitation of this review is that it was informal and did not include a process by which to evaluate the quality of articles included; however some were outstanding and most were performed with a high degree of scientific rigor. The review was qualitative rather than quantitative with meta-analysis. A strength of this review was that it was conducted with an eye toward local implementation and that it used increases in breast and cervical cancer screening as the outcome measure rather than simply knowledge, attitudes, beliefs or satisfaction with the program. An additional advantage is that unlike other reviews, it included practical, real-life assessment of strategies by key informants with a wide range of expertise, who collectively represent both local and national perspectives.

The search strategy for this review included published literature and other documents, including those found on internet websites, but did not include innovative and effective interventions that are currently being carried out and evaluated but have not been published. Contacting other breast and cervical cancer screening programs in other parts of the country, through their websites and directly by phone may be an area for future research.

Areas for future exploration also include informally searching PubMed periodically and by using the e-mail service to receive updated results on saved searches to maintain search currency. This would also identify evaluations of interventions that had not yet been conducted at the time of the current review; it would be especially important for identifying effective interventions for lesbians and women with disabilities. Since stage of change, especially pre-contemplation or contemplation, is likely as influential on screening behavior as, for example, not having health insurance, searches could include stage of change and TTM models as they are specifically applied to increasing breast and cervical cancer screening. Another area for exploration is contacting the authors reporting on especially effective interventions, not only to identify practical elements for potential implementation, such as materials, manuals, curricula, records, data systems and assessment tools used, but also to learn from their experience to avoid pitfalls, keep costs in check and identify other enabling components that might be required for successful adoption. Most authors look forward to opportunities to help others improve the quality of health outcomes in their areas of expertise.

Next steps should include the dissemination of the report to CWCCI and CDPHE program staff and others that were included in the process. Identifying and including individuals, agencies and groups that are affected by the findings and recommendations in this report will be important for assessing the results, identifying barriers and enabling factors related to implementing change, and to translate the evidence into practice.

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Appendixes

Appendix A

Glossary of Research Terms (from National Library of Medicine unless otherwise noted)

Experimental Study (from Cochrane Collaboration)
A study in which the investigators actively intervene to test a hypothesis. In a controlled trial, one type of experiment, the people receiving the treatment being tested are said to be in the experimental group or arm of the trial.

Meta-Analysis
A quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc., with application chiefly in the areas of research and medicine.

Meta-Analysis (Publication Type)
Works consisting of studies using a quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc. It is often an overview of clinical trials. It is usually called a meta-analysis by the author or sponsoring body and should be differentiated from reviews of literature.

Quasi-Random Allocation (from Cochrane Collaboration)
Methods of allocating people to a trial that are not random, but were intended to produce similar groups when used to allocate participants. Quasi-random methods include: allocation by the person's date of birth, by the day of the week or month of the year, by a person's medical record number, or just allocating every alternate person. In practice, these methods of allocation are relatively easy to manipulate, introducing selection bias.

Random Allocation
A process involving chance used in therapeutic trials or other research endeavor for allocating experimental subjects, human or animal, between treatment and control groups, or among treatment groups. It may also apply to experiments on inanimate objects.

Randomized Controlled Trials
Clinical trials that involve at least one test treatment and one control treatment, concurrent enrollment and follow-up of the test- and control-treated groups, and in which the treatments to be administered are selected by a random process, such as the use of a random-numbers table. Treatment allocations using coin flips, odd-even numbers, patient social security numbers, days of the week, medical record numbers, or other such pseudo- or quasi-random processes, are not truly randomized and trials employing any of these techniques for patient assignment are designated simply Controlled Clinical Trials.

Review (Publication Type)
An article or book published after examination of published material on a subject. It may be comprehensive to various degrees and the time range of material scrutinized may be broad or narrow, but the reviews most often desired are reviews of the current literature. The textual material examined may be equally broad and can encompass, in medicine specifically, clinical material as well as experimental research or case reports. State-of-the-art reviews tend to address more current matters.

Appendix B

Definitions of Interventions

From the Task Force (2001):
Client reminders: Advise people in communities in communities or health care systems that they are due or late for screening (e.g., letters, postcards, phone calls); the content varies and they can also be tailored to fit the client's risk profile or barriers to screening.
Reducing structural barriers: Enables client access to a preventive service in a clinical or non-clinical setting through changes in location, hours and availability of providing child care. These interventions are based on the premise that facilitating access will increase demand and use of screening services.
Client incentives with or without reminders: Non-coercive rewards such as money, coupons, gifts, that motivate people to seek screening.
Small media: Includes the use of brochures, flyers, newsletters, informational letters or videos and may or may not be tailored to individual risk. These interventions are based on the premise that dissemination of information about the benefits and availability of screening will motivate people to be screened.
Reduced client costs: Includes paying for screening tests, providing insurance coverage, reducing co-payments for services, reimbursing the client or the screening site for services rendered, or a combination of these. These interventions are based on the premise that lower costs will increase demand and use of screening services.
Group education: Led by health educators or lay health promoters convey factual and motivational information about screening in didactic or interactive formats; sessions may include role playing or presentations by cancer survivors. These interventions are based on the premise that providing information about benefits and availability will increase demand for screening.
One on one education: Provided by health care professionals or health educators or lay health advisors or volunteers. Clients receive information by phone or face to face in office or clinic settings or in homes or local gathering places. Counseling can be supplemented by using brochures, informational letters or reminders; interventions can be tailored to address individual risks and barriers or be non-tailored. These interventions are based on the premise that dissemination of information about the benefits and availability of screening will motivate people to be screened.
Multi-component: The use of mass media to increase cancer screening is almost always used in the context of broader efforts that include small media, small group or one on one education, access enhancing measures. The use of multi-component interventions is based on the premise that providing information about benefits and availability will increase the demand for screening and making services more accessible will promote higher screening rates.

From Forbes (2002):
Invitations: Letters or phone calls inviting people for the first or second round screening; not for those overdue for screening.

From Black (2002):

Mass media campaigns: Major media (newspapers, radio and TV) are intended to reach large audiences, while minor ones (newsletters, bulletins and other notices) target specific audiences to heighten awareness, enhance other methods and create cumulative impact.
Lay health educator: Lay people to whom others naturally turn for advice, emotions support and tangible aid; they supply information and advice, refer women for services and provide cues as to the social acceptability of health services.

From Ellis (2003):
Healthcare provider directed: Computerized and manual prompts, chart reminders, academic detailing and educational outreach, audit and feedback, opinion leaders.
Individual (patient) directed: Mailed invitations, letters from physicians, generic or tailored education print materials or videos.
Social network: Peer leaders, community organization techniques, church networks.
Policy level: Changing regulations for improved screening coverage.
Multi-component: Two or more interventions used in combination.

From Jepson (2000):
Home visits: Conducted by a lay (i.e., typically peer) health educator or health professional.

From Legler (2002):
Access enhancing: Transportation to appointments, facilitated scheduling, mobile vans, vouchers, reduced cost screening tests.
Individual directed: One on one counseling, tailored and untailored letters and reminders, telephone counseling.
Social network: Interventions conducted by peer leaders and lay health advisors.

From Sin (1999):
Social network directed: Aimed at the social network in which people live.

From Yabroff (2001):
Inreach: Recruitment from inside primary care settings.
Outreach: Recruitment from outside primary care settings.
Behavioral: Change stimuli associated with test use, reminders.
Cognitive: Provide new information, education, clarify misconceptions.
Sociological: Use social norms or peers to increase screening adherence.
Interactive delivery: Phone or in person.
Static delivery: Letters, videotapes.
Active control: A lower level of an intervention.
Usual care control: No intervention to increase screening.

From Stone (2002):
Social influence: Based on social science theory that delivery of an intervention through valued members of a social group is more likely to change behavior.
Regulatory and legislative actions: Instituted at the local or national level to change environmental, legal or organizational contexts in provider practice.
Organizational change: Changes in work processes, jobs, facilities or infrastructure.

Appendix C

Key Informant Discussion Points

- ✓ **Women <u>in care</u>:**

  What seems to work to get women already <u>in care</u> screened?

  What <u>doesn't</u> seem to work to get women already <u>in care</u> screened?

  What additional simple, relatively inexpensive efforts could be taken to recruit and retain more women into regular screening who are already <u>in care</u>? What other efforts (that might be less simple or more expensive) could be taken?

  If you personally could do more to get women already <u>in care</u> screened, what would you do or what would you recommend? Would you do this in addition to what you are doing or instead of something you are doing and if so, what would you stop doing?

- ✓ **Women <u>not</u> in care (women in the general population OR who may/may not be connected to other community settings in some other way)**

  What seems to work to get women <u>not</u> already in care screened?

  What <u>doesn't</u> seem to work to get women <u>not</u> already in care screened?

  What additional simple, relatively inexpensive efforts could be taken to recruit and retain more women into regular screening who are <u>not</u> in care? What other efforts (that might be less simple or more expensive) could be taken?

  If you personally could do more to get women <u>not in care</u> screened, what would you do or what would you recommend? Would you do this in addition to what you are doing or instead of something you are doing and if so, what would you stop doing?

✓ **Intervention effectiveness:** In your opinion, how well do these types of interventions work (scale of 1-4 with 1 being the worst and 4 being the best, and don't know):

INREACH (Women in care)					
	1 (Worst)	2	3	4 (Best)	Don't know
Mailed or phone reminders					
Small media (print, AV, flyers)					
Access enhancing (location, hours, child care)					
Incentives (coupons, money, gifts)					
Reduced costs (subsidizing, paying for, covering with insurance)					
Other (specify)					
OUTREACH (Women not in care)					
	1 (Worst)	2	3	4 (Best)	Don't know
Direct mail					
Small media (print, AV, flyers)					
Access enhancing (location, hours, child care)					
Incentives (coupons, money, gifts)					
Reduced costs (subsidizing, paying for, covering with insurance)					
Peer recruitment/education					
Mass media					
Other (specify)					

✓ **General recommendations and wrap-up**

What reports have you read or projects have you heard about that work for women either inside or out of care that could help inform future efforts?

What other general recommendations would you have for recruiting and retaining more women into screening?

What agencies or community groups serving women 40-64, especially those 50-64, should breast and cervical cancer screening programs start working with to increase screening in these women?

Appendix D

Systematic Review Summaries

TITLE, AUTHOR(S), REFERENCE	**BLACK ME, YAMADA J, MANN V. A SYSTEMATIC LITERATURE REVIEW OF THE EFFECTIVENESS OF COMMUNITY-BASED STRATEGIES TO INCREASE CERVICAL CANCER SCREENING. CAN J PUBLIC HEALTH. 2002 SEP-OCT;93(5):386-93.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To evaluate and summarize evidence of the effectiveness of strategies to increase cervical cancer screening in women in community based settings		
Interventions examined	A priori groupings: Individual, group or population directed, targeting women Categories listed in Results: Mass media campaigns, Letters of invitation/reminders, Lay/community volunteers, Education, Educational materials		
Inclusion criteria	Published 1989-9/1999, English or French, aimed to increase the uptake of cervical screening, used prospective design and had control group, applicable to public health practice in Canada, measured as being of strong or moderate quality		
Exclusion criteria	Focused on primary care settings, measured only process or health professional knowledge, attitudes or behavior (other than screening rates), measured as being of weak quality		
Population characteristics	Seven studies were with women living in cities, regions, counties or tribes; the rest were aimed at women selected from other types of areas. Participants in 10 studies were described as disadvantaged (low income and education).		
Location(s)	US	UK	Other: Australia, Taiwan
Studies included/identified	19/428		
Outcome(s) measured	Screening knowledge, attitudes or behaviors, satisfaction and cervical cancer incidence/prevalence		

Analyses conducted	Studies were rated on their methodological quality according to a scale (strong, moderate, weak). Pre-post-intervention measures for intervention and control groups.
Findings	Seventeen (89%) studies measured Pap smear rates and of these, 12 (70.5%) reported statistically significant increases in rates compared to controls. One intervention using an educational video with Cambodian women increased Pap smear use; this intervention was delivered by lay health educators. Sociologic interventions using lay health educators or community volunteers for individual or group approaches were effective. Only 1 of 4 mass media only interventions was effective; it targeted a sub-population with language-specific material. All of the studies that used mass media campaigns with other strategies were effective in increasing screening rates or early cancer detection. Invitation letters were effective; one study required a centralized registry to identify potential participants and the other used direct mailing to women in intervention and control locations.
Components of the most effective interventions	Mass media campaigns combined with other strategies such as group education, free screening, physician education and letters of invitation Invitation letters Lay health educators or community volunteers using individual or group approaches
Discussion, recommendations	Mass media is most useful when combined with other direct mailed information or education to women or health care providers. Media may provide a cue to action, but individual education more directly affects behavior. Communities of color may be more responsive to smaller culturally relevant group interventions than broader based approaches. Using lay health educators within communities of color is resource-intensive and results may not be generalizable to different cultural groups. Multiple intervention studies did not assess the relative contribution of each strategy.

	The use of self-report of screening was a potential source of bias in some studies, but others used lab results databases to verify screening. In some studies, the follow-up period may not have been long enough; in addition, it will be important to look at longer term sustainability of strategies in the future.
Implications for implementation	Using lay health educators within communities of color, including recent immigrants, appears promising but is resource intensive; and generalizing results to other cultural subgroups may not be valid. Successful programs would measure knowledge and Pap smear rates and be attentive to perceived barriers and sensitive to cultural issues.
Additional comments	Concise overview and comparison of effective interventions without meta-analysis.

TITLE, AUTHOR(S), REFERENCE	**BONFILL X, MARZO M, PLADEVALL M, MARTI J, EMPARANZA JI. STRATEGIES FOR INCREASING WOMEN PARTICIPATION IN COMMUNITY BREAST CANCER SCREENING. COCHRANE DATABASE SYST REV. 2001;(1):CD002943.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To assess the effectiveness of strategies for increasing the participation rate of women invited to community (not opportunistic) breast cancer screening		
Interventions examined	Any planned strategy or combination of approaches to recruit women from a target population for breast cancer screening		
Inclusion criteria	Published or unpublished 1966-2000, primary study, interventions that invited women to a community breast screening activity, used experimental or quasi-experimental design		
Exclusion criteria	Studies involving opportunistic screening, studies identifying women through other than a population database		
Population characteristics	Women invited to community breast screening activities or programs		
Location(s)	US	UK	Other: Australia
Studies included/identified	14/151		
Outcome(s) measured	Attendance achieved (mammography appointment) in response to mammogram invitation		
Analyses conducted	Pre-post or only post-intervention measures for intervention and control groups.		
Findings	5 strategies were found to be effective (i.e., achieved statistical significance, with ORs listed); they were letter of invitation (1.66), mailed educational materials (2.81), phone call (1.94), letters of invitation plus phone call (2.53), and training activities plus direct reminders (2.46). Letters of invitation to a screening for multiple health issues,		

	including breast cancer screening, plus educational material was more effective for the control group (0.62). 2 studies looking at the effectiveness of home visits showed no difference between intervention and control groups.
Components of the most effective interventions	Not described beyond what is listing in Findings.
Discussion, recommendations	Most active recruitment strategies were typically more effective than no intervention. The more costly interventions were not as effective as the more simple ones. The relative effectiveness of the most effective strategies could not be determined. A limitation is that no data were available about the long term effectiveness of the interventions. More work needs to be done to establish the cost-effectiveness of interventions, but decision makers should avoid interventions that were not shown to be effective.
Implications for implementation	Less costly, more simple interventions (i.e., phone call or letters, either separately or combined) should be considered as first steps in increasing uptake of mammography. Authors recommend that breast cancer screening not be merged with invitations to other screenings.
Additional comments	Thorough, well done study; simpler in design, significantly more concise, provided more synthesis by type of intervention but less detail on individual studies than the Cochrane review for cervical cancer screening.

TITLE, AUTHOR(S), REFERENCE	**DENHAERYNCK K, LESAFFRE E, BAELE J, CORTEBEECK K, VAN OVERSTRAETE E, BUNTINX F. MAMMOGRAPHY SCREENING ATTENDANCE: META-ANALYSIS OF THE EFFECT OF DIRECT-CONTACT INVITATION. AM J PREV MED. 2003 OCT;25(3):195-203.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To assess the overall effectiveness of direct-contact recruitment on mammography participation		
Interventions examined	Direct contact interventions that are individual directed and conducted by phone or any other personal contact (including in-home)		
Inclusion criteria	Published 1981-11/2001, participant targeted interventions that used phone or in person contact to promote mammography screening, used experimental or quasi-experimental design, single intervention only		
Exclusion criteria	Contained multiple interventions, not all necessary data could be obtained, non-published reports could not be obtained		
Population characteristics	Most were women ≥50 years old, only 6 studies recruited younger women (starting at 35-40 years of age), 16/21 studies focused on women who were scheduled to get their first mammogram or who had not gotten one within recommended interval		
Location(s)	US	UK	Other: Australia, Europe
Studies included/identified	21/987		
Outcome(s) measured	Attendance for mammography		
Analyses conducted	Studies were given quality assessments. Pre-post-intervention measures for intervention and control groups.		
Findings	In 21 of all 25 direct contact interventions identified, the proportion of intervention women attending mammography was higher than that of controls; differences were significant in 10 of the 21 studies. In only 4 of 25 interventions, control group attendance was higher, but these results were not significant.		

	Intervention effects for mammography under-utilizers were significantly higher than for women in a more general population. Results were non-significantly higher in the intervention group in the following pairs: non-responders to an initial invitation compared with women who were scheduled for mammography or who had not gotten mammography within a recommended interval screening; women contacted by phone compared with women contacted in person.
Components of the most effective interventions	Provider based settings: Reminder phone calls, phone counseling, physician phone call Community settings: Reminder phone calls, phone counseling, recurrent peer phone calls, personal phone calls and visits
Discussion, recommendations	Non-significant differences in results between phone and in person contact, and between primary populations and non-responders to a first invitation were consistent with 2 previous reviews. The studies involved did not indicate the proportions of women eligible for initial versus repeat mammography, therefore it was not possible to examine any potential declining effect of repeat invitations. Differences in health care systems need to be taken info effect when adapting interventions to other settings. Some studies have been conducted on the cost-effectiveness of telephone-associated contact interventions and these have identified some methods or combinations to be more than others.
Implications for implementation	Direct contact invitations are effective and they can increase mammography attendance by 21%-46%. Because it has been argued that direct contact interventions would be particularly useful for mammography underusers, low income women and communities of color, cost-effectiveness studies are needed so that these interventions can be used in the most cost effective way.
Additional comments	This review covered several immunization and health screening interventions and included a large number of studies. It provided less detail on the review methodology and components of effective interventions (especially outreach) than other reviews.

TITLE, AUTHOR(S), REFERENCE	**ELLIS P, ROBINSON P, CILISKA D, ARMOUR T, RAINA P, BROUWERS M, O'BRIEN MA, GAULD M, BALDASSARRE F. DIFFUSION AND DISSEMINATION OF EVIDENCE-BASED CANCER CONTROL INTERVENTIONS. EVID REP TECHNOL ASSESS (SUMM). 2003 MAY;(79):1-5.**		
Health screening issue studied	Breast cancer See also summary for Cervical cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To provide an overview of effective cancer control interventions to promote behavior uptake by individuals (and not included in this summary: a review of primary studies evaluating strategies to disseminate cancer control initiatives)		
Interventions examined	Media campaigns: Educational TV segments, radio public service announcements Provider directed: Provider reminders, education, feedback, opinion leaders Individual directed: Invitations, letters, phone counseling, education, print materials, videos Access enhancing: Mobile vans, decreased cost or free tests Social network: Peer leaders, community organization, church networks Policy level: Changing regulations for improved screening coverage Multi-component: Two or more of above		
Inclusion criteria	Published no earlier than 1990, English, addressed breast cancer, was a systematic review, stated inclusion criteria for the primary studies, evaluated 1 of 5 cancer control interventions, did not focus on attendance after abnormal mammogram or the use of breast self exam or clinical breast exam		
Exclusion criteria	Published before 1990, not in English, focused on children or adolescents		
Population characteristics	Not described		
Location(s)	US	UK	Other: Australia
Studies included/identified	15/190		

Outcome(s) measured	Uptake for mammography screening
Analyses conducted	Studies were given quality assessments for search strategy, level of evidence, quality of assessment, whether conclusions were supported by data, and an overall rating based on a scale (weak, moderate, strong). Pre-post-intervention measures for intervention and control groups.
Findings	Invitations or reminders: An invitation letter to a community screening was one of the most effective interventions; uptake increased 50% with mailed reminders compared to controls and increased 13.2% in women who received a phone or mailed reminder compared with usual care controls; appointments with reminder letters increased screening (86%) more than open ended invitations (76%) but a letter from a physician did not increase the benefit. Educational: In the 3 reviews including this category, 2 found a positive effect from educational materials (mailed materials recruiting women to a community screening) and other patient education interventions, and 1 found no effect with either printed materials or educational phone calls. Social network: Patient directed interventions of this type (peers, friends, lay health advisors, media representations) increased mammography by 12.6%. Other: One review reported that organizational change was consistently one of the most effective interventions. In 1 review consisting of 2 studies there was no improvement in using home visits compared with controls. A touch screen computer located in a waiting room increased mammography by 9%. Access enhancing: All reviews reported that access enhancing interventions were highly effective (18.9% in 1 review, ORs of 3.57 and 4.28 in 2 other reviews) especially those that used combinations of interventions (26.9%). Media campaigns: The 2 reviews that estimated the intervention effects showed opposing results; the one with 6 studies showed an OR of 1.3 and the other review reported lower uptake of mammography in media-promotion towns compared to community-intervention towns; 1 mass media campaign within this review increased knowledge of tests and intentions to be tested, but not uptake.

	Multi-strategy interventions: In the 8 reviews, combinations had an increased effect; the strongest combinations were access enhancing with individual directed (27%) and access enhancing with system directed (20%).
Components of the most effective interventions	Not described beyond what is listing in Findings, as the review was more of an overview describing categories of interventions that are effective, rather than specific components of interventions.
Discussion, recommendations	This report was non-duplicative in that it drew upon and summarized the existing high quality works of others, but as such, there was no attempt made to update any of the existing findings with more current results. A limitation is that it did not include meta-analysis or quantitative synthesis of results or intervention effects across the existing systematic reviews, but heterogeneity between studies and incomplete data made this inappropriate. Information specific to subpopulations, including communities of color, and information about perceived barriers, was not discussed, but this information can likely be obtained from the primary studies.
Implications for implementation	Effective interventions include invitations or mailed reminders, and financial barriers interventions, especially when strategies are multi-component and combine both behavioral and cognitive approaches.
Additional comments	This report was sponsored by the Agency for Healthcare Research and Quality to assist public and private sector organizations improve the quality of health care in the U.S. This very large, comprehensive report focuses on many cancer control initiatives. It is different than other systematic reviews, which review primary studies, in that it was a review of existing systematic reviews.

TITLE, AUTHOR(S), REFERENCE	**ELLIS P, ROBINSON P, CILISKA D, ARMOUR T, RAINA P, BROUWERS M, O'BRIEN MA, GAULD M, BALDASSARRE F. DIFFUSION AND DISSEMINATION OF EVIDENCE-BASED CANCER CONTROL INTERVENTIONS. EVID REP TECHNOL ASSESS (SUMM). 2003 MAY;(79):1-5.**		
Health screening issue studied	Breast cancer	Cervical cancer See also summary for Breast cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To provide an overview of effective cancer control interventions to promote behavior uptake by individuals (and not included in this summary: a review of primary studies evaluating strategies to disseminate cancer control initiatives)		
Interventions examined	Media campaigns: Educational TV segments, radio public service announcements Provider directed: Provider reminders, education, feedback, opinion leaders Individual directed: Invitations, letters, phone counseling, education, print materials, videos Access enhancing: Mobile vans, decreased cost or free tests Social network: Peer leaders, community organization, church networks Policy level: Changing regulations for improved screening coverage Multi-component: Two or more of above		
Inclusion criteria	Published no earlier than 1990, English, addressed cervical cancer, was a systematic review, stated inclusion criteria for the primary studies, evaluated 1 of 5 cancer control interventions, did not focus on attendance after abnormal mammogram or the use of breast self exam or clinical breast exam		
Exclusion criteria	Published before 1990, not in English, focused on children or adolescents		
Population characteristics	Not described		
Location(s)	US	UK	Other: Canada, Australia
Studies included/identified	9/95		

Outcome(s) measured	Uptake of Pap smear test for cervical cancer screening
Analyses conducted	Studies were given quality assessments for search strategy, level of evidence, quality of assessment, whether conclusions were supported by data, and an overall rating based on a scale (weak, moderate, strong). Pre-post-intervention measures for intervention and control groups.
Findings	Invitations or reminders: Mailed letters increased the rate of screening but lower increases were noted in studies of lower SES groups (OR 1.16) than in those looking at mixed populations (OR 2.02). In 1 review, reminder letters were more effective for cervical cancer than breast cancer screening; in a review of general screening, patient reminders for cervical cancer screening were effective. Health care provider advice: In the 1 review that examined 5 studies, there was no difference between face to face counseling in either care or home settings and controls. Educational materials: In 3 studies within 1 review, print, audio visual and group education had no effect. The other review found patient education to be effective (OR 1.53). Other: One review reported that organizational change was consistently one of the most effective interventions. One study within a review identified that the use of a health promotion nurse was so effective that the study was stopped early because the providers were no longer willing to continue the control condition. Access enhancing: Removal of financial barriers was shown to be effective for cervical cancer screening in 2 studies of general preventive screenings. Media campaigns: There was no effect between intervention and control communities in being up to date on cervical (and breast) cancer screening tests. Multi-strategy interventions: One review found 1 effective study (patient letter plus computer generated letter) and 2 ineffective studies (patient letter plus computer generated letter, physician reminder with patient carried health maintenance prompt card). Another identified several effective combinations (invitation letter from provider plus education, invitation letter plus follow-up with health educator, physician reminder plus individual invitation).

Components of the most effective interventions	Not described beyond what is listing in Findings, as the review was more of an overview describing categories of interventions that are effective, rather than specific components of interventions.
Discussion, recommendations	This report was non-duplicative in that it drew upon and summarized the existing high quality works of others, but as such, there was no attempt made to update any of the existing findings with more current results. A limitation is that it did not include meta-analysis or quantitative synthesis of results or intervention effects across the existing systematic reviews, but heterogeneity between studies and incomplete data made this inappropriate. Information specific to subpopulations, including communities of color, and information about perceived barriers, was not discussed, but this information can likely be obtained from the primary studies.
Implications for implementation	Effective interventions include invitations and reminders to patients. There was limited evidence of effectiveness for educational materials, phone counseling, removal of financial barriers, media campaigns and advice from providers.
Additional comments	This report was sponsored by the Agency for Healthcare Research and Quality to assist public and private sector organizations improve the quality of health care in the U.S. This very large, comprehensive report focuses on many cancer control initiatives. It is different than other systematic reviews, which review primary studies, in that it was a review of existing systematic reviews.

TITLE, AUTHOR(S), REFERENCE	**FORBES C, JEPSON R, MARTIN-HIRSCH P. INTERVENTIONS TARGETED AT WOMEN TO ENCOURAGE THE UPTAKE OF CERVICAL SCREENING. COCHRANE DATABASE SYST REV. 2002;(3):CD002834.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer: Colorectal cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To assess the effectiveness of interventions to increase the uptake of cervical cancer screening.		
Interventions examined	Invitations (for first or second round screening; not for those overdue), Reminders (women overdue not responding to first round), Education without counseling (materials, group or individual education, home visits), Message framing (verbal or written, positive or negative), Counseling (including a discussion of barriers), Risk factor assessment (questionnaires and computer programs that assess risk status), Procedures (making the process easier or more acceptable), Economic (removal of financial barriers).		
Inclusion criteria	Published or unpublished 1966-3/2000, primary study, interventions that targeted women eligible for screening, used experimental or quasi-experimental design		
Exclusion criteria	Studies with interventions aimed at health professionals and mass media campaigns		
Population characteristics	Women from communities, community clinics, health maintenance organizations, primary care practices, national screening programs		
Location(s)	US	UK	Other: Canada, Australia, Belgium
Studies included/identified	35/440		
Outcome(s) measured	Primary: Uptake or non-uptake of cervical screening as recorded by health records or self-report Informed uptake: Screening after decision making where risks and benefits are discussed Intermediate (only included if the primary study also included primary outcomes): Making appointments, intentions, attitudes,		

	knowledge, satisfaction with screening Other (only in studies reporting primary outcomes): Costs
Analyses conducted	Studies were rated on their methodological quality in 8 areas according to a scale (adequate, inadequate, unclear); pre-post-intervention measures for intervention and control groups.
Findings	Invitations: 8 of 9 studies where ORs could be calculated reported statistically significant improvements. In 2 studies, a combined letter from a GP was more effective than either a letter from a health clinic or a screening program coordinator. Letters with fixed appointments were more effective than letters with open appointments. Phone invitations were more effective than no intervention but there were mixed results when comparing phone with letter invitations (one favored letters and the other favored phone). Two studies looking at face to face invitations from a health worker or GP showed opposing non-significant results (one favored invitation and the other favored no intervention). A GP letter with a mass media campaign was more effective than the campaign alone. Reminders: No studies identified. Education without counseling: Across all types of educational interventions, 5 of 6 favored the intervention. There was no difference between groups receiving either community living skills education or cancer screening information, both from a community lay worker. None of the printed materials studies showed any significant positive effect; 2 of them favored the control over the intervention. Video/slide presentation was effective compared to no intervention in 1 study. Both face to face home education visit studies showed positive intervention effects and 1 of these was significant. Message framing: No studies identified. Counseling: Face to face counseling by a GP and phone counseling with patient prompts were effective when compared to either no counseling or patient prompts alone or provider prompts. Risk factor assessment: The 2 studies, both theory-based, and with a personalized risk discussion with a health care provider, showed mixed results: 1

	favored the intervention compared to usual care controls and the other showing no difference between intervention and control groups; this study also showed no difference between a typical (less intense) and enhanced risk assessment. Procedures: Compared to usual care, access to a lay health worker who offered screening with a female nurse practitioner was more effective as was the use of a health promotion nurse (significant in 1 of 2 studies). The offer of screening by a female was more effective than the offer by a male, but there was no difference in effectiveness when the gender of the smear taker was revealed (or not revealed) in invitation letters. Economic: In a study of abnormal Pap smears, transportational incentives were effective in returning women who were patients of county health clinics who had no health insurance and who had more severe Pap smear results. Informed uptake: No studies identified. Booking of appointments: Receiving usual care was more effective than receiving a cognitive behavioral intervention (feedback about personal risk and interview to enhance self-efficacy for preventive behavior), and these women were more likely to attend without scheduling the appointment. There was no difference in screening between women receiving cancer education (general information and screening recommendations) and women receiving the cognitive behavioral intervention. Attitudes to screening: In 1 study, 78% of the women receiving an invitation indicated they were pleased to have received it personally addressed; 68% of women receiving the letter and behavior prompts were pleased; 98% in the letter only and 95% of the combination group felt that the screening letter should be sent to all women. Costs: Comparative costs reported by 1 study were $14.23 for GP invitation letter and $5.88-$11.75 for phone intervention, depending on staff salary level. The other study only reported total costs, not costs per person or per additional Pap smear performed.
Components of the most effective interventions	Not described beyond what is listing in Findings.

Discussion, recommendations	Invitations and educational interventions were the most effective in increasing the uptake of cervical screening. The accuracy of population lists and registers affects the effectiveness of invitational interventions. Educational interventions using lay health workers for communities of color have promise; results may vary by ethnic group. Other interventions are also likely to be effective but there was not a sufficient number of high quality studies to determine the effectiveness of these. The review and results of the review depended on the quantity and quality of studies available; meta-analysis was limited because of statistical heterogeneity between studies. Therefore, conclusions are based more on narrative synthesis than the pooling of data. Future study should be done to determine the relative effectiveness and cost-effectiveness of the interventions. This would aid decision making and help determine which types of educational materials are the most effective and whether invitation letters alone or in combination with appointments are more or less effective. Future studies should be done to assess the effectiveness of interventions in increasing informed uptake.
Implications for implementation	Invitations were effective in increasing the uptake of cervical screening; there was also support for using educational interventions but it was difficult to determine which specific educational methods were more effective than others.
Additional comments	Thorough, well done study; provided more detail on individual studies, but less synthesis by type of intervention than the Cochrane review for breast cancer screening.

TITLE, AUTHOR(S), REFERENCE	**JEPSON R, CLEGG A, FORBES C, LEWIS R, SOWDEN A, KLEIJNEN J. THE DETERMINANTS OF SCREENING UPTAKE AND INTERVENTIONS FOR INCREASING UPTAKE: A SYSTEMATIC REVIEW. HEALTH TECHNOL ASSESS. 2000;4(14):I-VII, 1-133.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer and other health screening tests
Type of study	Systematic review	Meta-analysis	
Purpose of study	To examine factors associated with the uptake of 14 types of health screening programs (not all included in this summary) and assess the effectiveness of interventions methods used to increase uptake		
Interventions examined	Listed by category (number of types within category examined) Invitations (7), Education (6), Message framing (3), Risk factor assessment and management (3), Counseling of individuals or couples (3), Procedural or service provision (5), Economic (2), Community intervention (3), Single aimed at providers (4), Combined aimed at providers (5), Aimed at both providers and individuals (2), Provider versus individual (2) NOTE: Because of the complexity, scope and size of this review, only results of outreach interventions, including Education, Counseling, and Community, specifically for breast and cervical cancer screening, are reported in this summary		
Inclusion criteria	Published or unpublished studies of screening programs, used experimental or quasi-experimental design		
Exclusion criteria	Did not meet one or more inclusion criteria, outcome was an intermediate measure of screening uptake (e.g., booking appointments, intentions to test), interventions to increase the uptake of diagnostic (not screening) or self-exam (e.g., BSE) tests		
Population characteristics	Not described		
Location(s)	US	UK	Other: Canada, Australia, New Zealand, Europe, Singapore

Studies included/identified	190/440
Outcome(s) measured	Screening uptake as measured by self-report or administrative records
Analyses conducted	Studies were given quality assessments on 7 criteria. Pre-post-intervention measures for intervention and control groups.
Findings	Education: Printed materials had no statistically significant effect in 4 Pap smear or in 8 of 9 mammography interventions. Compared with the control condition, an educational video in a waiting room improved mammography uptake in low income African-American and Latina women; a tape-slide presentation in the waiting area within a different study had no effect on the uptake of Pap smear. In 5 studies providing group education to increase mammography and/or Pap smear use, 3 showed positive results (29% versus 18% and 21% for educational brochures and usual care, respectively); in 2, group education was more effective than receiving printed materials. Two interventions for breast and cervical cancer combined and 1 for cervical cancer screening only which provided home visits by lay health educators to women of color showed positive results. In contrast, there was no effect in 4 of 5 home visit interventions for mammography uptake; 1 resulted in increased clinical breast exam only. Home visit plus video was not more effective than home visit with brochure in an intervention to increase Pap smear use. Counseling: Uptake of mammography increased significantly in 3 of 5 interventions using phone counseling (4 targeted breast and 1 targeted both breast and cervical cancer screening) compared to controls. In the 1 mammogram and 1 Pap smear intervention using face to face counseling, there was no intervention effect. Community: One study showed significantly lower mammography uptake in communities with a mass media promotion (post-test results of 31% and 32%) compared with communities that received a community intervention (62% and 47%). In the same location, a second study showed that provider intervention towns had greater intervention effects (post-test results of 60% and 65%) than the matched community intervention towns (55% and 47%). One community education program targeting both women and providers increased mammography use compared to controls. One of 5 combination community interventions for mammography reported an increased effect of 10% in intent to screen, whereas positive effects were shown in 3 of 4 combination interventions for Pap smear use.
Components of the most effective interventions	Not described beyond what is listing in Findings.
Discussion, recommendations	Although odds ratios could be calculated for most of the RCT, meta-

	analysis could not be done because the studies were statistically heterogeneous. Since results could not be pooled by intervention type, the conclusions are based on reviews of individual studies, most of which were of good quality. In the determinants section of this review (results not reported in this summary) it was found that knowledge about cancer and screening tests was not an important factor for individuals in attending for screening. This is consistent with the intervention effectiveness finding that most educational interventions had limited effect. It was also found in the determinants section that women who had had previous mammography were more likely to come back for return screening. This has implications for intervention design, such that interventions that focus on getting the highest attendance for initial screening may also realize the benefits of increasing repeat/interval screening.
Implications for implementation	Telephone counseling was shown to be an effective outreach intervention for increasing the uptake of health screening. Interventions that may be effective include educational home visits, multi-component community interventions. Interventions with limited effectiveness were printed and audiovisual educational materials, group education and face to face counseling. Interventions for which there is not enough evidence include mass media campaigns and community education as single strategies.
Additional comments	Detailed and lengthy review of many interventions for 14 types of health screening programs. This review had much less rigorous inclusion criteria than most others and as a result contained little meta-analysis and instead resorted to describing most studies individually, including those for breast and/or cervical cancer. In the Results section, authors also reported on several additional outcomes, including intentions to test, changes in knowledge and attitudes and included many studies with non-significant results.

TITLE, AUTHOR(S), REFERENCE	**LEGLER J, MEISSNER HI, COYNE C, BREEN N, CHOLLETTE V, RIMER BK. THE EFFECTIVENESS OF INTERVENTIONS TO PROMOTE MAMMOGRAPHY AMONG WOMEN WITH HISTORICALLY LOWER RATES OF SCREENING. CANCER EPIDEMIOL BIOMARKERS PREV. 2002 JAN;11(1):59-71.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To determine which types of mammography-enhancing interventions are most effective for women with lower use of mammography than the general population (called diverse by the authors)		
Interventions examined	Individual directed: One on one counseling, letters, reminders, phone counseling System directed: Provider prompts Access enhancing: Transportation, facilitated scheduling, mobile vans, vouchers, reduced costs Social network: Peer leaders, lay health advisors Community education Mass media campaigns Multi-strategy: Combination of interventions		
Inclusion criteria	Published 1984-8/2000, English, aimed to increase use of screening mammography in diverse populations, used experimental or quasi-experimental design		
Exclusion criteria	Study's intervention effect was not statistically measurable, study focused exclusively on physician or office systems		
Population characteristics	Diverse populations of women who are older ($\geq$60), low income, of racial-ethnic minority, have high school education or lower, living in a rural areas or inner city area Six studies were with older women exclusively; 5 additional studies provided results for subsets of older women. Seven studies had populations that were low income; 7 were in rural areas. Women of color comprised >40% of the comparisons for 24 of the studies and 2/3 were African-American.		
Location(s)	US	UK	Other
Studies included/identified	38/750		

Outcome(s) measured	Receipt of mammogram by verification or self-report
Analyses conducted	Pre-post-intervention measures for intervention and control groups
Findings	Intervention effects: Access enhancing (18.9%), Individual directed in health care setting (17.6%), Community education (9.7%), Individual directed in community setting (6.8%), Media campaigns (5.9%), Social network (5.8%). Multiple intervention effect was 13.3% and those for combination interventions were 26.9% (access enhancing with individual directed) and 19.4% (access enhancing with system directed). For diverse populations, intervention effects were 7.9%, 12.7%, 12% and 11.6% in studies for all older women, >40% low income women, >40% non-whites and >40% blacks, respectively.
Components of the most effective interventions	Access enhancing: Mobile mammography vans, vouchers for mammography, same-day appointments, sign-up followed by a same day mobile van, help with appointment scheduling, free mammograms, dependent care, help navigating through the health system Individual directed in health care setting: Opportunistic screening, physician/provider recommendations, inreach within clinics serving predominantly indigent populations, providing services in connection with other community outreach efforts, bilingual program materials, individualized in-person or phone counseling, letters and reminders, vouchers, coupons, bus passes, appointment scheduling, case management, health educators or lay health advisors
Discussion, recommendations	The most effective interventions (access enhancing) may have helped promote healthy behavior change by altering social, structural and economic contexts, bringing health care closer to the environments in which women live and by providing cues to action and opportunities for screening, consistent with social learning theory and the Health Belief Model. In this way, they may have altered cognition and facilitated the healthy behavior. The study with the largest effect facilitated appointments, provided transportation as needed, free mammograms and information in Spanish (for mono-lingual women). Individual directed interventions, while many focused on women who already had some access to health care, demonstrated that it may take additional cues and efforts to facilitate the utilization of mammography. Multiple strategies were more effective than single ones, but it is

	difficult to determine which combinations are the strongest or the most effective; more research is needed in this area to assist in decision making and resource allocation. "Hard to reach" women may be less hard to reach than not reached with the appropriate strategies, as shown by the promising subgroup results for diverse women. Intervention effects declined over time. This could be because the rates of screening increased significantly over time in some control groups, mirroring secular trends in mammography use prevalence; however, some populations maintained low prevalence over time. Another explanation for the decline is that some studies promoted initial screening (where larger improvements would be expected) and others promoted repeat screening. Results of this review are similar to those of others that found invitations, reminders, patient-targeted sociologic interventions (access enhancing), behavioral and cognitive interventions (individual directed), training, home visits and strategy combinations to be effective.
Implications for implementation	Access enhancing strategies are likely to be highly critical for increasing mammography in diverse women and should be used to complement individual and system directed strategies.
Additional comments	Thorough, exceptionally well done review.

TITLE, AUTHOR(S), REFERENCE	**SIN JP, ST. LEGER AS. INTERVENTIONS TO INCREASE BREAST SCREENING UPTAKE: DO THEY MAKE ANY DIFFERENCE? J MED SCREEN. 1999;6(4):170-81.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To evaluate the effectiveness of interventions to increase breast screening uptake		
Interventions examined	Person directed: Aimed at eligible women (invitations, reminders) and providers System directed: Aimed at the organization of service delivery (prior notification lists, access) Social network directed: Aimed at the social network in which people live Multi-strategy: Combinations of the individual strategies listed above, where the combination of the effect is measured		
Inclusion criteria	Published 1980-7/1998, English, uptake was used as an outcome measure, relevant to the UK screening program (according to a scale: direct, indirect and not relevant)		
Exclusion criteria	Studies considered not relevant		
Population characteristics	Not described		
Location(s)	US	UK	Other: Australia
Studies included/identified	28 studies reviewed (no denominator provided)		
Outcome(s) measured	Uptake of (attendance at) mammography		
Analyses conducted	Studies were graded for quality of study design according to a scale (well designed RCT, RCT where sample size or power is unclear/insufficient, descriptive with comparisons, descriptive without comparisons). Similar interventions were grouped together and an indicator describing the direction of the grouped evidence was applied (increases, does not increase or decrease, suggestive that the intervention decreases the desired effect, unclear whether there is an		

	effect); if studies within a grouping showed opposing effects, the study which had the highest quality grading was used to determine the effect
Findings	Person directed: Appointments with invitation letters were more effective than invitations only; endorsement by the general practitioner (GP) did not increase the uptake. Health education by the GP was not more effective than a simple verbal recommendation. For women who failed to keep appointments, phone counseling was more effective than a second reminder letter. System directed: Only 2 descriptive studies were identified; only 1 showed increased uptake. Social network directed: None of the 4 descriptive or the 1 controlled study (general leaflet drops, health information at hair salons, encouraging friends to attend) showed any positive effect. Multi-strategy: The 1 study in this category showed no intervention effect (checking addresses of non-attenders and sending reminder letters).
Components of the most effective interventions	Person directed: Fixed appointments in invitation letters System directed: Bus transportation from the health to the screening center
Discussion, recommendations	The simpler interventions, rather than in-depth ones, resulted in the greatest increases in mammography uptake; these were mostly person directed interventions. This may be because they are easier to implement and evaluate. Social network directed interventions were not effective, but they may have actually contributed to knowledge and motivation levels, which are important aspects of increasing the impact of any screening program. Results of this review are not consistent with one conducted in the US, but there were differences in methods and definitions used. In the UK, there are organizational differences between breast and cervical cancer screening; those in the cervical cancer screening arena

	deserve examination for adaptation to breast cancer screening because of the higher uptake of cervical (85%) v. breast (>70%) cancer screening.
Implications for implementation	Inner city populations and their perceived barriers to screening are not homogeneous; therefore, single ones are not likely to be sufficient and multi-strategy approaches are needed. If brief, simple interventions (e.g., reminder letters with appointments) are not already in place in most inreach settings, they should be added, as there are many gains to be made through this simple mechanism.
Additional comments	This review was more descriptive than analytical in its approach and used much less rigorous inclusion criteria than other reviews. It is unclear why this review, completed on studies published during the same years as within other reviews, surfaced so many ineffective strategies; this may be related to differences in inclusion criteria or relevance to UK screening settings.

TITLE, AUTHOR(S), REFERENCE	**STONE EG, MORTON SC, HULSCHER ME, MAGLIONE MA, ROTH EA, GRIMSHAW JM, MITTMAN BS, RUBENSTEIN LV, RUBENSTEIN LZ, SHEKELLE PG. INTERVENTIONS THAT INCREASE USE OF ADULT IMMUNIZATION AND CANCER SCREENING SERVICES: A META-ANALYSIS. ANN INTERN MED. 2002 MAY 7;136(9):641-51.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer: Colon
Type of study	Systematic review	Meta-analysis	
Purpose of study	To evaluate the effectiveness of approaches for improving adherence to adult immunization and cancer screening guidelines		
Interventions examined	Reminders: Prompt the use of a prevention service Provider feedback: Rates of performance of specified prevention activities Education: Dissemination of information about prevention practices Financial incentives: Direct or indirect financial rewards to a specific action Regulatory and legislative actions: Instituted at the local or national level to change environmental, legal or organizational contexts in provider practice Organizational change: Changes in work processes, jobs, facilities or infrastructure Mass media campaigns: Target large segments of the population Key features: Social influence, Marketing and outreach, High visual appeal and clarity, Collaboration and teamwork, Design based on needs, barriers, incentives, assessments or theory, Top management support, Active learning strategies Targets: Patient, provider, organization, community		
Inclusion criteria	Published 1966-2/1999, controlled studies that assesses interventions to increase the use of immunizations (influenza and pneumococcal pneumonia) and screening for colon, breast and cervical cancer in adults		
Exclusion criteria	Did not include information on the number of subjects, unit of analysis was not the patient		
Population characteristics	Adults		
Location(s)	US	UK	Other:

			Locations not stated
Studies included/identified	108/552		
Outcome(s) measured	Rates of adult immunization and cancer screening		
Analyses conducted	Studies were given quality assessments. Pre-post-intervention measures for intervention and control groups.		
Findings	Effective interventions (in rank order from most to least effective, with target listed, odds ratios): Mammography: Patient financial incentives (2.74), Organizational change (2.47), Patient reminders (2.31), Provider education (1.99), Provider feedback (1.76), Provider reminders (1.63), Patient education (1.31) Cervical cytology: Organizational change (3.03), Patient financial incentives (2.82), Patient reminders (1.74), Provider education (1.72), Patient education (1.53), Provider reminders (1.37) There were few studies located to determine the effectiveness of Key features, but in rank order from most to least effective (with odds ratios), effectiveness was: Mammography: Design and theory (1.94); none of the others had significant results for this service Cervical cytology: Collaboration and teamwork (5.55), Active learning strategies (2.30), High visual appeal and clarity (1.99), Design and theory (1.44); none of the others had significant results for this service. Across all services (including non-breast and cervical cancer screening), organizational change and patient financial incentives were the most effective interventions. Patient reminders were less effective but they still consistently improved outcomes. Provider feedback was mostly not effective and Provider reminders and education were inconsistent in their effectiveness across types of immunization and cancer screening services. A singularly effective intervention paired with another effective intervention yielded significantly positive results. Ten of 12 interventions that added an effective component to a less effective one resulted in significant benefits, but 9 of 12 that added a less effective component to an effective one saw no additional benefit. Two weak interventions combined did not yield any more positive		

	results than when used alone.
Components of the most effective interventions	Organizational change: Establishment of a separate clinic for screening and prevention, use of a planned care visit for prevention, use of quality improvement, assignment of prevention responsibilities to non-physician staff Financial incentives: Reducing or eliminating co-pays Patient reminders: Personalized, not generic Patient education: Not described.
Discussion, recommendations	Organizational change interventions had strong effect and this suggests that the current organization of many practices is probably not optimal for prevention care. Prevention care providers and policymakers should be encouraged that adding one or more effective interventions to existing ones resulted in improvements. Patient education alone, since it was less effective than others, should not be the first intervention chosen for implementation. This review yielded more primary literature results than previous studies. Future intervention evaluation standards should include the collection of data to allow meta-analysis of cost-effectiveness.
Implications for implementation	Organizational changes in health care settings, specifically to help make the identification and delivery of immunization and cancer screening services a routine part of care, was the most effective strategy. Patient reminders in health settings should be used as a supplement or in addition to or in place of organizational change. Patient financial incentives should be implemented.
Additional comments	This review covered several immunization and health screening interventions and included a large number of studies. It provided less detail on the review methodology and components of effective interventions (especially outreach) than other reviews.

TITLE, AUTHOR(S), REFERENCE	**TASK FORCE ON COMMUNITY PREVENTIVE SERVICES. THE GUIDE TO COMMUNITY PREVENTIVE SERVICES: IMPROVING THE USE OF BREAST, CERVICAL AND COLORECTAL CANCER SCREENING. 2001. WWW.THECOMMUNITYGUIDE.ORG/CANCER/SCREENING/DEFAULT.HTM**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer: Colorectal cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To identify effective strategies to promote increased use of breast, cervical and colorectal cancer screening, to guide cancer screening programs toward effective and appropriate strategies, to inform programs and other researchers about interventions with demonstrated effectiveness and to identify areas for further research and review.		
Interventions examined	Client reminders (in communities or provider settings), Multi-component (include media, education, enhanced access), Reducing structural barriers (location, hours, providing child care), Client incentives (coupons, gifts, with or without reminders), Small media (printed materials, videos; tailored or non-tailored to individual risk), Reduced client costs, Group education, One on one education, Mass media (alone) NOTE: Only results of interventions specifically for breast and cervical cancer screening are reported in this summary.		
Inclusion criteria	Published 1966-4/2001, primary study, conducted in developed country, met evidence review definition of the intervention, provided one or more outcome measures of interest, compared exposed persons with control condition over a period of time, met quality criteria		
Exclusion criteria	Studies with limited quality of execution (5 or more limitations)		
Population characteristics	Not described		
Location(s)	US	UK	Other: Locations not stated
Studies included/identified	101/519		
Outcome(s) measured	Breast cancer screening by mammography, cervical cancer screening		

	by Pap smear
Analyses conducted	Studies were given quality assessments for suitability of design (greatest, moderate, least) and quality of execution (good, fair, limited). Pre-post-intervention measures for intervention and control groups.
Findings	Effect measures (n=number of positive effect measures, median percentage points) Client reminders: Recommended for both breast (n=29, 14.7%) and cervical (n=13, 10.1%) cancer screening based on strong evidence. Multi-component: Recommended for both breast (n=10, 10.8%) and cervical (n=13 of 16, 19%) cancer screening based on strong evidence. Reducing structural barriers: Recommended for breast cancer screening (n=3, 15%) based on strong evidence. Insufficient evidence to determine the effectiveness for cervical cancer screening because the 1 study in the review had only fair quality of execution. Client incentives (with reminders): Recommended for breast cancer screening (n=2, 18.5%) based on strong evidence; insufficient evidence to determine the effectiveness of this intervention when used to recruit friends because the 1 study in the review had only fair quality of execution. Insufficient evidence to determine the effectiveness for cervical cancer screening because the 1 study in the review had only fair quality of execution. Client incentives (without reminders): Insufficient to determine the effectiveness for both breast and cervical cancer screening as no qualifying studies identified were identified. Small media: Recommended for breast cancer screening (n=7 of 9, 7.1%) based on strong evidence. Insufficient to determine the effectiveness for cervical cancer screening as the effects in 3 studies were inconsistent in direction. Reduced client costs: Recommended for breast cancer screening (n=not provided, 12.5%)

	based on sufficient evidence. Insufficient evidence to determine the effectiveness for cervical cancer screening because the 1 study in the review had only fair quality of execution. Group education: Insufficient to determine the effectiveness for breast cancer screening as effect measures (n=8, 9%) showed positive changes, but they were inconsistent in magnitude and direction of effect. Insufficient to determine the effectiveness for cervical cancer screening because the 1 study in the review had only fair quality of execution. One on one education: Recommended for breast cancer screening (n=17 or 18, 8.2%) based on strong evidence. Insufficient to determine the effectiveness for cervical cancer screening as results were inconsistent in magnitude and direction of effect. Mass media (alone): Insufficient to determine the effectiveness for both breast and cervical cancer screening but no specific results or reasons were provided.
Components of the most effective interventions	Not described beyond what is listing in Findings.
Discussion, recommendations	The strength of evidence of effectiveness found through the systematic review is the basis for the Task Force's recommendations for client-oriented cancer screening interventions. Decision makers should consider their local needs, parameters and goals in making decisions about which interventions to implement. "Insufficient" evidence indicates that there was not enough evidence at the time of the review to determine the effectiveness of an intervention; it does not mean that the intervention does not work; more work is needed to determine effectiveness.
Implications for implementation	Interventions with strong evidence for both breast and cervical cancer screening include Client reminders and Multi-component. Insufficient evidence exists for all other types of interventions for cervical cancer screening. For breast cancer screening, strong evidence exists for Reducing structural barriers, Client incentives (with reminders), Small media

	and One on one education; sufficient evidence exists for Reduced client costs. There was insufficient evidence for Group education, Client incentives (without reminders) and Mass media (alone) for both types of cancer screening. There is a need to better investigate the effectiveness of most interventions for cervical cancer screening and for Group education and Client incentives (without reminders) for both types of cancer screening.
Additional comments	Concise and easy to read systematic review that informs and determines U.S. Preventive Services Task Force recommendations. Did not provide a specific definition for the effect measures, but presumably they include a combination of the number of qualifying studies and the size and consistency of the reported effect between intervention and control groups. No specific information is provided on individual studies.

TITLE, AUTHOR(S), REFERENCE	**WAGNER TH. THE EFFECTIVENESS OF MAILED PATIENT REMINDERS ON MAMMOGRAPHY SCREENING: A META-ANALYSIS. AM J PREV MED. 1998 JAN;14(1):64-70.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To compare the effectiveness of mailed reminders on increasing mammography screening and their cost		
Interventions examined	Reminders mailed to women (through health care systems or electoral lists)		
Inclusion criteria	Published 1985-9/1996, English, reminder had to be mailed to patient, published randomized controlled trial		
Exclusion criteria	Studies using phone calls from outreach workers or other mailed reminders		
Population characteristics	Not described		
Location(s)	US	UK	Other: Australia, New Zealand
Studies included/identified	16 studies reviewed (no denominator provided)		
Outcome(s) measured	Receipt of mammogram (method of verification not stated)		
Analyses conducted	Pre-post-intervention measures for intervention and control groups, costs per woman screened		
Findings	Initial invitations: Three of 4 studies outside the U.S. obtained their samples from voter registration lists; all U.S. studies intervened with women inside care settings. Overall, 15%-72% (average 41%) of women receiving reminders and 5%-54% (average 28%) of controls received a mammogram; the differences between the groups were -10%-33% (average 13%). In U.S. studies, intervention women were 48% more likely to receive mammography than controls; outside the U.S., the effect was extensively greater (5.57 times more likely) and only 8% of controls		

	obtained mammography. Tailored versus generic reminders were more effective; (85% more in U.S. studies and more [amount not stated] in 1 non-U.S. study); letters with appointments were more effective than letters without appointment times in an Australian study. In 2 U.S. studies, costs per woman were $0.45 and $2.78 and per woman screened were $1.08 and $15.10. In Australia, the costs for reminders without appointments were $1.68 per woman and $16.25 per woman screened; respective costs for letters with appointments were $6.13 and $18.29. Applying cost data from these 3 studies to the pooled (overall) effectiveness results from all 16 studies, estimated costs were $0.96, $3.55 and $5.88. Non-responders to initial invitations: One study found reminders (versus no reminder) to be significantly more effective; 1 study found phone counseling (versus second reminder) to be very effective; the other study found phone and mailed reminders to be equally effective. Costs for follow-up letters to those who had previously received a letter with an appointment were $23.88 per woman screened, and $26.81 for those provided a follow-up phone call, but only $10.98 for follow-up letters to those who had received a letter without an appointment. One study found follow-up reminder costs for mail reminders, phone counseling and a preventive letter to be $3.25, $5.86 and $4.38, respectively.
Components of the most effective interventions	Patient reminders with personalized versus generic information. Using computers to organize patient data and tailor messages in reminders (helps keeps the costs of reminders low). One study did not demonstrate, but suggested, that tailoring reminders to patient background and risk might be effective for multi-ethnic low income women.
Discussion, recommendations	Providers should use reminder systems (and use tailored versus generic) to increase initial and maintain annual recommended mammography, as women who received reminders were much more likely to be screened. There is still more work to be done because >50% of women in both intervention and control groups did not receive mammograms. Future study should be focused on how subpopulations (e.g.,

	according to race, education, income, insurance status) might be differentially affected by reminders. It should not be assumed that patient reminders are more cost effective than other types of interventions such as lay outreach workers or public awareness campaigns; further studies need to be conducted to determine the relative cost-effectiveness.
Implications for implementation	Contacting women (who may have less knowledge of cancer control efforts) outside of provider systems, as was done in the non-U.S. studies, resulted in a much higher effect than that in the U.S. studies.
Additional comments	Well done, concise study with a slightly more limited scope in terms of interventions reviewed than others. This was the only review that contained a meta-analysis of cost data.

TITLE, AUTHOR(S), REFERENCE	**YABROFF KR, MANDELBLATT J. INTERVENTIONS TOWARD PATIENTS TO INCREASE MAMMOGRAPHY USE. CANCER EPIDEMIOL BIOMARKERS PREV. 1999 SEP;8(9):749-57.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To review interventions to increase adherence with mammography, determine overall effect sizes, and determine the most effective strategies		
Interventions examined	Behavioral: Alter cues or stimuli associated with screening behavior Cognitive: Provide new information, education, clarify misconceptions Sociologic: Use social norms or peers Multiple: Use more than one type Type of control: Active: Provided a lower level of the intervention Usual care: No intervention for increasing mammography Mode of delivery: Interactive: Phone or in person Static: Letters, videotapes		
Inclusion criteria	Published 1980-8/1998, English, conducted to increase mammography use, used experimental or quasi-experimental design, had prospective follow-up		
Exclusion criteria	Pre-post designs did not have controls, uncontrolled trials, description of methods and/or intervention was too brief for classification		
Population characteristics	Majority were white women and women aged $\geq$50.		
Location(s)	US	UK	Other
Studies included/identified	43/600		
Outcome(s) measured	Receipt of mammogram by self-report, chart audit, medical claim or electronic records		
Analyses conducted	Pre-post-intervention measures for intervention and control groups		

Findings	Behavioral: The overall effect between intervention women and usual care was significant (13.2%), but that between intervention and active controls was not. In the 6 studies with multiple interventions, the effect was significant (13.0%). Cognitive: In the 7 interventions with generic patient education, the effect was not significant when compared with usual care. Theory-based interventions (e.g., Health Belief Model) using usual care controls were very effective (23.6%). Theory-based interventions using active controls and delivered interactively were significantly effective (7.9%), but those delivered statically were not. Sociologic: Interactively delivered interventions were effective (12.6%). The 2 interventions providing financial incentives increased screening, but meta-analysis could not be completed.
Components of the most effective interventions	Behavioral: Two reminder letters Cognitive: Education and materials based on theories of behavior change such as the Health Belief Model, delivered interactively Sociologic: Community peers, friends, lay health advisors, media representations of appropriate behavior, financial incentives, delivered interactively
Discussion, recommendations	Mode of delivery impacted the increases in mammography; multiple behavioral interventions improved screening rates. Interactively delivered theory-based cognitive interventions were effective but those delivered statically (letter, videotape) were not. Most of the women in the behavioral interventions had health insurance, but many of the women in the sociologic ones did not; in addition, they typically had lower rates of previous mammography. Adapting of interventions to dissimilar populations needs to be taken on cautiously; planning should consider existing strategies, the characteristics of the target populations and resources available for delivery. Intervention effect may have been overstated in the selected studies because self-report (usually higher than actual) was used as one of the outcome measures, but the differences in self-report are likely to be

	similar in intervention and control groups. In addition, published studies may be more likely than unpublished ones to have positive results. Further research should be conducted to more extensively assess the long-term effectiveness of interventions and impact in affected subgroups.
Implications for implementation	The most effective inreach cognitive (educational) strategies were theory-based; the most effective non-inreach approaches were delivered interactively in sociologic settings.
Additional comments	Well done study; used same categorization of interventions as in Yabroff, 2003.

TITLE, AUTHOR(S), REFERENCE	**YABROFF KR, MANGAN P, MANDELBLATT J. EFFECTIVENESS OF INTERVENTIONS TO INCREASE PAPANICOLAOU SMEAR USE. J AM BOARD FAM PRACT 2003;16:188-203.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To update previous reports; provide information on the effectiveness of controlled interventions to increase Pap smear use		
Interventions examined	Behavioral: Change stimuli associated with test use, reminders Cognitive: Provide new information, education, clarify misconceptions Sociologic: Use social norms or peers Combination: Use more than one type Type of control: Active: Provided a lower level of the intervention Usual care: No intervention for increasing Pap smear use Mode of delivery: Interactive: Phone or in person Static: Letters, videotapes Targets: Patients, providers (results not included in this summary), both patients and providers, health care systems		
Inclusion criteria	Published 1980-4/2001, English, aimed to increase use of Pap smear, used experimental or quasi-experimental design, prospective follow-up		
Exclusion criteria	Pre-post designs without control groups, non-US studies, designed to improve follow-up after abnormal Pap smear results		
Population characteristics	Diverse populations of women who are older, poorer, of racial-ethnic minority, have lower levels of education, living in rural areas. Most studies (60%) included women who were 50-59 years old; 30% included women <40. Over 40% included >20% minority women. In the 50% of studies reporting health insurance status, most (75%) of the women had insurance.		
Location(s)	US	UK	Other

Studies included/identified	46/467		
Outcome(s) measured	Pap smear use by self-report, chart audit or medical claim		
Analyses conducted	Pre-post-intervention measures for intervention and control groups		
Findings	Patient: Behavioral: The one intervention that used usual care controls had an effect of 24.4%; 4 of 5 with active controls had intervention effects ranging from 10.1%-18.8%, with phone reminders having the largest effect. Cognitive: None of the theory-based interventions (delivered by letter or phone) had a statistically greater effect over controls. Behavioral/cognitive: Mailed generic information with reminders had no significant effect; one intervention with a phone reminder from a health educator had a significant effect (13.5%). Sociologic: Most of these and a combination of sociologic/cognitive interventions improved Pap smear use (2.7%-9.2%). Two of 3 that used sociologic/behavioral/cognitive approaches showed significant effects of 18.0% and 36.0%; 1 used lay health workers, educational pamphlets and financial incentives; the 1 relying on mass media for presenting positive role models did not increase testing. Patient and provider: Behavioral/cognitive: Only 1 in 6 showed a significant effect. Behavioral/cognitive/sociologic: One that used a generic educational strategy had no effect, but the other that used multiple strategies had a significant effect (21%). Health care systems (not listed by type of intervention): One of 2 was effective (32.7%).		
Components of the most effective interventions	Patient: Behavioral/cognitive: Phone reminders, phone reminders from a health educator Behavioral/cognitive/sociologic: Lay health workers, educational pamphlets, financial incentives, culturally specific Patient and provider: Sociologic: Church liaisons, mass media, lay health workers, theory-based educations and community activities		

	Systems: Integrating into a clinic a nurse practitioner who performed same day screening
Discussion, recommendations	Phone reminders were effective and can also help women obtain regular screening. Women who have never been screened may be more difficult to reach through traditional clinic settings and may require extensive outreach efforts; one very effective intervention used lay health workers. The combination of patient and provider interventions were not much more effective than either type of intervention alone. Intervention effect may have been overstated in the selected studies because self-report (usually higher than actual) was used as one of the outcome measures, but the differences in self-report are likely to be similar in intervention and control groups. In addition, published studies may be more likely than unpublished ones to have positive results. Determining the cost and cost-effectiveness of interventions will help providers and public health make decisions about the feasibility of interventions to improve screening. Some of the interventions that were not effective in increasing Pap smear use were effective in increasing mammography use; some possible explanations include differences in perceptions about the tests, time involved and their proficiency, and of personal risk. Future studies should examine the barriers to each type of test separately.
Implications for implementation	Patient reminders were effective in inreach settings, but culturally appropriate sociological strategies (outreach efforts with lay health workers) may be required to reach women not reached through traditional clinic settings.
Additional comments	Thorough, well done study, but less detailed in descriptions of specific programs.

TITLE, AUTHOR(S), REFERENCE	**YABROFF KR, O'MALLEY A, MANGAN P, MANDELBLATT J. INREACH AND OUTREACH INTERVENTIONS TO IMPROVE MAMMOGRAPHY USE. J AM MED WOMENS ASSOC. 2001 FALL;56(4):166-73, 188.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Systematic review	Meta-analysis	
Purpose of study	To compare the effectiveness of inreach and outreach and strategies for increasing mammography use		
Interventions examined	Inreach: Recruitment was from inside primary care Outreach: Recruitment was from outside primary care settings Behavioral: Change stimuli associated with test use, reminders Cognitive: Provide new information, education, clarify misconceptions Sociologic: Use social norms or peers Multiple: Used more than one type Type of control: Active: Provided a lower level of the intervention Usual care: No intervention for increasing mammography Mode of delivery: Interactive: Phone or in person Static: Letters, videotapes		
Inclusion criteria	Published 1980-2/2001, English, located in US, aimed to increase the use of mammography, used experimental or quasi-experimental design, had prospective follow-up, used mammography use as the outcome, targeted patients		
Exclusion criteria	Targeted providers, description of methods and/or intervention was too brief for classification		
Population characteristics	Most studies were conducted with populations that were ≥50 years old, predominantly white; 26 (39%) were conducted where ≥20% were from communities of color. In the studies reporting health insurance status (58%) and prior mammography use (67%), most were conducted where ≥75% had insurance and ≥50% had had mammograms.		
Location(s)	US	UK	Other

Studies included/identified	66/441		
Outcome(s) measured	Mammography use		
Analyses conducted	Pre-post-intervention measures for intervention and control groups		
Findings	Behavioral: The effect of multiple inreach efforts between intervention women and active controls care was significant (14.0%); and multiple outreach efforts increased use significantly (18.7%). Cognitive: Generic patient education in both settings was not effective. Theory-based inreach interventions using active controls and delivered interactively were significantly effective (10.7%), but those delivered statically were not. Similarly, theory-based outreach interventions delivered interactively were significantly effective (19.9%), but those delivered statically were not. Behavioral/cognitive: Behavioral/theory-based cognitive interventions using usual care controls and delivered interactively were significantly effective (14.0%) in inreach and in outreach settings (27.3%). Sociologic: Interactively delivered interventions were effective in both inreach (10.7%) and outreach (9.1%) settings.		
Components of the most effective interventions	Behavioral: Reminder letters, phone calls, vouchers Cognitive: Theory-based or individually tailored education as a component of letters, pamphlets, videotapes, phone counseling Sociologic: Lay health workers, peer counselors		
Discussion, recommendations	Within categories of interventions (i.e., type, type of control group, mode of delivery), inreach and outreach efforts were similarly effective. In 3 of 4 of the comparisons listed in the findings, the effectiveness measures were higher for outreach than inreach, but the authors did not include the statistical significance of these differences. Theory-based cognitive interventions were more effective when		

	delivered interactively. Few outreach interventions targeted the general community; more targeted smaller subgroups within the community. Intervention effect may have been overstated in the selected studies because self-report (usually higher than actual) was used as one of the outcome measures, but the differences in self-report are likely to be similar in intervention and control groups. In addition, published studies may be more likely than unpublished ones to have positive results. Adapting inreach and outreach strategies for breast and cervical cancer screening will be important for the screening and control of other types of cancer.
Implications for implementation	Intensive outreach interventions that address barriers to screening in the 15% of women who have never been screened may be effective in increasing first time screening. Approaches that combine inreach and outreach have been shown to be effective; these included both patient and provider interventions (i.e., lay health educators, theory-based church based educational programs, reminders, mass media, visual prompts in exam rooms, chart reminders). Though no cost data were provided, the authors suggest that outreach strategies targeted to the larger community may be more effective than those that target specific women, because they have the potential to reach more women, but this would hold only if the general community contained large numbers of women who had not ever or recently been screened.
Additional comments	Methods were similar to those in Yabroff KR, 1999, but less detailed in descriptions of specific programs.

Appendix E

Results of Website Searches

Agency for Health Care Research and Quality (AHRQ) (www.ahrq.gov)

- Identified Evidence Report/Technology Assessment Number 79: Diffusion and Dissemination of Evidence-Based Cancer Control Initiatives (HHS, PHS, AHRQ), May 2003

American Cancer Society (www.cancer.org)

- No new evaluations found after searching site and CA and Cancer journal links online

Cancer Control Planet (cancerplanet.cancer.gov)

- No new evaluations found, but can look at brochures that have been used in various studies

Google (www.google.com)

- No new evaluations found, but identified CDC's Manual of Intervention Strategies to Increase Mammography Rates (www.cdc.gov/cancer/nbccedp/bccpdfs/prumanual.pdf)

Guide to Community Preventive Services (systematic reviews and evidence based recommendations) (www.thecommunityguide.org)

- Identified Task Force on Community Preventive Services' systematic review and recommendations for population based interventions designed to improve early detection and control of breast and cervical cancer

National Cancer Institute (NCI) (www.nci.nih.gov)

- No new evaluations found

NCI Research-Tested Intervention Programs (cancercontrol.cancer.gov/rtips)

- No new evaluations found

Resources identified through secondary references and key informants

- No new evaluations found, but identified Breast Health Access For Women with Disabilities program description and materials (BHAWD) (www.bhawd.org/sitefiles/index2.html)
- No new evaluations found, but identified Count Us In program to promote breast and cervical cancer screening in women with disabilities (www.aahd.us/research/BestPractices/singletrainingHCP.php?record=5)
- No new evaluations found but identified questions 15.1 and 15.2 (regarding limitations and special equipment) in the CDC Behavioral Risk Factor Surveillance System Survey Questionnaire, 2005 (www.cdc.gov/brfss/questionnaires/english.htm)
- No new evaluations found, but identified the Health Resource Center for Women with Disabilities at the Rehabilitation Institute of Chicago

www.ric.org/community/womendc.php), which provides provides multiple educational and advocacy activities.

- No new evaluations found, but identified the Women's Reproductive health Clinic at the University of Alabama at Birmingham (main.uab.edu/show.asp?durki=8970), which conducts provider training to meet the needs of women with disabilities.
- No new evaluations found, but identified Health information for lesbian and bisexual women at Public Health - Seattle & King County, Washington (www.metrokc.gov/health/glbt/lbwomen.htm), which also includes lesbian-specific breast and cervical cancer risk information and a link to the Washington Breast and Cervical Health Program (WBCHP)
- No new evaluations found, but identified individual projects funded by the Susan G. Komen Breast Cancer Foundation (www.komen.org/grants/step/stepsearch.asp?nodeid=400)

Appendix F

Primary Study Summaries

TITLE, AUTHOR(S), REFERENCE	**ALLEN JD, STODDARD AM, MAYS J, SORENSEN G. PROMOTING BREAST AND CERVICAL CANCER SCREENING AT THE WORKPLACE: RESULTS FROM THE WOMAN TO WOMAN STUDY. AM J PUBLIC HEALTH. 2001 APR;91(4):584-90.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To evaluate the effectiveness of a peer delivered intervention conducted in worksites to increase adherence with breast and cervical cancer screening (Woman to Woman Study), in collaboration with a labor union (Service Employees International Union-SEIU)		
Location(s)	US: Massachusetts	UK	Other
Intervention condition	Over a 16 month period, women at intervention sites were offered a total of 6 small group discussion sessions and 2 worksite-wide campaigns (health fairs and speakers, both publicized in flyers and newsletters). Peer health advisors (PHA) recruited and counseled women who had not attended. This program was designed and implemented using social cognitive theory, the Health Belief Model and the Transtheoretical stages of change model. N=13 worksites		
Interventionists	Voluntary boards at each intervention site were used in the intervention design and planning; they recruited PHA who served as role models for screening behavior and disseminated screening information; PHA received 16 hour of training in facilitation, cancer epidemiology, screening and resources.		
Control condition	No workplace intervention, but women meeting inclusion criteria participated in the 2 cross-sectional surveys. In addition, these sites received a workshop at the end of the intervention period so they could replicate the intervention at their sites. N=13 worksites		

Inclusion criteria	Worksites with a minimum of 60 female employees aged ≥40, SEIU representation within the workforce, worksite located within 1.5 hours of the study center. Women meeting these criteria and who were permanently employed for >15 hours per week were eligible to complete the cross-sectional surveys.
Exclusion criteria	None stated
Assignment to intervention or control	Worksites were blocked by type (health care, state agency, university), number of employees and physical plant (single v. multiple buildings), then randomized to receive the intervention or control condition.
Recruitment	26 worksites with a minimum of 60 female employees aged ≥40 were recruited by the study investigators (a cancer center and a labor union).
Population characteristics	Intervention and control groups were similar: mostly white (>80%), well educated (>70% college graduates), employed in professional occupations (>66%), had incomes of ≥$50k (>50%), had insurance for mammography (>83%) and a regular source of health care (>95%).
Data collected	Demographics, dates and reason for last test, and job category were collected through self-administered surveys; also documented were number and type of intervention activities, number of employees participating, and costs.
Outcome(s) measured	Screening rates for mammography, CBE and Pap test by self-report
Analyses conducted	Pre- and post-intervention measures for intervention and control groups through 2 cross-sectional surveys of female employees aged ≥40, process evaluation of program delivery and participation
Findings	Baseline surveys were completed by 3132 (72%) women; follow-up surveys were completed by 2795 (66%). Responders and non-responders were similar at both types of sites. The percentage of women receiving mammograms, CBE and Pap tests increased at both intervention and control sites. Absolute increases in all 3 types of screening increased more in intervention sites but after adjustment for age and worksite type, only that for Pap testing was significant (OR 1.28).
Discussion, recommendations	There was a weak positive effect of the program, especially with Pap

	tests. These results are similar to 2 previous worksite studies showing non-significant increases in mammography use; 1 of these showed improved attitude toward mammography; 2 additional studies showed increased in BSE and knowledge. All women, not just under-utilizers, were targeted and although the aim was to attract lower paid service workers, most participants were already highly adherent to screening recommendations. The low intervention effects may have been due to a "dose" too low to prompt behavior change, especially in the under-screened. It was hoped that peer delivery would enhance outcomes but it is believed that this method still has potential. Secular increases in screening and additional educational efforts conducted at control sites in response to concern following the baseline survey could explain the increases noted in the control sites. Because of the association with unions, a high percentage of women had health insurance; this may limit generalizability to other settings where many women do not have insurance.
Implications for implementation	Interventions should be targeted to those women who have not previously been adequately reached by other efforts or to "pockets of prevalence" segments of the population at increased risk. Other settings (e.g., churches, housing developments) with lower baseline screening rates may be more appropriate targets. A more comprehensive intervention that includes barrier-specific counseling, other tailored materials or those that attempt to effect change in multiple areas (e.g., families, community, policy) might produce more behavior change.
Additional comments	This study of collaboration with existing employer/employee organizations made use of PHA. Worksites where many women may not have insurance or are underinsured might be a more appropriate setting for this type of an intervention. Although the authors indicated that the intervention was theory-based, it was difficult to see that influence in it.

TITLE, AUTHOR(S), REFERENCE	**BERNSTEIN J, MUTSCHLER P, BERNSTEIN E. KEEPING MAMMOGRAPHY REFERRAL APPOINTMENTS: MOTIVATION, HEALTH BELIEFS, AND ACCESS BARRIERS EXPERIENCED BY OLDER MINORITY WOMEN. J MIDWIFERY WOMENS HEALTH. 2000 JUL-AUG;45(4):308-13.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other: Process evaluation	
Purpose of study	To explore influences on the willingness and ability of women ≥50 years old to keep mammography appointments. To test the effectiveness of a peer-delivered intervention to increase mammography. To examine differences in mammography compliance between English and non-English speaking women, after removal of financial barriers and after appointments were scheduled.		
Location(s)	US: Boston MA	UK	Other
Intervention condition	Enrolled women received the peer-delivered intervention which consisted of information about breast health and screening, review of the participants' pros and cons of making and keeping appointments, assistance in developing a personal plan for maintaining breast health, assessment of readiness for mammography, and next day, no cost appointments were made if requested. Follow-up phone surveys were conducted by outreach workers 80-100 days following the scheduled appointment. The design of this intervention was based on Roger's Motivational Theory, Miller's Motivational Interviewing Techniques, Prochaska and DiClemente's Transtheoretical Model, and Rollnick's Readiness to Change Model. N=151		
Interventionists	Older African-American women and Central American women from communities served by the Boston Medical Center. They were trained by role play methods and trained in confidentiality procedures.		
Control condition	None		

Inclusion criteria	Women aged ≥50 presenting to the emergency department (ED), who had not had a mammogram within the last 24 months
Exclusion criteria	Women admitted to the hospital, women who could not provide consent due to comprehension level
Assignment to intervention or control	None
Recruitment	Peer educators interviewed a convenience sample of women presenting to the ED from 6:00 a.m. to 12:00 p.m., 7 days a week; women who were past due for mammography were offered enrollment
Population characteristics	Women had a mean age of 61.6 (50-90), were black (70.8%), Latina (7.3%), had insurance (57%), had not had a Pap smear in the past 2 years (68%).
Data collected	Interview records collected information about mammography experiences, beliefs, behaviors; number of yearly mammograms missed after age 50
Outcome(s) measured	Adherence to screening (Pap smear, BSE, CBE and mammogram) by self-report
Analyses conducted	Pre-post-intervention measures for intervention and control groups
Findings	Of the 151 enrolled, 96 (66%) completed follow-up-p interviews; the nonresponders were younger than responders (58.1 v. 61.1) but were otherwise similar in demographics, behavior, access, beliefs and readiness to responders. Responders had a higher number of yearly mammograms missed after age 50 (11.3) compared to nonresponders (7.8), but this difference was due to age. Mammography history showed participants to be underutilizers: 25% had received CBE in the past year, 65% had never had a mammogram, and 21% had received only one mammogram. At baseline, most had good knowledge about early diagnosis and the benefits of mammography; but few (35%) knew that older women were at higher risk for breast cancer, understood (19%) that early identification and action resulted in excellent 5 year survival; and 30% believed themselves to be at risk. At baseline, few barriers to keeping appointments were reported; at follow-up fear of what might be found (46%), transportation (38%),

	cost (22%), and not wanting to know if they had breast cancer (24%) were reported as barriers. Most had previously received positive messages about mammography, including from physicians (86%), family (%), media (76%) and friends (64%). After the baseline interview but before appointment scheduling, participants scored 9.4 (on a scale of 0-10) in readiness for mammography (no pre-interview scores were reported). 60% had a mammogram within 3 months of receiving the intervention (53% kept the original appointment, 7% scheduled at a different facility); 5.5% indicated that mammography identified a breast problem requiring further follow-up; 91% said they would obtain a repeat mammogram in the next year. Of the women not receiving a mammogram at follow-up, 77% requested help in re-scheduling. Smokers were more likely than others to not keep their scheduled appointments.
Discussion, recommendations	The high rate of mammography uptake in this group suggests the potential for improving mammography adoption in harder to reach women. This theory based peer-delivered intervention appeared to have provided women the opportunity to move from precontemplators and contemplator into actors. The self-perception of low risk might explain the previous underutilization, despite the many positive messages that had been received from a variety of sources. This suggests opportunities to develop culturally strategies that have proven effective in increasing awareness of risk. It would have been helpful to schedule same day appointments, but this was not possible in this particular setting. The small sample size and lack of a control group prevented greater data analysis; future studies should examine separately the effects of the intervention and other intervening factors that might predict uptake. A randomized controlled trial could compare mammography utilization between women receiving and not receiving this type of intervention.
Implications for implementation	Much of the success of this intervention could be in its theory based and peer delivered approach coupled with the removal of financial and logistic barriers.

	This represents an opportunity to increase breast cancer screening in a setting where mammography under-utilizers present for other services.
Additional comments	Small but well intentioned study that showed good success. Mammography was paid for by the CDC funded Breast and Cervical Cancer Intervention Project (BCCI).

TITLE, AUTHOR(S), REFERENCE	**BIRD JA, MCPHEE SJ, HA NT, LE B, DAVIS T, JENKINS CN. OPENING PATHWAYS TO CANCER SCREENING FOR VIETNAMESE-AMERICAN WOMEN: LAY HEALTH WORKERS HOLD A KEY. PREV MED. 1998 NOV-DEC;27(6):821-9.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine whether rates of test recognition, receipt and maintenance of routine checkups and screening tests (CBE, mammograms, Pap smears) would be significantly greater in consumers in an experimental versus a comparison community		
Location(s)	US: San Francisco CA (experimental) Sacramento CA (control)	UK	Other
Intervention condition	Neighborhood based small group educational sessions: Trained LHW and neighborhood assistants conducted 3-phase sessions (importance of general prevention and visits for routine checkups, cervical cancer screening, breast cancer screening) in the Vietnamese language; 10-15 minute presentations with flip charts followed by discussion. Leaders, assistants and hostesses received stipends. Educational materials distribution: Vietnamese language materials (posters, brochures, calendars, and promotional items including potholders, magnets, with program logo) were distributed in the small groups, health fairs, incentive contest, local Vietnamese physician offices, neighborhood stores and agencies. Promotional events: Phases 1 and 3 included health fairs in conjunction with the annual Tet (new year) festival; activities included materials distribution, and medical screening (blood pressure, height, weight, vision, dental). Phase 2 included materials distribution, Q and A, information about free screening at 2 health days held at a Buddhist temple and protestant church that have Vietnamese language services. The beginning of Phase 3 included an educational incentive contest to promote screening; up to date women could enter drawings for prizes;		

	non-up to date women could enter this contest by keeping screening appointments. N=345
Interventionists	The 10 LHW were Vietnamese women recruited from the neighborhood; they recruited 16 neighborhood assistants; all received training in small group prevention education.
Control condition	No intervention. N=372
Inclusion criteria	Vietnamese women, ≥18 year of age, ability to understand Vietnamese language
Exclusion criteria	None stated
Assignment to intervention or control	Residence location
Recruitment	San Francisco: Census tracts making up the Tenderloin area Sacramento: Census tracts in the central city with the highest density Vietnamese populations Blocks within census tracts were ranked and canvassed until target samples of 300 interviewed for each group were reached.
Population characteristics	Most women were aged 18-39, had <12 years education, unemployed, ever married, below poverty level, had insurance (most Medi-Cal).
Data collected	The pre-and post-survey instrument contained 147 items; all intervention and control women were interviewed using a baseline and 6-month follow-up questionnaire to assess their past history of breast and cervical cancer screening, including dates of last exam, and knowledge and attitudes toward cancer and cancer prevention.
Outcome(s) measured	Self-reported test recognition, receipt and maintenance of routine preventive checkups and screening tests (CBE, mammograms, Pap smears)
Analyses conducted	Pre-post-intervention measures for intervention and control groups
Findings	Pre-intervention household response rates (to interviews) were 77% and 74% in intervention and control settings, respectively. Post-intervention rates were 79% and 74%.

	Women in the control sample were slightly younger, more likely to be ethnically Vietnamese (versus just born there), have poor/no English skills, below poverty and have poor health status. A total of 232 sessions for 960 women were conducted; health fairs drew 200 for health screenings and about 1500 viewed exhibits and/or took educational materials; of the 190 women eligible for the contest 23% achieved status by being screened. Pre-intervention screening rates were similar in intervention and control communities. In the control community, there were no increases in any of the outcome measures, but there were decreases in the rates of having heard about Pap smears, and ever having routine checkups and CBE. There were significant increases in the intervention community in all of the outcome measures, including CBE (18%-39%), mammography (37%-55%) and Pap smear (26%-45%); regression analysis yielded the same significant results. There were some increases in topic-specific knowledge based on sessions attended, but there were no associations between attendance frequency and receipt of mammogram or maintenance of nay screening test. In addition, there was no direct correlation between attending a health fair and test receipt or recognition.
Discussion, recommendations	Indigenous LHW can be successful in promoting rates of test recognition, receipt and maintenance of routine checkups and screening tests in Vietnamese women. The increases were not only statistically, but clinically, significant in that the difference over time in screening tests was 20 percentage points and this is a 37%-45% improvement from baseline. The women who had arrived in the U.S. most recently were the least likely to have had received any preventive services at baseline. Results cannot not be generalized to other Vietnamese-American populations, but the large increases noted lend support to the theoretical framework of the intervention; implementation of this or a similar program is still likely to have wider applicability beyond this study group. Outcome measures were based on self-report, but this bias would

	probably have been similar for both communities. Long term knowledge and adherence was not studied, but it is hoped that there would be some diffusion effect through the LHW themselves and the participating women as examples. Testing was provided for free in this study and if there had been costs associated with them, the screening uptake may have been lower. A drawback to this type of program is that it is labor intensive and only reaches a limited number of participants, whereas, less intense strategies (e.g., electronic or printed materials) can reach more people but may have a smaller effect.
Implications for implementation	Cultural competence and sensitivity are necessary for the delivery of successful health education.
Additional comments	Highly successful, well carried out study with high participation/low dropout rates.

TITLE, AUTHOR(S), REFERENCE	**BYLES JE, SANSON-FISHER RW, REDMAN S, DICKINSON JA, HALPIN S. EFFECTIVENESS OF THREE COMMUNITY BASED STRATEGIES TO PROMOTE SCREENING FOR CERVICAL CANCER. J MED SCREEN. 1994 JUL;1(3):150-8.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To evaluate 3 methods of increasing the use of Pap smear: television media (TV), TV with letter recruitment and TV with general practitioner (GP) recruitment		
Location(s)	US	UK	Other: Australia
Intervention condition	TV only communities received a 30 second TV ad targeting women ≥50 years old and emphasized knowledge and attitudes associated with positive screening behaviors. The ad used social modeling theory (a well know actress). TV plus letter communities received the TV ad as described above and all women on the electoral register aged 18-70 also received a personalized letter from the New South Wales (NSW) State Cancer Council advocating screening, information on where to be screened and how to enroll with the Council's Pap reminder service. TV plus GP recruitment communities received the TV ad and an education and capacity building campaign with local GP over a 6 month period. Components included an initial meeting with GP in each region to discuss the need for, efficacy and barriers of GP recruitment, assistance with developing and sustaining the strategies (materials, peer support), a mailed information packet to all GP with initial meeting proceedings, individual contact with GP to identify recruitment strategies to be used and resources required, a second workshop to review adopted strategies and 2 additional informational packets about the second workshop. The intervention was carried out in 3 postal regions of NSW: a rural locality (1000 women), a country town (3000 women) and a major rural center (100000 women) N=9 regions		
Interventionists	Trained interviewers conducted the post-intervention surveys.		

Control condition	No intervention in 3 control postal regions of NSW N=3 regions outside the TV broadcast areas
Inclusion criteria	Women aged 18-70 years on the electoral register
Exclusion criteria	For the post-intervention survey: if women were either <18 or >70 years old, non-English speaking with no interpreter available, cognitive inability to participate
Assignment to intervention or control	9 intervention localities were selected randomly from 72 regions within 3 adjacent TV broadcast areas and control communities were matched demographically.
Recruitment	For the post-intervention survey, households with eligible women were randomly selected and interviewers approached each separately and obtained consent.
Population characteristics	Not stated
Data collected	Post-intervention surveys in the 12 communities collected demographics, recollection of TV ads and 3 ad-specific questions, receipt of letter and questions about the 3 most important messages in it, recollection of GP education and recommendation for screening in the past 12 months
Outcome(s) measured	Cervical screening as documented by government health insurance claims and pathology lab records
Analyses conducted	Expected (from the 45 pre-intervention months) and observed (3 months post-intervention) Pap smear rates in intervention and control locations
Findings	85% of households were contacted and 86% (N=1001) agreed to participate. Responders and non-responders were similar demographically, except those 18-30 and 60-70 years of age were less likely to consent. TV only: 55% of intervention women reported receiving the campaign and 72% identified the main message of the ad. Corresponding figures for control areas were 34% and 37%; these differences were significant. Recollection rates were lower in the country town (26%) and rural center (38%). TV and letter: 55% of intervention women recalled receiving the

	letter and 82% read all of it. 87% could identify 1 of the 3 main messages. Only 3% of control women reported receiving a letter. TV and GP recruitment: 23% of women reported receiving GP recommendation for Pap screening during routine visits but there was not a significant difference between intervention and control group reports. The TV alone intervention increased Pap use in the rural center 13.3% over expected attendance. The TV plus letter intervention increased attendance in 2 of 3 areas (52.7% in rural localities and 43.2% in rural centers). The TV plus GP intervention increased attendance in all 3 localities (50.2% in rural localities, 80.8% in country towns, 15.7% in rural centers). Observed attendance was higher for women aged 50-69 years and women who had not had a Pap smear in the past 3 years.
Discussion, recommendations	This population based trial showed the impact that might occur if this were implemented as a public heath program. Self-report of having seen the TV ad may have been over-reported in the control region women. The reported GP recruitment was low but could also have been due to the GP's not making recommendations for women who were already in adherence with screening recommendations or due to lack of women's recollection. The accuracy of the screening outcome measures obtained from Pap and pathology records was likely to be similar across all intervention and control communities. Inconsistency of effect across all 3 types of regions could be explained by potential differences in baseline screening rates (which were not available pre-intervention). Attendance by older women and for previously underscreened women was not influenced by TV alone. This is consistent with other studies showing that a brief media campaign will not likely have a significant effect on increasing cervical cancer screening. In 1 region, the TV plus letter increased screening in previously unscreened women by 59%. Future evaluations should examine GP attitude, accessibility of services and community attitudes toward screening in addition to the

	individual GP characteristics where this recruitment strategy had the greatest effect.
Implications for implementation	TV media alone is not likely to encourage screening in older women and those previously screened; TV plus letter should be targeted to older women, and TV plus GP recommendation seems to have the greatest potential for increasing screening in those previously unscreened.
Additional comments	Well done population based multi-strategy study examining media alone and media in combination with other efforts that likely has implications for rural and other areas.

TITLE, AUTHOR(S), REFERENCE	**CALLE EE, MIRACLE-MCMAHILL HL, MOSS RE, HEATH CW JR. PERSONAL CONTACT FROM FRIENDS TO INCREASE MAMMOGRAPHY USAGE. AM J PREV MED. 1994 NOV-DEC;10(6):361-6.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine whether a phone intervention strategy of personal contacts between friends could significantly increase mammography use		
Location(s)	US: Florida	UK	Other
Intervention condition	Volunteers called each of their 5 intervention group acquaintances up to 3 times and emphasized the importance of getting mammograms and asking them to set a date by which to schedule one. Follow-up calls were made to determine whether an appointment had been scheduled and kept. At initial contact, if a participant already had a mammogram in the past year, she was not given a repeat call and the volunteer provided reinforcement. Volunteers tracked their activities using log sheets. Participants received an 8 month follow-up phone interview by an outside contractor to collect demographics and assess date of last mammogram and total number of lifetime mammograms. N=289		
Interventionists	Members of the community helped plan the project and received a presentation on the following: mammography and facilities to receive one, breast health guidelines, the intervention process and practice in it; they also received breast cancer fact sheets and a local resource guide.		
Control condition	No intervention, but they received the same 8 month follow-up phone interview that the intervention group received. N=305		
Inclusion criteria	Women >40 years (emphasis on women >50), living in households separate from volunteers		
Exclusion criteria	None stated		

Assignment to intervention or control	The submitted lists of acquaintances to be contacted were randomized such that 5 women on each list would receive the intervention and the remaining 5 would be in the control group. Volunteers received back by mail the names of 5 women to contact for the intervention.
Recruitment	This study used a convenience sampling technique where trained volunteer coordinators provided a list of names, addresses and phone numbers of 10 acquaintances that they would be willing to contact by phone over the following 6 months and encourage to have a mammogram.
Population characteristics	Most participants were white, just under 40% were black, 40 or older, well educated, married.
Data collected	The post-intervention interview record captured demographics and mammography history.
Outcome(s) measured	Proportion of women who had received their most recent mammogram, by self-report, since the start of the intervention..
Analyses conducted	Post-intervention measures for intervention and control groups
Findings	The 112 trained volunteers each identified 10 acquaintances and 80 (71%) volunteers completed the intervention (called all 5 participants randomized to the intervention group). Of the 800 names provided by volunteers, 769 were eligible and 594 (77%) completed the post-intervention interview. Controls and intervention group members were similar demographically and their prior mammography usage; however, they were older, less educated and had lower income than the volunteers who had recruited them. There was a relative increase of 40% in mammography use in intervention women (49%) compared to control women (34%). Regression analysis did not change these results and participation in the intervention was a more significant factor in mammogram receipt than any other factor looked at. The intervention was more effective (mammography use was twice as high) for women with an income of <$40k.
Discussion, recommendations	The intervention increased mammography in intervention women by 40%. The demographics of the women participating in a study with this

	type of design are directly related to those of the volunteers who recruit them, because people tend to acquaint themselves with people of similar background. The recruitment method used, though not experimental, could be very useful for identifying appropriate target populations for an intervention. There was high participation in completing the follow-up interview, but loss to follow-up does reduce the efficiency of an intervention. More support and incentives for volunteers could increase the efficiency of such volunteer-based efforts.
Implications for implementation	An intervention consisting of repeated contact and support from a friend was effective in increasing mammography uptake, especially in women with incomes of <$40k.
Additional comments	This intervention that used volunteer efforts to a large degree would be less costly than others that were more complex. This study called "Tell a Friend" was sponsored by the American Cancer Society; the model and materials are available for national use.

TITLE, AUTHOR(S), REFERENCE	**CRANE LA, LEAKEY TA, EHRSAM G, RIMER BK, WARNECKE RB. EFFECTIVENESS AND COST-EFFECTIVENESS OF MULTIPLE OUTCALLS TO PROMOTE MAMMOGRAPHY AMONG LOW-INCOME WOMEN. CANCER EPIDEMIOL BIOMARKERS PREV. 2000 SEP;9(9):923-31.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine whether the proportion of women receiving a screening mammogram would be higher in a group of women receiving multiple outcalls compared to groups receiving a single call, an advance card (mailed invitation) plus single call, or no intervention. To determine whether the "stage of change" in the multiple outcall group would be higher than that in the other groups. To compare costs of the single and multiple outcall interventions.		
Location(s)	US: Colorado	UK	Other
Intervention condition	Multiple outcall: Women were assessed as to their mammography stage of change; health educators then provided an interactive barriers counseling intervention that addressed particular concerns raised, and aimed to move the participant closer to adoption of routine screening. A re-assessment of stage of change was conducted before the end of the session to determine any immediate intervention impact and deliver any additional intervention related to the new stage. Completion of a baseline and follow-up interview 6 months later. All women not currently in or not planning to stay in compliance with screening recommendations or who were due for mammogram in the next 6 months were asked if they could be called again in about 2 weeks. Health educators made subsequent outcalls (similar in frame to the first) as necessary to achieve adherence to the guidelines. Calls continued until the participant indicated she had received a mammogram, at which time the health educator focused on promoting maintenance testing), a total of 5 outcalls had been placed, or the woman asked not to receive any more calls. N=783 Single call (existing data, previously collected):		

	All women were provided information on the locations of mammography facilities. Completion of a baseline and follow-up interview 6 months later. N= 746 Advance card and single outcall (existing data, previously collected): Households were mailed an invitation card for women >50 years old to participate in the program and a notice about a phone call/interview she would receive in 2 weeks. Completion of a baseline and follow-up interview 6 months later. N=771 Both the current and previous study (looking at a single call, a call preceded by a mailed invitation, no intervention/control) used direct marketing lists to identify low income and minority neighborhoods throughout Colorado); both were designed using the Transtheoretical Model and motivational interviewing.
Interventionists	2 health educators were used in the multiple outcall study; 11 information specialists had been used in the previous study.
Control condition	3 comparison conditions, as described above under intervention condition (data existed from a previous study). N=695
Inclusion criteria	>50 years of age, spoke English, had no history or current symptoms of breast cancer
Exclusion criteria	None stated
Assignment to intervention or control	The multiple outcall study used a convenience sampling scheme where no one was assigned to the control condition. In the previous study, households were randomized into the 2 intervention and 1 control groups.
Recruitment	The funder of the multiple outcall intervention study required written informed consent, so recruitment for this study group was done in person at stores in low income and minority neighborhoods throughout Colorado. 2 health educators traveled to the selected communities at the beginning of each of 8 months, set up tables with light refreshments and brochures on healthy eating and sun protection and approached women >50 years old to enroll into the study.

Population characteristics	Women were 50-80+ years old and were white. See Findings for demographic differences between the intervention and control groups.
Data collected	The interview tool captured the following information: demographics, stage(s) of change, knowledge, attitudes, supports and barriers surrounding mammography, current adherence to screening guidelines, whether mammogram was received since baseline and opinions regarding the conduct of the study, decisional balance score (at 6 month follow-up).
Outcome(s) measured	Receipt of a mammogram since baseline interview, stage of change at follow-up, decisional balance score, costs (printing, postage, personnel, overhead/indirect).
Analyses conducted	Pre-post-intervention measures for intervention and control groups. Cost analysis included the number of mammograms attributable to each intervention (the proportion of previously non-adherent women getting a mammogram minus the proportion of controls who received a mammogram) and a cost estimate model using 2 different baseline non-adherence rates (40% and 100%).
Findings	Of 2667 women approached, 1111 (41.6%) enrolled and 983 (88.5%) completed the initial outcall. The 6 month interview response rates were 80% for the multiple call group and 75% for the single call study. Women in the multiple call study were similar racially and ethnically to those in the single call study but differed in many other respects (multiple call women were younger, more highly educated, had higher incomes, more adherent, distributed higher up on stage of change). Most (82%) of women were currently adherent, so they were not eligible to receive multiple calls; 361 non-adherent women were offered multiple calls and 57% accepted. Answers to all process evaluation questions about the study were positive; 38% of respondents said the calls made them more likely to get a mammogram. In the subset of non-adherent women at baseline, significantly more women in the multiple call group received a mammogram (27%) compared with the other groups (11-16%); those who received more than one call were significantly more likely to be adherent at follow-up (36.8%) than those that only received one call (11.4%). Regression analysis also showed that the multiple outcall intervention significantly increased mammography in women non-adherent at baseline (OR 2.58), whereas the other 2 interventions did not have

	any significant effect. There was a significant trend that as the intervention increases in intensity (i.e., more calls), fewer initially non-adherent women were in pre-contemplation and relapse and more were in contemplation, action and maintenance. At follow-up, the multiple call group had higher decisional balance scores (greater acceptance of the benefits of mammography) than the women in the other 2 groups. Costs for delivering a program to 1000 women where 40% are non-adherent at baseline are $5,768, 6,868 and $10,088 for single call, advance card plus call and multiple call interventions, respectively. Costs per participant changed (to adherent) are $288, $390 and $154. Corresponding costs per participant changed for a population that is 100% non-adherent (such as would be in a more targeted effort based on medical record information in a clinic setting rather than in a community setting) are $131, $177 and $90.
Discussion, recommendations	Repeated calls seemed to give women a chance to consider the benefits of mammography, overcome barriers and move to action; the more intense the intervention, the greater the change was in stage of readiness for testing. Results of this and the previous study combined indicate that the single call with an advance card is successful for promoting repeat testing in women who are already adherent; and the multiple call approach is successful for initially non-adherent women. A combined approach using multiple calls for non-adherent women, followed by single calls for at the appropriate intervals for repeat testing may be useful. About 86% of currently adherent women will get repeat testing without any intervention, but the single call intervention raised the rate to 92%. A limitation of the study is that multiple call participants were recruited by a different method than the others, and this resulted in demographic and behavioral differences between groups. Nevertheless, regression analysis still showed that the non-adherent women in the multiple outcall group were 2.58 times more likely to receive a mammogram than controls.
Implications for implementation	The multiple call intervention, while very labor intensive, was shown to be effective and the most cost-effective of the 3 methods studied.

	The study's success is also likely due to its strong theoretical underpinnings.
Additional comments	This was a well carried out, complex, labor intensive study that would require adequate resources to replicate.

TITLE, AUTHOR(S), REFERENCE	**DIBBLE SL, ROBERTS SA. IMPROVING CANCER SCREENING AMONG LESBIANS OVER 50: RESULTS OF A PILOT STUDY. ONCOL NURS FORUM. 2003 JUL-AUG;30(4):E71-9.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer: Colorectal
Type of study	Experimental/quasi-experimental	Other: Process evaluation	
Purpose of study	To determine whether attending a lesbian-specific group educational intervention could improve cancer screening in lesbians older than 50		
Location(s)	US: San Francisco CA	UK	Other
Intervention condition	Participants completed a pre-test, attended a one hour educational session which included information about lesbian-specific cancer risks, screening, tests and current research findings with a 15 minute question and answer period, and completed a post-test 6 months after the intervention. N=40 (7 urban, 33 suburban)		
Interventionists	The education program was delivered by a lesbian family practice physician; a research assistant conducted the post-intervention phone interviews.		
Control condition	None		
Inclusion criteria	Lesbian women aged ≥50		
Exclusion criteria	None stated		
Assignment to intervention or control	None		
Recruitment	Educational programs were advertised at one urban and one suburban gay, lesbian, bisexual, transgendered senior organization.		
Population characteristics	Women had a mean age of 60.2, were Caucasian (86%), single (61%), employed (56%) and well educated (15.5 years); 72% had a family history of cancer.		

Data collected	Demographics, zip code, insurance status, income, family history of cancer
Outcome(s) measured	Mammography and pelvic exam histories, receipt of mammography and pelvic exam
Analyses conducted	Pre- and post-intervention measures in the intervention group, completion ratios of total number of mammograms and pelvic exams compared to recommendations
Findings	Only 55% of women completed the post-test; they were similar to those who did not respond. All women had had prior mammograms, but 6 (27%) had not had one in the past 2 years; post-intervention 2 of the 6 had received a mammogram. The 6 women had had only 29% of recommended mammograms; women with a recent mammogram had had 80% of recommended screenings. All women had had prior pelvic exams but 4 (18%) had not had one for 3 years or more; 1 of these received a pelvic exam after the intervention.
Discussion, recommendations	Some short term behavior change occurred in women attending a lesbian-specific educational session. The small post-intervention response rate was low and 20% of non-responders indicated perceived lack of anonymity as the reason for not responding. This needs to be addressed in future studies, especially in areas considered less gay safe than San Francisco.
Implications for implementation	Future randomized controlled trials of interventions like this one that could include other behavior change enhancing features such as a "screening coach" or other reminders, should be conducted in a larger more diverse population of lesbians aged $\geq$50.
Additional comments	Small pilot study that could be enhanced and replicated on a larger scale. Adding theory-based components and processes to increase confidentiality and allay associated fears might improve the results. This article also contained an extensive literature review.

TITLE, AUTHOR(S), REFERENCE	**DIGNAN M, MICHIELUTTE R, BLINSON K, WELLS HB, CASE LD, SHARP P, DAVIS S, KONEN J, MCQUELLON RP. EFFECTIVENESS OF HEALTH EDUCATION TO INCREASE SCREENING FOR CERVICAL CANCER AMONG EASTERN-BAND CHEROKEE INDIAN WOMEN IN NORTH CAROLINA. J NATL CANCER INST. 1996 NOV 20;88(22):1670-6.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To evaluate the outcomes for knowledge, intentions and behavior for women who participated in the North Carolina Native American Cervical Cancer Prevention Project in North Carolina		
Location(s)	US: Eastern Band tribal lands of North Carolina	UK	Other
Intervention condition	Two one on one visits, usually in women's home, by Cherokee lay health educators (LHE). Women were provided individualized instruction on cervical cancer and the benefits of early detection. Information was presented orally; a videotape and printed materials were also used. At the first visit, the LHE assessed women's barriers to obtaining Pap smear and then provided reinforcement and suggestions on the second visit. The program was developed using principles of Social Learning Theory, the Health Belief Model, the Minority Health Communication Model, the Communication Behavior Change framework and PRECEDE. N=481		
Interventionists	LHE were women recruited from the Cherokee population and trained in interviewing		
Control condition	No intervention except a post-intervention interview N=515		
Inclusion criteria	Women aged ≥18, living on tribal land, officially enrolled as member of the tribe		

Exclusion criteria	None stated
Assignment to intervention or control	Of 996 women enrolled, 540 were randomly selected to receive a pre-intervention interview and of these, 263 were randomly assigned to receive the intervention. The remaining 456 enrolled women did not receive the pre-intervention interview, but 218 of them were randomly assigned to receive the intervention. This Solomon Four-Group research design was used as it allowed for randomization, controlled estimation of intervention effects and could assess potential intervention-like effects that might be associated with the pre-intervention interview.
Recruitment	Households with eligible women were identified and mapped and project staff visited each household to screen and enroll women.
Population characteristics	Women in both education and control groups were similar: 18-44 years old, married or living with a partner, high school graduate, annual income of <$20k, without insurance to pay for Pap smears.
Data collected	A data collection tool with 96 items was used for both pre-and post-intervention interviews.
Outcome(s) measured	Knowledge (Pap smear can test for cervical cancer, early detection increases chance for cure, medical follow-up may be needed to treat cervical cancer), intentions (to have a Pap smear in the next year) and behavior (receipt of Pap smear in past year).
Analyses conducted	Pre-post-intervention measures for the 2 intervention and 2 control groups according to the Solomon Four-Group research design
Findings	Out of 1279 households with eligible women, 79.8% agreed to participate. Of the 996 women initially enrolled, only 181 were lost to follow-up; they were similar to the rest of the women in the 4 study groups. In women who did not receive the pretest, those that received the intervention were significantly more likely than controls to answer all the knowledge questions correctly (86.9% v. 76%). For women who received the pretest, there was no difference in knowledge between the intervention and control women. There was no significant difference between the intervention and control groups in intention. However, women in the intervention groups were significantly more likely than those in the control groups to report having a Pap smear (71% v. 65% in women receiving the pretest and 76% v. 62.5% in women not receiving the pretest).

	Regression analysis showed that the intervention had a positive effect on both knowledge and behavior. Answering all the knowledge questions correctly was associated with having an income of >$20k and having attended the intervention (OR 2.18). Women aged ≥35 were less likely than those aged ≤24 to report intention to have a Pap smear; women with a history of abnormal smear results were much more likely to report intention also. The odds of having had a Pap smear was related to having insurance to pay for a Pap smear, obtaining physical exams, having a history of abnormal smear results and receiving the intervention (OR 2.06).
Discussion, recommendations	Women who received the intervention were almost twice as likely to report having a Pap smear in the past year and more likely to have answered all the knowledge questions correctly. Access to health care was a critical factor in obtaining a Pap smear. LHE were lifelong members of the target community and as such required little in the way of training in order to deliver education in a culturally appropriate manner. Their success in this project is consistent with results of other studies showing the value of LHE, especially with populations with unique cultural features. More study is needed to look at the effects that pre-testing have when evaluating health education interventions.
Implications for implementation	Previous educational projects directed at large groups of women demonstrated changes in knowledge and attitude, but not behavior. Results of this health education intervention, which focused more on the individual and demonstrated behavior change, are consistent with the notion that individual attention increases learning. Adaptation to other settings would require high fidelity to the theoretic underpinnings of this program to ensure acceptability and success.
Additional comments	Well designed theory-based study with a unique evaluation design and a high participation rate that included almost an entire community of Cherokee women.

TITLE, AUTHOR(S), REFERENCE	**DOLAN NC, MCDERMOTT MM, MORROW M, VENTA L, MARTIN GJ. IMPACT OF SAME-DAY SCREENING MAMMOGRAPHY AVAILABILITY: RESULTS OF A CONTROLLED CLINICAL TRIAL. ARCH INTERN MED. 1999 FEB 22;159(4):393-8.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine the effectiveness of same day mammogram availability on adherence to physician screening recommendations		
Location(s)	US: Chicago IL	UK	Other
Intervention condition	Phase 1: Women were offered mammography immediately following the index exam and the research assistant notified the mammography center of the women accepting the offer and provided directions to the center (3 blocks away). Women not accepting the same day service were given information about scheduling later by phone. Phase 2: This portion was developed based on feedback received during Phase 1 where many women indicated they would have taken advantage of the same day test had they had advance notice. Women received informational postcards on screening mammography 2 weeks before their scheduled appointment and information about the same day testing. N=408		
Interventionists	Research assistants		
Control condition	Phase 1: No intervention other than the baseline questionnaire and physician recommendation, if given. Phase 2: Women received informational postcards on screening mammography 2 weeks before their scheduled appointment but no information about the same day testing. N=512		

Inclusion criteria	Women ≥50 years old presenting consecutively to a general internal medicine practice for a new or return visit
Exclusion criteria	Women presenting for acute care, with a history of breast cancer, with a mammogram in the past 12 months, active breast symptoms on exam, or who had not received the physician recommendation for screening at the index exam
Assignment to intervention or control	Random, by the 4th digit of social security number: assigned to the intervention group if number was even, control group if odd
Recruitment	Women completed a study questionnaire at check-in and the research assistant attached a physician prompt (for screening mammography) to the medical chart. Physicians documented whether they had recommended screening at the exam; the research assistant documented whether and where patients were intending on having a mammogram, then randomized women into intervention or control groups.
Population characteristics	Most women were white (40%) or African-American (40%), not married, not employed.
Data collected	Demographics, recollection of receiving the advance notice postcard, number of women reporting they would have received same day mammography if they had had advance notice (Phase 1), satisfaction with the same day screening service
Outcome(s) measured	Documentation of mammogram 3, 6 and 12 months after the index exam, as verified through radiology report
Analyses conducted	Post-intervention mammography adherence in intervention and control groups
Findings	Groups were similar in family history of breast cancer and prior number of mammograms in the past 5 years, but women in the intervention group were older, less educated, more likely to have Medicare and less often employed than control women. In Phase 1, 58% of intervention women and 42% of control women had obtained a mammogram within 3 months; the results increased to 61% and 49% at 6 months and to 64% and 58% at 12 months. The 3 and 6 month rates were significantly higher in the intervention group. In Phase 2, results were exactly the same in the 3 and 6 month time frames but the difference in the 12 month rates reached statistical

	significance with 67% of intervention and 54% of control women receiving mammograms. Women who accepted same day screening were similar demographically to those who didn't, except that they were slightly more educated and more likely to use public transportation for this appointment. Customer satisfaction for same day testers was 1.4 on a 5 point scale with 1 being the most satisfied. Regression analysis for both Phases combined indicated that all women benefited from same day mammography except those who had 3 or more mammograms in the past 5 years. The 3 month adherence in intervention women was significantly higher for those $\geq$65 years old, not employed and with none to 2 mammograms in the past 5 years. ORs for intervention group rates were 1.9, 1.7 and 1.5 for 3, 6 and 12 months, respectively.
Discussion, recommendations	Same day mammography service increased mammogram rates, but advance notice did not appear to influence this. Other studies have only suggested that same day service would likely increase compliance; this trial demonstrated its efficacy. Physician recommendation is likely to have the highest impact at the time it is given and then probably diminishes with time. Same day screening can provide logistical help at the highest impact time by also reducing patient time and access barriers. Physician prompt was a part of the intervention but it was not possible to determine the independent effect this may have had. Use of the 4th digit of social security numbers, which are assigned systematically but not randomly, inadvertently resulted in uneven sample sizes and somewhat dissimilar study groups (intervention group had more women with risk for non-adherence). Results showed that this intervention was still more effective for them than controls who were at baseline more likely to be screened.
Implications for implementation	The intervention was beneficial to the women at highest risk for not receiving recommended screening mammograms (those $\geq$65, unemployed and with a history of few mammograms). Targeting this same day intervention to those with a history of fewer mammograms would be effective and would limit the burden on facilities that are not able to handle a large load of same day appointments.

Additional comments	Large study with some methodological weaknesses within a general practice that used a relatively simple intervention that resulted in success. It also showed that same day testing does not need to be used indiscriminately but should be used on the highest risk women.

TITLE, AUTHOR(S), REFERENCE	**FLYNN BS, GAVIN P, WORDEN JK, ASHIKAGA T, GAUTAM S, CARPENTER J. COMMUNITY EDUCATION PROGRAMS TO PROMOTE MAMMOGRAPHY PARTICIPATION IN RURAL NEW YORK STATE. PREV MED. 1997 JAN-FEB;26(1):102-8.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To estimate the proportion of women in communities served by a mobile mammography unit who were not receiving screening from any source and to evaluate educational programs to increase mammography use.		
Location(s)	US: New York State	UK	Other
Intervention condition	Same as the control condition plus group educational programs by natural opinion leaders based on previous research and information from focus groups (on modifiable factors for influencing mammography); all households with women aged ≥35 received a direct mail package with information about the importance of early detection, screening guidelines, a risk profile questionnaire, van schedule and sliding fee information; primary care providers (PCP) were offered an office-based breast cancer screening educational program (screening guidelines, access to mammography, CBE with a silicone model). The model was designed and implemented based on results of focus groups with women in both areas, PCP surveys on factors that inhibit women from screening, and principles of PRECEDE, social learning theory and diffusion of innovation theory. N=6 communities, total of 2966 residents		
Interventionists	Opinion leaders were trained in screening and BSE modalities and provided information on how to obtain mammograms; they were also expected to become breast cancer screening promoters within their social networks.		
Control condition	These communities received equivalent mobile mammography services as in the intervention areas (i.e., same number of stops, similar advertisement through local media with a toll-free number for appointments; focus groups conducted to identify barriers to		

	screening). N=7 communities, total of 4157 residents
Inclusion criteria	Communities of <1000 residents served by the mobile mammography unit, women aged ≥35
Exclusion criteria	None stated
Assignment to intervention or control	2 matched sets of communities served by a mobile mammography unit were randomly (method not stated) assigned to the intervention of control conditions.
Recruitment	Not stated
Population characteristics	In both intervention and control communities, 25% of women were >35 years old, had a median education of 12 years, were of similar median age (33-35), mostly white.
Data collected	Mammography, CBE and BSE use behavior (ever, in the past 1 and 2 years), knowledge of screening guidelines, receipt of physician recommendation, perceptions of normative mammography behavior, perception of friends' support for mammography; information related to process evaluation
Outcome(s) measured	Mammography and CBE in the past year, performance of BSE, measures of social norms (perception of the percentage of women over 40 receiving regular breast exams)
Analyses conducted	Post-intervention (6 months) measures in intervention and control communities by phone survey of women > 35 years old
Findings	Program areas had slightly higher incomes but were otherwise similar to control communities. 98% felt that the program increased their knowledge of BSE skills, risk factors, and understanding of mammography. In 184 women receiving a mammogram after the direct mail campaign, 166 (90%) recalled receiving the direct mail package. 6 (86%) of the targeted PCP received the educational intervention; all indicted that the program was useful. Response rate to post-intervention surveys was 62%, similar in both intervention and control communities; respondents were similar between communities.

	Van mammography use (number of van users per woman >35 years old) in the program area increased from 49 in 1990 and 64 in 1991 (before the intervention) to 67 in 1992 to 179 in 1993. Corresponding rates for control communities were 36, 26, 31, and 69. More program women than control women received mammograms in the past 2 years (82% v. 72%), received mammograms in the past year (64% v. 60%), regularly (55% v. 51%) and ever (89% v. 80%). More program women reported receiving the mobile van mammography than control women (34% v. 10%); they also reported it took less time to receive the testing, including travel (in ≤1 hour) (29% v. 9%). There was no difference in knowledge of mammogram frequency and perception of provider recommendation, but a larger percentage of program women reported reinforcing factors that mammography is important to friends and that many/most women receive mammograms regularly. CBE and BSE behaviors were not influenced by the program.
Discussion, recommendations	A combination of interventions (barrier reducing and educational programs for women and providers) can increase mammography use. Mammography and the use of mobile van services both increased in intervention communities. This type of intervention may be especially helpful in rural areas because of the relatively cohesive social networks in existence there. Limitations included lack of a formal pre-test and a study design that was not a formal community trial. The short follow-up period (6 months) could not measure longer term impact.
Implications for implementation	The combination of interventions used in this study may be generalizable to other rural areas; the community organization efforts could be reproduced; the mailing was relatively inexpensive and resulted in wide coverage throughout the community. Mobile van mammography services should be considered by medical centers that serve rural populations with similar access problems. The use of focus groups and their results in program design likely enhanced results.
Additional comments	Emphasizes the need for more accessible mobile services in rural areas.

TITLE, AUTHOR(S), REFERENCE	**HEYDING RK, CHEUNG AM, MOCARSKI EJ, MOINEDDIN R, HWANG SW. A COMMUNITY-BASED INTERVENTION TO INCREASE SCREENING MAMMOGRAPHY AMONG DISADVANTAGED WOMEN AT AN INNER-CITY DROP-IN CENTER. WOMEN HEALTH. 2005;41(1):21-31.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other: Process evaluation	
Purpose of study	To determine the effectiveness of a community based intervention to increase the use of mammography in clients of an inner city drop-in center with a high prevalence of mental illness and homelessness		
Location(s)	US	UK	Other: Toronto, Canada
Intervention condition	In collaboration with a nearby hospital, mammography services were offered once a week during 3 open consecutive appointments that were held open for patrons of the drop-in center. Staff took the participants to lunch, then accompanied them to obtain mammography. The family physician working at the drop-in center served as the referring physician for the procedure. Most of the women had health insurance because of Canada's universal health insurance system; the costs of mammography were borne by this system. N=247		
Interventionists	Staff at the drop-in center		
Control condition	None		
Inclusion criteria	Women 50-70 years old who were in attendance at the drop-in center		
Exclusion criteria	None stated		
Assignment to intervention or control	None		
Recruitment	Once a week, on the same day as the held appointments, staff members of the drop-in center invited women to participate in the mammography screening program. They recruited women until 3 accepted.		

Population characteristics	The mean age of women using the drop-in center during the intervention period was 58, 63% had a psychiatric diagnosis, 15% had a substance abuse diagnosis, 32% were homeless or living in supportive housing.
Data collected	Data on mammography use and demographic information were abstracted from the drop-in center's medical record system.
Outcome(s) measured	Attendance for mammography and the annual rates of screening mammography at the drop-in center (pre-and post-intervention)
Analyses conducted	Pre-post annual rates of mammography screening in women at the drop-in center; demographic comparisons of women who were and who were not screened (pre-and post-intervention).
Findings	In the 7 years prior to the intervention, the average rate of annual mammography was 4.7% (1.8%-8.1%). During the intervention period, the rate increased to 29.2%. Time series analysis showed this effect to be significant. Obtaining mammography was not attributable to any demographic characteristics. In the 26 women who had a mammogram, only 4 (15%) had had a prior test within the past 5 years. Of the 26, 3 had abnormal results, one of whom was newly diagnosed as having breast cancer.
Discussion, recommendations	This intervention significantly increased the use of screening mammography in a population of women were underusers of mammography and who additionally had several predisposing factors associated with underuse (mental illness, substance abuse, limited knowledge of preventive health measures, lack of trust). The existing positive relationships between drop-in staff and the clients, the lunch incentive, flexible scheduling and accompaniment to appointments all probably contributed to the project's success. The program was not dependent on having medical services located at the drop-in center; therefore this intervention could be adapted to many other settings that at risk women frequent. The study was limited in its observational design and results could have been affected by selection bias, secular trends and inaccuracies associated with medical record abstraction. Even though many women were screened, a larger proportion (71%) were not; this indicates a continued need to address the barriers to and gaps in health care for women affected by homelessness and mental

	illness. Partnership models like this one need to be more fully researched for intervention effect potential and sustainability in other settings.
Implications for implementation	This approach may be very useful in promoting breast cancer screening in women who are homeless or who are affected with mental illness who have contact with community based agencies.
Additional comments	Practical intervention in a small subpopulation that made good use of existing resources. The approach would seem to have applicability to cervical cancer screening as well. Not all drop-in centers have medical services and a medical record system, so the annual rates of screening would have to be determined using another method or a different evaluation plan could be used. Funding would be needed for mammography, since the U.S. does not have a universal health insurance system.

TITLE, AUTHOR(S), REFERENCE	**NAVARRO AM, SENN KL, MCNICHOLAS LJ, KAPLAN RM, ROPPE B, CAMPO MC. POR LA VIDA MODEL INTERVENTION ENHANCES USE OF CANCER SCREENING TESTS AMONG LATINAS. AM J PREV MED. 1998 JUL;15(1):32-41.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To assess the short term effect of the Por La Vida intervention (PLV) on breast and cervical cancer screening in Latinas		
Location(s)	US: San Diego CA	UK	Other
Intervention condition	Small group sessions of 12 weeks duration on breast and cervical cancer early detection, importance of screening tests, nutrition, BSE and obtaining services. The program was developed using existing social linkship networks in the Latino community, the identification and training of female LHW who are recognized and trusted as natural helpers (consejeras), principles of Social Learning Theory, and culturally appropriate educational materials. N=274		
Interventionists	Community member identified women who were perceived as consejeras and study staff interviewed them to explore and rate their personal characteristics relevant to the project; the 36 chosen consejeras were then trained to recruit participants and conduct study activities all in accordance with the consejera manual.		
Control condition	Small group sessions of 12 weeks duration on Community Living Skills. N=238		
Inclusion criteria	None stated		
Exclusion criteria	None stated		
Assignment to intervention or control	Half of the consejeras were randomly selected to provide the control group sessions		

Recruitment	Women in the naturally occurring social networks of the consejeras
Population characteristics	Participants averaged 34 years old (18-72) and were typically low SES, median income of $12k, family size of 5, married, full-time homemakers, born in Mexico, of low acculturation, without insurance (60%), and without a regular health care provider (40%).
Data collected	A 178 item questionnaire was used and included items on access to health care, cancer knowledge, preventive measures, previous cancer screening exams, acculturation scale and social support.
Outcome(s) measured	Use of BSE, CBE, mammography and Pap test by self-report
Analyses conducted	Pre-post-intervention measures for intervention and control groups, using both the consejeras and the individuals as units of analysis
Findings	512 Latinas completed the baseline survey; 365 (71%) completed the follow-up survey; non-responders on follow-up were more likely to have insurance but were like responders in all other ways. The intervention and control groups were demographically similar at baseline, except a higher proportion of control group women were employed. A high proportion (88.4%) of the women completing both pre-and post-tests had attended at least half of the group sessions, but only 44.0% of those completing only the pretest had attended at least half of the sessions; most of the women not completing the post-test had moved without providing a forwarding address. In women who completed both the pre-and post-tests, test completion at follow-up was significantly higher for the intervention group than the control group for BSE (51.8% v. 41.4%) and mammography for women $\geq$40 years of age (56.4% v. 43.6%); but non-significantly higher for Pap test (65.3% v. 61.1%). CBE was the same in both groups (59.8% v. 59.6%), however, in the subset of women $\geq$40 years of age, the rate of improvement in CBE was twice as high in the intervention group (30.4%) as in the control (17.5%). The percentage increases from pre- to post-test were twice as high for BSE, and 3 times as high for mammography.
Discussion, recommendations	PLV was shown to be effective in reaching low income Latinas and in increasing the use of BSE and mammography; Pap test use increased, but not significantly.

	Self-report was used to report outcome measures, but lack of resources prohibited the conduct of any verification activities, such as contacting the providers where the women reported receiving the tests. This evaluation only looked at short term effects and some women may have had appointments scheduled, but not received, at the time of the follow-up interview. An advantage of PLV is that it used existing social networks within the community. In addition, consejeras modeled healthy behavior among their peers and this is consistent with Social learning theory that suggests that similar admired models are most effective in enhancing behavior change. Future projects are needed to test the feasibility and replicability of this intervention in larger areas and with different populations, such as Latinas who are not primarily Mexican born, Latinas of other socioeconomic status and acculturation, those in rural areas, and in broader mainstream settings.
Implications for implementation	Critical to the success of this model were: design by and for the Latina community, using existing linkship networks and identified natural helpers, and the use of social learning theory principles. Successful replication would require no less.
Additional comments	This study was one of 5 cooperative projects funded by NCI that targeted breast and cervical cancer control in Latina women.

TITLE, AUTHOR(S), REFERENCE	**PASKETT ED, TATUM CM, D'AGOSTINO R JR, RUSHING J, VELEZ R, MICHIELUTTE R, DIGNAN M. COMMUNITY-BASED INTERVENTIONS TO IMPROVE BREAST AND CERVICAL CANCER SCREENING: RESULTS OF THE FORSYTH COUNTY CANCER SCREENING (FOCAS) PROJECT. CANCER EPIDEMIOL BIOMARKERS PREV. 1999 MAY;8(5):453-9.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To assess the effects of the FoCaS project on mammography and Pap smear screening rates over time on older, low income minority women.		
Location(s)	US: Winston-Salem NC (intervention) Greensboro NC (comparison)	UK	Other
Intervention condition	The 2 year intervention had multiple components. Community focused: Health fairs, church based education by LHE, printed materials, mass media, monthly classes by LHE in housing communities, birthday cards with the project logo, targeted mailings and door knob hanger invitations to events, one on one educational sessions in women's homes. Clinic focused: In services and conferences for providers, visual prompts in exam rooms, educational games, abnormal test result protocol, posters and literature for waiting rooms, one on one counseling and personalized letters for abnormal results. The program was developed using results from previous surveys, focus groups, input from the project's community advisory board, and principles of Social Learning Theory, the Health Belief Model, PRECEDE/PROCEDE and the PENIII model and relied on a consortium of local community agencies which provided access to services and materials. N= 9 housing communities with 908 women		

Interventionists	LHE, ministers, health care providers
Control condition	No intervention N=18 housing communities with 1021 women
Inclusion criteria	Women aged ≥40, residing in low income housing
Exclusion criteria	None stated
Assignment to intervention or control	Cities were chosen based on the proximity to the research team; cities were matched in terms of numbers of women living in housing communities; selection of intervention and control city was random
Recruitment	Women in both communities were selected for pre-and post-intervention surveys using random selection within age groupings from Housing Authority lists. No information is provided about recruitment into the various interventions.
Population characteristics	Most were aged 65-68, African-American, ever married, had been pregnant in the past, obtained regular exams, had health insurance
Data collected	A data collection tool was used for both pre-and post-intervention interviews
Outcome(s) measured	Adherence to screening guidelines for mammography and Pap smear by self-report; knowledge, attitudes and beliefs about cancer screening tests
Analyses conducted	Pre-post-intervention measures for intervention and control groups
Findings	In the intervention city, 125 baseline and 168 follow-up surveys were completed. In the control city, 23 baseline and 134 follow-up surveys were completed. Response rates for both surveys were similarly high in both cities (average of 78% for pre-and 75% for post-); non-responders were similar to respondents. A higher proportion of respondents in the intervention city were African-American than in the control city for both surveys. Mammography use increased significantly (18%) in the intervention city (31%-56%) compared with the comparison city (33%-40%). Pap smear use also increased significantly (21%) in the intervention city (73%-87%) compared with the comparison city (67%-60%). For mammography, the proportion of women reporting few barriers

	was significantly higher at follow-up (40%) than in the comparison city (10%); although a higher proportion of women in the intervention city had positive beliefs at baseline (32%), fewer had positive beliefs at follow-up (20%); there were no differences between cities in good knowledge at either time. For Pap smear, the proportion of women reporting few barriers was significantly higher at follow-up (29%) than in the comparison city (55%); there were no differences between cities in positive beliefs or good knowledge at either time. Regression analysis confirmed that having received the intervention predicted (increased) test receipt; it also identified other predictors (regular exams, current smoker and positive beliefs for mammography; age <65, regular exams, good knowledge, few barriers for Pap smear).
Discussion, recommendations	The intervention program was associated with significantly higher test receipt and had some effect on belief, barriers and knowledge. The percentage point increases (18% for mammography and 21% for Pap smear) are higher than those reported in previous studies, but the current study used multiple behavioral theories in its framework. Findings for Pap smear uptake may be conservative since the follow-up period was only 2.5 years and the recommended schedule for testing is 3 years, but this would have affected both communities similarly. The study used self-report for receipt of screening tests, but validation of self-reports have previously shown good agreement (77% for mammography and 67% for Pap smear use). Response rates were high, but slightly lower in the comparison city. The relative contribution of each separate intervention in this study could not be measured. But this study showed the value of using community interventions, multiple strategies and theory based methods. Other community studies previously conducted have had mixed results, with some showing positive and others showing no effect.
Implications for implementation	The use of multiple behavioral theories allows for a study design that is appropriate for the target population.
Additional comments	This study was part of an NCI research program (Public Health Approaches to Breast and Cervical Cancer Screening). It shows the

	value of using multiple strategy and theory-based community interventions.

TITLE, AUTHOR(S), REFERENCE	**SAYWELL RM JR, CHAMPION VL, SKINNER CS, MENON U, DAGGY J. A COST-EFFECTIVENESS COMPARISON OF THREE TAILORED INTERVENTIONS TO INCREASE MAMMOGRAPHY SCREENING. J WOMENS HEALTH (LARCHMT). 2004 OCT;13(8):909-18.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To identify the relative cost-effectiveness of various combinations of a tailored physician print recommendation and tailored phone counseling by nurses on increasing adherence to mammography		
Location(s)	US: St. Louis MO Indianapolis IN	UK	Other
Intervention condition	Women in all groups completed a baseline phone interview, received the intervention 4 weeks after baseline and completed an 8 week post-intervention interview. A computerized-tailoring program was developed to put together the appropriate messages for each participant based on her perceived risk, benefits and barriers. Tailored phone counseling: Counselors tailored their messages based on the participant's perceptions and needs and were verbally walked through the procedure if they had never before received a mammogram. Counseling messages were based on those that would have been contained in the computerized-tailored letter had the participant been randomized to the mailing only or combination group. Tailored mailing: This had 3 components: a cover page with the individual recipient's age, breast cancer family history, stage of mammography adoption, digitally signed by her physician; tailored information addressing the recipient's perceived risk, benefits and barriers to mammography; women with low self-efficacy scores and those who did not understand the mammography procedure received text and graphics on how to set up an appointment and where to go. Combination of phone counseling and tailored mailing: This group received both interventions listed above. Total N for all interventions=1044		

	The intervention was designed and implemented using the Health Belief Model (HBM) and the Transtheoretical Model (TTM).
Interventionists	Phone counselors were trained on the study protocol, the intervention and role modeling.
Control condition	Women receiving usual care; no intervention except for baseline and post-intervention interview N=346
Inclusion criteria	No history of breast cancer, no mammogram in 15 months, ≥51 years of age
Exclusion criteria	None stated
Assignment to intervention or control	Random
Recruitment	Eligible women were identified through computer listings from a hospital's general medicine clinic (St. Louis, N=732, 72% response rate) and 2 managed care organizations (Indianapolis, N=658, 44% response rate). They were sent an informational letter about the study, told that someone would be calling them to talk further and they were given a phone number to call to opt out.
Population characteristics	Women were mostly African-American (52.3%), of mean age 65.6, not working (70.5%), income of ≤$15k (55.5%).
Data collected	Interview records collected demographics, perceived breast cancer susceptibility, mammography benefits and barriers, self-efficacy in obtaining a mammogram, stage of readiness to change in mammography adoption.
Outcome(s) measured	Mammography use 2 months post-intervention by self-report; and costs (direct, overhead/indirect).
Analyses conducted	Pre-post-intervention measures for intervention and control groups; cost analysis was conducted only if the intervention was deemed to be significantly more effective than the control condition; effectiveness was calculated as costs divided by the improvement/increase in mammogram rate expressed as dollars per percent increase; cost analysis included costs for the delivery of the intervention only.
Findings	A total of 1044 completed both the baseline and follow-up interviews. Women in all 4 groups were similar demographically.

	All 3 intervention groups were significantly more effective than controls (OR 1.489, 1.575, 2.014 for phone, mail and combination, respectively). Corresponding compliance rates were 41.91%, 43.27% and 49.38%; for controls it was 32.63%. In the subsets of contemplators and women with a history of mammography, all 3 interventions were more effective than control; the combination was 2 times as effective. For noncontemplators and women without a prior history of mammography, none of the interventions were more effective than control. Mean intervention costs for phone, mail and combination were $4.68, $4.14 and $9.38, respectively. Corresponding per capita costs of a 1% increase in the mammography rates were $0.50, $0.39 and $0.56. The mail intervention was the most cost-effective with 43.27% adherence and a cost of $0.39 per 1% increase in the adherence rate ($4.14 mean intervention cost divided by 43.27 [adherence in mail group] minus 32.63 [adherence in controls]). In the contemplator group, the combination approach was the most effective (57.22%, cost of $0.48), but the phone intervention was the most cost-effective at $0.28 (54.19%). In the group with prior mammograms, the combination was the most effective (53.00%, cost of $0.51), but the mail intervention was the most cost-effective at $0.32 (47.76%).
Discussion, recommendations	Some of the women in the study, including those in the usual care group, may have received additional reinforcement for mammography beyond the reach of the interventions implemented as part of the study; this effect would be difficult to measure. Both cost and non-cost factors need to be considered when making decisions about the most appropriate interventions to put into place. Using intervention effectiveness alone, the combination strategy emerges as the most effective (49.38%); examining costs alone, the mail intervention was the most cost-effective ($4.14 per contact, $0.39 per capita per 1% increase in adherence). The best balance between effectiveness and cost would be to use the mail intervention (43.27% adherence, cost of $.039). Knowing an individual patient's stage of readiness (e.g., by adding a question as part of a visit or survey) and having their mammography history could help providers better tailor interventions for pre-

	contemplators and historic under-utilizers. A previous study by the same authors indicated that in person counseling with a physician letter was most effective for women without a history of a prior mammogram and that a physician's letter was most effective for noncontemplators. In the present study, none of the interventions was effective with either of these groups; this may be because of the differences in demographics (this study had a higher proportion of African-American women) or some other factors which needs much further study.
Implications for implementation	The effectiveness and cost analysis results produced in this study setting may not be generalizable to all other settings, but they show that both effectiveness and cost-effectiveness measures can both be useful in choosing interventions appropriate for varying target audiences.
Additional comments	This article made very innovative and practical use of stages of change theory. A previous study not summarized here (Champion, 2003) conducted by 3 co-authors (tailored intervention to increase mammography use in non-adherent [pre-contemplators and contemplators] older women, based on the HBM and TTM, was most effective for pre-contemplators), thus emphasizing the important contribution of using theory-based interventions. Through personal communication with the primary author, it was determined that a tool to determine susceptibility, benefits, barriers and stage of change (Champion, 1999) is available and authorized for local use/revision with proper citation. This article contains a very detailed description of the costs and methods used to determine cost-effectiveness. This would be very useful for programs and agencies in their decision making about implementing this intervention locally. Cost studies are not always comparable, so several should be reviewed to determine local applicability and feasibility.

TITLE, AUTHOR(S), REFERENCE	**SHENSON D, CASSARINO L DIMARTINO D, MARANTZ P, BOLEN J, GOOD B, ALDERMAN M. IMPROVING ACCESS TO MAMMOGRAMS THROUGH COMMUNITY-BASED INFLUENZA CLINICS. A QUASI-EXPERIMENTAL STUDY. AM J PREV MED. 2001 FEB;20(2):97-102.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine whether offering women attending community influenza immunization clinics the opportunity for facilitated access to mammography would result in an increase in the number of mammograms performed over a 6 month period		
Location(s)	US: Litchfield County CT	UK	Other
Intervention condition	Women in the intervention clinic sites were asked if a local radiology clinic of her choice could contact her to later schedule a mammogram; women without insurance or regular care providers were offered free mammography (funded for low income women). The physicians of women requesting a mammogram appointment were notified if their patients had a test and were sent the results. Personnel from mammogram facilities contacted the participating women to make appointments for testing. Women were contacted 6 months after the date of the immunization clinic to determine the date of their last mammogram. N=137		
Interventionists	Health Care workers trained in the intervention and located at influenza immunization clinics		
Control condition	Women were contacted 6 months after the date of the immunization clinic to determine the date of their last mammogram. N=147		
Inclusion criteria	Women aged ≥50 who had not had a mammogram in the prior 12 months		
Exclusion criteria	None stated		
Assignment to intervention or	9 of 52 advertised influenza immunization clinics in Litchfield		

control	County CT were randomly selected; 4 were randomized to intervention and 5 were randomized to control.
Recruitment	Women awaiting influenza immunization were provided educational materials about mammography (brochures, listing of local mammography facilities with information on coverage for low income women, list of local physicians supporting the project, pink ribbon). They were asked for permission to be called in 6 months about using preventive care.
Population characteristics	Intervention site women were of mean age 73.1, controls were 72.4 and both groups had similar insurance, mostly Medicare.
Data collected	Date of last mammogram in controls and intervention women that did not want a call from a radiology department to schedule a mammogram; mammograms conducted for the women that the influenza immunization clinics had referred; and used existing BRFSS data on county use of mammograms and influenza immunization clinics, and mammography use in women attending and not attending influenza immunization clinics.
Outcome(s) measured	Rates of clinic-referred mammography by verification with mammography facilities, or by self-report
Analyses conducted	Post-intervention measures for intervention and control groups; existing population based surveys were used to evaluate whether the women in the clinics were similar to all county women in their mammography use; analyzed unknown (missing) data in 3 different ways (excluding unknowns, applying the observed rates of the intervention group to unknowns in both groups, and applying the observed rates of the control group to unknowns in both groups)
Findings	284 women from the 9 immunization clinics were eligible, 137 from the 4 intervention sites and 147 from the 5 control sites. In intervention sites, 48 (35%) had mammograms, 49 (36%) did not and for 40 (29%), mammography status was unknown. For control sites, the corresponding rates were 15%, 48% and 37%. The most common reason for unknown status was that women were not reachable after 3 calls. Analyzing the unknowns using the 3 methods resulted in similar statistically significant results, with the RR of the intervention site women ranging from 1.6-2.1. Differences in rates of mammography for intervention and control groups, for all Litchfield County women, for those who use/don't use

	immunization clinics were shown graphically rather than analytically. The graph showed that the rate in the intervention group was much higher than those of any of the others (none were ever higher than 20%).
Discussion, recommendations	Mammography use in the intervention clinics was significantly higher than that in the control clinics; showing a very practical benefit of this approach. Litchfield County is very homogeneous with most residents white with few African-Americans or Latinos; the majority are above the poverty line and most of those ≥50 years of age have insurance. Results may be different and should be assessed in areas with different demographics. Hospital record verification for the intervention group and use of self-report for the control group could have biased the results in the direction of overestimating the control results, since most self-report error is reportedly in the direction of underestimating the length of time since last mammogram.
Implications for implementation	Offering mammography within an existing service where women at risk are present can be effective and is probably less costly and labor intensive than other population based strategies that require more labor to recruit and intervene with women. Such integration of services requires community collaboration between groups who may not be used to working with each other. This strategy may be the most applicable where a large proportion of women receive influenza immunization through community clinics; but the strategy should also be evaluated within physician practices where many women routinely receive influenza immunizations.
Additional comments	Small but innovative operational study that also made good use of existing public health data in evaluation. Formative work and adherence to confidentiality practices added to the success of this project; it was carried out by Sickness Prevention Achieved through Regional Collaboration (SPARC), a community based disease prevention program. A concurrent social marketing campaign encouraged the use of adult immunizations (but not mammography). 17 of 18 local physicians supported the effort.

TITLE, AUTHOR(S), REFERENCE	**SKAER TL, ROBISON LM, SCLAR DA, HARDING GH. FINANCIAL INCENTIVE AND THE USE OF MAMMOGRAPHY AMONG LATINO(A) MIGRANTS TO THE UNITED STATES. HEALTH CARE WOMEN INT. 1996 JUL-AUG;17(4):281-91.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To test the effect of fully subsidized mammograms on utilization in a predominantly never/under-using community that had previously identified cost as being a major barrier to use		
Location(s)	US: Rural eastern Washington	UK	Other
Intervention condition	Women were told they were due for mammography and given information about recommended guidelines for screening, how to make an appointment, directions to the mammography facility and were given a voucher (in both English and Spanish) to obtain a free mammogram at the local mammography facility within 30 days. N=40		
Interventionists	Bilingual nurses from each clinic were hired and trained as interviewers		
Control condition	Women were given the same information as listed under the intervention condition but they did not receive the voucher for a free mammogram. N=40		
Inclusion criteria	All Latina women, foreign born, ≥40 years old, without a history of breast cancer who had not obtained a mammogram within the past year or longer		
Exclusion criteria	None stated		
Assignment to intervention or control	Two of the 6 nonprofit clinics serving migrant and low income residents that had participated in the baseline survey were randomly selected to host both the intervention and control conditions. Consecutively attending eligible women were assigned randomly		

	(every other one) to the intervention or control group; the recruitment period was for 2 months.
Recruitment	Nurse interviewers in each clinic recruited eligible women.
Population characteristics	The average woman was 52.4 (40-76) years old, with a family income ≤$15k, residence in U.S. of 16.7 years, 3.6 years of education, 72.5% married and 20% had insurance.
Data collected	A brief survey instrument was used to obtain demographic information; clinic staff additionally searched records to verify receipt of mammogram.
Outcome(s) measured	Receipt of mammogram within 30 days of clinic visit, verified through medical record search
Analyses conducted	Post-intervention measures for intervention and control groups
Findings	The intervention and control groups were demographically similar at baseline. In the voucher group, 87.5% received a mammogram, compared to 17.5% in the control group. Regression analysis showed that receipt of a voucher (OR 47.03) and having health insurance (OR 6.29) were significantly associated with obtaining a test. Distances from the migrant health clinic to the mammography facility were 1 mile in one site and 6 in the other, but there was no difference in use (and no distance barrier) between the 2 sites.
Discussion, recommendations	Women given a voucher were more than 47 times more likely to obtain a mammogram than women who were not given one. The high rate of mammography in the intervention group is much higher than expected in a group of women of very low income and education (both factors typically associated with low mammography use). This study does not address the issue of women outside care; also it is unknown if other women would be as motivated to receive a mammogram if given the same financial incentive. This confirms women's self-report that cost is a major barrier to receiving mammography and that when financial barriers are

	removed, they will access the test.
Implications for implementation	"First dollar coverage" can increase mammography screening rates in high risk populations and this approach should be given further economic analysis and policy consideration.
Additional comments	This was a small study conducted over a short period of time with a small number of women, but results were overwhelmingly consistent and positive in this group of women for whom test cost is a barrier to use.

TITLE, AUTHOR(S), REFERENCE	**SLATER JS, HENLY GA, HA CN, MALONE ME, NYMAN JA, DIAZ S, MCGOVERN PG. EFFECT OF DIRECT MAIL AS A POPULATION-BASED STRATEGY TO INCREASE MAMMOGRAPHY USE AMONG LOW-INCOME UNDERINSURED WOMEN AGES 40 TO 64 YEARS. CANCER EPIDEMIOL BIOMARKERS PREV. 2005 OCT;14(10):2346-52.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To test the effectiveness of two mailed strategies, as a population-based approach, on increasing mammography use in women aged 40-64 who are eligible for free screening through Sage, the Minnesota NBCEDP. A secondary purpose was to assess the utility of the National Cancer Institute's Consumer Health Profiles (database of health behavior, demographic, lifestyle and geographic data for audience segmentation; see also cis.nci.nih.gov/research/CHP_FACT_SHEET.pdf) for targeting direct mail interventions to increase mammography use.		
Location(s)	US: Minnesota	UK	Other
Intervention condition	Mail: Women were sent two different mailers (1 month apart) with a brief message about the free mammography through the Minnesota health department and a prompt to call a toll free phone number for more information (unique extensions coded each call to the specific mailer). The mailers were designed to catch the reader's attention and prompt quick action and were personally addressed to the recipient. Women calling the toll free number were assessed for eligibility for free screening and encouraged to schedule for an appointment, by 3-way phone call (to the extent possible) with the clinic; when this was not possible, the women were called back to ensure that the appointment had been made; appointment confirmations were mailed out and women screened <9 months before their call to the program were offered reminder calls to schedule appointments. Women not eligible for free screening were referred to the American Cancer Society's low cost mammogram program. Formative work for the mailers and incentives took 2 years to complete and included 6 focus groups, 4 pilot studies and the use of a direct marketing communications company.		

	Mail plus incentive: Same as Mail plus the offer of a $10 incentive who completed a Sage mammogram within about 1 year. N=51,266 (25,633 in each group)
Interventionists	NA
Control condition	No intervention other than ongoing Sage recruitment efforts. N=94,201
Inclusion criteria	None stated other than assignment
Exclusion criteria	None stated other than assignment
Assignment to intervention or control	Cases were split into low and high mammography rate clusters (MRC). For the low MRC group, the mailing list names were allocated in equal proportions into the 2 intervention and 1 control conditions; for the high MRC, the mailing list names were allocated in a 1:1:5.9 ratio for mail, mail plus and control, respectively; this kept costs down and maximized statistical power.
Recruitment	Only as listed above in assignment, and directly by the mailing, if received.
Population characteristics	Women on a commercial mailing list of Minnesota women aged 40-63 from census tracts with a household size and income characteristics consistent with Sage income guidelines; the list also provided a Claritas PRIZM cluster assignment for each woman into a high or low MRC. Women aged 40-63 (average=49.7), household income of $35k-$49.9k, Twin cities metropolitan (54.9%) or non-metro (45.1%) residence, no prior Sage screening (97.6%).
Data collected	Call outcomes, number and percentage screened
Outcome(s) measured	Overall completion of mammography through Sage, between intervention groups and by MRC, within 13 months of the beginning of the intervention through matching of the Sage patient list and mailing list; phone call outcomes were documented to determine the % eligible and the % making appointments.
Analyses conducted	Post-intervention measures for intervention and control groups

Findings	Groups were similar demographically and with respect to prior Sage screening within the MRC strata. Women in the low MRC were more likely to have lower household incomes, live outside the metro area and have had Sage screening prior to the intervention. 3.92% of intervention group women called (1.56% of the Mail only group compared to 6.28% of the Mail plus group); 32.27% were eligible for Sage screening and 75.04% of eligible callers scheduled appointments. Four times as many women in the Mail plus group called than in the Mail alone group even though the sample sizes were the same. In low MRC areas, screening rates were: 1.68%, 2.02% and 2.72% for controls, Mail only and Mail plus. Differences reached significance in Mail plus v. controls and Mail plus v. Mail only. More than 3 times more women in the low MRC were screened. In high MRC areas, screening rates were: .56%, .78% and 1.24%. Differences were significant between all 3 comparisons. Significant intervention effects occurred in women with no prior Sage screening (regardless of MRC cluster); there were no intervention effects in high MRC women with prior Sage screening, but differences in the low MRC women approached significance. More women claimed the incentive than were on the Mail plus list; this was probably due to diffusion of the intervention.
Discussion, recommendations	Direct mail, used with toll-free number for screening and appointment scheduling, significantly increased mammography screening in women who received the intervention. The intervention effect was smaller than that reported in other studies, but most of the other studies were conducted outside the U.S. where they have national screening and recruitment programs. Inreach invitation/reminder studies are not directly comparable to this one, because they only include women who are known to be eligible and in need of mammography; a study like the present one could not be aware of the target audience's income, insurance or screening status.

	Adding the incentive tripled the effect even though most women did not claim it; the offer probably increased the attention to the mailer but was not the primary motive for getting screened; others may have forgotten to ask for the incentive or thought it too much trouble to obtain. More than half of callers were not eligible for Sage and this points out the need for more finely honed target list. More work is needed to determine the effectiveness of PRIZM based clusters in identifying persons in need that would be responsive to direct mail strategies. Given that Sage continued to conduct other screening promotion activities during the direct mail campaign, these results might have been influenced by the ongoing efforts. Direct mail strategies may have an even larger effect in communities that do not have underlying mammography screening recruitment programs. Results may be different in other states, based on literacy and diversity of primary language, on the proportion of women who would be eligible for NBCEDP or other free screening and the availability of an appointment scheduling system. Results also have applicability to those that promote preventive services in Medicare beneficiaries (study completed and report is currently being prepared in Minnesota). Cost-effectiveness was not a focus of this study, but the direct mail program has become the primary recruitment strategy for Sage since it is effective and is one of the lowest cost strategies for the program.
Implications for implementation	Direct mail, using monetary incentives and an enhanced mailing list that includes behavioral and lifestyle data, should be considered as a method to increase mammography use in low income underserved women. Formative work and pilot testing are critical aspects for the success of a direct mail program.
Additional comments	Very well designed, innovative study that made good use of existing NCI data. Could probably increase efficiencies and costs associated with appointment scheduling and incentive claim processes. Personal communication with the author revealed that virtually all women who got mammograms through Sage also got Pap tests; and that the extensive pilot work on this project was so important that it will be the focus of a third manuscript; a second will focus on cost-effectiveness. He felt that this approach would also have great

	potential for increasing both breast and cervical cancer screening in the same population, but that adapting this exclusively for cervical cancer would require more formative work.

TITLE, AUTHOR(S), REFERENCE	**SUNG JF, BLUMENTHAL DS, COATES RJ, WILLIAMS JE, ALEMA-MENSAH E, LIFF JM. EFFECT OF A CANCER SCREENING INTERVENTION CONDUCTED BY LAY HEALTH WORKERS AMONG INNER-CITY WOMEN. AM J PREV MED. 1997 JAN-FEB;13(1):51-7.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine if an in-home educational intervention conducted by lay health workers (LHW) could increase breast and cervical cancer screening adherence by low income inner city African-American women		
Location(s)	US: Atlanta GA	UK	Other
Intervention condition	Intervention women were visited by a LHW twice, one month apart, and again two months later, at their homes. The first educational session included breast and cervical cancer and their screening methods, a videotape of a Pap smear and breast exam depicting an African-American patient, nurse and physician; the second covered reproductive health, contraception and high risk sexual practices, and printed materials. N=163		
Interventionists	LHW were group leaders from the same inner city community health center, received 10 weeks of training in interviewing and health education		
Control condition	Received educational materials on cancer screening after follow-up interviews. In addition, women who had not been screened during the follow-up period received a mailed reminder to receive breast and cervical cancer screening. N=158		
Inclusion criteria	Not stated		
Exclusion criteria	Not stated		
Assignment to intervention or control	Random		

Recruitment	Contacted women at an inner city community health center, public and senior housing projects, inner city business settings, churches, health oriented self-help organization for African-American women
Population characteristics	Most were 35-44, income ≤$15,000, unmarried; baseline screening rates were 51%, 55% and 35% for Pap smear, CBE (both within 1 year) and mammography in those ≥35 (as appropriate for age), respectively.
Data collected	All intervention and control women were interviewed using a baseline and 6-month follow-up questionnaire to assess their past history of breast and cervical cancer screening, including dates of last exam, and knowledge and attitudes toward cancer and cancer prevention.
Outcome(s) measured	Adherence to screening (Pap smear, BSE, CBE and mammogram) by self-report
Analyses conducted	Pre-post-intervention measures for intervention and control groups
Findings	Women were similar in demographics and screening history at baseline. Using baseline data twice (for both pre-and post-measures) for women lost to follow-up (conservative approach), there were no significant differences between intervention and control groups for Pap smear, BSE and CBE (slightly higher for intervention women), but the difference in mammography was significantly higher in the intervention group (9.8%). Both groups had non-significantly higher adherence to Pap smear screening between time periods. Using pre-and post-data for only the women who completed both questionnaires (optimistic approach), results were similar, but the differences in both CBE (8.9%) and mammography (12.4%) were significant. For the subset of women not on recommended screening schedules at baseline, and using only data for the women who completed both questionnaires, differences were significant for BSE (21.3%), CBE (24.6%) and mammography (14.5%). Using the conservative approach, there were no differences noted. Both groups still had non-significantly higher adherence to Pap smear screening between time periods.
Discussion, recommendations	The breast cancer screening portion of the intervention was most effective for the women it was intended to reach, those who were

	non-adherent at baseline. The cervical cancer screening portion of the intervention was not effective. 75% of the intervention women interviewed at follow-up had received both educational sessions, but only 33% of those lost to follow-up did; therefore, the intervention could not have had as much effect on them and the actual intervention effect is likely to be somewhere in between the conservative and optimistic results. Other cancer screening efforts in the community or simply participating in the baseline interview only (for controls) may have influenced the increases in Pap smear screening in both intervention and control women over time. There was a large loss to follow-up rate in both groups (only 57% of intervention women and 65% of control women completed the follow-up interview), but this is somewhat common in prevention research and also when recruiting people who typically seek health care only when symptoms are present. The sample used, however, is likely to be reflective of the population that health education and prevention are trying to reach. Dropouts in the intervention group were more likely than dropouts in the control group to be older, poorer, less well educated, unmarried and unemployed. This real world response to health education programs probably biased results toward the negative, but in reality these women are probably less likely to receive cancer screening tests as well.
Implications for implementation	Using culturally appropriate interventions and LHW has significant potential but reaching highly mobile persons on a sustained basis will require additional strategies.
Additional comments	Fairly labor intensive work for moderate gain.

TITLE, AUTHOR(S), REFERENCE	**VOGT TM, GLASS A, GLASGOW RE, LA CHANCE PA, LICHTENSTEIN E. THE SAFETY NET: A COST-EFFECTIVE APPROACH TO IMPROVING BREAST AND CERVICAL CANCER SCREENING. J WOMENS HEALTH (LARCHMT). 2003 OCT;12(8):789-98.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To assess the cost-effectiveness of 3 interventions to deliver breast and cervical cancer screening to women unscreened for ≥3 years. To determine the relation of invasive cancer diagnosis in the interval since the last screening test (not reported in this summary).		
Location(s)	US: Portland OR	UK	Other
Intervention condition	Letter/letter: Women were mailed a letter on NWKP stationery signed by the study investigators and a brochure with Q+A on breast and cervical cancer screening. They were told of their screening status, the importance of screening, offered an appointment and given a phone number for scheduling. Interventionists made appointments with short delay times. Women who did not receive an exam within 6 weeks of receiving the first letter were sent another with similar information. Follow-up letters focused on the availability of appointments and also addressed the safety and efficacy of tests and coverage by the health care plan. N=300 for mammography, 300 for Pap smear study Letter/phone: Women in this group received the same initial letter as listed above, but received a phone call (with the same messages as the second letter and an assessment of barriers and concerns) instead of a second letter if they had not received an exam within 6 weeks. N=300 for mammography, 300 for Pap smear study Phone/phone: Women in this group received 2 phone calls (with the same messages as in the initial and follow-up letter/phone call as listed above); the second phone call was made if an exam had not been received within 6 weeks.		

	N=300 for mammography, 300 for Pap smear study
Interventionists	Not described
Control condition	Women receiving usual care from NWKP; their screening experience was monitored through the regular information systems N=300 for mammography, 300 for Pap smear study
Inclusion criteria	Women who had been members of Northwest Kaiser Permanente (NWKP) for ≥3 continuous years. For the mammogram study, women aged 40-70; for the Pap smear study women aged 18-70; for both groups women who had not had a screening test in the previous for 3 years (these women were considered to be in the "safety net").
Exclusion criteria	Women with a prior history of breast or cervical cancer as determined by a record search of the NWKP Tumor Registry; women who had undergone bilateral mastectomy or hysterectomy as determined by a search of inpatient admissions and procedures, women with benign breast disorders or cervical dysplasia, women with invalid addresses or phone numbers
Assignment to intervention or control	Eligible safety net women were randomly assigned to intervention and control groups.
Recruitment	5285 (13%) female members of NWKP met eligibility criteria for the mammography study; 12,856 (23%) women were eligible for the Pap smear study.
Population characteristics	For mammography, most (41%) were in the 40-49 age group; for Pap smear, most (45%) were 35-49 years old. No other demographics were reported.
Data collected	Age, screening and eligibility status, intervention results, costs
Outcome(s) measured	Receipt of mammogram and Pap smear within 6 and 12 weeks after the intervention, as documented by radiology and pathology records; costs.
Analyses conducted	Post-intervention measures for intervention and control groups; cost analysis included estimates of the costs (in 1996 $) of production for all activities in the 3 intervention groups, and compared the cost-effectiveness of each intervention by estimating the incremental costs over usual care for each screening test in each of the intervention arms. The phone/phone intervention allowed for identification of

	women who should not be screened at the time of the first contact, therefore there were no costs for a second phone intervention in these cases. Likewise, costs of the follow-up for the 2 initial letter interventions were saved when women responded to the first letter indicating that they had been screened elsewhere.
Findings	Fewer women in the safety net for mammography were 40-49; more were aged 60-70 compared to all women in NWKP. Women in the safety net for Pap smear were less likely to be aged 20-34 and more likely to be 35-49 than all women in NWKP. For the mammography portion of the study, the proportions receiving a test in the 12 weeks following the intervention were 9%, 21%, 34% and 36% for control, letter/letter, letter/phone and phone/phone groups, respectively. When excluding women who were not truly eligible for screening based on information obtained during the initial phone call, phone reminders brought in half of the women in need of screening; they were more effective than usual care and letter/letter. For the Pap smear portion of the study, the proportions receiving a test in the 12 weeks following the intervention were 16%, 18%, 32% and 27% for control, letter/letter, letter/phone and phone/phone groups, respectively. Again when excluding women who were not truly eligible for screening, both interventions involving phone reminders were equally effective and brought in half of the women in need of screening; they were more effective than usual care and letter only. All interventions were more effective than usual care except for the letter only intervention for Pap smears. For mammography, ORs comparing usual care to intervention groups were 2.82, 9.63 and 9.22 for letter/letter, letter/phone and phone/phone, respectively. Corresponding ORs for Pap smear were 1.37 5.57 and 4.77. Letter/phone and phone/phone were equally effective in both studies. For mammography, the letter/phone and phone/phone interventions both resulted in 1 additional test for $125; the result was $247 for the letter/letter intervention. For Pap smears, the letter/phone approach cost was $185, for phone/phone it was $305 and letter/letter was $1117 per additional test.
Discussion, recommendations	The letter only intervention was successful, but the addition of the phone strategy further enhanced the effect. Phone contact brought

	into exam about half of the women in true need of screening. The letter/letter intervention was the least effective and least expensive per person contacted for both studies, but was the most expensive in cost per incremental additional screen. The finding that phone reminders are more effective for those less likely to be screened is similar to the results of another study, that found the cost-effectiveness of phone calls was greater in women with no medical record history of mammography. To be most effective, reminder systems should focus on those who rarely get screening and should use the most cost-effective methods to do so. Results here showed that 1 initial letter resulted in getting the motivated women into testing at low cost. Phone calls that provide immediate access to scheduling increase testing in those who were initially more reluctant. However, the cheapest approach to implement is the least cost-effective (i.e., is the most expensive in terms of the net effects). Future work should be done to see if letter only approaches could be better tailored to the recipient and result in greater effect. One of the limitations of the study is that it could not account for (i.e., exclude) women who had had hysterectomies outside of the managed care plan. One way to eliminate this inefficiency is to systematically collect this information from new members and maintain it in the information system.
Implications for implementation	Screening strategies should focus on identifying, then contacting, those who are rarely or never screened. Data systems should be improved to more easily identify these women. Agencies should implement strategies based on the “net impact per dollar spent”, which in this case was a letter followed by a phone call, even though it was not the least expensive to operate.
Additional comments	This was a large study in an environment where a vast amount of information was already available on the target population. This article contains a detailed table showing costs for each study. The study used a very complex, somewhat confusing, scheme for inclusion and exclusion of participants and for reporting results. Cost studies are not always comparable, so several should be reviewed to determine local applicability and feasibility.

TITLE, AUTHOR(S), REFERENCE	**WEBER BE, REILLY BM. ENHANCING MAMMOGRAPHY USE IN THE INNER CITY. A RANDOMIZED TRIAL OF INTENSIVE CASE MANAGEMENT. ARCH INTERN MED. 1997 NOV 10;157(20):2345-9.**		
Health screening issue studied	Breast cancer	Cervical cancer	General cancer
Type of study	Experimental/quasi-experimental	Other	
Purpose of study	To determine whether culturally sensitive case management by lay community health educators (CHE) would increase mammography in primary care practices already using a clinical information system and physician reminders.		
Location(s)	US: Rochester NY	UK	Other
Intervention condition	Women received a personalized letter from their PCP on medical practice letterhead indicating they had not had a mammogram; the letter advised them to receive one, followed by usual care. In addition, the women received case management from CHE, which included a second letter to encourage mammography signed by a CHE. The CHE then made additional individually-tailored outreach efforts as needed: up to 3 phone calls after the initial letter, a second letter if phone calls did not result in an office visit or exam, a third letter indicating that the CHE would make a home visit on a specific date and time with instructions to call back if the visit would not be convenient, additional education, and additional system navigation help such as assistance with transportation, obtaining financial assistance, meeting patients at exams and providing supportive counseling. N=163		
Interventionists	6 women were recruited from the local community to serve as CHE. Their ethnicity was similar to that of the women in the study. 50% of their duties entailed the duties listed above under Intervention condition and 50% of their time was spent promoting health care and recruiting community members into primary care by visiting soup kitchens, shelters and other settings.		
Control condition	Women received a personalized letter from their primary care physician on medical practice letterhead indicating they had not had a mammogram; the letter advised them to receive one, followed by usual care.		

	N=174
Inclusion criteria	Women between 52-77 years of age who had not had a mammogram in the past 2 years, but had visited 1 of the 6 medical practices at least once in the previous 2 years, as verified by a medical chart and information system review, no prior history of breast cancer or mastectomy
Exclusion criteria	None stated
Assignment to intervention or control	Random
Recruitment	Women from 6 primary care practices located in inner city Rochester were recruited, but the exact methods were not described.
Population characteristics	Mean age was 63, race/ethnicity was white (42%), black (36%), Latina (7%), 60% had had prior mammography, most had insurance (61% including Medicare).
Data collected	Demographics, baseline and post-intervention mammography use, costs.
Outcome(s) measured	Baseline mammography rates (determined during the observational phase after randomization but before the intervention), mammography completion as documented in medical records, mammography results, incremental costs of the CHE intervention.
Analyses conducted	Differences in mammography uptake between the 2 study groups; cost-effectiveness was the incremental cost (1994 $) of the CHE intervention per estimated year of life saved, including direct costs plus follow-up care for abnormal mammograms minus the cost of terminal care avoided.
Findings	In the CHE group, 25% completed mammograms; 9.8% of the usual care group did; these differences were significant. Including only the 338 women who ultimately received the intervention, results were still significantly different (RR 2.67 in the CHE group). Excluding 82 women who indicated they thought they had already received a mammogram in the prior 2 years and 39 who had received mammograms between the observational and intervention phases, left 217 women actually eligible for mammography; 41% (RR 2.87) in the CHE group and 14% in the usual care group completed

	mammograms. Out of 118 mammograms performed between randomization and post-intervention, 7 (6%) were found to be abnormal; 1 revealed cancer (detection rate of 0.8%). The incremental cost per year of life saved for the CHE intervention was $11,591 (this uses the observed detection rate and assumes a 25% mortality reduction per cancer detection to determine that 500 women would need to be screened to save 1 life, includes the costs and subtracts the terminal care costs).
Discussion, recommendations	The CHE intervention was more effective than usual care; the effectiveness persisted in subgroup analyses. The pre-intervention baseline mammography rate for usual care in this practice was 12%; this increased to 41% of truly eligible women. Dis-continuity of care, a prevalent condition in inner city populations at risk, can affect the accuracy and completeness of community based research. Women of color, as reported in other studies, have responded well to CHE-type interventions. It was impossible to determine the relative effectiveness of the various CHE activities. The study size was small; larger studies with more in-depth cost analyses which also look at diverse populations are needed.
Implications for implementation	Reminder systems are sufficient for some women; others with more pressing needs require more intensive efforts. The true denominator is all eligible women in the community, not just those already in care; this case management model may be appropriate in larger community settings as well.
Additional comments	This study used a different cost-effectiveness (benefit) approach than the others and the article includes details of the costs and assumptions used. The CHE intervention in this study was somewhat hybrid in that it used both inreach types of methods (i.e., recruitment through letters from inside a care setting) and population-based outreach methods (e.g., home visits, navigation).

Appendix G

Key Informants

Name	Title	Affiliation
BJ Boucher	Coordinator	American Cancer Society, Durango CO, bj.boucher@cancer.org, 970-247-0278
Marilyn Bosenbecker	Program Manager	Breast and Cervical Cancer Program, El Paso County Department of Health and Environment, Colorado Springs CO, marilynbosenbecker@epchealth.org, 719-578-3253
Joyce Goldsboro	Mammography Quality Standards Act Inspector, Former mammographer	Radiation Management Program, Colorado Department of Public Health and Environment, Denver CO, joyce.goldsboro@state.co.us, 303-692-3446
Mary Kuhn	CWCCI Community Coordinator	Mesa County Dept. of Human Services, Grand Junction CO, kuhma@mcdss.co.gov, 970-248-7173
Olivia Martinez	CWCCI Program Coordinator, Platicas Project Director	Weld County Department of Public Health and Environment, Greeley CO, omartinez@co.weld.co.us, 970-304-6420 x2382
Bev Reddick-Jenkins	Recruitment Coordinator	CWCCI, Colorado Department of Public Health and Environment, Denver CO, beverley.reddick-jenkins@state.co.us, 303-692-2521
Julie Reiskin	Executive Director	Colorado Cross-Disabilities Coalition, Denver CO, jreiskin@ccdconline.org, 303-839-1775
JoAnn Thierry	Behavioral Scientist	Division of Human Development and Disability, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, Atlanta GA, jxt4@cdc.gov, 404-498-3022
Jennifer Woodard	Program Manager	Healthy Living & Cancer Support Services, The Center, Denver CO, jwoodard@glbtcolorado.org, 303-733-7743

Appendix H

Additional Resources for Increasing Screening in Women with Disabilities

(Provided by Margaret A. Nosek, PhD, Executive Director, Center for Research on Women with Disabilities, Professor, Department of Physical Medicine and Rehabilitation, Baylor College of Medicine, Office: 713-798-5782 or 713-661-4678, Fax: 713-798-4688, mnosek@bcm.edu)

Sarah C. Blake, Emory University, Atlanta GA, 404-712-9713, scblake@sph.emory.edu

Carol Scarborough, Women Working For Women, 17300 El Camino Real, Suite 110, Houston TX 77058, 281-534-3100, 800-507-0157

Ellen D. S. Lopez, PhD., MPH, University of Florida, 101 S. Newell Drive, Room 4160, PO Box 100175, Gainesville FL 32610-0175, Office: 352-273-5361, Fax: 352-273-6048, elopez@phhp.ufl.edu