Missed Cancer Screening Opportunities Among Older Women

A Provider Survey

Breast and cervical cancer represent leading causes of estimated new cancer cases for American women. Fortunately, the tremendous suffering associated with these diseases can be mitigated through early detection with screening tests, prompt treatment, and appropriate follow-up care. The 5-year survival rates for women who have breast cancer or cervical cancer detected at an early, localized stage are 97% and 88%, respectively, as compared with only 21% and 13% for women whose cancers are diagnosed at late, distant stages.

Many asymptomatic women, however, underutilize screening, whereby they never obtain the screening procedures or do not follow the recommended schedules (annual clinical breast examinations [CBE] and mammography after age 40* and Pap smears every 1 to 2 years after age 18). In Florida, the 1997 Behavioral Risk Factor Surveillance Survey indicated that within the past 2 years, 77.7% of women older than 50 reported receiving mammography, and 76.3% of women older than 50 with an intact uterus reported receiving Pap smears. Underutilization of screening is especially prevalent among medically underserved women, who are often elderly, poor, unmarried, of minority status, residents of rural settings, and limited in years of education. Women may not obtain screening due to a lack of regular preventive care, the absence of afford-
able screening services in their communities, and/or missed screening opportunities. The latter problem occurs when providers do not take advantage of clinical opportunities to perform or recommend screening, and has often been demonstrated to be the best predictor of underutilization of screening.

In response to analyses of Florida's Behavioral Risk Factor Surveillance Survey data documenting underutilization of breast and cervical cancer screening in Florida, the state health office commissioned a comprehensive two-part study of health professionals' perspectives on this issue. For findings of the qualitative component of the study, which includes an analysis of interviews and open-ended questions on a provider survey, see the authors' review article. In this quantitative component, a stratified, randomized mail survey of Florida primary care providers was used to: 1) investigate providers' cancer screening practices; 2) identify characteristics of providers who were least likely to screen older women; and 3) measure providers' level of agreement regarding a variety of screening issues. The purpose of this report is 1) to present the survey results and 2) to apply the public health concepts of assessment, policy, and assurance toward increasing breast and cervical screening among medically underserved older women.

Methods

Survey Instrument

A 37-item, self-administered questionnaire was developed by the authors, reviewed by cancer screening experts, and pilot tested with a convenience sample of 30 primary care providers. In the first part of the survey, respondents were asked about their screening activities. Questions focused on women 50 years and older, because the survey was conducted before the 1997 change in the American Cancer Society's mammography guidelines from annual screening after age 50 to annual screening after age 40. In the second part of the survey, respondents were asked to respond to a series of 3 open and 34 closed questions regarding their own, their patients', and other providers' reasons for participating or not participating in screening. This article reports on responses to the closed items.

Sample

The target population of providers included physicians (MDs, DOs), nurse practitioners (NPs), and certified nurse midwives (CNMs), all of whom play a significant role in the provision of primary care services for women. Providers were giving direct care in the following practices: general/family, internal or preventive medicine, obstetrics and gynecology (OB/GYN), adult health, geriatrics, women's health, or family planning. These specialties comprised the most exhaustive list of practitioners who see age-eligible women (older than 50 years of age) on a routine basis.

For Florida's population of 7411 MDs, 544 DOs, and 2918 NPs/CNMs, a minimum random sample of 136 MDs, 110 DOs, and 132 NPs/CNMs was required to estimate, with 95% probability and a confidence interval of 5%, the true proportion of providers performing and ordering screening tests. To allow for an estimated attrition rate of 75% due to nonreturns or ineligibles, the sample size was adjusted upward, and 2052 surveys were mailed to licensed providers randomly selected from professional listings. Follow-up procedures included a mailing and phone calls, yielding 496 usable surveys (Table 1).

Analysis

Data were analyzed using the SPSS/PC+ statistical software to generate descriptive analysis and graphical presentation. Detailed analysis of the survey's respondents was performed with the SPSS/PC+ Chi-Squared Automatic Interaction Detector (CHAID) program. CHAID applies segmentation modeling procedures to divide the total population of survey respondents into segments that differ with respect to the dependent variable. These distinctive subgroups of respondents are mutually exclusive and exhaustive, and they are derived to select the best predictors of the dependent variable. CHAID has been used in public health to segment populations into target subgroups for health promotion messages or strategies so that individuals in these groups will be motivated to adopt the desired health behaviors.

In this study, the primary outcome or dependent variable was whether or not the provider performs or orders breast and cervical cancer screening tests for asymptomatic women older than 50. The sociodemographic and clinical practice characteristics, or independent variables, chosen as potential predictors included the respondent's age group, gender, ethnicity, number of clinicians in the practice with the provider, the practice location (rural/urban), the primary care specialty, professional training (MD, DO, NP, or CNM), and the percentage of the total patient population of women older than age 50. Repeated CHAID analyses were then performed to identify the provider subgroups.

Table 1. Distribution/Number of Returned Questionnaires

<table>
<thead>
<tr>
<th>Questionnaires mailed</th>
<th>2052</th>
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<tbody>
<tr>
<td>Broken down by provider type</td>
<td>1013 MDs, 202 DOs, 837 NPs/CNMs</td>
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<tr>
<td>Returned survey</td>
<td>611</td>
</tr>
<tr>
<td>Undeliverable survey</td>
<td>48</td>
</tr>
<tr>
<td>Ineligible respondents</td>
<td>67</td>
</tr>
<tr>
<td>Complete and eligible respondents</td>
<td>496</td>
</tr>
<tr>
<td>Broken down by provider type</td>
<td>218 MDs (44%), 54 DOs (10.9%), 224 NPs/CNMs (45.2%)</td>
</tr>
<tr>
<td>Return rate</td>
<td>24.17%</td>
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</table>

*Ineligible surveys included 32 from other clinical specialties, 20 from providers not in direct patient care, and 15 received after the deadline.
that were the least likely to screen age-eligible women for breast and cervical cancer.

Results

Sample

The majority of physicians (218 MDs, 54 DOs) were men (78% and 87%, respectively), while most nurses (178 NPs, 46 CNMs) were women (94% and 100%, respectively). Almost half of the MDs (44%) and nurses (45.2%) responded to the survey, while only 10.9% of DOs responded. The majority of respondents in these professional groups were white. MDs represented the oldest group, with 25% older than 60 years of age, whereas only 8% of NPs were older than 60 years of age. MDs and DOs also saw an older population of female patients (n = 40% and 41%, respectively) than did NPs and CNMs (n = 12% and 2%, respectively). Most physicians specialized in family/general medicine, internal medicine, and OB/GYN, while NPs and CNMs worked in women’s health, OB/GYN, and family/general medicine. One half of the respondents (51%) were proportionally concentrated in the state’s seven most urbanized counties, yet there were respondents from the majority (55) of the state’s 67 counties.

Provider Screening Practices

Breast Cancer. Nearly 95% of the respondents reported that they perform CBE on older asymptomatic patients. According to CHAID results, the best predictors of respondents performing CBE were the providers’ specialty (likelihood ratio chi-square = 21.45, df = 1, P = .00046 [adjusted: Bonferroni]) and the number of other clinicians on site (likelihood ratio chi-square = 9.83, df = 1, P = .019 [adjusted: Bonferroni]). Family/general practitioners, geriatricians, and adult health providers in small practices (fewer than three other clinicians) were less likely to perform CBE (87.8%, n = 188) than similar providers in larger practices (99.1%, n = 42) or providers specializing in internal/preventive medicine, gynecology, women’s health, or family planning (100%, n = 227).

Fewer respondents (86%), however, ordered routine mammograms. Here, provider age was the best predictor variable of providers ordering mammography, with only 76.4% of older providers (older than 50 years of age) ordering mammograms as compared with 86.4% of providers aged 40 to 49 years of age and 96.5% of providers younger than 40 years of age (likelihood ratio chi-square = 25.09, df = 2, P = .000043 [adjusted: Bonferroni]). In addition, older providers practicing in rural counties were less likely to order mammography (65.8%) than older providers practicing in urban counties (85.9%) (Fig. 1). This was the only CHAID in which professional training became a predictor, with only 81.5% of 40- to 49-year-old NPs ordering mammography as compared with 92.1% of other providers in this age group (Fig. 1).

Cervical Cancer. Among all respondents, 87.1% reported performing routine pelvic examinations, and 89.3% reported performing Pap smears on older asymptomatic women. According to CHAID analysis, provider specialty was the best predictor variable for performing cervical cancer screening. Providers who were least likely to report that they performed pelvic examinations were geriatricians

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Figure 1 CHAID tree diagram. Sample segmentation by cancer screening practice: providers who routinely order screening mammograms for women older than 50 years of age, by age of the provider. PCP, primary care provider.
(53.9%, n = 26), followed by older practitioners (older than 50 years of age) in adult health or internal/preventive medicine (60.6%, n = 35). Similarly, practitioners in adult health and geriatrics were least likely to perform Pap smears (62.8%, n = 43), followed by male practitioners in internal/preventive medicine (73.7%, n = 57).

**Predictors of Not Screening.** A comparison of CHAID and logistic regression analysis (based upon forward stepwise selection, P < .05) produced similar results. For both procedures, the variables of being older and practicing in geriatrics or adult health represented the most common “best” predictors of providers not performing/ordering the four screening procedures for breast and cervical cancer, followed by working in a small office or rural county.

Only 18.5% of the providers reported that they had computerized medical records, and less than one third of this group used a computerized system to alert them when screening procedures were due (32.6%) and to mail reminders to patients (31.5%).

**Provider Perceptions**

**Acceptance of Screening.** Most providers considered mammography to be clinically effective, with more than 92% agreeing that it has potential for improving breast cancer prognosis in post-menopausal women and for detecting very small malignancies. However, a number of providers agreed with (12%) or were uncertain about (10%) a statement that annual mammography in women older than 50 is too frequent. Moreover, 10% of providers only referred women who presented symptoms or had risk factors.

**Patient Opinion.** Many providers thought their patients were very (52.8%) or somewhat (45.5%) interested in early cancer detection. However, 20% of geriatrics and preventive medicine practitioners believed that their patients were not interested, as compared with 1.4% of other providers (likelihood ratio chi-square = 22.67, df = 2, P < .005 [adjusted: Bonferroni]). When providers were asked to estimate the percentage of asymptomatic patients that refuse or feel reluctant to follow through on providers’ mammography referral, the mean (estimated) percentage of refusing patients was 15.5%.

To better understand providers’ perceptions of why women may not obtain screening, the survey also asked providers to select the two most common objections of patients to mammography from a list of potential obstacles (Table 2). Financial barriers represented the most frequently selected objection, with 46.4% of providers choosing inadequate insurance coverage. Providers also selected another group of patient objections representing attitudinal and knowledge barriers, with 30.9% selecting “patients do not see themselves as susceptible to breast cancer.” Thirty-four percent of respondents indicated that their patients do not perceive a need for mammography in the absence of symptoms, and this was reported by a higher proportion of physicians (41%) than nurses (24.8%). Some providers believed that older patients thought themselves to be too old or too sick to have mammograms, with 8.55% choosing “patients have other medical conditions to worry about.” Geriatrics and adult health practitioners were more likely to report this concern (26.5%) than other specialists (6%) (Fishers’ Exact Test, P < .000384). Finally, 24% of the respondents to this question wrote in other objections. In a similar question, 76.7% of respondents agreed that it is common to encounter post-menopausal patients who believe that they no longer need pelvic examinations or Pap smears.

**Barriers to Screening.** Similar to their impression that women worried about inadequate insurance for mammography, providers also expressed concerns about financial barriers. Thirty-eight percent stated that they lacked a site, program, or facility to which they could refer uninsured or low-income women for screening mammography, while 30% indicated that they have had low-income patients with suspected breast or cervical malignancies for whom they have been unable to obtain free or reduced-cost tests for further needed diagnosis. Similarly, 30% of providers agreed that mammography is not financially accessible to the majority of their women patients, with twice as many NPs and CNMs (43%) as physicians (19%) concurring. This may be attributable to nurses often working in medically underserved areas, being responsible for locating screening facilities for patients, and spending more time talking with patients and learning about their financial problems.

**Ease and Importance of Screening.** While only 5.7% of providers agreed that counseling or performing breast and cervical cancer screening tests is too time consuming, 42.4% concurred that, when a practitioner cares for patients with many chronic health problems, he or she may unwillingly neglect to provide preventive care. Providers not specializing in OB/GYN or women's health were asked whether they inquire about their patients' gynecologic health. Seventy-seven percent responded that they “always” asked, 13.8% selected “at my discretion,” and 9.4% chose “no.” In another item, 10% of respondents agreed that it should be the patient’s responsibility to request rou-
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Discussion

Survey results indicate that providers who were least likely to screen older asymptomatic women were older, specialized in geriatrics or adult health, and worked in small or rural practices. These findings have been confirmed in the literature.¹¹,²⁵–²⁷ These providers may miss the opportunity to screen due to a combination of patient, provider, practice, and access barriers.

Researchers have referred to patient barriers, such as the difficulties of screening “hard-to-reach,” medically underserved women² who only seek episodic care due to a lack of income, insurance,¹¹,¹²,²⁷ transportation,²⁸,²⁹ or a combination of the three. Providers also find it frustrating to screen women who are embarrassed about the tests,²⁸,²⁹ do not believe that they are susceptible to cancer or need screening,¹¹,²⁷–²⁹ and/or fear the pain of the tests and the diagnosis of cancer.²,¹₅,²⁷–₃₁ Providers may also encounter obstacles, or provider barriers, that make it difficult or unappealing for them to participate in the screening process. They may lack confidence or training in CBE,⁵⁻¹⁹⁻³⁰,⁻³¹ feel uncertain about their ability to convince women to have a Pap smear or mammogram,² and be uncertain about screening guidelines, particularly for women older than 75 years of age.¹₅⁻²⁷,⁻³⁰ Without definitive information as to an upper age limit at which screening is no longer clinically or financially effective,¹ there continues to be a lack of clear screening guidelines for elderly women, particularly with respect to cervical cancer screening.²,⁶,¹₈

Primary care providers may also miss screening opportunities due to practice-related barriers, including a lack of support systems such as additional personnel (nurse educators, patient schedulers) and reminder systems.²⁷,²⁸ This problem is often expressed by providers working in small, rural, family medicine offices who treat chronically ill elderly patients, feel too rushed to take on new responsibilities, and cannot afford additional staff or office space.²⁵,²⁷,²⁸,⁻³⁰,⁻₃¹

Finally, providers may avoid recommending screening as a result of access barriers. This may be the case when providers are unaware of affordable, accessible screening facilities in their communities and do not know other providers who accept Medicaid patients for primary care or specialized treatment, due to inadequate reimbursement systems.²⁸,⁻³⁰

The barriers involving the inability or reluctance of patients and the hesitancy of providers may be considered human factors, while the latter barriers of practice limitations and limited access to affordable facilities may be classified as system factors. As illustrated in Figure 2, the combination of these factors may determine whether providers promote screening or miss this important opportunity. When their patients obtain regular preventive care, their practices are not overloaded, there are affordable screening sites in the community, and the referral process is simple, then providers are more likely to screen. However, when providers lack support personnel and reminders, are unaware of low-cost screening and treatment options, and treat patients who resist screening, then they may feel that it is too time consuming to screen these hard-to-reach patients. These providers may be missing a critical clinical opportunity to screen, as indicated by the many women who report that they would have obtained screening if their physician had recommended it.¹¹,¹₅,⁻₃₁,⁻₃₂

Limitations and Future Research

As a self-report mail survey, this study faced limitations that have been reported previously in the literature, such as the inflation of actual screening results and low response rate.³⁰ For example, the data collected via a self-administered questionnaire only approximate actual screening practices. Validation of self-reported physicians' practices have indicated that physicians overestimate their screening practices by 10% as compared with chart data and patient reports. Future research might benefit from validation studies to compare reported and actual practices; however, this was not possible in this study due to financial and time constraints. Another common limitation of mail surveys is a low response rate, which limits the ability to generalize from the results to the total population. A review of the data concerning nonrespondent characteristics (location and specialty) indicated that many of the nonrespondents were specialists not practicing in family medicine or OB/GYN, which would reduce their likelihood of screening and their interest in responding to this study. Future studies might involve an even more intensive effort to increase the response rate, perhaps through requests from professional groups. In addition, future studies might explore providers' screening practices and their opinions regarding screening women older than 75 years.

Clinical Implications: Increasing Screening

An understanding of these human and system factors can be helpful in designing strategies to help providers seize the opportunity to screen. Obstacles that can be minimized may be considered areas of potential change, which can then serve as the basis for new interventions. Cancer control experts can develop strategies to motivate providers to screen, which are based on these areas of potential change, as well as the essential public health services (assessment, policy development, and assurance), as delineated in the 1988 Institute of Medicine’s The Future of Public Health³³ and described here (Table 3).

Assessment entails monitoring the population’s health needs. Public health experts can apply research methods to identify providers who are least likely to screen and to learn why they do not screen, and these providers can be targeted for specific interventions (eg, training courses) to meet their particular concerns and needs. Community assets mapping³⁴ may also be applied to identify community strengths (radiology facilities, dedicated staff, committed
HUMAN FACTORS
PROVIDER CHARACTERISTICS
* Agreement with screening guidelines
* Perceptions of patients’ inability to afford screening
* Perceptions of access barriers
* Experience in patient education
* Confidence in screening techniques

PATIENT CHARACTERISTICS
* Patient knowledge about screening
* Patient concerns about screening
* Continuity of care with a regular primary care provider
* Sociodemographics (income, education, age)
* Health status

SYSTEM FACTORS
PRACTICE CHARACTERISTICS
* Time per patient visit
* Office reminder systems
* Support staff in practice
* Number of providers in practice
* Location (metrop./rural)

ACCESS ISSUES
* Availability of low cost screening facilities
* Availability of low cost follow up care
* Physical accessibility of screening facilities
* Ease of referral for provider
* Insurance, Medicaid, Medicare coverage

Figure 2 Determinants of primary care providers performing or recommending breast and cervical cancer screening. * represent “areas of potential change” that can serve as focal points for developing interventions to help providers promote screening in their practices.

Policy development involves planning and implementing sound policy. Advocates in medicine, nursing,39 and public health can collaborate in developing legislative mandates to increase private insurance, Medicare, and Medicaid coverage of mammography, preventive health visits, and patient education. Reimbursement for patient education may motivate physicians to allocate more time to counseling or to hire nurses for this essential task. Similarly, providers may be more likely to recommend mammography if they receive an incentive payment from their patients’ insurers.

Assurance refers to assuring that citizens are guaranteed access to high-quality, cost-effective healthcare. Health professionals can collaborate in designing affordable, accessible screening options, such as free screening weeks at designated facilities,26,37 coupons for free or reduced-cost screening,2,36-37 free transportation and babysitting, and mobile screening units that travel to retirement centers, rural areas, and low-income inner city neighborhoods.26-37 Mobile clinics hold the most potential when they incorporate self-referral, patient education, referral to low-cost treatment facilities, and follow-up tracking systems, as demonstrated by one comprehensive program in Pittsburgh.40 Finally, information regarding current screening and treatment options can be made readily accessible to providers and patients, as exemplified by Florida’s Breast and Cervical Cancer Screening Inventory on the Internet.41

Health professionals also can work together in developing professional continuing education courses on patient motivation and communication, office management, and screening techniques.12,14,30,51 Courses should be directed toward providers identified in the assessment stage as being the least likely to screen and may be offered via conferences, self-study modules, or distance learning formats.

Public health leaders can share their skills in health education and social marketing to design culturally appropriate consumer education campaigns with easy-to-read materials.29 In Florida, formative research findings are being applied to develop a comprehensive social marketing campaign to encourage women (particularly the medically underserved) to obtain screening.42

Health professionals can also design cost-effective reminder systems for providers,30,31,36,37,43 as exemplified by patient education brochures, patient reminder postcards, and chart reminders. In Colorado, a centralized computer system prompts physicians to refer patients to mammography and tracks women’s screening histories, demonstrating the collaboration of public health and medicine in an assessment and quality assurance capacity.11,36,37
### Table 3. Application of Public Health Practice Concepts to Increase Breast and Cervical Cancer Screening in Primary Care

<table>
<thead>
<tr>
<th>Essential Public Health Services</th>
<th>Examples of Analytic Strategies to Increase Screening</th>
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<tbody>
<tr>
<td>Assessment</td>
<td>Analytic methods to identify providers' and consumers' screening practices</td>
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<td></td>
<td>Community assets mapping to identify community strengths</td>
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<tr>
<td>Policy Development</td>
<td>Mammography facilities required to accept self-referrals and to perform free/low-cost screenings</td>
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<td></td>
<td>Reimbursement for patient education and preventive care visits</td>
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<td></td>
<td>Increased use of NPs and RNs for patient education and referral</td>
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<td>“First dollar coverage” for mammograms</td>
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<td>Provider incentives for working in mammography vans, screening fairs, etc.</td>
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<tr>
<td>Assurance</td>
<td>Accessible, affordable screening resources</td>
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<tr>
<td></td>
<td>Physically accessible, low-cost “women’s health” mobile screening vans</td>
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<td></td>
<td>Free screening days at local hospitals and mammography facilities</td>
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<td>Professional education</td>
<td>Information on screening elderly women</td>
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<td></td>
<td>Messages emphasizing providers’ role in convincing women to obtain screening</td>
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<td></td>
<td>Patient counseling courses</td>
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<tr>
<td>Patient education</td>
<td>Messages addressing knowledge and attitudinal barriers</td>
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<tr>
<td></td>
<td>Culturally sensitive, easy-to-read materials</td>
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<tr>
<td>Quality assurance</td>
<td>Reminder systems</td>
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<tr>
<td>Evaluation</td>
<td>Comparisons of screening among providers</td>
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<td></td>
<td>Cost-benefit studies</td>
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<td></td>
<td>Monitor changes in mortality and morbidity rates within underserved populations</td>
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Another office reorganization strategy (giving NPs and other nurses an increased role in patient counseling and referral) can increase patient knowledge and satisfaction, enable physicians to focus on complex diagnostic and treatment procedures, and help practices to increase their efficiency.  

Finally, public health practitioners can evaluate the effectiveness of different strategies in increasing screening among medically underserved groups in different communities or health maintenance organizations. They can apply population-based studies to demonstrate reductions in morbidity and mortality and can use cost-benefit studies to document decreases in hospitalizations and outpatient visits associated with different screening programs.

In conclusion, the authors propose that health professionals develop interventions to motivate providers to seize the opportunity to screen, that are based on human and system barriers to screening as well as on the public health functions of assessment, policy development, and assurance. This comprehensive approach may contribute to increased utilization of screening, which can prevent unnecessary morbidity and mortality among older women, improve their quality of life, and reduce the tremendous personal and economic costs associated with breast and cervical cancer.

### Acknowledgments

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### References
