Implementing Recommendations for the Early Detection of Breast and Cervical Cancer Among Low-Income Women

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Although the causes and natural histories of breast and cervical cancer are different, the public health responses to these diseases have been similar. Early detection of breast cancer and primary prevention of cervical cancer are possible through community-based screening programs; however, early detection of both breast and cervical cancer is less common among low-income women (defined as up to 250% of poverty level, depending on family size). This report presents morbidity and mortality data regarding breast and cervical cancer, screening recommendations, an update on the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), and recommended priority activities for the NBCCEDP. The NBCCEDP is a major public health effort to increase breast and cervical cancer screening among uninsured, low-income women.

Scope of the Problem

Breast Cancer

Among women in the United States, breast cancer is the most commonly diagnosed cancer and remains second only to lung cancer as a cause of cancer-related death. The American Cancer Society (ACS) estimates that 182,800 new cases of female breast cancer and 41,200 deaths from breast cancer will occur in 2000. In 1996, data from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI) indicated that the incidence of breast cancer increased 25.3% between 1973 and 1996 (Figure 1). Most of the increase occurred from 1973 to 1991; incidence rates remained stable from 1992 to 1996.

In 1996, the incidence rate for breast cancer was 110.7 cases per 100,000 women, a 29.6% increase since 1980. In addition, in 1996, the case-fatality rate for breast cancer was 24.3 per 100,000 women, a 4.5% decrease since 1992, representing the first sustained decline in breast cancer-related mortality since 1973 (when SEER surveillance for breast cancer began). Although the percentage increases in incidence from 1973 to 1996 were similar among black and white women, the percentage decrease in mortality from 1992 to 1996 was substantially greater among white women than black women.

Overall, from 1992 to 1996, breast cancer incidence rates were higher among white women (113.1 per 100,000) than black women (100.3), but breast cancer death rates were lower among white women (25.1) than black women (32.0). Furthermore, these race-specific differences in rates varied by age.

Among women aged < 50 years, the incidence rate for black women (32.7) was higher than that for white women (31.1). Among women aged ≥ 50 years, the rate was higher for white women (365.8) than for black women (308.7). The death rate among women aged < 65 years was higher for black women (20.4) than for white women (14.3). Although the death rate among women aged ≥ 65 years was higher for white women than for black women before 1987, recent data indicate that the death rate among this age group is higher for black women (130.9) than for white women (124.0). On the basis of SEER data for 1988 to 1992 (the most recent data available), incidence rates were highest...
for white (145.7), Hawaiian (105.6), and black women (95.4), and lowest for Korean (28.5), American Indian (31.6), and Vietnamese (37.5) women. Incidence rates among white, non-Hispanic women were four times higher than among Korean women.

Stage-specific survival rates among women with breast cancer have increased slightly since the 1970s. The overall 5-year survival rates for women from 1989 to 1995 were 86% for white women and 71% for black women. Survival was greatest at the earliest stage of disease. Age-specific survival rates were similar for white and black women. One explanation for the disparity in race-specific survival rates is that white women, on average, seek medical care for tumors at an earlier stage of disease than black women. However, the interim between symptom recognition and medical consultation does not appear to account for these race-specific differences in survival rates or stage at diagnosis of breast cancer.

Limited data are available regarding survival for other ethnic groups in the United States. In a study of stage at diagnosis and tumor histology among white and Asian women, the 5-year survival rate at all stages was higher among Asian women than among white women. In addition, based on data from another study, the survival rate among Hispanic women is similar to the rate among white women in the United States.

Cervical Cancer

Since the 1950s, the incidence of invasive cervical cancer and mortality from this disease has decreased substantially. In large part, the decline has been attributed to widespread use of the Papanicolaou (Pap) test—a highly effective preventive measure. However, the rate of decline in invasive cervical cancer has slowed since the early 1980s and appears to have stabilized in recent years (Figure 2). The ACS projects that approximately 12,800 cases of invasive cervical cancer will be diagnosed and that approximately 4,600 cervical cancer deaths will occur in the United States in 2000. From 1992 to 1996, the incidence rate at SEER sites was 7.9 cases per 100,000 women, and the death rate for cervical cancer was 2.8 per 100,000 women.

On the basis of SEER data, both incidence and death rates for cervical cancer vary among racial/ethnic groups. The incidence rate for cervical cancer is highest among Vietnamese women (43.0), and the death rate for cervical cancer is highest among black women (6.7). The incidence rate among black women (11.2 per 100,000) is approximately 50% higher than among white women (7.3). Death rates among black women (5.9) are approximately twice as high as those among white women (2.4). Although the disparities in rates between blacks and whites have declined since 1990, differences in rates persist. This persistent disparity has been attributed to several factors, including differences in the prevalence of risk factors for cervical cancer; differences in screening, diagnostic evaluation, and treatment; and differences in the stage of disease at diagnosis.

Race-specific differences in incidence and death rates for cervical cancer also varied by age. From 1992 to 1996, among women aged < 35 years, the rate of invasive cervical cancer among black women was lower than the rate among white women. However, in older age groups, incidence rates among white women fluctuated between 13 and 15 per 100,000 women, whereas rates among black women tended to increase with age to approximately 32 per 100,000 for those aged ≥ 75 years. Among both black and white women, death rates for cervical cancer increased with advancing age; however, rates were substantially higher for black women aged > 40 years than for white women the same age. Regardless of race, most cervical cancer deaths occur among women aged ≥ 50 years.

For women in whom invasive but localized (ie, stage I) cervical cancer has been diagnosed, the 5-year relative survival rate is approximately 90%. In contrast, for women with advanced invasive cervical cancer (beyond the cervix and pelvis [ie, stage III and IV, respectively]), the 5-year relative survival rate is approximately 12%. As with breast cancer, diagnosis of invasive cervical cancer in black women usually occurs at a later stage of disease compared with white women. Moreover, 5-year relative survival rates for local and regional stages are lower for blacks than for whites.

Etiologic Factors

Breast Cancer

The risk for breast cancer increases with advancing age. Other risk factors include personal or family history of breast cancer, history of certain benign breast diseases, early age at menarche, late age at menopause, exposure to ionizing radiation, obesity, white race, nulliparity, late age at first birth, nodular densities on mammogram, higher socioeconomic status, and residence in urban areas of the northern United States. Less clearly established risk factors include the duration between menstrual periods, use of oral contraceptives, use of replacement hormones (estrogen), height, alcohol
consumption, and not breast-feeding. Studies of immigrants to the United States suggest that environmental factors rather than genetic factors are responsible for variations in breast cancer rates among countries. For example, the rate of breast cancer among first-generation Japanese-American women is only slightly higher than the rate among their mothers, but the rate among their daughters is considerably higher. No primary prevention measures suitable for use in the general population have been established for breast cancer. Preliminary results from clinical trials among high-risk women regarding the use of the drug tamoxifen (Novaldex) indicate a 45% decline in incidence from its use. Although side effects and the potential development of other neoplasms are associated with tamoxifen use, other medications in its class might offer even greater benefits in breast cancer treatment. The Study of Tamoxifen and Raloxifene (STAR) trial is underway to evaluate tamoxifen vs raloxifene (Evista) and the potential for reducing the incidence of breast cancer in high-risk postmenopausal women.

Cervical Cancer
The risk for cancer of the cervix has been associated with several factors, including infection with certain types of human papillomavirus (HPV), early age at first intercourse, multiple male sex partners, a history of sexually transmitted diseases, smoking, certain nutritional deficiencies, and low socioeconomic status. HPV infection is widely accepted as the cause of most squamous cell cervical cancers, and the sexual practices listed are well-established risk factors for the disease; however, the role of other demographic and behavioral factors is less clear. Black, Hispanic, or American Indian race/ethnicity is considered a risk factor for cervical cancer because rates of detection and death from cervical cancer are higher among these women. However, some of the racial/ethnic differences in cervical cancer rates can be explained by the strong inverse association between socioeconomic indicators and the risk for invasive cervical cancer. This increased risk could be associated with differences in access to care and cultural behavior.

Recommendations for Prevention

Breast Cancer
Studies of the etiology of breast cancer have failed to identify feasible primary prevention strategies suitable for use in the general population. Many established risk factors for the disease are neither environmental nor behavioral and, therefore, are not amenable to prevention. Most of the hypothesized behavioral factors are not fully accepted as risk factors and are typically difficult to alter at the individual level. For these reasons, reducing mortality from breast cancer through early detection has become a high priority. The potential for reducing death rates from breast cancer is contingent on increasing initial and repeat mammography screening rates and subsequently detecting the disease at an early stage when more treatment options are available, and survival rates are higher.

Mammography is the most effective method of detecting breast cancer in its earliest and most treatable stage. Mammography is a low-dose x-ray procedure that visualizes the internal structure of the breast to detect cancers too small to be palpated during a clinical breast examination performed by a health-care provider. Mammography detects cancer before the woman can palpate the lump herself. Cancers detected at a small size are more likely to be localized. The sensitivity of mammography (75% to 94%) is higher than comparable values for clinical breast exam alone or breast self-examination. The specificity of mammography (ie, the likelihood that a mammogram will correctly indicate that breast cancer is not present) is also high (83% to 98%). Widespread use of this procedure, alone or with a clinical breast exam performed by a trained health-care provider, can reduce overall mortality from breast cancer. Since the 1970s, scientific studies have demonstrated that regular screening mammograms among women aged 50 to 69 years can reduce mortality from breast cancer by 30%. However, evidence is not as conclusive for women aged 40 to 49 years and ≥70 years.

The ability of mammography to identify breast cancer at an early stage improves the opportunity for effective treatment and survival. Women in whom localized/stage I disease has been diagnosed have a 5-year relative survival rate of 94%. In comparison, women with disease spread beyond regional lymph nodes have a 5-year relative survival rate of only 18.2%. Treatment at this late stage is substantially less effective, as well as more debilitating. • Breast Cancer Screening Guidelines Annual breast cancer screening for women aged ≥50 years is widely recommended. In addition, screening is recommended for women aged 40 to 49 years; however, consensus has not been reached regarding the effectiveness of screening or the
optimal interval for screening in this age group. Several review groups have reached different conclusions about the efficacy of mammography among younger women because of the limitations of studies conducted among women in this age group. These limitations include small sample sizes and limited duration of follow-up after entry into the screening programs.

In 1996, the US Preventive Services Task Force (USPSTF) recommended that women aged 50 to 69 years receive routine breast cancer screening every 1 to 2 years using mammography alone or mammography combined with annual clinical breast exams. The USPSTF noted that insufficient evidence exists to recommend or not recommend routine mammography or clinical breast exam for women aged 40 to 49 years and ≥ 70 years. Moreover, insufficient evidence exists to recommend clinical breast exam alone or teaching breast self-examination. In addition, the USPSTF noted that recommendations for mammography among high-risk women aged 40 to 49 years and among healthy women aged ≥ 70 years might be made on other grounds.

In 1997, a National Institutes of Health Consensus Development Conference panel reviewed new data not previously available to the USPSTF, which documented mortality benefit from mammography among women aged 40 to 49 years. However, the panel concluded that these data did not warrant a universal recommendation for mammography for women aged 40 to 49 years. As a result, the panel encourages these women to determine for themselves whether to receive mammography on the basis of objective analysis of scientific evidence, individual health history, and perceived risks and benefits.

Because mortality can be reduced among women aged 40 to 49 years, in 1997 the NCI accepted new guidelines for mammography screening recommended by the presidentially appointed National Cancer Advisory Board. These guidelines recommend that all women aged ≥ 40 years receive mammography every 1 to 2 years to achieve the best possible outcome if breast cancer is detected.

**Prevalence of Breast Cancer Screening**

Data collected through the 1997 Behavioral Risk Factor Surveillance System (BRFSS), from the Centers for Disease Control and Prevention (CDC), indicate that 85% of all interviewed women aged ≥ 40 years had ever received a mammogram. The percentage of low-income women and women without health insurance who had ever received a mammogram was comparable (77% and 69%, respectively). The percentage of all interviewed women aged ≥ 40 years who had received a mammogram within the preceding 2 years was 71%. In contrast, rates for low-income women and women without health insurance were substantially lower (58% and 50%, respectively).

A Healthy People 2000 objective is to increase to at least 80% the proportion of women aged ≥ 40 years who have ever received a clinical breast exam and a mammogram, and to at least 60% those aged ≥ 50 years who have received them within the preceding 1 to 2 years (objective 16.11). Although 1997 BRFSS data indicate the goal has been attained for all women interviewed aged ≥ 40 years who had ever received a mammogram, progress is still needed to attain the goal for low-income women and women without health insurance.

**Cervical Cancer**

Effective control of cervical cancer depends primarily on early detection of precancerous lesions through use of the Pap test, followed by timely evaluation and treatment. The Pap test is probably the most successful screening test ever developed to detect a cancer. Although the efficacy of cervical cancer screening using the Pap test has not been evaluated in clinical trials, at least two factors support the positive impact of this screening test: (a) evidence from many observational studies and (b) the marked decline in cervical cancer incidence and death rates in the United States and other countries since the introduction of the Pap test more than 40 years ago.

In the United States, approximately 50 million Pap tests are performed annually. Approximately 10% of these tests indicate an abnormality requiring further testing. Detection and treatment of precancerous cervical intraepithelial neoplasia (CIN) lesions identified by the Pap test can prevent cervical cancer. Thus, the intended outcome of cervical cancer screening differs from breast cancer screening. The primary goal of cervical cancer screening is to detect and treat CIN to prevent the occurrence of invasive cancer. For women in whom CIN lesions have been detected, the likelihood of survival is nearly 100% with appropriate evaluation, treatment, and follow-up.

**Cervical Cancer Screening Guidelines**
The American College of Obstetricians and Gynecologists (ACOG) and ACS recommend that women have a Pap test and pelvic examination when they become sexually active or at age 18 years, whichever occurs first. Annual Pap tests are recommended until three consecutive Pap tests are interpreted as being normal. Following this, the two groups recommend that Pap tests can be performed less frequently at the discretion of the provider.

In 1996, the USPSTF recommended routine screening for women who are or who have been sexually
active and who have a uterine cervix. The task force recommends Pap tests with the onset of sexual activity and repeated screening every 3 years. A reduced interval between screenings can be recommended by the physician on the basis of a woman’s risk factors for cervical cancer. In addition, the USPSTF recommends that, on the basis of existing evidence, Pap screening might not be necessary for women after age 65 years. Moreover, the USPSTF recommends not performing Pap tests on women who have undergone total hysterectomies for diseases unrelated to cervical cancer or its precursors.

In recent years, several studies have been conducted to determine the value of expanding HPV testing from testing only women with abnormal Pap test results to routinely testing all women to detect those at greatest risk for developing CIN or invasive cervical cancer. Evidence from these studies does not support routine HPV testing to screen for cervical cancer. Although new cervical cancer screening technologies have been approved for primary screening, professional organizations have not endorsed their widespread use because of concerns about cost-effectiveness. An increasing concern is that rescreening the same women annually will not result in further reductions in cervical cancer mortality. Increased effort is needed to target groups with large proportions of unscreened or rarely screened women, including women residing in rural areas; minorities; and recent immigrants who have different attitudes, knowledge, and behaviors regarding disease prevention and health promotion. Screening for cervical cancer among these women could further reduce the burden of disease from cervical cancer.

Prevalence of Cervical Cancer Screening

The 1997 BRFSS documented that 93% of women aged ≥ 18 years with a uterine cervix reported ever having received a Pap test. Corresponding values for low-income and uninsured women were 89% and 85%, respectively. Among all women with a uterine cervix, 80% had obtained a Pap test within the preceding 2 years. For low-income women and uninsured women, the proportion who had obtained a Pap test was substantially lower (69% and 65%, respectively).

A Healthy People 2000 objective is to increase to at least 95% the proportion of women aged ≥ 18 years with a uterine cervix who have ever received a Pap test, and to at least 85% those who have received a Pap test within the preceding 1 to 3 years (objective 16.12). Although 1997 BRFSS data indicate the goal for women aged ≥ 18 years with a uterine cervix who reported ever having received a Pap test is near attainment, progress is still needed, as with breast cancer screening, to attain the goal for low-income women and women without health insurance.

Low income and lack of health insurance are barriers to both cervical and breast cancer screening. These factors increase the likelihood that these diseases will be diagnosed at a later stage, when survival rates are lower.

National Breast and Cervical Cancer Early Detection Program

In August 1990, Congress enacted the Breast and Cervical Cancer Mortality Prevention Act, thereby authorizing the CDC to establish a national public health infrastructure to increase breast and cervical cancer screening among low-income women who are uninsured. Consequently, the CDC established the NBCCEDP, a comprehensive women’s health initiative implemented through cooperative agreements with qualifying health agencies (including state and territorial health departments and American Indian/Alaskan Native tribes and tribal organizations). In addition to providing breast and cervical cancer screening, participating programs provide diagnostic testing, surveillance and follow-up, case management, public education and outreach, professional education and training, quality-assurance screening tests, coalition and partnership development, and program evaluation.

The NBCCEDP-sponsored programs have initiated outreach efforts to serve women in high-priority groups (eg, women with increased risk for breast or cervical cancer and women who do not or rarely access breast and cervical cancer screening), including older women, racial/ethnic minorities, foreign-born women, women with disabilities, lesbians, and women residing in rural or other hard-to-reach areas.

Fiscal year 2000 marked the 10th year of the NBCCEDP, with congressional appropriations of $167 million. The CDC provides funds to all 50 states, six US territories, the District of Columbia, and 15 American Indian/Alaskan Native tribes and tribal organizations to implement comprehensive screening programs for breast and cervical cancer.

During the reporting period of July 1991 to March 1999, approximately 2.2 million screenings for breast and cervical cancer were provided to uninsured women. The program supported 1,049,752 mammograms: 64% of the mammograms were provided to women aged ≥ 50 years; 48% were
provided to racial/ethnic minorities (Figure 3). Breast cancer was diagnosed in 6,265 women aged ≥ 40 years. Although the rate of abnormalities detected by a mammogram was highest for younger women, the rate of breast cancers detected per 100,000 mammograms increased directly with advancing age (Figure 4).

A total of 1,192,346 Pap tests were performed: 72% of the tests were provided to women aged ≥ 40 years; 47% were provided to racial/ethnic minorities (Figure 5). Cervical intraepithelial neoplasia was detected in 34,046 women. Invasive cervical cancer was diagnosed in 561 women. The rate of abnormal Pap tests varied inversely with age.

Policy of the NBCCEDP

As the NBCCEDP has evolved, the program has addressed many challenges, especially regarding screening recommendations and treatment resources for women in whom precancerous cervical lesions or cancer of the breast or cervix has been diagnosed through the NBCCEDP. Fiscal year 2000 congressional appropriations will enable the NBCCEDP to screen approximately 12% to 15% of the eligible uninsured women aged 50 to 64 years in the United States. The remaining unmet need and the absence of funding to cover treatment expenses for women who have received a diagnosis of precancerous cervical lesions or breast or cervical cancer have been persistent challenges to the program.

A key public health priority of the NBCCEDP is to direct program resources to eligible women who have rarely or have never received breast or cervical cancer screening. To address this priority and maximize efficient use of limited resources, the program has developed cancer-control policies on the basis of programmatic data, current scientific research, and availability of screening services through other government-supported programs (eg, Medicare and Title X Family Planning programs).

Breast Cancer Screening Policies

Following implementation of the NBCCEDP in 1991, the CDC encouraged NBCCEDP-sponsored programs to place a high priority on screening women aged ≥ 50 years. NBCCEDP data indicated that only 57% of their mammograms were provided to women aged ≥ 50 years. In October 1994, the CDC established the first age-specific targets for the breast cancer screening component of the NBCCEDP. For 1995, 75% of the mammograms were to be provided to women aged ≥ 50 years. The percentage was gradually increased to 90% by October 1998. A review of NBCCEDP mammography screening data in 12-month intervals indicated that, since 1994, programs had screened increasing numbers of women aged ≥ 50 years for breast cancer; however, the age-specific percentage goals had not been attained. For example, the percentage of initial mammograms provided to women aged ≥ 50 years for the reporting period October 1996 to September 1997 was 74%.

In 1998, the NBCCEDP mammogram screening policy was revised in response to new scientific research, recent changes in recommendations by the NCI and ACS, changes in Medicare preventive services coverage, and the need to establish a more realistic national target based on historical programmatic screening data. The new NBCCEDP policy is to provide at least 75% of mammograms to women aged ≥ 50 years who are not eligible to receive Medicare Part B benefits or are unable to pay the premium to enroll in Medicare Part B. Correspondingly, no more than 25% of mammograms should be provided to women aged < 50 years.

As a result of this new policy, some participating health agencies have developed strategies to cover breast cancer screening for women aged 40 to 49 years. Several programs have obtained breast cancer screening resources for these women from state appropriations or tobacco tax revenues and through collaborative efforts with foundations (eg, the Susan G. Komen Breast Cancer Foundation). From October 1997 to September 1998, 75% of NBCCEDP-sponsored mammograms were provided to women aged ≥ 50 years.

Cervical Cancer Screening Policies

The primary purpose of the cervical cancer component of the NBCCEDP is to identify and treat precancerous cervical lesions and to detect and treat invasive cervical cancer at an early stage. When the program was established in 1991, the CDC implemented program guidelines for cervical cancer screening that were consistent with ACS guidelines. Women enrolled in the NBCCEDP who were aged ≥ 18 years, with an intact uterine cervix, were eligible for an annual Pap test and pelvic examination. After a woman has had three consecutive annual examinations with normal findings, Pap tests could be performed less frequently at the discretion of the woman and her health-care provider.

In 1999, the CDC, in consultation with an external work group comprising clinical experts, epidemiologists, and public health practitioners, reexamined the NBCCEDP’s cervical cancer
screening policy and other emerging issues related to Pap testing. One of the key issues addressed by this work group concerned recommendations for Pap screening intervals.

The ACOG and ACS recommendations regarding the frequency of screening are similar and advise that after a woman has had three consecutive annual examinations with normal findings, the Pap test can be performed less frequently at the discretion of the woman’s provider. Scientific data suggest that once a woman has demonstrated no signs of CIN, as evidenced by three consecutive annual Pap tests with normal findings, her chance of developing CIN II or worse within a 3-year period is extremely low, regardless of other risk factors. Preliminary analysis of NBCCEDP data support these findings.

Since March 2000, NBCCEDP-sponsored programs have been required to direct more cervical cancer screening resources to women who have never had a Pap test or who have not had a Pap test for at least 5 years. Among all women screened, at least 20% should be women who have either never been screened or have rarely been screened (i.e., not screened for ≥ 5 years). Programs are also being required to reduce overscreening among program-enrolled women.

Beginning in October 2001, programs will be required to document that at least 75% of women with three consecutive annual Pap tests with normal findings did not receive a fourth annual Pap test. Their screening interval will be changed to every 3 years. To successfully implement this policy change, the CDC will assist NBCCEDP-sponsored programs in assessing current program provider practices, modifying patient recall systems, and developing professional and public education strategies.

Follow-up and Treatment Policy

The policy issue that has caused the greatest controversy in the NBCCEDP concerns the availability of funds to pay for the treatment of cancerous or precancerous lesions diagnosed in enrolled women. A crucial component of the NBCCEDP is to ensure that all women with abnormal screening results, precancerous breast or cervical lesions, or a diagnosis of cancer receive timely and appropriate follow-up care.

Program providers receive reimbursement for most diagnostic procedures, including diagnostic mammography, breast ultrasound, fine-needle aspiration of the breast, breast and cervical biopsies, and colposcopy of the cervix. However, the Breast and Cervical Cancer Mortality Prevention Act of 1990 prohibits use of federal program funds for any component of breast or cervical cancer treatment, primarily because of a concern that such payment would rapidly deplete resources available for screening services. NBCCEDP-sponsored programs are required to identify and secure resources for treatment from other sources.

In 1996, the CDC conducted in-depth case studies of seven state programs to determine how early-detection programs identified and obtained resources for treatment. The results indicated that state health agencies and their partners had developed a wide range of strategies for procuring treatment services in the absence of program resources. However, the study respondents considered the strategies used to obtain these services as short-term solutions that were labor intensive and that diverted resources away from screening activities.

The NBCCEDP surveillance data for October 1991 to September 1998 indicate that 92% of the clients in whom breast cancer had been diagnosed and 93% of the clients in whom invasive cervical cancer had been diagnosed initiated treatment. The remainder either refused treatment, were lost to follow-up, or had an outcome pending. In fiscal year 1999, the CDC received increased congressional appropriations to expand case-management activities to assist women in overcoming financial, logistical, and other barriers to obtaining these services.

Recommended Priority Activities for the CDC

The Breast and Cervical Cancer Mortality Prevention Act of 1990 has played an important role in focusing public health efforts on cancer control in the United States. Since 1991, the CDC has collaborated with a diverse group of public and private partners to build the public health infrastructure, implement screening services, and conduct research activities. The CDC will continue to foster these relationships to achieve goals set in the following four priority areas of screening initiatives, case-management services, professional education and training, and partnerships.

Screening Initiatives

- Collaborate with NBCCEDP-sponsored programs to increase public education and outreach strategies to reach women who have rarely or have never received breast or cervical cancer screening.
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• Collaborate with NBCCEDP-sponsored programs to implement strategies among health-care providers to address missed opportunities for enrolling women into screening.

• Collaborate with NBCCEDP-sponsored programs to implement strategies through professional groups and public education to modify screening intervals for all program-enrolled women who have had three consecutive annual Pap tests with normal findings.

• Continue to promote the need for routine rescreening for breast and cervical cancer at regular intervals to improve rescreening rates for women enrolled in the NBCCEDP.

Case-Management Services

• Expand case-management activities to ensure that women enrolled in the NBCCEDP receive timely and appropriate rescreening and diagnostic services and treatment services, if indicated.

• Increase case-management activities to sustain networks and partnerships to maximize access to and availability of diagnostic, treatment, and essential support services for women enrolled in the NBCCEDP.

Professional Education and Training

• Increase collaboration with professional groups that provide continuing education for their constituents to address breast and cervical cancer control issues in standardized curricula and training.

• Continue to advocate for incorporation of breast and cervical cancer education in curricula for health professionals to facilitate a long-term effect on provider practice.

Partnerships

• Continue to build partnerships with public health departments, tribes and tribal organizations, national and voluntary organizations, academic centers, and health-care purchasers through the following activities: implementing strategies community-wide to promote awareness and screening practices among all women; replicating and disseminating programmatic approaches that are proven effective in providing screening to priority populations (eg, racial/ethnic minorities and women residing in rural or other hard-to-reach areas); cosponsoring conferences, workshops, and training related to breast and cervical cancer issues; and advocating for breast and cervical cancer control priorities (eg, policies and standards) to ensure the quality of mammography and Pap screening delivered by all providers.

Research Agenda

To support the recommended priority activities for the NBCCEDP, the CDC has developed a research agenda comprising six priorities. This research will assist in improving cancer screening services provided to women enrolled in the NBCCEDP and in developing new methods to recruit eligible women who have rarely or have never received breast or cervical cancer screening.

• Priority: Determine effective strategies to communicate changes in NBCCEDP policy to cancer screening providers and women enrolled in the program.

Emerging developments in cancer prevention and control occasionally require substantial changes in program policy (eg, changing from annual to triennial cervical cancer screening among women with three previous normal Pap tests). Changes in program policy might require adapting the practice patterns of providers and modifying the expectations and behaviors of enrolled women. Research is needed to develop and evaluate effective public and provider education and materials for dissemination that will help translate policy changes into practice as rapidly as possible.

• Priority: Identify effective strategies to increase the proportion of enrolled women who complete routine breast and cervical cancer rescreening according to NBCCEDP policy.

Available data submitted twice a year to the CDC by participating programs suggest that many women enrolled in the NBCCEDP, regardless of their race/ethnicity, do not complete routine rescreening on schedule. Some research is underway in this area, but more is needed. A multiethnic, multicultural focus group study of the barriers to mammography rescreening among NBCCEDP enrollees in Texas resulted in development of an ongoing retrospective cohort investigation among 2,500 randomly selected enrollees in Maryland, New York, Ohio, and Texas. Findings from this research that identify risk factors for failure to rescreen on schedule will be used to develop and test new interventions to increase routine rescreening; however, additional research is needed in this area.

• Priority: Identify effective strategies to increase NBCCEDP enrollment among eligible women who have never received breast or cervical cancer screening.

Data from the 1997 BRFSS suggest that substantial numbers of age-eligible, low-income women have never received mammography or Pap smear screening. To develop effective outreach and enrollment strategies for women who have rarely or have never received cancer screening, participatory research methods that involve unscreened women and members of their communities...
in all phases of the research process might be particularly valuable. In addition, quantitative research designs might be necessary to test proposed interventions. Research initiatives related to this priority topic must address both missed screening opportunities in diverse provider settings and various cultural, language, and institutional barriers that might influence a woman’s willingness to accept free or low-cost cancer screening when offered.

**Priority:** Evaluate variations in clinical practice patterns among providers of NBCCEDP screening services.

Analyses of data submitted every 6 months to the CDC by participating programs have identified several practice patterns that differ markedly across these programs. These variations raise concern regarding quality assessment. For example, an analysis of mammography results for 1991 to 1996 reported through the Breast Imaging Reporting and Data System (BI-RADS) lexicon developed by the American College of Radiology documented that the proportion of mammograms coded “probably benign, short-term follow-up recommended” varied substantially across the state, territorial, and tribal programs.

To understand the reasons for such variations and to develop appropriate provider education materials, where necessary, case studies and record linkage investigations within collaborating programs might be necessary. Such studies must be conducted within participating programs, because data submitted to the CDC cannot be linked with medical records, pathology laboratory reports, or cancer registries.

**Priority:** Determine optimal models for providing case-management services to women in the NBCCEDP who have an abnormal screening result or a diagnosis of cancer.

Without effective case management, some low-income women who need additional cancer testing or treatment will not receive the necessary care or will not receive it as rapidly as possible. Diverse case-management models have been developed for other public health concerns, including tuberculosis control, adolescent prenatal care, and human immunodeficiency virus infection/acquired immunodeficiency syndrome.

Research is needed to evaluate the applicability of these and other models to low-income, medically uninsured women who need additional cancer testing and treatment. Critical issues include determining how women will be selected for case management, how extensive case-management efforts should be, and what proportion of screening resources should be allocated to case-management activities.

**Priority:** Conduct economic analyses to determine costs of providing screening services in the NBCCEDP.

Because the funds appropriated by Congress to the NBCCEDP are not adequate to screen all eligible women who need breast and cervical cancer screening, economic analyses are necessary to enhance efficient use of the available resources. Important issues include the potential cost advantages of high-volume vs low-volume laboratories and mammography facilities, the sustainability of facilities that are providing program-funded screenings below their current cost levels, and the costs and benefits of mammography vans compared with standard facilities.

**Conclusion**

Breast and cervical cancer continue to be major health problems in the United States. Preventive measures are available to reduce morbidity and mortality associated with these diseases. The NBCCEDP, through federal, state, territorial, and tribal governments, in collaboration with national and community-based organizations, has increased access to breast and cervical cancer screening among low-income and uninsured women. In addition, NBCCEDP-sponsored programs have increased the staff working in cancer control and the expertise of these persons, implemented professional education programs for health-care providers, and developed innovative public education and outreach strategies to encourage medically underserved women to seek screening services.

This national effort enabled the United States to make substantial progress toward achieving the Healthy People 2000 objectives for breast and cervical cancer control, particularly among racial/ethnic minorities and the medically underserved. However, the NBCCEDP still reaches only 12% to 15% of uninsured women aged 50 to 64 years who are eligible for screening services. A continuing challenge for the future is to increase national commitment to providing screening services for all eligible uninsured women to ultimately reduce morbidity and mortality from breast and cervical cancer.