

Despite Mammography Screening Guideline Disagreements, the Early Detection of Breast Cancer Remains the Best Strategy to Reduce Breast Cancer Mortality

ABSTRACT: *In order to reduce the mortality rate from breast cancer, health professionals focus on efforts to promote and improve early detection of the disease. Screening guidelines for detecting breast cancer play a critical role in educating the targeted demographic of women 40 and older to initiate health behaviors at the right age, which can help clinicians identify early stage breast cancer (in situ or localized). The recent controversy surrounding changes in age-appropriate guidelines for starting routine mammography drew attention to ongoing screening methods that include mammograms, clinical breast exams (CBEs) and magnetic resonance imaging (MRI). While overall early stage breast cancer detection rates are high (70%), there are differences among African American women and women of other races.¹ The early stage detection rates also may not be high enough to reach a national goal of reducing breast cancer mortality rates by 50%.*

Screening Matters: Experts generally agree that breast cancer screening saves lives. The primary advantage associated with early screening of any illness or disease is that test's or those tests' ability to identify a disease at an early stage, so it can be treated. Such actions are linked to longer life expectancy as well as gains in the quality of a person's life.² In the case of early detection of breast cancer, cases found through screening will result in using chemotherapy treatment less frequently, which overall will improve a person's quality of life. Screening significantly contributed to a 23.5% drop in U.S. breast cancer mortality from 1990 to 2000.³ A 2011 study of the National Breast and Cervical Cancer Early Detection Program's (NBCCEDP) efforts to promote breast cancer screening to low-income women aged 40-64 found that of 1.8 million women screened over 15 years through 2006, the program had saved 100,800 life years when compared to no intervention.⁴ Therefore, the limited success identified in our case of boosting African American women's uptake of mammography and referrals to a potentially life-saving procedure appears to be a health issue meriting the federal funding awarded to Public Health-Seattle & King County's Breast, Cervical and Colon Health Program (BCCHP).

Current Screening Practices: Early screening for breast cancer includes all tests and exams used to find the disease in those without symptoms. The goal is to detect cancers before they become symptomatic.⁵ The American Cancer Society's guidelines for early detection offer women what the organization says is "the best chance to reduce the risk of dying from breast cancer." The recommended interventions include using mammograms, using MRI for high-risk women, having CBEs, and identifying any changes early to specialists.⁵

Mammography is a form of imaging using a low-dose x-ray to examine breasts. The actual exam is called a mammogram, and it enables the early detection and diagnosis of breast diseases in women.⁶ Mammography is still considered the most effective means for the early detection of breast cancer.⁷ However, clinical exams also are important, as up to 10% of breast cancers may be clinically present but not detected on mammography.³ Recent developments include digital mammography and computer-aided detection (CAD), which can digitize an image of a breast, but these technologies have not significantly changed overall breast cancer detection rates.^{3,6} For women at high risk of breast cancer, MRI scans, which use radio waves to produce cross sectional body images, can be used in conjunction with an annual mammogram. But it is not recommended as a screening tool because MRI can miss some cancers.⁵ While MRI is more sensitive than mammograms, it also has a higher false-positive rate.

Mammograms are conducted as part of recommended screenings for women for early detection of breast disease in women (screening mammography) or for further diagnoses for women presenting symptoms such as a lump, pain or nipple discharge (diagnostic mammography).⁶ When reading the films from a mammogram, radiologists are searching for spots with abnormal areas of density, mass, or calcification. All signal the possible presence of cancer that may require further attention.⁶

The American Cancer Society makes these recommendations for early breast cancer detection⁵:

- **CBEs:** Women in their 20s and 30s should have a CBE by a health professional as part of a periodic health exam at least every 3 years, and after age 40, every year.
- **Breast Self Exam (BSE):** A BSE is an option for women starting in their 20s; any breast changes should be reported promptly to a health professional.
- **MRI:** Women at high risk (>20% lifetime risk) should get an MRI yearly with a mammogram starting at age 30; women with lower risk (<15%) should not do yearly MRI.

As our mammography screening case from January showed, there are still simmering debates among experts regarding guidelines when women should begin annual mammogram screening as well as confusion in the media and the public how to interpret those recommendations (see table 1 below). This debate has a bearing on our case, as early detection is linked to mortality reductions. For years, experts have examined whether mammography should be universally recommended for women in their 40s. Reductions of mortality have been estimated at 17% for women in their 40s who had annual mammograms⁸ (2004 figure), and more recently at 15%⁹ (2009 figure), but the trial participants from the 2004 published estimate were in their late 40s, and the benefits may have occurred for mammograms taken after age 50. In addition, when

screened and unscreened women in their 40s are compared, mortality curves do not demonstrate differences for up to 12 years after enrollment, suggesting more follow-up studies are needed to show if the difference in the mortality curves shows a genuine advantage for women who had mammograms in their 40s.⁸

Revisiting the Screening Debate: The U.S. Preventive Services Task Force's (USPSTF) November 2009 breast cancer screening recommendations that revised the body's 2002 guidelines re-ignited a national dialogue on when early screening should begin and the efficacy of screening at different ages in detecting breast cancer, and thus reducing mortality. Given breast cancer is the most frequently diagnosed cancer among U.S. women, claiming an estimated 39,840 lives in 2010¹⁰, the efficacy of developing appropriate early screening practices is major health concern in King County and nationally.

Table 1: Summary* of USPSTF Screening Mammography Guidelines: 2002 and 2009.^{11,12}

New USPSTF Guidelines (Nov. 2009)			USPSTF Guidelines 2002-2009	American Cancer Society Guidelines
Mammo-grams	Before age 50	-No routine screening -Mammograms to be given on case-by-case basis after assessing risk factors	Age 40+: routine screening every 1-2 years.	Age 40+, annual mammograms
	Age 50-74	Mammograms every 2 years		
	Age 75+	No recommendations		
Self-exam		Recommends against physicians teaching patients how to do this	No recommendations	Recommends but does not specify time interval
Clinical breast exam		No recommendations	No recommendations	-Age 40+ annual -Age 20-39, every 3 years

The panel updated its earlier statement that women age 40 and older have a mammogram every 1-2 years, creating misunderstanding by issuing and then retracting the statement recommending “against routine screening mammography in women aged 40 to 49 years.” The final text said the “decision to start regular biennial screening mammography before the age of 50 years should be an individual one and take into account patient context, including the patient’s values regarding specific benefit and harms”(see table 1).^{11,13} The USPSTF also recommended against teaching BSE and concluded the current evidence was insufficient to assess the additional benefits and harms of CBEs beyond screening mammography for women ages 50-74.¹¹ The American Cancer

*Table information and much of the summary with it regarding the controversy was published previously in author's Jan. 31, 2011 CPHP post: "Changing Health Recommendations on Controversial Procedures Requires a Careful Consideration of the Public's Interests Prior to Rolling Out New Guidelines."

Society, the National Cancer Institute, and the American College of Obstetricians and Gynecologists criticized these conclusions and said their guidelines would continue to urge women aged 40-49 to undergo the tests.¹⁴

For its revised recommendations, the USPSTF reviewed data from more than 600,000 women 40 and older undergoing routine screening (mammography once every 2 years). The data showed that women aged 40-49 have the largest number of false positives (97.8/1,000 women screened), compared to women aged 50-59 (86.6/1,000 women screened).¹⁵ Women in their 40s have more false positive mammograms because their denser breasts make it harder to identify problems. The USPSTF recommendations report the absolute risk reduction from screening (seen in the number needed to invite to screen) is greater for women aged 50-59 than for those aged 40-49. The panel noted that 1,904 women in their 40s would need to be screened to avoid a single death (compared to 1,399 women in their 50s), and many of those women would have false positive results that led to more testing, biopsies, and worry.¹¹ Thus screening women in their 40s for breast cancer did not make good public health sense because of little net benefit relative to the harms from false positive test results.⁹

Screening, Race, and Impacts: Though our case focuses on issues impacting African American women's barriers to mammography in King County, some national data are worth a closer look. Despite the debate over screening guidelines, a mammography and clinical breast exam is identified as the most important activity for medical providers to reduce breast cancer suffering and mortality. Data show African American women are getting screened.¹⁶ Nationally, as of 2006, 70% of women 40 and older report having had a mammogram in the last 2 years, varying by race, income, and insurance status.¹⁶ Among white women, the percent of those 40 and older who reported having a mammogram in the last two years rose from 30% in 1987 to 71% in 2003. During that same time, prevalence of mammography usage among African American women jumped from 24% to 70%.¹⁶ While screening rates were similar, mortality rates painted another story. Overall, mortality from breast cancer among U.S. women fell 1.9% each year from 1999 to 2006.¹⁷ But from 1998 to 2002, African American women had the highest breast cancer death rate (34.7/100,000 cases) followed by whites (25.9/100,000), with even lower rates for Latinas, American Indians/Alaska Natives, and Pacific Islanders/Asian Americans. And the disparity in breast cancer death rates between whites and African Americans is growing—by 2002, African American women had a 37% higher death rate than white women.¹⁶ (See appendix 1 for tables.)

Data from 250,985 cases from the California Cancer Registry analyzed in a 2010 study found disparities in the detection, treatment, and survival rates of white women and non-white women. Early breast cancer detection rates remained much lower among African American and Hispanic women, compared to whites and Pacific Islanders/Asian Americans, though overall early breast cancer detection rates from 1988 to 2002 were 70% for all women (see appendix 2, table 4).¹ The study's authors, Summers et al., note that if one of the American Cancer Society's "Year 2015" public health goals is to reduce breast cancer mortality in half, adherence to mammography screening guidelines, and thus early detection rates, will need to be increased. To meet this national goal, increasing the adherence of breast cancer screening guidelines for women 40 and older would need to jump to 90%.¹ The study's authors conclude that efforts need to be focused on identifying and understanding barriers to screening faced by African American and Hispanic women, in order to reach women who were among the slowest to adopt recommended breast cancer guidelines.¹

Back to the Case: Our case confronts the problem of women who are not taking advantage of early consistent screening, which can help lower death rates due to breast cancer. A possible issue could be the cost associated with mammography use. An analysis of prices from 2008 pegged mammogram costs between \$73 and \$91, not factoring insurance.¹⁸ A 2007 study on the perception of cost of mammograms as a barrier to use found that more than half of the women interviewed (white, Native American, and African American) said the cost of mammograms was a barrier, and cost presents a greater burden to women who are black or women who have lower education or income levels.⁷ As we see in the case, peer outreach with free mammography has not attracted enough women, suggesting social, behavioral, and environmental factors may be stronger determinants than cost issues identified by other researchers.

1. Is it realistic to assume that there are adequate resources to meet a goal of 90% adherence to breast cancer screening guidelines for women 40 and older?
2. What levels of adoption of a health behavior, even a life-saving one like mammography and a clinical exam, are considered acceptable as measured as a return on an investment in a health awareness and health intervention campaign? Who decides, and what criteria apply?

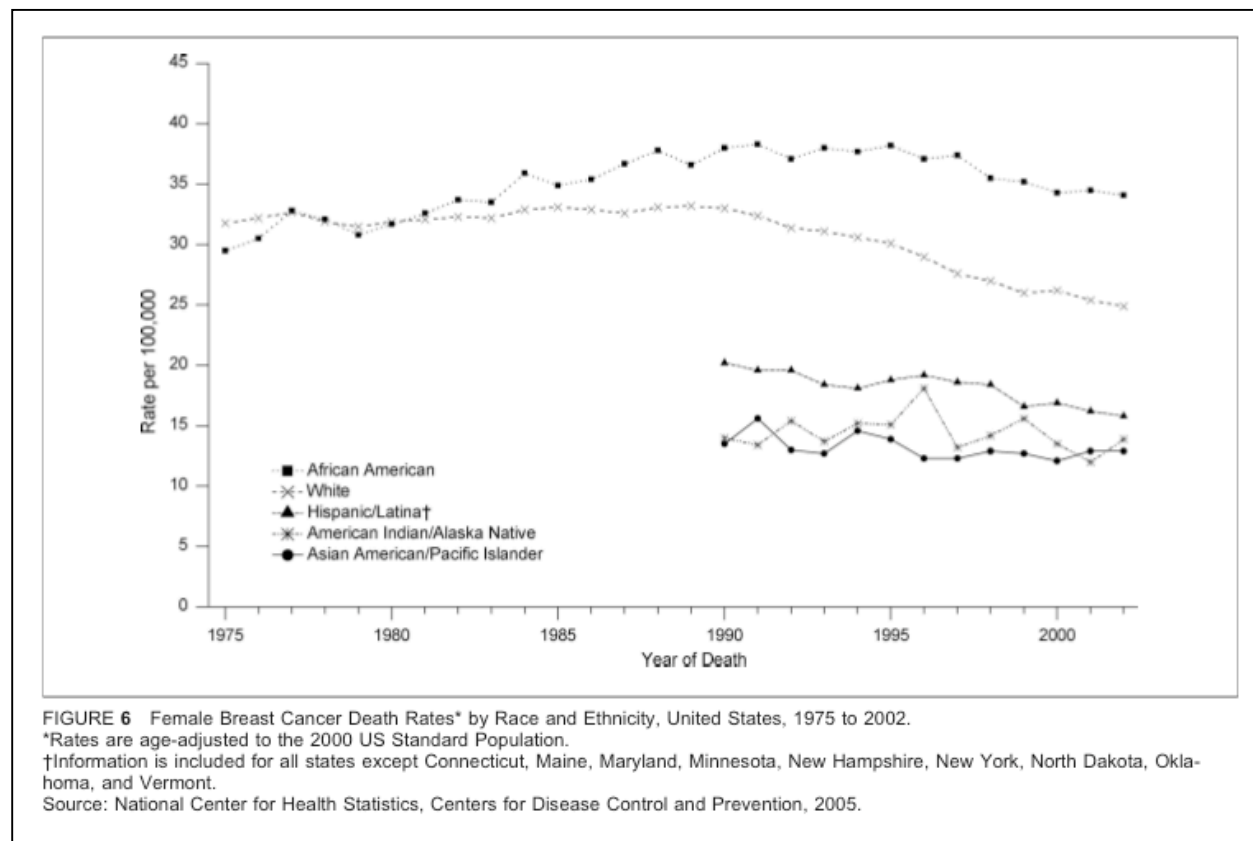
Appendix 1

Table 2: Comparison of white and African-American women ≥ 40 years who had a mammogram within the last two years. (Source, National Center for Health Statistics [NCHS], 2004)¹⁶

Year	≥ 40 years		40-49 years		50-64 years		≥ 65 years	
	White	AA	White	AA	White	AA	White	AA
1987	30.3	23.8	34.3	27.8	33.6	26.4	24.0	14.1
1990	52.7	46.0	57.0	48.4	58.1	48.4	43.8	39.7
1991	56.0	47.7	58.1	48.0	61.5	52.4	49.1	41.6
1993	60.6	59.2	61.6	55.6	66.2	65.5	54.7	56.3
1994	61.3	64.4	62.0	67.2	67.5	63.6	54.9	61.0
1998	68.0	66.0	64.4	65.0	75.3	71.2	64.3	60.6
1999	71.1	71.0	68.3	69.2	77.9	75.0	66.8	68.1
2000	72.1	67.9	67.1	60.9	80.5	77.7	68.3	65.5
2003	70.7	70.4	65.5	68.3	77.3	76.7	68.3	65.7

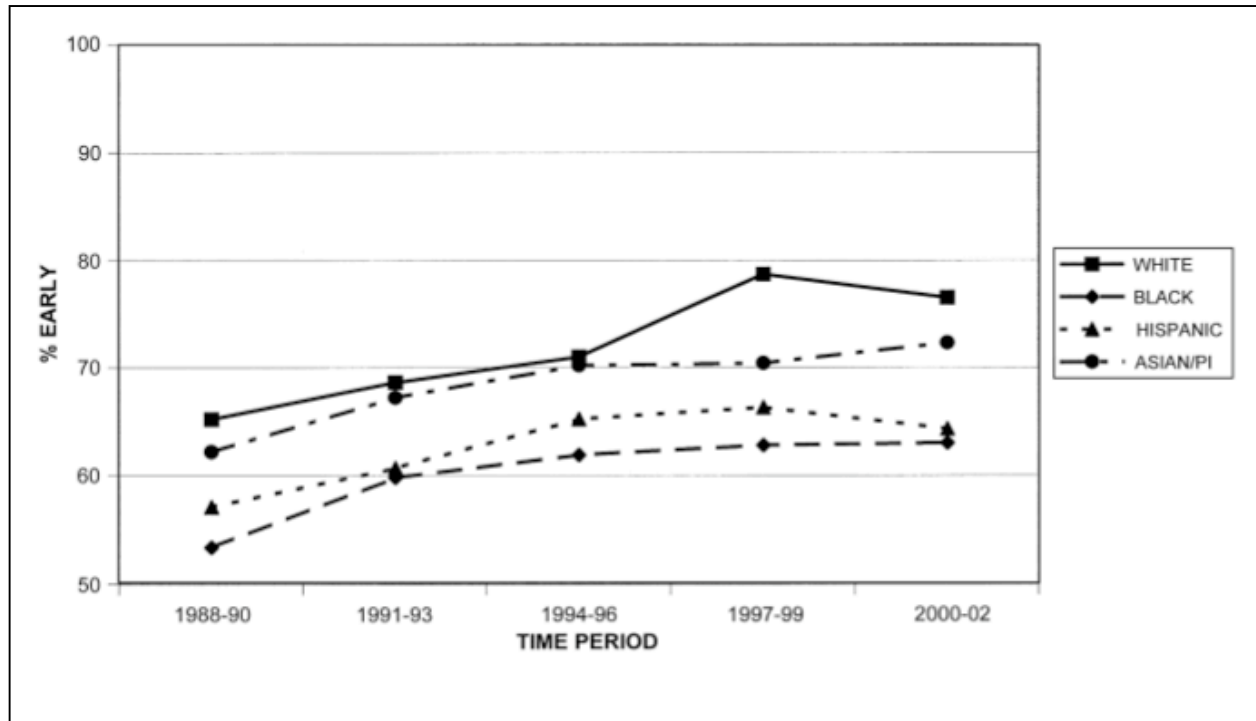
*Percent of women having a mammogram within the past 2 years.

Table 3: U.S. breast cancer death rates by race, 1975-2002.¹⁶



Appendix 2:

Table 4: Early breast cancer detection rates by ethnicity in California (aged ≥ 50), 1988-2002. ¹



References:

1. Summers C, Saltzstein SL, Blair SL, Tsukamoto TT, Sadler GR. Racial/ethnic differences in early detection of breast cancer: a study of 250,985 cases from the California Cancer Registry. *J Womens Health (Larchmt)*. Feb 2010;19(2):203-207.
2. Parmigiani G, Kamlet M. *A cost-utility analysis in alternative strategies in screening for breast cancer*. Manuscript, Duke University Library. March 1992; <http://ftp.isds.duke.edu.offcampus.lib.washington.edu/WorkingPapers/91-A17.ps>. Accessed April 27, 2011.
3. Knutson D, Steiner E. Screening for breast cancer: current recommendations and future directions. *Am Fam Physician*. Jun 1 2007;75(11):1660-1666.
4. Hoerger TJ, Ekwueme DU, Miller JW, et al. Estimated effects of the National Breast and Cervical Cancer Early Detection Program on breast cancer mortality. *Am J Prev Med*. Vol 40. Netherlands: Published by Elsevier Inc.; 2011:397-404.
5. American Cancer Society. *Can breast cancer be found early?* 2011; <http://www.cancer.org/Cancer/BreastCancer/DetailedGuide/breast-cancer-detection>. Accessed April 26, 2011.
6. RadiologyInfo.org. *Mammography*. 2011; <http://www.radiologyinfo.org/en/info.cfm?pg=mammo>. Accessed April 27, 2011.
7. McAlearney AS, Reeves KW, Tatum C, Paskett ED. Cost as a barrier to screening mammography among underserved women. *Ethn Health*. Vol 12. England 2007:189-203.
8. Gordis L. The epidemiologic approach to evaluation of screening programs. In *Epidemiology*. 3rd ed. Philadelphia: Elsevier Saunders; 2004.
9. Harvard Health Publications. *Screening mammography*. March 2010; <http://www.health.harvard.edu/fhg/updates/screening-mammography.shtml>. Accessed April 28, 2011.
10. American Cancer Society. *Cancer facts & figures, 2010*. 2010; <http://www.cancer.org.offcampus.lib.washington.edu/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-026238.pdf>. Accessed April 27, 2011.
11. U.S. Preventive Services Task Force. Screening for Breast Cancer. December 2009; <http://www.uspreventiveservicestaskforce.org/uspstf09/breastcancer/brcanrs.htm#rationale>. Accessed April 27, 2011.
12. Stein R. Potential harm of frequent mammograms outweighs benefit, task force says. *Washington Post*. November 17, 2009; <http://www.washingtonpost.com.offcampus.lib.washington.edu/wp-dyn/content/article/2009/11/16/AR2009111602822.html>. Accessed Jan. 28, 2011.
13. Woolf S. The 2009 Breast Cancer Screening Recommendations of the US Preventive Services Task Force. *JAMA*. January 13, 2010;303(2).
14. Graham J, Maugh T. Mammogram guidelines spark heated debate. *Los Angeles Times*. November 17, 2009; <http://www.latimes.com.offcampus.lib.washington.edu/news/nationworld/nation/la-na-mammogram17-2009nov17,0,3942708.story>. Accessed Jan. 30, 2011.
15. U.S. Preventive Services Task Force. Screening for breast cancer results: harms associated With mammography screening. 2009; <http://www.uspreventiveservicestaskforce.org/uspstf09/breastcancer/brcanup2.htm#tab2>. Accessed April 27, 2011.
16. Smigal C, Jemal A, Ward E, et al. Trends in breast cancer by race and ethnicity: update 2006. *CA Cancer J Clin*. Vol 56. United States 2006:168-183.
17. U.S. Centers for Disease Control and Prevention. *Breast cancer trends*. 2006; <http://www.cdc.gov/cancer/breast/statistics/trends.htm>. Accessed April 27, 2011.
18. Subramanian S, Ekwueme DU, Gardner JG, Bapat B, Kramer C. Identifying and controlling for program-level differences in comparative cost analysis: lessons from the economic evaluation of the National Breast and Cervical Cancer Early Detection Program. *Eval Program Plann*. Vol 31. United States 2008:136-144.

Key References:

1. Smigal C, Jemal A, Ward E, et al. Trends in breast cancer by race and ethnicity: update 2006. *CA Cancer J Clin*. Vol 56. United States 2006:168-183.
2. Summers C, Saltzstein SL, Blair SL, Tsukamoto TT, Sadler GR. Racial/ethnic differences in early detection of breast cancer: a study of 250,985 cases from the California Cancer Registry. *J Womens Health (Larchmt)*. Feb 2010;19(2):203-207.