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Trends in Breast Cancer by Race and Ethnicity

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ABSTRACT In this article, the American Cancer Society (ACS) describes trends in incidence, mortality, and survival rates of female breast cancer in the United States by race and ethnicity. It also provides estimates of new cases and deaths and shows trends in screening mammography. The incidence and survival data derive from the National Cancer Institute's Surveillance, Epidemiology, and End Results program; mortality data are from the National Center for Health Statistics. Approximately 211,300 new cases of invasive breast cancer, 55,700 in situ cases, and 39,800 deaths are expected to occur among women in the United States in 2003. Breast cancer incidence rates have increased among women of all races combined and white women since the early 1980s. The increasing rate in white women predominantly involves small (≤ 2 cm) and localized-stage tumors, although a small increase in the incidence of regional-stage tumors and those larger than five cm occurred since the early 1990s. The incidence rate among African American women stabilized during the 1990s for all breast cancers and for localized tumors. African American women are more likely than white women to be diagnosed with large tumors and distant-stage disease. Other racial and ethnic groups have lower incidence rates than do either white or African American women. However, the proportion of disease diagnosed at advanced stage and with larger tumor size in all minorities is greater than in white persons. Death rates decreased by 2.5% per year among white women since 1990 and by 1% per year among African American women since 1991. The disparity in mortality rates between white and African American women increased progressively between 1980 and 2000, so that by 2000 the age-standardized death rate was 32% higher in African Americans. Clinicians should be aware that 63% and 29% of breast cancers are diagnosed at local- and regional-stage disease, for which the five-year relative survival rates are 97% and 79%, respectively. This information,

coupled with decreasing mortality rates and improvements in treatment, may motivate women to have regular mammographic and clinical breast examinations. Continued efforts are needed to increase the availability of high-quality mammography and treatment to all segments of the population. (*CA Cancer J Clin* 2003;53:342-355.) © American Cancer Society, 2003.

INTRODUCTION

Breast cancer is the most common invasive cancer in women, with more than one million cases and nearly 600,000 deaths occurring worldwide annually.¹ Incidence rates are highest in industrialized nations such as the United States, Australia, and countries in Western Europe. Breast cancer incidence increased in many countries during the 20th century, largely reflecting global changes in reproductive patterns²⁻⁴ and regional increases in mammography.^{5,6}

Because of social and cultural considerations, breast cancer ranks highest among women's health concerns.⁷ It is the most frequently diagnosed cancer in women in the United States beginning at ages 30 to 39 years,⁸ and the fourth most common cancer in women aged 20 to 29 years after thyroid cancer, melanoma, and lymphoma. Most cases are diagnosed at local (63%) and regional (29%) stages, for which five-year relative survival rates are 97% and 79%, respectively.⁹ Clinicians play

a vital role in addressing concerns about breast cancer and encouraging women to follow recommended guidelines for early detection.

This article describes trends in the incidence, mortality, and survival rates of female breast cancer by race and ethnicity in the United States. It also presents estimates of the number of new cases and deaths and trends in screening mammography. Additional data are available from the biennial publication of *Breast Cancer Facts & Figures* (available at http://www.cancer.org/docroot/STT/stt_0.asp).

MATERIALS AND METHODS

Data Sources

Data on invasive and in situ female breast cancer cases, including information on tumor size, stage at diagnosis, and survival for invasive cancers, were obtained from the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute.⁸ The SEER program has been collecting clinical, pathologic, and demographic information on persons with cancer since 1973. Data are available for whites, African Americans, and all races combined since 1973 and for American Indians/Alaska Natives, Asian Americans/Pacific Islanders, and Hispanics since 1992. Data on breast cancer mortality were obtained from the National Center for Health Statistics.¹⁰ Mortality data for both whites and African Americans are available since the mid-twentieth century, whereas for other racial and ethnic groups they are uniformly available beginning in 1992. Population data were obtained from the US Census Bureau.¹¹ Information on use of mammography for women 40 years and older by race and ethnicity was obtained from the National Center for Health Statistics' *Health, United States, 2002*.¹²

Statistical Analyses

Estimated New Cancer Cases and Deaths

We estimated the number of female breast cancer deaths expected to occur in the United

States in 2003 by fitting the number of female breast cancer deaths recorded annually from 1979 through 2000 in whites and African Americans and from 1992 through 2000 in other racial and ethnic groups using autoregressive quadratic models.¹³

Because cancer registration is incomplete in many states in the United States, the exact number of new breast cancer cases diagnosed each year is unknown. Accordingly, for each racial and ethnic group, we first estimated the number of new female breast cancer cases occurring annually in the United States from 1979 through 1999 for whites and African Americans and from 1992 through 1999 for other racial and ethnic groups by applying age-specific cancer incidence rates from SEER to the corresponding age and calendar time-specific population data as reported by the US Census Bureau. We then forecast the number of female breast cancer cases expected to be diagnosed among each racial and ethnic group in the United States in 2003 by fitting the annual estimated number of new breast cancer cases with autoregressive quadratic models. Because the estimates for each racial and ethnic group are determined independently, final adjustments were applied to the race/ethnic-specific estimated cases and deaths so that they add up to the total number of new cases and deaths forecasted for all races combined in the United States.

Incidence, Mortality, and Survival Rates

We examined the long-term temporal trend (1975–2000) in age-adjusted breast cancer incidence and mortality rates (2000 standard million population) for women of all races, whites, and African Americans using a joinpoint regression model.¹⁴ Joinpoint analysis is a model of joined lines (straight lines on a log scale). Joinpoint analysis chooses a model of line segments, such that each is joined at points called a “joinpoint.” Each joinpoint denotes a statistically significant change in trend. For joinpoint analysis, the overall significance was set at $P = .05$, with a maximum of three joinpoints and four line segments allowed. An annual percent change (APC) was used to describe the trend

for each line. We also examined the temporal trend in incidence rates by tumor size (≤ 2 cm, 2.1–5.0 cm, and > 5 cm) from 1988 through 2000 and by stage, expressed as extent of disease at diagnosis (local, regional, and distant) from 1975 through 2000 for the same racial groups using the joinpoint model. For the other racial and ethnic groups, we estimated the annual percent change in incidence and mortality rates from 1992 through 2000 using a simple linear model,¹⁵ as data were sparse to analyze the incidence trend by tumor size and tumor stage. We also computed the five-year relative survival rate by tumor stage and race for cases diagnosed during two time periods (1975–1979 and 1992–1999) using SEER*Stat.¹⁶ Rates shown in figures are based on moving averages of two years (ie, the average rate for two consecutive years) to improve stability of rates.

SELECTED FINDINGS

Expected Numbers of New Cases and Deaths

Table 1 shows the estimated number of female breast cancer cases and deaths that will occur in the United States in 2003 by race and ethnicity. Approximately 211,300 new cases of invasive breast cancer will be diagnosed and 39,800 deaths will occur among women in the United States in 2003. Whites account for the largest portion of estimated cases (82%) and deaths (80%). In addition to invasive breast cancers, approximately 55,700 cases of in situ cancer will be diagnosed among women in the United States in 2003.¹⁷

Incidence Rates

Female breast cancer incidence rates vary considerably across racial and ethnic groups. The average annual age-adjusted incidence rate from 1996 to 2000 was 140.8 cases per 100,000 among white women, 121.7 among African Americans, 97.2 among Asian Americans/Pacific Islanders, 89.8 in Hispanics, and 58 in American Indians/Alaska Natives.⁹ Probable reasons for the higher incidence rates in whites than in other racial and ethnic groups are discussed below.

Female breast cancer incidence rates increased for all women combined from 1980 to 2000, although the rate of increase slowed in the 1990s (Table 2). The temporal trends in incidence are shown by race and ethnicity in Figure 1. Incidence rates continue to increase in white women (0.4% per year for 1987–2000), but have stabilized in African American women since 1992 (Table 2). In the other racial and ethnic groups, rates increased from 1992 through 2000 in Asian Americans/Pacific Islanders (2.1% per year) and Hispanics (1.3% per year) but decreased among American Indians/Alaska Natives (3.7% per year).⁹

The prevalence of several established risk factors differ across racial and ethnic subpopulations and may contribute to the higher incidence rates in whites compared with other racial and ethnic groups. These include differences in underlying reproductive risk factors (older age at first birth), use of hormone replacement therapy (HRT), and access to and use of screening. White women tend to have delayed child bearing¹⁸ and more commonly use HRT. Among women who participated in the First National Health and Nutrition Survey and who were followed from 1970 to 1992, the proportion of those who used HRT for at least five years after menopause was 23% among whites and 8% among African Americans.¹⁹ Mammography use has also been historically higher in white than in African American women, although rates have become comparable in the most recent survey years.¹²

Several studies have examined the long-term trends in breast cancer in relation to historical changes in reproductive patterns^{4,20} and use of mammography.^{5,6} More limited data document the increased use of HRT since the 1970s. In National Health and Nutrition Examination Survey I data, the proportion of postmenopausal women who used HRT for five years or more increased from 20% in the early 1970s to 31% in the late 1980s and early 1990s.¹⁹

Figures 2 and 3 and Tables 2 and 3 present incidence data on female breast cancer by tumor size and stage for women of all races, whites, and African Americans. The absolute rate and temporal trend differs between white

TABLE 1

Estimated Female Breast Cancer Cases and Deaths by Race/Ethnicity, United States, 2003.						
Race/Ethnicity	In Situ Cases*	%	Invasive Cases*	%	Deaths*	%
White	46,200	82.9	173,300	82.0	31,700	79.6
African American	5,400	9.7	20,000	9.5	5,700	14.3
Hispanic	2,200	3.9	11,000	5.2	1,600	4.0
Asian or Pacific Islander	1,800	3.2	6,500	3.1	700	1.8
Native American/Alaska Native	50	0.1	500	0.2	100	0.3
Total	55,700		211,300		39,800	

*Rounding to nearest hundred except Native American/Alaska Natives.
 Percentages may not exactly total 100%, due to rounding.
 Estimates of new cases are based on incidence rates from 1979 to 1999.
 American Cancer Society, Surveillance Research, 2003.

TABLE 2

Trends in Breast Cancer Incidence, by Stage at Diagnosis, and Mortality Rates, by Race, 1975-2000								
Race/Stage	Line Segment 1		Line Segment 2		Line Segment 3		Line Segment 4	
	Years	APC	Years	APC	Years	APC	Year	APC
Incidence								
All races								
All Stages	1975-1980	-0.4	1980-1987	3.7*	1987-2000	0.4*		
Localized	1975-1982	0.4	1982-1987	8.6*	1987-2000	1.2*		
Regional	1975-1986	1.2*	1986-1994	-2.9*	1994-2000	2.2*		
Distant	1975-2000	-0.1						
White								
All Stages	1975-1980	-0.3	1980-1987	3.8*	1987-2000	0.4*		
Localized	1975-1982	0.4	1982-1987	8.9*	1987-2000	1.2*		
Regional	1975-1986	1.3*	1986-1993	-3.4*	1993-2000	1.7*		
Distant	1975-2000	-0.1						
African American								
All Stages	1975-1992	2.2*	1992-2000	-0.2				
Localized	1975-1995	3.9*	1995-2000	-1.7				
Regional	1975-1977	-8.6	1977-1985	2.8*	1985-1997	-1.4*	1997-2000	4.4
Distant	1975-2000	0.1						
Mortality								
All Races	1975-1990	0.4*	1990-2000	-2.3*				
White	1975-1990	0.3*	1990-2000	-2.5*				
African American	1975-1991	1.6*	1991-2000	-1.0*				

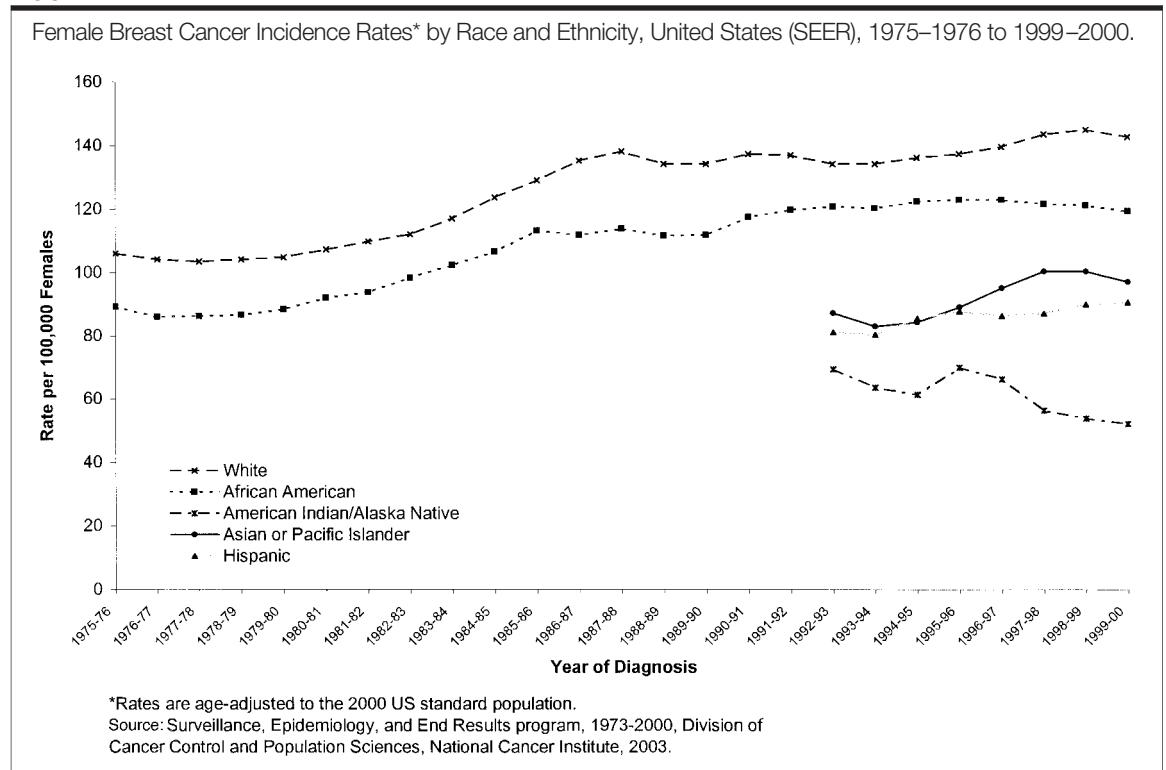
*The APC is significantly different from zero ($P < .05$).
 APC, annual percentage change is based on rates age adjusted to the 2000 US standard population and is determined by joinpoint regression program, with a maximum of three joinpoints (ie, four line segments). The APC for each line segment is for different time periods, and the APC for all stages may not equal the average of APCs of individual stage categories.
 Incidence is from Surveillance, Epidemiology, and End Results program, 1973-2000, Division of Cancer Control and Population Sciences, National Cancer Institute, 2003. Mortality is from US Mortality Public Use Data Tapes, 1969-2000, National Center for Health Statistics, Centers for Disease Control and Prevention, 2003.

and African American women. The incidence of small tumors (≤ 2 cm) and localized disease was consistently higher in white women, whereas the incidence of larger tumors (> 5 cm) and distant-stage disease was higher in African American women. The incidence of small tumors (≤ 2 cm) increased in both white and African American women from 1988 to

2000 (Table 3). Unexpectedly, the incidence rate of large tumors (> 5 cm) increased by 2.1% per year, from 1992 (5.6 cases per 100,000) to 2000 (6.3 cases per 100,000) in white women.

The incidence rate for breast tumors diagnosed at a localized stage has continued to increase among white women but has stabilized in African American women since 1995 (Table 2

FIGURE 1



and Figure 3). The incidence of regional-stage disease increased from 1993 to 2000 in white women but stabilized in African American women after decreasing in both white (1986–1993) and African American women (1985–1997). In contrast, rates for distant-stage disease were constant among both African American and white women during these time periods. The percentage of breast cancer cases that are unstaged has decreased over time, with no significant difference between African American and white women. The proportion with unstaged diseases decreased from 6% in 1975 to 2% in 2000 in white women and from 5% to 3% in African American women in the corresponding time periods.

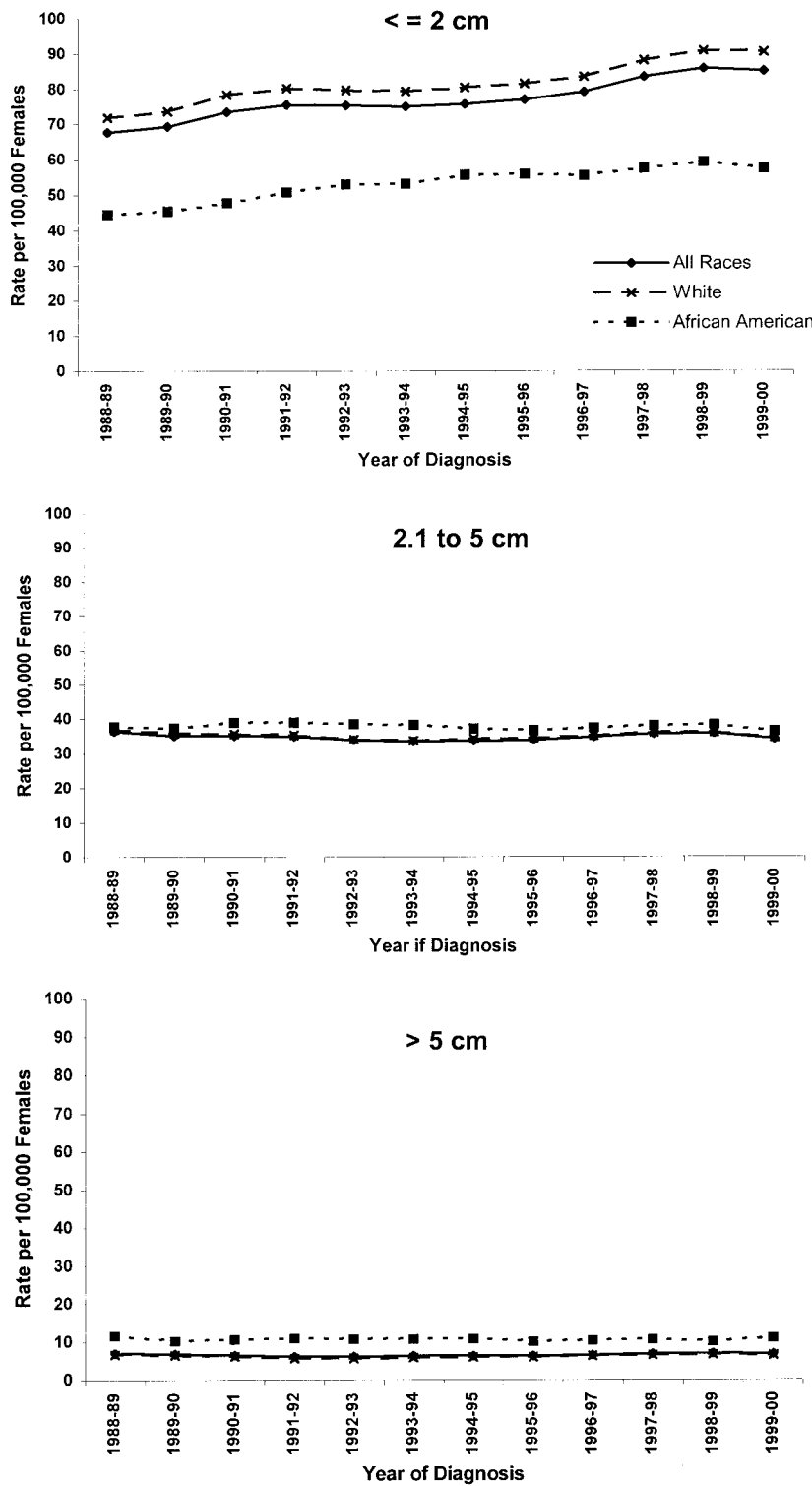
Reasons for the small increase in regional stage and larger tumors among white women during the most recent time period (1993–2000) are not fully understood. The increase may reflect the higher prevalence of some underlying risk factor such as postmenopausal obesity, HRT, or both. Data from the Women's Health Initiative Randomized Trial documented that breast cancers

were larger and were diagnosed at more advanced stage in women who used estrogen plus progestin than in those who did not use HRT.²¹ The increased incidence of regional-stage disease may also reflect new technologies used to stage breast cancer.²²

Although women of other racial and ethnic groups have substantially lower breast cancer incidence rates than do African American and white women (Figure 1), in general, they are more likely to be diagnosed with advanced-stage disease and large tumors compared with white women. During the period 1996 to 2000, the proportion of cases diagnosed with tumors larger than two cm was 46.4% in African American women, 46% in Hispanics, 42.5% in American Indians/Alaska Natives, 36% in Asian Americans/Pacific Islanders, and 32.3% in white women. The corresponding proportions for distant-stage diseases was 9% in African American women, 8.1% in American Indians/Alaska Natives, 7.1% in Hispanics, 5.4% in whites, and 4.5% in Asian Americans/Pacific Islanders.

FIGURE 2

Trends in Breast Cancer Incidence Rates by Tumor Size and Race, 1988-1989 to 1999-2000.

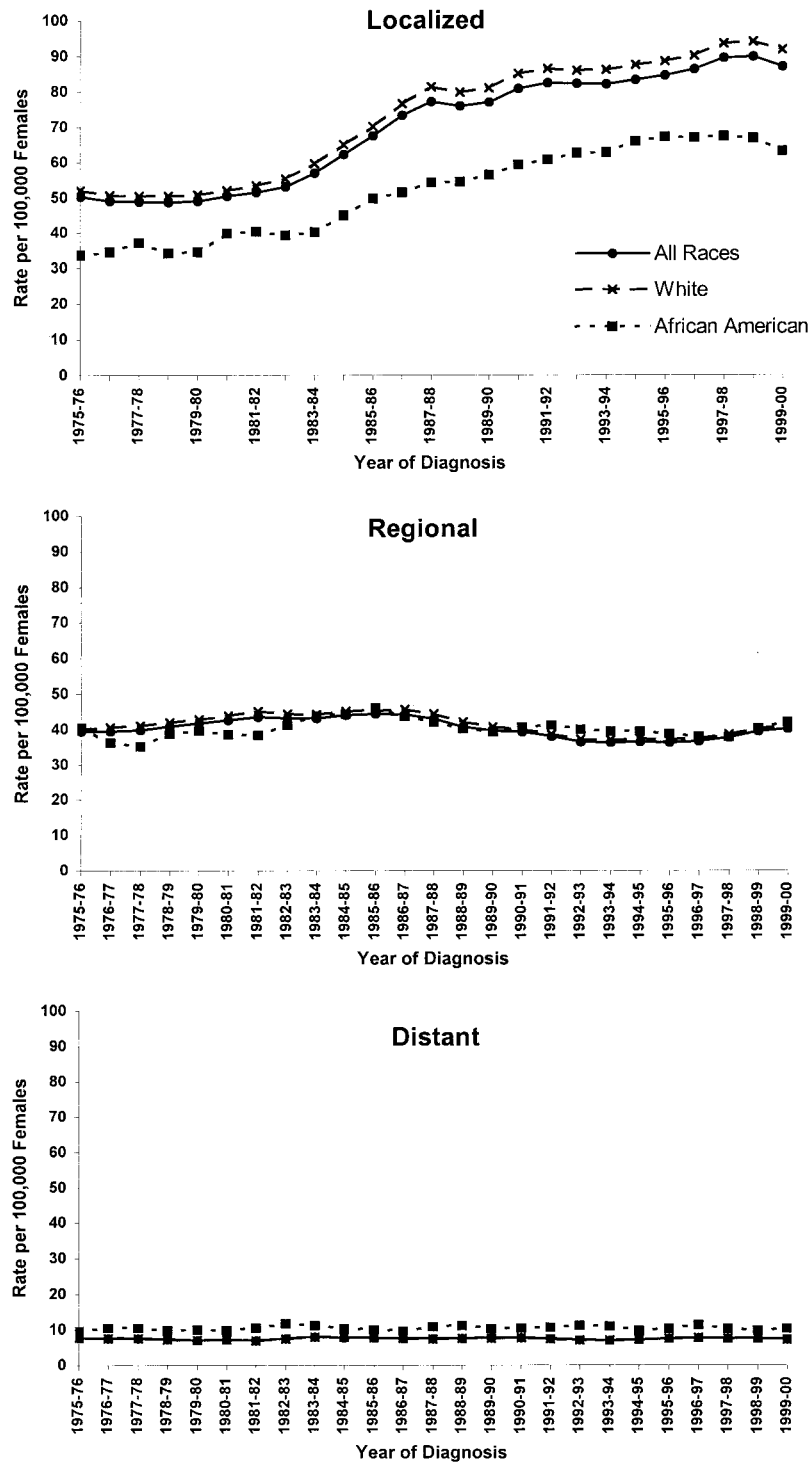


Source: Surveillance, Epidemiology, and End Results Program, 1973-2000, Division of Cancer Control and Population Sciences, National Cancer Institute, 2003.

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FIGURE 3

Trends in Female Breast Cancer Incidence Rates by Stage and Race, 1975–1976 to 1999–2000.



Source: Surveillance, Epidemiology, and End Results Program, 1973-2000, Division of Cancer Control and Population Sciences, National Cancer Institute, 2003.

TABLE 3

Trends in Breast Cancer Incidence Rates by Tumor Size and Race, 1988–2000						
Race/Tumor Size	Line Segment 1		Line Segment 2		Line Segment 3	
	Year	APC	Year	APC	Year	APC
All races						
≤ 2.0 cm	1988–2000	1.9*				
2.1–5.0 cm	1988–1994	–1.8*	1994–1998	2.3	1998–2000	–3.9
> 5.0 cm	1988–1992	–4.0*	1992–2000	1.7*		
White						
≤ 2.0 cm	1988–2000	1.9*				
2.1–5.0 cm	1988–1993	–2.3*	1993–1998	1.6	1998–2000	–3.2
> 5.0 cm	1988–1992	–4.4*	1992–2000	2.1*		
African American						
≤ 2.0 cm	1988–2000	2.2*				
2.1–5.0 cm	1988–2000	–0.4				
> 5.0 cm	1988–2000	0.4				

*The APC is significantly different from zero ($P < .05$).

APC = Annual Percent Change based on rates age adjusted to the 2000 US standard population

Note: Trends were analyzed by joinpoint regression program with a maximum of three joinpoints, ie, four line segments.

Source: Incidence from Surveillance, Epidemiology, and End Results program of NCI, 1975–2000.

The higher proportion of disease diagnosed at advanced stage and larger tumor size among the minority women, compared with white women, is thought to reflect access to and use of screening and timely treatment. Mammography use among racial and ethnic minorities lagged behind that in white women for most of the interval from 1987 to 2000, although rates are now approaching those for white women (Table 4a). The Centers for Disease Control and Prevention's National Breast and Cervical Cancer Early Detection Program was begun in 1990 to improve access to breast cancer screening and diagnostic services for low-income women.²³ However, it has been estimated that this program reaches only 12% to 15% of uninsured women between the ages of 50 and 64 years who are eligible for screening services.²⁴ The percentage of low-income women who reported recent mammography screening in 2000 was 55% in age 40 and older (Table 4a) and 47% in age 40 to 49 (Table 4b), 20% lower than the average among all women. Other factors beyond not having had a recent mammogram that may contribute to later stage at diagnosis among poor and minority women are less frequent mammography, delays between abnormal mammographic findings and definitive diagnosis, more limited access to health care services, and host characteristics.^{25,26}

Figure 4 shows trends in ductal carcinoma in situ (DCIS) by race and ethnicity. Among white and African American women, the incidence of DCIS increased rapidly between the early 1980s and late 1980s, stabilized between the late 1980s and early 1990s, and increased rapidly afterward. Rates for DCIS during the 1990s also increased in Asian Americans/Pacific Islanders and to a lesser extent in Hispanics. Rates were stable in American Indians/Alaska Natives. The rapid increases in DCIS are largely attributed to increased use of mammography,²⁷ because most cases of DCIS are detectable only through mammography.

Survival Rates

Figure 5 shows five-year relative survival rates from breast cancer for white and African American women by tumor stage for cases diagnosed during two time periods (1975–1979 and 1992–1999). Higher relative survival rates and greater improvement in survival over time are observed in white than in African American women. For white women, the five-year relative survival rates increased from 90.7% to 97.6% for localized disease, 68.8% to 80.3% for regional-stage disease, and 18% to 24.6% for distant-stage disease. Among African Americans, relative survival increased from 84.8% to 89.7% for localized disease and from 55.1% to 66% for regional disease but

TABLE 4a

Year	All Women 40+,		Race/Ethnicity				
	Crude	Crude, Below Poverty	White	African American	American Indian & Alaska Native	Asian†	Hispanic
1987	28.7	16.4	29.6	24.0	‡	‡	18.3
1990	51.4	30.8	52.2	46.4	43.2	46.0	45.2
1991	54.6	35.2	55.6	48.0	54.5	45.9	49.2
1993	59.7	41.1	60.0	59.1	49.8	55.1	50.9
1994	60.9	44.2	60.6	64.3	65.8	55.8	51.9
1998	66.9	50.5	67.4	66.0	45.2	60.2	60.2
1999	70.3	56.9	70.6	71.0	63.0	58.3	65.7
2000	70.3	55.2	71.4	67.8	47.3	53.3	61.4

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

†Data for Asian category do not include Native Hawaiians and other Pacific Islanders.

‡Estimates are not considered reliable.

TABLE 4b

Year	40–49 years		50–64 years		65 years and Older	
	Below poverty	At or above poverty	Below poverty	At or above poverty	Below poverty	At or above poverty
1987	23.0	33.4	15.1	34.3	13.6	25.5
1990	32.2	57.0	29.9	58.5	30.8	46.2
1991	33.0	58.1	37.3	63.0	35.2	51.1
1993	36.1	62.1	47.3	66.8	40.4	56.4
1994	43.0	63.4	46.2	68.8	43.9	57.7
1998	44.9	65.0	53.5	75.7	52.3	66.2
1999	52.5	68.7	61.1	77.4	57.3	67.8
2000	47.2	65.9	62.7	80.6	55.4	70.0

*Percent of women having a mamogram within the past two years.

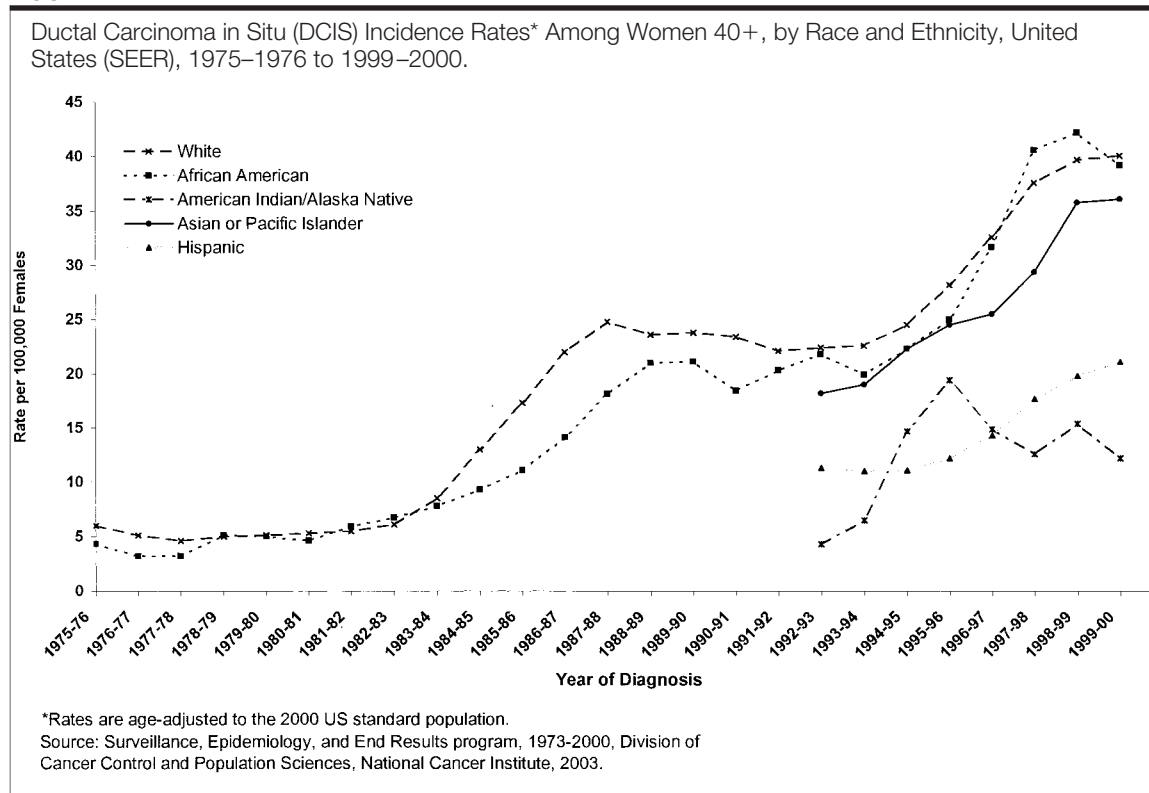
†Before 1998, poverty status is based on family income and family size using Bureau of the Census poverty thresholds. Beginning in 1998, poverty status is based on family income, family size, number of children in the family, and for families with two or fewer adults, the age of the adults in the family. Missing family income data were imputed for 13%–16% of adults in the sample in 1990–1994. Poverty status was unknown for 25% of persons in the sample in 1998, 28% in 1999, and 27% in 2000. Source: Health, United States, 2002.¹² Source: Centers for Disease Control Prevention, Health, United States, 2002

remained unchanged (15%) for distant-stage disease. Five-year relative survival rates cannot be estimated for other racial and ethnic groups. However, an analysis of cancer-specific survival, adjusted for age and tumor stage, among women with breast cancer reported to SEER from 1988 to 1997 revealed increased odds of cancer death for Hispanic whites (RR = 1.1; CI = 1.1–1.2), African Americans (RR = 1.6; CI = 1.6–1.7), and American Indians/Alaska Natives (RR = 1.6; CI = 1.3–2.0) compared with to non-Hispanic whites.²⁸

The modest improvements in stage-specific relative survival is thought to result from a com-

bination of advances in treatment (adjuvant chemotherapy, radiation and hormonal therapies, and better characterization of prognostic factors and targeted therapies) and earlier detection within stage.²⁹ One collaborative trial reported that polychemotherapy (multiagent chemotherapy) reduced mortality rates by 27% and 11% in women younger than 50 years and in women 50 to 69 years who have early breast cancer.³⁰ Five-year treatment with adjuvant tamoxifen reduced mortality rates by more than 26% in women with estrogen receptor-positive breast cancer.³¹ There is some evidence that these treatments have disseminated fairly rapidly to community-based

FIGURE 4



physicians and their patients in the United States.³² However, not all segments of the population have benefited equally from medical advances, as reflected in survival and mortality rate disparities between white and African American women.

Mortality Rates

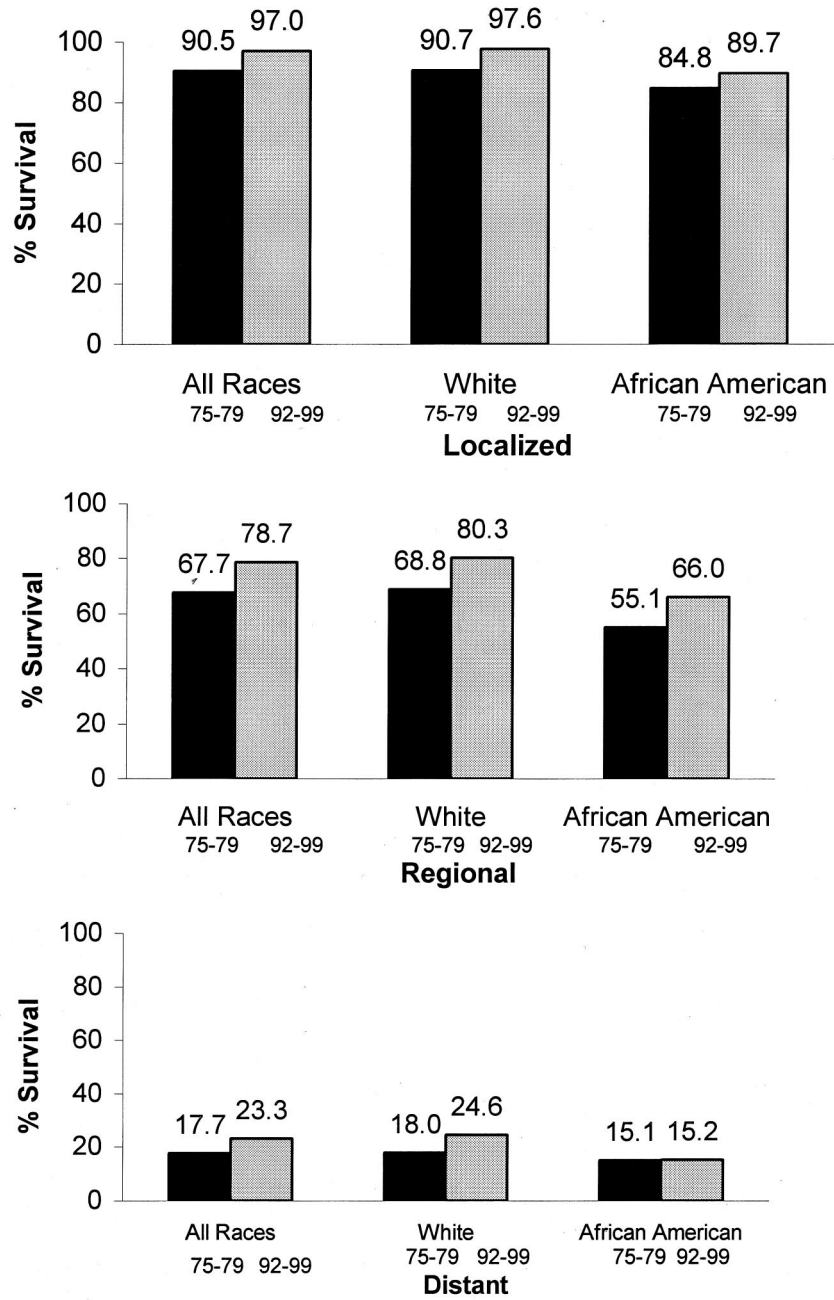
As with incidence rates, mortality rates vary by race and ethnicity (Figure 6). From 1996 to 2000, the average annual female breast cancer death rate was highest in African Americans (35.9 cases per 100,000 women), followed by whites (27.2), Hispanics (17.9), American Indians/Alaska Natives (14.9), and Asian Americans/Pacific Islanders (12.5).⁹ The death rate is higher among African American than white women despite lower incidence. Similarly, the breast cancer mortality rate is higher in Hispanic and American Indians/Alaska Natives than in Asian American/Pacific Islanders despite lower incidence.

Breast cancer death rates decreased by 2.5% per year since 1990 among white women, and by 1% per year since 1991 among African American women (Table 2). From 1992 through 2000, female breast cancer death rates also decreased in Hispanics (1.4% per year), whereas rates remained unchanged among Asian Americans/Pacific Islanders and American Indians/Alaskan Natives.⁹ There has been a notable divergence between long-term breast cancer mortality rate trends for white and African American women. During the early 1980s, breast cancer death rates for white and African American women were approximately equal, but by 2000, African American women had a 32% higher death rate than did white women.

Factors that may explain the difference in breast cancer death rates between African American and white women include differences in timely diagnosis through mammography and unequal access to prompt, high-quality treatment. Use of mammography in the 1980s and early 1990s was lower in African American

FIGURE 5

Five-Year Relative Survival Rates* by Race and Stage, United States (SEER), 1975–1979 to 1992–1999.



*Survival rates are based on follow-up of patients through 2000.

Source: Surveillance, Epidemiology and End Results Program, 1973-2000, Division of Cancer Control and Population Sciences, National Cancer Institute, 2003.

FIGURE 6

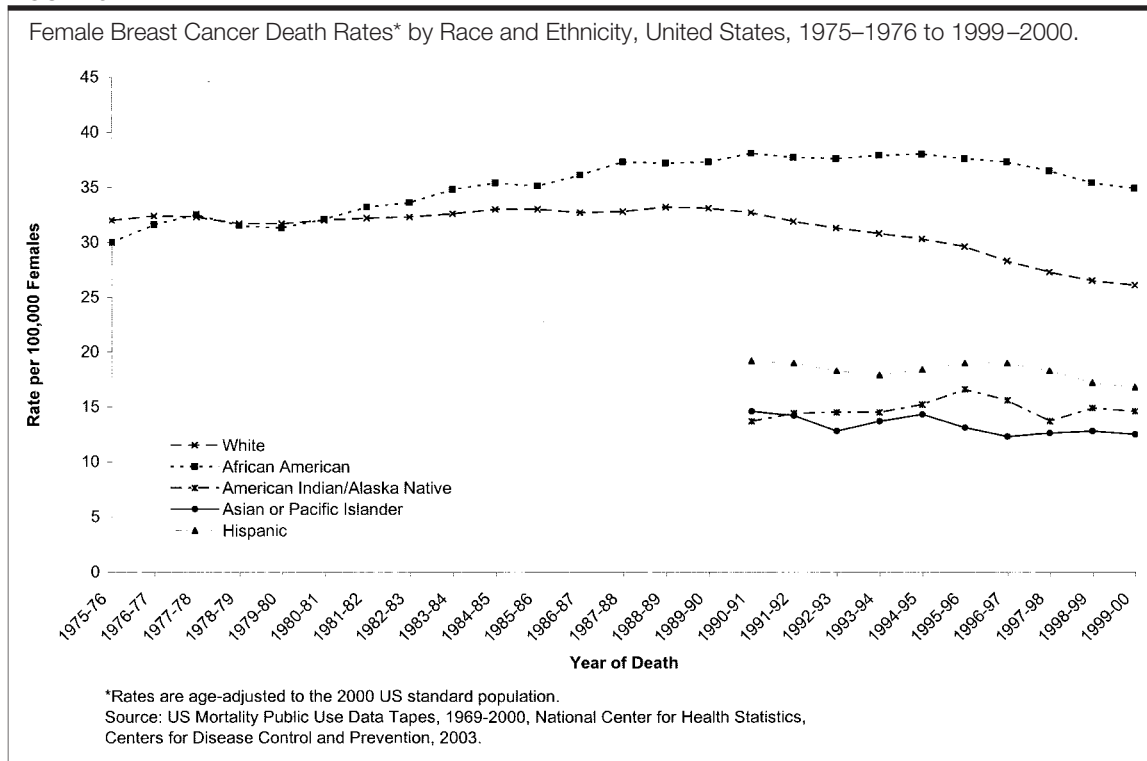


TABLE 5

American Cancer Society Guideline for Early Breast Cancer Detection, 2003	
Women at average risk	Begin mammography at age 40. Women should have an opportunity to become informed about the benefits, limitations, and potential harms associated with regular screening. For women in their 20s and 30s, it is recommended that clinical breast examination be part of a periodic health examination, preferably at least every 3 years. Asymptomatic women aged 40 and older should continue to receive CBE as part of a periodic health examination, preferably annually. Beginning in their 20s, women should be told about the benefits and limitations of BSE. The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.
Older women	Screening decisions in older women should be individualized by considering the potential benefits and risks of mammography in the context of current health status and estimated life expectancy. As long as a woman is in reasonably good health and would be a candidate for treatment, she should continue to be screened with mammography.
Women at increased risk	Women at increased risk of breast cancer might benefit from additional screening strategies beyond those offered to women of average risk, such as earlier initiation of screening, shorter screening intervals, or the addition of screening modalities (such as ultrasound or MRI) other than mammography and physical examination. However, the evidence currently available is insufficient to justify recommendations for any of these screening approaches.

CBE, clinical breast examination; BSE, breast self-examination; MRI, magnetic resonance imaging.

women than in white women (Table 4a). African American women are also less likely to receive radiation therapy after breast-conserving surgery.³³⁻³⁶ In the general population, the relative survival rate is lower among

African American than white women. The disparity is substantially less in situations where treatment is equal across racial and ethnic groups.^{37,38} An analysis of the survival experience of women with breast cancer treated in

US military health care facilities suggest that the disparity in breast cancer survival between African American and white women could be reduced by 70% by providing equal treatment to all women.³⁷ Passage of the Breast and Cervical Cancer Prevention Act of 2000, which states the option to provide medical assistance through Medicaid to eligible women who were screened through the Center for Disease Control and Prevention's National Breast and Cervical Cancer Early Detection Program, should reduce economic barriers to those who meet the eligibility criteria.³⁹

Although continued research is needed on the causes, prevention, and treatment of breast cancer, much progress can be made by applying current knowledge fully and equitably to all segments of the population. ACS recommendations for early detection⁴⁰ are presented in Table 5, and recommendation for treatments are provided elsewhere.⁴¹ Continued progress against breast cancer disparities requires continued efforts to ensure that all women have access to high-quality prevention, detection, and treatment services.

REFERENCES

- IARC, WHO. Breast cancer, in Stewart B, Kleihues P (eds). World Cancer Report. Lyon: IARC Press, 2003;188–19.
- Armstrong B. Recent trends in breast-cancer incidence and mortality in relation to changes in possible risk factors. *Int J Cancer* 1976;17:204–211.
- King S, Schottenfeld D. The “epidemic” of breast cancer in the U. S. –Determining the factors. *Oncology* 1996;10:453–472.
- Chu K, Tarone R, Kessler L, et al. Recent trends in US breast cancer incidence, survival, and mortality rates. *J Natl Cancer Inst* 1996;88:1571–1579.
- Miller B, Feuer E, Hankey B. Recent incidence trends for breast cancer in women and the relevance of early detection: an update. *CA Cancer J Clin* 1993;43:27–41.
- Garfinkel L, Boring CC, Heath CW Jr. Changing trends. An overview of breast cancer incidence and mortality. *Cancer* 1994;74:222–227.
- Smith R, Saslow D. Breast cancer, in Win-good GM, DiClemente RJ (eds). *Handbook of Women's Sexual and Reproductive Health*. New York: Kluwer Academics/Plenum Publishers, 2002; pp 345–365.
- Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence–SEER 9 Regs Public Use, Nov. 2002 Sub (1973–2000) < 18 Age Groups >, National Cancer Institute, DC-CPS, Surveillance Research Program, Cancer Statistics Branch, released April 2003, based on the November 2002 submission.
- Ries LAG, Eisner MP, Kosary CL, et al. SEER Cancer Statistics Review, 1975–2000. Bethesda, MD: National Cancer Institute, 2003.
- National Center for Health Statistics. Division of Vital Statistics, Centers for Disease Control. Available at: <http://www.cdc.gov/nchs/nvss.htm>, 2003.
- US Census Bureau. Available at: <http://www.census.gov>.
- National Center for Health Statistics. Health, United States, 2002 With Chartbook on Trends in the Health of Americans. Hyattsville, MD: National Center for Health Statistics, 2002.
- Wingo PA, Landis S, Parker S, et al. Using cancer registry and vital statistics to estimate the number of new cases cancer cases and deaths in the US for the upcoming year. *J Registry Management* 1998;25:43–9.
- Kim HJ, Fay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with applications to cancer rates. *Stat Med* 2000;19:335–351.
- SAS Institute. SAS/STAT User's Guide, version 6, vol. 1. Cary, NC: SAS Institute, 1989.
- Surveillance Research Program, National Cancer Institute SEER*Stat software (available at www.seer.cancer.gov/seerstat), version 5.0.17.
- Jemal A, Murray T, Samuels A, et al. Cancer statistics, 2003. *CA Cancer J Clin* 2003;53:5–26.
- Hamilton BE, Sutton PD, Ventura SJ. Revised birth and fertility rates for the 1990s and new rates for Hispanic populations, 2000 and 2001: United States. *Natl Vital Stat Rep* 2003;51:1–94.
- Brett KM, Madans JH. Use of postmenopausal hormone replacement therapy: estimates from a nationally representative cohort study. *Am J Epidemiol* 1997;145:536–545.
- Tarone RE, Chu KC. Implications of birth cohort patterns in interpreting trends in breast cancer rates. *J Natl Cancer Inst* 1992;84:1402–1410.
- Chlebowski RT, Hendrix SL, Langer RD, et al. Influence of estrogen plus progestin on breast cancer and mammography in healthy postmenopausal women: the Women's Health Initiative Randomized Trial. *JAMA* 2003;289:3243–3253.
- Wong SL, Chao C, Edwards MJ, et al. The use of cytokeratin staining in sentinel lymph node biopsy for breast cancer. *Am J Surg* 2001;182:330–334.
- Centers for Disease Control and Prevention. The National Breast and Cervical Cancer Early Detection Program—Reducing Mor-tality Through Screening. Available at <http://www.cdc.gov/cancer/nbccedp/about.htm>, 2003.
- Implementing recommendation for the early detection of breast and cervical cancer among low income women. *MMWR* 2000;49:37–50.
- Caplan LS, May DS, Richardson LC. Time to diagnosis and treatment of breast cancer: results from the National Breast and Cervical Cancer Early Detection Program, 1991–1995. *Am J Public Health* 2000;90:130–134.
- Brawley OW. Disaggregating the effects of race and poverty on breast cancer outcomes. *J Natl Cancer Inst* 2002;94:471–473.
- Ernster VL, Barclay J, Kerlikowske K, et al. Incidence of and treatment for ductal carcinoma in situ of the breast. *JAMA* 1996;275:913–918.
- Clegg LX, Li FP, Hankey BF, et al. Cancer survival among US whites and minorities: a SEER (Surveillance, Epidemiology, and End Results) Program population-based study. *Arch Intern Med* 2002;162:1985–1993.
- National Cancer Institute. Breast Cancer (PDQ): Treatment. Health Professional Version. Available at <http://cancer.gov/cancerinfo/pdq/treatment/breast/healthprofessional/>, 2003.
- Polychemotherapy for early breast cancer: an overview of the randomised trials. Early Breast Cancer Trialists' Collaborative Group. *Lancet* 1998;352:930–942.
- Early Breast Cancer Trialists' Collaborative Group. Tamoxifen for early breast cancer: an overview of the randomised trials. *Lancet* 1998;351:1451–1467.
- Mariotto A, Feuer EJ, Harlan LC, et al. Trends in use of adjuvant multi-agent chemotherapy and tamoxifen for breast cancer in the United States: 1975–1999. *J Natl Cancer Inst* 2002;94:1626–1634.
- Farrow DC, Hunt WC, Samet JM. Geographic variation in the treatment of localized breast cancer. *N Engl J Med* 1992;326:1097–1101.
- Ballard-Barbash R, Potosky AL, Harlan LC, et al. Factors associated with surgical and

radiation therapy for early stage breast cancer in older women. *J Natl Cancer Inst* 1996;88:716-726.

35. Mandelblatt JS, Hadley J, Kerner JF, et al. Patterns of breast carcinoma treatment in older women: patient preference and clinical and physical influences. *Cancer* 2000;89:561-573.
36. Joslyn SA. Racial differences in treatment and survival from early-stage breast carcinoma. *Cancer* 2002;95:1759-1766.
37. Wojcik BE, Spinks MK, Optenberg SA. Breast carcinoma survival analysis for African American and white women in an equal-access health care system. *Cancer* 1998;82:1310-1318.
38. Bach PB, Schrag D, Brawley OW, et al. Survival of blacks and whites after a cancer diagnosis. *JAMA* 2002;287:2106-2113.
39. Guidance and Summary of Actions on the Breast and Cervical Cancer Prevention and Treatment Act of 2000. Atlanta: Centers for Disease Control and Prevention, 2003.
40. Smith R, Saslow D, Sawyer K, et al. American Cancer Society Guidelines for Breast Cancer Screening: Update 2003. *CA Cancer J Clin* 2003; 53:141-169.
41. U. S. Preventive Services Task Force Update, 2002 Release. Chemoprevention: Hormone Replacement. <http://www.ahcpr.gov/clinic/uspstf/uspsmho.htm>.