Breast Cancer Statistics, 2013

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In this article, the American Cancer Society provides an overview of female breast cancer statistics in the United States, including data on incidence, mortality, survival, and screening. Approximately 232,340 new cases of invasive breast cancer and 39,620 breast cancer deaths are expected to occur among US women in 2013. One in 8 women in the United States will develop breast cancer in her lifetime. Breast cancer incidence rates increased slightly among African American women; decreased among Hispanic women; and were stable among whites, Asian Americans/Pacific Islanders, and American Indians/Alaska Natives from 2006 to 2010. Historically, white women have had the highest breast cancer incidence rates among women aged 40 years and older; however, incidence rates are converging among white and African American women, particularly among women aged 50 years to 59 years. Incidence rates increased for estrogen receptor-positive breast cancers in the youngest white women, Hispanic women aged 60 years to 69 years, and all but the oldest African American women. In contrast, estrogen receptor-negative breast cancers declined among most age and racial/ethnic groups. These divergent trends may reflect etiologic heterogeneity and the differing effects of some factors, such as obesity and parity, on risk by tumor subtype. Since 1990, breast cancer death rates have dropped by 34% and this decrease was evident in all racial/ethnic groups except American Indians/Alaska Natives. Nevertheless, survival disparities persist by race/ethnicity, with African American women having the poorest breast cancer survival of any racial/ethnic group. Continued progress in the control of breast cancer will require sustained and increased efforts to provide high-quality screening, diagnosis, and treatment to all segments of the population.

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Introduction
Excluding skin cancers, breast cancer is the most common cancer diagnosed among women in the United States, accounting for nearly 1 in 3 cancers. It is also the second leading cause of cancer death among women after lung cancer. In this article, we describe trends in breast cancer incidence, mortality, and survival rates by race/ethnicity in the United States, as well as state variations in these measures. We further examine recent incidence trends by estrogen receptor (ER) status and age at diagnosis. Additional data are available from the biennial publication of Breast Cancer Facts & Figures (available at cancer.org/statistics).

Materials and Methods
Data Sources
Data regarding incidence, probabilities for developing cancer, and cause-specific survival were obtained from the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute.1-4 The SEER program has been collecting clinical, pathological, and demographic information on cancer patients 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/Latinas since 1992.

The SEER program began collecting information on ER status in 1990. Over time, data concerning ER status have become more complete, with missing information ranging from 23% in 2000 to 4% in 2010. To account for the improvement in completeness when analyzing trends, we allocated ER status for those with missing information according to

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observed proportions of ER-positive (ER+) and ER-negative (ER-) breast cancer cases by age and year of diagnosis using the method previously described by Anderson et al.\(^5\)

Trends by ER status were also adjusted for reporting delay using delay adjustment ratios from the National Cancer Institute through the Cancer Query Systems (CanQues) database.\(^6\) Delay adjustment accounts for anticipated future corrections to reported cancer case counts and primarily affects the most recent years of incidence data. Delay adjustment ratios are not available for the SEER 13 and SEER 18 registries, and therefore SEER 9 delay factors were used to adjust these data. Furthermore, ratios are not available by Hispanic ethnicity and therefore ratios for whites and African Americans were used to adjust rates for non-Hispanic whites and non-Hispanic African Americans, respectively, and white ratios were used for Hispanics.

Incidence rates by race/ethnicity for 2006 through 2010, state-specific incidence rates, and the proportion of breast cancers diagnosed at in situ and regional/distant stages were obtained using data from the North American Association of Central Cancer Registries based on incidence data from SEER and the National Program of Cancer Registries.\(^7,8\)

Mortality data were obtained from the SEER program’s SEER*Stat database as provided by the National Center for Health Statistics.\(^4,9,10\) Beginning in 1969, data are available for whites and African Americans. Since 1990, data are available for the 5 major racial and ethnic groups: non-Hispanic whites, Asian Americans, African Americans/Pacific Islanders, American Indians/Alaska Natives, and Hispanics. Population data were obtained from the US Census Bureau.

Prevalence data regarding mammography by age and state were obtained from the 2010 and 2012 Behavioral Risk Factor Surveillance System, an ongoing system of surveys conducted by the individual state health departments in cooperation with the Centers for Disease Control and Prevention. For describing the current screening prevalence by state, we used 2012 data; however, we used data from 2010 for examining the association with currently available incidence data from 2006 through 2010.

Statistical Analyses

Estimates of the total number of invasive and in situ breast cancer cases and breast cancer deaths for 2013 were published previously.\(^11\) We calculated the estimated number of breast cancer cases by age at diagnosis by applying the proportion of cases diagnosed in each age group during 2006 through 2010 from the North American Association of Central Cancer Registries analytic file to the total number of estimated cases of invasive and in situ breast cancer. Similarly, we calculated the estimated number of breast cancer deaths by age at death by applying the proportion of deaths that occurred in each age group during 2006 through 2010 to the total estimated breast cancer deaths in 2013.

We examined incidence trends by race/ethnicity, age, and ER status and mortality trends by state using the Join-point regression program to calculate the average annual percent change.\(^12\) The relationship between state-level mammography screening rates in 2010 and the percentage of breast cancer cases diagnosed at in situ and late stages between 2006 and 2010 was examined by the Pearson correlation coefficient. Probabilities of developing breast cancer were calculated using DevCan (Probability of Developing Cancer Software), which was developed by the National Cancer Institute.\(^13\)

Selected Findings

Expected Numbers of New Cases and Deaths

Table 1 shows the estimated number of female breast cancer cases and deaths that are expected to occur in the United States in 2013 by age. Approximately 232,340 new cases of invasive breast cancer and 39,620 deaths are expected among US women in 2013.\(^11\) Approximately 79% of new cases and 88% of breast cancer deaths in 2013 will occur among women aged 50 years and older. In addition to invasive breast cancers, about 64,640 new diagnoses of in situ breast cancer are expected among US women in 2013.

Probability of Developing Invasive Female Breast Cancer

A woman living in the United States has a 12.3%, or a 1-in-8, lifetime risk of being diagnosed with breast cancer (Table 2). In the 1970s, the lifetime risk of being diagnosed with breast cancer was 1 in 11. This increase in risk is due to a longer life expectancy, as well as increases in breast

| AGE | IN SITU CASES | INVASIVE CASES | DEATHS |
|-----|---------------|----------------|--------|
| <40 | 1,900         | 10,980         | 1,020  |
| <50 | 15,650        | 48,910         | 4,780  |
| 50-64 | 26,770       | 84,210         | 11,970 |
| 65+ | 22,220        | 99,220         | 22,870 |
| All ages | 64,640       | 232,340        | 39,620 |

*Rounded to the nearest 10. Source: Total estimated cases are based on 1995 to 2009 incidence rates from 49 states as reported by the North American Association for Central Cancer Registries. Total estimated deaths are based on data from US Mortality Data, 1995 to 2009, National Center for Health Statistics, Centers for Disease Control and Prevention.
cancer incidence. Lifetime risk reflects an average woman’s risk over an entire lifetime, including the possibility that she may die of another cause before she would have been diagnosed with breast cancer. Age-specific probabilities for developing breast cancer over a 10-year period are also provided in Table 2. For example, the risk for a woman aged 50 years without cancer of being diagnosed with breast cancer over the next 10 years is 2.3\% (or 1 in 43 women who are aged 50 years will be diagnosed with breast cancer by age 60 years).

### Long-Term Incidence Trends

Delay-adjusted incidence rates for in situ and invasive female breast cancer for women aged younger than 50 years and those aged 50 years and older are presented in Figure 1. Much of the historic increase in breast cancer incidence reflects changes in reproductive patterns, such as delayed childbearing and having fewer children, which are recognized risk factors for breast cancer. However, breast cancer incidence rates increased rapidly in the 1980s due largely to the greater use of mammography screening. The widespread uptake of mammography screening inflated the incidence rate because cancers were being diagnosed 1 to 3 years earlier than they otherwise would have in the absence of screening and may also have led to the detection of indolent cases. Overall rates stabilized in the early 1990s, followed by a slower increase during the latter half of the decade. This trend may reflect further increases in the prevalence of mammography screening as well as rising rates of obesity and the use of menopausal hormones, both of which increase breast cancer risk. Between 2002 and 2003, breast cancer rates dropped sharply (nearly 7\%), most likely due to the decreased use of menopausal hormones after the 2002 publication of the results of the Women’s Health Initiative randomized trial. The decline occurred primarily in white women, in women aged 50 years and older, and in women with ER\+ disease. This trend may also, in part, reflect declines in mammography screening. The percentage of women aged 40 years and older who reported having a mammogram within the past 2 years peaked in 2000, declined slightly, and has since stabilized. Similar reversals in breast cancer trends have been observed internationally as well. Breast cancer incidence rates have been relatively stable among women aged younger than 50 years since 1985 and since 2004 among women aged 50 years and older.

Incidence rates of in situ breast cancer rose rapidly in the 1980s and 1990s (Fig. 1), largely because of increased

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**TABLE 2. Age-Specific Probabilities of Developing Invasive Female Breast Cancer**

| IF CURRENT AGE IS: | THE PROBABILITY OF DEVELOPING BREAST CANCER IN THE NEXT 10 YEARS IS: OR 1 IN: |
|---------------------|--------------------------------------------------------------------------------|
| 20                  | 0.06% 1,732                                                                  |
| 30                  | 0.44% 228                                                                    |
| 40                  | 1.45% 69                                                                     |
| 50                  | 2.31% 43                                                                     |
| 60                  | 3.49% 29                                                                     |
| 70                  | 3.84% 26                                                                     |
| Lifetime risk       | 12.29% 8                                                                     |

*Among those free of cancer at the beginning of the age interval. Based on cases diagnosed between 2008 and 2010. Percentages and “1 in” numbers may not be numerically equivalent due to rounding. Probabilities derived using the National Cancer Institute DevCan Software (version 6.7.0).

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**FIGURE 1. Incidence and Mortality Rates* of Female Breast Cancer by Age, United States, 1975 to 2010.** Rates are age adjusted to the 2000 US standard population within each age group. Sources: Incidence: Surveillance, Epidemiology, and End Results (SEER) Program, SEER 9 registries, 1975-2010. Bethesda, MD: National Cancer Institute, Division of Cancer Control and Population Sciences; 2013; data were adjusted for reporting delay. Mortality: National Center for Health Statistics, Centers for Disease Control and Prevention, as provided by the SEER program.
diagnosis as a result of increases in mammography screening. The increase was observed in women aged both older and younger than 50 years, although it was larger in the older age group. Since 1999, incidence rates of in situ breast cancer have stabilized in women aged 50 years and older, but continue to increase in younger women (1.9% per year from 1998 to 2010). The stabilization in incidence among older women likely reflects trends in mammography screening rates, which peaked in 2000 and then stabilized at a slightly lower rate. It may also reflect a reduced pool of prevalent cases as a result of widespread screening.

Incidence Trends by Race/Ethnicity
Breast cancer incidence rates and short-term (2006-2010) trends by race/ethnicity are described in Table 3. Long-term trends in incidence rates by race/ethnicity are also shown in Figure 2. Female breast cancer incidence rates vary substantially by race/ethnicity. From 2006 to 2010, the average annual female breast cancer incidence rate was highest in non-Hispanic white women (127.3 cases per 100,000 females) and lowest for Asian Americans/Pacific Islanders (84.7 cases per 100,000 females). During 2006 through 2010 (the most recent 5 years of data available), overall breast cancer incidence rates increased slightly (0.2% per year) among African American women; decreased by 0.6% per year in Hispanic women; and did not change significantly among non-Hispanic whites, Asian Americans/Pacific Islanders, or American Indians/Alaska Natives. Notably, breast cancer incidence rates for white and African American women are converging. Rates for white and African American women were adjusted for delays in case reporting; delay-adjusted rates are not available for other races/ethnicities, resulting in slightly underestimated rates for the most recent data years. In addition, rates for American Indians/Alaska Natives are less stable than for other racial and ethnic groups because high-quality data for this group are only available from limited geographic areas.

Incidence Trends by Age and ER Status
Breast cancer incidence trends by age for the 3 largest racial/ethnic groups are presented in Figure 3. Although non-Hispanic white women have the highest overall breast cancer incidence rates in most age groups, African American women have higher rates among women aged younger than 40 years. In this figure, incidence rates are similar for white and African American women aged 30 years to 49 years.

TABLE 3. Rates and Trends in Incidence and Mortality and Cause-Specific Survival for Female Breast Cancer by Race/Ethnicity

| RACE/ETHNICITY          | INCIDENCE Rate 2006-2010 | AAPC* 2006-2010 | MORTALITY Rate 2006-2010 | AAPC* 2001-2010 | 5-YEAR CAUSE-SPECIFIC SURVIVAL Rate 2003-2009 |
|-------------------------|---------------------------|-----------------|---------------------------|-----------------|-----------------------------------------------|
| Non-Hispanic White      | 127.3                     | 0.1\(^{b}\)      | 22.7                      | −1.8\(^{c}\)    | 88.6                                          |
| African American        | 118.4                     | 0.2\(^{c}\)      | 30.8                      | −1.6\(^{c}\)    | 78.9                                          |
| Asian American/Pacific Islander | 84.7            | 0.0              | 11.5                      | −1.0\(^{c}\)    | 91.1                                          |
| American Indian/Alaska Native | 90.3               | −0.3             | 15.5                      | −0.4            | 85.4                                          |
| Hispanic/Latina         | 91.1                      | −0.6\(^{c}\)     | 14.8                      | −1.7\(^{c}\)    | 87.0                                          |

*AAPC indicates average annual percent change.
*AAPC is for white women and is not exclusive of Hispanic ethnicity.
*AAPC is significantly different from zero (\(P < .05\)).
Sources: Incidence rates: Copeland et al. AAPCs, mortality rates, and survival: Howlader et al.
Notably, in the women aged 50 years to 59 years, breast cancer incidence rates have recently converged among non-Hispanic white and African American women.

Overall breast cancer incidence rates increased during the most recent time period (2006-2010) among non-Hispanic white women aged 30 years to 49 years and African American women aged 60 years to 69 years, whereas rates decreased for Hispanic women aged 30 years to 49 years and 50 years to 59 years. If incidence rates continue to increase among African American women aged 60 years to 69 years, rates for African American and white women may also converge in this age group.

We further examined the age-specific and race-specific incidence trends by ER status. In every age group, white women have the highest rates of ER+ breast cancer and African American women have the highest rates of ER- breast cancer. These differences may reflect racial variations in the prevalence of risk factors that differ by

**FIGURE 3.** Trends in Female Breast Cancer Incidence Rates* by Age, Race/Ethnicity, and Estrogen Receptor Status, 2000 to 2010. *Rates are per 100,000 age adjusted to the 2000 US standard population. Note: A smaller scale was used to plot estrogen receptor-negative incidence rates to facilitate visualization of the trends. ER status was imputed for those with missing information. Source: Incidence: Surveillance, Epidemiology, and End Results (SEER) Program, SEER 18 registries, 1975-2010. Bethesda, MD: National Cancer Institute, Division of Cancer Control and Population Sciences; 2013. Data were adjusted for reporting delay.
ER status. For example, reproductive history and obesity appear to be more strongly associated with ER+ breast cancer, whereas lower socioeconomic status is associated with an increased risk of ER- breast cancer. Studies that include black women with breast cancer in Africa have suggested that genetic differences may also play a role.

Recent incidence trends vary substantially by ER status. During 2006 through 2010, the incidence rates of ER+ breast cancer increased in every age group among African American women except for the oldest (those aged 70 years and older), with faster increases among younger age groups. Rates of ER+ breast cancers also increased among younger (aged 30 years to 49 years) white women and Hispanic women aged 60 years to 69 years, whereas a slight decrease was observed for older (those aged 70 years and older) Hispanic women. Significant decreases were also observed for ER- breast cancer in most age/racial/ethnic groups. ER-breast cancer declined sharply (more than 3% per year) among all women aged younger than 60 years. Among women aged 60 years to 69 years, the decrease in ER-breast cancers was observed only among white women. In the oldest age group (those aged 70 years and older), ER-breast cancers decreased among both non-Hispanic white and Hispanic women.

Previous studies have also noted increasing trends for ER+ breast cancer and decreasing trends for ER- breast cancer in the United States and Denmark. The reasons for the diverging trends are not clear. We previously suggested that they may reflect the establishment of a newer lower cutoff for ER positivity (1% of tumor nuclei positive by immunohistochemistry), which had been as high as 10%. However, a recent study suggests this may not be much of a contributing factor because similar recent trends were observed in Denmark, where ER measurement has been consistent. There is a growing body of evidence that breast cancer risk factors for ER+ and ER- breast cancers are distinct.

**Long-Term Mortality Trends**

Figure 1 also shows trends in death rates for breast cancer by age at death. After slowly increasing for many years (0.4% annually from 1975-1990), breast cancer death rates decreased by 34% from 1990 to 2010. The decline was larger among women aged younger than 50 years (3.1% per year) than among those aged 50 years and older (1.9% per year). Declines in breast cancer mortality have been attributed to both improvements in treatment and early detection.

**Mortality Trends by Race/Ethnicity**

Similar to incidence rates, mortality rates vary by race and ethnicity. During 2006 through 2010, the average annual female breast cancer death rate was highest in African Americans (30.8 deaths per 100,000 females) and lowest among Asian Americans/Pacific Islanders (11.5 deaths per 100,000 females) (Table 3). The higher death rate among African Americans, despite their having a lower incidence rate than non-Hispanic whites, is due to both a later stage of disease at diagnosis and poorer stage-specific survival. For example, the 5-year relative survival for regional stage breast cancer is 74% in African American women compared with 86% in white women. Research suggests that racial disparities in cancer mortality are driven in large part by differences in socioeconomic status.

Long-term trends in breast cancer mortality rates by race/ethnicity are shown in Figure 4. From 2001 through 2010, breast cancer death rates declined annually by 1.8% in non-Hispanic whites, 1.7% in Hispanics/Latinas, 1.6% in African Americans, and 1.0% in Asian Americans/Pacific Islanders, but remained unchanged among American Indians/Alaska Natives. A striking divergence in long-term breast cancer mortality trends between African American and white women began in the early 1980s. This mortality difference most likely reflects a combination of factors, including differences in stage at diagnosis, obesity and other comorbidities, and tumor characteristics, as well as access to, compliance with, and response to treatment. By 2010, death rates were 41% higher in African American compared with white women.

**Survival**

The 5-year cause-specific survival rates by race/ethnicity are provided in Table 3. Cause-specific survival rates are used instead of relative survival to describe survival in racial and ethnic minorities because estimates of normal life expectancy are not available for all racial/ethnic groups. Cause-specific survival is the probability of not dying of breast cancer within a specified number of years after diagnosis. African American women have the lowest 5-year survival rate (78.9%) of any racial or ethnic group. Asian American/Pacific Islander women have the highest 5-year breast cancer survival rate (91.1%).

Poverty, less education, and a lack of health insurance are also associated with lower breast cancer survival. Patients with breast cancer who reside in lower-income
areas have lower 5-year survival rates than those in higher-income areas at every stage of diagnosis.41

Variation by State

State variations in mammography screening prevalence, breast cancer incidence, and mortality rates and the proportion of breast cancers diagnosed at in situ and regional/distant stages are presented in Table 4. In 2012, the prevalence of recent mammography screening within the past year among non-Hispanic white women aged 40 years and older ranged from 48% in Wyoming to 72% in Massachusetts. Thirty-two states had sample sizes large enough to estimate the prevalence of mammography screening within the past year in African American women aged 40 years and older, which ranged from 49% in Arkansas to 73% in Delaware.

Breast cancer incidence rates ranged from 109.6 cases per 100,000 females in Arkansas to 160.5 cases per 100,000 females in the District of Columbia among non-Hispanic white women and from 83.4 cases per 100,000 females in New Mexico to 147.5 cases per 100,000 females in Alaska among African American women. When comparing incidence rates among states, it is important to consider that incidence rates reflect the intensity of screening as well as disease occurrence. The percentage of in situ breast cancers, an indicator of mammography use, varied from 15.6% in New Mexico to 25.2% in Massachusetts among non-Hispanic white women and from 15.6% in Mississippi to 27.7% in Massachusetts among African American women. The proportion of regional/distant stage cancers ranged from 29.0% in Vermont to 38.4% in Utah among non-Hispanic white women and from 36.9% in Delaware to 53.2% in Arkansas among African American women.

We assessed the relationship between mammography screening rates in 2010 and breast cancer stage at diagnosis during 2006 through 2010. State-level mammography screening prevalence was positively correlated with the percentage of breast cancers diagnosed at in situ stage (correlation coefficient $r = 0.62; P < .001$) and negatively correlated with the percentage of breast cancers diagnosed at late stages ($r = -0.51; P < .001$) among non-Hispanic white women. Among African American women, state-level mammography screening prevalence was also correlated with in situ diagnoses ($r = 0.47; P = .006$), but not with late-stage diagnoses. Despite similar screening rates, African American women have remained more likely to be diagnosed with regional and distant stage breast cancers compared with white women, which may reflect differences in the quality of mammography screening and delayed follow-up for abnormal mammography findings.42,43

Breast cancer death rates among non-Hispanic white women ranged from 19.9 in Hawaii to 26.2 in New Jersey. In contrast, breast cancer death rates among African American women ranged from 19.7 in Rhode Island to 35.4 in Tennessee. We also examined trends in breast cancer mortality rates from 2001 through 2010 by state for women of all races combined (data not shown). Death rates significantly declined in 36 states during the last 10 years; however, they remained relatively unchanged in the remaining 14 states (Alaska, Arkansas, Delaware, Hawaii, Idaho, Maine, Montana, Nebraska, Nevada, New Mexico, South Dakota, Utah, West Virginia, and Wyoming) as well as the District of Columbia. The lack of a decline in these states is likely related to variations in the prevalence and quality of mammography screening, as well as state differences in racial and socioeconomic composition.

Conclusions

Overall breast cancer incidence rates are converging among white and African American women because of increases in African American women coupled with stable rates in white women. Incidence rates decreased for ER- tumors and increased for ER+ tumors. The decrease in ER- breast cancers may have contributed to the declines in breast cancer mortality rates because these cancers often have a poorer prognosis than ER+ breast cancers.
| State            | NON-HISPANIC WHITE | AFRICAN AMERICAN |
|-----------------|--------------------|-----------------|
|                 | RECENT MAMMOGRAM<sup>a</sup> 2012 | INCIDENCE 2006-2010 | MORTALITY 2006-2010 | AGE 40+, % | % IN SITU<sup>b</sup> | % REGIONAL/ DISTANT<sup>b</sup> | INVASIVE OVERALL RATE | OVERALL RATE |
|                 |                    | INCIDENCE 2006-2010 | MORTALITY 2006-2010 | AGE 40+, % | % IN SITU<sup>b</sup> | % REGIONAL/ DISTANT<sup>b</sup> | INVASIVE OVERALL RATE | OVERALL RATE |
| Age 40+<sup>c</sup> |                    | 2012              | 2012              | 2012        | 2012              | 2012              | 2012              | 2012              |
| Alabama         | 58                 | 18.6              | 37.2              | 117.9       | 21.0              | 64                | 18.3              | 46.3              | 121.2              | 31.5              |
| Alaska          | 53                 | 22.6              | 33.8              | 130.7       | 25.2              | a                 | a                 | a                 | 147.5              | a                 |
| Arizona         | 56                 | 18.9              | 32.9              | 117.1       | 21.5              | a                 | 17.9              | 42.8              | 95.7               | 27.7              |
| Arkansas        | 50                 | 17.7              | 37.3              | 109.6       | 22.3              | 49                | 18.8              | 53.2              | 100.8              | 32.9              |
| California      | 60                 | 18.7              | 33.4              | 140.6       | 24.7              | 70                | 18.4              | 43.1              | 120.7              | 31.8              |
| Colorado        | 55                 | 19.6              | 33.3              | 127.9       | 20.2              | a                 | 18.2              | 46.5              | 121.5              | 23.3              |
| Connecticut     | 66                 | 25.0              | 31.1              | 140.2       | 21.8              | 67                | 26.7              | 40.0              | 110.9              | 27.0              |
| Delaware        | 66                 | 23.2              | 31.6              | 126.9       | 23.3              | 73                | 23.3              | 36.9              | 126.7              | 23.4              |
| District of Columbia<sup>d</sup> | 57                 | 20.8              | 35.5              | 160.5       | 22.6              | 66                | 18.6              | 44.2              | 133.6              | 34.7              |
| Florida         | 60                 | 18.8              | 32.8              | 119.7       | 21.5              | 60                | 19.4              | 46.5              | 105.4              | 29.1              |
| Georgia         | 61                 | 20.0              | 34.2              | 124.0       | 21.9              | 65                | 19.7              | 45.5              | 120.9              | 29.6              |
| Hawaii          | 60                 | 19.2              | 29.8              | 130.4       | 19.9              | a                 | a                 | a                 | 128.5              | a                 |
| Idaho           | 50                 | 16.6              | 36.1              | 121.6       | 22.3              | a                 | a                 | a                 | a                  | a                 |
| Illinois        | 58                 | 20.2              | 34.9              | 131.6       | 23.2              | 59                | 21.0              | 45.5              | 123.4              | 33.4              |
| Indiana         | 53                 | 18.5              | 34.0              | 118.1       | 23.6              | 52                | 20.5              | 42.8              | 117.6              | 31.6              |
| Iowa            | 62                 | 18.6              | 33.5              | 124.6       | 21.6              | a                 | 22.7              | 44.4              | 114.0              | 28.3              |
| Kansas          | 60                 | 16.8              | 34.7              | 123.1       | 22.3              | 60                | 17.2              | 48.1              | 124.0              | 28.1              |
| Kentucky        | 57                 | 16.8              | 35.0              | 121.5       | 22.7              | 68                | 19.1              | 41.8              | 129.4              | 32.9              |
| Louisiana       | 59                 | 17.3              | 35.7              | 119.9       | 22.7              | 64                | 16.1              | 46.2              | 124.6              | 33.8              |
| Maine           | 66                 | 21.8              | 32.0              | 127.3       | 20.8              | a                 | a                 | a                 | a                  | a                 |
| Maryland        | 64                 | 20.6              | 33.7              | 131.3       | 22.8              | 72                | 20.5              | 42.9              | 125.7              | 31.7              |
| Massachusetts<sup>c</sup> | 72                 | 25.2              | 29.7              | 137.9       | 21.8              | 70                | 27.7              | 38.5              | 97.7               | 23.2              |
| Michigan        | 59                 | 21.6              | 32.5              | 118.7       | 22.8              | 60                | 22.7              | 42.7              | 119.4              | 34.3              |
| Minnesota       | 64                 | a                 | a                 | a           | 21.1              | 54                | a                 | a                 | a                  | a                 |
| Mississippi     | 52                 | 16.6              | 36.9              | 112.3       | 20.8              | 53                | 15.6              | 48.4              | 117.3              | 33.4              |
| Missouri        | 58                 | 17.7              | 35.6              | 121.5       | 23.7              | 71                | 19.2              | 47.4              | 130.9              | 32.4              |
| Montana         | 51                 | 19.1              | 34.5              | 123.5       | 20.0              | a                 | a                 | a                 | a                  | a                 |
| Nebraska        | 55                 | 18.3              | 33.6              | 123.7       | 20.0              | 56                | 19.0              | 42.2              | 122.8              | 27.5              |
| Nevada          | 52                 | 16.3              | 34.8              | 120.6       | 24.9              | a                 | 17.1              | 43.4              | 103.7              | 26.6              |
| New Hampshire   | 65                 | 21.9              | 31.1              | 133.1       | 21.5              | a                 | a                 | a                 | 107.3              | a                 |
| New Jersey      | 60                 | 23.5              | 33.7              | 139.4       | 26.2              | 67                | 20.3              | 44.3              | 117.1              | 30.9              |
| New Mexico      | 50                 | 15.6              | 32.1              | 122.9       | 22.4              | a                 | a                 | a                 | 43.0              | 83.4              |
| New York        | 62                 | 24.4              | 32.3              | 138.4       | 22.9              | 66                | 22.0              | 43.2              | 109.0              | 25.8              |
| North Carolina  | 62                 | 18.9              | 34.0              | 127.2       | 21.9              | 63                | 18.4              | 43.3              | 123.0              | 29.9              |
| North Dakota<sup>e</sup> | 59                 | 16.7              | 36.8              | 122.9       | 21.1              | a                 | a                 | a                 | a                  | a                 |
| Ohio            | 60                 | 18.4              | 35.1              | 119.2       | 24.2              | 64                | 19.7              | 43.3              | 116.2              | 31.6              |
| Oklahoma        | 53                 | 16.5              | 35.4              | 120.0       | 24.0              | 60                | 17.2              | 46.0              | 129.4              | 34.7              |
| Oregon          | 54                 | 19.3              | 32.4              | 130.2       | 22.3              | a                 | 17.5              | 50.0              | 106.7              | 22.0              |
Although breast cancer death rates have dropped 34% since 1990, not all segments of the population have benefited from this decrease. Clinicians should follow recommended screening guidelines (Table 5) and encourage their patients aged 40 years and older to have annual mammography. Consistent follow-up of abnormal results, prompt diagnosis, and the delivery of high-quality treatment is critical to further improve breast cancer outcomes. It is also important that patients at high risk of breast cancer are identified and offered appropriate screening and follow-up.

Strategies that may help reduce the risk of breast cancer include avoiding weight gain and obesity, engaging in regular physical activity, and minimizing alcohol intake. The increased risk of breast cancer associated with the use of combined estrogen and progestin therapy should be considered when evaluating treatment options for patients with menopausal symptoms. Clinicians are advised to

### TABLE 4. Continued

| NON-HISPANIC WHITE | AFRICAN AMERICAN |
|--------------------|------------------|
| **RECENT MAMMOGRAM** | **INCIDENCE 2006-2010** | **MORTALITY 2006-2010** | **RECENT MAMMOGRAM** | **INCIDENCE 2006-2010** | **MORTALITY 2006-2010** |
| **AGE** | **% IN SITU** | **% REGIONAL/ DISTANT** | **INVASIVE OVERALL RATE** | **OVERALL RATE** | **AGE** | **% IN SITU** | **% REGIONAL/ DISTANT** | **INVASIVE OVERALL RATE** | **OVERALL RATE** |
| Pennsylvania | 60 | 20.5 | 34.3 | 126.5 | 23.4 | 65 | 21.5 | 43.5 | 127.8 | 32.1 |
| Rhode Island | 68 | 21.1 | 31.5 | 137.3 | 21.5 | a | 18.3 | 41.0 | 104.0 | 19.7 |
| South Carolina | 53 | 18.6 | 34.3 | 124.0 | 21.3 | 59 | 18.1 | 45.4 | 118.5 | 29.8 |
| South Dakota | 62 | 19.9 | 36.5 | 119.0 | 20.7 | a | a | a | a | a |
| Tennessee | 57 | 18.3 | 35.3 | 118.9 | 21.8 | 53 | 16.5 | 45.1 | 122.7 | 35.4 |
| Texas | 55 | 17.5 | 32.9 | 124.6 | 22.0 | 61 | 18.1 | 43.6 | 117.2 | 33.5 |
| Utah | 51 | 17.8 | 38.4 | 113.7 | 22.8 | a | a | a | 96.7 | a |
| Vermont | 62 | 23.7 | 29.0 | 133.2 | 20.7 | a | a | a | a |
| Virginia | 64 | 21.4 | 32.6 | 126.8 | 22.8 | 65 | 21.9 | 41.5 | 127.3 | 33.2 |
| Washington | 57 | 21.0 | 33.0 | 134.8 | 22.7 | 65 | 22.4 | 41.4 | 116.4 | 24.5 |
| West Virginia | 58 | 16.8 | 34.1 | 110.7 | 22.2 | a | 17.9 | 42.4 | 105.7 | 25.8 |
| Wisconsin | 63 | 20.4 | 34.1 | 123.4 | 21.3 | 69 | 24.6 | 48.9 | 116.5 | 29.1 |
| Wyoming | 48 | 16.3 | 36.3 | 113.2 | 21.4 | a | a | a | a |
| United States | 59 | 19.8 | 33.7 | 127.3 | 22.7 | 64 | 19.7 | 44.4 | 118.4 | 30.8 |
| Range | 48-72 | 15.6-25.2 | 29.0-38.4 | 109.6-160.5 | 19.9-26.2 | 49-73 | 15.6-27.7 | 36.9-53.2 | 83.4-147.5 | 19.7-35.4 |

*aStatistics were not shown for mammography if estimates were based on fewer than 50 respondents and for incidence and mortality rates based on 25 or fewer cases or deaths.
*bAll rates are per 100,000 females and age-adjusted to 2000 US standard population.
*cRecent mammogram is defined as having had a mammogram within the past year.
*dThe denominators for percent in situ include all breast cancers. The denominators for percent regional/distant include only invasive breast cancers.
*eMortality data for white women in these states are not exclusive of Hispanic ethnicity.
*fThe incidence rate for white women in Massachusetts is not exclusive of Hispanic ethnicity.

Sources: Mammography: Behavioral Risk Factor Surveillance System 2012, Centers for Disease Control and Prevention. Incidence: Surveillance, Epidemiology, and End Results and National Program of Cancer Registries areas reported by the North American Association of Central Cancer Registries (NAACCR) for 2006 through 2010. Incidence data are not available for Minnesota. Overall US incidence data do not include data from Arkansas, Minnesota, Nevada, Ohio, and Virginia. Mortality: National Center for Health Statistics, Centers for Disease Control and Prevention.

### TABLE 5. American Cancer Society Guidelines for the Early Detection of Breast Cancer in Average-Risk, Asymptomatic Women

**Age 40 and over**
- Annual mammogram
- Annual clinical breast examination (preferably prior to mammogram)
- Breast self-examination (optional)

**Ages 20-39**
- Clinical breast examination at least every 3 y
- Breast self-examination (optional)
discussion of tamoxifen and raloxifene for chemoprevention with women at an increased risk of breast cancer. Data from the 2010 National Health Interview Survey suggest that the use of breast cancer chemoprevention drugs remains remarkably low (well under 1%), with little increase in use observed since 2000, and note a slight shift toward raloxifene since its approval in 2007. Although exemestane is currently approved by the US Food and Drug Administration to prevent breast cancer recurrence, promising results from clinical trials led the American Society of Clinical Oncology to include exemestane in their guidelines as a third option for chemoprevention. Continued progress in the control of breast cancer will require sustained and increased efforts to provide high-quality screening, diagnosis, and treatment to all segments of the population.

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