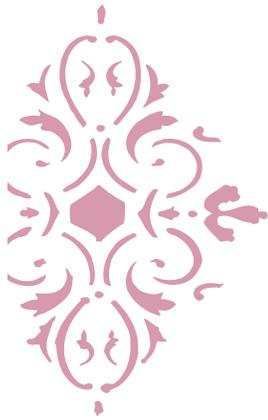


Breast Cancer in Arizona

2000-2009

Revised August 24, 2012





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Introduction Breast Cancer:

The most common invasive cancer diagnosed and reported among females in the United States (U.S.) is breast cancer. The American Cancer Society (ACS) estimates that females have a 1 in 8 chance (12%) of developing invasive breast cancer at some time in their life. The ACS estimated in 2011 that 230,480 new cases of invasive breast cancer and 57,650 new cases of carcinoma in situ were diagnosed in U.S. females.¹

Breast cancer is the second leading cause of cancer death in females in the United States, exceeded only by lung cancer. It was estimated to be responsible for 39,520 deaths among women in the U.S. The ACS reported death rates from breast cancer “have been declining since about 1990, with larger decreases in women younger than 50. These decreases are believed to be the result of earlier detection through screening and increased awareness, as well as improved treatment”.²



Breast cancer usually begins in ducts or tubes of the breast that move milk to the nipple (ductal carcinoma) or in the lobules that produce milk (lobular carcinoma).³ The breast cancer cells can be invasive or non-invasive. Non-invasive cells have not invaded the basement membrane. Breast cancer cases treated when the cancer is in the in situ stage are most likely to be cured, as the cancer has not begun spread to other tissues.

This report analyzes female breast cancer incidence, mortality, and prevalence among women living in Arizona for the years 2000-2009. Male breast cancer is not reviewed as few men develop breast cancer. In the U.S., females are 100 times more likely to get breast cancer than males.⁴ In Arizona, an annual average of 48 males and 3,515 females per year were diagnosed with invasive breast cancer between 2000 and 2009.⁵ All data about Arizona resident female breast cancer incidence was retrieved from the Arizona Cancer Registry database and mortality data was attained from the Arizona Vital Statistics in the Bureau Public Health Statistics of the Arizona Department of Health Services.

Incidence Count and Rate of Female Breast Cancer:

Incidence is defined as the frequency with which a disease, in this case breast cancer, occurs in a particular population or area. Breast cancer is the most frequently diagnosed cancer among females in Arizona. The age adjusted rate of invasive breast cancer (see Figure 1) has decreased from 124.6 cases in year 2000 to 111.3 cases in 2009 per 100,000 females (10.7% decrease), even though the number of invasive breast cancer cases reported has risen from 3,367 in year 2000 to 3,991 in 2009 (see Figure 2). The increase in the number of cases has been driven by the almost 25% increase in the Arizona population during this time period.⁶ When compared against U.S. female breast cancer rates, Arizona has a lower breast cancer rate.⁷ In 2008 (latest U.S. data available), Arizona had an age adjusted female breast cancer rate that was 6.6% lower than the U.S rate. Between 2000 and 2008, the Arizona breast cancer rate decreased slightly more than the US cancer rate (8.6% to 7.6%).

Figure 1: Comparison of Arizona and U.S. Resident Age Adjusted Incidence Rates of Female Breast Cancer 2000–2009

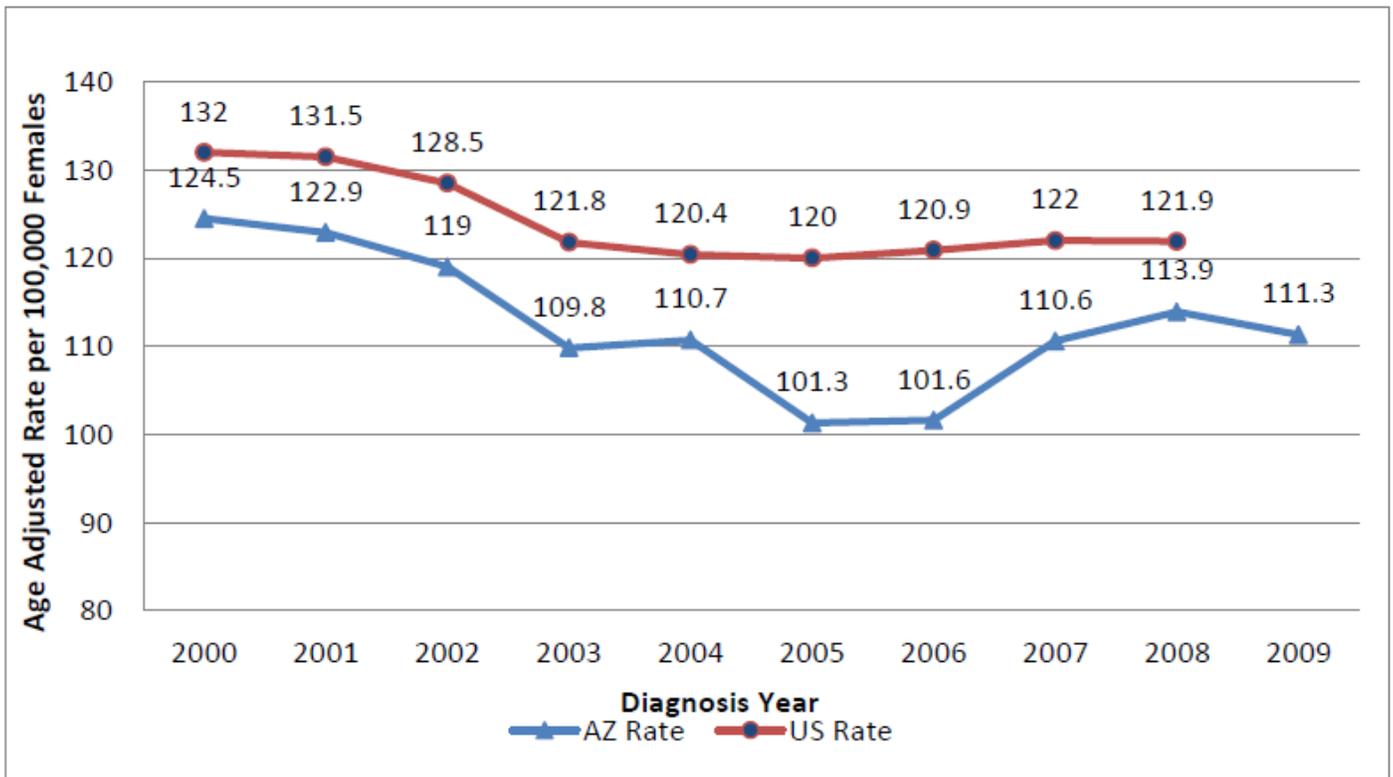
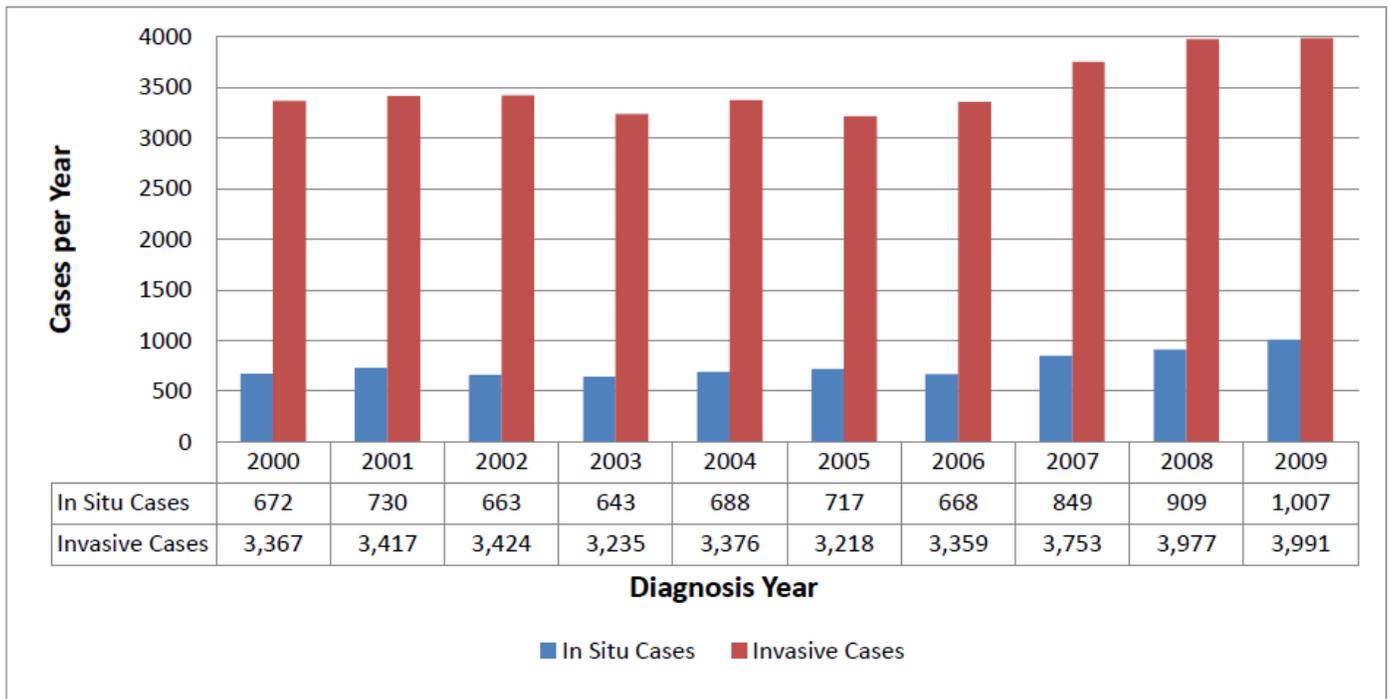


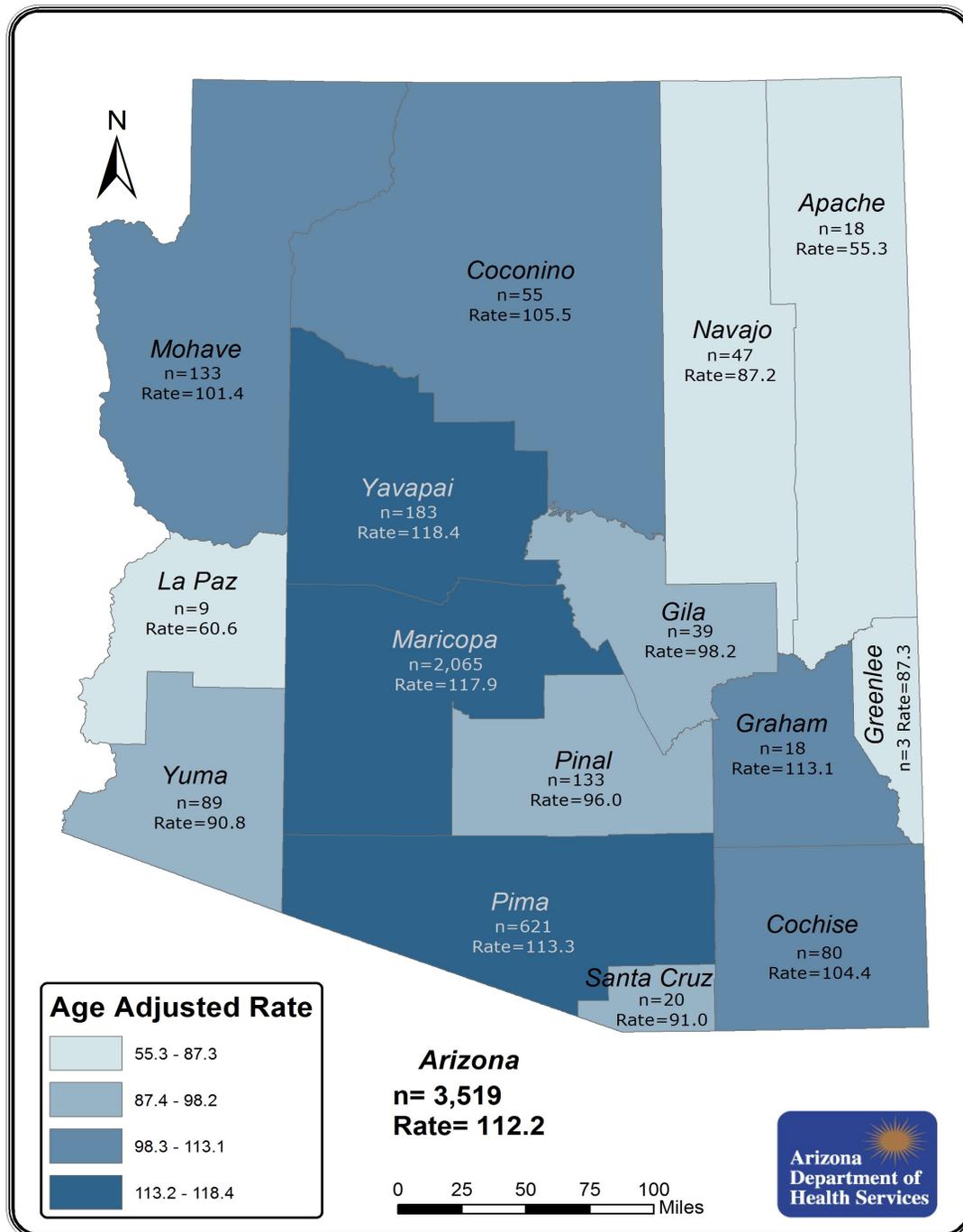
Figure 2: Counts of Invasive and In Situ Female Breast Cancer 2000-2009



County of Residence

In the years 2000- 2009, Yavapai County had the highest incidence rate of female breast cancer (118.4 per 100,000 females), while Apache and La Paz Counties had the lowest rates (55.3 and 60.6 respectively) (see Figure 3). All counties had lower female breast cancer rates than the US rate of 124 cases per 100,000 females.

Figure 3: Incidence of Invasive Breast Cancer in Arizona
Average Annual Counts and Age Adjusted Rates by County*, 2000 - 2009



*An average of 4 cases per year were reported with an unknown county of residence

AGE GROUP

The risk of developing breast cancer increases with age. The National Cancer Institute estimates that a female's chance of developing breast cancer increases from 1 in 233 in the 30-39 age group to 1 in 29 in the 60-69 year age group. In Arizona, the average annual case count increased from 150 cases for the 30 to 39 year age group to 871 cases for the 60 to 69 year age group (See Figure 4) and the age specific rates per 100,000 females increases from 1.3 cases per 100,000 for the under 30 year age group to 407 cases per 100,000 for the 70-79 year age group (see Figure 5).



Figure 4: Average Number of New Arizona Resident Female Breast Cancer Incidence by Age Group for Diagnosis Years 2000-2009

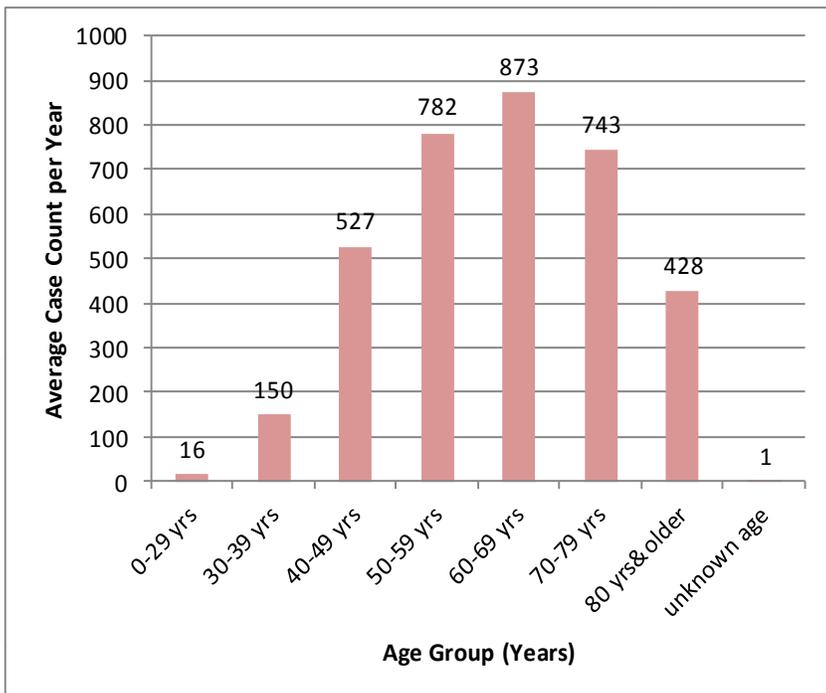
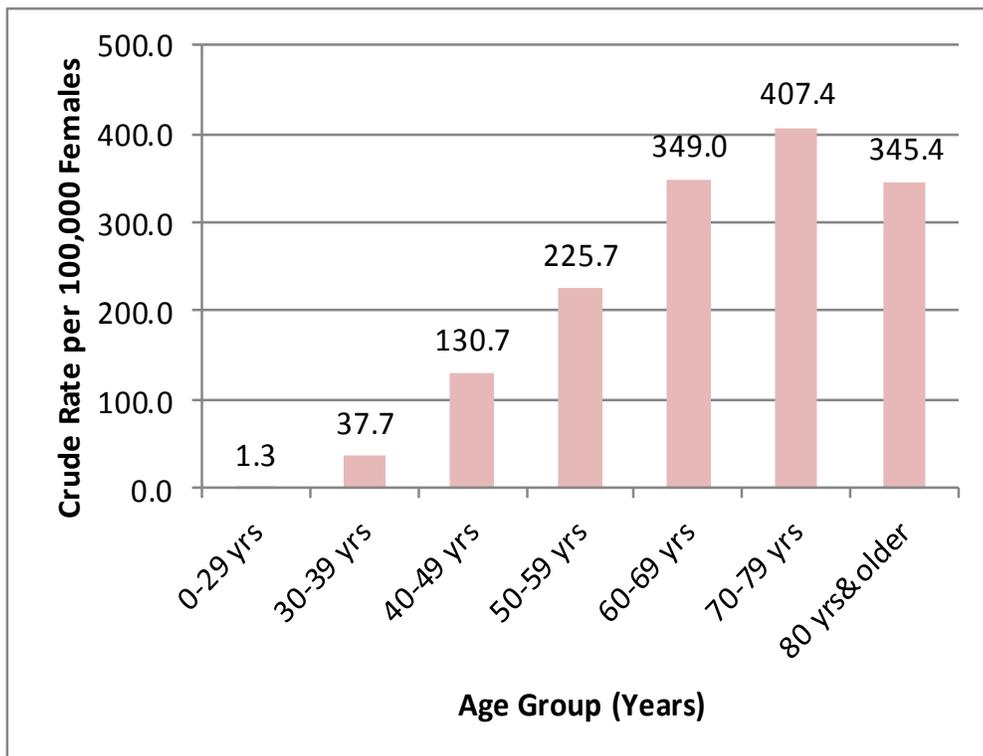


Figure 5: Age Specific Rate of Arizona Resident Female Breast Cancer Incidence by Age Group for Diagnosis Years 2000-2009

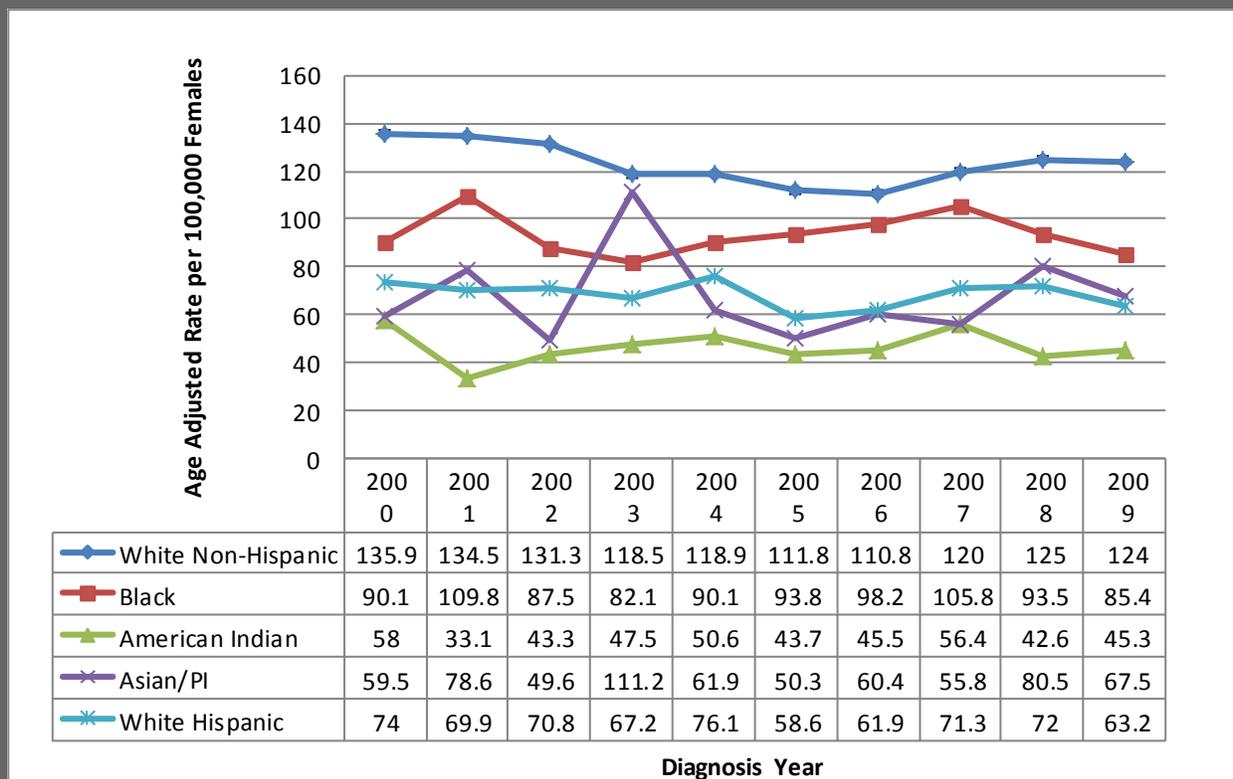


Race/Ethnicity

Female invasive breast cancer cases are most common among the White Non-Hispanic population (84.6% of all cases). White Hispanic cases comprise 8.8% of cases, while other racial groups make up 5% of cases (Black 2.2%, American Indian 1.5%, and Asian & Pacific Islander 1.3%). White Non-Hispanic female breast cancer incidence decreased 8.8% between year 2000 and 2009 dropping from (136 to 124 per 100,000 females). In the ten years reviewed in this report, White Non-Hispanic female breast cancer rates registered their lowest rate in 2006 at 110.8 per 100,000 females (18.5% decrease). However these rates have increased in 2007 to 2009. White Hispanic female breast cancer incidence has decreased 14.8%; from 74.2 in 2000 to 63.2 per 100,000 cases in 2009. The lowest rate was 58.6 per 100,000 cases in 2005. There is a general decreasing trend in female breast cancer among White Hispanics of about two thirds of 1% each year. Significant change from year to year was difficult to measure among the non-White racial groups as they make up about 5% of all female breast cancer cases resulting in small numbers of cases. The age adjusted rates of these groups vary widely due to the small number of cases in each group. No statistically significant change was measured from year to year for any of the racial/ethnic groups. (see Figure 6).



Figure 6: Age Adjusted Incidence Rates by Race\Ethnicity for Arizona Resident Female Breast Cancer for Years 2000-2009



Type of Cancer (Cell Histology)

Infiltrating ductal carcinoma is the most common invasive histology (68%) followed by mixed infiltrating carcinoma with other histologies (10%) and lobular carcinoma (9%) - see Figure 7. Intraductal carcinoma is also the most common in situ histology (58%), followed by comedocarcinoma 10%, lobular 10%, and mixed intraductal carcinoma 9% (see Figure 8).

Figure 7: Histology Percent of Arizona Resident Invasive Breast Cancer Cases 2000-2009

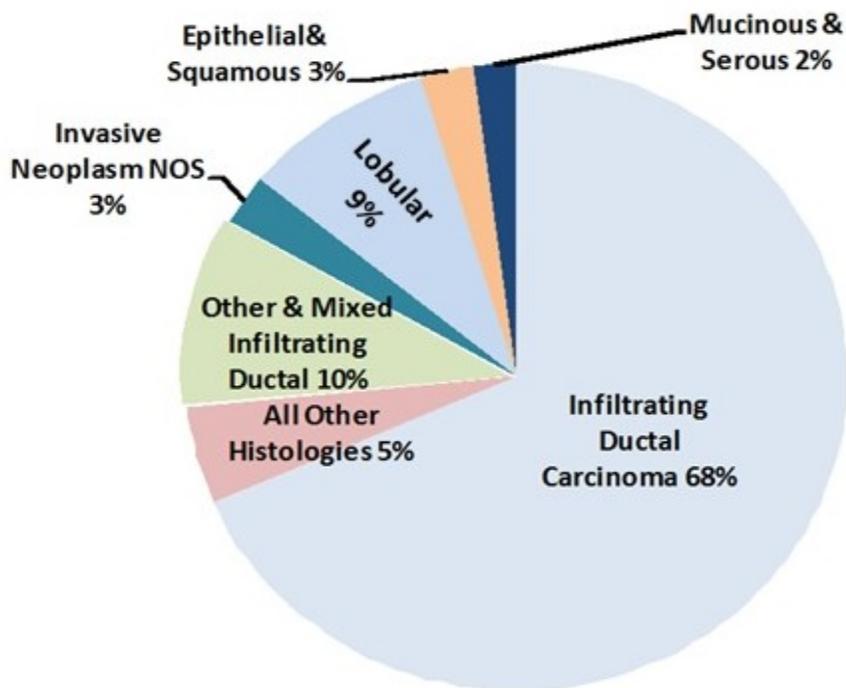
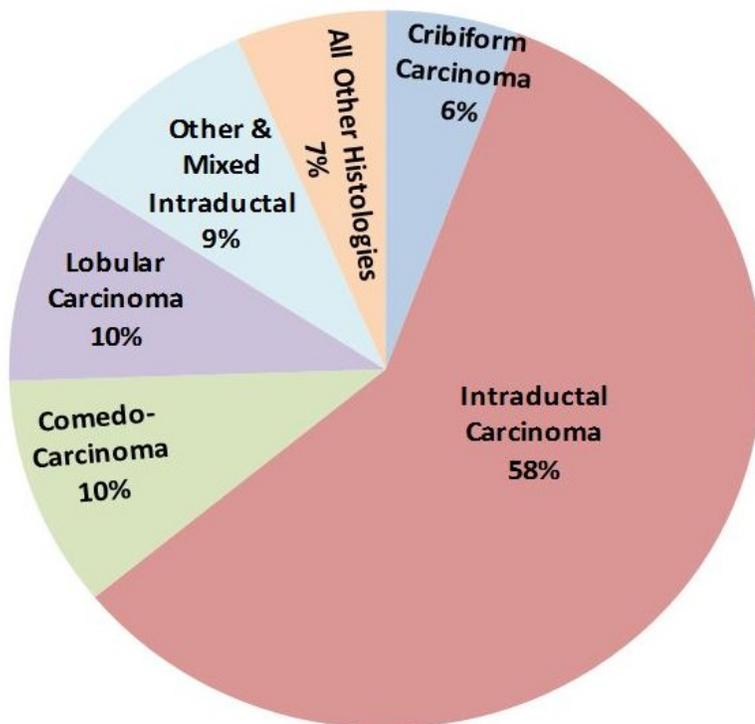


Figure 8: Histology Percent of Arizona Resident In Situ Breast Cancer Cases 2000-2009



Stage of Disease

Almost two thirds (64.9%) of cases were diagnosed in an early stage (In Situ or Local) and only 3.5% were diagnosed in a distant stage (see Figure 9). Over the 10 year period analyzed, White Non-Hispanic females had the highest percent of localized disease (48.3%) (see Figure 10). All race/ethnic groups had more than half of their cases in an early stage. The percent of cases in an early stage ranged from 68.5% for Asian and Pacific Islanders to 54.5% for American Indians.

Figure 9: Percentage of Female Breast Cancer by Surveillance, Epidemiology and End Results (SEER) Summary Stage

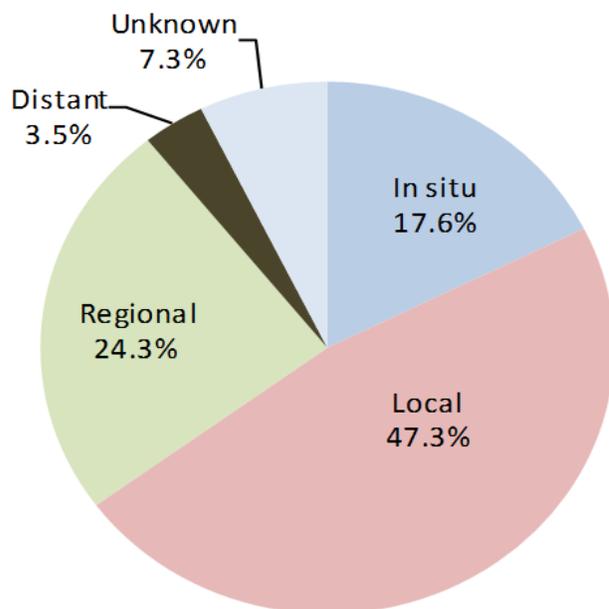
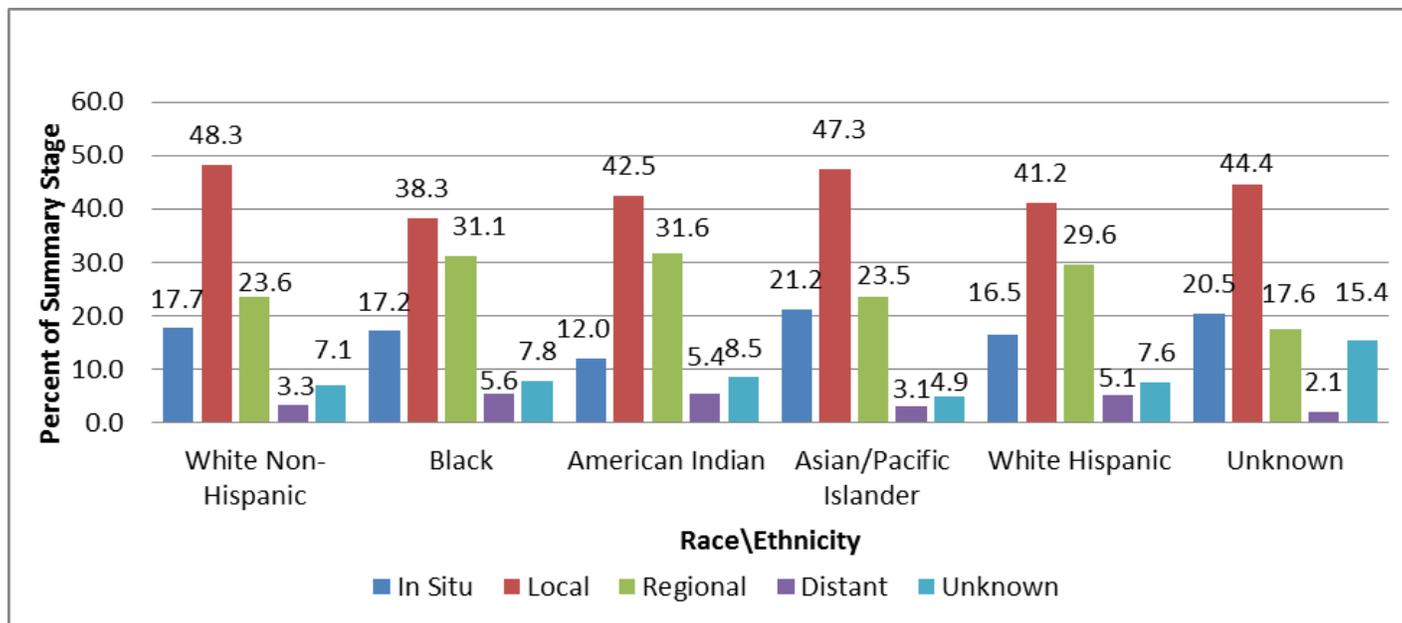


Figure 10: Percent of SEER Summary Stage by Race/Ethnicity for Arizona Resident Female Breast Cancer Cases for Years 2000-2009

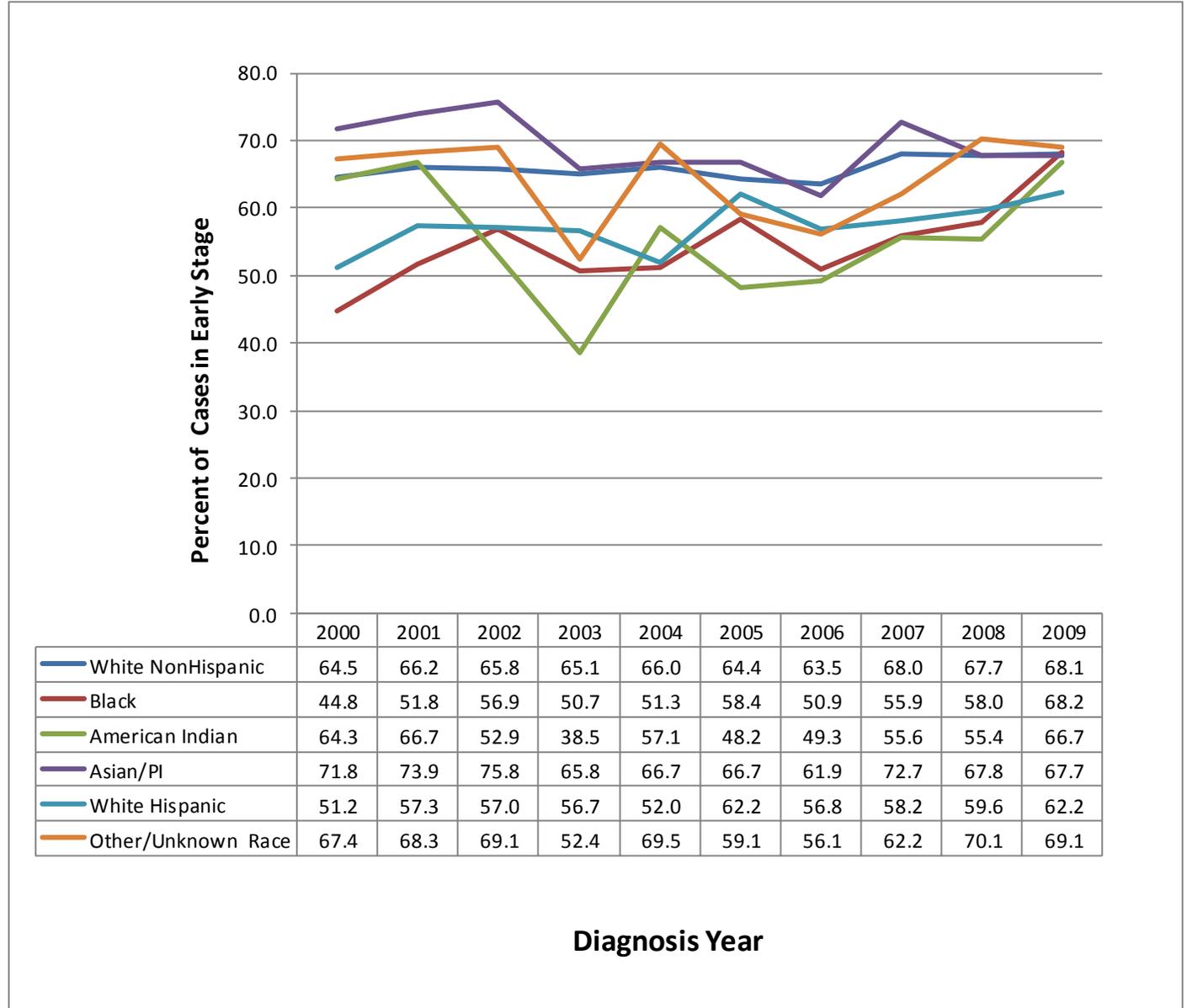




Increases in Early Stage Diagnosis

Most breast cancer cases were diagnosed in an early stage (local & in situ stages) in 2009. Over 60% of females in all racial groups were diagnosed in an early stage in 2009 as less than 7 percentage points separated the racial groups with lowest percent of early stage diagnosis from the highest. In year 2000, 27 percentage points separated the racial groups with the lowest and highest percent of early stage diagnoses. Increases in early detection and increased awareness have most likely played a role in the increases to early stage diagnoses (see Figure 11).

Figure 11: Percent of Early Stage by Race/Ethnicity for Arizona Resident Female Breast Cancer Cases Diagnosed for Years 2000-2009



Breast Cancer Prevalence

Female breast cancer prevalence measures the total number of females living with breast cancer at any point in time. Prevalence differs from incidence in that prevalence includes all living cases from any time period and incidence only includes newly diagnosed cases for a given year. Although it is not a measure of cancer occurrence, prevalence gives us insight to another dimension of cancer burden. This measure shows the number of females that may need additional oncology services, health, and social services after the initial diagnosis and cancer treatment. These services can include continuing cancer therapies, treatment for cancer caused disabilities, screenings for new cancer occurrences and long term counseling and support.⁹ The American Cancer Society estimates that there are more than 2.6 million breast cancer survivors in the U.S.^{8,10} The authors of this paper estimate that there are 50,000 Arizona females living with breast cancer. This estimate is based on Centers for Disease Control’s Behavioral Risk Factor Surveillance Study an annual survey of Arizona residents.

Methodology

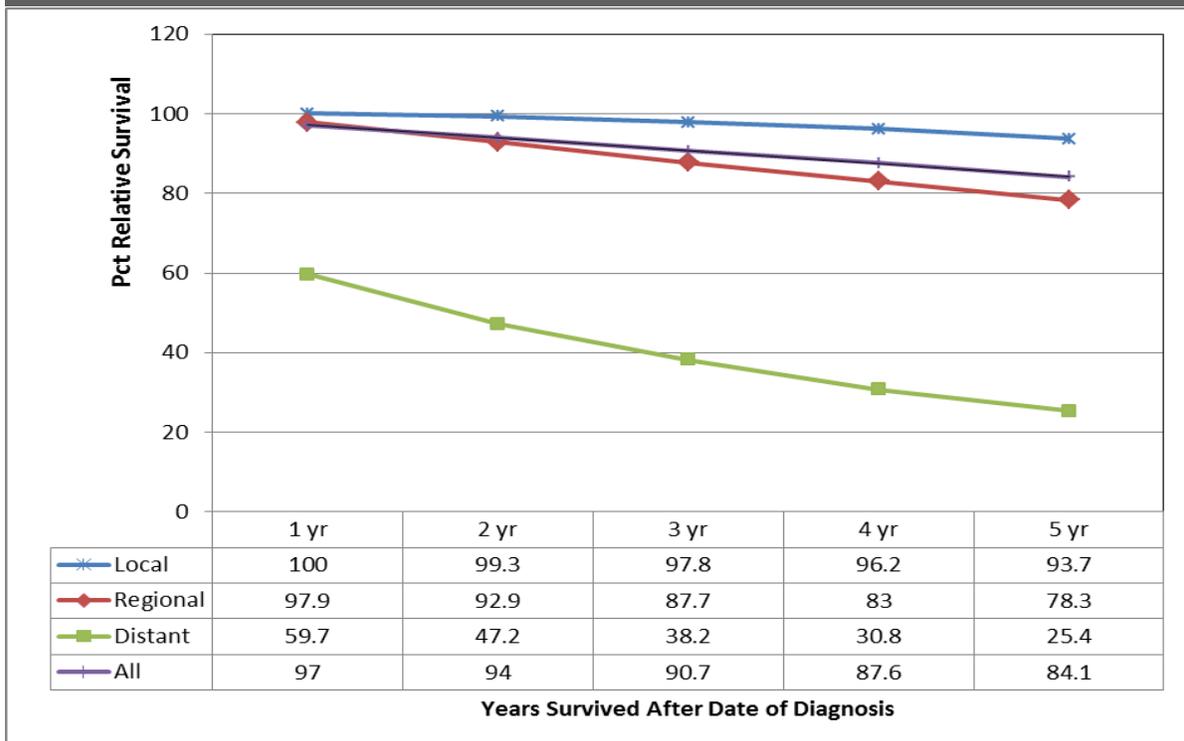
The prevalence estimate is based on responses to questions about whether a person was ever diagnosed with breast cancer in the Behavioral Risk Factor Surveillance Study (BRFSS) in 2009. This study estimated that the overall prevalence of female breast cancer was 1.52%. When extrapolated to the Arizona female population (3,288,937 persons) it gives a breast cancer prevalence of 50,024 females.



Female Breast Cancer Survival

The stage of disease at which female breast cancer is diagnosed impacts survival of the patient. Local stage diagnosis has a 93.7% five year relative survival rate while a distant stage diagnosis has a 25.4% relative survival rate. Earlier diagnosis and treatment contributes to longer survival for the patient (see Figure 12).

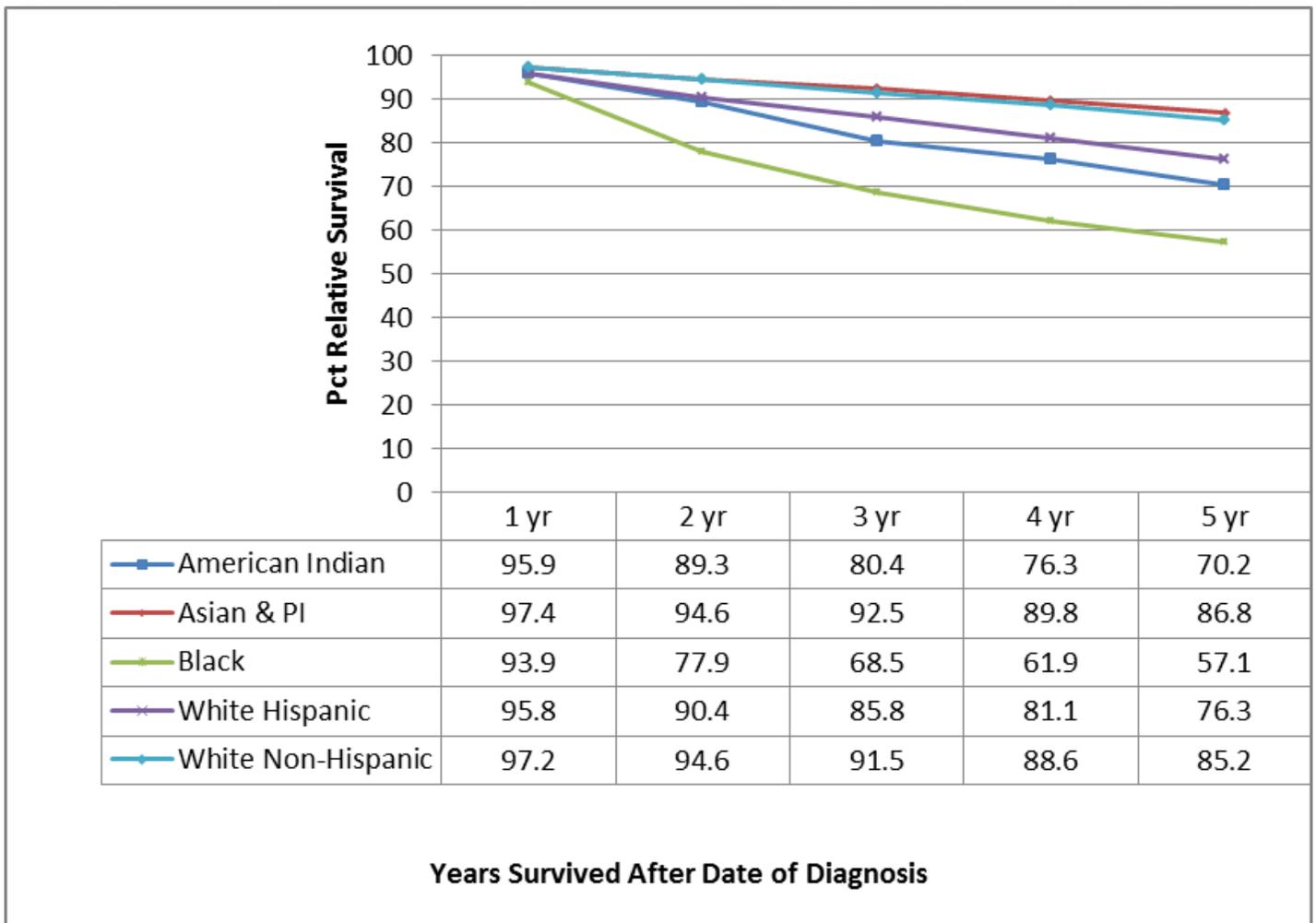
Figure 12: Five Year Relative Survival of Invasive Female Breast Cancer by SEER Summary Stage for Diagnosis Years 1995-2006



Female Breast Cancer Survival

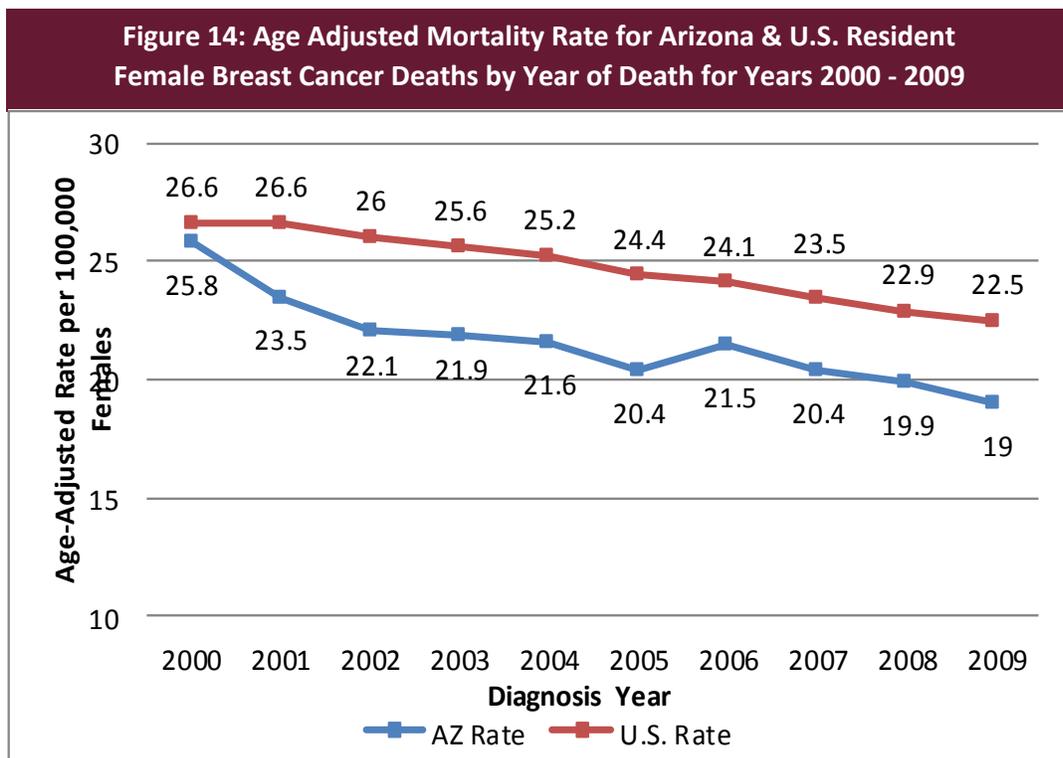
The importance of early stage diagnosis is also shown in the race/ethnicity survival patterns in Figure 13. Asian & White Non-Hispanics have the highest five year survival rate (86.8% and 85.2%) and the greatest percentage of females diagnosed in a local stage. The lower percentage of early stage diagnosis for Blacks and American Indians for the 1995-2006 time periods show lower five year relative survival rates. However, it should be noted that the gains in early stage diagnosis among Blacks and American Indians in the last five years are not shown in this survival graph. Future survival graphs should show gains in percentages surviving among these racial

Figure 13: Five Year Relative Survival of Invasive Female Breast Cancer by Race/Ethnicity for Diagnosis Years 1995-2006



Female Breast Cancer Mortality

Arizona female breast cancer mortality has decreased 26% from year 2000 to 2009. It has fallen faster than the U.S. national average. In year 2000, the U.S. and Arizona rates were not significantly different. However in 2001, and thereafter the Arizona rate dropped faster than the national rate and was significantly lower. In 2009, the Arizona female breast cancer mortality rate was 16 percent lower than the U.S. rate (see Figure 14).

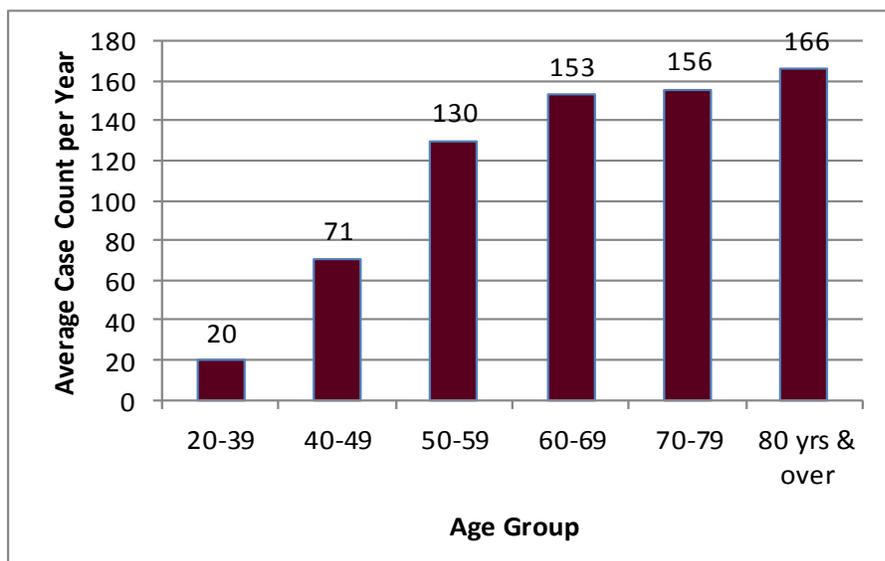


Mortality by Age Group

The majority of female breast cancer deaths occurred after age 60 years, with the median age of death taking place at age 68 years. On average, 90 deaths are recorded annually for females younger than age 50 years (see Figure 15).



Figure 15: Female Breast Cancer Deaths by Age Group Average Annual Count For Arizona Resident Deaths for Years 2000-2009



Deaths by County of Residence

Seventy five (75) percent of the female breast cancer deaths occurred in Maricopa and Pima Counties (Phoenix & Tucson metro regions) (see Figure 16).

Most county death rates did not significantly differ from the state rate (fell outside the confidence bounds) of 21.5 cases per 100,000 females. No counties had a significantly higher rate and three counties (Apache, La Paz, and Yuma) had a significantly lower rate than the state rate. La Paz County had the lowest rate at 13.7 deaths per 100,000 females (see Figure 17).

Figure 16: Female Breast Cancer Deaths by County—Average Annual Count For Arizona Resident Death for Years 2000-2009

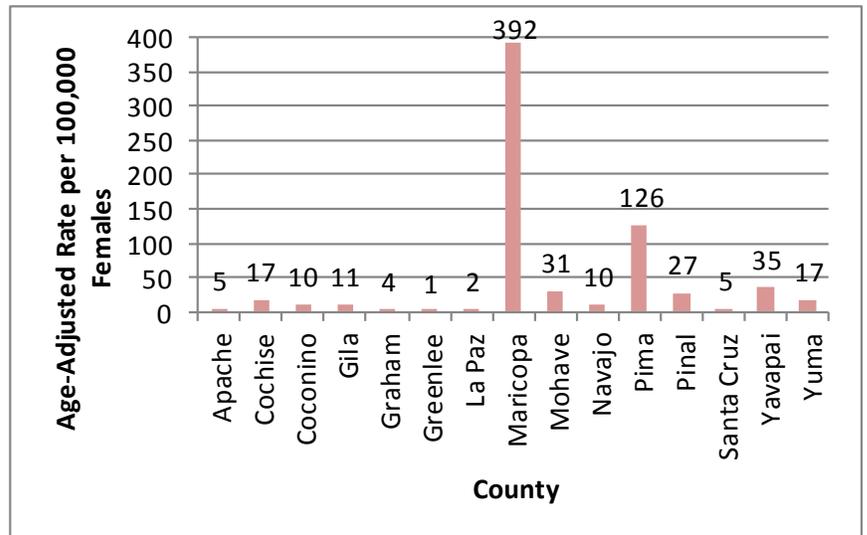
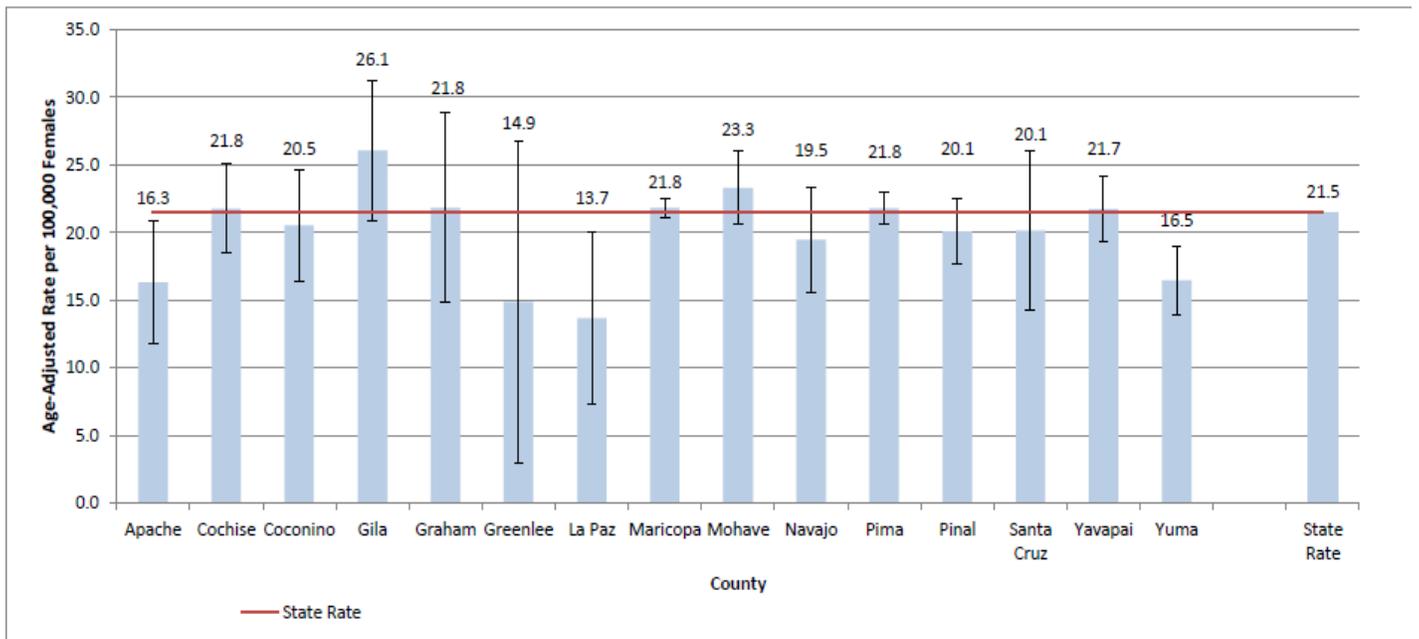


Figure 17: Female Breast Cancer Deaths by County—Age Adjusted Rates for Arizona Resident Deaths for Years 2000-2009



Mortality by Race/Ethnicity

White Non-Hispanics averaged the most female breast cancer deaths per year (577) and Blacks had the highest average annual mortality rate 30.8 cases per 100,000 females. The other racial groups (White Hispanic, American Indian, and Asian and Pacific Islanders) had an average annual mortality rate that was significantly lower than the Arizona average of 21.5 cases per 100,000 females (see Figures 18 and 19).

Figure 18: Average Annual Counts of Arizona Resident Female Breast Cancer Mortality by Race/Ethnicity Group

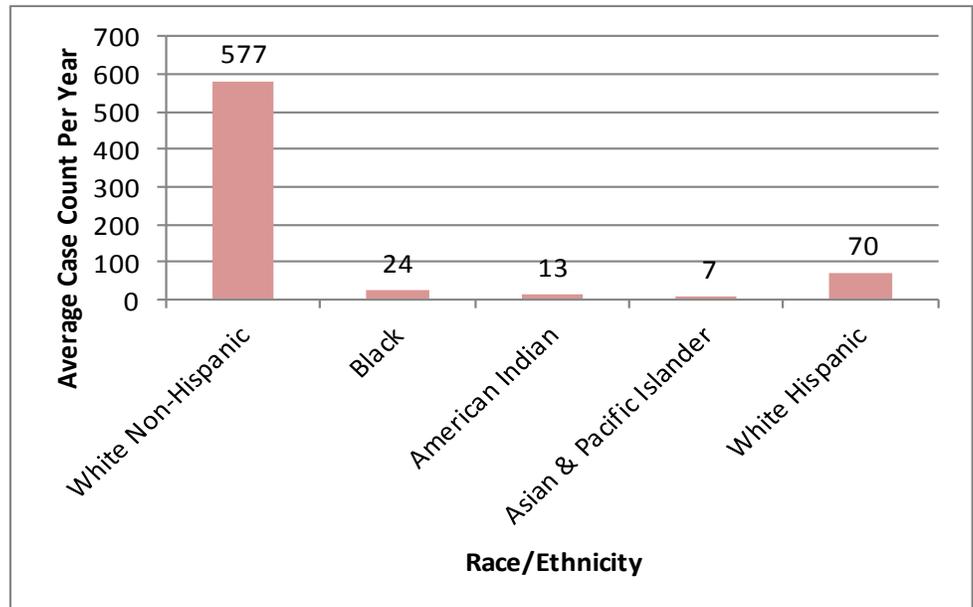
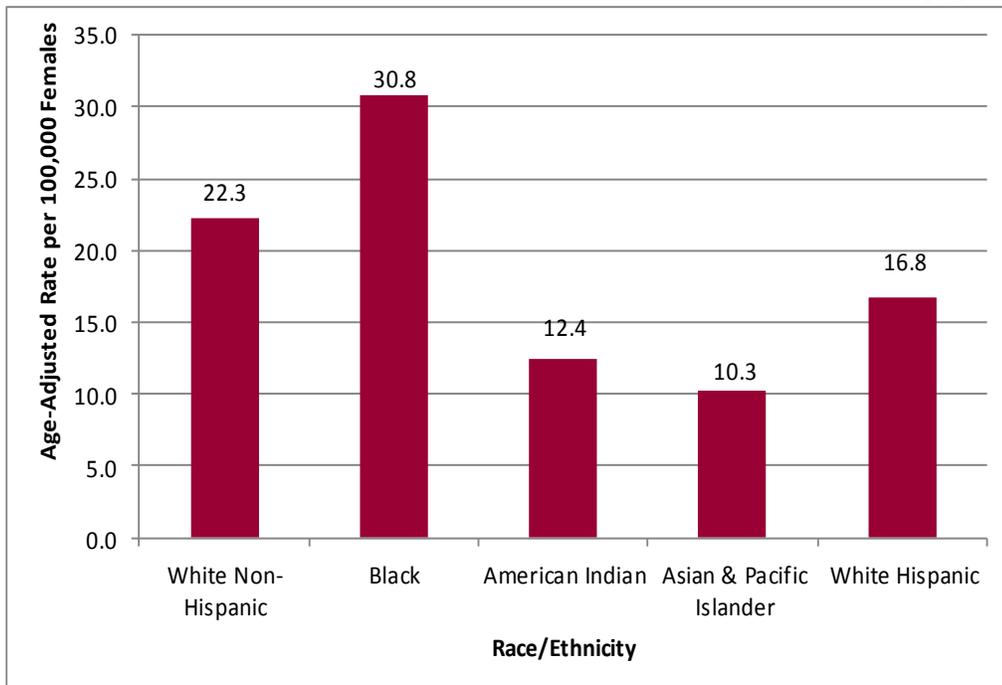


Figure 19: Age Adjusted Rate of Arizona Resident Female Breast Cancer Mortality by Race/Ethnicity Group



Endnotes

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