

# Cancer in Oklahoma Data Brief Series:

## Female Breast Cancer in Oklahoma – Update 2025

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### Introduction

In the United States (US), 1 in 8 women will be diagnosed with breast cancer.<sup>1</sup> Breast cancer is the most commonly diagnosed cancer and the second most common cause of cancer death among women in the US and Oklahoma.<sup>2</sup> Breast cancer is a highly treatable and survivable cancer, with 91% surviving at least five years.<sup>2</sup> Recent trends in the world and the US show either an increase or a flattening of female breast cancer rates.<sup>3</sup> Breast cancer in women can be detected at an early, treatable stage using mammography, an evidence-based cancer screening test. The United States Preventive Services Task Force (USPSTF) recommends biennial mammography screening for women aged 40-74 with a Grade B recommendation.<sup>4</sup> The goal of this data brief is to describe breast cancer incidence, mortality, and screening rates among women in Oklahoma. This brief concludes with a discussion of the significance of findings on clinical practice and public health policy.

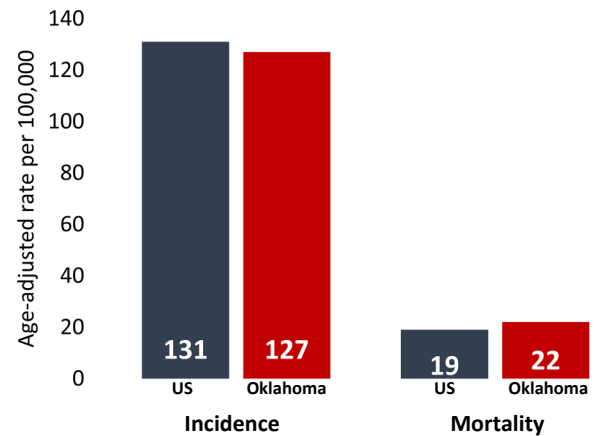
### Methods

Data for cancer incidence were obtained from the CDC Wonder and OK2Share. Information about breast cancer screening was obtained from the Behavioral Risk Factor Surveillance System (BRFSS). All data sources used in this brief were publicly available. For this study, Hispanic persons were classified as Hispanic regardless of race. Those who identified as White, Black or African American, American Indian or Alaska Native, and Asian or Pacific Islander were of non-Hispanic ethnicity. To ensure the stability of estimates and confidentiality, rates were suppressed if fewer than 16 counts were reported in a specific category. All rates, except age-specific rates, were adjusted for age to the 2000 US standard population. Breast cancer cases used in analyses were classified using the International Classification of Diseases for Oncology system (ICD0-03 C50.0-50.9) and limited to women. Cases were limited to invasive incident cancers, except when looking at staging. Temporal patterns were assessed using the Annual Percent Change (APC) in rates, with a 95% confidence interval (CI) determined by Joinpoint regression analysis.<sup>5</sup> BRFSS estimates were suppressed for stability if the unweighted sample size was less than 50. Unknown values were excluded, and resulting percentages were weighted averages estimated from the sample and population sizes. All incidence and mortality rates are reported per 100,000 population. Staging for this data brief used the SEER summary stage.<sup>6</sup> This brief has been updated to reflect the most recent estimates available. In this brief, we used the 2023 Rural-Urban Continuum Codes (RUCC) for this study.<sup>7</sup> Rural refers to counties in the RUCC 4-9 group and urban to those in the RUCC 1-3 group.

## Results

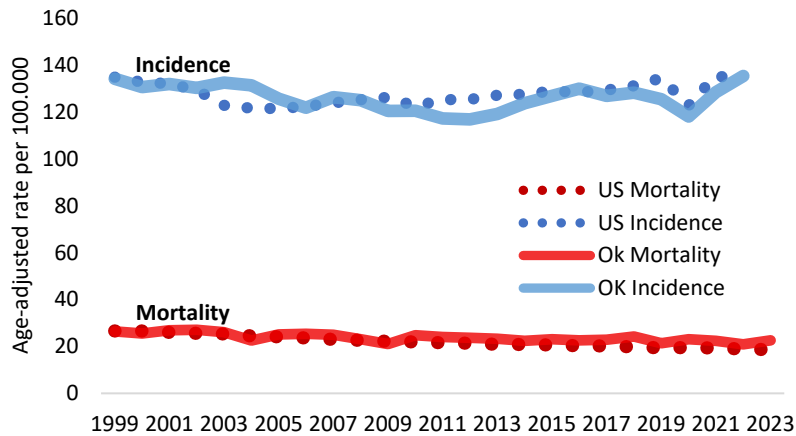
Overall, 1,351,224 female breast cancers were diagnosed between 2018 and 2022 in the US. Of these cancers, 15,098 female breast cancers were diagnosed in Oklahoma (1.1% of all US cases). In other words, there are over 3,000 women in Oklahoma diagnosed with breast cancer each year. While 91% of American women diagnosed with breast cancer from 2011-2017 survived at least five years, 211,287 women succumbed to this disease, and 2,783 of those women were in Oklahoma (1.3% of all deaths). The 2017-2021 age-adjusted female breast cancer incidence rate in the US was 131 per 100,000 compared to 127 per 100,000 for Oklahoma (**Figure 1**). During that same time, the US female age-adjusted breast cancer mortality rate was 19 per 100,000 compared to 22 per 100,000 for Oklahoma.

**Figure 1: Female breast cancer incidence (2018-2022) and mortality (2019-2023), Oklahoma and the US**



Source: United States Cancer Statistics: Data Visualization

**Figure 2: Female breast cancer incidence and mortality by year in Oklahoma and the US, 1999-2023**



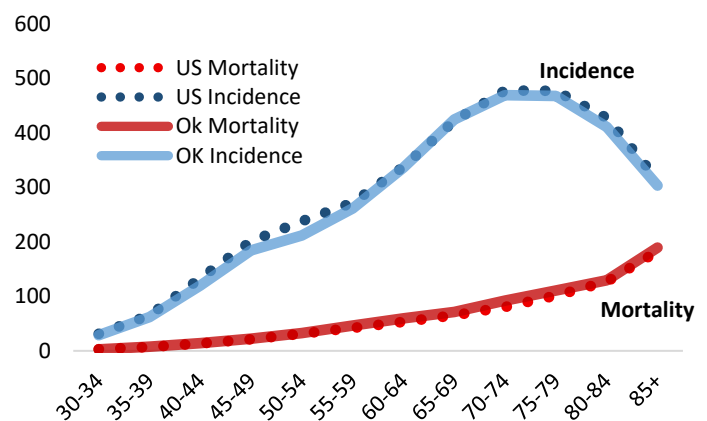
Source: CDC Wonder

**Figure 2** shows the trend in age-adjusted incidence rates and mortality rates per 100,000 women for Oklahoma and the US. There has not been a great deal of change in either incidence or mortality for the last 20 years. In Oklahoma, there has been a slight decrease in incidence from 1999 (134.1 per 100,000) to its lowest point in 2012 (116.8 per 100,000); however, there has been a slight increase from 2012 to 2018 at 128.2 per 100,000. There has been virtually no change in mortality from 1999 (26.4 per 100,000) to 2023 (22.6 per 100,000). There was a dip in incidence in 2020 due to known decreases in screening and diagnosis due to the COVID-19

pandemic. Both the US and Oklahoma showed no significant changes in incidence rate as measured by APC; Oklahoma's was -0.16 (p-value 0.23) and the US's was 0.11 (p-value 0.30). In mortality, there was a significant decrease in both the US (APC = -1.51, p-value < 0.0001) and Oklahoma (APC = -0.75, p-value < 0.0001). Oklahoma, however, showed a less steep decrease.

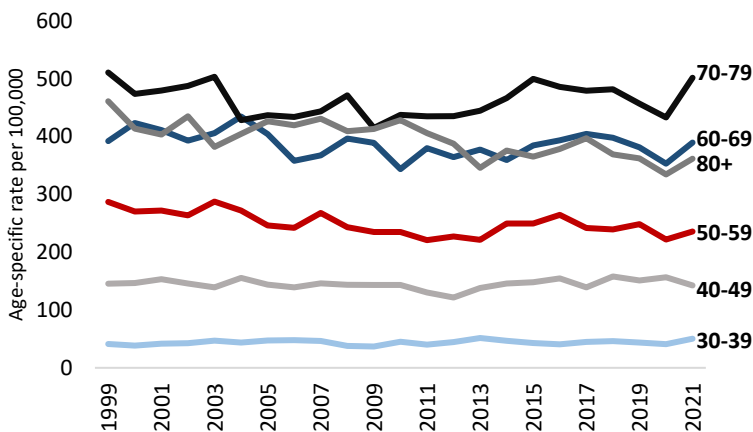
**Figure 3** shows female breast cancer incidence and mortality by age for women in Oklahoma and the US. Female breast cancer incidence rises dramatically until the 70-74 age group and then drops. Female breast cancer mortality steadily increases until the age 80-84 age group at which time the mortality rate begins to rise more steeply.

**Figure 3: Female breast cancer incidence and mortality by age in Oklahoma and the US, 2017-2021**



Source: CDC Wonder

**Figure 4. Female breast cancer incidence by age group and year in Oklahoma, 1999-2021**



Source: CDC Wonder

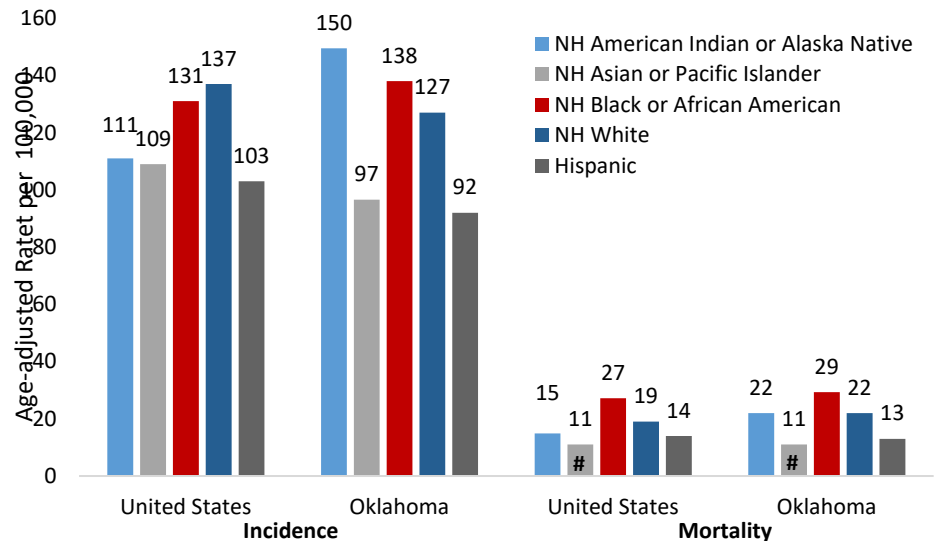
Figure 4 shows female breast cancer incidence by ten-year age groups for women in Oklahoma. These data show that women aged 80 and older (APC = -0.91, p-value < 0.001) and those aged 50-59 (APC = -0.76, p-value = 0.001) exhibited a statistically significant decline in incidence. However, women aged 40-49 (APC 0.06, p-value 0.75) and women aged 30-39 (APC 0.32, p-value 0.350) did not show a significant trend in incidence over this timeframe.

Figure 5 shows the age-adjusted incidence and mortality rates for female breast cancer (per 100,000 women) for Oklahoma and the US by race and ethnicity. Compared to their US counterparts of the same race or ethnicity, NH American Indian or Alaska Native women (150 OK vs. 111 US) and NH Black women (138 OK vs. 131 US) experienced higher

incidence rates, while NH Asian or Pacific Islander women (97 vs. 109) experienced lower incidence rates. Compared to their US counterparts of the same race or ethnicity, all racial or ethnic groups in Oklahoma had higher mortality rates. In Oklahoma, Black or African American women had the highest age-adjusted mortality rate (29 per 100,000).

Figure 6 shows maps of the female breast cancer (a) incidence and (b) mortality rates by county in Oklahoma. Rural and urban differences exist. From 2018 to 2022, women residing in rural (non-metropolitan) counties were significantly less likely to be diagnosed with female breast cancer (138.4 per 100,000) than their counterparts living in metropolitan counties (154.4 per 100,000). This is also true when excluding in situ cancers, with urban women at 130.4 and rural women at 121.7 per 100,000. In addition, there was virtually no difference in age-adjusted mortality rates between women living in rural and urban counties, 22.1 per 100,000 vs 22.4 per 100,000, respectively (data not shown).

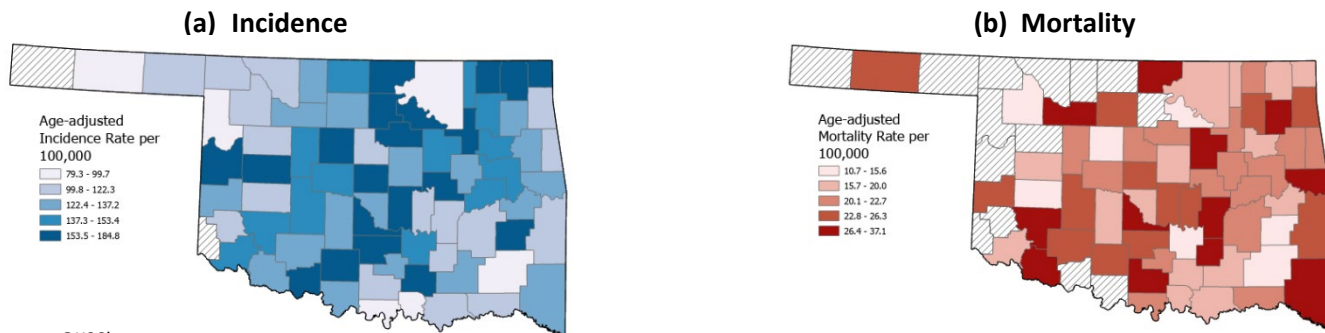
**Figure 5: Age-adjusted female breast cancer incidence and mortality by race and ethnicity in Oklahoma and the US, 2017-2021**



# Asian only

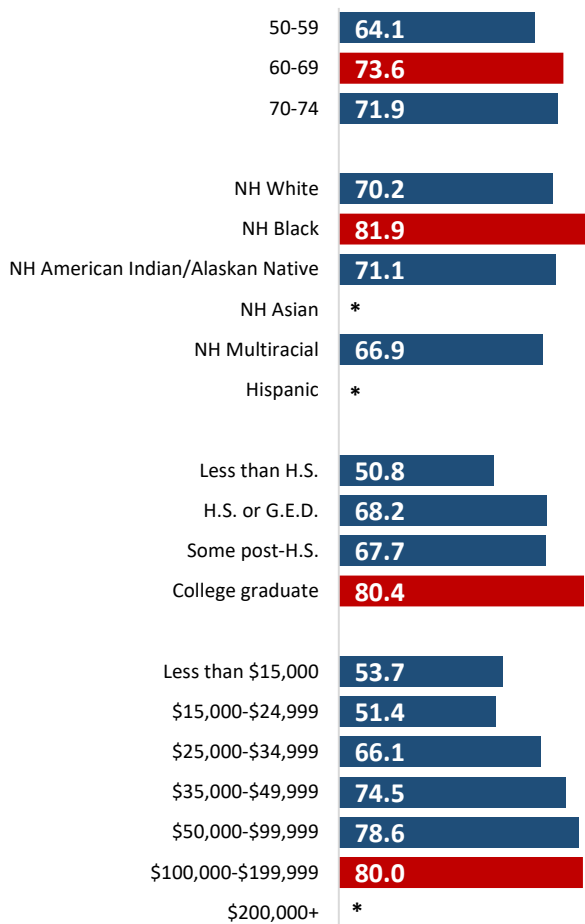
Source: United States Cancer Statistics: Data Visualization

From 2018 to 2022, compared to national rates, women in Oklahoma were more likely to be diagnosed at a distant stage (7.3% in Oklahoma, 6.0% in the US), regional stage (26.6%, 25.2%), or with an unknown stage (3.3%, 2.3%). Conversely, women in Oklahoma were less likely than women in the US to be diagnosed at the local stage (62.8%, 66.5%) (data not

**Figure 6: Overall age-adjusted female breast cancer incidence and mortality rate by county Oklahoma, 2018-2022**

Source: OK2Share

shown). In Oklahoma from 2018-2022, rural women were more likely to be diagnosed at distant (6.8% in rural vs. 5.9% in urban) and unknown (5.8%, 2.5%) stages (data not shown). Urban women were more likely to be diagnosed with an in situ cancer at 15.4% compared to 12.3% among rural women. Rural women were less likely to have private insurance (34.9% compared to 43.6%) at the time of diagnosis and more likely to have Medicare (47.8%, 44.3%) and Medicaid (62% vs 4.8%)(data not shown).

**Figure 7: Percentage of Oklahoma women aged 40-75 who have had a mammogram in the past two years, 2022**

\*Suppressed

Source: Oklahoma Behavioral Risk Factor Surveillance System (BRFSS)

**Figure 7** illustrates the percentage of women aged 50 to 74 years in Oklahoma in 2022 who had undergone a mammogram in the past two years, categorized by sociodemographic characteristics. Overall, among Oklahomans aged 50-74, 69.3% had received a mammogram in the past two years compared to 76.3% among women in the US (data not shown). The rate in Oklahoma is less than the rate in 2000 at 74.3% (data not shown). NH Black or African American women had the highest (81.9%) proportion of women who had received a mammogram. NH American Indian or Alaska Native women (71.1%) and NH White women (70.2%) were virtually identical. Multiracial women (66.9%) were the least likely to have received a mammogram (Figure 7). For the most part, as educational attainment increased so did the proportion of women who had a mammogram: 50.8% for respondents who did not graduate from high school, 68.2% of for respondents who graduated high school, 67.7% for respondents who had some college, and 80.4% of respondent who graduated college. As income increased, the likelihood of mammography also increased, except for women with a household income of less than \$15,000. Women whose household income was less than \$15,000 had a higher proportion receiving a mammogram in the past two years (53.7%) than those with household incomes between \$15,000 to \$24,999 (51.4%).

## Conclusions and Implications for Practice and Policy

The breast cancer incidence rates for the overall Oklahoma and the US populations have improved only marginally over the past 20 years, and the mortality rate for the Oklahoma general population of women remains slightly higher than for the US. Significant disparities in incidence for those identifying as American Indian or Alaska Native in Oklahoma, and mortality for American Indian or Alaska Native and Black or African American women in the state, persist. People from several high-risk socioeconomic groups are less likely to undergo mammography. Rural populations are more likely to be diagnosed at a later and less treatable stage. Recommendations that could be used to reduce the disproportionate burden breast cancer places on high-risk populations of women in Oklahoma are discussed below.

Efforts to increase breast cancer screening are needed for several groups of women, including those who lack health insurance coverage, have lower educational attainment, or have income levels that may be too high for subsidized screening programs, but too low to be able to obtain health insurance coverage. For the latter, women whose household income was less than \$15,000 had a higher proportion receiving a mammogram in the past two years (53.7%). Programs to increase health insurance coverage would enable more women to be screened. Additionally, fully funding federal programs that increase screening, such as the Breast and Cervical Cancer Early Detection Program (BCCEDP), would enable more low-income and uninsured women to be screened. Increasing support provided by charitable organizations, including Komen and the American Cancer Society, would also contribute to this goal.

Second, removing barriers to breast cancer screening and follow-up diagnostic services could increase screening rates in high-need populations. This could be accomplished by issuing standing orders for breast cancer screening, allowing women to get screened without needing to see a primary care provider. Additionally, providing screening via mobile mammography could be beneficial, especially in geographic locations where mammography facilities may be located far from patients' homes. Increasing the number of facilities in Oklahoma recognized as mammographic centers of excellence would improve the quality of screening services.

Third, women with any of the cardinal breast cancer symptoms, including breast swelling of all or part of the breast, skin irritation or dimpling, breast or nipple pain, nipple retraction, redness, scaliness, or thickening of the nipple or breast skin, or nipple discharge, should receive prompt evaluation even if they have had a timely screening mammogram. At best, mammography reduces breast cancer mortality by 25%,<sup>8</sup> so even when rates of screening are high, mortality rates may remain high. This is especially true for women from groups with high mortality rates. For example, Black or African American women in Oklahoma have relatively high breast cancer screening rates, but they also have high breast cancer mortality rates. Until screening modalities improve, prompt diagnosis and treatment at the time when symptoms occur may be one of the best ways to reduce mortality.

Fourth, there is a need to ensure that all Oklahoma women diagnosed with breast cancer have access to the newest, most effective treatments. This can be accomplished by providing funds to help patients address the financial challenges of treatment and funds to help defray the costs of traveling for care, including transportation and lodging costs.<sup>9,10</sup>

Finally, the lack of major improvement in breast cancer mortality over the past two decades signifies the need to develop more effective screening tests and more effective therapies. Newer but still experimental imaging modalities may prove superior to mammography. In 2019, the US Preventive Services Task Force (USPTF) issued a recommendation to screen women for hereditary cancer if they have a personal or family history of breast, ovarian, tubal, or peritoneal cancer or an ancestry associated with breast cancer susceptibility 1 and 2 (BRCA1/2)<sup>12</sup>. However, uptake of this guideline remains low. Moreover, recent advances in therapy, including immunotherapy, for breast cancer hold great promise in improving survival. As women who participate in clinical trials tend to have the best outcomes, efforts to enroll more women in trials to evaluate new breast cancer treatments are needed. Taken together, these and additional actions would enable Oklahoma to reduce the unacceptably high burden of breast cancer in the state.

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