

Cancer in Oklahoma Data Brief Series:

Cancer among the American Indian Population in Oklahoma - Updated 2026 Ver 2

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Introduction

In 2023, Oklahoma had the fourth highest all-race, all-cause cancer mortality rate among US states, compared to having the nineteenth highest incidence rate in 2022.¹ This disparity highlights the need to examine cancer rates within Oklahoma sub-populations, particularly those with a disproportionate cancer burden.

The American Indian and/or Alaska Native (AIAN) population residing in counties on or near reservations and tribal jurisdictional areas has the highest overall cancer incidence and mortality rates in the US.² Oklahoma has the second-largest number of AIAN residents (after California) and the second-highest percentage of AIAN residents (after Alaska) when combined with another race.³ In 2020, an estimated 3,727,135 AIAN residents identifying solely as AIAN lived in the US (1.1% of the total population), and, when combined with another race, the estimated US AIAN population was 9,666,058 (2.9%). In Oklahoma, there were an estimated 332,791 (8.4%) AIAN-only residents, and, when combined with another race, the state's AIAN estimated population was 633,831 (16.0%).³ While the majority of Indigenous persons in Oklahoma are of American Indian ancestry, in this Data Brief, we use the term "AIAN" for consistency with nationwide data sources.

Racial misclassification is a frequent issue affecting cancer statistics for US AIAN populations.⁴ To improve the accuracy of AIAN cancer statistics, a common approach links cancer incidence and mortality records with Indian Health Services (IHS) administrative records.⁵ Persons matched in the IHS database are considered AIAN, while race is unchanged for those not matched.⁶ This is the approach taken with our previous Data Briefs.⁷ These linked datasets are available for incidence data, but are no longer available for mortality in Oklahoma.

This Data Brief presents information on overall and cause-specific cancer incidence and estimated cancer mortality rates among the AIAN population of Oklahoma. It also examines cancer screening rates for the AIAN population and concludes with a brief discussion of the significance of the findings for clinical practice and public health policy.

Methods

Cancer incidence data were obtained from the Centers for Disease Control's (CDC) National Program of Cancer Registries (NPCR), the NCI's Surveillance, Epidemiology, and End Results (SEER) program, and from the Oklahoma Central Cancer Registry (OCCR). All cancer mortality data were from the National and Oklahoma Vital Statistics programs. Information about cancer screening was obtained from the Oklahoma Behavioral Risk Factor Surveillance System (BRFSS). All data sources used in this brief were publicly available and provided de-identified data. Only persons who identified their race as White or AIAN (alone or in combination with another race) and who were not of Hispanic ethnicity are included in this report.

To ensure the stability of estimates and confidentiality, incidence rates were suppressed if fewer than 10 counts for incidence and fewer than 5 for mortality were reported in a specific category, and all rates were age-adjusted to the 2000 US standard population. Incidence data is limited to invasive cancers, except bladder cancer, which also includes in situ

cancers. Behavioral Risk Factor Surveillance System (BRFSS) estimates were suppressed for stability if the unweighted sample size for the denominator was less than 50 or if the Relative Standard Error was above 0.3. All unknown values, except for staging, were excluded, and the resulting percentages were weighted averages estimated from the sample and population sizes.

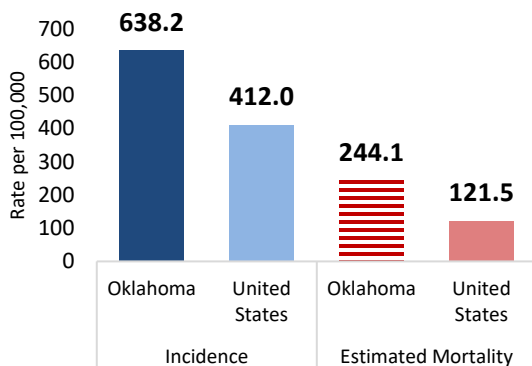
For incidence, we used IHS-linked data for non-Hispanic AIAN and for Non-Hispanic White populations. All references to these populations herein will refer to non-Hispanic populations. As noted, IHS-linked mortality data for the years presented here have not been released. We thus make a 29% adjustment for cancer mortality rates for AIAN in Oklahoma throughout this Data Brief⁸ as per prior estimates of racial misclassification for Oklahoma.⁹ We represent these estimated mortality data for Oklahoma AIAN with dashed lines throughout this Brief. We chose not to adjust the US AIAN mortality rates because we lacked an overall estimate nationwide and because the misclassification rate varies across the US.

Results

The cancer incidence rate in the Oklahoma AIAN population was estimated to be 1.6 times that of the US AIAN population between 2018 and 2022. Overall, 10,682 cancer cases were diagnosed in Oklahoma's AIAN population, with a corresponding incidence rate of 638.2 per 100,000. The number of new cancer cases for the US AIAN population was 57,626, for an incidence of 412.0 per 100,000 (**Figure 1**). Of note, 18.5% of the US AIAN cancer diagnoses occurred in Oklahoma.

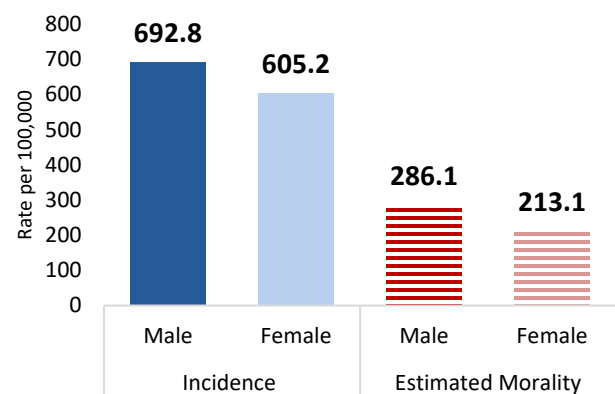
For cancer mortality, we estimate that 3,655 deaths in the Oklahoma AIAN population occurred between 2019 and 2023, for a rate of 244.1 per 100,000, adjusted for racial misclassification. In the US AIAN population, there were 15,552 cancer deaths, for a rate of 121.5 per 100,000, not adjusted for racial misclassification (**Figure 1**). The estimated death rate for the Oklahoma AIAN population was higher than that of the US AIAN population. Although the US rates were not adjusted for racial misclassification, prior research has shown that nationwide, AIAN deaths are underestimated by as much as 40%.¹⁰ Even if the US AIAN mortality were adjusted for 40% racial misclassification (to 170 per 100,000), the OK AIAN estimated mortality rate would still be 1.44 times the US AIAN rate.

Figure 1: Age-adjusted overall cancer incidence (2018-2022) and estimated mortality (2019-2023) Non-Hispanic American Indian and Alaska Native rates, Oklahoma, and the United States



Source: CDC Cancer Data Visualization

Figure 2: Age-adjusted overall cancer incidence (2018-2022) and estimated mortality (2019-2023) Non-Hispanic American Indian and Alaska Native rates by sex, Oklahoma

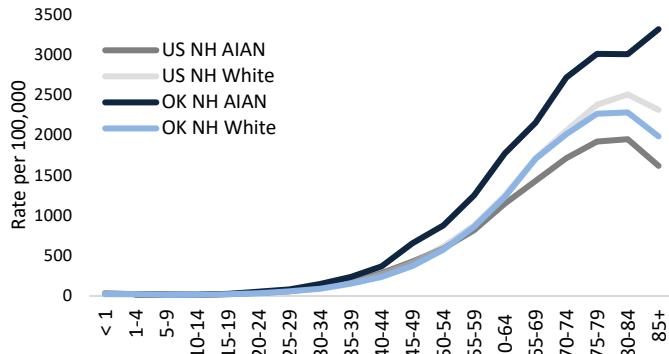


Source: CDC Cancer Data Visualization

Figure 2 shows the age-adjusted incidence (2018-2022) and estimated mortality (2019-2023) rates for the Oklahoma AIAN population by sex. Both cancer incidence and cancer mortality were higher in the male population than in the female population.

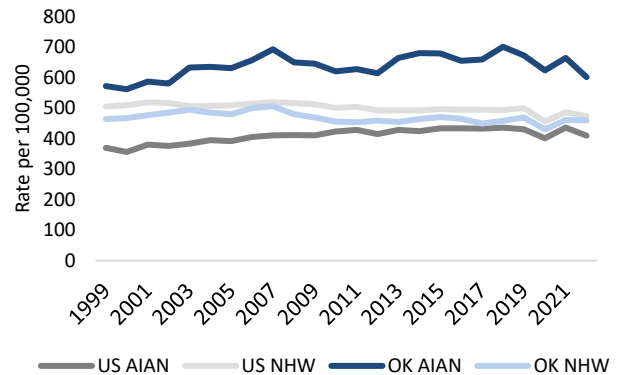
Figure 3 shows the overall cancer incidence rate by age groups. From an early age, Oklahoma's AIAN population was higher than either the US AIAN, White, or Oklahoma's White populations.

Figure 3: Overall, Cancer Incidence (2018-2022) for Non-Hispanic American Indian or Alaska Native and Non-Hispanic White by Age Group in Oklahoma and the US



Source: CDC WONDER

Figure 4: Yearly trends of overall NH AIAN and NH White cancer incidence for Oklahoma and the US, (1999 - 2022)

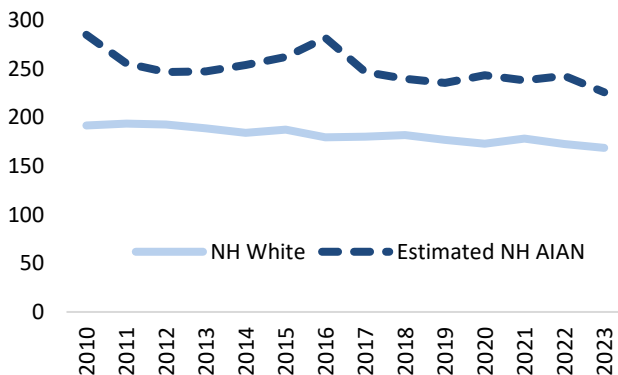


Source: CDC WONDER

Figure 4 shows that the US and Oklahoma AIAN populations experienced rising cancer incidence (AAPC 0.66, p-value<0.0001 and AAPC 0.47, p-value = 0.005, respectively), in contrast to decreasing rates among the US and Oklahoma White populations (AAPC -0.32, p-value < 0.0001; AAPC -0.30, p-value = 0.002, respectively).

As shown in **Figure 5**, cancer mortality among AIAN and White populations in Oklahoma has been decreasing since 2010 (AAPC: -1.05, p-value = 0.011; AAPC: -1.00, p-value < 0.0001, respectively).

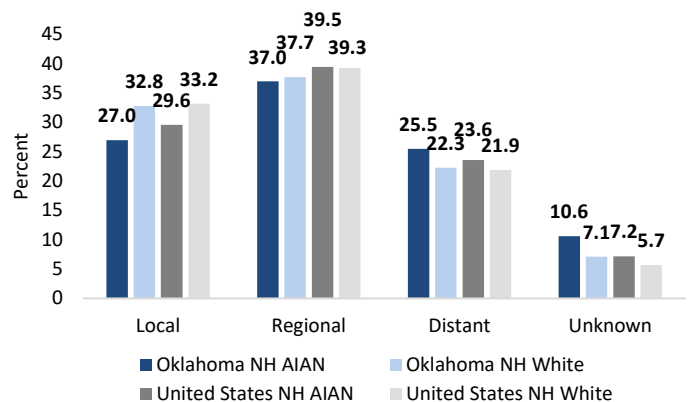
Figure 5: Shows yearly trends of overall NH AIAN and NH White cancer age-adjusted estimated mortality for Oklahoma (2010 - 2023)



Source: OK2SHARE.

AIAN cancer mortality rates are estimated using a 29% upward correction factor for racial misclassification.

Figure 6: Stage at diagnosis, for NH AIAN and NH Whites in Oklahoma and the United States

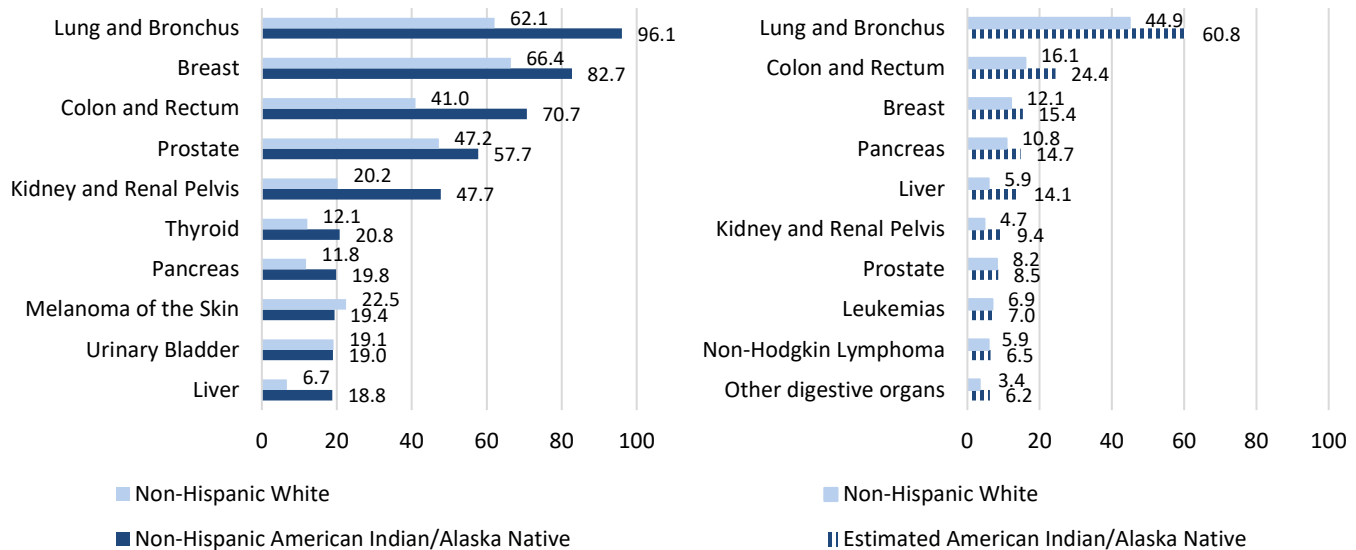


Source: CDC Cancer Data Visualization

Figure 6 shows that, among the groups presented, the AIAN population in Oklahoma was the least frequently diagnosed at a local stage (where survival is highest) and the most frequently diagnosed at a distant stage (where survival is lowest). Additionally, the AIAN population in Oklahoma was most often diagnosed at an unknown stage of cancer, which is also associated with low survival.

Figure 7 ranks the top ten cancers by incidence (2018-2022) and estimated mortality (2019-2023) for the AIAN population in Oklahoma, and compares these rates with those for the White population. Incidence rates for the Oklahoma AIAN population in Oklahoma were higher than for the White population for each cancer except melanoma and urinary bladder, and rates were particularly more prevalent for cancers of the liver and bile duct (2.8 times higher than in the White

Figure 7: Top ten cancers for incidence (2018-2022) and estimated mortality (2019-2023) for the Non-Hispanic American Indian/Alaska Native and Non-Hispanic White populations in Oklahoma



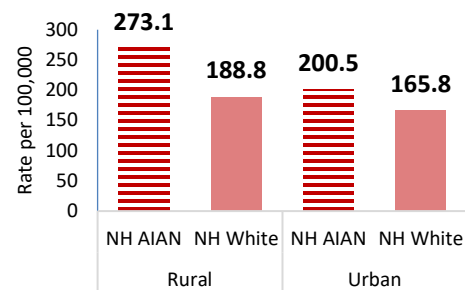
Source: OK2SHARE

population), kidney and renal pelvis (2.4 times higher), colon and rectum (1.7 times higher), and lung and bronchus (1.5 times higher). For mortality, all ten cancers were higher among the AIAN than the White populations, with the greatest disparities also for cancers of the liver and bile duct (2.4 times), kidney and renal pelvis (2.0 times), colon and rectum (1.5 times), and lung and bronchus (1.4 times).

As shown in **Figure 8**, rural and urban AIAN cancer mortality rates in Oklahoma were higher than their White counterparts. Cancer mortality among rural residents was higher than among urban residents, markedly so for the AIAN population.

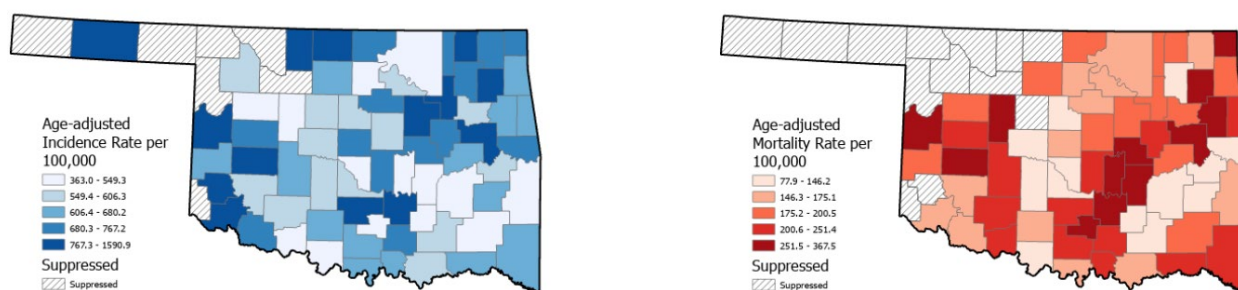
Oklahoma county level data in **Figure 9** (next page) show that all-cause cancer mortality for the AIAN population is highest in the northeastern quadrant of the state. See Appendix 1 for the underlying numbers of incident cases, deaths, crude and age-adjusted rates, and differences between the AIAN and White populations by county.

Figure 8: Age-Adjusted Overall Estimated Cancer Mortality (2019-2023) for NH AIAN and NH White population by Urban Rural Status, Oklahoma



Source: OK2SHARE

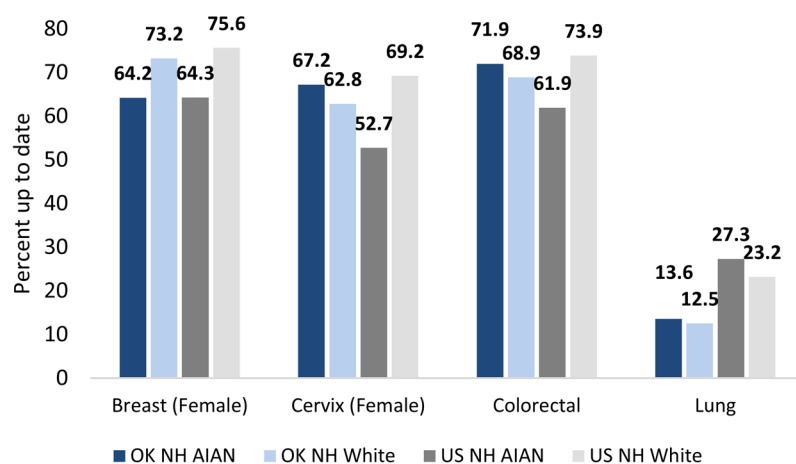
Figure 9: Overall Age-adjusted Cancer Incidence (2013-2022) and Mortality (2014-2023) Rates for the American Indian Population by County, Oklahoma



Source: OK2SHARE

Figure 10 shows that the prevalence of breast cancer screening among AIAN women in Oklahoma (81.8%) was lower than that for White women in both Oklahoma and the US, but virtually identical to that of AIAN women in the US. For cervical cancer screening, AIAN women were more often up to date than White women in Oklahoma. For colorectal cancer, AIAN individuals in Oklahoma more often reported screening than White or US AIAN individuals, but slightly less than the US White population. AIAN respondents more often reported undergoing lung cancer screening than did the White population in Oklahoma, but the percentages were only half those in the US AIAN population and 58% of the US White population.

Figure 10: Cancer Screening for the American Indian and Non-Hispanic White Populations in Oklahoma and the United States, 2024



Source: BRFSS

BRFSS Cancer Screening Definitions:

Breast: Women aged 40-74 years who have received a mammogram in the past 2 years

Cervical: Women who have not had a hysterectomy aged 21-29 are up to date if they report a Pap test in the past 3 years. Women aged 30-65 are up to date if they report a Pap test in the past 3 years OR an HPV test (alone or with Pap) in the past 5 years.

Colorectal: Adults aged 45-75 years who have fully met the USPSTF recommendation (blood stool test in the past year, and/or sigmoidoscopy in the past 5 years, and/or colonoscopy in the past 10 years, and/or stool DNA test within the past 3 years, and/or virtual colonoscopy within the past 5 years).

Lung: Adults aged 50-80 with at least 20 pack-year history and either currently smoking or quit within the last 15 years.

Conclusions and Implications for Practice and Policy

The Oklahoma state AIAN population experiences substantially higher overall and cause-specific cancer incidence and mortality than the state's White population. Concerted efforts to improve surveillance, screening, healthcare financing, and research could ameliorate these unacceptably high cancer rates for the AIAN population in Oklahoma.

For this report, we obtained reliable IHS-linked incidence data, but we estimated mortality rates using prior work to account for racial misclassification.¹¹ IHS-linked data have been used to improve the accuracy of cancer data for AIAN populations. However, IHS-linked mortality data for Oklahoma have not been released by the Centers for Disease Control and Prevention for over five years. When IHS-linked cancer mortality data become available, data will be updated.

Programs to reduce or eliminate financial barriers to screening services and high-quality cancer care services are also warranted. Financial concerns cause many individuals with symptoms to delay health care, which can be devastating in terms of cancer outcomes.¹² Importantly, the expansion in 2021 of Medicaid coverage in Oklahoma for individuals between the ages of 19-64 through the Affordable Care Act has reduced the state's uninsurance rate from about 14% to under 10%, likely reducing financial barriers to cancer related care for many low-income individuals.¹³

To improve cancer outcomes and mitigate disparities such as the higher frequency of late-stage vs early-stage cancer diagnoses among AIAN populations, programs to increase demand for and receipt of evidence-based cancer screening services are needed. Access to cervical and breast cancer screenings could be preserved or even increased by continuing initiatives such as the National Breast and Cervical Cancer Early Detection Program (NBCEDP) and the Native American Breast and Cervical Cancer Treatment Technical Amendment Act, which is specifically directed to AIAN women who are eligible for health services provided by the IHS or by a tribal organization.¹⁴ Similarly, establishing programs to increase evidence-based cancer screening for lung, colorectal, and prostate cancer merits consideration. This disparity in late-stage and unknown-stage cases also suggests the need for early entry into cancer treatment services, particularly in rural locations where cancer incidence rates are highest.

Clinical trials advance cancer treatment, which is why it is imperative that they enroll participants from diverse populations and backgrounds. Research funding should help ensure adequate participation in cancer clinical trials among AIAN and other populations. Also, funding should support research to improve the understanding of why some cancers, such as liver, kidney, and colorectal cancers, are particularly lethal among AIAN patients. Additional funding is warranted to support implementation science studies that increase cancer screening rates and improve access to cancer care and treatment for AIAN patients. These actions are needed to achieve the ambitious goal of eliminating cancer disparities among the AIAN population in Oklahoma.

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