

Cancer in Oklahoma Data Brief Series:

Pancreatic Cancer in Oklahoma-Update 2025

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Introduction

In 2023, pancreatic cancer was 3rd leading cause of cancer death in the United States (US), accounting for 8% of all cancer deaths.¹ Pancreatic cancer is one of the deadliest cancers, with a five-year survival rate of 13.5%.²

Several risk factors are associated with the development of pancreatic cancer, including smoking, race, age, sex, obesity, physical inactivity, alcohol consumption, diabetes, and several hereditary conditions.³ People with diabetes have an increased risk of pancreatic cancer (RR 1.82) compared to non-diabetic individuals.³ Moreover, studies have found that obese individuals (BMI>30) have a relative risk of 1.72 compared to those of normal weight.³ Finally, smoking cigarettes is a significant risk factor, contributing to approximately a relative risk of 1.5 compared to those who do not smoke.³

Pancreatic cancer is difficult to diagnose as the signs and symptoms tend to be vague. Symptoms may include fatigue without exertion, jaundice (yellowing of the skin and whites of the eyes), abdominal pain in the upper or middle abdomen and back, and unintentional weight loss.⁴ Five-year survival rates depend on stage at diagnosis: 41.1% of those diagnosed at the early stage survive, compared to 3.9% of those diagnosed at the distant stage.² Treatment modalities, including surgery, radiation therapy, chemotherapy, chemoradiation therapy, immunotherapy, and molecularly targeted therapy, are selected based on the type/stage of pancreatic cancer diagnosed.⁵ Clinical trials are in progress to identify and evaluate additional treatments.

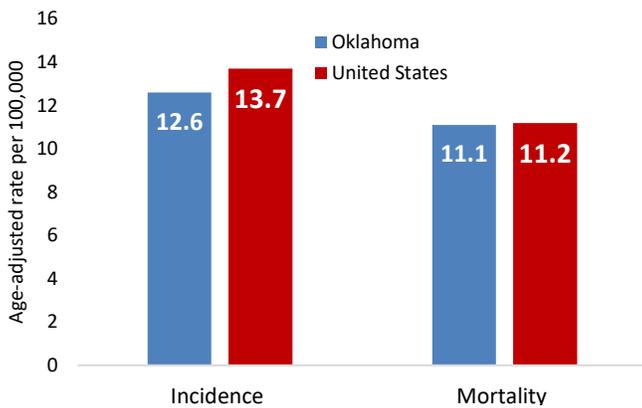
This data brief focuses on pancreatic cancer incidence and mortality rates in Oklahoma and concludes with a discussion of the significance of the findings for public health policy.

Methods

Data for pancreatic cancer incidence were obtained from the Oklahoma Central Cancer Registry (OCCR), the Centers for Disease Control's (CDC) National Program of Cancer Registries (NPCR), and the NCI's Surveillance, Epidemiology, and End Results (SEER) program. Cancer mortality data were from Oklahoma Vital Statistics and the CDC's National Vital Statistics System (NVSS). All data sources used in this brief were publicly available. Pancreatic cancer in this brief is defined according to the International Classification of Diseases for Oncology (ICD-O-3 C25.0-25.9). To ensure stability of estimates and confidentiality, CDC and SEER rates were suppressed if fewer than 16 counts were reported in a specific category. All rates were age-adjusted to the 2000 US standard population. All incidence and mortality rates are per 100,000 population. Staging for this data brief utilized the SEER summary staging classification.

We used the 2023 Rural-Urban Continuum Codes (RUCC), which classify U.S. counties into three metropolitan and six non-metropolitan categories based on population size, degree of urbanization, and proximity to metropolitan areas. In this brief, urban refers to counties in the RUCC 1-3 group and rural refers to counties in the RUCC 4-9 group. Hispanic] persons were categorized as being Hispanic regardless of race. All individuals in the sample were categorized into one of the following ethnic and racial groups: Hispanic, Non-Hispanic (NH) White, NH Black or African American, NH American Indian or Alaska Native, or NH Asian or Pacific Islander. Temporal patterns were assessed using Average Annual Percent Change (AAPC) in rate determination by Joinpoint regression analysis.⁶

Figure 1: Pancreatic cancer incidence (2018-2022) and mortality (2019-2023) in Oklahoma and the US



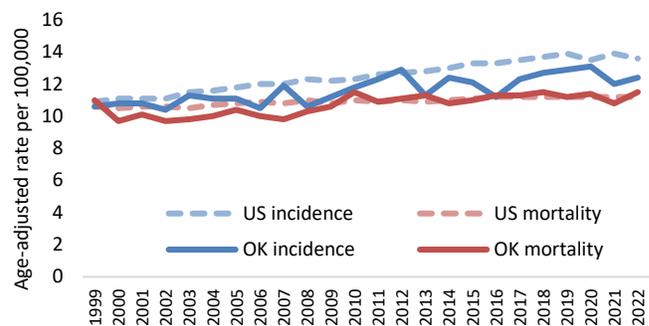
Source: CDC Cancer Data Visualizations

Results

Overall, there were 284,526 cases of pancreatic cancer diagnosed between 2018 and 2022 in the US (3.0% of all cancer cases). Of these cancers, 3,014 cases occurred in Oklahoma (2.8% of all cancer cases in the state). For mortality in the US, there were 238,339 pancreatic cancer deaths between 2019 and 2023 (7.3% of all cancer deaths). Of these cancer deaths, 2,717 were in Oklahoma (6.5% of all cancer deaths). From 2018 to 2022, the age-adjusted pancreatic cancer incidence rate in the US was higher than in Oklahoma, with rates of 13.7 per 100,000 and 12.6 per 100,000 people, respectively (Figure 1). During 2019 to 2023, the age-adjusted pancreatic cancer death rate for Oklahoma and the US was 11.1 and 11.2 per 100,000 people, respectively.

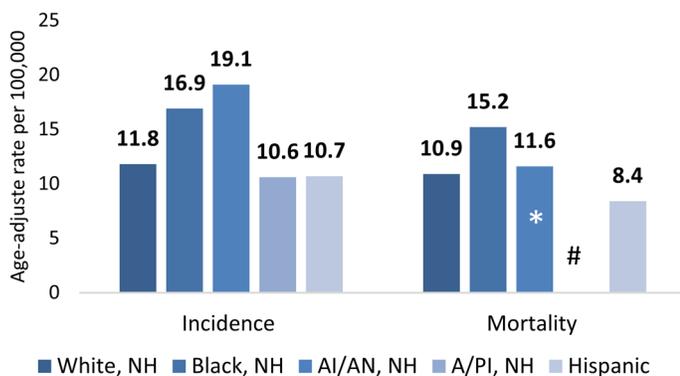
Figure 2 shows age-adjusted pancreatic cancer incidence and mortality rates in Oklahoma and the US by year from 1999 to 2022. Overall, both incidence and mortality rates in Oklahoma and the US have increased gradually over time. For age-adjusted incidence, Oklahoma generally had lower rates than the US. For mortality, Oklahoma initially had lower rates than the US; however, as Oklahoma's rates have increased, they have converged with those in the US in recent years. Using Joinpoint regression, all groups showed a significant increase in age-adjusted incidence (US: 1.10 and OK: 0.82 AAPC) and age-adjusted mortality (US: 0.30 and OK: 0.65 AAPC) (p-value = 0.00001 for all).

Figure 2: Age-adjusted pancreatic cancer incidence and mortality by year in Oklahoma and the US, 1999-2022



Source: CDC WONDER

Figure 3: Pancreatic cancer incidence (2018-2022) and mortality (2019-2023) by race/ethnicity in Oklahoma

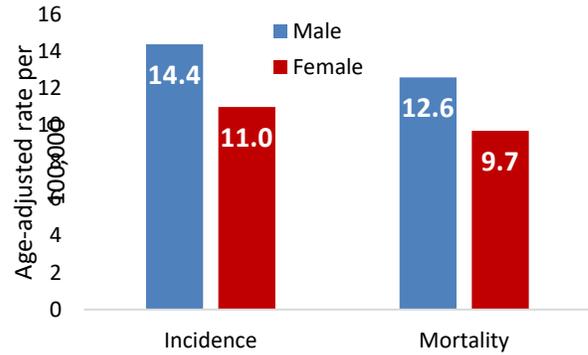


Source: OK2SHARE; Abbreviations: AI/AN: American Indian/Alaska Native; API: Asian/Pacific Islander; #Suppressed *Estimates suggest a 29% high rate of AIAN mortality not accounted for in this chart

Figure 3 shows pancreatic cancer incidence (2018-2022) and mortality (2019-2023) rates by race/ethnicity in Oklahoma. Among age-adjusted incidence rates, NH American Indians and Alaska Natives have the highest rates of all groups. NH Black Oklahomans have the second-highest incidence and highest mortality rates compared to all other groups. It is important to note that the mortality rates presented for NH AI/AN persons in Oklahoma are likely to be underestimated. Analyses that used data from prior years linking Indian Health Service data to the national death index revealed higher mortality for this group. However, the Indian Health Service-linked mortality data for the years presented here have not been released. We estimate about a 29% increase when adjusting for misclassification in Oklahoma.⁷

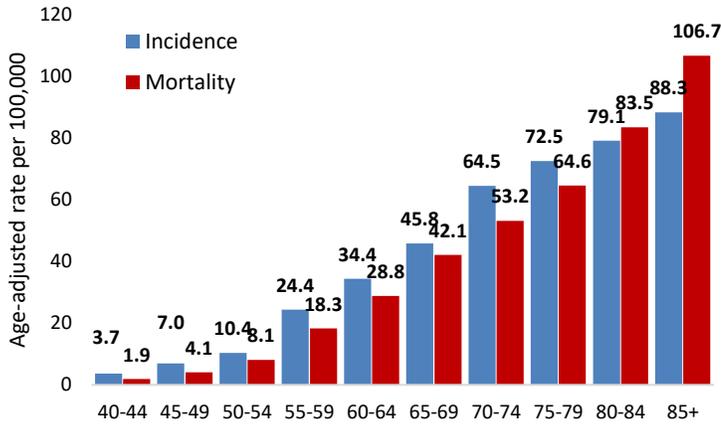
Figure 4 shows the age-adjusted rates of pancreatic cancer incidence (2018-2022) and mortality (2019-2023) by sex in Oklahoma. Overall, both incidence and mortality rates were higher among men compared to women.

Figure 4: Pancreatic cancer incidence (2018-2022) and mortality (2019-2023) by sex in Oklahoma



Source: CDC Cancer Data Visualizations

Figure 5: Pancreatic cancer age-adjusted incidence (2018-2022) and mortality (2019-2023) rates by age group, Oklahoma

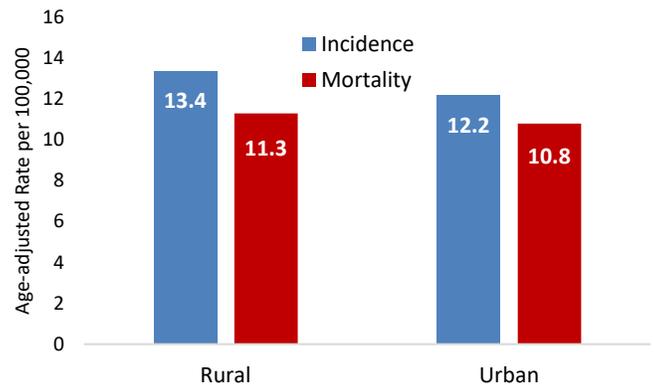


Source: OK2SHARE

Figure 5 shows the incidence of pancreatic cancer from 2018 to 2022 and mortality from 2019 to 2023, categorized by 10-year age groups, in Oklahoma. The highest incidence and mortality rate is observed among those 85 years and older. Both incidence and mortality rates increased with age.

Figure 6 shows the age-adjusted incidence and mortality rates by rural and urban status. Rural locations of the state have higher incidence and mortality rates.

Figure 6: Age-Adjusted Pancreatic Cancer Incidence (2018-2022) and Mortality (2019-2023) by Urban Rural, Oklahoma



Source: OK2SHARE

Figure 7 presents maps of age-adjusted pancreatic cancer incidence and mortality rates by county in Oklahoma. The northwest section of the state has many counties with suppressed data due to a small sample size. Higher incidence rates are observed in the west and southeastern areas of the state. Higher mortality rates are observed in the southwest region and in other random counties throughout the state. See [Appendix 1](#) for the underlying number of cancer cases, deaths, and age-adjusted incidence and mortality rates for each county in Oklahoma.

Figure 7: Age-Adjusted Pancreatic Cancer Incidence (2018-2022) and Mortality (2019-2023) by County in Oklahoma

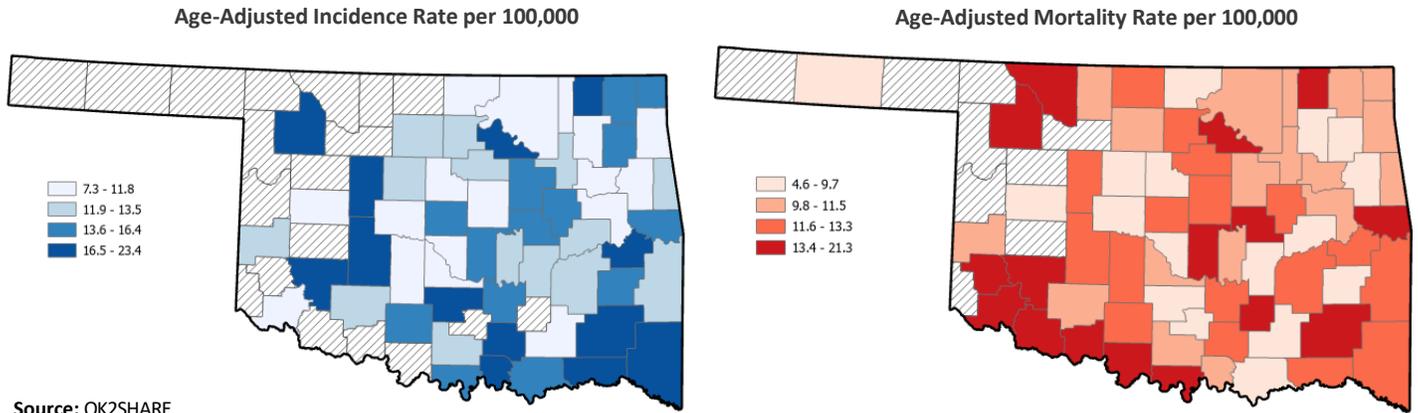
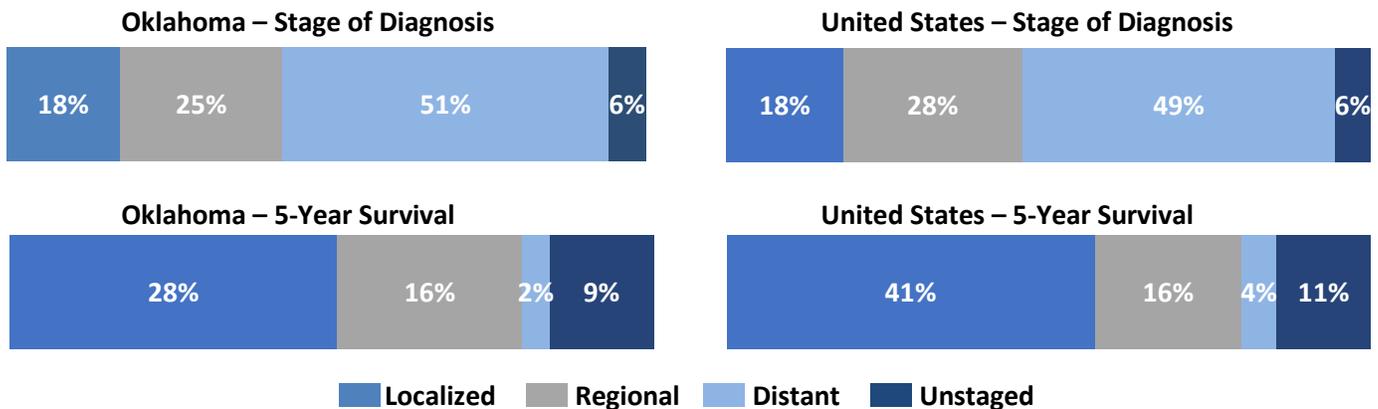


Figure 8 shows the percentage of cancer cases at each stage at diagnosis from 2018 to 2022, along with the 5-year relative survival by stage for pancreatic cancer in Oklahoma and the US. The stage at diagnosis provides the percentage of pancreatic cancer cases diagnosed at each stage. The 5-year relative survival rate by stage indicates the percentage of pancreatic cancer cases that survive for up to 5 years among those diagnosed at each stage. Most pancreatic cancers diagnosed in Oklahoma and the US are at the distant stage, which is also the stage with the lowest survival. It is important to note that, in Oklahoma, 5-year survival is lower for localized stage cancer than in the US. For both Oklahoma and the US, the localized stage is the least common stage at diagnosis (ignoring the unstaged); however, it has the highest survival rate. Overall, as the stage at diagnosis increases, the 5-year relative survival decreases. The 5-year relative survival rate for pancreatic cancer in Oklahoma is lower than in the US at all stages of diagnosis

Figure 8: Pancreatic cancer diagnosis and percentage surviving 5-year relative survival by stage in Oklahoma and the United States, 2018-2022



Source: CDC Cancer Data Visualizations

Conclusions and Implications for Practice and Policy

Pancreatic cancer is one of the deadliest cancers, with only 13.5% of people in the US with this cancer surviving five years, and only 10.5% surviving five years in Oklahoma. Thus, diagnosing and treating pancreatic cancer early is critical to Oklahoma's health and economic productivity. Moreover, pancreatic cancer incidence and mortality rates are increasing in Oklahoma and the US, so there is a growing need to reduce the burden of pancreatic cancer.

Because obesity increases the risk of pancreatic cancer, we must continue to support efforts to reduce obesity through programs and policies. The Community Preventive Services Task Force recommends several evidence-based interventions to reduce obesity, including school-based meals or fruit-and-vegetable snack programs combined with physical activity interventions; behavioral interventions to mitigate recreational sedentary screen time among children; technology-supported, multicomponent coaching or counseling programs; and worksite obesity prevention initiatives.⁸ Recent observational research also indicates that interventions to reduce obesity, including bariatric surgery and the use of GLP-1 receptor agonist medications in diabetes, may decrease the incidence of obesity-related cancers, such as pancreatic cancer.

Cigarette smoking is a preventable risk factor for many cancers, including pancreatic cancer. We must continue to support tobacco prevention and cessation programs and policies. The Oklahoma Tobacco Helpline, a program funded by the Oklahoma Tobacco Settlement Endowment Trust (TSET), provides no-cost services and customized plans to help individuals quit smoking.

Pancreatic cancer is often diagnosed at later stages, which have very low survival rates. There is an urgent need to develop effective screening methods for pancreatic cancer. There is promising work being done with increasing survival through surveillance programs assembling cohorts of people who are *high-risk for pancreatic cancer* (strong family history or high-penetrance germline mutations) and surveilling them with magnetic resonance imaging, magnetic resonance cholangiopancreatography, and/or endoscopic ultrasound.⁹

Finally, there is a need to ensure that all Oklahomans diagnosed with pancreatic cancer have access to the newest treatments. Oklahoma's low survival among those diagnosed at the early stages makes this particularly important, as those found at the early stages of pancreatic cancer respond well to surgery either alone or in combination with other treatments. We need statewide efforts to ensure that people at all stages of the disease can get potentially curable treatment promptly.

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Data Sources:

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