



Department of  
**Health**

**2017-2021**

# **CANCER IN TENNESSEE**

## **ANNUAL REPORT**

**PREPARED BY:**

Tennessee Cancer  
Registry (TCR)

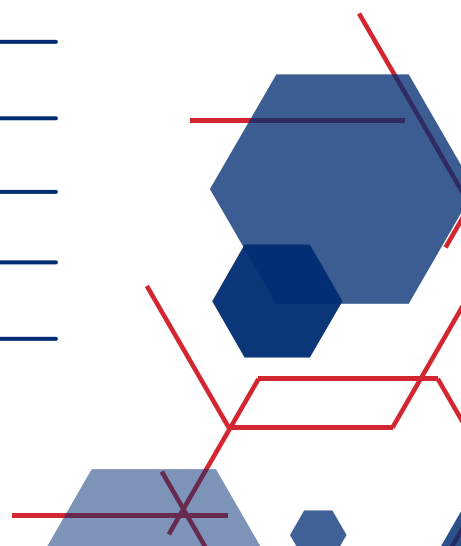
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# Executive Summary

## About Report

This report contains cancer incidence and mortality data for the entire state of Tennessee from 2017 through 2021, with comparisons to national rates. Data collected by the Tennessee Cancer Registry (TCR), as well as cancer registries nationwide, made the creation of this report possible. This report published by the TCR is meant to serve as a reference for researchers and the general public. This comprehensive report offers meticulously gathered statistics from diverse data sources, curated to facilitate easy access and utilization, enabling direct comparisons and fostering a thorough comprehension of the prevailing cancer landscape in Tennessee. Within its pages lie essential insights into cancer incidence, mortality rates, trend analyses, behavioral risk factors, alongside a wealth of cancer resource information, educational materials, and more.

## Preventable Cancer Risk Factors

While cancer is typically caused by a combination of factors, an estimated **40.0%** of all new cancers and **44.0%** of all cancer deaths are preventable with better lifestyle choices, such maintaining a healthy weight and avoiding smoking and alcohol.<sup>13</sup> In Tennessee, smoking is a major cancer risk factor, with the second-highest percentage of current smokers,<sup>15</sup> third-highest percentage of cancer deaths attributable to smoking,<sup>14</sup> and sixth-highest lung cancer incidence and mortality in the nation, per age-adjusted rates.<sup>10</sup>

## Cancer Occurrence in TN

There were 193,946 new cancer diagnoses with a rate of 457.3 per 100,000 in Tennessee (TN) from 2017-2021.<sup>18</sup> Trousdale County has the highest age-adjusted cancer incidence rate per 100,000 in TN from 2017-2021 (583.1), followed by Marshall County (566.2), Macon County (539.8), Humphreys County (532.7), Haywood County (522.6), Dickson County (522.5), Marion County (520.0), Rhea County (517.4), Hancock County (512.1), and Benton County (511.9).<sup>17</sup>

## Cancer Deaths (Mortality) in TN

During this same time period, 71,742 Tennesseans died from cancer with a rate of 169.0 per 100,000, making cancer the second leading cause of death in TN following heart disease.<sup>10</sup> Overton County has the highest age-adjusted cancer mortality rate per 100,000 in TN from 2017-2021 (241.3), followed by Houston County (220.7), Scott County (216.7), Lauderdale County (214.3), Carroll County (212.9), Gibson County (212.5), Hardeman County (211.2), Crockett County (210.7), Grundy County (210.6), and Stewart County (209.8).<sup>17</sup>

# About the Tennessee Cancer Registry (TCR)

## Who We Are

The Tennessee Cancer Registry (TCR) was established in 1983 by the Tennessee General Assembly with the passage of Tennessee Code Annotated (T.C.A.) § 68-1-1001 and is responsible for collecting information on all reportable cancer diagnoses in Tennessee, including non-residents diagnosed and/or treated in Tennessee (TN). Every year beginning with the 2005 diagnosis year, the TCR has been certified as a National Program of Cancer Registries (NPCR), "Registry of Distinction," and has achieved the, "Gold Certification," which is the highest level of certification by the North American Association of Central Cancer Registries (NAACCR).

## What We Do

In collaboration with health care facilities located across the state and their cancer registrars, TCR staff identify new cases of cancer through routine, systematic review of medical records, pathology reports, radiation therapy records, hospital discharge lists, state vital records, and other source documents. Information regarding patient characteristics, cancer diagnosis, and first-course treatment is ascertained primarily from specific statements in the medical record and other sources such as death certificates and physician reports.

## Our Purpose

- Collect accurate information on cancer cases diagnosed and/or treated in TN annually.
- Increase general awareness of cancer in TN.
- Promote and assist cancer abstractors in each facility to accurately code cancer abstracts.
- Provide information to the public regarding cancer incidence and mortality in TN.
- Serve as a data repository for those requesting information on cancer, its effects, treatment, and some risk factors.
- Support epidemiological research into the causes, distribution, prevention, and treatment of cancer.



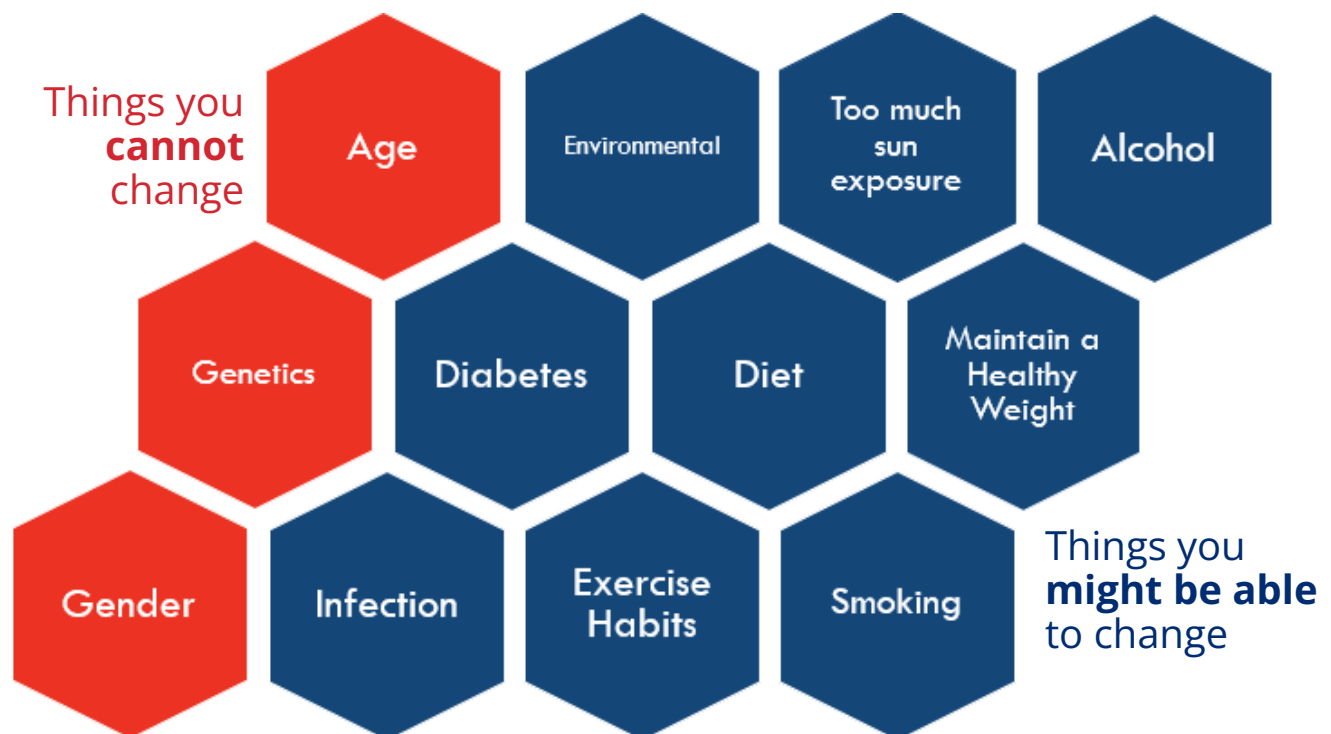
# Cancer Risk Factors

## Cancer and Cancer Risk Factors

Cancer is a group of more than 100 diseases characterized by uncontrolled growth and spread of abnormal cells that may have varying causes, symptoms, prognoses, treatment options, and more.<sup>11, 16</sup> Cancer is common, with **1 in 3** people being diagnosed with cancer in their lifetime in the US.<sup>4</sup> While cancer is typically caused by a combination of factors, an estimated **40%** of all new cancers and **44%** of cancer deaths in adults aged 30+ are preventable by maintaining a healthy weight and avoiding smoking and alcohol.<sup>13</sup>

Figure 1 shows a few known risk factors for cancer and Figure 2 shows the prevalence of modifiable (things you can change) factors.

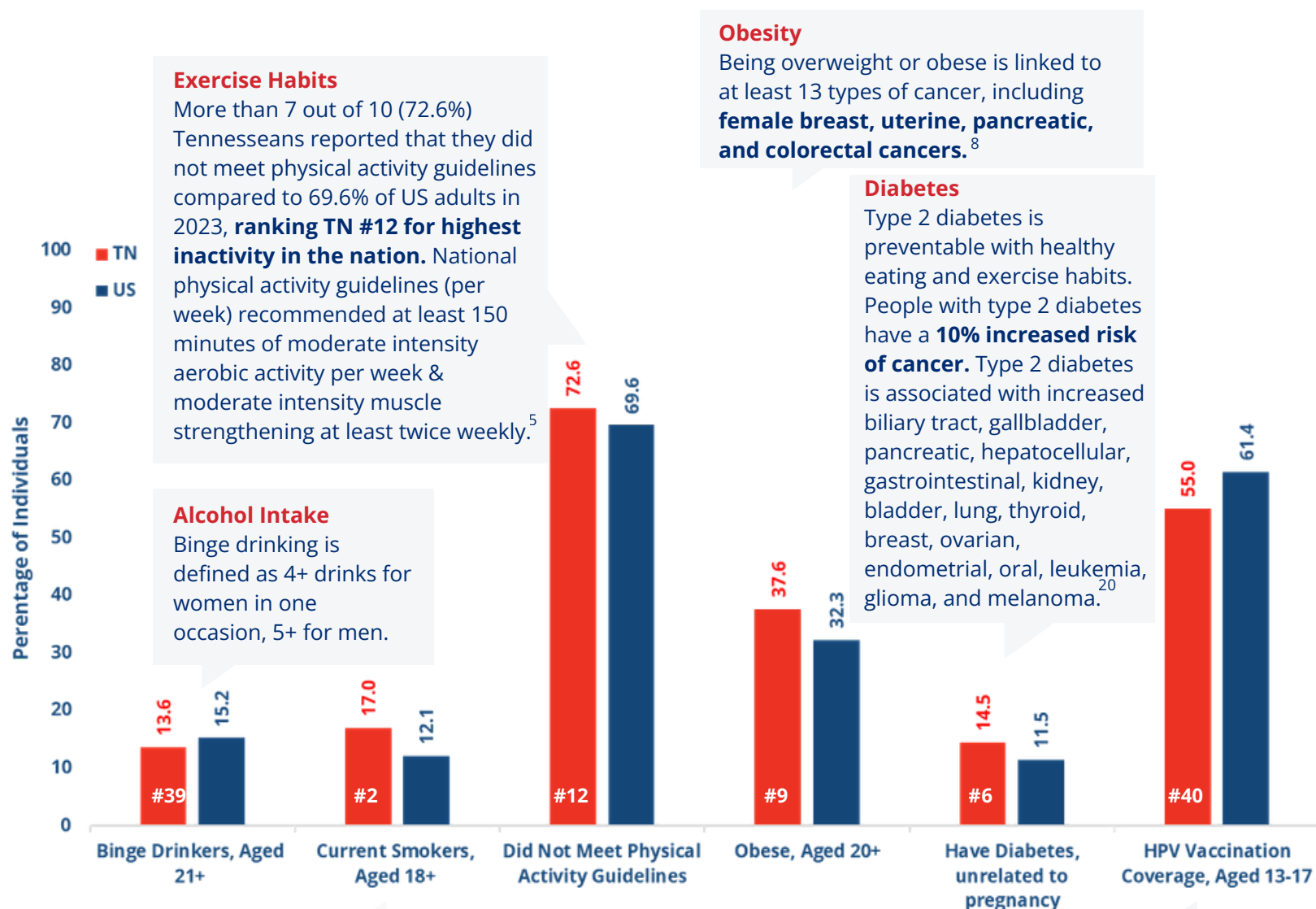
Figure 1. Cancer Risk Factors



# Cancer Risk Factors Continued...

**Figure 2. The Prevalence of Modifiable Risk Factors in TN and in the US, 2023**

*-The TN rankings are denoted in white as “#” and are interpreted as the #\_highest rate in the US.*



## Exercise Habits

More than 7 out of 10 (72.6%) Tennesseans reported that they did not meet physical activity guidelines compared to 69.6% of US adults in 2023, **ranking TN #12 for highest inactivity in the nation.** National physical activity guidelines (per week) recommended at least 150 minutes of moderate intensity aerobic activity per week & moderate intensity muscle strengthening at least twice weekly.<sup>5</sup>

## Alcohol Intake

Binge drinking is defined as 4+ drinks for women in one occasion, 5+ for men.

## Obesity

Being overweight or obese is linked to at least 13 types of cancer, including **female breast, uterine, pancreatic, and colorectal cancers.**<sup>8</sup>

## Diabetes

Type 2 diabetes is preventable with healthy eating and exercise habits. People with type 2 diabetes have a **10% increased risk of cancer.** Type 2 diabetes is associated with increased biliary tract, gallbladder, pancreatic, hepatocellular, gastrointestinal, kidney, bladder, lung, thyroid, breast, ovarian, endometrial, oral, leukemia,<sup>20</sup> glioma, and melanoma.

## Smoking

In the US, smoking causes about **20%** of all new cancers, **30%** of all cancer deaths, **80%** of new lung cancers, and **80%** of all lung cancer deaths. Smoking increases the risk of mouth, larynx, pharynx, esophagus, kidney, cervix, liver, bladder, pancreas, stomach, colorectal, acute myeloid leukemia, and lung cancers.<sup>2</sup> Almost **1 in 6 (17.0%) TN adults currently smoke** compared to 12.1% of US adults, ranking Tennessee second in the nation for the highest percentage of current smokers in 2023.<sup>5</sup> **More than 1 in 3 (35.2%) cancer deaths in TN were attributable to smoking,** compared to 29.4% in the US. **TN has the #3 highest percentage of cancer deaths attributable to smoking** in the nation.<sup>14</sup>

## HPV Vaccine

Certain infections associated with cancer are not preventable; however, infection with certain types of human papillomavirus (HPV) are preventable with the HPV vaccine. HPV can cause cervical, vaginal, vulvar, penile, anal, and oropharyngeal cancers. **HPV vaccination is estimated to prevent more than 90% of cancers caused by HPV.**<sup>6</sup>

# Cancer in TN Overview

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## Incidence

There were 193,946 new cancer diagnoses with a rate of 457.3 per 100,000 in Tennessee from 2017-2021 (USCS).<sup>18</sup>



## Cancer Survivors

There are 326,530 estimated cancer survivors in Tennessee in 2019. This number includes anyone with a history of cancer.<sup>3</sup>



## Mortality

71,742 Tennesseans died from cancer with a rate of 169.0 per 100,000 from 2017-2021.<sup>10</sup>



## Cancer is the #2 Cause of Death

Cancer was the 2nd leading cause of death in Tennessee from 2017-2021, following heart diseases.<sup>17</sup>



# Cancer in TN Overview: By Site

Figure 3. Overview of New Cancers in TN and the US (Numbers within the red bar are TN state rankings in the U.S.), 2017-2021

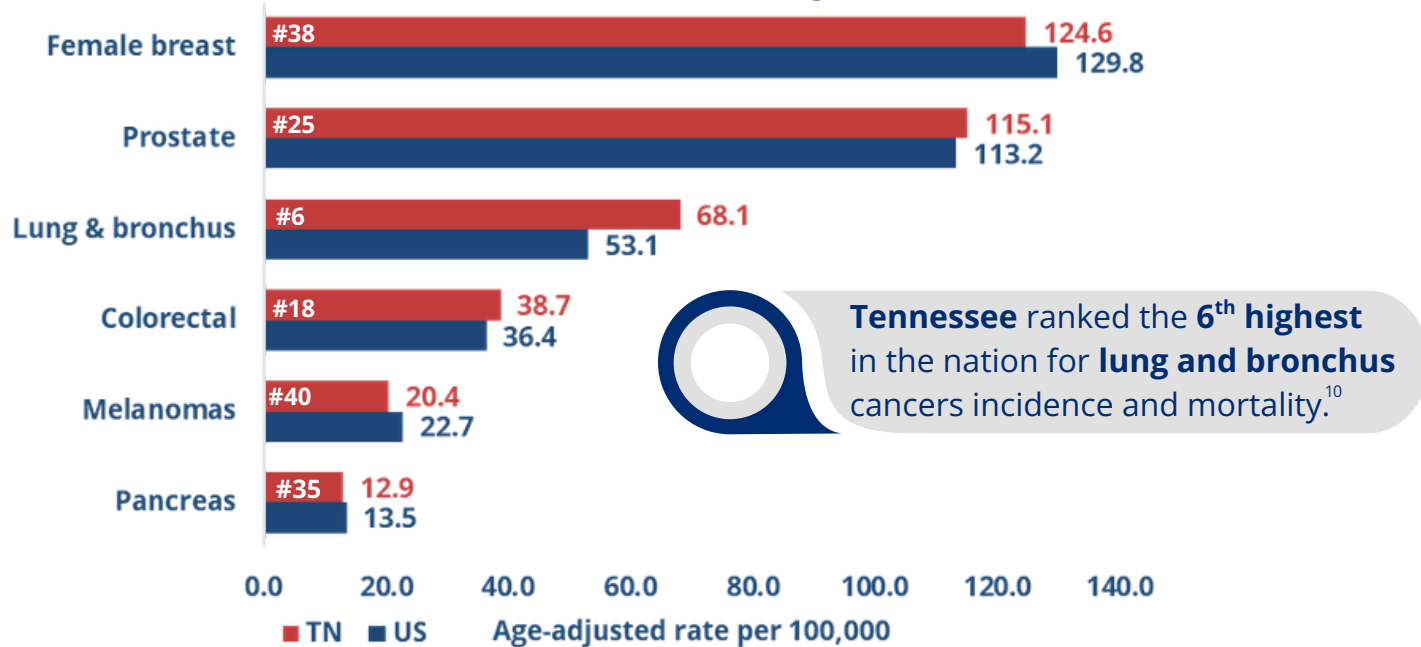
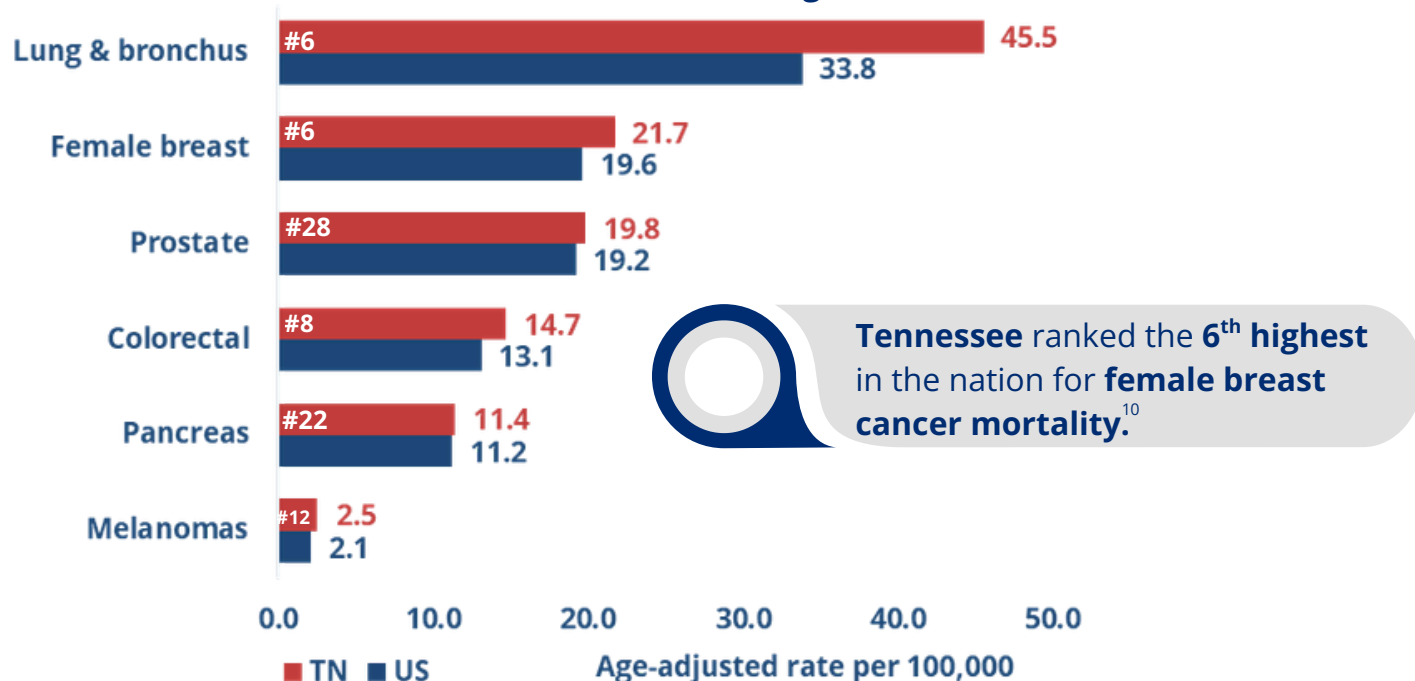


Figure 4. Overview of Cancer Deaths in TN and the US (Numbers within the red bar are TN state rankings in the U.S.), 2017-2021



## Notes

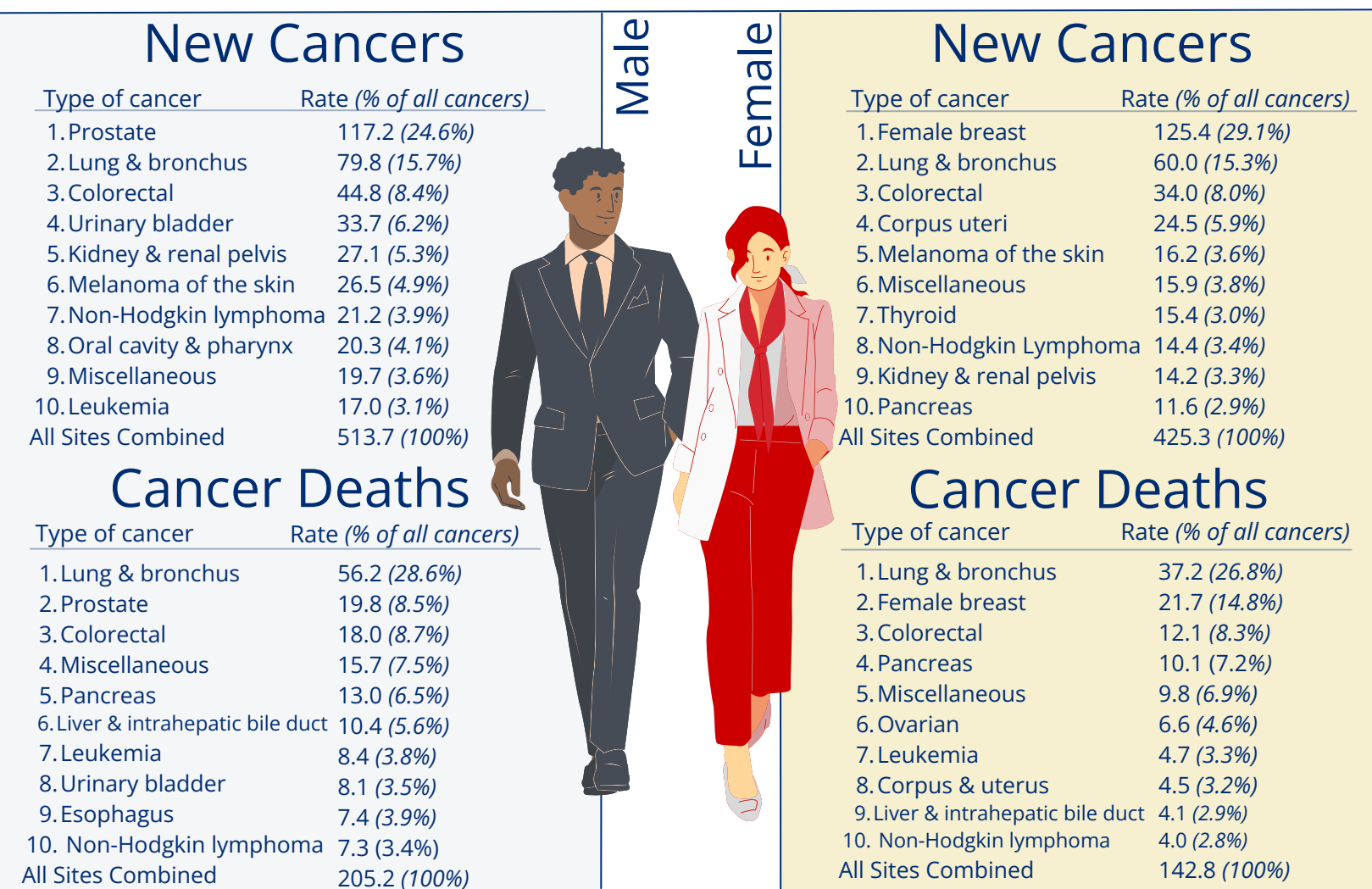
-Incidence statistics were obtained from USCS.<sup>18</sup>

-Mortality statistics were obtained from CDC Wonder.<sup>10</sup>

-The TN state rankings, interpreted as the #\_highest rate in the US, were obtained from CDC Wonder, and are denoted in white as "#".<sup>10</sup>

# Cancer in TN Overview: By Sex

Figure 5. Top 10 Cancers among Tennesseans by Sex, 2017-2021



-Data are obtained from the TCR, which may have non-significant differences from USCS and CDC Wonder.  
 -The top 10 cancer types are ranked by highest to lowest age-adjusted rate per 100,000.

# Cancer in TN Overview: By County

Figure 6. Age-adjusted Incidence Rates by County in TN, 2017-2021

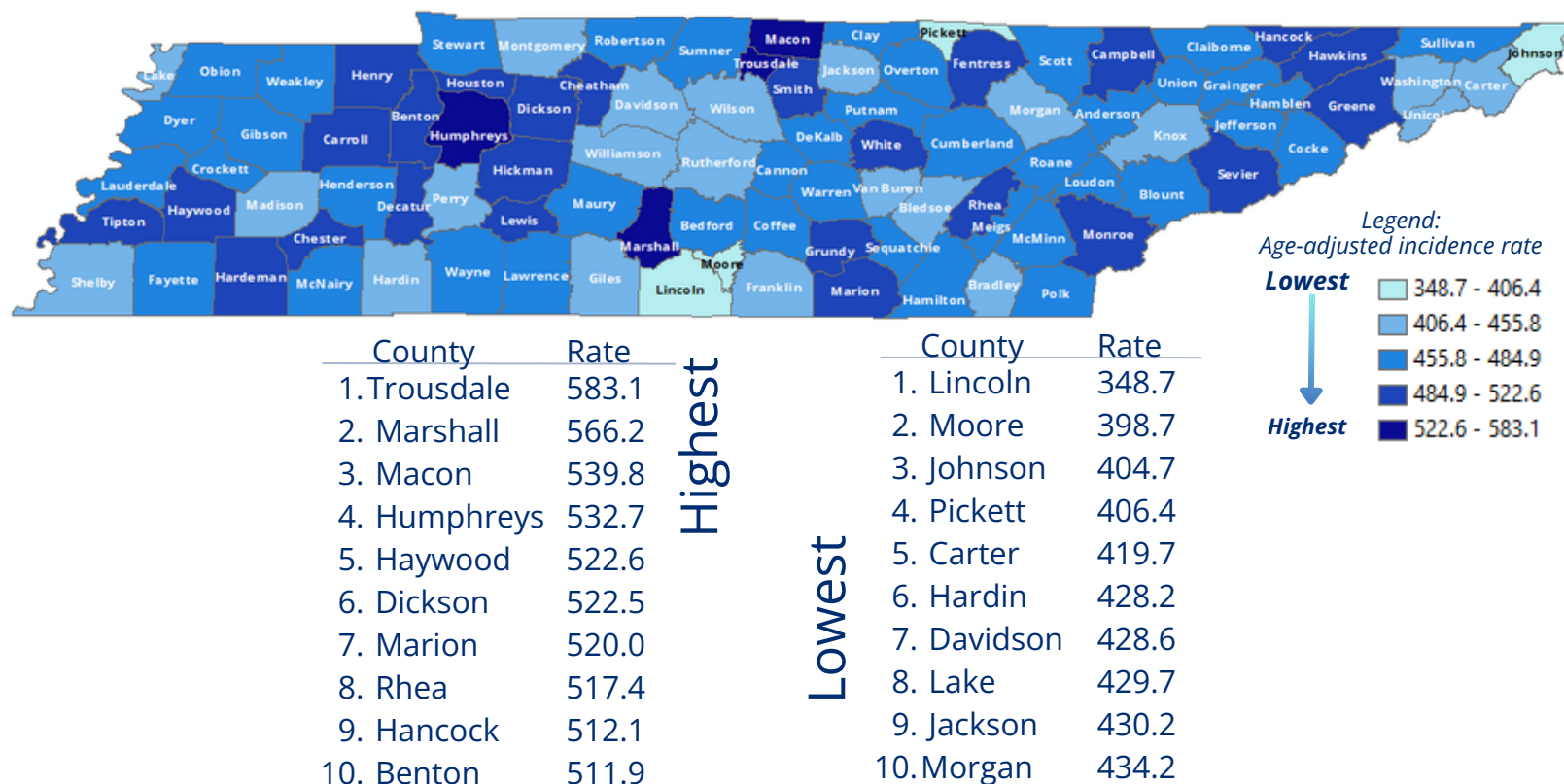
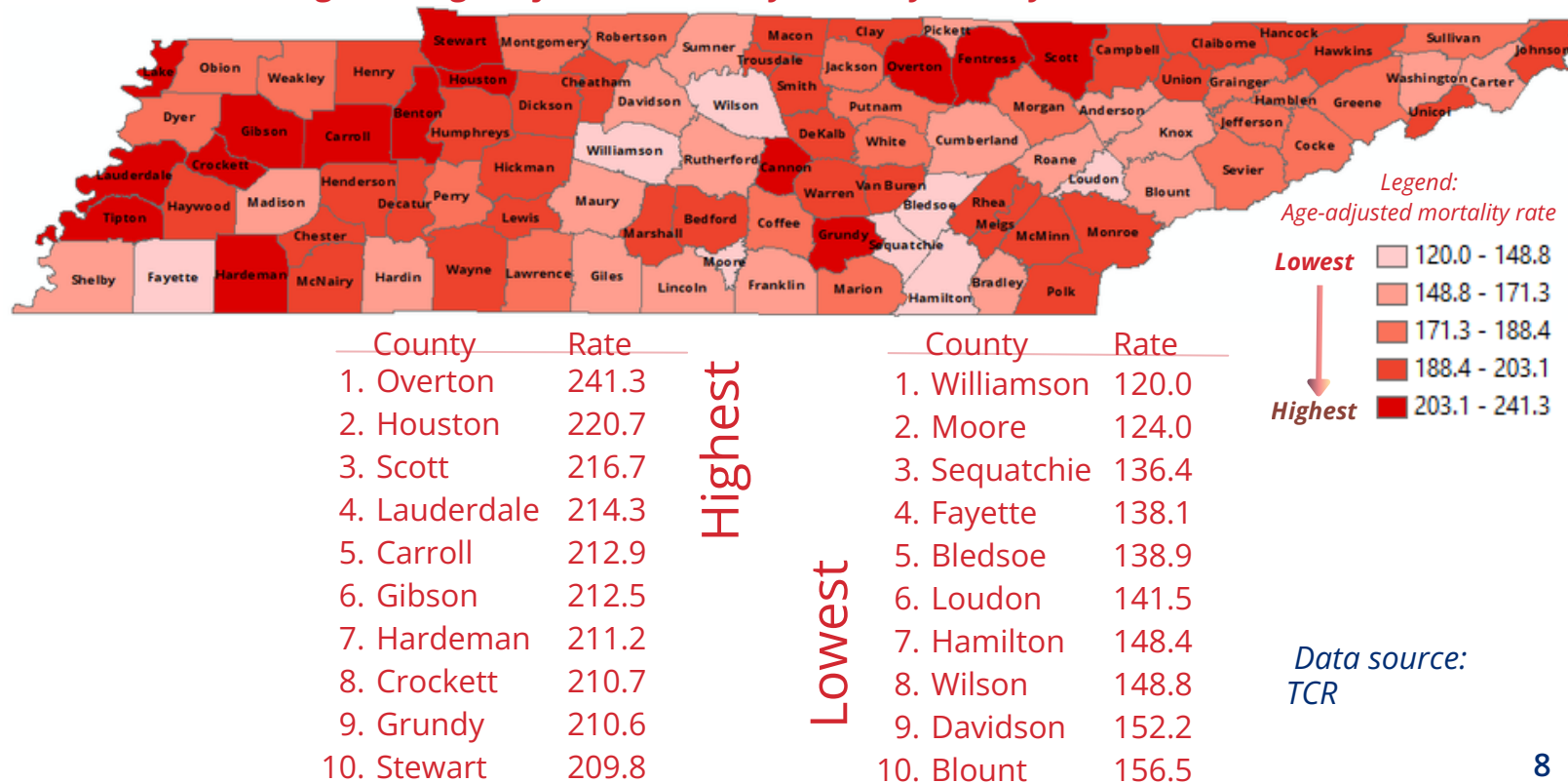


Figure 7. Age-adjusted Mortality Rates by County in TN, 2017-2021



Data source:  
TCR

# Cancer Disparities in TN

## Race

### Cancer Incidence

- The **Black** population in TN had significantly higher **prostate, colorectal, and pancreatic cancer incidence rates** than any other race from 2017-2021. The White population in TN had significantly higher cancer incidence rates for all sites combined, lung cancer, melanoma of the skin, and childhood cancers (ages 0-19 yrs) than any other race in 2017-2021.<sup>18</sup>

### Cancer Mortality

- The **Black** population in TN had significantly higher **mortality rates for all sites combined, female breast cancer, prostate cancer, colorectal cancer, and pancreatic cancer** during this time. The White population had significantly higher lung cancer and melanoma of the skin mortality rates than any other race during this time.<sup>10</sup>

### Late Stage Diagnosis

- Of those with known race and staging information, a significantly higher percentage of Black (50.5%), American Indian/Alaska Native (AI/AN) (56.9%) and Asian or Pacific Islander (API) (53.5%) individuals were diagnosed at late stages than White (48.7%) individuals in TN from 2017-2021.<sup>17</sup>

## Insurance Coverage

### Late Stage Diagnosis

- Among Tennesseans who were diagnosed with cancer between 2017 and 2021 with known staging and insurance status information, a significantly higher percentage of **individuals without insurance were diagnosed at late, more advanced stages** (68.3%) compared to those with insurance (48.5%).<sup>17</sup> This trend mirrors what has been found across the United States. Regular cancer screenings play a crucial role in catching some types of cancer early when it's more treatable. Research indicates that having health insurance significantly increases the likelihood of receiving recommended cancer screenings, revealing that uninsured adults tend to have much lower rates of cancer screening compared to those with insurance coverage.<sup>12</sup>

Figure 8. Stages of Cancer



Being diagnosed at late stages has serious implications, leading to poorer outcomes and higher chances of mortality.<sup>12</sup>

# Cancer Screenings



Regular cancer screenings play a crucial role in catching cancer early when it's more treatable.

Table 1a. Cancer Screening Recommendations and Prevalence of Screenings in TN

| Type of Cancer    | Prevalence of Screening in TN                                                                                                                                                                                     | U.S. Screening Recommendations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Colorectal Cancer | In 2022, <b>64.3%</b> of Tennesseans aged 45-75 received at least one recommended colorectal screening test, compared to <b>66.9%</b> of people in the US, ranking TN #39 highest in this category. <sup>15</sup> | <ul style="list-style-type: none"><li>The US Preventive Services Taskforce (USPSTF) recommends colorectal cancer screening for individuals aged 50 to 75 with a grade of "A," meaning there is a high certainty that the net benefit is substantial. The USPSTF recently expanded its recommendation for screening to include those 45-49 years of age with a grade of "B," meaning there is evidence of moderate to substantial net benefit. For adults aged 76 to 85, the USPSTF recommends considering their overall health, prior screening history, and preference to determine whether to undergo colorectal screening.<sup>19</sup></li></ul> |
| Prostate Cancer   | In 2020, <b>32.9%</b> of men in TN aged 40+ received a PSA Test in past 2 years, compared to <b>31.8%</b> of men in the US, ranking TN #18 highest (tied with MO) in this category in the nation. <sup>5</sup>    | <ul style="list-style-type: none"><li>The USPSTF recommends against population-based screening for prostate cancer for men 70 years or older. For individuals aged 55-69, the decision to get a periodic PSA screening for prostate cancer is an individual-level decision. Each clinician and patient can discuss potential benefits, potential harms, and overall interest in getting periodic PSA screenings to help each individual decide.</li><li>The USPSTF is currently in the process of updating this recommendation.<sup>19</sup></li></ul>                                                                                               |

# Cancer Screenings Continued...

Table 1b. Cancer Screening Recommendations and Prevalence of Screenings in TN

| Type of Cancer       | Prevalence of Screening in TN                                                                                                                                                                           | U.S. Screening Recommendations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Female Breast Cancer | In 2022, <b>69.4%</b> of women in TN aged 40+ had a mammogram in past 2 years, compared to <b>70.2%</b> of women in the US, ranking TN at the #29 highest in this category in the nation. <sup>15</sup> | <ul style="list-style-type: none"> <li>• Screening Mammography               <ul style="list-style-type: none"> <li>◦ The USPSTF recommends biennial screening mammography for women 40-74 years as there is moderate certainty that the net benefit is moderate to substantial. There is insufficient evidence to assess the positives and negatives of screening mammography for women aged 75 years or older.</li> </ul> </li> <li>• Digital Breast Tomosynthesis (DBT)               <ul style="list-style-type: none"> <li>◦ Current evidence shows that both mammography and digital breast tomosynthesis (DBT) are effective primary screening methods, however, the USPSTF recommends that women aged 40 to 74 undergo screening mammography every two years.</li> </ul> </li> <li>• Supplemental MRI or breast ultrasonography               <ul style="list-style-type: none"> <li>◦ According to the USPSTF, there is not enough evidence to determine whether additional breast cancer screening with MRI or breast ultrasonography is beneficial or harmful for women with dense breast tissue who have<sup>19</sup> already had a negative mammogram.</li> </ul> </li> </ul> |

# Cancer Screenings Continued...

Table 1c. Cancer Screening Recommendations and Prevalence of Screenings in TN

## Type of Cancer

## U.S. Recommended Screenings

### Lung Cancer

- The USPSTF has recommended an annual screening with low-dose computed tomography screening for lung cancer a grade of “B” for certain individuals: adults aged 50-80 years with a 20 pack-year history of smoking and who currently smoke or quit smoking within the past 15 years. Annual screenings may be discontinued after a person has stopped smoking for 15 years or has another health condition that greatly limits life expectancy and the ability to have lung surgery. It should be noted a pack year is defined as smoking an average of 1 pack of cigarettes per day for 1 year.<sup>19</sup>

### Skin Cancer

- The USPSTF recommends limiting exposure to ultraviolet (UV) radiation from the sun, indoor tanning beds, and other sources. However, the USPSTF finds there is not enough evidence to determine the benefits and harms of routine skin cancer screening through visual skin exams. As a result, it does not recommend general screening for people without a personal or family history of skin cancer or without suspicious moles or spots.<sup>19</sup>
- The American Academy of Dermatology (AAD) recommends that all individuals should use a broad-spectrum and water-resistant sunscreen with SPF of 30 or higher, wear protective clothing, avoid tanning beds, and seek shade to protect against the sun’s UV rays. They also recommend that all individuals should perform regular self-exams of the skin. They recommend seeing a board-certified dermatologist if anyone notices a suspicious spot that changes, itches, or bleeds.<sup>1</sup>

# Cancer Screenings Continued...

Table 1c. Cancer Screening Recommendations and Prevalence of Screenings in TN

| Type of Cancer    | U.S. Recommended Screenings                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pancreatic Cancer | <ul style="list-style-type: none"><li>The USPSTF recommends against routine screening for pancreatic cancer by any means in asymptomatic adults, grade of "D."<sup>19</sup></li></ul> |
| Childhood Cancers | <ul style="list-style-type: none"><li>No effective screening methods for childhood-related cancers have been discovered.<sup>19</sup></li></ul>                                       |

# All Cancer Sites Combined

## INCIDENCE

There were 193,946 new cancer diagnoses in TN from 2017-2021. TN has an all cancers incidence rate of 457.3 per 100,000 (95% CI 455.2, 459.4), which is significantly higher than the US rate of 444.4 per 100,000 (95% CI 444.1, 444.7). TN was ranked the 23rd highest in cancer incidence in the nation during this time.

- **Men in TN had a significantly higher all cancers incidence rate** (507.9 per 100,000; 95% CI 504.7, 511.2) than women (421.8 per 100,000; 95% CI 419.0, 424.6) in TN from 2017-2021.
- The **White** population in TN had a significantly **higher all cancers incidence rate** than all other races during this time.

Figure 9. Cancer Incidence Rates by Sex and Race in TN and in the US, 2017-2021, All Sites Combined

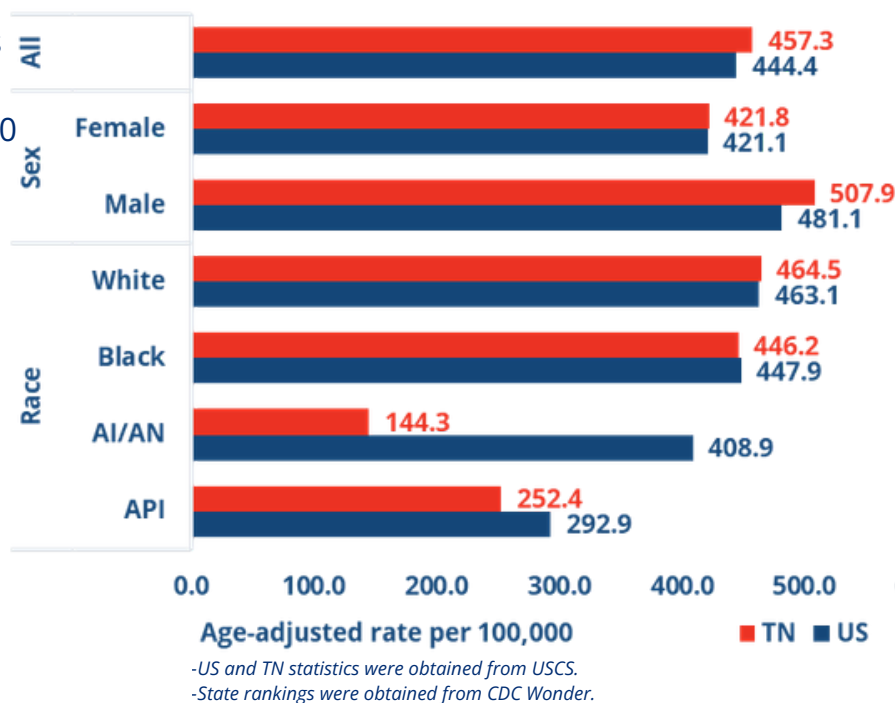
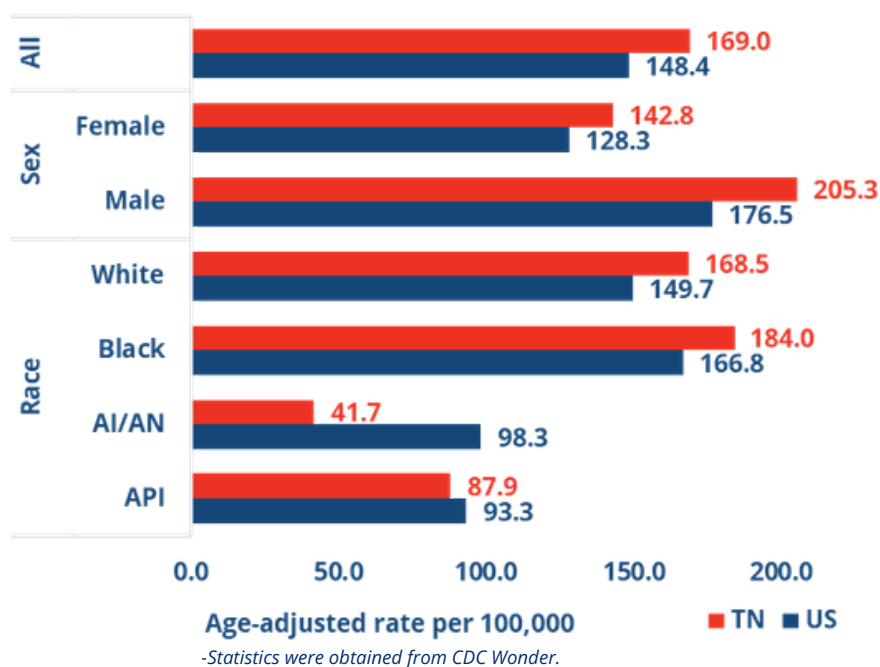


Figure 10. Cancer Mortality Rates by Sex and Race in TN and in the US, 2017-2021, All Sites Combined



## MORTALITY

71,742 Tennesseans died from cancer in TN from 2017-2021. TN had an all cancers mortality rate of 169.0 per 100,000 (95% CI 167.7, 170.3) from 2017-2021, which is significantly higher than the US rate of 148.4 per 100,000 (95% CI 148.2, 148.6). **TN was ranked the 6th highest in all cancers mortality in the nation during this time.**

- **Men in TN had a significantly higher all cancers mortality rate** (205.3 per 100,000; 95% CI 203.1, 207.4) than women (142.8 per 100,000; 95% CI 141.3, 144.4) in TN during this time.
- The **Black population in TN had a significantly higher all cancers mortality rate** than any other race in TN during this time.

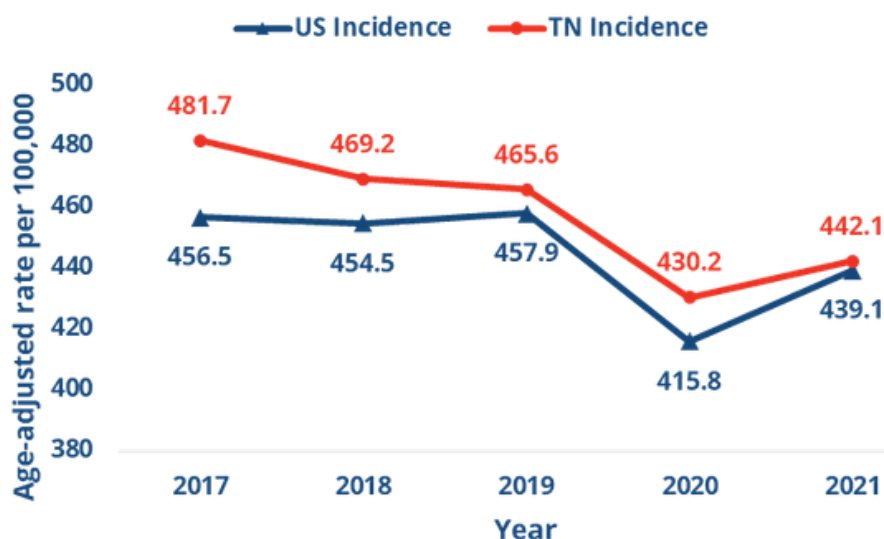
# All Cancer Sites Combined

## INCIDENCE TRENDS

From 2017-2021, cancer incidence rates decreased in TN by 1.8% each year, but this finding was not significant.

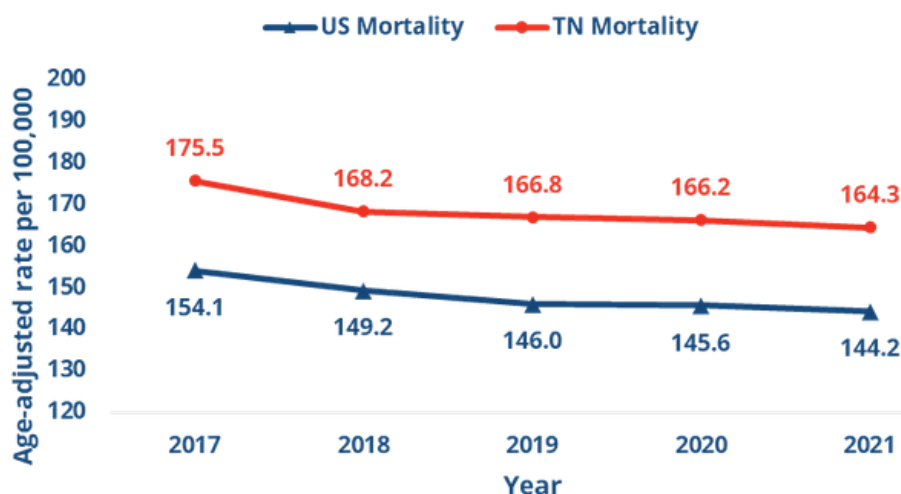
- Men in TN experienced significant decreases in cancer incidence rates from 2017-2021, by 2.7% each year.
  - Specifically, White men in TN experienced a significant decrease in cancer incidence rates by 2.8% each year during this time.

Figure 11. Cancer Incidence Trends in TN and in the US, 2017-2021, All Sites Combined



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 12. Cancer Mortality Trends in TN and in the US, 2017-2021, All Sites Combined



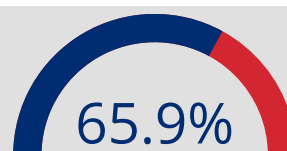
-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Cancer mortality rates in TN significantly decreased by 1.5% each year from 2017-2021.

- White and Black populations in TN experienced significant decreases in cancer mortality rates from 2017-2021, by 1.4% each year and 3.4% each year, respectively.

**THE 5-YEAR RELATIVE SURVIVAL RATE FOR ALL CANCER SITES COMBINED IN TN IS 65.9%, COMPARED TO 68.6% IN THE US. (USCS, 2015-2021 STATISTICS).**



# Lung & Bronchus Cancer

## INCIDENCE

There were 30,246 new lung cancer diagnoses in TN from 2017-2021. TN has an overall lung cancer incidence rate of 68.1 per 100,000 (95% CI 67.3, 68.9). This is significantly higher than the US rate of 53.1 per 100,000 (95% CI 53.0, 53.2). TN was ranked the **6th highest in lung cancer incidence** in the nation during this time.

- **Men** in TN had a **significantly higher lung cancer incidence rate** (79.4 per 100,000; 95% CI 78.1, 80.7) than women (59.6 per 100,000; 95% CI 58.7, 60.6) in TN during this time.
- The **White** population in TN had a **significantly higher** lung cancer incidence rate than all other races.

Figure 13. Lung Cancer Incidence Rates by Sex and Race in TN and in the US, 2017-2021

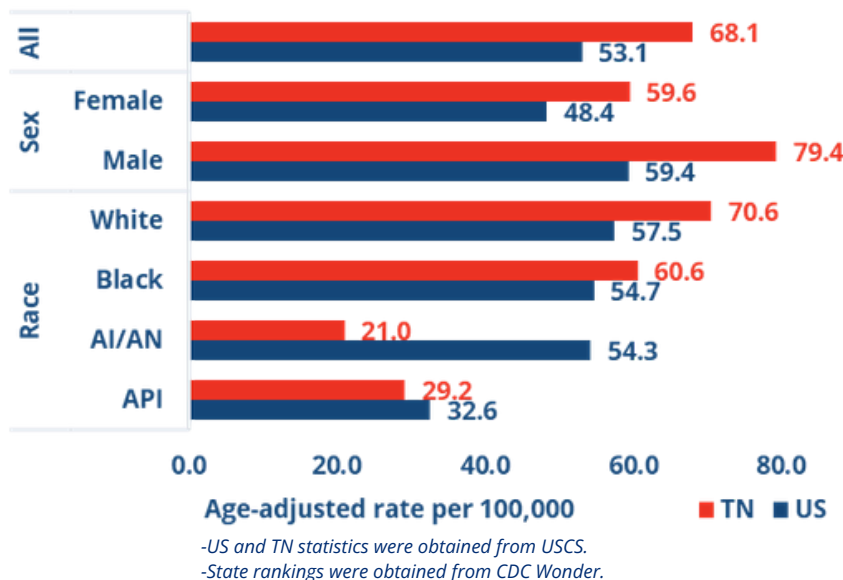
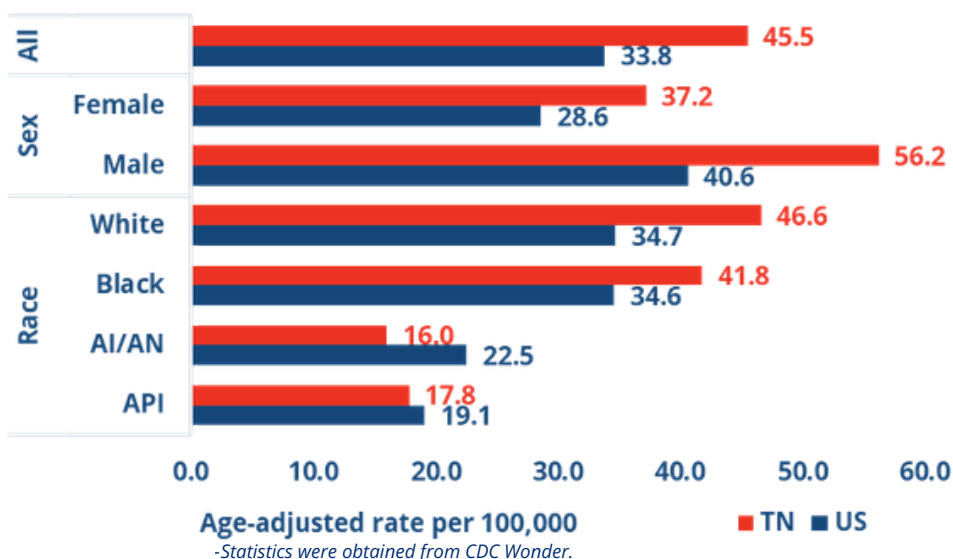


Figure 14. Lung Cancer Mortality Rates by Sex and Race in TN and in the US, 2017-2021



## MORTALITY

There were 19,899 Tennesseans that died from lung cancer in TN from 2017-2021. TN had a lung cancer mortality rate of 45.5 per 100,000 (95% CI 44.8, 46.1) from 2017-2021, which is significantly higher than the US rate of 33.8 per 100,000 (95% CI 33.8, 33.9). **TN** was ranked the **6th highest in lung cancer mortality** in the nation during this time.

- **Men** in TN had a **significantly higher lung cancer mortality rate** (56.2 per 100,000; 95% CI 55.2, 57.3) than women (37.2 per 100,000; 95% CI 36.4, 38.0) in TN during this time.
- The **White** population in TN had a **significantly higher lung cancer mortality rate** than all other races.

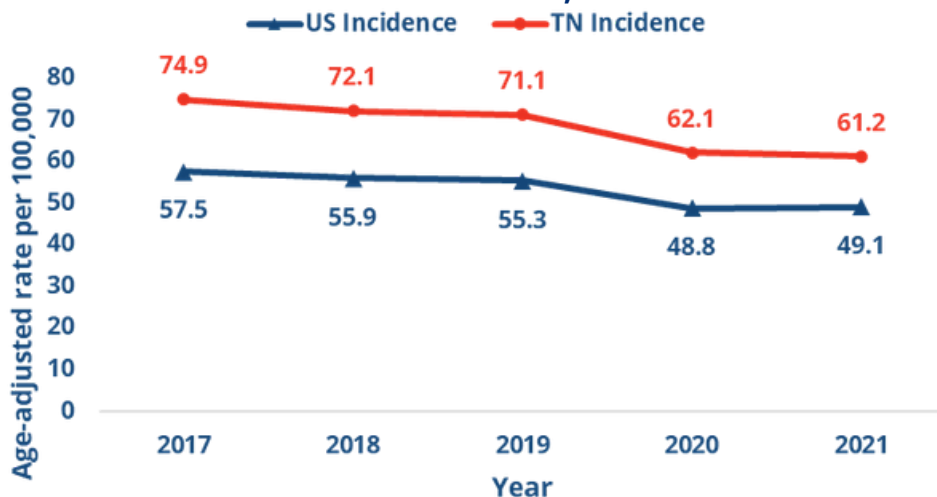
# Lung & Bronchus Cancer

## INCIDENCE TRENDS

From 2017-2021, lung cancer incidence rates significantly decreased in TN by 4.8% each year.

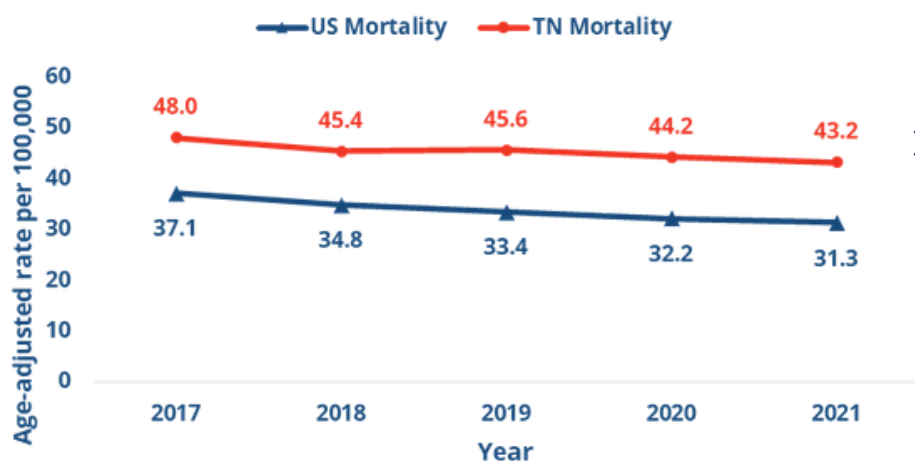
- Males in TN experienced a significant decrease in lung cancer incidence, specifically decreasing by 5.8% each year.
  - Specifically, White and Black men in TN experienced significant decreases in lung cancer incidence rates, decreasing by 5.7% and 7.8% each year, respectively.

**Figure 15. Lung Cancer Incidence Trends in TN and in the US, 2017-2021**



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

**Figure 16. Lung Cancer Mortality Trends in TN and in the US, 2017-2021**



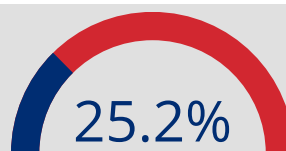
-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Lung cancer mortality rates in TN significantly decreased by 2.5% each year.

- Males in TN experienced a significant decrease in lung cancer mortality rates, decreasing by 4.1% each year.
- White and Black populations in TN experienced significant decreases in lung cancer mortality rates, decreasing by 2.1% and 5.4% each year, respectively.

**THE 5-YEAR RELATIVE SURVIVAL RATE FOR LUNG CANCER IN TN IS 25.2%, COMPARED TO 28.6 IN THE US. (USCS, 2015-2021 STATISTICS).**



# Female Breast Cancer

## INCIDENCE

There were 27,182 new female breast cancer diagnoses in TN from 2017-2021. TN has an overall female breast cancer incidence rate of 124.6 per 100,000 (95% CI 123.1, 126.1), compared to the US rate of 129.8 per 100,000 (95% CI 129.5, 130.0). TN was ranked the 38th highest in female breast cancer incidence in the nation during this time.

Figure 17. Female Breast Cancer Incidence Rates by Race in TN and in the US, 2017-2021

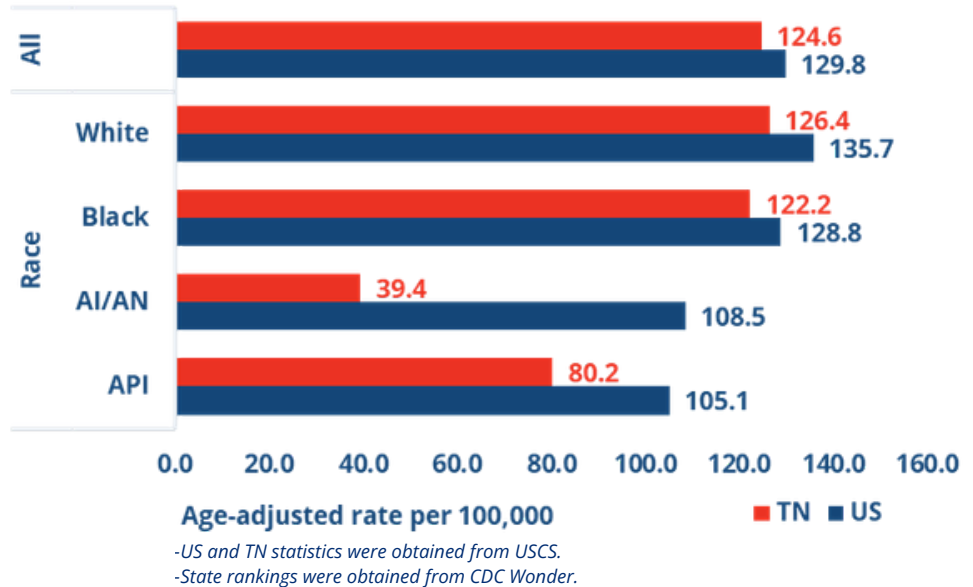
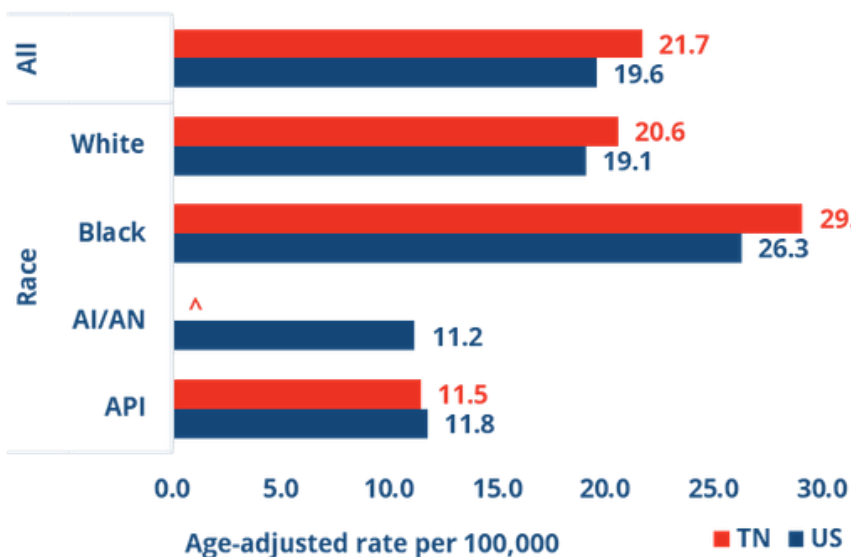


Figure 18. Female Breast Cancer Mortality Rates by Race in TN and in the US, 2017-2021



## MORTALITY

There were 4,910 Tennesseans that died from breast cancer in TN from 2017-2021. TN had a breast cancer mortality rate of 21.7 per 100,000 (95% CI 21.0, 22.3) from 2017-2021, compared to the US rate of 19.6 per 100,000 (95% CI 19.5, 19.7). **TN** was ranked the **6th highest in female breast cancer mortality** in the nation during this time.

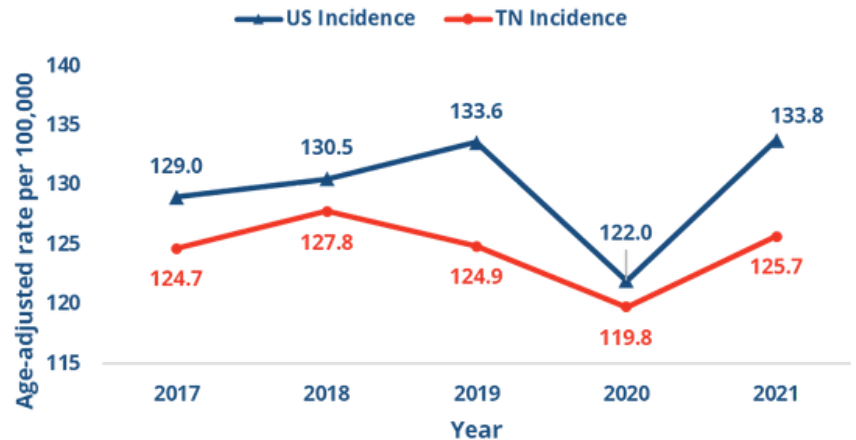
- **Black women** in TN had a **significantly higher** breast cancer mortality rate (29.1 per 100,000; 95% CI 27.2, 31.1) than all other races.

# Female Breast Cancer

## INCIDENCE TRENDS

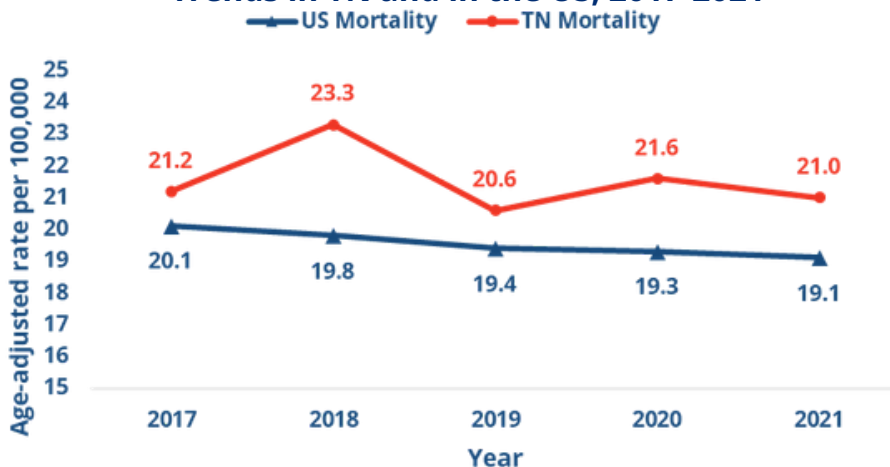
From 2017-2021, female breast cancer incidence rates decreased in TN by 0.1% each year, but this finding was not significant.

Figure 19. Female Breast Cancer Incidence Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 20. Female Breast Cancer Mortality Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

From 2017-2021, female breast cancer mortality rates in TN decreased by 1.1% each year, but this finding was not significant.

THE 5-YEAR RELATIVE SURVIVAL RATE FOR FEMALE BREAST CANCER IN TN IS 90.5%, COMPARED TO 91.6% IN THE US. (USCS, 2015-2021 STATISTICS).



# Prostate Cancer

## INCIDENCE

There were 24,630 new prostate cancer diagnoses in TN from 2017-2021. TN has an overall prostate incidence rate of 115.1 per 100,000 (95% CI 113.6, 116.6), compared to the US rate of 113.2 per 100,000 (95% CI 113.0, 113.4). TN was ranked the 25th highest in prostate cancer incidence in the nation during this time.

- **Black males** in TN had a **significantly higher** prostate cancer incidence rate than all other races in TN during this time.

Figure 21. Prostate Cancer Incidence Rates by Race in TN and in the US, 2017-2021

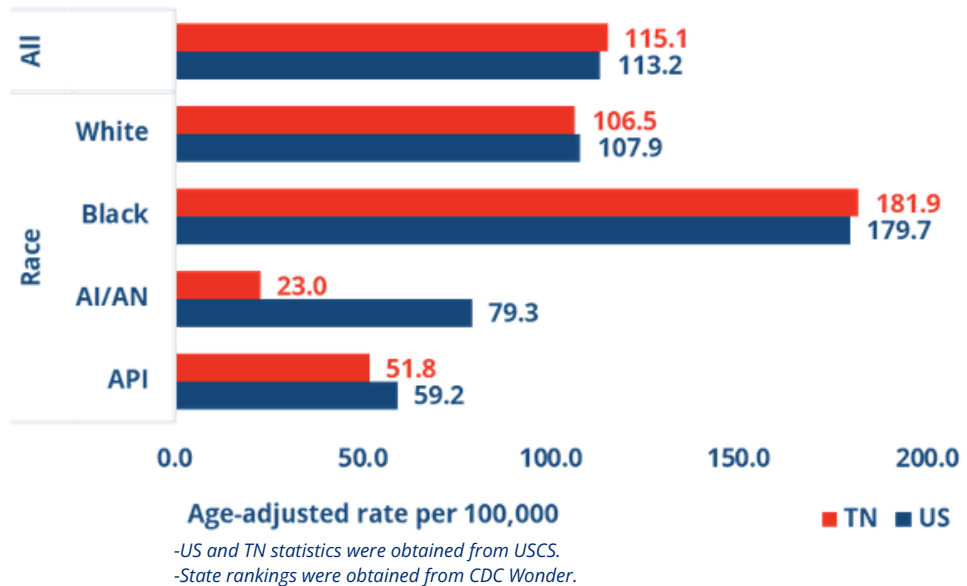
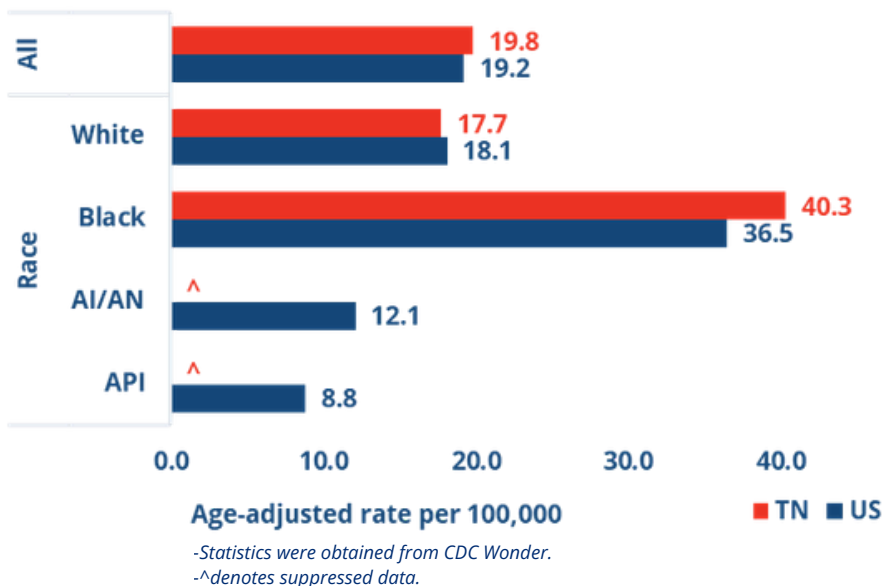


Figure 22. Prostate Cancer Mortality Rates by Race in TN and in the US, 2017-2021



## MORTALITY

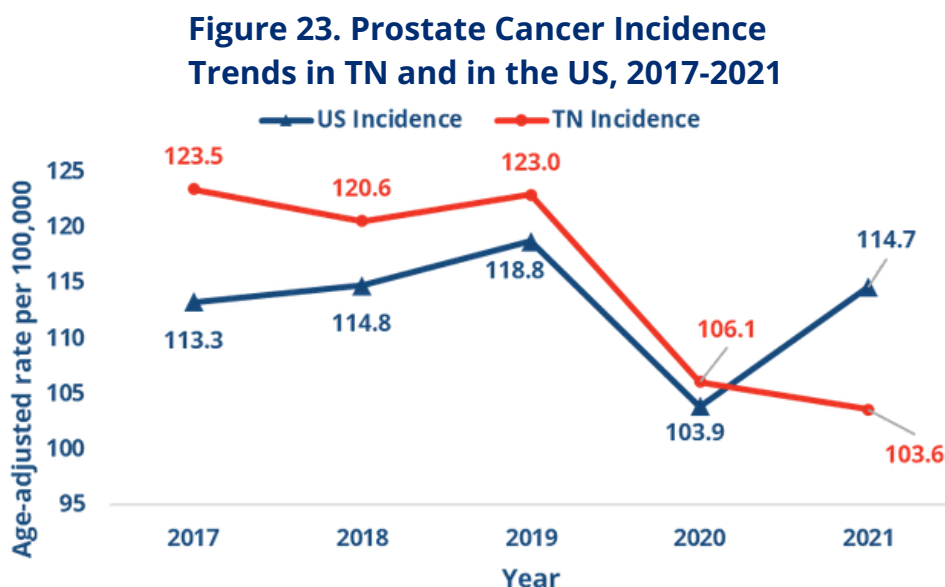
There were 3,292 men that died from prostate cancer in TN from 2017-2021. TN had a prostate cancer mortality rate of 19.8 per 100,000 (95% CI 19.1, 20.5) during this time, compared to the US rate of 19.2 per 100,000 (95% CI 19.1, 19.2). TN was ranked the 28th highest in prostate cancer mortality in the nation during this time.

- **Black males** in TN had a **significantly higher prostate cancer mortality rate** (40.3 per 100,000; 95% CI 37.0, 43.7) than White males in TN (17.7; 95% CI 17.1, 18.5) during this time.

# Prostate Cancer

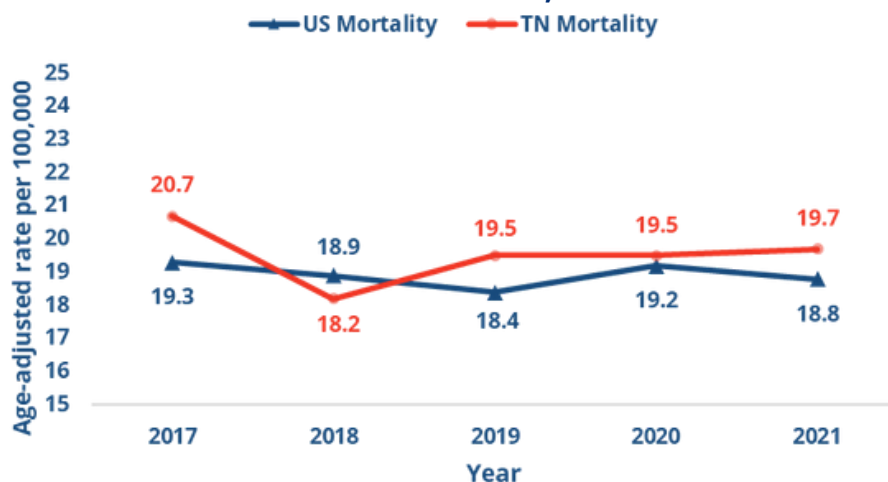
## INCIDENCE TRENDS

From 2017-2021, prostate cancer incidence rates decreased in TN by 3.2% each year, but this finding was not significant.



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

**Figure 24. Prostate Cancer Mortality Trends in TN and in the US, 2017-2021**



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Prostate cancer mortality rates in TN decreased by 0.6% each year, but this finding was not significant.

**THE 5-YEAR RELATIVE SURVIVAL RATE FOR PROSTATE CANCER IN TN IS 99.7%, COMPARED TO 97.7% IN THE US. (USCS, 2015-2021 STATISTICS).**



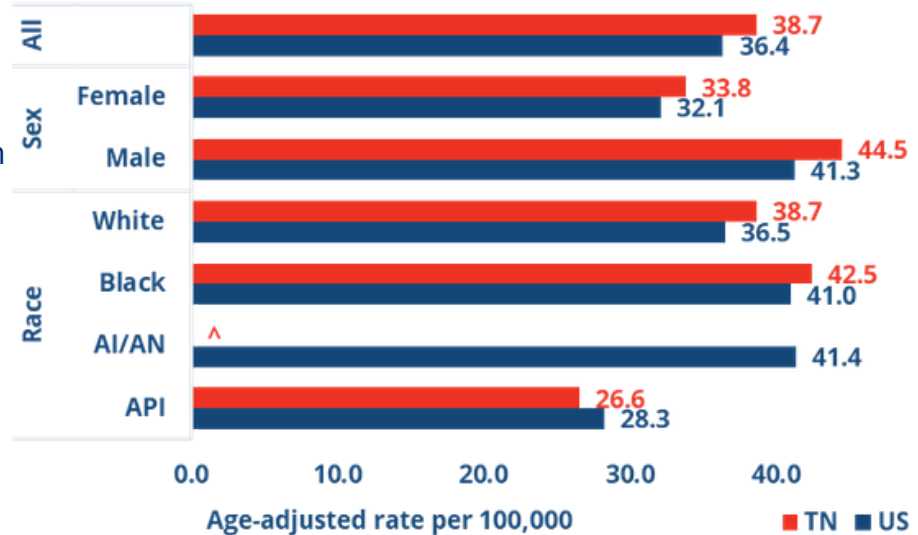
# Colorectal Cancer

## INCIDENCE

There were 16,003 new colorectal cancer diagnoses in TN and a colorectal cancer incidence rate of 38.7 per 100,000 (95% CI 38.1, 39.4), which is significantly higher than the US rate of 36.4 per 100,000 (95% CI 36.3, 36.4) in 2017-2021. TN was ranked the 18th highest in colorectal cancer incidence in the nation at this time.

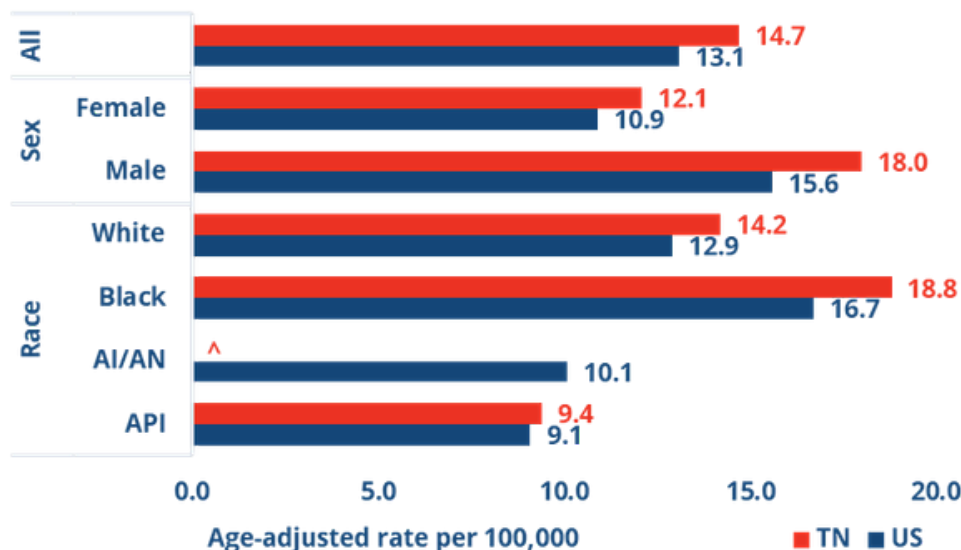
- **Men** in TN had a **significantly higher incidence rate of colorectal cancer** (44.5 per 100,000; 95% CI 43.5, 45.5) than women (33.8 per 100,000; 95% CI 33.0, 34.6).
- The **Black** population in TN had a **significantly higher incidence rate of colorectal cancer** than any other race.

Figure 25. Colorectal Cancer Incidence Rates by Sex and Race in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-State rankings were obtained from CDC Wonder.

Figure 26. Colorectal Cancer Mortality Rates by Sex and Race in TN and in the US, 2017-2021



-Statistics were obtained from CDC Wonder.  
-^denotes suppressed data.

## MORTALITY

From 2017 to 2021, 6,128 Tennesseans died from colorectal cancer in TN. TN had a cancer mortality rate of 14.7 per 100,000 (95% CI 14.3, 15.1), compared to the US rate of 13.1 per 100,000 (95% CI 13.0, 13.1). TN was ranked the 8th highest in colorectal cancer mortality in the nation.

- **Males** in TN had a **significantly higher colorectal cancer mortality rate** (18.0 per 100,000; 95% CI 17.4, 18.6) than females (12.1 per 100,000; 95% CI 11.6, 12.5) during this time.
- The **Black** population in TN had a **significantly higher colorectal cancer mortality rate** than all other races during this time.

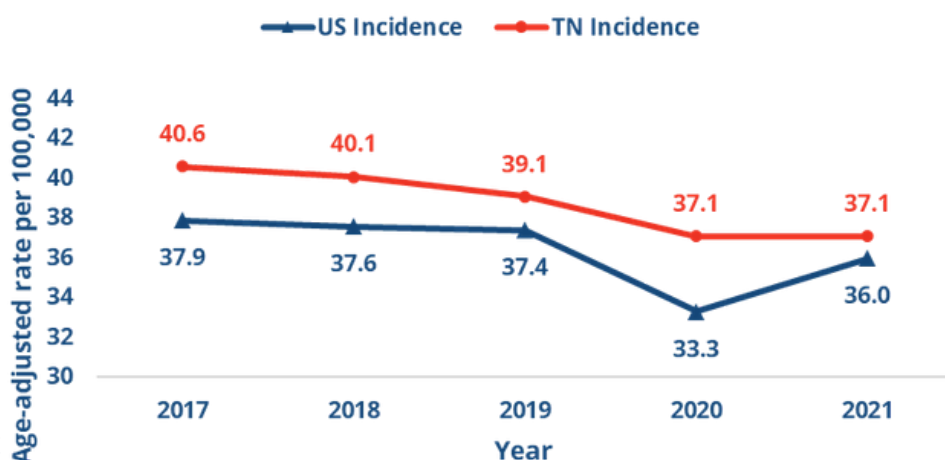
# Colorectal Cancer

## INCIDENCE TRENDS

From 2017-2021, incidence rates decreased in TN by 1.9% each year, but this finding was not significant.

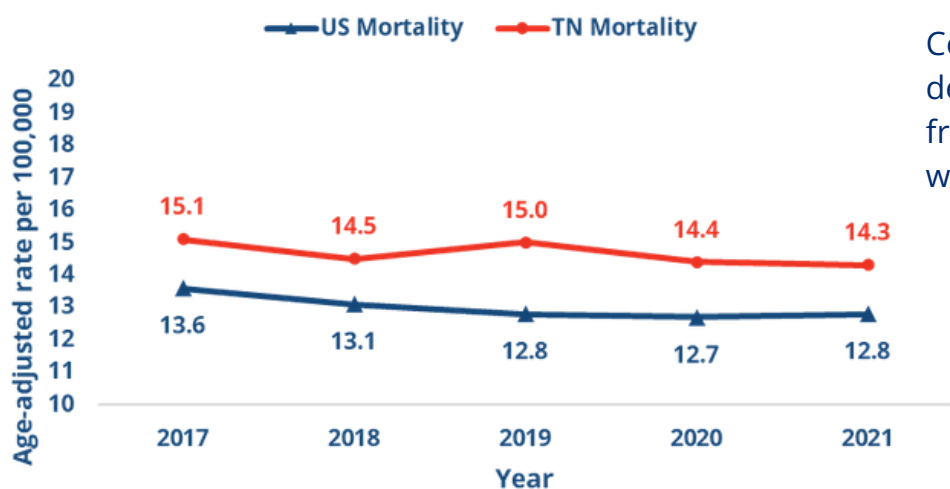
- Men in TN experienced a significant decrease in colorectal cancer incidence rates during this time, by 2.4% each year.
  - Specifically, White men in TN experienced a significant decrease in colorectal cancer incidence rates, by 2.7% yearly during this time.

Figure 27. Colorectal Cancer Incidence Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 28. Colorectal Cancer Mortality Trends in TN and in the US, 2017-2021

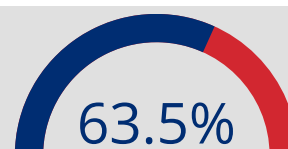


-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Colorectal mortality rates in TN decreased by 1.1% each year from 2017-2021, but this finding was not significant.

THE 5-YEAR RELATIVE SURVIVAL RATE FOR COLORECTAL CANCER IN TN IS 63.5%, COMPARED TO 64.9% IN THE US. (USCS, 2015-2021 STATISTICS).



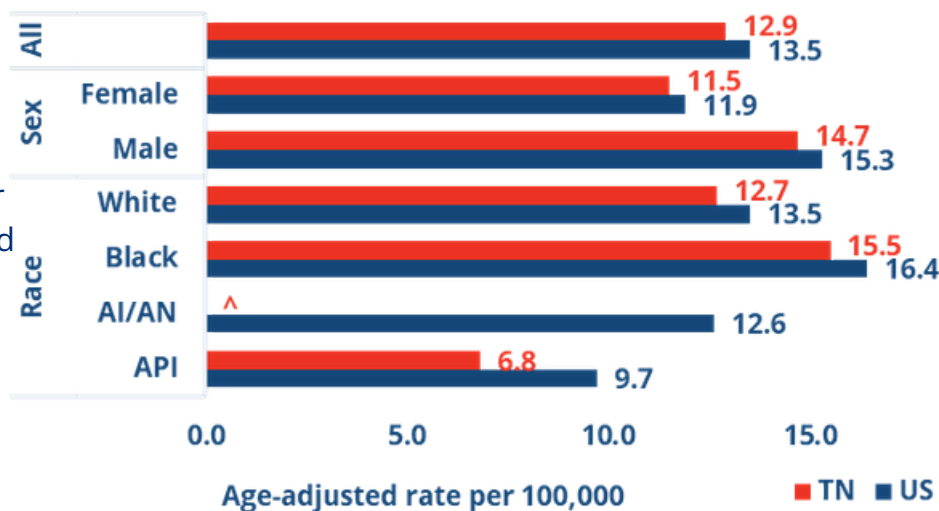
# Pancreatic Cancer

## INCIDENCE

There were 5,549 new pancreatic cancer diagnoses in TN from 2017-2021. TN has an overall pancreatic cancer incidence rate of 12.9 per 100,000 (95% CI 12.6, 13.3), compared to the US rate of 13.5 per 100,000 (95% CI 13.4, 13.5). TN was ranked the 35th highest in pancreatic cancer incidence in the nation during this time.

- The **Black** population in TN had a **significantly higher pancreatic cancer incidence rate** (15.5 per 100,000; 95% CI 14.4, 16.6) than all other races.
- Men** in TN had a **significantly higher pancreatic cancer incidence rate** (14.7 per 100,000; 95% CI 14.1, 15.2) than the women (11.5 per 100,000; 95% CI 11.0, 11.9) during this time.

Figure 29. Pancreatic Cancer Incidence Rates by Sex and Race in TN and in the US, 2017-2021



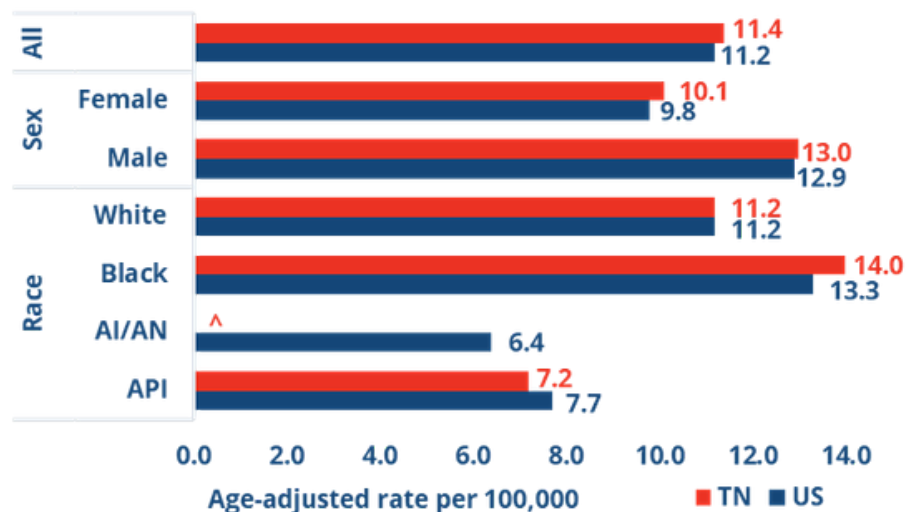
-US and TN statistics were obtained from USCS.  
-State rankings were obtained from CDC Wonder.

Figure 30. Pancreatic Cancer Mortality Rates by Sex and Race in TN and in the US, 2017-2021

## MORTALITY

There were 4,899 deaths from pancreatic cancer in TN from 2017-2021. TN had a pancreatic cancer mortality rate of 11.4 per 100,000 (95% CI 11.1, 11.8) from 2017-2021, compared to the US rate of 11.2 per 100,000 (95% CI 11.1, 11.2). TN was ranked the 22nd highest in pancreatic cancer mortality in the nation during this time.

- The **Black** population in TN had a **significantly higher pancreatic cancer mortality rate** than all other races during this time.
- Men** in TN had a **significantly higher pancreatic cancer mortality rate** (13.0 per 100,000; 95% CI 12.5, 13.6) than the women (10.1 per 100,000; 95% CI 9.7, 10.5) in TN during this time.



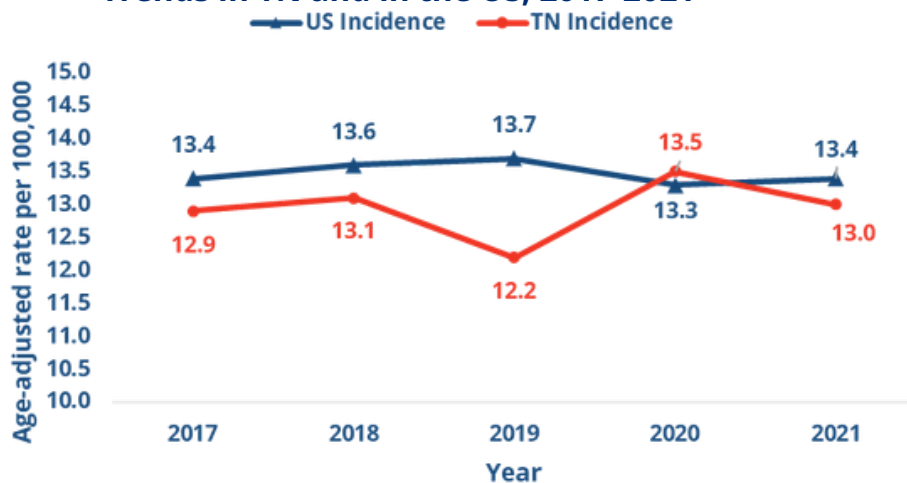
-Statistics were obtained from CDC Wonder.  
-^denotes suppressed data.

# Pancreatic Cancer

## INCIDENCE TRENDS

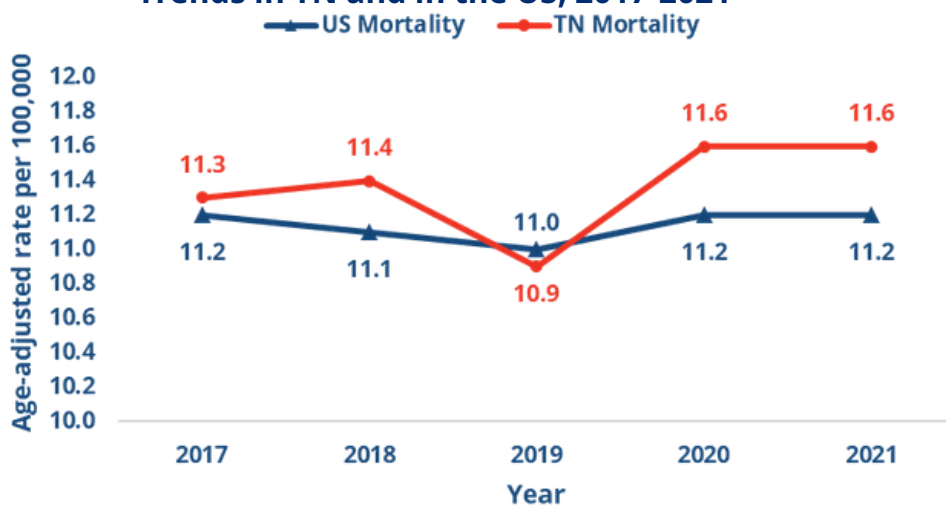
From 2017-2021, pancreatic cancer incidence rates increased in TN by 1.2% each year, but this finding was not significant.

Figure 31. Pancreatic Cancer Incidence Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 32. Pancreatic Cancer Mortality Trends in TN and in the US, 2017-2021



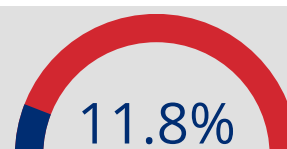
-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Pancreatic cancer mortality rates in TN increased by 0.6% each year in 2017-2021, but this finding was not significant.

- Black men in TN experienced a significant decrease in pancreatic cancer mortality rates during this time by 7.7% each year.

THE 5-YEAR RELATIVE SURVIVAL RATE FOR PANCREATIC CANCER IN TN IS 11.8%, COMPARED TO 13.5% IN THE US. (USCS, 2015-2021 STATISTICS).



# Melanoma of the Skin

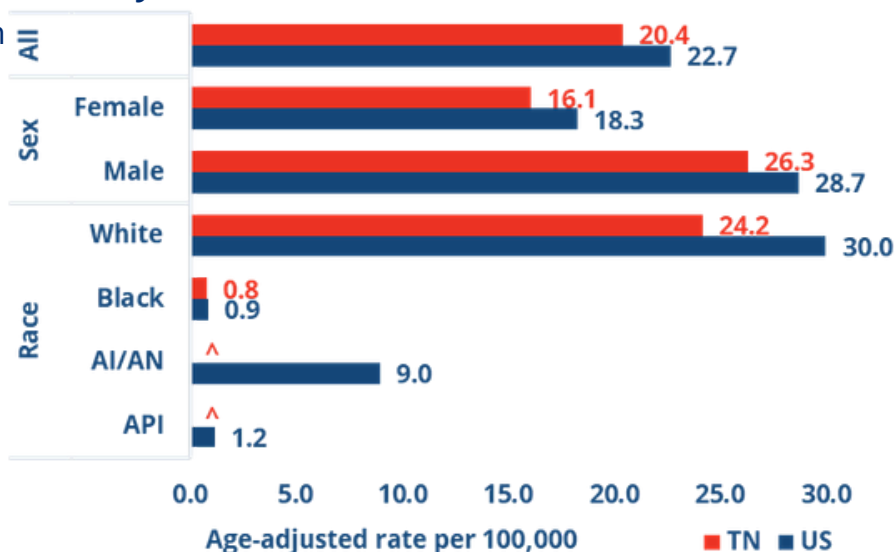
## INCIDENCE

There were 8,309 new melanoma of the skin diagnoses in TN from 2017-2021. TN has an overall melanoma of the skin incidence rate of 20.4 per 100,000 (95% CI 19.9, 20.9), compared to the US rate of 22.7 per 100,000 (95% CI 22.6, 22.8). TN was ranked the 40th highest in incidence in the nation for melanoma of the skin during this time.

- The **White** population in TN had a **significantly higher incidence rate of melanoma of the skin** than all other races.
- **Men** in TN had a **significantly higher incidence rate** (26.3 per 100,000; 95% CI 25.6, 27.1) of melanoma of the skin than women in TN (16.1 per 100,000; 95% CI 15.5, 16.6).

**Figure 34. Melanoma of the Skin Mortality Rates by Sex and Race in TN and in the US, 2017-2021**

**Figure 33. Melanoma of the Skin Incidence Rates by Sex and Race in TN and in the US, 2017-2021**

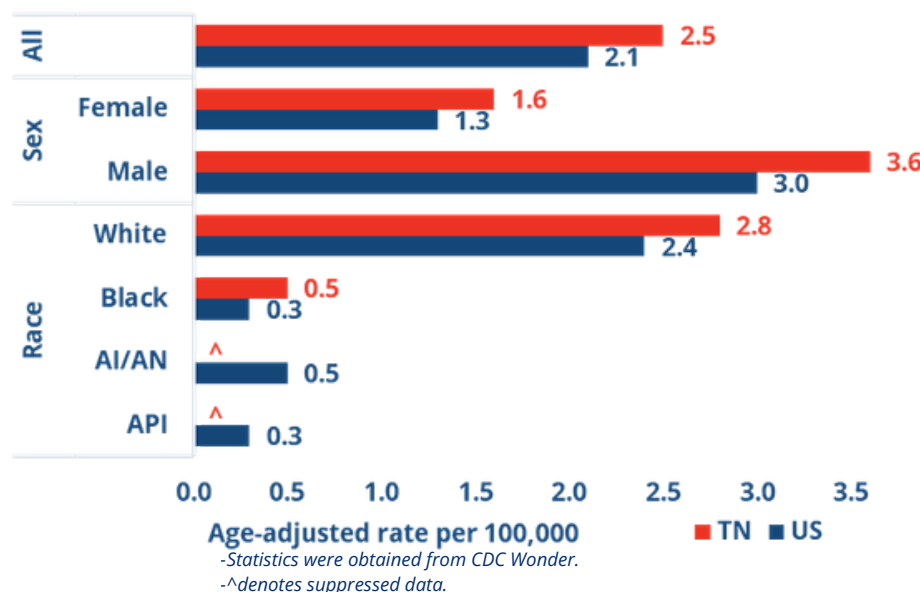


-US and TN statistics were obtained from USCS.  
 -State rankings were obtained from CDC Wonder.  
 -^ denotes suppressed data.

## MORTALITY

There were 1,017 deaths in TN from melanoma of the skin from 2017-2021. TN had a mortality rate of 2.5 per 100,000 (95% CI 2.3, 2.7) from 2017-2021 for melanoma of the skin, compared to the US rate of 2.1 per 100,000 (95% CI 2.0, 2.1). TN was ranked the 12th highest in mortality for melanoma of the skin in the nation during this time.

- The **White** population in TN had a **significantly higher melanoma of the skin mortality rate** (2.8 per 100,000; 95% CI 2.7, 3.0) than the Black population (0.5 per 100,000; 95% CI 0.3, 0.7) in TN during this time.
- **Men** in TN had a **significantly higher melanoma of the skin mortality rate** (3.6 per 100,000; 95% CI 3.3, 3.9) than women in TN (1.6 per 100,000; 95% CI 1.5, 1.8) during this time.



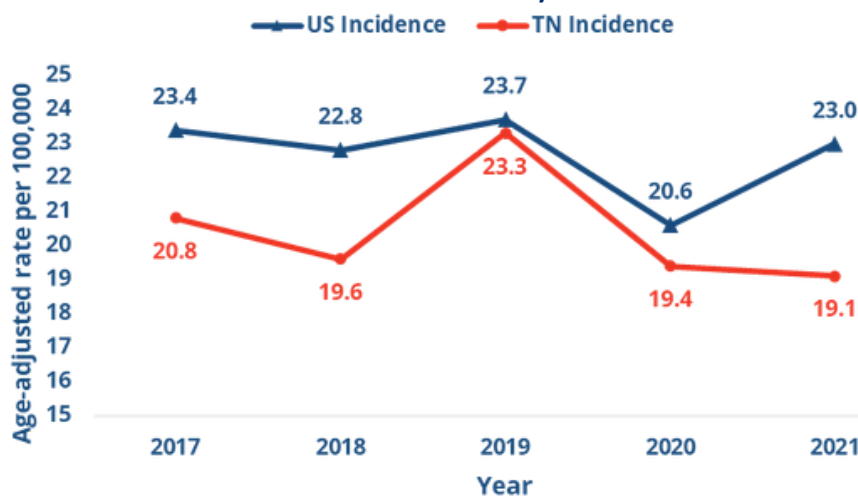
-Statistics were obtained from CDC Wonder.  
 -^ denotes suppressed data.

# Melanoma of the Skin

## INCIDENCE TRENDS

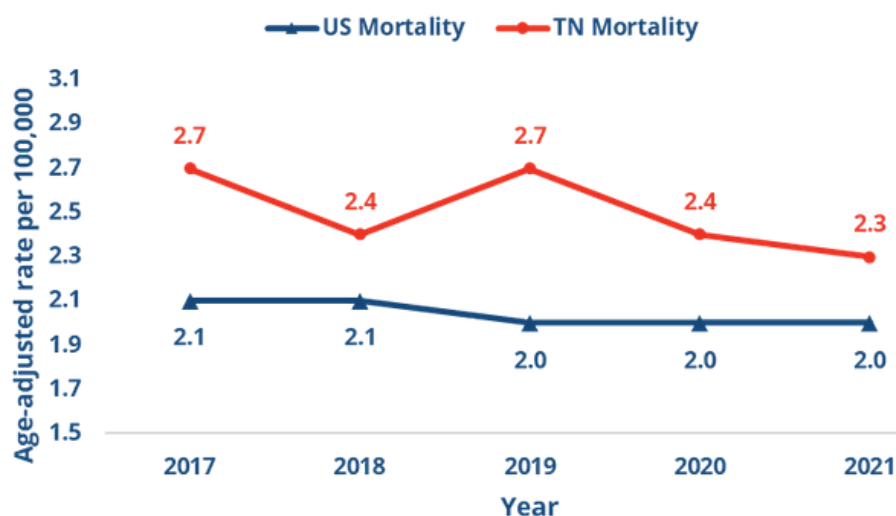
From 2017-2021, incidence rates for melanoma of the skin decreased in TN by 1.3% each year, but this finding was not significant.

Figure 35. Melanoma of the Skin Incidence Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 36. Melanoma of the Skin Mortality Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from USCS.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Melanoma of the skin mortality rates in TN decreased by 3.7% each year, but this finding was not significant in 2017-2021.

THE 5-YEAR RELATIVE SURVIVAL RATE FOR MELANOMA IN TN IS 92.8%, COMPARED TO 94.6% IN THE US. (USCS, 2015-2021 STATISTICS).

92.8%

# Childhood (0-19 Years Old) Cancer

## INCIDENCE

There were 1,574 new childhood cancer diagnoses in TN from 2017-2021. TN has an overall childhood cancer incidence rate of 18.3 per 100,000 (95% CI 17.4, 19.2), compared to the US rate of 18.6 per 100,000 (95% CI 18.4, 18.7). TN was ranked the 27th highest in childhood cancer incidence in the nation during this time.

- White** children (18.2 per 100,000; 95% CI 17.1, 19.2) and **API** children (22.6 per 100,000; 95% CI 16.8, 29.8) in TN had **significantly higher childhood cancer incidence rates** than Black children (13.2 per 100,000; 95% CI 11.6, 15.0) in TN from 2017-2021.

Figure 37. Childhood Cancer Incidence Rates by Sex and Race in TN and in the US, 2017-2021

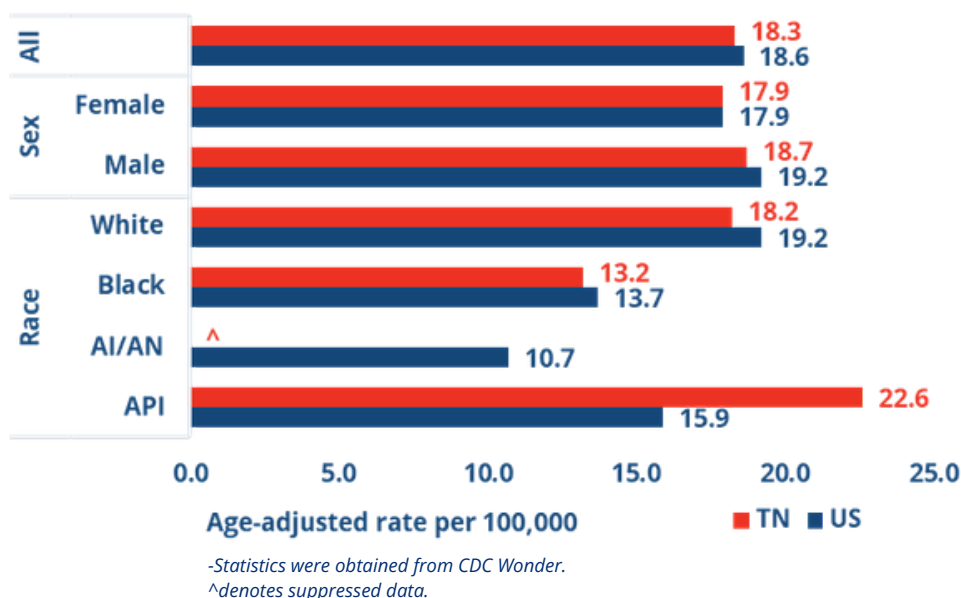
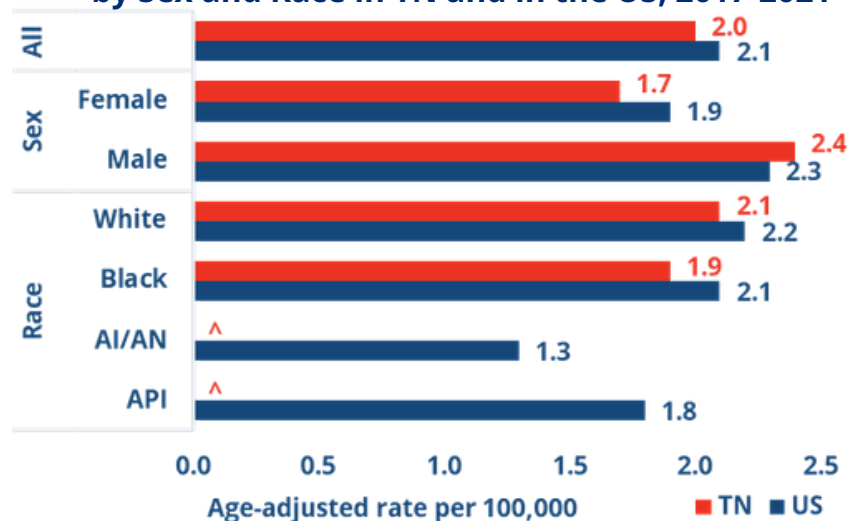


Figure 38. Childhood Cancer Mortality Rates by Sex and Race in TN and in the US, 2017-2021



## MORTALITY

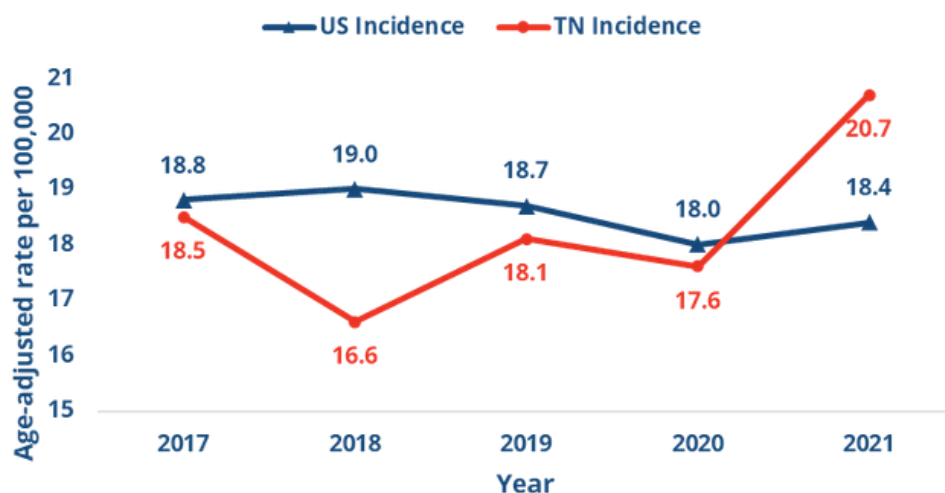
There were 175 children who died from cancer in TN from 2017-2021. TN had a childhood cancer mortality rate of 2.0 per 100,000 (95% CI 1.8, 2.4), compared to the US rate of 2.1 per 100,000 (95% CI 2.1, 2.2). TN was ranked the 30th highest (tied with Oregon, Ohio, New Hampshire, Washington, and Indiana) in childhood cancer mortality in the nation during this time.

# Childhood (0-19 Years Old) Cancer

## INCIDENCE TRENDS

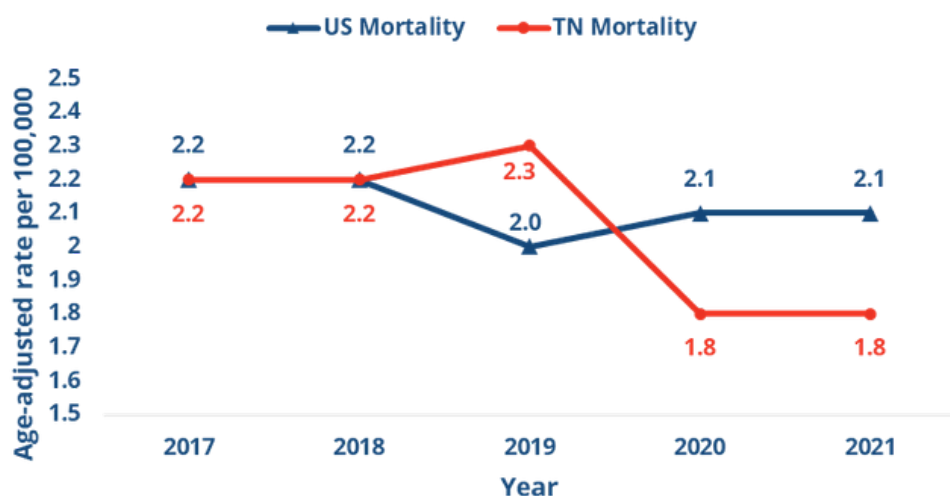
From 2017-2021, childhood cancer incidence rates increased in TN by 3.2% each year, but this finding was not significant.

Figure 39. Childhood Cancer Incidence Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from CDC Wonder.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

Figure 40. Childhood Cancer Mortality Trends in TN and in the US, 2017-2021



-US and TN statistics were obtained from CDC Wonder.  
-Annual percent changes were calculated using the weighted least squares method with 1-year endpoints in SEER\*STAT using TCR data.

## MORTALITY TRENDS

Childhood cancer mortality rates in TN decreased by 6.2% each year in 2017-2021, but this finding was not significant.

# Glossary of Terms

Table 2a. Glossary of Terms

| Term                                | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Age-adjustment                      | Age is the most important risk factor for the development of most cancers, so it is challenging to compare cancer rates in populations with different age distributions. Age-adjustment is a statistical technique that allows for the comparison of rates among populations with different age distributions, by weighting the age-specific rates in each population to one standard population, usually the 2000 US Standard Population, obtained during the 2000 US Census.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Cancer Site Recodes - Cancer Coding | The Tennessee Cancer Registry uses the International Classification of Diseases for Oncology, 3rd Edition (ICD-O-3) to code site (topography), histology (cell morphology), and behavior (whether it is malignant or not) of new cancer cases. Cases are categorized according to the 2003 revised recodes of the Surveillance, Epidemiology and End Results (SEER) program of the National Cancer Institute (NCI). These recodes define standard groupings of primary cancer sites. Following CDC's National Program of Cancer Registries (NPCR) and SEER cancer registries' guidelines, the TCR considers as reportable all incident cases with a behavior code of 2 (in situ, noninvasive) or 3 (invasive, primary site only) in ICD-O-3 terminology with the exception of in situ cancer of the cervix. Benign brain tumors are also reportable but not included in this report. For cancer mortality data, the International Classification of Diseases, 10th Revision (ICD-10), is used. |
| Confidence Intervals                | A confidence interval is a range of values that has a specified probability of containing the true rate of interest in the population. The width of a confidence interval reflects the amount of variability in the estimated rate, with wider confidence intervals representing greater uncertainty identifying the true rate. In this report, 95% confidence intervals were calculated using a gamma distribution method developed by Fay and Feuer and modified by Tiwari, Clegg, and Zou.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

# Glossary of Terms Continued...

Table 2b. Glossary of Terms

| Term                  | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Incidence             | Incidence is defined as the number of new cancers diagnosed in the population at risk in the reference year. The population considered at risk for cancer in this report is the entire resident population of Tennessee in the reference year.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Cancer Incidence Rate | <p>The cancer incidence rate is the number of new cases of cancer diagnosed in a specified population during a specified time period, usually expressed as the number of new cases per 100,000 persons at risk. That is,</p> $\text{Incidence Rate} = \left( \frac{\text{Number of New Cases}}{\text{Population at Risk}} \right) * 100,000$ <p>The numerator of the incidence rate is the number of newly diagnosed cancer cases; the denominator of the incidence rate is the size of the population at risk. The number of new cancers may include multiple primary cancers occurring in one patient. The primary site reported is the site of origin and not the metastatic site, the distant site to which the cancer has spread. In general, the incidence rate does not include recurrences. The incidence rate can be computed for a given type of cancer or for all cancers combined.</p> |
| Mortality             | Mortality is defined as the number of deaths from cancer in the population at risk during the reference year. A cancer death is defined as a death for which cancer is determined to be the principal underlying cause of death based on the death certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# Glossary of Terms Continued...

**Table 2c. Glossary of Terms**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cancer Mortality Rate | <p>The cancer mortality rate is the number of deaths with cancer as the principal underlying cause of death in a specified at-risk population in a given time period, usually expressed as the number of deaths due to cancer per 100,000 persons at risk. That is,</p> $\text{Mortality Rate} = \left( \frac{\text{Number of Cancer Deaths}}{\text{Population at Risk}} \right) * 100,000$                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Prevalence            | <p>Prevalence is defined as the percentage of people exhibiting the behavior out of the total number in the defined population, usually at a specified point in time.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Cancer Staging        | <p>Cancer stage is the extent to which a cancer has spread from the organ of origin at the time of diagnosis. The stage information used in this report is based on the SEER Summary Stage Guidelines:</p> <ul style="list-style-type: none"> <li>• In situ: Cancerous cells have not invaded the tissue basement membrane and there is no stromal invasion, therefore, these cancers are not invasive.</li> <li>• Local: The tumor has invaded locally but is still confined to the organ of origin.</li> <li>• Regional: The tumor has spread to adjacent tissues outside of the organ of origin; regional lymph nodes may also be involved.</li> <li>• Distant: The tumor has spread beyond the adjacent organs or tissues; distant lymph nodes, organs, and/or tissues may also be involved.</li> </ul> |
| Trends                | <p>Trend data should be interpreted with caution. Increases and decreases in rates over time may reflect changes in diagnostic methods or case reporting rather than genuine changes in cancer occurrence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

# Technical Notes

It is important to note that cancer data in this report is dynamic and it is possible that even after the completion of this report, a few cases may be reported, which may have a minor, non-significant impact on the statistics presented.

## **Site recodes**

Site recode values were converted using the International Classification of Diseases for Oncology 3rd Edition (ICD-O-3) and World Health Organization (WHO) 2008 Definition for incidence and ICD-10 for mortality.<sup>9</sup>

## **Exclusions/Inclusions**

This report only contains cancer statistics for individuals who identified as male or female. Individuals who identified as other (hermaphrodite), transsexual, or unknown/not stated were excluded. Cases with races other than White, Black, Asian or Pacific Islander (API), or American Indian/Alaska native (AI/AN) and unknown race were included in the “Total Population” category.

## **Interpreting Groups with Lower Number of Cases**

AI/AN and API groups have fewer cases, so each case affects the overall rate more. This makes the statistics less stable and results in a larger margin for error. As a result, these numbers should be interpreted with caution, as the range of possible values is broader.

## **Age-standardization**

Rates found throughout the report are age-adjusted to the 2000 US standard population (19 age groups: <1, 1-4, 5-9, ..., 80-84, 85+)<sup>8</sup> and include invasive cancers only (except for bladder cancer which is invasive and in situ) or unless otherwise specified.<sup>7</sup>

## **Data Suppression**

TCR data with fewer than 11 observations were suppressed, per the TCR’s guidelines. Trend analyses were suppressed if counts were fewer than 25. USCS and CDC Wonder data with fewer than 16 cases were suppressed.

## **The Impact of COVID-19**

**“The COVID-19 pandemic disrupted health services, leading to delays and reductions in cancer screening, diagnosis, and reporting of data to some central cancer registries, which may have contributed to an observed decline in incidence for most cancer sites in 2020.”**

**-Centers for Disease Control and Prevention (CDC), 2023<sup>9</sup>**

# Technical Notes Continued...

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## Data Sources Used

### TCR

Tennessee cancer incidence data were obtained from the Tennessee Cancer Registry database for cases diagnosed among Tennessee residents between January 1, 2017 and December 31, 2021. The record-level Tennessee mortality data were obtained by the TCR from the Vital Records Information System Management (VRISM) provided by the Office of Vital Records and Statistics for deaths recorded during the years of 2017-2021.

### USCS and CDC Wonder

U.S. and Tennessee incidence and mortality counts, age-adjusted rates, and state rankings were obtained from the CDC's United States Cancer Statistics from the Official Federal Cancer Statistics website (<https://gis.cdc.gov/Cancer/USCS/>) and CDC Wonder (<https://gis.cdc.gov/Cancer/USCS/> and <https://wonder.cdc.gov/cancer.html>).

*Note: The TCR TN statistics are more up-to-date than the USCS and CDC Wonder TN statistics. There are non-significant differences between these statistics.*

### U.S. Census Bureau

Population figures were produced by the U.S. Census Bureau's Population Estimates Program and downloaded from <https://seer.cancer.gov/popdata/> and used for age-adjusted rate calculations.

### State Cancer Profiles and BRFSS

Behavioral risk factors, cancer screening prevalence data, and the associated state rankings were obtained from CDC's State Cancer Profiles website (<https://statecancerprofiles.cancer.gov/>) and CDC's Behavioral Risk Factor Surveillance System (BRFSS) at the following website (<https://www.cdc.gov/brfss/brfssprevalence/index.html>).

Note: State rankings referenced in this report, from sources, such as the State Cancer Profiles or BRFSS, include all U.S. states and the District of Columbia, but do not account for U.S. territories.

# Technical Notes Continued...

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## Software Used

### File\*Pro

### SEER\*Prep

### SEER\*Stat

SEER-specific software platforms were utilized to clean, prepare, and analyze incidence and mortality data to generate age-adjusted rates, counts, confidence intervals, standard errors, annual percent changes, and more. For more information:

National Cancer Institute (NCI). Surveillance, Epidemiology, and End Results Program (SEER). Tools & Software. File\*Pro Software. <https://seer.cancer.gov/tools/filepro/>  
<https://seer.cancer.gov/seerprep/>  
<https://seer.cancer.gov/seerstat/>

### ESRI ArcGIS Pro

Esri's ArcGIS Pro was utilized to create the data visualization maps of Tennessee containing age-adjusted rates and count data at the county-level.

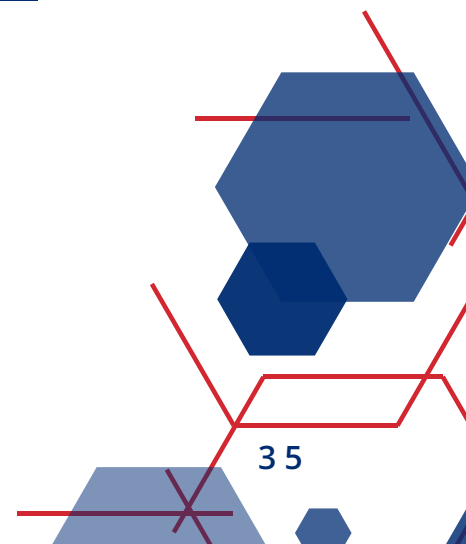
For more information:

Environmental Systems Research Institute (ESRI). ArcGIS Pro. <https://www.esri.com/en-us/arcgis/products/arcgis-pro/overview>

### Chi-Square Test Tool

This interactive tool was used for chi-square analyses to determine if the frequencies of two categorical groups (for example White population versus API populations, insured versus uninsured, etc.) statistically significantly differ from each other, or not.

For more information: <https://www.quantpsy.org/chisq/chisq.htm>



# Publication Details

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All information obtained on patients is confidential. Absolutely no personal or identifying information, such as name or social security number, can be released to researchers unless Institutional Review Board (IRB) approval is obtained. All information shall be used solely for statistical, scientific, and medical research purposes and shall be held strictly confidential.

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# References

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- 01 American Academy of Dermatology (AAD). (2025). How to Prevent Skin Cancer. <https://www.aad.org/news/guidelines-to-treat-nonmelanoma-skin-cancer>
- 02 American Cancer Society (ACS). (2024). All About Cancer. Cancer Risk and Prevention. Tobacco. Health Risks of Using Tobacco Products. Health Risks of Smoking Tobacco. <https://www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/health-risks-of-smoking-tobacco.html>
- 03 ACS. (2019). Cancer Treatment and Survivorship Facts & Figures 2019-2021. [https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-treatment-and-survivorship-facts-and-figures/cancer-treatment-and-survivorship-facts-and-figures-2019-2021.pdf?trk=public\\_post\\_comment-text](https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-treatment-and-survivorship-facts-and-figures/cancer-treatment-and-survivorship-facts-and-figures-2019-2021.pdf?trk=public_post_comment-text)
- 04 ACS. (2025). Cancer Risk and Prevention. Lifetime Risk of Developing or Dying from Cancer. <https://www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/lifetime-probability-of-developing-or-dying-from-cancer.html>
- 05 Centers for Disease Control and Prevention (CDC). (2023). Behavioral Risk Factor Surveillance System (BRFSS) Prevalence & Trends Data. <https://www.cdc.gov/brfss/brfssprevalence/index.html>
- 06 CDC. (2021). Human Papillomavirus (HPV). Clinical Overview of HPV. <https://www.cdc.gov/hpv/hcp/protecting-patients.html>
- 07 CDC. National Center for Health Statistics (NCHS). (2021). Home. Age adjustment <https://www.cdc.gov/nchs/hus/sources-definitions/age-adjustment.htm>
- 08 CDC. (2025). Obesity and Cancer. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/cancer.htm>
- 09 CDC. United States Cancer Statistics (USCS). (2022). Cautionary Notes. <https://www.cdc.gov/cancer/uscs/public-use/cautionary-notes.htm#:~:text=The%20COVID%2D19%20pandemic%20disrupted,most%20cancer%20sites%20in%202020.>
- 10 CDC Wonder. (2025). United States Cancer Statistics. United States Cancer Statistics Data. Current Cancer Statistics. <https://wonder.cdc.gov/cancer.html>

# References Continued...

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- 11 Foster S, Lavery AM, Condon SK, et al. Guidelines for examining unusual patterns of cancer and environmental concerns. 2022. doi:10.15620/cdc:122695.
- 12 Guixiang Zhao, Catherine A. Okoro, Jun Li, Machell Town, Health Insurance Status and Clinical Cancer Screenings Among U.S. Adults, American Journal of Preventive Medicine, Volume 54, Issue 1, 2018, Pages e11-e19, SSN 0749-3797, <https://doi.org/10.1016/j.amepre.2017.08.024>.
- 13 Islami F, Marlow EC, Thomson B, et al. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States, 2019. CA Cancer J Clin. 2024; 74(5): 405-432. doi:10.3322/caac.21858
- 14 Islami, F, Marlow, EC, Zhao, J, et al. Person-years of life lost and lost earnings from cigarette smoking-attributable cancer deaths, United States, 2019. Int J Cancer. 2022; 151(12): 2095-2106. doi:10.1002/ijc.342171 Retrieved from Person-years of life lost and lost earnings from cigarette smoking-attributable cancer deaths, United States, 2019 - Islami - 2022 - International Journal of Cancer - Wiley Online Library
- 15 National Cancer Institute (NCI). CDC. State Cancer Profiles. (2024). <https://statecancerprofiles.cancer.gov/index.html>
- 16 NCI. (2021). Home. About Cancer. Understanding Cancer. What is Cancer? <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
- 17 Tennessee Cancer Registry (TCR). (2025).
- 18 U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2022 submission data (1999-2020): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; https://www.cdc.gov/cancer/dataviz, released in November 2023.
- 19 U.S. Preventive Services Task Force (USPSTF). (2024). Published Recommendations. Rockville, MD: U.S. Preventive Services Task Force. <https://www.uspreventiveservicestaskforce.org/BrowseRec/Index/browse-recommendations>
- 20 Zhu, B., & Qu, S. (2022). The Relationship Between Diabetes Mellitus and Cancers and Its Underlying Mechanisms. Frontiers in endocrinology, 13, 800995. <https://doi.org/10.3389/fendo.2022.800995>