



CANCER SURVIVAL REPORT

Wisconsin Cancer Relative Survival Ratios, 2011-2017

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For more information, or to view the Wisconsin Cancer Plan 2020-2030 for strategies and action steps to improve cancer survival in Wisconsin, please visit www.wicancer.org.

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Introduction

This report serves as an important update to Wisconsin's first-ever cancer survival report, originally published in 2016. The original report, *2016 Wisconsin Cancer Survival*, covered years 2005-2011 and was based on passive follow-up with death data in the National Death Index. Both the original report and this update offer a detailed breakdown of cancer survival in our state.

The updated report covers years 2011-2017. This was made possible thanks to the National Program of Cancer Registries (NPCR) and the North American Association of Central Cancer Registries (NAACCR), which provided access to the data that informed their 2021 *Cancer in North America* report.

The Wisconsin Cancer Collaborative is the state's comprehensive cancer control program. We coordinate a state-wide coalition of organizations working together to reduce the burden of cancer for everyone in Wisconsin. Our work is guided by the Wisconsin Cancer Plan 2020-2030. As part of our Centers for Disease Control and Prevention survivorship grant, the Wisconsin Cancer Collaborative worked closely with the Wisconsin Cancer Reporting System (WCRS) to update the original *Wisconsin Cancer Survival* report with data from 2011-2017.

The information contained here can help to inform opportunities to reduce the burden of cancer for everyone in Wisconsin.

Understanding Relative Survival

Cancer survival statistics tell us the percentage of people who survive a certain type of cancer for a specific amount of time. These statistics can help people understand prognosis, evaluate and compare treatment options, look at trends, and identify areas for improvement in the prevention, screening, and early detection of different types of cancers. Survival statistics include adults of all ages and health conditions who have been diagnosed with cancer, including those diagnosed very early and those diagnosed very late. Survival statistics don't specify whether cancer survivors are still undergoing treatment or if they've become cancer-free (achieved remission).

The two most common ways of measuring cancer survival are *absolute survival rates* and *relative survival ratios*:

Five-year absolute survival rates are commonly used to show the percentage of people who will be alive five years after diagnosis. Absolute survival rates include deaths from all causes, not just deaths from cancer. For example, a person with cancer who dies in a car crash and a person with cancer who dies from their disease would be counted the same way in absolute survival rates.

Relative survival ratios are a theoretical measure used to show the probability of dying from cancer by removing other causes of death. According to the National Cancer Institute, relative survival ratios are calculated by "dividing the percentage of patients with cancer who are still alive at the end of the period of time by the percentage of people in the general population of the same sex and age who are alive at the end of the same time period. The relative survival rate shows whether cancer shortens life."¹ For example, if the five-year relative survival ratio for a specific type of cancer is 90 percent, it means that people who have that cancer are, on average, about 90 percent as likely as people in the general population to be alive five years later.

This report uses relative survival ratios. Relative survival is useful for comparing survival over time or between different groups or geographic areas, and is often used to show cancer's impact across large populations. Relative survival ratios are sometimes also referred to as "relative survival rates".

However, it is important to note that because relative survival ratios are based on past outcomes of large numbers of people who had cancer, they do not predict what will happen in any particular person's case. Additionally, survival rates do not reflect quality of life,

which is an important part of cancer survivorship (the health and life of a person with a cancer, from time of diagnosis until the end of life).

The relative survival ratios used in this report are based on diagnoses that occurred up to a decade ago. Because we must go back so far to track people for five years, these ratios may not reflect treatment and research advances in recent years.

Methods

This report compares five-year relative survival ratios from Wisconsin and the United States, and provides detailed ratios based on sex, race, stage of disease at diagnosis, and age for major sites (lung, colorectal, breast, and prostate) and selected sites (leukemia, melanoma, thyroid, pancreas, and liver). Selected sites were chosen based on reviewing trends to identify any significant changes (increases, decreases, or areas of notable difference from US ratios). NAACCR prepared SEER (SEER stands for Surveillance, Epidemiology and End Results)*Stat databases used in the analysis—one including all state registries that met their inclusion criteria, and another with Wisconsin-only data, originally provided by the WCRS.^{2,3} SEER*Stat (Version 8.3.9) was used to perform survival calculations.⁴

Unfortunately, access to ethnicity data for this analysis was not possible for many groups, such as Hispanic/Latino populations. The technical notes indicated that in “areas with small Latino populations [such as Wisconsin], methods to indirectly identify Latinos can overestimate the counts of cancer cases. Also, even small errors in population estimates can impact the magnitude of the cancer ratios.”⁵ Technical notes also indicated that the NAACCR-provided life tables were not recommended for use for Asian or Pacific Islander groups and were not included in the national NAACCR report. Thus, these groups were not included in our analysis by race/ethnicity.⁵ Other factors informing this decision include: findings that show higher rates of incomplete follow-up among Hispanic and Asian populations (compared to non-Hispanic whites and African Americans); those with worse prognoses across all racial groups are more likely to have incomplete follow-up; and death ascertainment among Hispanic people may be biased for all causes of death (not just cancer), so life tables can be problematic and impact

survival statistics.⁶ Additionally, this analysis only includes data on cisgender male and female sexes. Very few observations in other categories, such as transgender, in Wisconsin’s SEER data lead to suppressed data.

This analysis included cancers in patients ages 15- to 99-years-old who were diagnosed between 2011 and 2017, with follow-up/death ascertainment through the study cutoff date of December 31, 2018. We were able to observe the full five-year follow-up period for individuals diagnosed in 2011, 2012, and 2013. People diagnosed after 2013 had shorter follow-up intervals; however, this still helps strengthen five-year relative survival ratios due to a larger sample and informing a sequential measure. The 2021 Cancer in North America Survival Volume⁶ (often called CiNA) prepared by NAACCR utilized a December 31, 2017, study cutoff date, so United States relative survival ratios will differ slightly between the CiNA volume and this report.⁶ The Wisconsin population-based cancer registry uses passive follow-up to ascertain survival. A linkage with the National Death Index (NDI) is conducted yearly. Any patients who were not identified through NDI linkage as deceased by the study cutoff date were presumed alive.

Cases reported solely via death certificates or autopsy were excluded. These exclusion criteria resulted in counts with fewer cases than the total malignant case counts published for standard incidence ratios, and therefore survival counts are not comparable to incidence counts or age-adjusted ratios based on total number of malignant cancers.

Survival calculations were performed using the actuarial method on monthly intervals, and 60-month age-standardized relative survival ratios are reported in the results. The relative survival was calculated using the Ederer II method to compute expected survival.⁷ The Ederer II method calculates the expected survival ratios for patients under observation at each point of follow-up, so the matched individuals are considered to be at risk until the corresponding cancer patient dies or is censored.

Cases were censored at an achieved age of 100 years. Expected survival was estimated from life tables matched to the cancer patients by age, sex, year, geo-

graphic area, race, and socioeconomic status.⁸ Please refer to the complete NAACCR Survival Methods and Notes for a more complete description.

Because the excess mortality of cancer is often age dependent, relative survival estimates were age-standardized using the International Cancer Survival Standards (ICSS)–1.⁹ Relative survival ratios for all sites except prostate cancer used age groups 15-44, 45-54, 55-64, 65-74, and 75+ for age standardization. Prostate cancer relative survival ratios were age-standardized using the Age Standard for Prostate Cancer Survival, which utilizes age groups 15-54, 55-64, 65-74, 75-84, 85+.

Survival statistics were not calculated if the number of cases was fewer than 10. If the number of cases was between 10 and 49, age standardization was not performed, and unstandardized relative survival ratios were calculated (as footnoted in the tables). If the number of cases was 50 or more, age-standardized relative survival ratios were calculated unless: (1) there were no cases in one or more of the age groups or a constituent age-specific relative survival ratio could not be calculated; (2) the width of the confidence interval for the age-standardized estimate was > 40 percentage points; or (3) the standard error of the age-standardized estimate was ≥ 10 percent. In those instances, unstandardized relative survival ratios were used instead. Estimates of unstandardized relative survival ratios were suppressed if the width of the confidence interval was > 40 percentage points or if the standard error for a relative survival ratio was ≥ 10 percent. If the last patient involved in a survival calculation was censored alive prior to 60 months, the relative survival ratios at 60 months was not defined.

Overall Five-Year Relative Survival Ratios

In Wisconsin, the overall five-year relative survival ratio for all cancers is 66.9 percent. This means that people diagnosed with cancer are about 67 percent as likely to survive at least five years after diagnosis compared to the overall population. The overall five-year relative survival ratio for all cancer increased from 64.3 percent in the previous report (measuring 2005-2011).

Figure 1 shows that five-year relative survival patterns in Wisconsin are similar to survival patterns reported for the United States, with the overall relative survival

ratio in Wisconsin being marginally higher than the ratio for the United States (66.9 in Wisconsin, compared to 65.0 nationally).

Variation among cancer sites

Relative survival can vary greatly among cancer sites. Overall, five-year relative survival patterns in Wisconsin are similar to national patterns, with Wisconsin often being marginally higher. However, Wisconsin has lower relative survival ratios compared to the United States for four cancer sites: melanoma of the skin, thyroid, brain and nervous system, and prostate.

In both Wisconsin and the United States, the five cancers with the highest relative survival ratios (of all the sites we analyzed) are prostate, thyroid, testis, female breast, and melanoma of the skin, while the five cancers with the lowest relative survival ratios are mesothelioma, pancreas, liver, esophagus, and brain and other nervous system. Lung cancer is no longer in the bottom five, as relative survival ratios for lung cancer have shown increases in recent years both in Wisconsin and nationally. More detailed relative survival ratios by race, sex, age, and stage at diagnosis are shown with site-specific tables.

Additionally, our analysis shows how survival ratios for major cancer sites (lung, colorectal, breast, and prostate) have changed compared to the previous report (measuring 2005-2011): Lung cancer relative survival ratios have increased considerably from 19.3 percent to 25.1 percent. Female breast cancer relative survival ratios have increased marginally, from 89.6 percent to 91.3 percent. And both prostate and colorectal cancer relative survival ratios have decreased marginally, from 96.2 to 94.5 percent and from 67.2 percent to 65.5 percent, respectively.

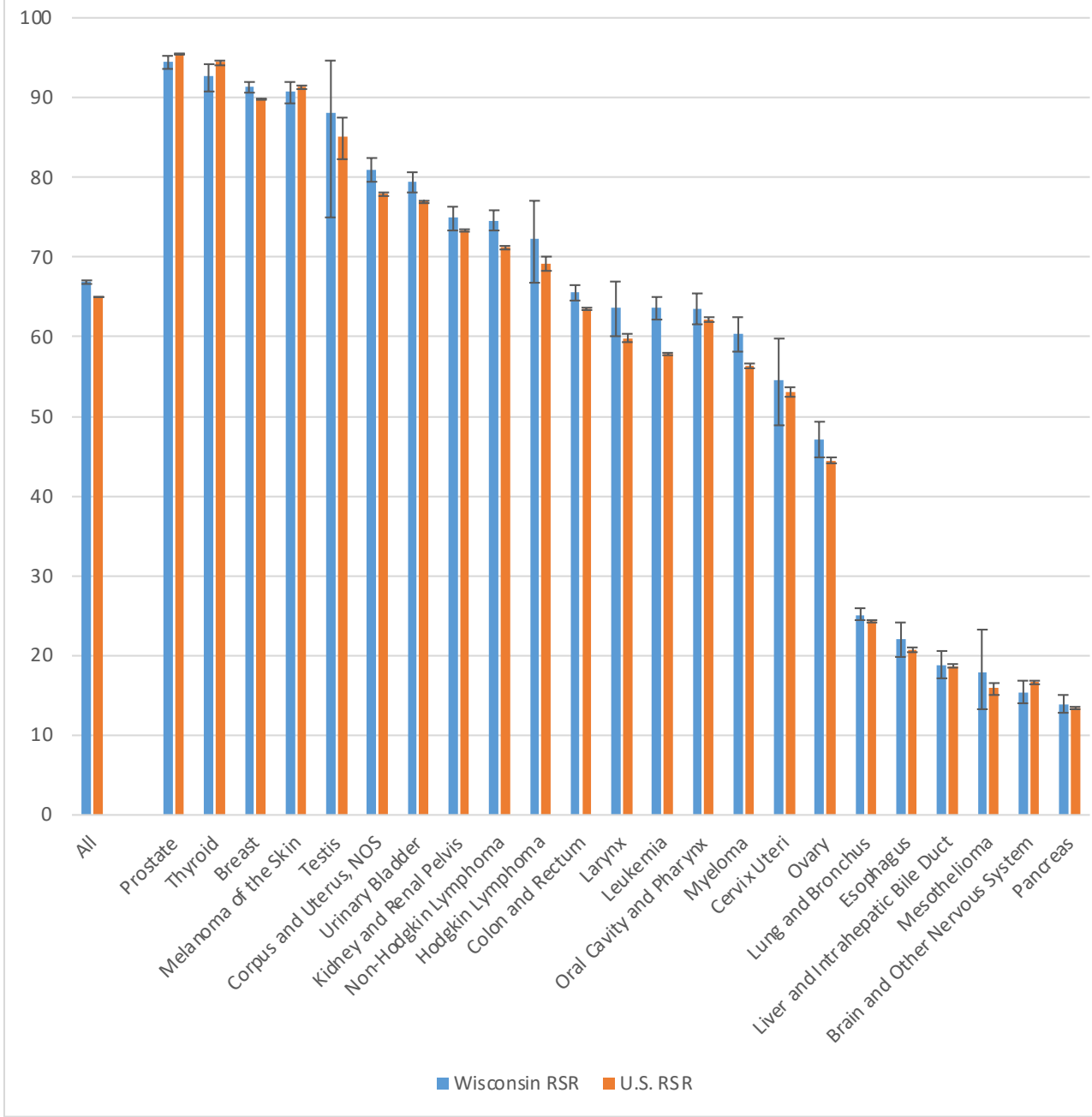
However, perceived gains or reductions in relative survival should be interpreted with extreme caution. Careful consideration of changes in clinical treatments, screening behaviors, and diagnostic methods can help determine whether the changes in relative survival represent true progress or decline in the survival of people with cancer. Gains in relative survival could be caused by factors other than treatment and diagnostic improvements. Similarly, a reduction in relative survival does not necessarily mean that cancer treatment and

diagnosis are getting worse, but that population characteristics for that cancer have changed.

For example, we have seen a well-documented increase in prostate cancer incidence in the United States since the 1980s, with studies estimating that 1.7-67 percent

of new cases could be due to overdiagnosis.¹⁰ Overdiagnosis would artificially inflate relative survival ratios by including patients in the prostate cancer cohort whose cancer would not shorten their lifespan at all, even without treatment.¹⁰ A possible explanation for the marginal decrease in relative survival for people

Figure 1. Wisconsin and United States Five-year Relative Cancer Survival Ratios, 2011-2017



Source: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.^{2,3}

Notes: RSR = Relative Survival Ratios; NOS = Not otherwise specified

with prostate cancer could be recent reductions in overdiagnosis. Further research is needed to determine potential reasons for these slight declines in prostate and colorectal cancer survival.

Impact of stage at diagnosis

Stage at diagnosis is strongly associated with relative survival. Patients diagnosed with cancer at an earlier stage of disease progression, such as the localized stage, are 88.7 percent as likely to survive for five years after diagnosis as the general population. Patients diagnosed at a later stage, such as the distant stage, are only 33.4 percent as likely to survive for five years after diagnosis as the general population (Figure 2). However, the advantage of local stage diagnosis varies greatly by major cancer site, ranging from 99.7 percent for prostate cancer, to 61.7 percent for lung cancer overall (and 55.4 percent for lung cancer among males).

Impact of age at diagnosis

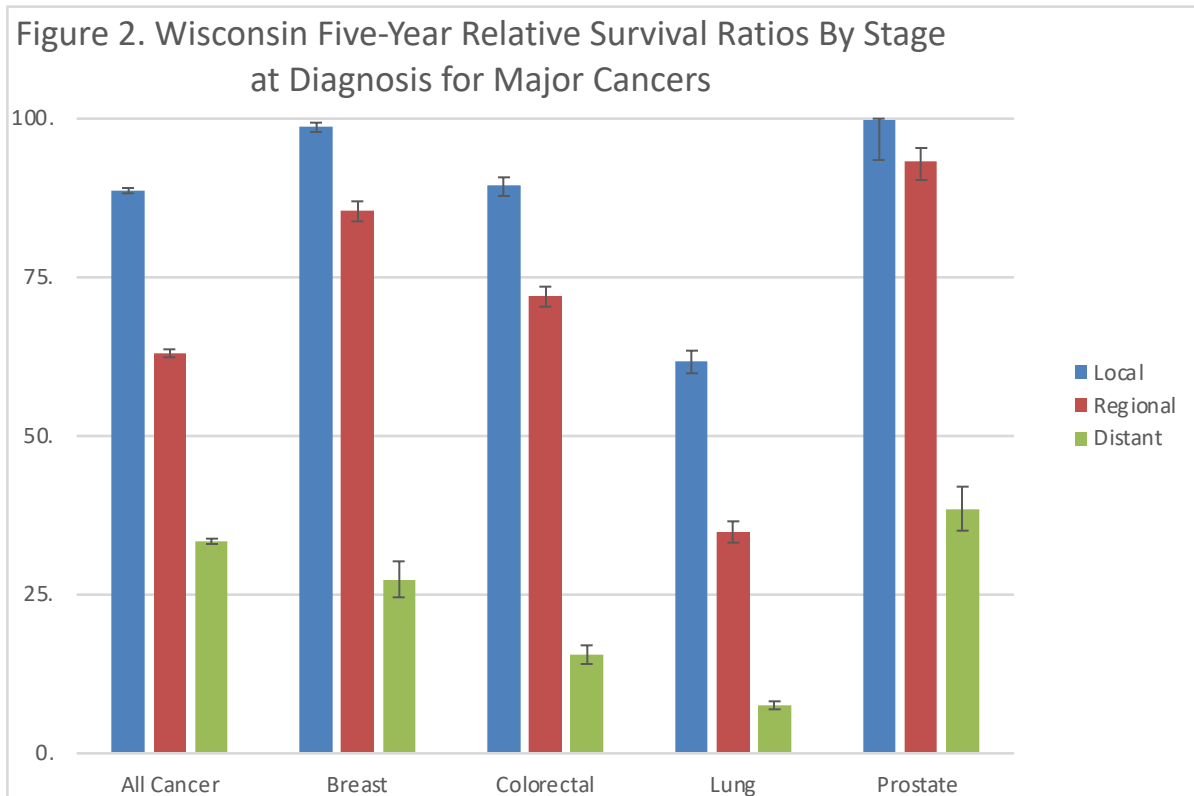
When looking at all cancers, relative survival is generally higher for younger age groups, and it declines as age increases. For example, people diagnosed with cancer between ages 15-44 are about 87 percent as likely as

15- to 44-year-olds in the general population to survive for five years after diagnosis. For people diagnosed with cancer at age 75 or older, that probability falls to about 53 percent compared to the general population in the 75+ age group (Figure 3).

For some cancers this demographic pattern is less evident, particularly for breast and prostate cancers. While for lung and colorectal cancers, even wider gaps appear in relative survival between age groups.

Race and ethnicity

Although racial disparities were not the focus of this report, the data presented here have implications for efforts to advance cancer health equity and can help to inform opportunities for improvement. Everyone in Wisconsin deserves the chance to live life to the fullest. Yet, many populations are still more likely to develop or die from cancer due to factors including race or ethnicity, socioeconomic status, gender, age, religion, mental health, ability status, body size, sexual orientation, gender identity, geographic location, or other characteristics linked to racism, discrimination, and exclusion.¹¹

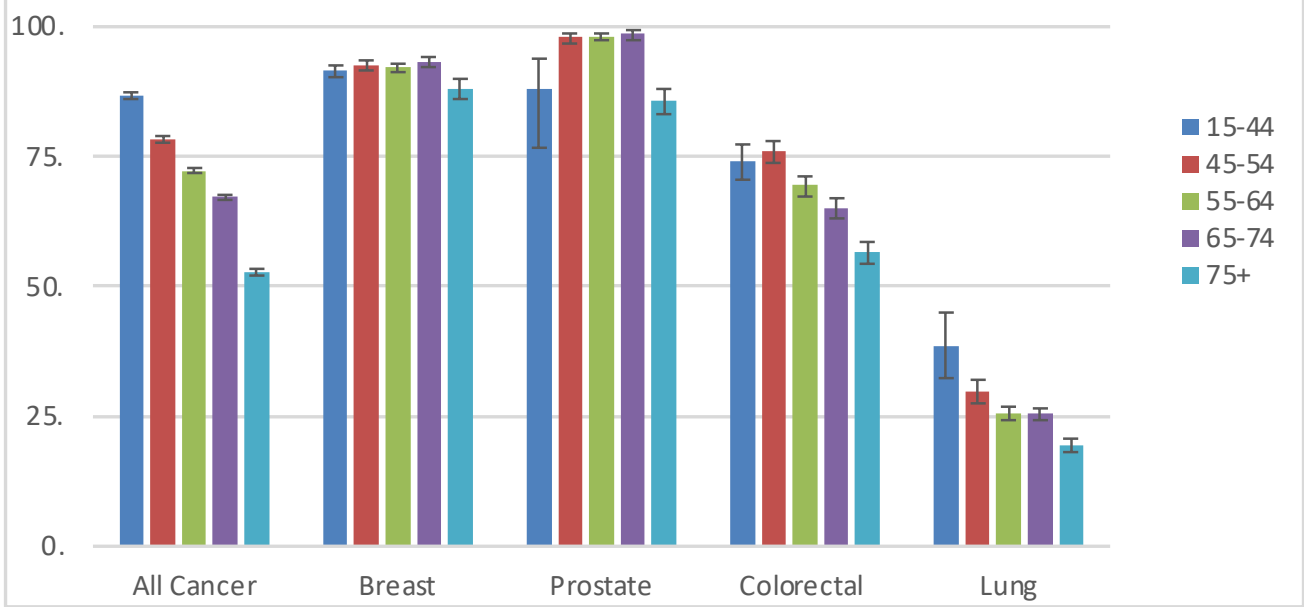


Source: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

As shown in Figure 4, relative survival ratios for African Americans are lower than relative survival ratios for whites across many cancers. However, African Americans have slightly higher relative survival ratios than whites for lung and prostate cancer. Additionally, relative survival ratios for American Indians/Alaska Natives are even lower compared to whites and African Americans. These measures quantify survival among

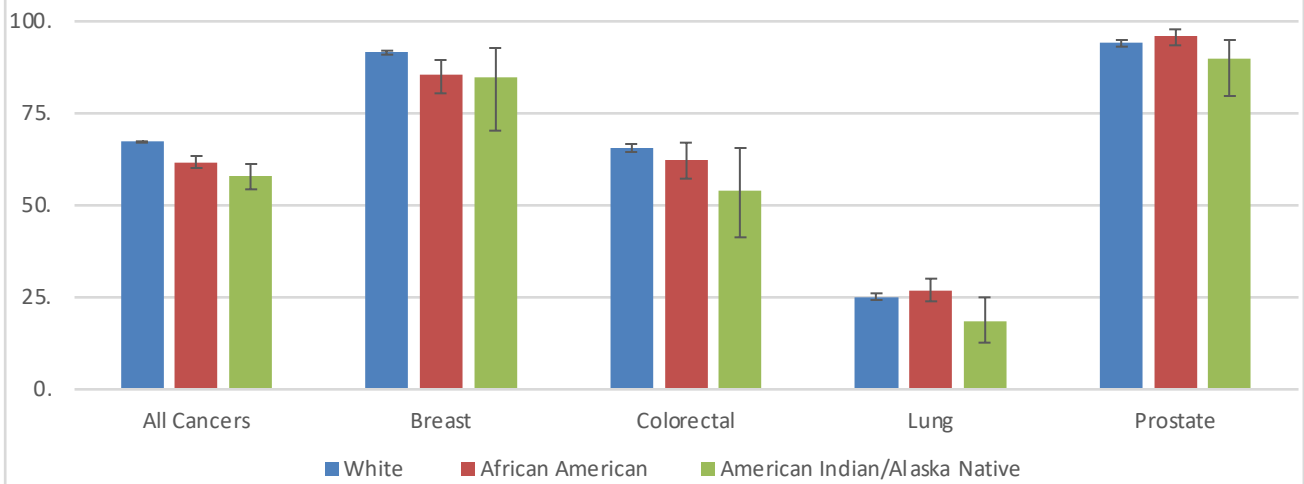
African Americans and American Indians/Alaska Natives and reflect systemic and structural inequalities. These measures also present an opportunity for future programs to identify factors impacting survival (such as access to timely care) and opportunities to implement actions to improve survival among African Americans and American Indians/Alaska Natives.

Figure 3. Wisconsin Five-year Relative Survival Ratios by Age for Major Cancers



Source: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Figure 4. Wisconsin Five-Year Relative Cancer Survival Ratios by Race for Major Cancers



Source: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Data Strengths and Limitations

The strength of the current NAACCR survival data is in the standardized and well-documented estimates based on the widest populations for national coverage. The NAACCR Survival Analysis Task Force provided the resources and guidance to NAACCR members and provided five-year relative survival estimates in the *Cancer in North America* report. Survival reports will be generated for inclusion in future NAACCR reports and provided to state cancer registries.

This approach has a time limitation, in that even the most recent survival estimates are exclusively based on patients diagnosed many years ago. Recent progress in cancer diagnosis and treatment are not reflected in these estimates, especially for cancer sites where there have been improvements in survival. As treatments are improving over time, people who are now being diagnosed with cancer may have a better outlook than these statistics indicate.

Population-based survival (passive follow-up) derived from cancer registries differs in several important ways from survival derived in clinical trial settings and from SEER registries that conduct active follow-up of cancer patients. In clinical trials and active follow-up settings, there is a detailed review of medical records to ascertain whether death or censoring occurred, as well as the cause of death. The Wisconsin population-based cancer registry, like many other registries, relies on linkages with death certificates to determine whether death occurred, and presumes individuals to be alive if no report of death is found. Strict criteria for linkages may require manual review, and human error and missed matches may be the result. Passive follow-up is more likely to miss deaths that would have been caught through active follow-up; thus, survival ratios provided by passive follow-up may overestimate actual survival ratios.

Although relative survival ratios are important tools, it is important to remember that survival ratios are based on previous outcomes of large numbers of people who had cancer and do not predict what will happen in any particular person's case. Also, while this is a population-based registry, some cases may have been missed due to care in other states that wasn't reported.

Additionally, this data does not reflect the effects of the COVID-19 pandemic, which disproportionately impacted communities of color and impacted cancer screenings and treatment in ways that may affect cancer ratios in subsequent years. Future survival reports will be beneficial in monitoring trends over time regarding cancer diagnosis, survival, and mortality.

Implications

- An increase in overall five-year relative survival ratio for all cancer sites (from 64.3 percent to 66.9 percent) is encouraging.
- Compared to the previous report (measuring 2005-2011), lung cancer relative survival ratios have increased from 19.3 percent to 25.1 percent, which means lung cancer is no longer among the five cancers with the lowest survival ratios.
- Wisconsin has notably higher relative survival than the United States as a whole for five cancer sites: leukemia, bladder, uterine, myeloma, and colorectal.
- However, Wisconsin has lower relative survival ratios than the United States as a whole for four cancer sites: melanoma, thyroid, brain and nervous system, and prostate.
- More research is needed to learn more about risk factors and treatments for cancer and identify factors influencing increases and decreases in relative survival ratios.
- Additionally, expanded community outreach and engagement efforts can promote cancer screening, risk reduction behaviors, and other policies and systems that impact survival.

Our goal is to reduce the burden of cancer for everyone in Wisconsin, yet many people are still disproportionately impacted by cancer. Overall relative survival ratios for American Indians/Alaska Natives (57.8 percent) and African Americans (61.7 percent) are lower than the state's overall ratio (66.9), as well as the overall ratio for whites (67.2 percent). These results highlight opportunities for improving factors that shape cancer survival, such as risk reduction, timely routine cancer screenings, access to affordable and quality treatment options, scientific advancements in treatment, and improving the structural factors that shape health behaviors.

Taking Action to Improve Survival

We all can work to increase cancer survival and improve the tools available to assess cancer survival across all our communities.

For example:

- **Use the Wisconsin Cancer Plan 2020-2030¹¹** to find strategies and action steps you can take to address cancer survival.
- **Identify factors influencing increases and decreases** in relative survival ratios. (For example, researching why leukemia relative survival ratios are significantly higher in Wisconsin compared to the United States overall, or why melanoma relative survival ratios for females in Wisconsin are decreasing when the cancer is highly curable, especially when caught early.)
- **Monitor and share data** on cancer survival and factors that impact survival.
- **Increase awareness** of the importance of reporting and capturing demographic information, specifically related to race, ethnicity, and applicable social determinants of health.
- **Engage underrepresented communities** in identifying critical data gaps.
- **Expand the collection and availability of data from people disparately impacted by cancer**, including racial and ethnic minorities, members of the LGBTQ community, and people with behavioral health conditions.
- **Promote and expand access to the routine use of cancer screenings**, which can dramatically reduce mortality. Many of the major cancers highlighted in this report are routinely screened for. We have the tools to prevent and identify these cancers early on. However, significant disparities must be addressed to ensure all populations in Wisconsin enjoy equitable cancer screening benefits. Work is needed to reduce barriers to ensure all people in Wisconsin are able to access and complete in a timely manner the cancer screenings they need.
- **Promote ways to lower cancer risk.** While some risk factors such as age or genetic risk cannot be changed, other risk factors such as health behaviors can be modified to lower risk and prevent disease.
- **Structural factors that shape health behaviors need to be addressed.** We will improve health outcomes for everyone in Wisconsin when we improve the conditions in which people are born, live, work, worship, learn, play, and age. By incorporating health equity into cancer control efforts, we can reduce the unequal burden of cancer in Wisconsin. Every Wisconsinite deserves access to affordable, timely, quality cancer treatment options. Further work is necessary to eliminate barriers to treatment and reduce both the financial repercussions and the health side effects that negatively affect cancer survivors and their support systems.

More people in Wisconsin and the nation are surviving cancer. However, cancer survivors regularly experience unique challenges, health issues, and quality-of-life concerns long after treatment ends. We need to be better equipped to respond to the diverse needs of Wisconsin's growing survivor populations.



Wisconsin Five-Year Relative Survival Ratios

The following tables provide five-year relative survival ratios for cancer overall in Wisconsin (“all cancer”), as well as detailed ratios for nine cancer sites. These sites include the four most commonly diagnosed cancers in Wisconsin (lung and bronchus, colorectal, breast, and prostate), as well as five additional sites chosen based on notable trends in the data (leukemia, melanoma, thyroid, pancreas, and liver).

Introductory text for each cancer site summarizes some of the major highlights drawn from the data. The tables for each cancer site include detailed relative survival ratios according to sex, race, stage of disease at diagnosis, and age at diagnosis.

All Cancer

In Wisconsin, people diagnosed with cancer are, on average, 66.9 percent as likely to survive at least five years after diagnosis compared to the overall population. The survival ratio for “total” cancer includes people of all ages and health conditions who have been diagnosed with cancer, including those diagnosed very early and those diagnosed very late.

The proportion of persons with cancer who survived five years was higher among females (68

percent) than among males (65.6 percent). Relative survival was lower among American Indians/Alaska Natives (57.8 percent) and African Americans (61.7 percent) than whites (67.2 percent). Survival was higher among people diagnosed a localized stage of disease (88.7), with a precipitous drop in survival for people diagnosed at a distant stage (33.4). Five-year relative survival was highest among people who were diagnosed with cancer before the age of 45 (86.8 percent), and survival decreased as age increased.

Table 1. Wisconsin Five-Year Relative Survival Ratios (RSR), All Cancer (Standardized)

| Overall State | | | | | | |
|-------------------------------|----------------|-----------|----------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 66.9 (208,923) | 66.6-67.1 | 65.6 (106,325) | 65.1-66.0 | 68.0 (102,598) | 67.6-68.3 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 67.2 (193,395) | 66.9-67.4 | 65.7 (98,521) | 65.3-66.1 | 68.4 (94,874) | 68.0-68.8 |
| African American | 61.7 (10,106) | 60.0-63.3 | 62.6 (5,228) | 60.3-64.9 | 60.1 (4,878) | 57.9-62.3 |
| American Indian/Alaska Native | 57.8 (1,771) | 54.2-61.2 | 55.9 (835) | 50.7-60.7 | 58.7 (936) | 53.6-63.4 |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 88.7(98,772) | 88.3-89.1 | 87.9 (48,555) | 87.3-88.5 | 89.3 (50,217) | 88.7-89.8 |
| Regional | 63.0 (46,882) | 62.3-63.6 | 59.2 (22,184) | 58.3-60.1 | 66.0 (24,698) | 65.2-66.9 |
| Distant | 33.4 (58,587) | 32.9-33.9 | 33.4 (32,212) | 32.8-34.1 | 33.4 (26,375) | 32.7-34.1 |
| Unknown | 32.3 (7,080) | 30.9-33.8 | 33.7 (3,654) | 31.7-35.7 | 30.5 (3,426) | 28.5-32.6 |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 86.8 (15,044) | 86.2-87.5 | 82.5 (5,559) | 81.4-83.6 | 89.4 (9,485) | 88.6-90.1 |
| 45-54 | 78.3 (26,357) | 77.1-78.9 | 73.3 (11,438) | 72.4-74.3 | 82.1 (14,919) | 81.4-82.8 |
| 55-64 | 72.3 (52,640) | 71.9-72.8 | 70.7 (28,433) | 70.1-71.4 | 74.2 (24,207) | 73.5-74.9 |
| 65-74 | 67.2 (59,121) | 66.7-67.7 | 67.6 (33,014) | 66.9-68.3 | 66.7 (26,107) | 65.9-67.4 |
| 75+ | 52.7 (57,431) | 52.0-53.3 | 52.1 (28,847) | 51.1-53.1 | 53.2 (28,584) | 52.3-54.2 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation. Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Age Group values are not age-standardized. Standardized total counts (N) for Total and Race exceed total counts for Stage and Age because standardized counts include all cancers, while Stage and Age are limited to one case per person.

Lung and Bronchus Cancer

Lung cancer is the leading cause of cancer deaths for men and women in Wisconsin, resulting in approximately 4,200 new cases and 2,900 deaths each year.¹² More people die from lung cancer than from colorectal, breast, and prostate cancers combined.¹² Risk factors for lung cancer include: tobacco smoke; secondhand smoke; radon exposure in homes, schools, and other buildings; exposure to asbestos; occupational exposures to carcinogens; pollution; and family history of lung cancer.¹³ Cigarette smoking is the primary risk factor for lung cancer, linked to about 80-90 percent of lung cancer deaths in the United States.¹⁴

Overall lung cancer survival ratios have increased to 25.1 percent, from 19.3 in the previous report (measuring 2005-2011), possibly due to advancements in treatment.¹⁵ When diagnosed at a localized stage (within the lung), the five-year survival ratio is 61.7 percent; however, only 22.2 percent of

lung cancers are detected at the local stage. When diagnosed at a distant stage, which accounts for approximately 50 percent of lung cancer cases¹², the survival ratio falls to 7.5 percent.

Although lung cancer has one of the lowest survival ratios across sex, race, and age groups, there are patterns of variation. American Indian/Alaskan Native males have the lowest relative survival (14.5 percent), while white females have the highest relative survival (29.6 percent). Ratios also see a decline with increasing age.

Annual lung cancer screening is recommended for people ages 50-80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years.¹⁶ Additionally, quitting smoking, reducing exposure to the smoke of others, reducing air pollution, and testing homes and schools for radon are ways to reduce risk.¹⁷

Table 2. Wisconsin Five-Year Relative Survival Ratios (RSR), Lung and Bronchus Cancer

| Overall State | | | | | | |
|-------------------------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 25.1 (28,098) | 24.4-25.9 | 20.8 (14,480) | 19.8-21.9 | 29.4 (13,618) | 28.3-30.5 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 25.1 (25,917) | 24.3-25.9 | 20.5 (13,348) | 19.3-21.7 | 29.6 (12,569) | 28.4-30.7 |
| African American | 26.8 (1,590) | 23.7-30.0 | 24.8 (871) | 20.8-28.9 | 29.0 (719) | 24.5-33.6 |
| American Indian/Alaska Native | 18.5 (269) | 12.8-24.9 | 14.5 (113) | 7.4-23.8 | 21.1 (156) | 13.5-29.9 |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 61.7 (6,327) | 59.8-63.5 | 55.4 (2,948) | 52.2-58.5 | 66.3 (3,379) | 63.9-68.5 |
| Regional | 34.8 (6,770) | 33.1-36.5 | 29.0 (3,498) | 26.6-31.4 | 40.2 (3,272) | 37.9-42.5 |
| Distant | 7.5 (14,956) | 6.9-8.2 | 6.2 (8,007) | 5.3-7.2 | 9.0 (6,949) | 8.0-10.0 |
| Unknown | 26.5 (394) | 20.8-32.5 | NA | NA | 34.8 (198) | 26.6-43.0 |
| Age Group | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 38.6 (298) | 32.3-44.8 | 32.4 (149) | 23.1-42.2 | 43.3 (149) | 34.6-51.7 |
| 45-54 | 29.8 (1,984) | 27.5-32.1 | 21.7 (935) | 18.6-24.9 | 36.9 (1,049) | 33.6-40.1 |
| 55-64 | 25.5 (6,361) | 24.2-26.8 | 21.0 (3,424) | 19.4-22.7 | 30.7 (2,937) | 28.7-32.7 |
| 65-74 | 25.5 (9,748) | 24.3-26.6 | 22.0 (5,045) | 20.5-23.5 | 29.2 (4,703) | 27.5-30.8 |
| 75+ | 19.3 (9,790) | 18.2-20.5 | 16.4 (4,972) | 14.8-18.1 | 22.3 (4,818) | 20.6-24.0 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation.

Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Age Group values are not age-standardized.

Colorectal Cancer

Colorectal cancer is cancer in the colon or the rectum¹⁸, which make up the large intestine. Colorectal cancer is the second-most commonly diagnosed cancer and the third-leading cause of cancer death in both men and women nationally.¹⁹ However, when colorectal cancer is found early, it is highly curable. Death rates from colorectal cancer have been declining for both men and women since the mid-1980s because of improvements in screening, early diagnosis, and treatment.¹⁹

The five-year relative survival ratio for all people with colorectal cancer is 65.5 percent, which is a slight decrease from 67.2 percent in the previous report (measuring 2005-2011). However, relative survival ratios for colorectal cancer vary greatly based on the stage of disease at diagnosis. About 39 percent of colorectal cancers are found at the localized stage¹², where the five-year relative survival ratio is 89.4 percent. Regional diagnosis, where the cancer has spread to surrounding tissues, organs, and/or the regional lymph nodes, accounts for 36 percent of colorectal cancer cases¹²; the five-year relative survival ratio for colorectal cancers diagnosed at the regional stage is 72.0 percent. The five-year relative survival ratio drops

to 15.6 percent for colorectal cancers diagnosed at the distant stage, which accounts for 21 percent of colorectal cancer cases.¹²

When looking at racial disparities in colorectal cancer relative survival ratios, the overall ratios for colorectal cancer among American Indians/Alaska Natives (54.1 percent) and African Americans (62.4 percent) are lower than the overall ratio among whites (65.7 percent). Across all racial groups, males experience lower colorectal cancer survival ratios than females.

Routine screening at ages 45-75 can help to prevent colorectal cancer and find it early.²⁰ People may need to be tested earlier if they have inflammatory bowel disease, family or personal history of colorectal cancer or polyps, or a genetic syndrome such as Lynch syndrome. Numerous screening options include colonoscopies, at-home stool tests, flexible sigmoidoscopy, and CT colonography (virtual colonoscopy). Additionally, maintaining a healthy weight, being physically active, limiting processed meats and red meats in your diet, stopping smoking, and reducing alcohol can help reduce risks of colorectal cancer.²¹

Table 3. Wisconsin Five-Year Relative Survival Ratios (RSR), Colorectal Cancer

| Overall State | | | | | | |
|-------------------------------|---------------|-------------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 65.5 (17,262) | 64.5-66.5 | 64.3 (9,049) | 62.8-65.8 | 66.7 (8,213) | 65.2-68.1 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 65.7 (15,825) | 64.6-66.8 | 64.7 (8,296) | 63.1-66.2 | 66.8 (7,529) | 65.3-68.3 |
| African American | 62.4 (970) | 57.3-67.1 | 59.5 (512) | 52.1-66.2 | 65.3 (458) | 58.1-71.5 |
| American Indian/Alaska Native | 54.1 (186) | 41.2-65.4 | 48.0 (103) | 32.7-61.7 | 65.5 (83) | 49.4-77.6 |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 89.4 (6,829) | 87.9 - 90.8 | 88.9 (3,593) | 86.6-90.9 | 89.9 (3,236) | 87.7-91.6 |
| Regional | 72.0 (6,339) | 70.3-73.6 | 70.2 (3,300) | 67.7-72.6 | 73.3 (3,039) | 70.9-75.6 |
| Distant | 15.6 (3,750) | 14.1-17.1 | 14.0 (2,014) | 12.0-16.0 | 17.6 (1,736) | 15.4-20.1 |
| Unknown | 37.5 (547) | 31.4-43.6 | 33.7 (253) | 25.8-41.8 | NA | NA |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 74.1 (988) | 70.6-77.3 | 69.9 (522) | 64.7-74.5 | 78.8 (466) | 73.8-82.9 |
| 45-54 | 75.9 (2,466) | 73.8-77.9 | 74.7 (1,372) | 71.8-77.3 | 77.4 (1,094) | 74.3-80.2 |
| 55-64 | 69.4 (3,540) | 67.4-71.2 | 69.0 (2,149) | 66.4-71.4 | 70.0 (1,391) | 66.9-72.9 |
| 65-74 | 65.1 (4,014) | 63.0-67.1 | 64.7 (2,268) | 61.8-67.3 | 65.6 (1,746) | 62.6-68.5 |
| 75+ | 56.5 (6,270) | 54.3-58.6 | 54.7 (2,749) | 51.2-58.0 | 57.9 (3,521) | 55.0-60.6 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation.

Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Age Group values are not age-standardized.

Breast Cancer

Breast cancer is the most common cancer among women, accounting for nearly one-third of female cancers, or approximately 4,600 cases each year.¹² It is the second-leading cause of cancer death among women in Wisconsin, causing approximately 740 deaths each year.¹²

For all female breast cancers, the five-year relative survival ratio is 91.3 percent, which is a slight increase from 89.6 in the previous report (measuring 2005-2011). This relatively high ratio is found across all age groups. Relative survival ratios for African American women are lower than for white women, 85.6 percent compared with 91.6 percent, respectively. Additionally, American Indian/Alaska Native women have the lowest relative survival ratio (84.8 percent). The relative survival ratio is 98.8 percent when diagnosed at the localized stage, which accounts for approximately 67 percent of female breast cancer

cases.¹² The relative survival ratio falls to 27.4 percent when diagnosed at the distant stage, which accounts for 5 percent of breast cancer cases.¹² Male breast cancer is rare and was not included in this report.

Routine screening and early detection can improve survival. Women at average risk for breast cancer should begin discussing screening options with their clinician at age 40.²² Women at high risk for breast cancer may need to start screening at an earlier age and should discuss their screening risk with their health care provider. Talking about family history of cancer can help inform screening options, and some people may benefit from genetic counseling. Additionally, reducing alcohol consumption, maintaining a healthy weight, and increasing physical activity may help to reduce risk.²³

Table 4. Wisconsin Five-Year Relative Survival Ratios (RSR), Breast Cancer

| Overall State | | |
|-------------------------------|-----------------|-----------|
| | RSR (N) Females | 95% CI |
| Total | 91.3 (31,167) | 90.6-92.0 |
| Race | | |
| | RSR (N) Females | 95% CI |
| White | 91.6 (29,026) | 90.8-92.2 |
| African American | 85.6 (1,466) | 80.3-89.6 |
| American Indian/Alaska Native | 84.8 (255) | 70.3-92.6 |
| Stage | | |
| | RSR (N) Females | 95% CI |
| Localized | 98.8 (21,067) | 97.9-99.3 |
| Regional | 85.5 (8,671) | 83.9-86.9 |
| Distant | 27.4 (1,663) | 24.5-30.2 |
| Unknown | 54.7 (139) | 43.2-64.9 |
| Age Group* | | |
| | RSR (N) Females | 95% CI |
| 15-44 | 91.5 (2,794) | 90.2-92.7 |
| 45-54 | 92.7 (5,972) | 91.7-93.5 |
| 55-64 | 92.1 (7,999) | 91.2-92.9 |
| 65-74 | 93.2 (8,054) | 92.1-94.2 |
| 75+ | 88.1 (6,391) | 86.1-89.9 |

SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation. Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*African American male numbers are too small for age-standardization. Age Group values are not age-standardized.

Prostate Cancer

Prostate cancer is the most commonly diagnosed cancer and the second-leading cause of cancer death among men in Wisconsin, most commonly among men aged 55 or older. More than 600 people die of prostate cancer each year in Wisconsin.¹² Risk factors for prostate cancer include increasing age, family history, and some inherited gene changes.²⁴ Additionally, prostate cancer seems to occur more often in African American men and in Caribbean men of African ancestry.²⁴ Prostate cancer is also more common in certain areas of the world, such as North America, northwestern Europe, Australia and the Caribbean islands, for reasons that are unclear.²⁴ Differences in global distribution of prostate cancer may be due to factors such as screening practice differences and lifestyle differences such as diet, which warrant further investigation.²⁴

The overall five-year relative survival ratio for prostate cancer is 94.5 percent, which is a slight decrease from 96.2 percent in the previous report (measuring 2005-2011). This high five-year relative survival ratio reflects the fact that the majority of prostate cancers are diagnosed at the early local stage, and because prostate cancer is commonly slow to grow, it may never be life-threatening for some people. Relative survival approaches 100 percent for localized prostate cancers, with approximately 74 percent of prostate cancers

being detected at the local stage.¹² However, the relative survival ratio drops to 38.5 percent for distant stage prostate cancers, which account for approximately 9 percent of prostate cancer cases.¹² Additionally, when looking at racial disparities in prostate cancer relative survival ratios, African Americans have a higher ratio than whites for prostate cancer (96.1 percent compared to 94.1 percent respectively, and American Indians/Alaska Natives have the lowest ratio (89.8 percent)). In the previous report, which used 2005-2011 data, African American males in Wisconsin did not have higher relative survival for prostate cancer than white males. More research is needed to understand possible factors contributing to this change.

Routine prostate cancer screening is no longer recommended for all men. For men ages 55 to 69 years²⁵, prostate-specific antigen (PSA)-based screening is an individual choice. Men should talk with their health care provider about the benefits and harms of screening on a case-by-case basis. Conversations should include family history, race/ethnicity, other medical conditions, patient values, treatment outcomes, and other health needs. This is because the risk of death from prostate cancer is generally low, while overdiagnosis and treatment complications can negatively impact quality of life.

Table 5. Wisconsin Five-Year Relative Survival Ratios (RSR), Prostate Cancer

| Overall State | | |
|-------------------------------|---------------|-----------|
| | RSR (N) Males | 95% CI |
| Total | 94.5 (27,673) | 93.6-95.2 |
| Race | | |
| | RSR (N) Males | 95% CI |
| White | 94.1 (25,235) | 93.2-94.9 |
| African American | 96.1 (1,780) | 93.5-97.7 |
| American Indian/Alaska Native | 89.8 (202) | 79.7-95.1 |
| Stage | | |
| | RSR (N) Males | 95% CI |
| Localized | 99.7 (20,612) | 93.5-100 |
| Regional | 93.3 (4,306) | 90.4-95.3 |
| Distant | 38.5 (2,428) | 35.0-42.1 |
| Unknown | 80.2 (327) | 70.4-87.0 |
| Age Group* | | |
| | RSR (N) Males | 95% CI |
| 15-44 | 88.0 (78) | 76.7-94.0 |
| 45-54 | 98.0 (2,295) | 96.8-98.8 |
| 55-64 | 98.2 (9,425) | 97.4-98.7 |
| 65-74 | 98.7(10,794) | 97.4-99.4 |
| 75+ | 85.8 (5,081) | 93.1-88.1 |

SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation. Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Number is too small for age-standardization. Age Group values are not age-standardized.

Leukemia

Leukemia is a broad term for cancers of the blood cells. Leukemia makes up approximately 3.2 percent of all cancers in Wisconsin.²⁶ There are several types of leukemia (including acute/fast-growing and chronic/slow-growing), which can have drastically different risk factors, treatment options, and outcomes.²⁷

Risk factors for leukemia include radiation exposure, previous treatment for cancer using radiation therapy and/or chemotherapy, certain chemical exposures such as benzene, smoking, some viral infections such as Epstein-Barr virus (which causes “mono”), and certain genetic syndromes.^{28,29} However, many people are diagnosed with leukemia without these risk factors.

Overall, relative survival in Wisconsin for people with leukemia is 63.6 percent. Leukemia was not investigated in the previous report, so a comparison is not possible.

Interestingly, Wisconsin has a higher relative survival ratio for leukemia compared to the United States by 5.8 percentage points (63.6 percent in

Wisconsin, compared to 57.8 percent in the United States). Reasons for this are unknown.

A breakdown by stage of diagnosis is unavailable, as leukemia staging differs from other cancers. Leukemia occurs most often in adults older than 55, and the risk of leukemia increases as people age. However, although this report doesn’t focus on cancer in children, leukemia is also the most common cancer in children younger than 15.³⁰ Highest relative survival is for people ages 45-54 years (80.1 percent).

Additionally, when looking at racial disparities in leukemia relative survival ratios, whites have a higher survival ratio than African Americans (63.9 percent compared to 57.6 respectively), and American Indians/Alaska Natives have the lowest ratio (57.2 percent).

There is no routine screening for leukemia, and it is unknown what causes the genetic changes resulting in leukemia. Research is ongoing to learn more about the risk factors and treatment of the disease.

Table 6. Wisconsin Five-Year Relative Survival Ratios (RSR), Leukemia

| Overall State | | | | | | |
|-------------------------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 63.6 (7,491) | 62.1-65.0 | 63.8 (4,508) | 61.9-65.7 | 63.0 (2,983) | 60.7-65.2 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 63.9 (7,072) | 62.4-65.4 | 64.1 (4,275) | 62.1-66.0 | 63.3 (2,797) | 60.9-65.5 |
| African American | 57.6 (276) | 48.5-65.7 | 55.0 (155) | 43.4-65.2 | 57.1 (121) | 45.0-67.5 |
| American Indian/Alaska Native | 57.2 (45) | 40.5-70.8 | NA | NA | NA | NA |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 76.0 (577) | 72.0-79.5 | 76.9 (341) | 71.6-81.3 | 74.8 (236) | 68.4-80.1 |
| 45-54 | 80.1 (770) | 76.7-83.0 | 82.8 (461) | 78.5-86.4 | 75.8 (309) | 70.1-80.6 |
| 55-64 | 73.7 (1,570) | 71.0-76.2 | 75.5 (972) | 72.0-78.7 | 70.8 (598) | 66.4-74.7 |
| 65-74 | 60.8 (2,081) | 58.0-63.5 | 61.4 (1,298) | 57.7-64.8 | 60.0 (783) | 55.5-64.2 |
| 75+ | 48.5 (2,500) | 45.2-51.7 | 46.1 (1,442) | 41.6-50.4 | 51.7 (1,058) | 46.7-56.5 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation. Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*African American numbers are too small for age-standardization. Age Group values are not age-standardized.

Melanoma

Melanoma is a cancer of the skin that happens when melanocytes (cells that make melanin, which gives skin its pigmentation) start to grow out of control.³¹ The number of melanoma cases in Wisconsin and nationally is dramatically increasing. From 2011 through 2017, the number of melanomas diagnosed annually in Wisconsin increased from 2,078 to 3,000.¹² Although melanoma accounts for about 1 percent of all skin cancers nationally, it causes the vast majority of skin cancer deaths.³² For the years covered in this analysis, 2011-2017, approximately 170 people died from melanoma each year.¹²

Fortunately, the five-year relative survival ratio for melanoma is 90.7 percent. This is a slight increase from 89.4 percent in the previous report (measuring 2005-2011). Melanoma is one of only four cancer sites where Wisconsin has lower relative survival ratios than the nation (90.7 percent in Wisconsin, compared to 91.3 percent for the United States).

Melanoma is often curable if detected and treated at an early stage. More than 80 percent of mela-

nomas were diagnosed at the localized stage each year between 2011-2017. The relative survival ratio for melanoma diagnosed at the localized stage is 96.8 percent. However, relative survival drops to 25.5 percent for melanoma diagnosed at distance stages.

Melanoma is more common among men than women, overall. The relative survival ratio for males with melanoma increased from 85.8 percent to 90.1 percent since the previous report (measuring 2005-2011). However, the relative survival ratio for females with melanoma declined from 93.2 percent to 91.2 percent since the previous report (measuring 2005-2011). Unfortunately, data was not available for African Americans and American Indians/Alaska Natives.

Limiting exposure to UV rays (such as avoiding tanning beds, using sunscreen, seeking shade, and wearing protective clothing items such as a hat) can help reduce risk. Additionally, checking your skin regularly for changes in moles or new moles is also encouraged.³³

Table 7. Wisconsin Five-Year Relative Survival Ratios (RSR), Melanoma

| Overall State | | | | | | |
|---------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 90.7 (10,630) | 89.3-92.0 | 90.1 (6,130) | 88.3-91.7 | 91.2 (4,500) | 89.0-93.0 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White** | 89.9 (10,028) | 88.4-91.2 | 89.3 (5,838) | 87.4-90.9 | 90.3 (4,190) | 88.0-92.2 |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 96.8 (8,999) | 95.1-97.9 | 96.9 (5,102) | 94.5-98.3 | 96.3 (3,897) | 93.5-97.9 |
| Regional | 63.3 (922) | 58.1-68.1 | 60.3 (577) | 53.5-66.5 | 66.9 (345) | 58.8-73.8 |
| Distant | 25.5 (495) | 20.7-30.6 | 23.9 (343) | 18.4-29.8 | 29.6 (152) | 20.7-39.1 |
| Unknown | 84.5 (312) | 76.5-89.9 | 87.0 (176) | 75.5-93.3 | 78.6 (136) | 67.9-86.1 |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 96.6 (1,503) | 95.3-97.5 | 93.9 (516) | 90.7-96.0 | 97.9 (987) | 96.6-98.7 |
| 45-54 | 94.1 (1,702) | 92.5-95.4 | 92.9 (817) | 90.1-94.9 | 95.3 (885) | 93.0-96.8 |
| 55-64 | 93.7 (2,507) | 92.1-95.0 | 92.3 (1,495) | 90.0-94.1 | 95.4 (1,012) | 93.2-96.9 |
| 65-74 | 91.7 (2,384) | 89.4-93.6 | 91.5 (1,629) | 88.4-93.8 | 91.8 (755) | 88.1-94.4 |
| 75+ | 84.6 (2,568) | 80.3-88.0 | 84.9 (1,693) | 79.4-89.0 | 84.1 (875) | 77.1-89.1 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation. Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*African American numbers are too small for age-standardization. Age Group values are not age-standardized.

Thyroid Cancer

Thyroid cancer makes up a relatively small number of total cancers in Wisconsin (2.3 percent)²⁶; however, cases have been rapidly increasing in recent years.¹² Several inherited conditions, family history, radiation exposure, and being overweight or obese have been linked to different types of thyroid cancer. Many cases of thyroid can be found early at the local stage and treated successfully.³⁴

The five-year relative survival ratio for all people with thyroid cancer is 92.7 percent. This is a slight decrease from 94.0 percent in the previous report (measuring 2005-2011). Thyroid cancer is one of only four cancer sites where Wisconsin has lower relative survival than the United States (92.7 percent in Wisconsin, compared to 94.4 percent for the United States). Reasons are not fully understood, but over diagnosis could influence survival ratios.

Thyroid cancer is more common at a younger age (under 55 years of age) compared to most other cancers. Relative survival for thyroid cancer is relatively high across age groups, but is highest

among 15- to 44-year-olds (99.6 percent). Thyroid cancer is more common among women, and relative survival ratios are higher among females compared to males (94.5 percent compared to 87.8 percent, respectively). When looking at racial disparities in thyroid cancer relative survival ratios, American Indians/Alaska Natives have the highest relative survival (96.3 percent), followed by whites and then African Americans (92.6 percent and 91.0 percent, respectively).

Increased detection due to more sensitive diagnostic procedures has likely contributed to the rapid increase in cases in recent years. However, there is no recommended routine screening test for people at average risk.³⁵ More research is needed to identify risk factors and prevention strategies for thyroid cancer. For people with a family history of a specific type of thyroid cancer (familial medullary thyroid cancer), genetic testing and counseling can be helpful.³⁶ Additionally, changes have been made to reduce radiation exposure, especially in children, by using the lowest dose or radiation for x-rays and CT scans.

Table 8. Wisconsin Five-Year Relative Survival Ratios (RSR), Thyroid Cancer

| Overall State | | | | | | |
|-------------------------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 92.7 (5,808) | 90.7-94.2 | 87.8 (1,506) | 82.8-91.5 | 94.5 (4,302) | 92.4-96.0 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 92.6 (5,339) | 90.6-94.2 | 87.6 (1,410) | 83.3-90.9 | 94.4 (3,929) | 92.3-95.9 |
| African American | 91.0 (242) | 65.6-97.9 | 90.4 (48) | 73.7-96.7 | 87.9 (194) | 67.6-95.8 |
| American Indian/Alaska Native | 96.3 (47) | 80.2-99.4 | NA | NA | 95.4 (39) | 77.9-99.1 |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 98.9 (3,889) | 94.6-99.8 | 95.6 (875) | 86.8-98.6 | 99.3 (3,014) | 97.6-99.8 |
| Regional | 89.0 (1,676) | 83.2-92.9 | 79.3 (535) | 67.2-87.4 | 91.9 (1,141) | 86.8-95.1 |
| Distant | 46.9 (204) | 38.6-54.7 | 38.0 (85) | 25.2-50.8 | 52.8 (119) | 41.6-62.7 |
| Unknown | 73.6 (40) | 51.3-86.8 | N/A | N/A | 79.5 (28) | 57.2-91.0 |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 99.6 (2,047) | 98.6-99.9 | 99.1 (387) | 93.6-99.9 | 99.7 (1,660) | 98.7-99.9 |
| 45-54 | 97.6 (1,292) | 95.9-98.6 | 93.1 (317) | 88.0-96.1 | 99.0 (975) | 96.9-99.7 |
| 55-64 | 95.9 (1,265) | 93.6-97.4 | 93.0 (396) | 89.2-95.5 | 96.9 (869) | 94.0-98.4 |
| 65-74 | 94.2 (769) | 90.5-96.6 | 89.5 (260) | 81.2-94.3 | 96.5 (509) | 92.8-98.3 |
| 75+ | 84.8 (435) | 79.0-89.1 | 77.2 (146) | 60.8-87.4 | 87.3 (289) | 81.0-91.6 |

SEER*Stat Database: NAACCR Incidence Data – CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation.

Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*African American numbers are too small for age standardization. Age Group values are not age-standardized.

Pancreas Cancer

Cancer of the pancreas, or pancreatic cancer, is the fourth-most common cause of cancer death in Wisconsin.^{12,26} While relative pancreatic cancer survival ratios have been improving, the disease still has one of the lowest relative survival ratios of all cancers in Wisconsin and in the United States, and it is considered largely incurable.

For all pancreatic cancers, the five-year relative survival ratio is 13.9 percent, which is an increase from 10.0 percent in the previous report (measuring 2005-2011). Although relative survival increased for both males and females, females saw a greater increase (from 10.5 percent in 2005-2011, to 15.8 percent in 2011-2017). Africans Americans have a lower relative survival ratio compared to whites, 10.9 percent and 14.2 percent, respectively. Data was not available for American Indians/Alaska Natives.

Low relative survival ratios for pancreatic cancer are attributable to the majority of cases being diagnosed at more advanced stages; approximately 50 percent of cases are diagnosed at the

distant stage, where the relative survival ratio is only 4.1 percent.¹² However, the relative survival ratio increases to 47.1 percent when diagnosed at the local stage. Although people of younger ages have an advantage in survival, about 90 percent of people diagnosed with pancreatic cancer in Wisconsin are 55 years of age or older.

The pancreas is located behind the stomach and produces enzymes to help in food digestion.³⁷ Risk factors for pancreatic cancer include smoking, being overweight, having diabetes, chronic pancreatitis, workplace exposure to certain chemicals (such as dry cleaning and metal working), family history, and inherited genetic syndromes.³⁷ Pancreatic cancer is hard to find early, and no routine screening is recommended for people who are at average risk. However, genetic testing is available for people who might be at increased risk due to family history of pancreatic cancer or due to a genetic syndrome that increases their risk.³⁸ Work is being done to increase awareness of pancreatic cancer and identify treatments to increase survival.

Table 9. Wisconsin Five-Year Relative Survival Ratios (RSR), Pancreas Cancer

| Overall State | | | | | | |
|-------------------------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 13.9 (6,377) | 12.8-15.1 | 13.0 (3,404) | 11.5-14.7 | 15.8 (2,973) | 14.1-17.6 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 14.2 (5,913) | 13.0-15.4 | 13.4 (3,181) | 11.8-15.1 | 15.9 (2,732) | 14.1-17.8 |
| African American | 10.9 (340) | 7.4-15.2 | 9.7 (164) | 5.0-16.3 | 15.1 (176) | 9.6-21.8 |
| American Indian/Alaska Native | NA | NA | NA | NA | NA | NA |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 47.1 (845) | 43.1-51.0 | 49.0 (407) | 43.1-54.7 | 46.2 (438) | 40.7-51.4 |
| Regional | 17.5 (1,982) | 15.1-19.9 | 18.3 (1,044) | 15.0-21.8 | 16.9 (938) | 13.6-20.5 |
| Distant | 4.1 (3,367) | 3.2-5.1 | 3.3 (1,872) | 2.4-4.5 | 3.5 (1,495) | 2.5-4.7 |
| Unknown | 5.9 (183) | 2.5-11.3 | 5.9 (81) | 1.4-15.2 | 5.5 (102) | 1.9-12.0 |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 40.4 (143) | 31.3-49.3 | 28.4 (84) | 17.6-40.2 | 56.7 (59) | 42.3-68.8 |
| 45-54 | 22.6 (540) | 18.7-26.7 | 18.8 (325) | 14.3-23.8 | 28.2 (215) | 21.5-35.3 |
| 55-64 | 12.6(1,496) | 10.7-14.8 | 11.1 (840) | 8.6-13.8 | 14.7 (656) | 11.6-18.2 |
| 65-74 | 13.2 (1,871) | 11.3-15.3 | 12.9 (1,079) | 10.5-15.6 | 13.6 (792) | 10.7-16.9 |
| 75+ | 5.7 (2,327) | 4.5-7.2 | 8.6 (1,076) | 6.3-11.4 | 3.8 (1,251) | 2.6-5.4 |

SEER*Stat Database: NAACCR Incidence Data – CiNA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation.

Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Age Group values are not age-standardized.

Liver and Intrahepatic Bile Duct Cancer

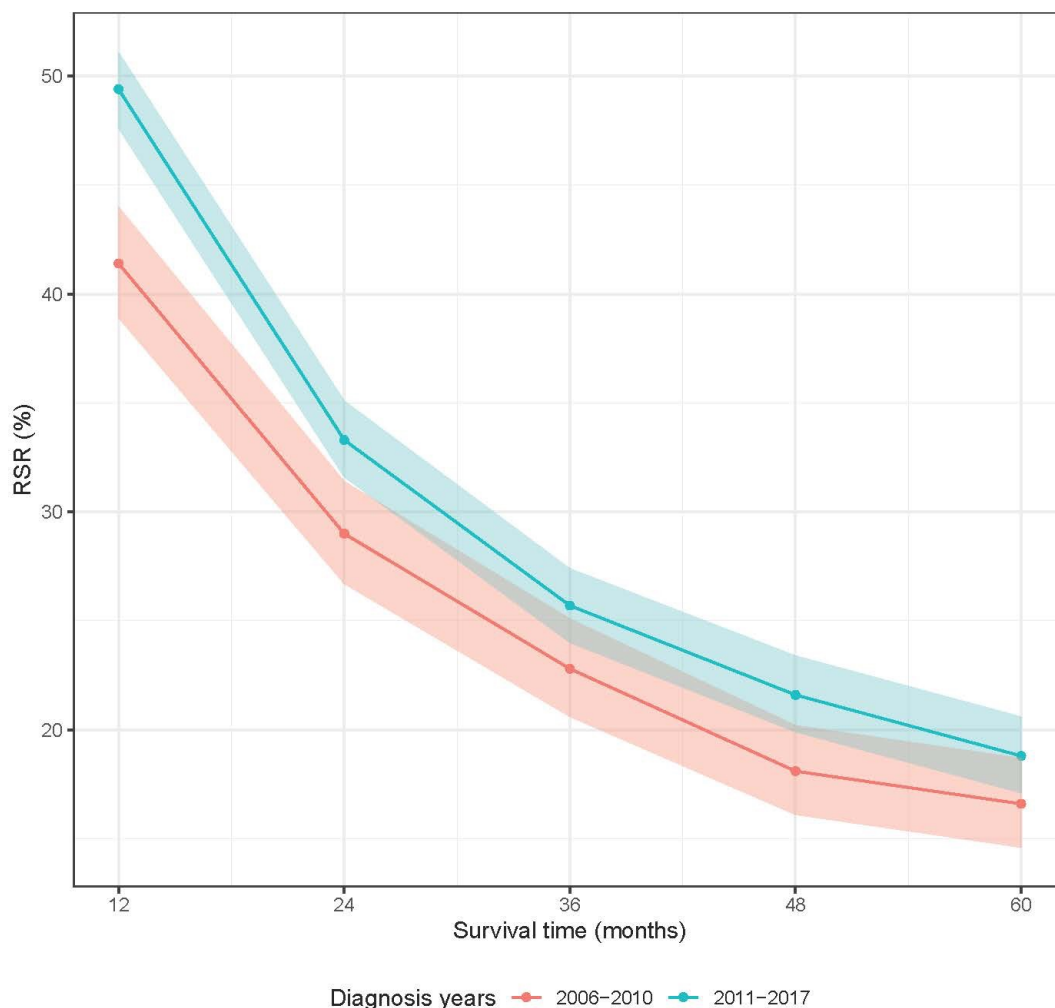
Liver cancer and intrahepatic bile duct cancer (also called bile duct cancer) are less common in the United States than they are globally.³⁹ While these two cancer sites are grouped in the data, we largely focus on primary liver cancer in this report.

Primary liver cancer is cancer that begins in the liver itself. The most common type of primary liver cancer in adults is hepatocellular carcinoma, and the most common type of cancer that forms in the bile duct is intrahepatic cholangiocarcino-

ma. It is important to note that in the US, most cancers found in the liver are cancers that have spread from other parts of the body, such as the colon or lung. These are known as metastatic or secondary cancers, and they are treated based on where they started; these cancers are not included in the data.⁴⁰

Risk factors that may lead to primary liver cancer include chronic infection with hepatitis B and/or C viruses, cirrhosis, heavy alcohol use, and smok-

Figure 5. Liver and Intrahepatic Bile Duct Relative Survival Ratios Over Time²⁶



ing.⁴¹ Wisconsin leads the nation in high alcohol consumption, and alcohol sales have increased during the COVID-19 pandemic⁴²; as a result, liver cancer is being closely monitored.

The overall relative survival ratio for liver and intrahepatic bile duct cancer is 18.8 percent. Liver cancer was not investigated in the previous report, so a comparison is not possible. Wisconsin's relative survival ratio for liver and intrahepatic bile duct cancers is only 0.1 percent above the United States.

While the focus of this report is five-year relative survival, we reviewed internal data to look at overall survival trends based on years of follow-up, to look for any notable patterns. Interestingly, we found a large increase in one-year relative survival for both males and females with liver cancer (9 percent) when comparing 2011-2017 data with internal data from 2006-2010, but only modest increases for subsequent years of follow-up (Figure 5). This pattern was not seen for other cancer sites included in this analysis.

Liver cancer is more common among men. However, women in Wisconsin have a higher relative survival ratio (21.9 percent for women, compared to 17.3 percent for men). Relative survival is also higher among younger ages (36.9 percent for 15- to 44-year-olds), but these cancers are most commonly diagnosed in people ages 55 years and older, for whom relative survival is lower. The relative survival ratio is as high as 32.0 percent if the liver cancer is found at the local stage, and as low as 2.2 percent if found at the distant stage. African Americans have the highest relative survival for liver cancer compared to whites (20.6 percent, compared to 19 percent). American Indians/Alaska Natives have the lowest relative survival ratio of 13.7 percent.

Currently there is no routine screening test for liver cancer. However, hepatitis B vaccination, hepatitis B and C testing, hepatitis B and C treatment, and limiting alcohol use are ways to lower the risk of getting liver cancer.

All people from birth to 59 years of age should receive the hepatitis B vaccine.⁴³ Adults ages 60 years and older with known risk factors for hepatitis B also may receive the hepatitis B vaccine. These risk factors include: people with diabetes; people on dialysis; having sex with more than one partner; current or recent injection drug use; health-care personnel; international travelers to countries with high or intermediate levels of endemic hepatitis B infection; people with hepatitis C infection; people with HIV infection; people who are incarcerated; and people with chronic liver disease.⁴³

People who should be tested for Hepatitis B Surface Antigen (HBsAg) include women during each pregnancy, people born in regions of high or intermediate hepatitis B endemicity (HBsAg prevalence ≥ 2 percent) regardless of vaccination status, and people born in the United States who were not vaccinated as infants whose parents were born in regions with high hepatitis B endemicity (≥ 8 percent such as many countries in southeast Asia and Africa). Additional risk factors, such as people needing immunosuppressive therapy and people on hemodialysis, may warrant testing, as well.⁴⁴

All adults should be screened for hepatitis C once in their lifetime, as well as during each pregnancy, except in settings where the prevalence of hepatitis C infection is less than 0.1 percent. People may be tested more often due to ongoing risk factors or exposures.⁴⁵

Table 10. Wisconsin Five-Year Relative Survival Ratios (RSR), Liver and Intrahepatic Bile Duct Cancer

| Overall State | | | | | | |
|-------------------------------|---------------|-----------|---------------|-----------|-----------------|-----------|
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Total | 18.1 (3,367) | 17.1-20.6 | 17.3 (2,366) | 15.3-19.5 | 21.9 (1,001) | 18.9-25.1 |
| Race | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| White | 19.0 (2,843) | 17.2-21.0 | 17.3 (1,980) | 15.1-19.7 | 22.6 (863) | 19.3-26.0 |
| African American | 20.6 (344) | 14.4-27.6 | 17.3 (271) | 12.7-22.6 | 21.7 (73) | 11.3-34.3 |
| American Indian/Alaska Native | 13.7 (70) | 3.6-30.5 | 26.3 (43) | 11.5-43.9 | NA | NA |
| Stage | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| Localized | 32.0 (1,472) | 28.8-35.3 | 29.1 (1,058) | 25.1-33.2 | 38.2 (414) | 32.7-43.6 |
| Regional | 11.8 (1,030) | 9.5-14.3 | 11.4 (742) | 8.8-14.4 | 13.6 (288) | 9.2-18.8 |
| Distant | 2.2 (695) | 1.0-4.2 | 2.8 (469) | 1.2-5.4 | NA | NA |
| Unknown | 9.2 (174) | 4.7-15.4 | 7.9 (99) | 2.8-16.7 | 10.0 (75) | 3.8-19.9 |
| Age Group* | | | | | | |
| | RSR (N) Total | 95% CI | RSR (N) Males | 95% CI | RSR (N) Females | 95% CI |
| 15-44 | 36.9 (86) | 26.1-47.8 | 29.1 (56) | 16.5-42.8 | 50.1 (30) | 31.3-66.2 |
| 45-54 | 24.7 (353) | 19.8-30.0 | 22.3 (252) | 16.8-28.3 | 31.5 (101) | 21.4-42.0 |
| 55-64 | 24.5 (1,113) | 21.4-27.6 | 23.0 (854) | 19.6-26.6 | 29.2 (259) | 22.9-35.7 |
| 65-74 | 20.3 (965) | 17.0-23.8 | 20.2 (691) | 16.2-24.5 | 20.2 (274) | 14.7-26.4 |
| 75+ | 6.0 (851) | 3.7-9.1 | 5.2 (513) | 2.4-9.4 | 7.0 (338) | 3.8-11.6 |

SEER*Stat Database: NAACCR Incidence Data - CINA Analytic File, 1995-2018, Survival for U.S and WI. Combined Research File.³

Notes: Ratios are for cancers diagnosed in 2011-2017, and follow-up of patients through 2018. RSR=relative survival ratios, expressed in percent. CI = Confidence Intervals. Confidence Intervals are 95% for ratios. N=number of cancer cases in calculation.

Ratios are age-standardized using the International Cancer Survival Standards (ICSS).

*Age Group values are not age-standardized.

Additional Resources

The Wisconsin Cancer Collaborative offers support and resources designed to help you reduce the burden of cancer within specific populations, communities, and issue areas:

County Cancer Data Dashboard: Get the latest data about cancer risks, screening rates, and health outcomes for every county in Wisconsin.

Issue briefs and reports: Explore cancer-related topics and align your work with the latest research. Our issue brief and reports are authored by experts and backed by the latest available data.

Health literacy tools: Our How-To Sheets offer straightforward answers to questions about cancer risk, screenings, and insurance coverage, so that patients can make informed choices about their health. Many of these tools are available in both English and Spanish.

Online Resource Center: Find exactly what you need to adopt best practices, implement successful interventions, and improve health outcomes in your community.

Member networking and events: From online to in-person, we offer a variety of ways for members to network, engage, connect, and collaborate.

Direct support: Our Outreach works closely with member organizations to provide technical assistance, networking opportunities, peer learning collaboratives, access to content experts, support with health equity promotion, and more.

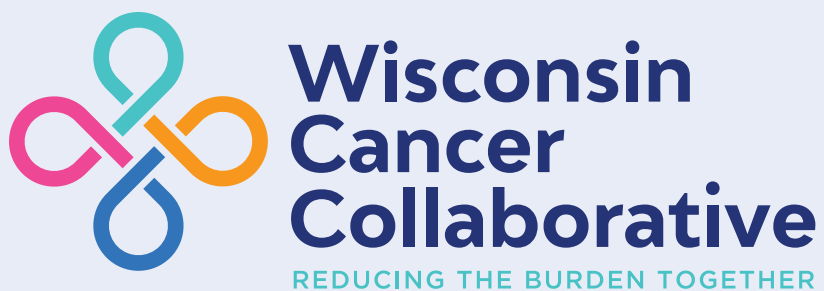
Learn more at www.wicancer.org.



References

1. National Cancer Institute. Definition of Relative Survival Rate. Accessed June 2, 2022.
2. US survival dataset: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S., Standard File - U.S. Combined Research File (which includes data from CDC's National Program of Cancer Registries (NPCR), CCCR's Provincial and Territorial Registries, and the NCI's Surveillance, Epidemiology and End Results (SEER) Registries), certified by the North American Association of Central Cancer Registries (NAACCR) as meeting high-quality incidence data standards for the specified time periods, submitted December 2020.
3. US survival dataset: SEER*Stat Database: NAACCR Incidence Data - CiNA Analytic File, 1995-2018, Survival for U.S., Standard File - U.S. Combined Research File (which includes data from CDC's National Program of Cancer Registries (NPCR), CCCR's Provincial and Territorial Registries, and the NCI's Surveillance, Epidemiology and End Results (SEER) Registries), certified by the North American Association of Central Cancer Registries (NAACCR) as meeting high-quality incidence data standards for the specified time periods, submitted December 2020.
4. Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.3.9
5. North American Association of Central Cancer Registries. Average Annual Age-adjusted NAACCR Combined Cancer Incidence Rates and Rate Ratios for Selected Cancer Sites by Race/Ethnicity and Gender, 2014-2018. 2021. <https://www.naaccr.org/wp-content/uploads/2021/06/2014-2018.Hispanic-Rate-Ratio.pdf>.
6. North American Association of Central Cancer Registries. 2014-2018: Cancer in North America: Cancer Survival in the United States and Canada 2011-2017. 2021. <https://www.naaccr.org/wp-content/uploads/2021/06/CiNA.2014-2018.v4.survival-1.pdf>.
7. Ederer F, Heise H (1959). Instructions to IBM 650 programmers in processing survival computations, methodological note 10. End Results Evaluation Section, National Cancer Institute.
8. Mariotto AB, Zou Z, Johnson CJ, Scoppa S, Weir HK, Huang B. Geographical, racial, and socio-economic variation in life expectancy in the US and their impact on cancer relative survival. PLoS ONE. 2018. 13(7): e0201034. <https://doi.org/10.1371/journal.pone.0201034>.
9. Corazziri I, Quinn M, Capocaccia R. Standard cancer patient population for age standardizing survival ratios. Eur J Cancer. 2004 Oct;40(15):2307-16.
10. Loeb S, Bjurlin M, Nicholson J, Tammela TL, Penson D, Carter HB, Carroll P, and Etzioni R. Overdiagnosis and overtreatment of prostate cancer. Eur Urol. 2014; 65(6): 1046-1055.
11. Wisconsin Cancer Plan 2020-2030. Madison, WI: University of Wisconsin Carbone Cancer Center and Wisconsin Department of Health Services; 2020. Available online at: www.wicancer.org.
12. Wisconsin Dept. of Health Services, Division of Public Health, Office of Health Informatics, Wisconsin Cancer Reporting System. Wisconsin Interactive Statistics on Health (WISH) data query system, <https://www.dhs.wisconsin.gov/wish/index.htm>. Cancer Module accessed April 14, 2022.
13. Lung Cancer Risk Factors. American Cancer Society. Updated October 1, 2019. Accessed April 26, 2022.
14. Basic Information About Lung Cancer. Centers for Disease Control and Prevention. Updated October 18, 2021. Accessed April 26, 2022.
15. Howlader N, Forjaz G, Mooradian MJ, et al. The effect of advances in lung-cancer treatment on population mortality. N Engl J Med. 2020; 383:640-649. DOI: 10.1056/NEJMoa1916623
16. Final Recommendation Statement: Lung Cancer: Screening. United States Preventive Services Task Force. Updated March 9, 2021. Accessed April 26, 2022.
17. Can Lung Cancer Be Prevented? American Cancer Society. Updated October 1, 2019. Accessed April 26, 2022.

18. What is Colorectal Cancer? American Cancer Society. Updated June 29, 2020. Accessed April 26, 2022.
19. Key Statistics for Colorectal Cancer. American Cancer Society. Updated January 21, 2022. Accessed April 26, 2022.
20. Final Recommendation Statement: Colorectal Cancer: Screening. United States Preventive Services Task Force. Updated May 18, 2021. Accessed April 26, 2022.
21. Can Colorectal Cancer Be Prevented? American Cancer Society. Updated June 9, 2020. Accessed April 26, 2022.
22. Breast Cancer Screening Guidelines for Women. Centers for Disease Control and Prevention. Updated September 22, 2020.
23. Can I Lower My Risk of Breast Cancer? American Cancer Society. Updated December 16, 2021. Accessed April 26, 2022.
24. Prostate Cancer Risk Factors. American Cancer Society. Updated June 9, 2020. Accessed April 26, 2022.
25. Final Recommendation Statement: Prostate Cancer: Screening. United States Preventive Services Task Force. Updated May 8, 2021. Accessed April 26, 2022.
26. Based on data from the Wisconsin Cancer Reporting System.
27. Cancer A-Z: Leukemia. American Cancer Society. Accessed April 26, 2022.
28. Risk Factors for Acute Lymphocytic Leukemia (ALL). American Cancer Society. Updated October 17, 2018. Accessed April 26, 2022.
29. Risk Factors for Acute Myeloid Leukemia (AML). American Cancer Society. Updated August 21, 2018. Accessed April 26, 2022.
30. Cancer A-Z: Leukemia in Children. American Cancer Society. Accessed April 26, 2022.
31. What is Melanoma Skin Cancer? American Cancer Society. Updated August 14, 2019. Accessed April 26, 2022.
32. Key Statistics for Melanoma Skin Cancer. American Cancer Society. Updated January 21, 2022. Accessed April 26, 2022.
33. Iberg, A. J., LoConte, N. K., Foxhall, L., et al. American Society of Clinical Oncology policy statement on skin cancer prevention. *JCO oncology practice*, 2020; 16(8), 490-499. DOI: 10.1200/JOP.19.00585
34. Thyroid Cancer Risk Factors. American Cancer Society. Updated January 16, 2020. Accessed April 26, 2022.
35. Key Statistics for Thyroid Cancer. American Cancer Society. Updated January 21, 2022. Accessed April 26, 2022.
36. Can Thyroid Cancer Be Found Early? American Cancer Society. Updated March 14, 2019. Accessed April 26, 2022.
37. Pancreatic Cancer Risk Factors. American Cancer Society. Updated June 9, 2020. Accessed April 26, 2022.
38. Can Pancreatic Cancer Be Found Early? American Cancer Society. Updated February 11, 2019. Accessed April 26, 2022.
39. Key Statistics About Liver Cancer. American Cancer Society. Updated January 12, 2022. Accessed June 24, 2022.
40. What Is Liver Cancer? American Cancer Society. Updated April 1, 2019. Accessed June 23, 2022.
41. Liver Cancer Risk Factors. American Cancer Society. Updated April 1, 2019. Accessed April 26, 2022.
42. Alcohol Tax Revenues Surge During Pandemic. Wisconsin Policy Forum. Updated September 2021. Accessed April 26, 2022.
43. Weng MK, Doshani M, Khan MA, et al. Universal Hepatitis B Vaccination in Adults Aged 19-59 Years; Updated Recommendations of the Advisory Committee on Immunization Practices – United States, 2022. *MMWR Morb Mortal Wkly Rep* 2022;71:477-483. DOI: <http://dx.doi.org/10.15585/mmwr.mm7113a1>.
44. Recommendations for Routine Testing and Follow-up for Chronic Hepatitis B Virus (HBV) Infection. Centers for Disease Control and Prevention. Updated 2008. Accessed April 26, 2022.
45. Testing Recommendations for Hepatitis C Virus Infection. Centers for Disease Control and Prevention. Updated July 29, 2020. Accessed April 26, 2022.



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