

Childhood Cancers in Wisconsin: Data Brief

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Introduction

Childhood cancers are relatively rare, but extremely challenging for children and their families when diagnosed. This data brief summarizes childhood cancer incidence and mortality in Wisconsin with a focus on leukemias, brain and other central nervous system (CNS) tumors, and lymphomas. Cancer site groupings are defined by the International Classification of Childhood Cancer (ICCC), which allows for comparisons of incidence rates within and outside of Wisconsin.

Childhood cancers are defined here as all newly diagnosed, malignant, invasive neoplasms occurring before age 20. Childhood cancers are a collection of many types of diseases found in different places throughout the body. The three most common sites for childhood cancers are:

- Leukemias (cancers of the blood cells),
- Brain and other CNS tumors, and
- Lymphomas (lymph system cancers like Hodgkin's lymphoma or non-Hodgkin's lymphoma).



Key findings

Wisconsin childhood cancer incidence rates have increased slightly since 2000, and mirror U.S. trends.

Wisconsin childhood cancer mortality rates declined on average since 2000. Rates rose slightly in 2019-2020, but are not statistically different from U.S. rates.

In 2020:

- 251 Wisconsin children were newly diagnosed with cancer and reported to the Wisconsin Cancer Reporting System.¹
- Thirty six children died of cancer.²
- Cancer was the fourth leading cause of death in Wisconsin children over the age of one.²

Between 2016 and 2020:

- 1,379 Wisconsin children were newly diagnosed with cancer, and 158 died of cancer.¹
- Non-Hispanic American Indian/or Alaskan Native children had the highest incidence rates, and Non-Hispanic Asian or Pacific Islander had the lowest. However, these differences were not statistically significant.¹
- Rural counties had higher childhood cancer rates than urban counties, but differences were not statistically significant.¹

Incidence

Childhood cancer incidence rates represent the number of new cases of reportable cancers diagnosed divided by the number of children under age 20 during a specific time (e.g., 2016-2020). Incidence rates in this data brief are age-adjusted to the U.S. 2000 standard population. This allows for comparisons between groups and geographies with different age distributions. All rates in this are expressed per 1,000,000 individuals at risk for the given cancer. This differs from data you might see for adult cancers, which are typically reported per 100,000.

Changes over time in childhood cancer incidence rates should be interpreted with caution. Changes in cancer incidence rates may reflect changing diagnostic methods or reporting standards, rather than true changes in occurrence. Additionally, since childhood cancer is rare, case counts are small and subject to substantial fluctuations year-to-year.

Males are more likely to be diagnosed with childhood cancer before the age of 15 (Figure 1). Between 2016 and 2020, 746 Wisconsin males were diagnosed with cancer, compared to 633 females, with a total of 1,379 children diagnosed and reported with cancer (Table 1). Wisconsin childhood cancer incidence rates have increased since 2000 from 169.8 per 1,000,000 to 177.4 in 2020, and mirror national trends available made available by 22 cancer registries across the U.S. (Figure 2).

Figure 1. Age-Adjusted Childhood Cancer Incidence Rates per 1,000,000 by Age at Diagnosis and Sex in Wisconsin, 2016-2020.

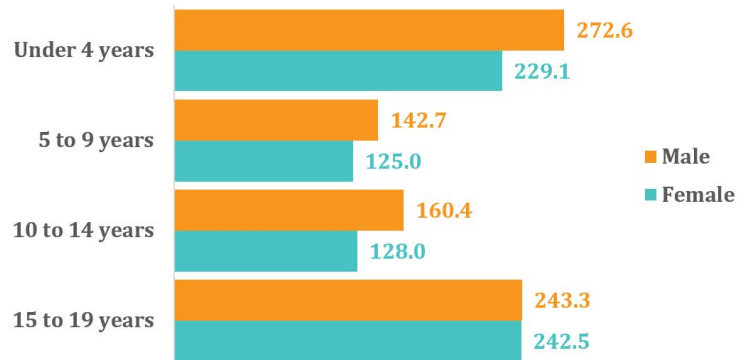
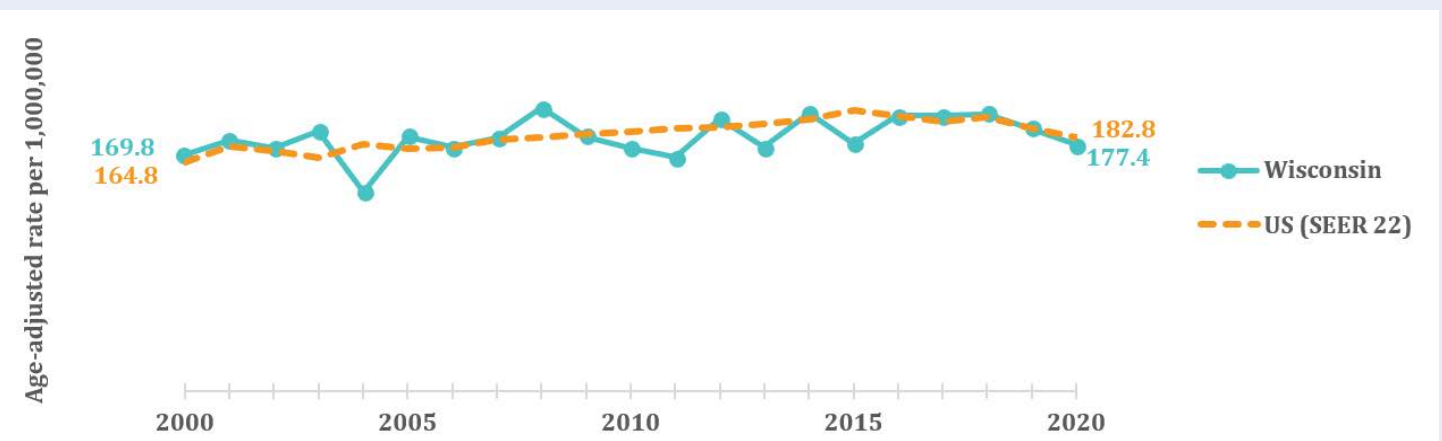


Table 1. Childhood Cancer Case Count by Age at Diagnosis and Sex in Wisconsin, 2016-2020.

Age at Diagnosis	Males	Females	Total
Under 4 years	232	186	418
5 to 9 years	128	107	235
10 to 14 years	151	115	266
15 to 19 years	235	225	460
Total	746	633	1,379

Figure and Table 1 Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. Data: SEER*Stat Database: 9520Incidence. Created on 5/16/2023.

Figure 2. Age-Adjusted Childhood Cancer Incidence Rates per 1,000,000 in Wisconsin and U.S., 2000-2020.



Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. U.S. Data: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov), SEER Research Plus Limited-Field Data, 22 Registries, Nov 2022 Sub (2000-2020) - Linked to County Attributes. Wisconsin Data: SEER*Stat Database: 9520Incidence. Created on 5/16/2023.

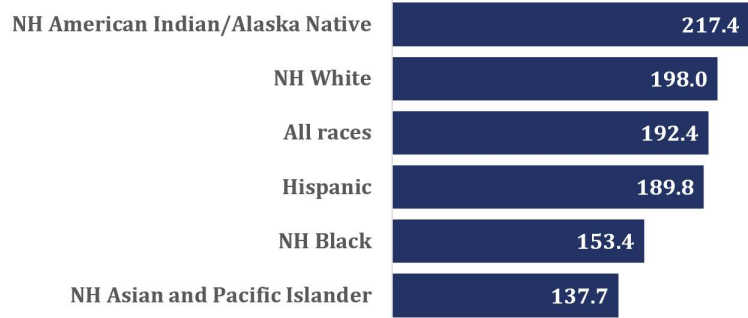
Additionally, Non-Hispanic (NH)*American Indian/Alaskan Native children had the highest incidence rates across race and Hispanic ethnicity categories (Figure 3). Non-Hispanic Asian or Pacific Islander had the lowest. However, differences between race and ethnicity categories were not statistically significant and should be interpreted with caution.

Rural counties had higher childhood cancer rates than urban counties, but these differences were not statistically significant (Figure 4).

Leukemias, brain and other central nervous system tumors, and lymphomas were the most diagnosed cancers in Wisconsin children (Figure 5). Leukemias account for one fourth of all childhood cancers diagnosed between 2016-2020, with 355 cases out of the 1,379 total cases diagnosed and reported.

Wisconsin age-adjusted childhood cancer incidence rates by cancer site have fluctuated over time, but 2000-2002 rates are not statistically different from 2018-2020 (Figure 6). Additionally, U.S. and Wisconsin 2018-2020 rates are not statistically different from one another.

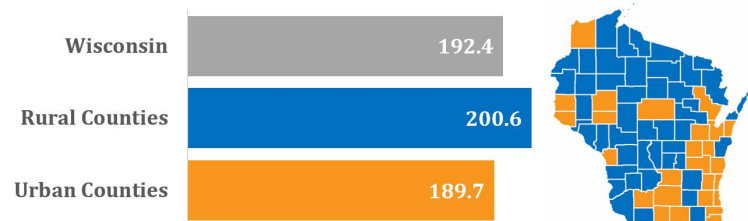
Figure 3. Age-Adjusted Childhood Cancer Incidence Rates per 1,000,000 by Race and Ethnicity in Wisconsin, 2016-2020.



Differences were not statistically significant between groups.

Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. Data: SEER*Stat Database: 9520IncidencePatched. Created on 8/8/2023.

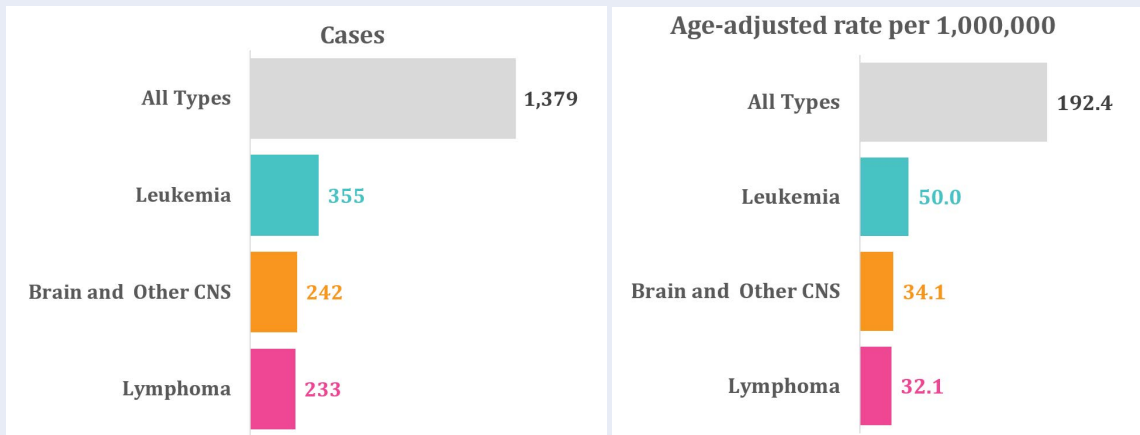
Figure 4. Age-Adjusted Childhood Cancer Incidence Rates per 1,000,000 by Rural-Urban County in Wisconsin, 2016-2020.



Differences were not statistically significant between urban and rural counties.

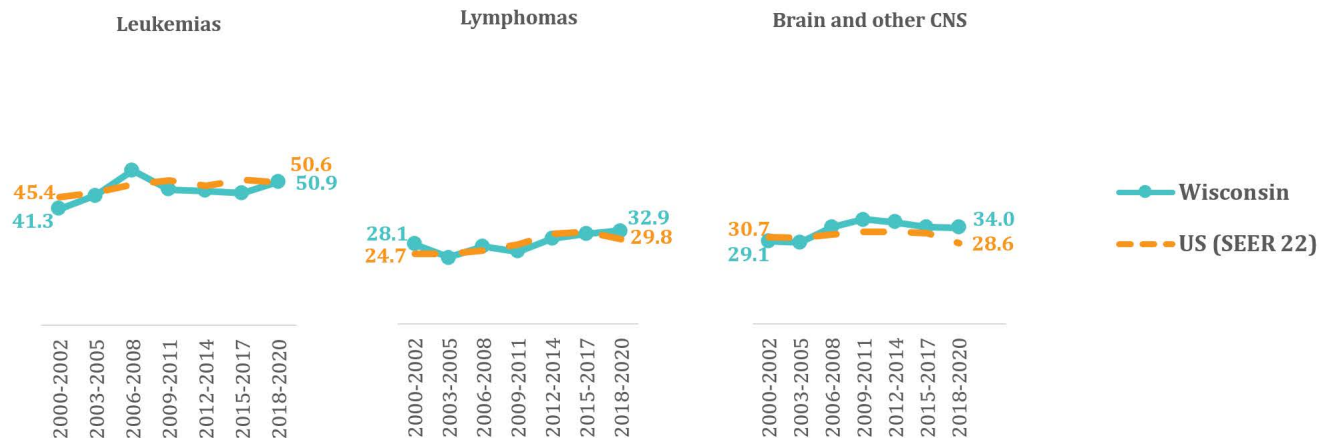
Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. Data: SEER*Stat Database: 9520Incidence. Created on 5/16/2023.

Figure 5. Childhood Cancer Cases and Age-Adjusted Incidence Rates per 1,000,000 by Site in Wisconsin, 2016-2020.



Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. Data: SEER*Stat Database: 9520Incidence. Created on 5/16/2023.

Figure 6. Age-Adjusted Childhood Cancer Incidence Rates per 1,000,000 by Site in Wisconsin and U.S., 2000-2020, (3-year groupings).



Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.1.2. U.S. Data: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov), SEER Research Plus Limited-Field Data, 22 Registries, Nov 2022 Sub (2000-2020) - Linked to County Attributes. Wisconsin Data: SEER*Stat Database: 9520Incidence. Created on 5/16/2023.

Mortality

Childhood cancer mortality rates represent the number of deaths from malignant cancers divided by the numbers of persons at risk during a specific time. Mortality rates in this data brief are age-adjusted to the U.S. 2000 standard population and displayed per 1,000,000 individuals at risk (ages 0-19).

Between 2016 and 2020, 158 Wisconsin children died of childhood cancers (Table 2). In the last five years of most recently available data, 80 male and 78 female children died of cancer.

Mortality rates for all top three childhood cancer sites declined significantly (Figure 7). When comparing data from the last two decades—2001-2010 compared to 2011-2020—Wisconsin childhood cancer mortality rates declined by 12% overall. The most progress was seen for lymphomas (56% decline), followed by leukemias (26% decline), and then brain and other CNS tumors (11%).

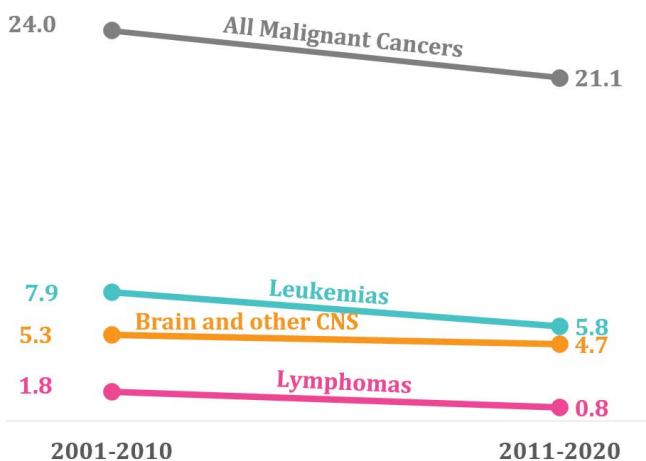
Wisconsin childhood cancer overall mortality rates have declined on average since 2000. Rates rose slightly in 2019-2020 but are not statistically different from the U.S. rate (Figure 8).

Table 2. Childhood Cancer Mortality Count by Age at Death and Sex in Wisconsin, 2016-2020.

Age at Death	Males	Females	Total
Under 4 years	14	18	32
5 to 9 years	20	11	31
10 to 14 years	22	25	47
15 to 19 years	22	26	48
Total	80	78	158

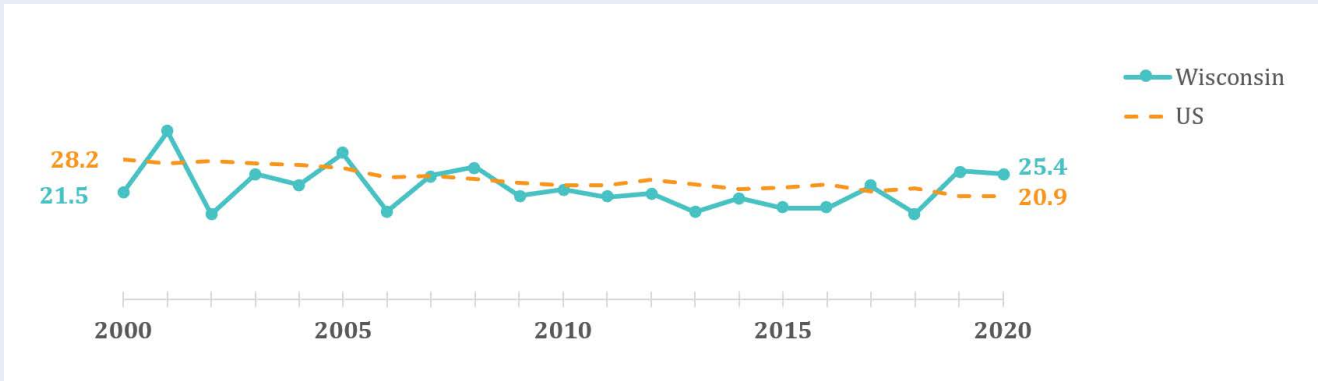
Software: Surveillance Research Program, National Cancer Institute SEER*Stat software version 8.4.2. Data: Surveillance, Epidemiology, and End Results Program. SEER*Stat Database: Mortality - All COD, Aggregated with DATA Database: Mortality - All COD, Aggregated with State, Total U.S. (1990-2020) <Katrina/Rita Population Adjustment>.

Figure 7. Age-Adjusted Childhood Cancer Mortality Rates per 1,000,000 by Site in Wisconsin, 2001-2010 and 2011-2020.



Software: Surveillance Research Program, National Cancer Institute SEER*Stat software version 8.4.1.2. Data: SEER*Stat Database: 9520Mortality. Created on 4/24/2023.

Figure 8. Age-Adjusted Childhood Cancer Mortality Rates per 1,000,000 in Wisconsin and U.S., 2000-2020.



Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.4.2. Data: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With DATA Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2020) <Katrina/Rita Population Adjustment>.

Survivorship

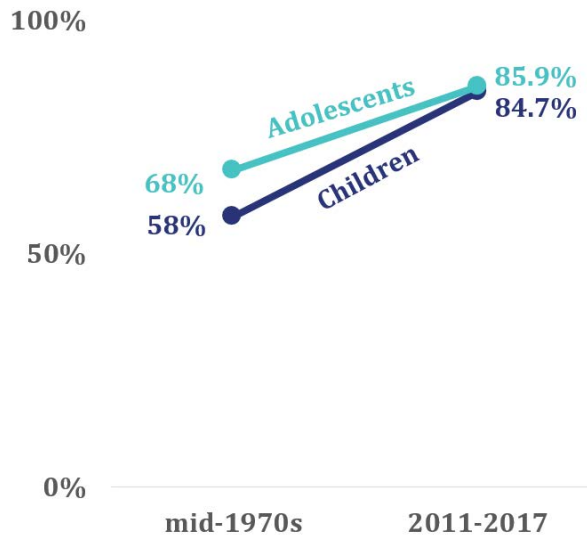
The outlook for children diagnosed with cancer has improved over the last five decades (Figure 9). In the mid-1970s, 58% of children (ages 0-14) and 68% of adolescents (ages 15-19) diagnosed with cancer survived at least five years.³ The most recent five-year survival rates are now 85%.⁴ As of January 2018, an estimated 483,000 survivors of childhood cancer were living in the United States.⁴



The number of cancer survivors is growing, and cancer survivors regularly report unique challenges, health issues, and quality-of-life concerns long after treatment ends, especially childhood and young adult cancer survivors. The diverse needs of Wisconsin’s growing cancer survivor population and survivorship experience need to be addressed and considered.

The [Wisconsin Cancer Plan 2020-2030](#) calls for increasing awareness of issues relevant to cancer survivors and caregivers, increasing the implementation of best practices for the transition from active treatment to post-treatment care, and increasing provider, patient, and caregiver awareness of the importance of cancer risk reduction behaviors and cancer screening for cancer survivors.⁵

Figure 9. Five-Year Survival Estimates for U.S. Children and Adolescents Diagnosed with Cancer, mid-1970s and 2011-2017.



References

1. Wisconsin Cancer Reporting System, August 2023. Wisconsin Department of Health Services.
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3. Siegel RL, Miller KD, Fuchs HE, Jemal A Cancer Statistics, 2021. CA: A Cancer J. for Clin. 2021; 71(1): 7–33.
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5. 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.

Important Considerations for Interpreting Data

This data brief relies on information from the Wisconsin Cancer Reporting System (WCRS). WCRS was established in 1976 by Wis. Stat. § 255.04, Cancer Reporting to collect cancer data on Wisconsin residents. Readers should consider the following:

- *WCRS is a population-based state cancer registry.* WCRS collects, classifies, consolidates, and links information on new cancer cases on Wisconsin residents from hospital reports, medical records, pathology reports, and death certificates.
- *WCRS data are dynamic, meaning data are always being updated and improved.* WCRS staff are constantly updating data when new information becomes available. The data are "frozen" annually in a database so that published statistics for any given year remain consistent.
- *Underreporting of cases diagnosed in other states is a limitation.* Although WCRS has data exchange agreements with other U.S. states and territories, underreporting of Wisconsin residents who were diagnosed in other states is still a limitation, particularly for residents diagnosed in Minnesota.
- *Changes in cancer incidence over time should be interpreted with caution.* These changes may reflect changes to diagnostic methods or changes to reporting standards, rather than true changes in cancer occurrence.
- *Data on race and ethnicity should be interpreted with caution.* Race categories in this data brief are based on information from medical records and death certificates. Incorrect or missing information from these can impact incidence and mortality rates.

For questions about data in this publication, contact WCRS at DHSWCRSDataRequests@dhs.wisconsin.gov

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