PEDIATRIC CANCER IN IDAHO, 2010–2019

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BACKGROUND

Although relatively rare in comparison with cancer in older adults, from 2010–2019 cancer was the fourth leading cause of death in persons aged 1-19 years.[1] The epidemiology of cancer among children differs markedly from that of adults, both in the patterns of anatomic sites involved and the predominant histologic types. Most notably, the tumors diagnosed in children frequently involve the hematopoietic and central nervous systems or are of mesenchymal origin. In contrast, malignancies of epithelial tissues, which are predominant in adults, are uncommon in children. Similar to adult cancers, the etiology of many childhood cancers remains unclear.

The Cancer Data Registry of Idaho (CDRI) receives several requests per year from physicians and others for data on pediatric cancer incidence for the state of Idaho. This report describes the incidence of pediatric cancers in Idaho, with comparisons to data from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program and the US Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR).[2,3,4] SEER currently publishes cancer incidence and survival data from population-based cancer registries covering approximately 47.9 percent of the US population and is considered the standard for quality among cancer registries around the world. NPCR supports central cancer registries in 46 states, the District of Columbia, Puerto Rico, the U.S. Pacific Island Jurisdictions, and the U.S. Virgin Islands. These data represent 97% of the U.S. population. Together, NPCR and SEER collect data for the entire U.S. population.

METHODS

The data analyzed for this report include cancers diagnosed between 2010 and 2019 among Idaho residents less than 20 years of age. Cases were grouped according to the International Classification of Childhood Cancer (ICCC) based on site and morphology coded according to ICD-O-3.[5]

A total of 910 cases were diagnosed among Idaho resident children under the age of 20 between 2010 and 2019. This number includes 834 malignant cancers and 76 benign and borderline behavior neoplasms. Thirty-six cases were excluded from analyses of malignant cases because they are not defined in the ICCC system (21 cases) or they were in situ, which are not included in the ICCC system (15 cases). Health District was assigned from county of residence at time of diagnosis. All Idaho incidence rates presented were calculated per million population and are averages for the period 2010 through 2019 (rates per million, rather than per 100,000, are commonly used for pediatric cancers). Age-adjustment was performed using the direct method to the 2000 U.S. standard population. Cancer incidence, mortality and survival statistics were calculated using SEER*Stat.[6] State rankings were obtained from the NPCR and SEER Incidence Public Use Data File.[3]

RESULTS

A total of 910 cases that met the study criteria were diagnosed among Idaho residents aged less than 20 years between 2010 and 2019, yielding an overall age-adjusted rate of 189.8 cases per million population (Table 1). In comparison, the SEER-12 rate was 214.8 cases per million population for 2010-2019. The distribution of pediatric cancers by ICCC grouping was very similar for Idaho and SEER Regions. For no ICCC major classification category did Idaho show a statistically significantly higher rate of pediatric cancer from SEER-12 data based on the comparisons of 95% confidence intervals.

For all races combined, Idaho ranked 40th highest among states in pediatric (ages 0-19) cancer incidence 2010-2019, with a rate of 190.1 per million population based on USCS data.[3] North Dakota ranked lowest with 165.2 cases per million population and District of Columbia ranked highest with 240.8 cases per million population. When restricting to non-Hispanic whites alone, Idaho ranked 44th in pediatric cancer incidence. Pediatric cancer incidence is higher among whites, and Idaho has a higher proportion of white residents than many states. Although the distribution of race may be driving some of the differences in incidence by state, there may be other factors to consider when understanding Idaho's relatively low pediatric cancer rate.

Nearly 87% of children aged less than 20 years diagnosed with malignant cancer survived at least 5 years after their diagnosis, both in Idaho and SEER-12 Regions (Table 2 and Figure 1). For no ICCC major classification category, nor overall, was there a statistically significant difference in 5-year relative survival between Idaho and SEER cases.

Table 3 and Figure 2 show malignant pediatric cancer incidence in Idaho and SEER Regions by year of diagnosis for 2010 to 2019. Idaho incidence rates are lower than SEER rates for most years and show more variability year-to-year due to smaller numbers of cases. Pediatric cancer incidence increased at a rate of about 0.5% per year in Idaho from 1975 to 2019. This parallels the long-term increase observed in SEER Regions from 1975 to 2019 of about 0.8% per year.[4]

Table 4 shows pediatric cancer incidence in Idaho by health district for the ICCC major classification categories for the period 2010 to 2019. For all sites combined, no health district had a statistically significantly higher or lower rate than the state of Idaho, based on the comparison of 95% confidence intervals. Health Districts 5 and 7 had statistically significantly lower rates of lymphomas and reticuloendothelial neoplasms. For no other ICCC major classification category was there a statistically significant difference between any health district and the state of Idaho.

From 2010 to 2020, 111 of Idaho's children aged 0-19 died from some form of cancer (Table 5).[7] The leading types of cancer mortality were brain and other central nervous system and leukemia, accounting for approximately 43% of pediatric cancer-related mortality, and cancers of the bones and joints and cancers of the soft tissue (including heart), accounting for 21% of cancer-related mortality (data not shown). While pediatric

cancer incidence rates have increased over time, pediatric cancer mortality rates have decreased about 2% per year during 1975-2020 in Idaho and the U.S.[7,8] Figure 3 depicts trends in pediatric cancer mortality rates from 2010 to 2020. The annual rates plotted for Idaho demonstrate large year-to-year variability that is expected due to the relatively small numbers of deaths per year; although there were large increases in pediatric cancer mortality in Idaho during 2018–2019, the overall trend for the period from 2010–2020 did not show a statistically significant increase. Idaho ranked 43rd among states and the District of Columbia in pediatric (ages 0-19) cancer mortality 2010-2019.[8] Hawaii ranked highest, with 3.2 cancer deaths per million children, and Wyoming ranked lowest, with 1.4 cancer deaths per million children.

CONCLUSIONS

These data demonstrate strong similarity in pediatric cancer incidence and survival patterns between Idaho and SEER Regions. Compared with cancer in adults,[9] there is less geographic variability in pediatric cancer incidence, which is likely related to the distribution of hereditary predispositions to cancer in the pediatric population. A 2015 study that tested children and adolescents with cancer revealed that 8.5% had predisposing gene mutations: 16.7% in patients with non-CNS solid tumors, 8.6% in patients with CNS tumors, and 4.4% in patients with leukemia.[10]

Largely because of improvements in therapy for pediatric cancers, there has been a decrease in mortality rates over time. Data collected by CDRI for 2019 show that about 3.2% of pediatric patients participated in clinical trials (not shown), a slightly higher proportion than that for adults (2.1%). The 3.2% participation is a decrease over prior years, which may be reflective of an increase in our ability to successfully treat pediatric cancer and a subsequent increase in patient eligibility requirements, e.g., a tumor must have specific biomarkers, or a patient must have received specific therapy; this phenomenon is not unique to Idaho.

While over 86% of children diagnosed with cancer survive at least five years, studies show that adult survivors of childhood cancer have higher prevalence of adverse health outcomes later in life and are at risk for higher health care expenditures and lost productivity, compared to adults without a history of childhood cancer.[11,12] Education, intervention programs, and ongoing follow-up care are important for improving health and economic outcomes associated with cancer survivorship in this population.

Table 1. Pediatric (Ages 0-19) Cancer Incidence in Idaho and SEER Regions

Site/Type of Cancer	Idaho 2010-2019			SEER 2010-2019		
	Rate	Cases	Pop	Rate	Cases	Pop
All Sites Combined	189.8	910	4,808,116	214.8	21,796	101,098,909
I Leukemias, myeloproliferative & myelodysplastic diseases	44.9	217	4,808,116	50.2	5,101	101,098,909
I(a) Lymphoid leukemias	36.4	176	4,808,116	36.7	3,734	101,098,909
I(b) Acute myeloid leukemias	5.6	27	4,808,116	8.7	887	101,098,909
I(c) Chronic myeloproliferative diseases	1.3	6	4,808,116	2.1	217	101,098,909
I(d) Myelodysplastic syndrome and other myeloproliferative	0.4	2	4,808,116	1.5	157	101,098,909
I(e) Unspecified and other specified leukemias	1.3	6	4,808,116	1.0	106	101,098,909
II Lymphomas and reticuloendothelial neoplasms	28.8	138	4,808,116	30.4	3,077	101,098,909
II(a) Hodgkin lymphomas	12.0	57	4,808,116	11.6	1,171	101,098,909
II(b) Non-Hodgkin lymphomas (except Burkitt lymphoma)	11.0	53	4,808,116	11.0	1,114	101,098,909
II(c) Burkitt lymphoma	1.7	8	4,808,116	2.4	242	101,098,909
II(d) Miscellaneous lymphoreticular neoplasms	3.9	19	4,808,116	5.2	523	101,098,909
II(e) Unspecified lymphomas	0.2	1	4,808,116	0.3	27	101,098,909
III CNS and misc intracranial and intraspinal neoplasms	42.7	205	4,808,116	49.0	4,962	101,098,909
III(a) Ependymomas and choroid plexus tumor	3.5	17	4,808,116	4.4	446	101,098,909
III(b) Astrocytomas	16.4	79	4,808,116	15.6	1,574	101,098,909
III(c) Intracranial and intraspinal embryonal tumors	4.1	20	4,808,116	5.7	576	101,098,909
III(d) Other gliomas	3.7	18	4,808,116	5.5	560	101,098,909
III(e) Other specified intracranial/intraspinal neoplasms	12.8	61	4,808,116	16.5	1,672	101,098,909
III(f) Unspecified intracranial and intraspinal neoplasms	2.1	10	4,808,116	1.3	134	101,098,909
IV Neuroblastoma and other peripheral nervous cell tumors	8.3	40	4,808,116	8.0	817	101,098,909
IV(a) Neuroblastoma and ganglioneuroblastoma	8.1	39	4,808,116	7.7	792	101,098,909
IV(b) Other peripheral nervous cell tumors	0.2	1	4,808,116	0.2	25	101,098,909
V Retinoblastoma	1.9	9	4,808,116	3.1	314	101,098,909
VI Renal tumors	6.8	33	4,808,116	6.3	639	101,098,909
VI(a) Nephroblastoma and other nonepithelial renal tumors	6.0	29	4,808,116	5.7	579	101,098,909
VI(b) Renal carcinomas	0.9	4	4,808,116	0.6	58	101,098,909
VI(c) Unspecified malignant renal tumors	0.0	0	4,808,116	0.0	2	101,098,909
VII Hepatic tumors	2.7	13	4,808,116	3.1	319	101,098,909
VII(a) Hepatoblastoma	2.1	10	4,808,116	2.5	253	101,098,909
VII(b) Hepatic carcinomas	0.6	3	4,808,116	0.6	64	101,098,909
VII(c) Unspecified malignant hepatic tumors	0.0	0	4,808,116	0.0	2	101,098,909
VIII Malignant bone tumors	7.3	35	4,808,116	9.0	910	101,098,909
VIII(a) Osteosarcomas	4.8	23	4,808,116	5.4	545	101,098,909
VIII(b) Chondrosarcomas	0.0	0	4,808,116	0.2	23	101,098,909
VIII(c) Ewing tumor and related sarcomas of bone	1.5	7	4,808,116	2.9	288	101,098,909
VIII(d) Other specified malignant bone tumors	1.1	5	4,808,116	0.4	39	101,098,909
VIII(e) Unspecified malignant bone tumors	0.0	0	4,808,116	0.1	15	101,098,909
IX Soft tissue and other extraosseous sarcomas	12.1	58	4,808,116	12.1	1,222	101,098,909
IX(a) Rhabdomyosarcomas	4.1	20	4,808,116	4.2	427	101,098,909
IX(b) Fibrosarcomas, peripheral nerve & other fibrous	0.6	3	4,808,116	1.2	126	101,098,909
IX(c) Kaposi sarcoma	0.0	0	4,808,116	0.1	6	101,098,909
IX(d) Other specified soft tissue sarcomas	4.6	22	4,808,116	5.1	513	101,098,909
IX(e) Unspecified soft tissue sarcomas	2.7	13	4,808,116	1.5	150	101,098,909
X Germ cell & trophoblastic tumors & neoplasms of gonads	12.9	61	4,808,116	13.0	1,326	101,098,909
X(a) Intracranial & intraspinal germ cell tumors	2.3	11	4,808,116	2.5	248	101,098,909
X(b) Extracranial & extragonadal germ cell tumors	1.3	6	4,808,116	1.6	162	101,098,909
X(c) Malignant gonadal germ cell tumors	8.9	42	4,808,116	8.3	841	101,098,909
X(d) Gonadal carcinomas	0.2	1	4,808,116	0.5	47	101,098,909
X(e) Other and unspecified malignant gonadal tumors	0.2	1	4,808,116	0.3	28	101,098,909

Table 1. Pediatric (Ages 0-19) Cancer Incidence in Idaho and SEER Regions - Continued

Site/Type of Cancer	Idaho 2010-2019			SEER 2010-2019		
	Rate	Cases	Pop	Rate	Cases	Pop
XI Other malignant epithelial neoplasms and melanomas	21.1	100	4,808,116	22.4	2,273	101,098,909
XI(a) Adrenocortical carcinomas	0.6	3	4,808,116	0.2	21	101,098,909
XI(b) Thyroid carcinomas	9.7	46	4,808,116	10.6	1,073	101,098,909
XI(c) Nasopharyngeal carcinomas	0.0	0	4,808,116	0.5	48	101,098,909
XI(d) Malignant melanomas	4.6	22	4,808,116	3.8	387	101,098,909
XI(e) Skin carcinomas	0.0	0	4,808,116	0.1	11	101,098,909
XI(f) Other and unspecified carcinomas	6.1	29	4,808,116	7.2	733	101,098,909
XII Other and unspecified malignant neoplasms	0.2	1	4,808,116	0.7	73	101,098,909
XII(a) Other specified malignant tumors	0.2	1	4,808,116	0.5	52	101,098,909
XII(b) Other unspecified malignant tumors	0.0	0	4,808,116	0.2	21	101,098,909
Not classified by ICCC or in situ	7.5	36	4,808,116	7.5	763	101,098,909

Rates are per 1,000,000 and age-adjusted to the 2000 U.S. standard.
Cases and rates are for benign, borderline, and malignant behavior.
Statistical Note: Rates based upon 10 or fewer cases (numerator) should be interpreted with caution.

Figure 1. Pediatric Cancer Relative Survival

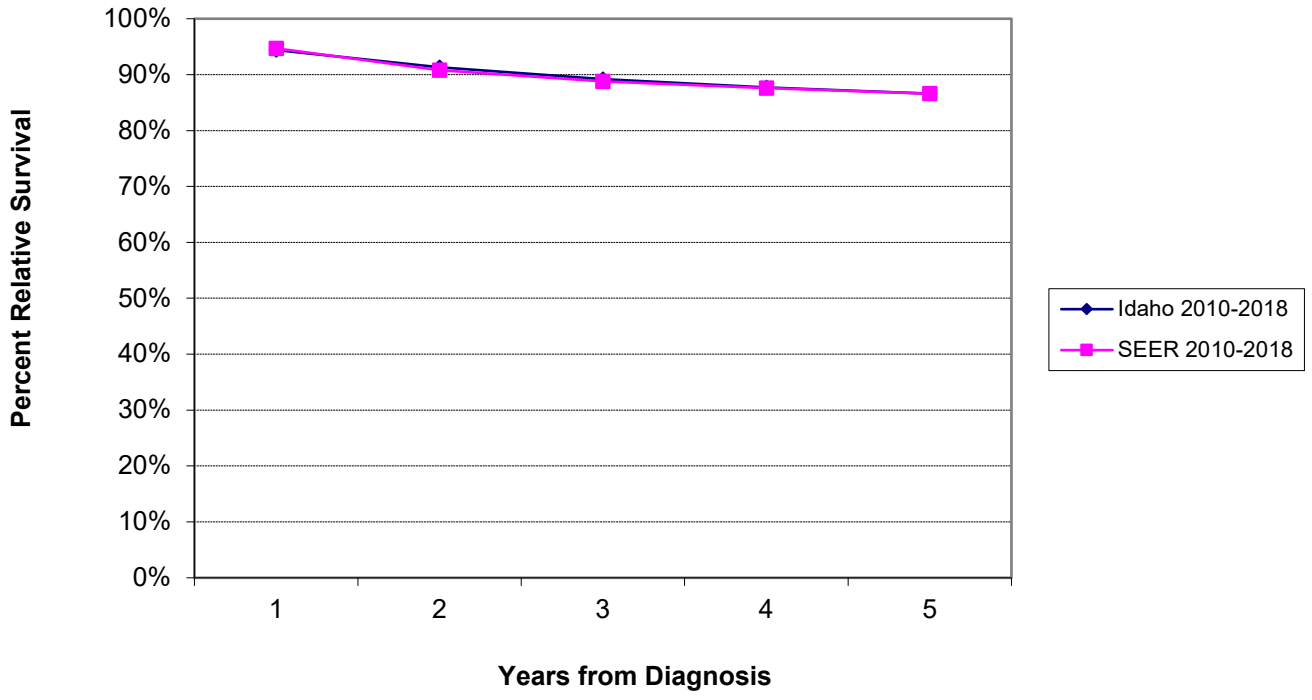


Table 2. Five-Year Relative Cancer Survival by Major ICCC Classification Category

Site/Type of Cancer	Idaho 2010-2018			SEER 2010-2018		
	Cases	% Survival	95% CI	Cases	% Survival	95% CI
All Sites Combined	**752**	**86.5%**	**83.6% - 88.9%**	**12783**	**86.4%**	**85.7% - 87.0%**
I Leukemias, myeloproliferative & myelodysplastic diseases	193	89.2%	83.4% - 93.1%	3481	85.9%	84.5% - 87.1%
II Lymphomas and reticuloendothelial neoplasms	120	94.0%	87.6% - 97.1%	2024	94.7%	93.5% - 95.6%
III CNS and misc intracranial and intraspinal neoplasms	125	79.9%	71.1% - 86.2%	2057	75.9%	73.9% - 77.8%
IV Neuroblastoma and other peripheral nervous cell tumors	37	80.2%	60.0% - 90.9%	518	83.7%	79.8% - 86.9%
V Retinoblastoma	9	100.0%	+	200	95.1%	89.8% - 97.6%
VI Renal tumors	27	83.2%	60.6% - 93.5%	429	93.1%	89.9% - 95.3%
VII Hepatic tumors	11	80.1%	40.8% - 94.6%	205	79.7%	73.2% - 84.8%
VIII Malignant bone tumors	33	59.2%	39.2% - 74.5%	623	70.2%	65.9% - 74.0%
IX Soft tissue and other extraosseous sarcomas	52	73.3%	57.2% - 84.2%	762	76.3%	72.8% - 79.4%
X Germ cell & trophoblastic tumors & neoplasms of gonads	55	90.8%	79.1% - 96.1%	892	93.5%	91.5% - 95.0%
XI Other malignant epithelial neoplasms and melanomas	90	96.2%	88.2% - 98.8%	1603	95.8%	94.5% - 96.8%
XII Other and unspecified malignant neoplasms	1	+	+	43	89.8%	74.6% - 96.1%

+ The statistic could not be calculated.

Table 3. Malignant Pediatric (Ages 0-19) Cancer Incidence in Idaho and SEER Regions

Year of Diagnosis	Idaho 2010-2019			SEER 2010-2019		
	Rate	Cases	Pop	Rate	Cases	Pop
Total	175.8	843	4,808,116	187.2	18,995	101,098,909
2010	160.9	77	475,084	187.1	1,930	10,229,400
2011	168.6	80	473,836	182.4	1,875	10,204,875
2012	191.3	90	472,242	181.0	1,852	10,174,086
2013	182.9	86	472,827	183.6	1,871	10,155,628
2014	160.4	76	475,405	192.2	1,953	10,131,157
2015	188.8	90	478,085	202.2	2,053	10,118,358
2016	195.4	94	483,243	193.9	1,964	10,101,673
2017	188.8	92	489,002	187.9	1,897	10,066,610
2018	159.0	78	492,219	185.9	1,863	10,000,143
2019	161.4	80	496,173	174.8	1,737	9,916,979

Rates are per 1,000,000 and age-adjusted to the 2000 U.S. standard.

Figure 2. Trends in Malignant Pediatric Cancer Incidence Rates

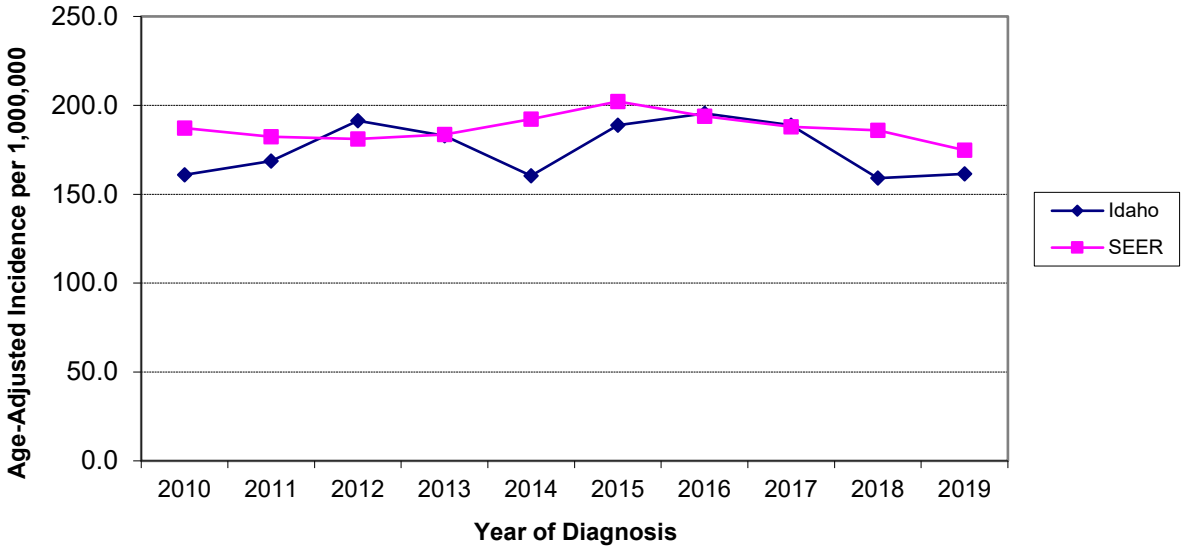


Table 4. Pediatric (Ages 0-19) Cancer Incidence in Idaho by Health District, Major Classification Categories, 2010-2019

Site/Type of Cancer	Health District 1			Health District 2			Health District 3		
	Rate	95% CI	Cases	Rate	95% CI	Cases	Rate	95% CI	Cases
All Sites Combined	185.5	151.6 - 224.8	104	150.7	107.3 - 206.0	40	193.2	164.8 - 225.2	164
I Leukemias, myeloproliferative & myelodysplastic diseases	48.4	31.9 - 70.5	27	24.3	8.9 - 52.9	6	51.0	37.1 - 68.6	44
II Lymphomas and reticuloendothelial neoplasms	28.1	16.1 - 45.7	16	25.4	9.3 - 54.9	6	35.6	24.0 - 50.8	30
III CNS and misc intracranial and intraspinal neoplasms	31.8	18.9 - 50.4	18	40.9	20.2 - 73.9	11	43.3	30.5 - 59.7	37
IV Neuroblastoma and other peripheral nervous cell tumors	9.2	3.0 - 21.4	5	12.5	2.6 - 36.2	3	5.9	1.9 - 13.7	5
V Retinoblastoma	0.0	0.0 - 6.6	0	0.0	0.0 - 14.8	0	2.5	0.3 - 8.8	2
VI Renal tumors	7.2	2.0 - 18.5	4	3.2	0.1 - 20.1	1	2.3	0.3 - 8.4	2
VII Hepatic tumors	9.2	3.0 - 21.4	5	0.0	0.0 - 14.8	0	0.0	0.0 - 4.4	0
VIII Malignant bone tumors	5.3	1.1 - 15.7	3	4.3	0.1 - 23.2	1	11.7	5.6 - 21.6	10
IX Soft tissue and other extraosseous sarcomas	8.8	2.9 - 20.7	5	11.6	2.3 - 34.3	3	5.9	1.9 - 13.8	5
X Germ cell & trophoblastic tumors & neoplasms of gonads	12.4	5.0 - 25.7	7	9.5	2.0 - 29.8	3	17.0	9.3 - 28.5	14
XI Other malignant epithelial neoplasms and melanomas	24.9	13.6 - 41.8	14	19.1	7.0 - 43.1	6	18.1	10.1 - 29.8	15
XII Other and unspecified malignant neoplasms	0.0	0.0 - 6.6	0	0.0	0.0 - 14.8	0	0.0	0.0 - 4.4	0

Site/Type of Cancer	Health District 4			Health District 5			Health District 6			Health District 7		
	Rate	95% CI	Cases	Rate	95% CI	Cases	Rate	95% CI	Cases	Rate	95% CI	Cases
All Sites Combined	208.5	184.3 - 235.1	268	173.8	141.8 - 210.9	103	215.1	177.7 - 258.0	116	162.7	134.3 - 195.3	115
I Leukemias…	51.5	39.8 - 65.5	66	46.3	30.7 - 66.9	28	32.8	19.4 - 51.8	18	39.1	25.9 - 56.5	28
II Lymphomas…	39.6	29.4 - 52.0	51	13.5	5.8 - 26.6	8	31.5	18.3 - 50.4	17	14.3	6.9 - 26.3	10
III CNS and…	41.6	31.3 - 54.3	54	50.4	34.0 - 72.0	30	52.4	34.8 - 75.8	28	38.6	25.4 - 56.1	27
IV Neuroblastoma…	10.4	5.5 - 17.7	13	6.4	1.7 - 16.6	4	14.7	6.3 - 28.9	8	2.8	0.3 - 10.0	2
V Retinoblastoma	1.6	0.2 - 5.8	2	3.3	0.4 - 12.1	2	5.5	1.1 - 16.0	3	0.0	0.0 - 5.1	0
VI Renal tumors	8.6	4.3 - 15.5	11	6.4	1.8 - 16.6	4	9.0	2.9 - 21.2	5	8.1	3.0 - 17.8	6
VII Hepatic tumors	3.9	1.3 - 9.1	5	0.0	0.0 - 6.2	0	1.8	0.0 - 10.1	1	3.0	0.4 - 10.5	2
VIII Malignant bone tumors	4.6	1.7 - 10.0	6	10.1	3.7 - 22.1	6	7.6	2.1 - 19.4	4	7.1	2.3 - 16.6	5
IX Soft tissue…	14.7	8.9 - 23.0	19	6.8	1.9 - 17.5	4	24.0	12.8 - 41.1	13	12.4	5.7 - 23.6	9
X Germ cell…	12.5	7.2 - 20.4	16	8.8	2.8 - 20.3	5	17.1	7.8 - 32.4	9	9.7	3.9 - 20.1	7
XI Other malig epithelial…	19.5	12.6 - 28.8	25	21.8	11.3 - 37.9	12	16.7	7.7 - 31.8	9	27.7	16.6 - 43.1	19
XII Other/unspecified…	0.0	0.0 - 2.9	0	0.0	0.0 - 6.2	0	1.9	0.0 - 10.4	1	0.0	0.0 - 5.1	0

Rates are per 1,000,000 and age-adjusted to the 2000 U.S. standard.

Confidence intervals (CIs) are 95% for rates.

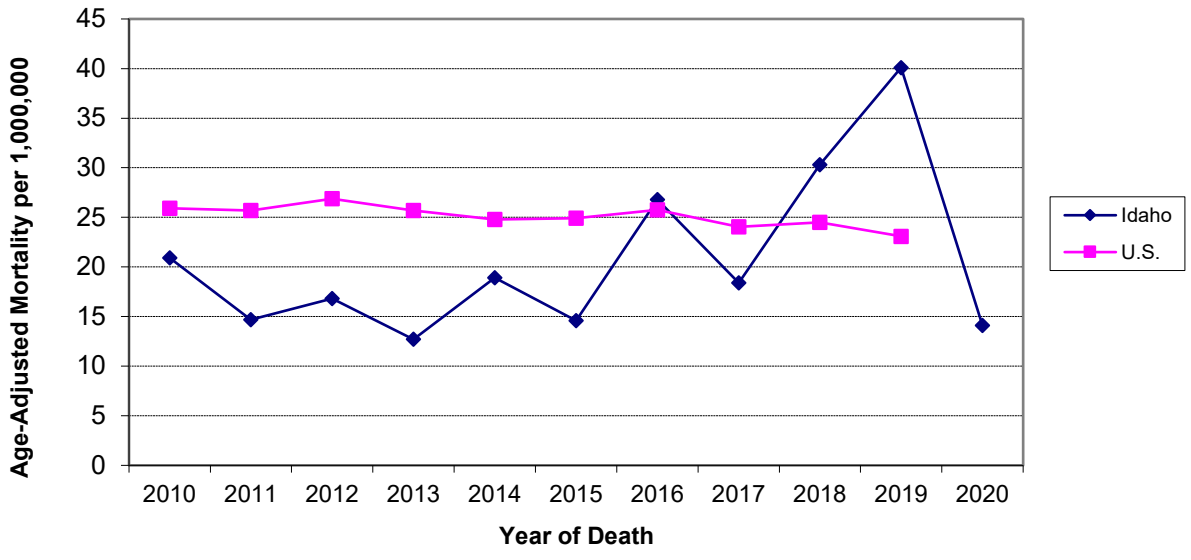
Statistical Note: Rates based upon 10 or fewer cases (numerator) should be interpreted with caution.

Table 5. Pediatric (Ages 0-19) Cancer Mortality in Idaho and the U.S.

Year of Death	Idaho 2010-2020			U.S. 2010-2019		
	Rate	Deaths	Pop	Rate	Deaths	Pop
Total	20.9	111	5,309,390	25.1	20,711	822,601,020
2010	20.9	10	475,108	25.9	2,160	83,181,748
2011	14.7	7	473,968	25.7	2,135	82,826,880
2012	16.8	8	472,426	26.9	2,221	82,482,164
2013	12.7	6	473,095	25.7	2,116	82,244,884
2014	18.9	9	475,754	24.8	2,038	82,105,856
2015	14.6	7	478,516	24.9	2,047	82,080,244
2016	26.8	13	483,710	25.7	2,118	82,106,582
2017	18.4	9	489,540	24.1	1,977	82,062,709
2018	30.3	15	492,415	24.5	2,010	81,884,537
2019	40.1	20	496,044	23.1	1,889	81,625,416
2020	14.1	7	498,814			

Rates are per 1,000,000 and age-adjusted to the 2000 U.S. standard.

Figure 3. Trends in Pediatric Cancer Mortality Rates



REFERENCES

1. Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 1999-2020 on CDC WONDER Online Database, released in 2021. Data are from the Multiple Cause of Death Files, 1999-2020, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/ucd-icd10.html on Jun 27, 2022, 9:33:01 AM
2. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER Research Data, 12 Registries, Nov 2021 Sub (1992-2019) - Linked To County Attributes - Time Dependent (1990-2019) Income/Rurality, 1969-2020 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2022, based on the November 2021 submission.
3. National Program of Cancer Registries and Surveillance, Epidemiology and End Results Program SEER*Stat Database: NPCR and SEER Incidence - U.S. Cancer Statistics Public Use Research Database, 2021 Submission (2001-2019). United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2022. Accessed at www.cdc.gov/cancer/uscs/public-use.
4. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER Research Data, 8 Registries, Nov 2021 Sub (1975-2019) - Linked To County Attributes - Time Dependent (1990-2019) Income/Rurality, 1969-2020 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2022, based on the November 2021 submission.
5. International Classification of Childhood Cancer (ICCC). ICCC based on ICD-O-3/WHO 2008. Accessed at https://seer.cancer.gov/iccc/iccc-who2008.html on June 27, 2022.
6. Surveillance Research Program, National Cancer Institute SEER*Stat software (https://seer.cancer.gov/seerstat/) version 8.4.0.
7. Final 2020 mortality data. Bureau of Vital Records and Health Statistics, Idaho Department of Health and Welfare; October 2021.
8. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1969-2019) <Katrina/Rita Population Adjustment>, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2021. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).
9. Johnson CJ, Morawski BM, Rycroft RK. Cancer in Idaho – 2019. Boise, ID: Cancer Data Registry of Idaho; December 2021.
10. Zhang J, Walsh MF, Wu G, Edmonson MN, Gruber TA, Easton J et al. Germline mutations in predisposition genes in pediatric cancer. N Engl J Med. 2015 Dec 10;373(24):2336-2346. doi: 10.1056/NEJMoa1508054. Epub 2015 Nov 18.
11. Hudson MM, Ness JJ, Gurney JG, Mulrooney DA, Chemaitilly W, Krull KR et al. Clinical ascertainment of health outcomes among adults treated for childhood cancer. JAMA. 2013;309(22):2371-2381. doi:10.1001/jama.2013.6296.
12. Guy GP, Yabroff KR, Ekwueme DU, Wilder Smith A, Dowling EC, Rechis R et al. Estimating the health and economic burden of cancer among those diagnosed as adolescents and young adults. Health Aff. 2014;33(6):1024-1031. doi: 10.1377/hlthaff.2013.1425.