

PEDIATRIC CANCER INCIDENCE IN IDAHO, 1997-2004

FOLLOW-UP OF INCIDENCE RATES SINCE 1982-1996 STUDY: LYMPHOID LEUKEMIA IN BANNOCK COUNTY MALES IN GEM COUNTY

Although relatively rare in comparison with cancer in older adults, cancer is the second leading cause of death in persons aged 1-14 years. 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. 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. In 1998, CDRI published a report describing the incidence of pediatric cancers in Idaho, with comparisons to U.S. data (NAACCR) and comparisons among health districts and counties in Idaho. The results demonstrated a strong similarity between pediatric cancer incidence in Idaho and the U.S. For no International Classification of Childhood Cancer (ICCC) grouping was there a statistically significant difference between the observed number of cases in Idaho and the expected number of cases based upon U.S. rates for whites. With few exceptions, there was little evidence of differences in pediatric cancer incidence by health district or county within Idaho. However, the small numbers of cases for many ICCC groupings, particularly when examined at the health district or county levels, make spatial trends difficult to interpret. Two results warranted follow-up monitoring: lymphoid leukemia in Bannock County, and total pediatric cancers among males in Gem County.

METHODS & RESULTS

The data analyzed for this report include cancers diagnosed among Idaho residents less than 20 years of age. Cases with all tumor behavior types (benign, borderline, in situ and malignant) were included. Cases were grouped according to the International Classification of Childhood Cancer (ICCC) based on site and morphology coded according to ICD-O-3. Tables are presented with pediatric cancer case counts and incidence rates for the period 1997-2004. The numbers in parentheses after the county names in these tables are Federal Information Processing Standards (FIPS) state-county codes.

All rates presented were calculated per million population, and are averages for the period 1997 through 2004 (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.

The spatial scan statistic was used to identify potential clusters of pediatric cancers in Idaho. Tests were conducted for all pediatric cancers combined, separately for males and males, and for lymphoid leukemias. No individual counties or groups of counties with statistically significant higher incidence of pediatric cancers were detected in any of the tests.

CONCLUSIONS

Compared with many cancers diagnosed among adults, there is little geographic variability in pediatric cancer rates in Idaho. For the two results that warranted follow-up monitoring from the 1982-1996 Idaho pediatric cancer study (lymphoid leukemia in Bannock County, and total pediatric cancers among males in Gem County), follow-up monitoring for the period 1997-2004 shows cancer incidence rates for these areas are not significantly different from elsewhere in Idaho.

References

1. Steliarova-Foucher E, Stiller C, Lacour B, Kaatsch P. International Classification of Childhood Cancer, Third Edition. *Cancer*, 2005;103:1457-67.
2. Kulldorff M. and Information Management Services, Inc. SaTScan™ v6.0: Software for the spatial and space-time scan statistics. <http://www.satscan.org/>, 2006.
3. Kulldorff M. A spatial scan statistic. *Communications in Statistics: Theory and Methods*, 26:1481-1496, 1997.

Pediatric Cancer in Idaho (Ages 0-19) 1997-2004
Total cases by county of residence at time of diagnosis
Males and Females Combined

Geographic Area	Rate	Cases	Person-Years
Idaho	188.6	628	3,301,047
ID: Ada County (16001)	204.3	150	729,824
ID: Adams County (16003)	217.1	1	7,145
ID: Bannock County (16005)	192.6	38	192,835
ID: Bear Lake County (16007)	156.7	3	17,932
ID: Benewah County (16009)	298.7	6	21,078
ID: Bingham County (16011)	161.7	21	127,251
ID: Blaine County (16013)	168.6	7	40,804
ID: Boise County (16015)	271.6	4	15,104
ID: Bonner County (16017)	178.2	15	82,072
ID: Bonneville County (16019)	197.1	46	233,471
ID: Boundary County (16021)	204.9	5	24,875
ID: Butte County (16023)	580.0	4	7,306
ID: Camas County (16025)	0.0	0	2,107
ID: Canyon County (16027)	197.3	73	370,568
ID: Caribou County (16029)	56.4	1	19,907
ID: Cassia County (16031)	250.8	16	63,277
ID: Clark County (16033)	0.0	0	2,795
ID: Clearwater County (16035)	49.7	1	17,103
ID: Custer County (16037)	234.3	2	9,206
ID: Elmore County (16039)	151.6	11	71,660
ID: Franklin County (16041)	109.9	4	36,455
ID: Fremont County (16043)	306.9	11	34,512
ID: Gem County (16045)	161.0	6	36,786
ID: Gooding County (16047)	274.1	10	36,217
ID: Idaho County (16049)	61.4	2	33,736
ID: Jefferson County (16051)	245.4	15	60,703
ID: Jerome County (16053)	118.4	6	50,373
ID: Kootenai County (16055)	188.9	49	259,436
ID: Latah County (16057)	146.8	11	76,794
ID: Lemhi County (16059)	51.2	1	17,188
ID: Lewis County (16061)	237.1	2	8,226
ID: Lincoln County (16063)	0.0	0	10,991
ID: Madison County (16065)	178.9	15	88,619
ID: Minidoka County (16067)	213.4	12	54,879
ID: Nez Perce County (16069)	152.0	12	78,828
ID: Oneida County (16071)	340.0	4	11,434
ID: Owyhee County (16073)	306.1	9	29,376
ID: Payette County (16075)	111.5	6	54,756
ID: Power County (16077)	99.8	2	21,829
ID: Shoshone County (16079)	302.2	8	27,040
ID: Teton County (16081)	236.3	4	17,247
ID: Twin Falls County (16083)	149.2	24	159,774
ID: Valley County (16085)	269.0	5	15,669
ID: Washington County (16087)	244.0	6	23,859

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population.

Note: Case counts include all tumor behaviors: benign, borderline, in situ and malignant. Rates based on these counts are not comparable to SEER rates which include malignant behavior only.

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

Pediatric Cancer in Idaho (Ages 0-19) 1997-2004
Total cases by county of residence at time of diagnosis
Males Only

Geographic Area	Rate	Cases	Person-Years
Idaho	193.3	330	1,691,872
ID: Ada County (16001)	226.2	85	373,670
ID: Adams County (16003)	384.4	1	3,898
ID: Bannock County (16005)	177.1	18	98,798
ID: Bear Lake County (16007)	218.6	2	9,116
ID: Benewah County (16009)	388.1	4	11,113
ID: Bingham County (16011)	177.3	12	65,073
ID: Blaine County (16013)	139.1	3	21,481
ID: Boise County (16015)	117.8	1	7,817
ID: Bonner County (16017)	185.3	8	42,284
ID: Bonneville County (16019)	181.0	22	120,645
ID: Boundary County (16021)	179.3	2	12,715
ID: Butte County (16023)	1144.6	4	3,833
ID: Camas County (16025)	0.0	0	1,126
ID: Canyon County (16027)	164.9	31	189,531
ID: Caribou County (16029)	0.0	0	10,023
ID: Cassia County (16031)	272.0	9	32,768
ID: Clark County (16033)	0.0	0	1,462
ID: Clearwater County (16035)	97.7	1	8,901
ID: Custer County (16037)	316.7	1	4,630
ID: Elmore County (16039)	185.1	7	36,947
ID: Franklin County (16041)	164.4	3	18,512
ID: Fremont County (16043)	374.1	7	18,038
ID: Gem County (16045)	207.7	4	18,820
ID: Gooding County (16047)	209.6	4	18,999
ID: Idaho County (16049)	44.3	1	17,301
ID: Jefferson County (16051)	253.5	8	31,183
ID: Jerome County (16053)	36.9	1	25,827
ID: Kootenai County (16055)	189.1	25	133,862
ID: Latah County (16057)	138.6	6	40,124
ID: Lemhi County (16059)	100.3	1	8,746
ID: Lewis County (16061)	213.4	1	4,422
ID: Lincoln County (16063)	0.0	0	5,700
ID: Madison County (16065)	237.1	10	40,378
ID: Minidoka County (16067)	278.7	8	27,971
ID: Nez Perce County (16069)	98.3	4	40,275
ID: Oneida County (16071)	482.7	3	5,998
ID: Owyhee County (16073)	257.1	4	15,591
ID: Payette County (16075)	78.3	2	28,347
ID: Power County (16077)	94.3	1	11,105
ID: Shoshone County (16079)	301.2	4	14,098
ID: Teton County (16081)	111.9	1	8,994
ID: Twin Falls County (16083)	183.9	15	81,253
ID: Valley County (16085)	297.2	3	8,280
ID: Washington County (16087)	245.8	3	12,217

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population.

Note: Case counts include all tumor behaviors: benign, borderline, in situ and malignant. Rates based on these counts are not comparable to SEER rates which include malignant behavior only.

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

Pediatric Cancer in Idaho (Ages 0-19) 1997-2004
Total cases by county of residence at time of diagnosis
Females Only

Geographic Area	Rate	Cases	Person-Years
Idaho	183.8	298	1,609,175
ID: Ada County (16001)	181.5	65	356,154
ID: Adams County (16003)	0.0	0	3,247
ID: Bannock County (16005)	208.7	20	94,037
ID: Bear Lake County (16007)	96.8	1	8,816
ID: Benewah County (16009)	202.3	2	9,965
ID: Bingham County (16011)	146.0	9	62,178
ID: Blaine County (16013)	200.4	4	19,323
ID: Boise County (16015)	434.9	3	7,287
ID: Bonner County (16017)	170.4	7	39,788
ID: Bonneville County (16019)	214.1	24	112,826
ID: Boundary County (16021)	245.2	3	12,160
ID: Butte County (16023)	0.0	0	3,473
ID: Camas County (16025)	0.0	0	981
ID: Canyon County (16027)	231.1	42	181,037
ID: Caribou County (16029)	113.3	1	9,884
ID: Cassia County (16031)	229.6	7	30,509
ID: Clark County (16033)	0.0	0	1,333
ID: Clearwater County (16035)	0.0	0	8,202
ID: Custer County (16037)	193.9	1	4,576
ID: Elmore County (16039)	118.7	4	34,713
ID: Franklin County (16041)	57.6	1	17,943
ID: Fremont County (16043)	234.7	4	16,474
ID: Gem County (16045)	111.5	2	17,966
ID: Gooding County (16047)	345.5	6	17,218
ID: Idaho County (16049)	77.3	1	16,435
ID: Jefferson County (16051)	234.3	7	29,520
ID: Jerome County (16053)	204.3	5	24,546
ID: Kootenai County (16055)	189.4	24	125,574
ID: Latah County (16057)	157.6	5	36,670
ID: Lemhi County (16059)	0.0	0	8,442
ID: Lewis County (16061)	268.1	1	3,804
ID: Lincoln County (16063)	0.0	0	5,291
ID: Madison County (16065)	137.1	5	48,241
ID: Minidoka County (16067)	146.7	4	26,908
ID: Nez Perce County (16069)	209.5	8	38,553
ID: Oneida County (16071)	174.5	1	5,436
ID: Owyhee County (16073)	364.0	5	13,785
ID: Payette County (16075)	151.2	4	26,409
ID: Power County (16077)	106.0	1	10,724
ID: Shoshone County (16079)	311.6	4	12,942
ID: Teton County (16081)	417.2	3	8,253
ID: Twin Falls County (16083)	113.1	9	78,521
ID: Valley County (16085)	238.9	2	7,389
ID: Washington County (16087)	247.6	3	11,642

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population.

Note: Case counts include all tumor behaviors: benign, borderline, in situ and malignant. Rates based on these counts are not comparable to SEER rates which include malignant behavior only.

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

Pediatric Cancer in Idaho (Ages 0-19) 1997-2004
Lymphoid leukemia cases by county of residence at time of diagnosis
Males and Females Combined

Geographic Area	Rate	Cases	Person-Years
Idaho	31.4	103	3,301,047
ID: Ada County (16001)	35.0	26	729,824
ID: Adams County (16003)	0.0	0	7,145
ID: Bannock County (16005)	31.1	6	192,835
ID: Bear Lake County (16007)	0.0	0	17,932
ID: Benewah County (16009)	52.4	1	21,078
ID: Bingham County (16011)	32.2	4	127,251
ID: Blaine County (16013)	0.0	0	40,804
ID: Boise County (16015)	0.0	0	15,104
ID: Bonner County (16017)	27.2	2	82,072
ID: Bonneville County (16019)	26.3	6	233,471
ID: Boundary County (16021)	0.0	0	24,875
ID: Butte County (16023)	0.0	0	7,306
ID: Camas County (16025)	0.0	0	2,107
ID: Canyon County (16027)	40.8	15	370,568
ID: Caribou County (16029)	56.4	1	19,907
ID: Cassia County (16031)	16.5	1	63,277
ID: Clark County (16033)	0.0	0	2,795
ID: Clearwater County (16035)	0.0	0	17,103
ID: Custer County (16037)	93.8	1	9,206
ID: Elmore County (16039)	50.9	4	71,660
ID: Franklin County (16041)	55.8	2	36,455
ID: Fremont County (16043)	60.0	2	34,512
ID: Gem County (16045)	80.8	3	36,786
ID: Gooding County (16047)	27.8	1	36,217
ID: Idaho County (16049)	37.2	1	33,736
ID: Jefferson County (16051)	66.4	4	60,703
ID: Jerome County (16053)	59.9	3	50,373
ID: Kootenai County (16055)	32.1	8	259,436
ID: Latah County (16057)	0.0	0	76,794
ID: Lemhi County (16059)	0.0	0	17,188
ID: Lewis County (16061)	0.0	0	8,226
ID: Lincoln County (16063)	0.0	0	10,991
ID: Madison County (16065)	26.4	3	88,619
ID: Minidoka County (16067)	19.0	1	54,879
ID: Nez Perce County (16069)	13.5	1	78,828
ID: Oneida County (16071)	101.6	1	11,434
ID: Owyhee County (16073)	0.0	0	29,376
ID: Payette County (16075)	19.5	1	54,756
ID: Power County (16077)	49.9	1	21,829
ID: Shoshone County (16079)	0.0	0	27,040
ID: Teton County (16081)	56.7	1	17,247
ID: Twin Falls County (16083)	12.7	2	159,774
ID: Valley County (16085)	51.7	1	15,669
ID: Washington County (16087)	0.0	0	23,859

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population.

Note: All cases of lymphoid leukemia are malignant behavior. Rates based on these counts are comparable to SEER rates.

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