

Addendum; Summary report of cancer incidence among children residing within Cherokee County

Background

At the close of 2017, data inclusive of cancer diagnosis during 2015 was finalized in the Oklahoma Central Cancer Registry and available to update the **Summary report of cancer incidence among children residing within Cherokee County, which was published by the Oklahoma State Department of Health in July 2017.**

Methods

Cancer data was reviewed in 5-year intervals, calculating the age-adjusted incidence rates (AAIR) for the most recent five years of finalized data, 2011-2015. Standard incidence ratios (SIR) were calculated for three 5-year time periods to determine if there was an upward trend on all cancer diagnosis among children ages 0 through 19 years. To evaluate childhood leukemia cases in Cherokee County, which have lower counts than all childhood cancer types combined, calculation of SIR was performed for the expanded diagnosis years of 1997-2015. A SIR for leukemia diagnoses was also calculated for the comparison population referred to in the original report as the 7-County region, which includes children residing in Cherokee, Adair, Delaware, Mayes, Muskogee, Sequoyah, or Wagoner counties. Ninety-five percent confidence intervals (CI) were calculated for the AAIR and SIR analyses.

Results

Table 1 and Figure 1 display the AAIR for all cancers diagnosed between 2011 and 2015 among children 0 through 19 years of age per 1,000,000 population by county of residence where the case count during this period was 10 or more. In 52 counties, there were less than 10 diagnosed cases of childhood cancer, so these data are not presented. For the 25 Oklahoma counties with 10 or more cases of childhood cancer diagnosed during 2011-2015, the AAIR ranged from 143.50 cases per 1,000,000 population to 315.71 cases per 1,000,000 population. The overall state AAIR for all types of cancer diagnosed in Oklahoma children during this time period was 192.63 cases per 1,000,000 population. Age-adjusted incidence rates for 17 of the 25 counties were above the overall state rate and five of these were above the Cherokee County rate. The 95% CI for the Cherokee County AAIR (138.46 – 389.38 per million) overlaps with the CI for the overall state AAIR which indicates that the difference between the Cherokee county rate and the state rate is not statistically significant.

Table 1. Age-Adjusted all cancers incidence rates among Oklahoma children aged 0 through 19 years by county of residence, 2011-2015

County	Number of Cancer Cases	AAIR per 1,000,000	Upper 95% Confidence Interval	Lower 95% Confidence Interval
Custer County	13	315.71	487.34	144.09
Jackson County	11	313.83	499.29	128.37
Washington County	20	296.63	426.63	166.62
Seminole	10	277.70	449.82	105.58
Osage County	16	271.43	404.43	138.43
Cherokee County	17	263.92	389.38	138.46
Lincoln County	10	220.50	357.17	83.83
Comanche County	38	215.27	283.72	146.83
McClain County	11	214.49	341.25	87.73
Cleveland County	73	206.29	253.62	158.97
Muskogee County	19	205.10	297.32	112.87
Le Flore County	13	202.13	312.02	92.25
Tulsa County	173	202.09	232.21	171.98
Logan County	12	200.63	314.15	87.11
Grady County	14	198.97	303.20	94.74
Creek County	18	196.87	287.81	105.92
Oklahoma County	207	195.08	221.65	168.50
Oklahoma State	1009	192.63	204.52	180.75
Okmulgee County	10	190.38	308.38	72.38
Carter County	12	184.82	289.39	80.25
Canadian County	33	181.12	242.91	119.32
Wagoner County	18	179.30	262.13	96.47
Garfield County	14	174.46	265.84	83.07
Payne County	16	152.51	227.24	77.78
Rogers County	18	152.27	222.62	81.93
Pottawatomie County	14	143.50	218.67	68.33

Figure 1. Age-adjusted all cancers incidence rates among Oklahoma children aged 0-19 years, by county of residence, 2011-2015.

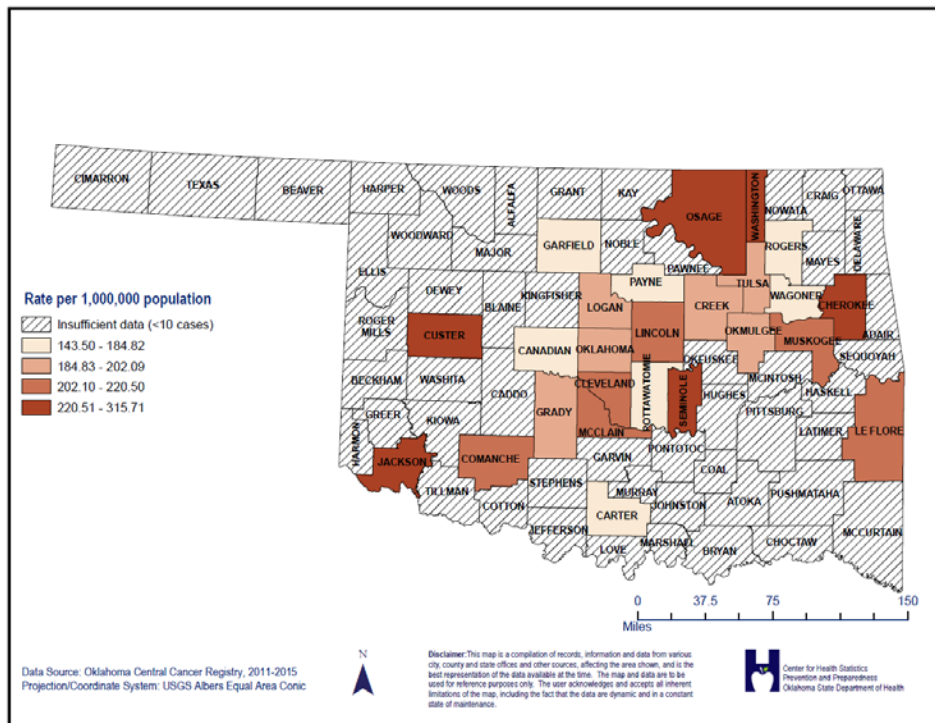


Table 2 displays SIRs and 95% CIs calculated for all childhood cancers diagnosed during 2001-2015 in 5-year increments for Cherokee County and the surrounding 7-Counties. Calculated SIRs of leukemia cases and corresponding 95% CIs are presented for Cherokee County and the 7-County population for the diagnosis time period of 1997-2015. The 7-County region SIRs for all childhood cancers and leukemia were less than 1.0, except for all cancer diagnosis years 2006-2010. The Cherokee County SIRs for all childhood cancers and leukemia were higher than 1.0. However, the CIs for each of the SIRs calculated for Cherokee County and the 7-County region do include 1.0, which implies that the SIRs are not excessive and fall within an expected range.

Table 2. Standardized incidence ratios (SIR) for all cancer diagnoses among Oklahoma children aged 0 through 19 years during 2001-2015 and leukemia diagnoses during 1997-2015, Cherokee County and Surrounding 7-County Region.

	Diagnosis year	Oklahoma	Cherokee County			7-County Region		
		Observed # of cases	Observed # of cases	SIR	95% CI	Observed # of cases	SIR	95% CI
All cancers	2001-2005	832	12	1.07	0.55-1.86	65	0.86	0.66-1.09
All cancers	2006-2010	1,012	15	1.13	0.63-1.86	95	1.03	0.83-1.25
All cancers	2011-2015	1,009	17	1.32	0.77-2.12	80	0.91	0.72-1.14
Leukemia	1997-2015	829	17	1.63	0.95-2.61	73	0.99	0.78- 1.24

Conclusion

The inclusion of another year of data (cancer diagnosis year of 2015) to the assessment of pediatric cancer occurrence in Cherokee County has not changed the results reported by the Oklahoma State Department of Health in the July 2017 *Summary report of cancer incidence among children within Cherokee County*. The age-adjusted incidence rates for all cancer occurrences among children residents of Cherokee county are higher than the overall Oklahoma state rate; however, evaluation of the confidence intervals calculated for each of these rates indicates that the rates have a 95% probability of overlapping or being very similar meaning the difference is not statistically significant. Additionally, the SIR analysis, which included an evaluation of leukemia incidence only, concluded that the observed number of cases for all cancers combined and leukemia among children residing in Cherokee county or in the surrounding 7-county region, are within the expected range and are not statistically higher than the overall state rates.

As new data are finalized, the OCCR will continue to conduct periodic re-evaluations.