Appendix: OSDH Maps

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Report Description: Show the geographical relationships and patterns in administrative and demographic variables

1 C1 Lead Nurse Regions

With the exception of the two large urban counties (ie, Tulsa and Oklahoma Counties), a "lead nurse" oversees nurses in several counties. The non-urban counties are managed by 18 lead nurses. We are calling these areas "Lead Nurse Regions", and are numbering them 1 through 18. Oklahoma County is 19, and Tulsa County is 20. Note that multiple lead nurses operate in each urban county, but we are assigning a single region to each county.

A county's region assignment is listed in the legend, and below its name in the map. Each region has a unique color below; these color assignements are used for the lead nurse regions in other reports.

Of the state's 77 counties, 51 receive C1 funding; these are labeled in black. The remaining 26 unfunded counties have asteristics, and are labeled in gray.

```
## Warning: 'axis.ticks.margin' is deprecated.  Please set 'margin' property  of 'axis.text' instead
```
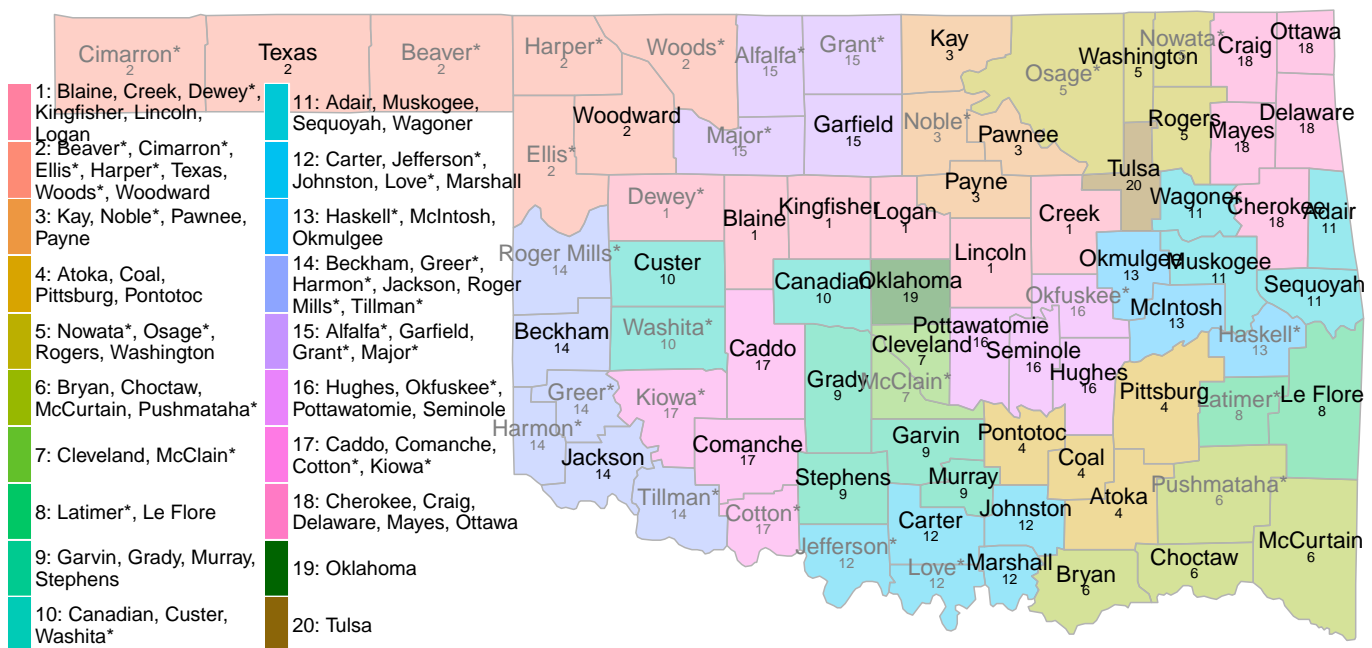
2   MEICHV Community Survey Counties

The Community Survey, administered by the MIECHV External Evaualtion Team, samples from residents of the four counties below. The sampling frame is created creating a list from eligible WIC and Medicaid recipients. Kay and Garfield counties are funded through the formula MIECHV grant; the other four are funded through the competitive expansion MIECHV grant.
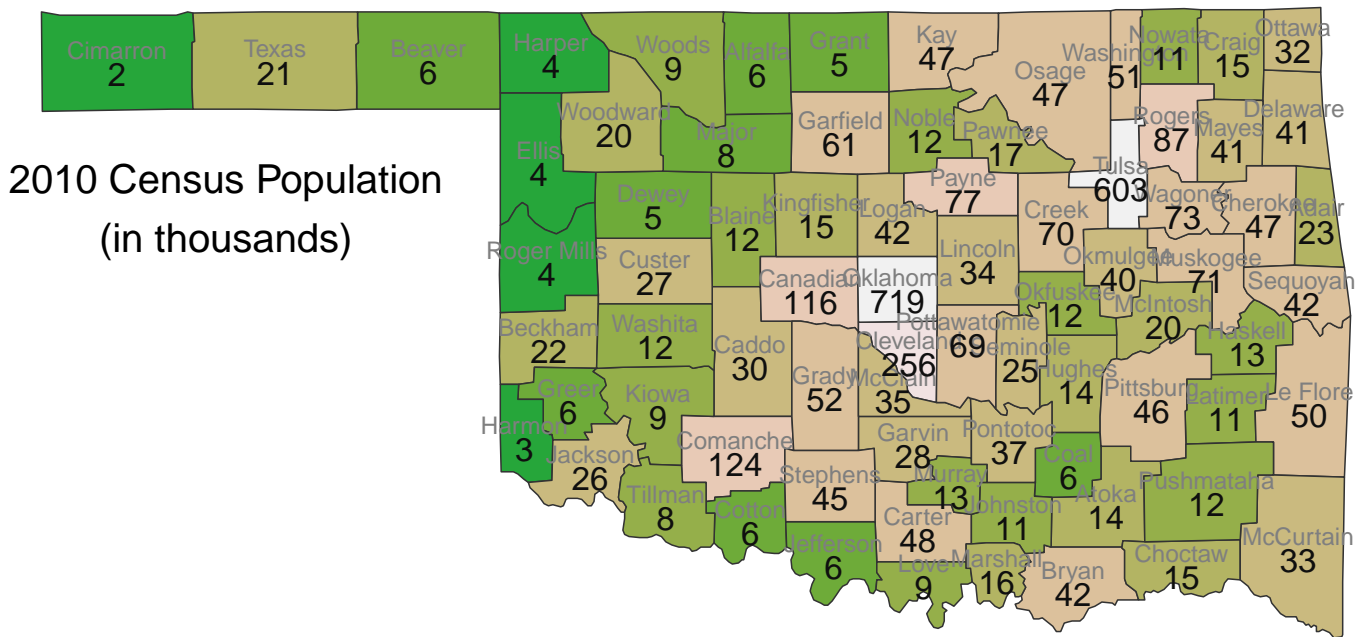
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## Warning: 'axis.ticks.margin' is deprecated.  Please set 'margin' property  of 'axis.text' instead
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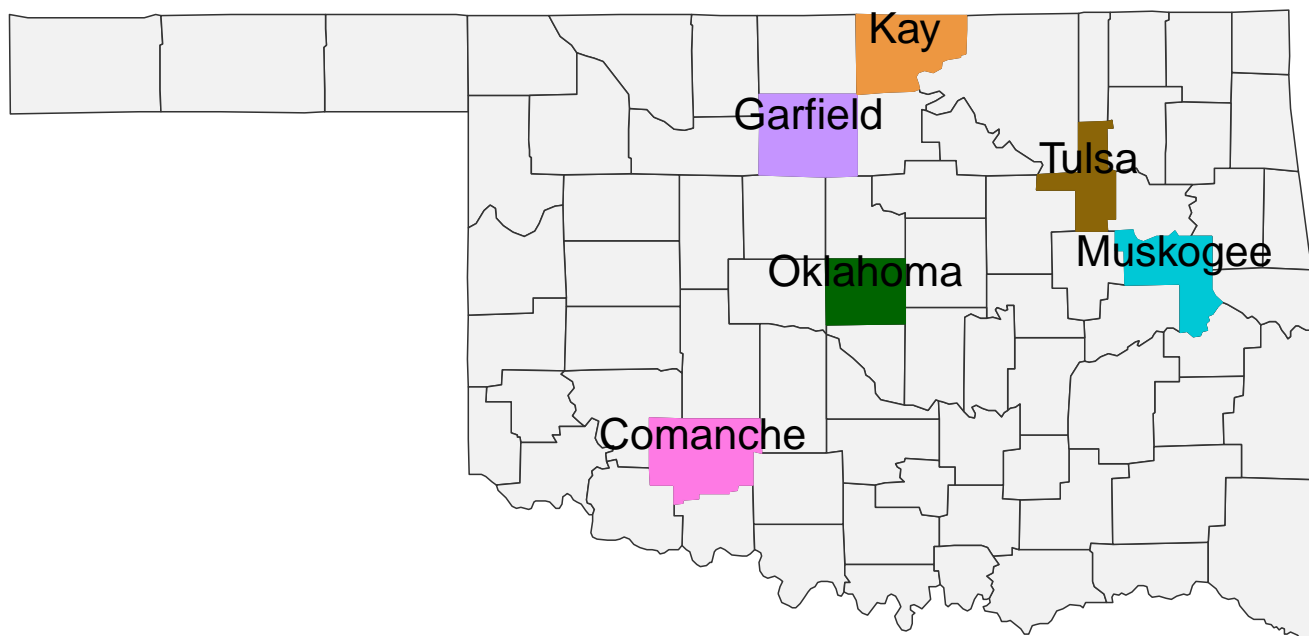

3   Population

For reference, here are the county populations as of 2010. A topographical color scheme represents the number of people; greener values represent a lower population/elevation. A county's population (in thousands) is labeled on the map.
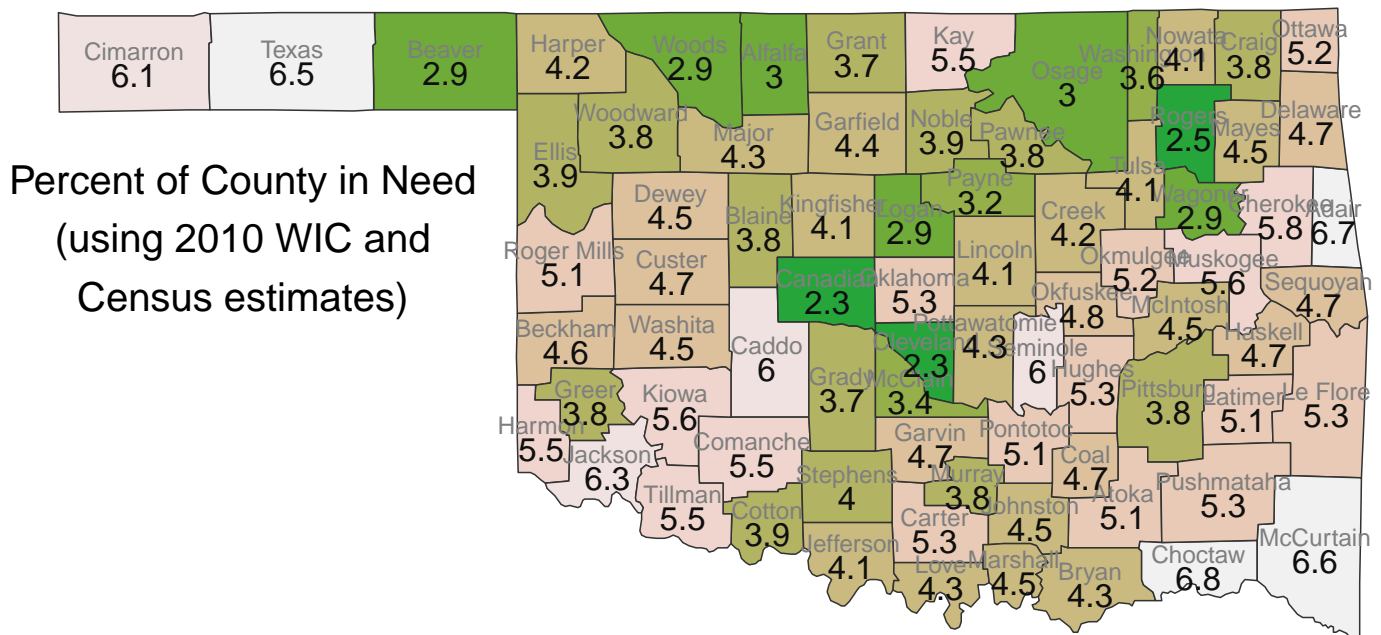
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## Warning: 'axis.ticks.margin' is deprecated.  Please set 'margin' property  of 'axis.text' instead
```

2010 Census Population
(in thousands)

Cimarron 2 | Texas 21 | Beaver 6 | Harper 4 | Woods 9 | Alfalfa 6 | Grant 5 | Kay 47 | Osage 47 | Washington 51 | Nowata 11 | Craig 15 | Ottawa 32
Woodward 20 | Major 8 | Garfield 61 | Noble 12 | Pawnee 17 | Rogers 87 | Mayes 41 | Delaware 41
Ellis 4 | Dewey 5 | Blaine 12 | Kingfisher 15 | Logan 42 | Payne 77 | Creek 70 | Tulsa 603 | Wagoner 73 | Cherokee 47 | Adair 23
Roger Mills 4 | Custer 27 | Canadian 116 | Oklahoma 719 | Lincoln 34 | Okmulgee 40 | Muskogee 71 | Sequoyah 42
Beckham 22 | Washita 12 | Caddo 30 | Grady 52 | McClain 35 | Cleveland 256 | Pottawatomie 69 | Seminole 25 | Okfuskee 12 | McIntosh 20 | Haskell 13
Greer 6 | Kiowa 9 | Comanche 124 | Garvin 28 | Pontotoc 37 | Hughes 14 | Pittsburg 46 | Latimer 11 | Le Flore 50
Harmon 3 | Jackson 26 | Tillman 8 | Cotton 6 | Stephens 45 | Murray 13 | Coal 6 | Atoka 14 | Pushmataha 12
Jefferson 6 | Carter 48 | Johnston 11 | Choctaw 15 | McCurtain 33
Love 9 | Marshall 16 | Bryan 42

4 WIC Need

For reference, here are percentage of county residents in need. A 2010 WIC county estimate (that consider the number of women, children, and infants) is divided by the 2010 Census county population. A topographical color scheme represents the percent of of people; greener values represent a lower need/elevation. A county's percentage is labeled on the map.

```
## Warning:  'axis.ticks.margin' is deprecated.  Please set 'margin' property  of 'axis.text' instead
```

Percent of County in Need
(using 2010 WIC and
Census estimates)

Cimarron 6.1 | Texas 6.5 | Beaver 2.9 | Harper 4.2 | Woods 2.9 | Alfalfa 3 | Grant 3.7 | Kay 5.5 | Osage 3 | Washington 3.6 | Nowata 4.1 | Craig 3.8 | Ottawa 5.2
Woodward 3.8 | Major 4.3 | Garfield 4.4 | Noble 3.9 | Pawnee 3.8 | Rogers 2.5 | Mayes 4.5 | Delaware 4.7
Ellis 3.9 | Dewey 4.5 | Blaine 3.8 | Kingfisher 4.1 | Logan 2.9 | Payne 3.2 | Creek 4.2 | Tulsa 4.1 | Wagoner 2.9 | Cherokee 5.8 | Adair 6.7
Roger Mills 5.1 | Custer 4.7 | Canadian 2.3 | Oklahoma 5.3 | Lincoln 4.1 | Okmulgee 5.2 | Muskogee 5.6 | Sequoyah 4.7
Beckham 4.6 | Washita 4.5 | Caddo 6 | Grady 3.7 | McClain 3.4 | Cleveland 2.3 | Pottawatomie 4.3 | Seminole 6 | Okfuskee 4.8 | McIntosh 4.5 | Haskell 4.7
Greer 3.8 | Kiowa 5.6 | Comanche 5.5 | Garvin 4.7 | Pontotoc 5.1 | Hughes 5.3 | Pittsburg 3.8 | Latimer 5.1 | Le Flore 5.3
Harmon 5.5 | Jackson 6.3 | Tillman 5.5 | Cotton 3.9 | Stephens 4 | Murray 3.8 | Coal 4.7 | Atoka 5.1 | Pushmataha 5.3
Jefferson 4.1 | Carter 5.3 | Johnston 4.5 | Choctaw 6.8 | McCurtain 6.6
Love 4.3 | Marshall 4.5 | Bryan 4.3

WIC Estimates of Need are available periodically (*i.e.*, 1998, 2000, 2004, 2005, 2006, 2010, 2014). Loess regression (with a span of 2) was used to provide smooth and continuous county estimates for the years through 2016 for many of our longitudinal models. Furthermore, loess provides stable extrapolations, which is necessary for the years following the last official estimate (*i.e.*, 2014).

In the graph below, each county has two lines. A county's survey estimate is represented a solid line with sharp corners. The

smoother dashed line represents the loess regression. County lines are colored according to their C1 Region (described in the appendix's first map).

The first graph has all 77 counties; Oklahoma and Tulsa counties are distinguishable above the other 75. The second graph is similar, but focuses on the counties with less than 60 infants in need (for a given year). The purpose of these graphs is to provide a feel for our smoothed WIC estimates (which are relied on by several of our later statistical models). If you would like the exact values, please download them from our project website's collection of public county-level datasets.

Infants in Need, by County
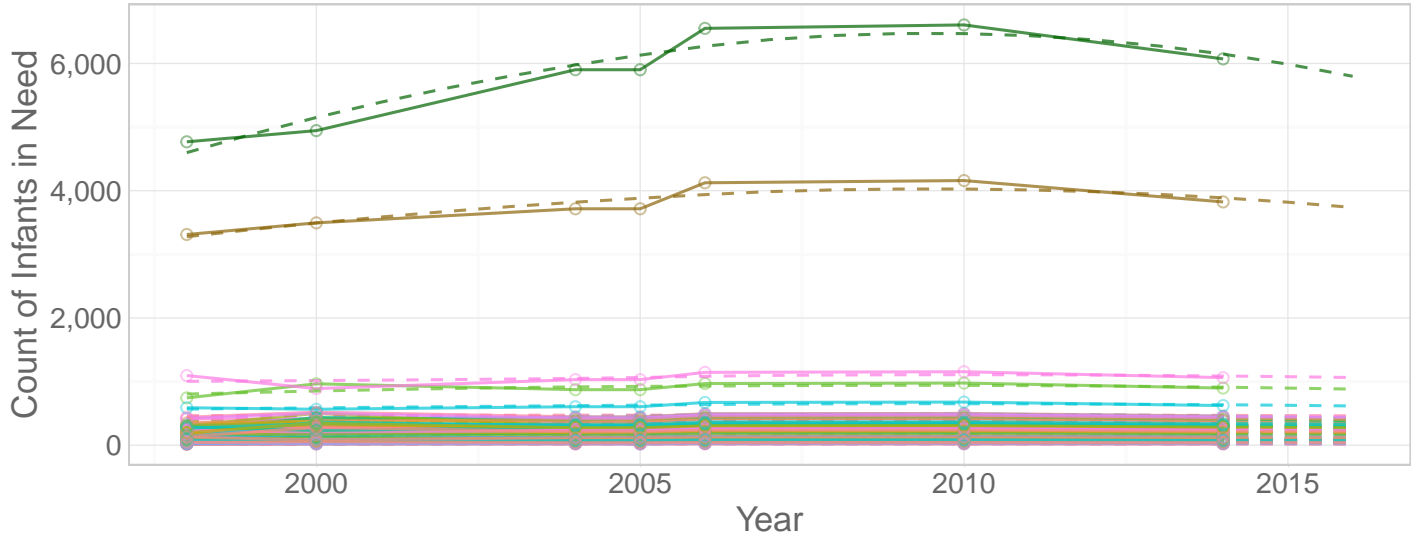
Infants in Need, by County (zoomed in)
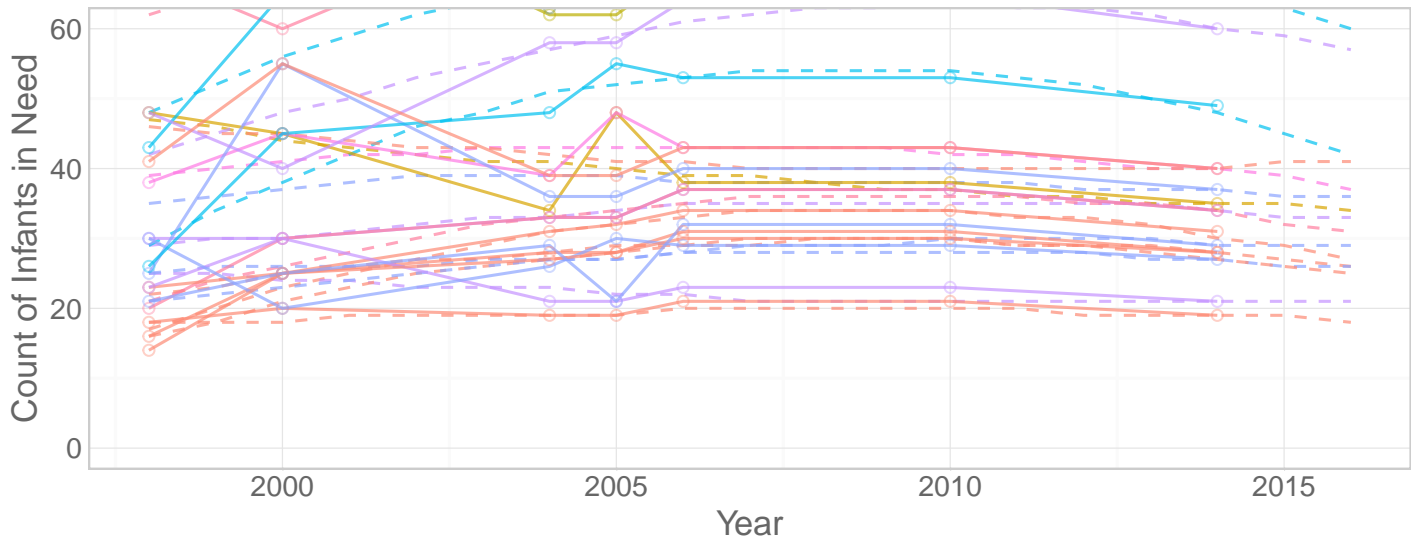
5 Demographics across Lead Nurse Regions and Counties

Here are some demographics for the C1 Lead Nurse Regions, using WIC's 2010 estimates of the total population need. Notice that some reports use the more selective 'Infants in Need' instead. The final column is the percentage of the population in need. Counties with an asterisk do not receive C1 funding.

Region	Counties	Pop Total	Pop in Need	Need %
1	Blaine, Creek, Dewey*, Kingfisher, Lincoln, Logan	177,875	6,847	3.8%
2	Beaver*, Cimarron*, Ellis*, Harper*, Texas, Woods*, Woodward	65,546	2,996	4.6%
3	Kay, Noble*, Pawnee, Payne	152,050	6,110	4.0%
4	Atoka, Coal, Pittsburg, Pontotoc	103,436	4,649	4.5%
5	Nowata*, Osage*, Rogers, Washington	195,889	5,896	3.0%
6	Bryan, Choctaw, McCurtain, Pushmataha*	102,344	5,662	5.5%

7	Cleveland, McClain*	290,261	6,929	2.4%
8	Latimer*, Le Flore	61,538	3,253	5.3%
9	Garvin, Grady, Murray, Stephens	138,543	5,508	4.0%
10	Canadian, Custer, Washita*	154,639	4,510	2.9%
11	Adair, Muskogee, Sequoyah, Wagoner	209,149	9,617	4.6%
12	Carter, Jefferson*, Johnston, Love*, Marshall	90,249	4,381	4.9%
13	Haskell*, McIntosh, Okmulgee	73,090	3,607	4.9%
14	Beckham, Greer*, Harmon*, Jackson, Roger Mills*, Tillman*	69,365	3,707	5.3%
15	Alfalfa*, Garfield, Grant*, Major*	78,276	3,315	4.2%
16	Hughes, Okfuskee*, Pottawatomie, Seminole	121,118	5,829	4.8%
17	Caddo, Comanche, Cotton*, Kiowa*	169,337	9,439	5.6%
18	Cherokee, Craig, Delaware, Mayes, Ottawa	176,610	8,741	4.9%
19	Oklahoma	718,633	37,921	5.3%
20	Tulsa	603,403	24,746	4.1%

Here a some demographics for Oklahoma's funded and unfunded counties, using WIC's estimates of need in 2010.

ID	County	Lead Nurse Region	C1	Pop Total	Pop in Need	Need %
1	Adair	11	Y	22,683	1,526	6.7%
2	Alfalfa	15	-	5,642	172	3.0%
3	Atoka	4	Y	14,182	730	5.1%
4	Beaver	2	-	5,636	166	2.9%
5	Beckham	14	Y	22,119	1,007	4.6%
6	Blaine	1	Y	11,943	457	3.8%
7	Bryan	6	Y	42,416	1,830	4.3%
8	Caddo	17	Y	29,600	1,778	6.0%
9	Canadian	10	Y	115,541	2,704	2.3%
10	Carter	12	Y	47,557	2,508	5.3%
11	Cherokee	18	Y	46,987	2,705	5.8%
12	Choctaw	6	Y	15,205	1,032	6.8%
13	Cimarron	2	-	2,475	152	6.1%
14	Cleveland	7	Y	255,755	5,760	2.3%
15	Coal	4	Y	5,925	277	4.7%
16	Comanche	17	Y	124,098	6,886	5.5%
17	Cotton	17	-	6,193	242	3.9%
18	Craig	18	Y	15,029	566	3.8%
19	Creek	1	Y	69,967	2,919	4.2%
20	Custer	10	Y	27,469	1,279	4.7%
21	Delaware	18	Y	41,487	1,946	4.7%
22	Dewey	1	-	4,810	218	4.5%
23	Ellis	2	-	4,151	163	3.9%
24	Garfield	15	Y	60,580	2,653	4.4%
25	Garvin	9	Y	27,576	1,287	4.7%
26	Grady	9	Y	52,431	1,922	3.7%
27	Grant	15	-	4,527	169	3.7%
28	Greer	14	-	6,239	238	3.8%
29	Harmon	14	-	2,922	162	5.5%
30	Harper	2	-	3,685	155	4.2%
31	Haskell	13	-	12,769	602	4.7%
32	Hughes	16	Y	14,003	740	5.3%
33	Jackson	14	Y	26,446	1,674	6.3%
34	Jefferson	12	-	6,472	267	4.1%
35	Johnston	12	Y	10,957	491	4.5%
36	Kay	3	Y	46,562	2,548	5.5%
37	Kingfisher	1	Y	15,034	623	4.1%
38	Kiowa	17	-	9,446	533	5.6%
39	Latimer	8	-	11,154	564	5.1%
40	Le Flore	8	Y	50,384	2,689	5.3%
41	Lincoln	1	Y	34,273	1,412	4.1%
42	Logan	1	Y	41,848	1,218	2.9%
43	Love	12	-	9,423	407	4.3%
44	McClain	7	-	34,506	1,169	3.4%
45	McCurtain	6	Y	33,151	2,189	6.6%
46	McIntosh	13	Y	20,252	913	4.5%
47	Major	15	-	7,527	321	4.3%
48	Marshall	12	Y	15,840	708	4.5%
49	Mayes	18	Y	41,259	1,859	4.5%
50	Murray	9	Y	13,488	516	3.8%
51	Muskogee	11	Y	70,990	3,983	5.6%
52	Noble	3	-	11,561	447	3.9%
53	Nowata	5	-	10,536	434	4.1%
54	Okfuskee	16	-	12,191	589	4.8%
55	Oklahoma	19	Y	718,633	37,921	5.3%
56	Okmulgee	13	Y	40,069	2,092	5.2%
57	Osage	5	-	47,472	1,436	3.0%

58	Ottawa	18	Y	31,848	1,665	5.2%
59	Pawnee	3	Y	16,577	635	3.8%
60	Payne	3	Y	77,350	2,480	3.2%
61	Pittsburg	4	Y	45,837	1,725	3.8%
62	Pontotoc	4	Y	37,492	1,917	5.1%
63	Pottawatomie	16	Y	69,442	2,983	4.3%
64	Pushmataha	6	-	11,572	611	5.3%
65	Roger Mills	14	-	3,647	185	5.1%
66	Rogers	5	Y	86,905	2,185	2.5%
67	Seminole	16	Y	25,482	1,517	6.0%
68	Sequoyah	11	Y	42,391	1,989	4.7%
69	Stephens	9	Y	45,048	1,783	4.0%
70	Texas	2	Y	20,640	1,350	6.5%
71	Tillman	14	-	7,992	441	5.5%
72	Tulsa	20	Y	603,403	24,746	4.1%
73	Wagoner	11	Y	73,085	2,119	2.9%
74	Washington	5	Y	50,976	1,841	3.6%
75	Washita	10	-	11,629	527	4.5%
76	Woods	2	-	8,878	256	2.9%
77	Woodward	2	Y	20,081	754	3.8%

6   Session Information

Report rendered by Will at Fri Jan 15 16:04:48 2016

- R version 3.2.3 Patched (2015-12-12 r69765), `x86_64-w64-mingw32`

- Base packages: base, datasets, graphics, grDevices, grid, methods, stats, utils

- Other packages: classInt 0.1-23, colorspace 1.2-6, ggplot2 2.0.0, knitr 1.12, maps 3.0.2, plyr 1.8.3, scales 0.3.0, stringr 1.0.0, xtable 1.8-0

- Loaded via a namespace (and not attached): assertthat 0.1, class 7.3-14, DBI 0.3.1.9008, digest 0.6.9, dplyr 0.4.3, e1071 1.6-7, evaluate 0.8, formatR 1.2.1, gtable 0.1.2, labeling 0.3, magrittr 1.5, mapproj 1.2-4, munsell 0.4.2, parallel 3.2.3, R6 2.1.1, Rcpp 0.12.3, readr 0.2.2, stringi 1.0-1, tools 3.2.3

7   Additional Information

We would like to address any questions or suggestions during any stage of the evaluation. Please contact David Bard (David-Bard@ouhsc.edu), Will Beasley (William-Beasley@ouhsc.edu), or Thomas Wilson (Thomas-Wilson@ouhsc.edu).