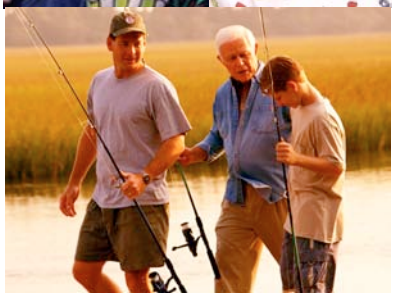
Summary of Reportable Injuries in Oklahoma

Burn & Smoke Inhalation Injuries in Oklahoma, 1988-2004



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Burn and Smoke Inhalation Injuries in Oklahoma, 1988-2004

Background

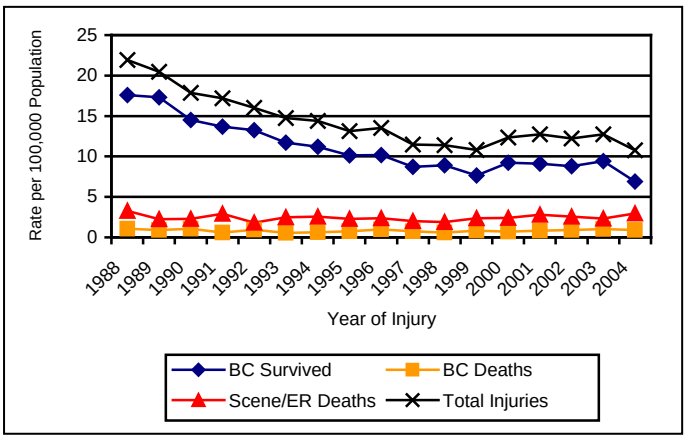
Hospitalized and fatal burns and smoke inhalation injuries were made reportable conditions in Oklahoma in November 1986. In September 1987, systematic data collection of all burn and smoke inhalation injuries from the three burn centers in the state and the Office of the Chief Medical Examiner began. In 1992, surveillance was expanded to include all hospitals in Oklahoma. Patients with a discharge diagnosis of ICD-9-CM codes 940.0-949.9 and 987.9 were included in surveillance. This expanded surveillance continued through 1996. In 1997, surveillance was consolidated to the data collection method used in 1987. In order for data to be consistent through the years since the beginning of collection, only data collected from the three burn centers and the Office of the Chief Medical Examiner were included in this summary. Since the data collected in 1987 was not complete for the year, that year was excluded from the analysis as well. Average annual rates were calculated using bridged-race population estimates summed for all 17 years of data with the exception of the years 1988-1989 for which regular census data were used.

Table 1. Case-Fatality Rates of Burn-Related Injuries by Agent, Oklahoma, 1988-2004

Agent	Total Burns	%	Number of Deaths	%	Case-fatality rate
Residential Fire	1,639	20%	1,097	59%	67%
Other Flame/Fire	3,376	42%	623	34%	18%
Hot Liquid	1,817	23%	29	2%	2%
Hot Solid	490	6%	18	1%	4%
Electricity	390	5%	69	4%	18%
Chemical	197	2%	3	0.2%	2%
Other	165	2%	14	0.8%	8%
Total	8,074	100%	1,853	100%	23%

- A total of 8,074 persons were hospitalized in a burn center or died from burn/smoke inhalation injuries.
- Flame/fire burns accounted for 62% of all burns and 93% of all burn deaths.
- Males accounted for 73% of all burn injuries.
- 38% of females died as a result of their burn injuries, while only 27% of males sustained fatal burn injuries.

Figure 1. Burn-Related Injury Rates by Year & Hospitalization Status, Oklahoma, 1988-2004



- Overall, the number of injuries dropped from 695 in 1988 to 380 in 2004 for a 45% decrease.
- The rate of admission to a burn center dropped 53% from 1988 to 2004.
- In 1988 and 2004, the same number of persons died at the scene or in the emergency department (104).
- The lowest number of pre-hospital deaths occurred in 1992 (58), 44% fewer than in 1988 and 2004.

Table 2. Burn-Related Injury Rates by Age Group and Outcome, Oklahoma, 1988-2004

Age Group	Total Injuries	% of Total Injuries	Annual Rate per 100,000 Population	Fatal Injuries	Case-Fatality Rate
0-4	1,425	18%	35.7	199	14%
5-14	754	9%	9.1	105	14%
15-24	1,131	14%	13.4	209	18%
25-34	1,383	17%	17.1	252	18%
35-44	1,179	15%	14.1	272	23%
45-54	775	10%	11.4	214	28%
55-64	535	7%	10.4	172	32%
65+	882	11%	11.7	427	48%
Unknown	10	0.1%	--	3	--
Total	8,074	100%	14.2	1,853	23%

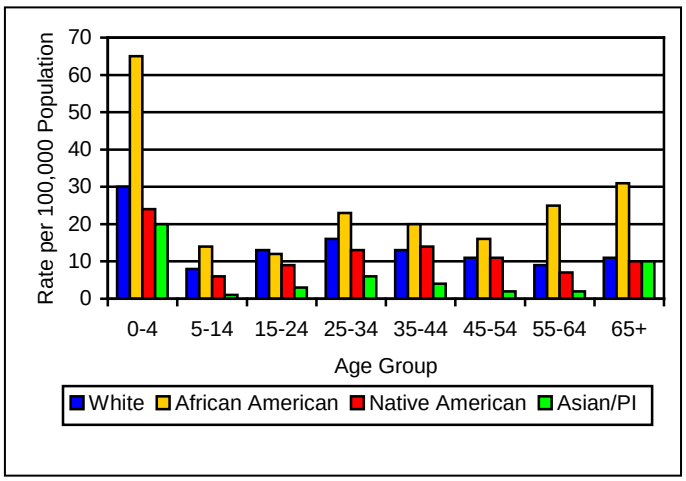
- Ages ranged from infants less than 1 month old to 99 years.
- Children between the ages 0 and 4 had the highest rate of injury.
- Persons 65 years and older had the highest case-fatality rate.
- Males had a higher rate of injury across all age groups than females (overall rates 21.1 and 7.7 per 100,000 population, respectively).

Table 3. Three Leading Causes of Burn-Related Injuries by Age Group, Oklahoma, 1988-2004

Age Group	Causes of Burn-Related Injuries (Fatal/Total)					
0-4	Scald	(5/699)	Flame/Fire	(191/387)	Hot Solid	(2/261)
5-14	Flame/Fire	(101/513)	Scald	(2/158)	Hot Solid	(0/41)
15-24	Flame/Fire	(196/747)	Scald	(4/215)	Electricity*	(10/70)
25-34	Flame/Fire	(230/927)	Scald	(1/253)	Electricity*	(20/112)
35-44	Flame/Fire	(242/801)	Scald	(0/204)	Electricity*	(23/84)
45-54	Flame/Fire	(201/546)	Scald	(2/118)	Electricity*	(6/45)
55-64	Flame/Fire	(163/398)	Scald	(3/73)	Electricity*	(3/22)
65+	Flame/Fire	(393/688)	Scald	(16/116)	Hot Solid	(8/46)
*Excludes Medical Examiner cases coded "electricity" without mention of burns.						

- Case-fatality rates for each age group were highest for the flame/fire category, ranging from 20% (5-14 year olds) to 57% (65+ year olds).
- Almost half (49%) of all burn injuries among children under the age of 5 were scalds.
- 78% of burn injuries among persons 65 years and older were by flame or fire.

Figure 2. Burn-Related Injury Rates by Age Group & Race, Oklahoma, 1988-2004



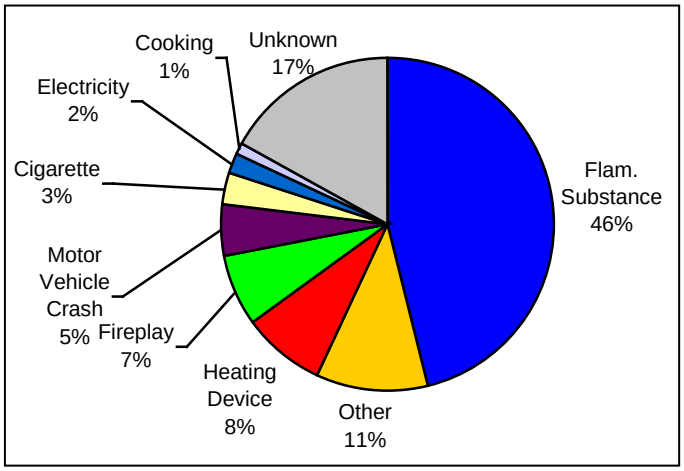
- African Americans had the highest injury rates in every age group except 15-24.
- Asians had the lowest rates in every age group with an overall rate of 5.0 burn injuries per 100,000 population.
- Rates were highest for African Americans 0-4 years of age followed by African Americans ages 65 and older (65.0 and 31.1 per 100,000 population, respectively).

Table 4. Burn-Related Injuries by Alcohol Use* & Agent, Oklahoma, 1988-2004

Agent	Using Alcohol/Total Burns	% Positive
Chemical	4 / 159	3%
Electrical	19 / 341	6%
Flame/Fire	801 / 4107	20%
Hot Solid	20 / 188	11%
Scald	49 / 979	5%
Other	19 / 111	17%
Total	912 / 5885	16%
*Includes only persons over 14 years of age.		

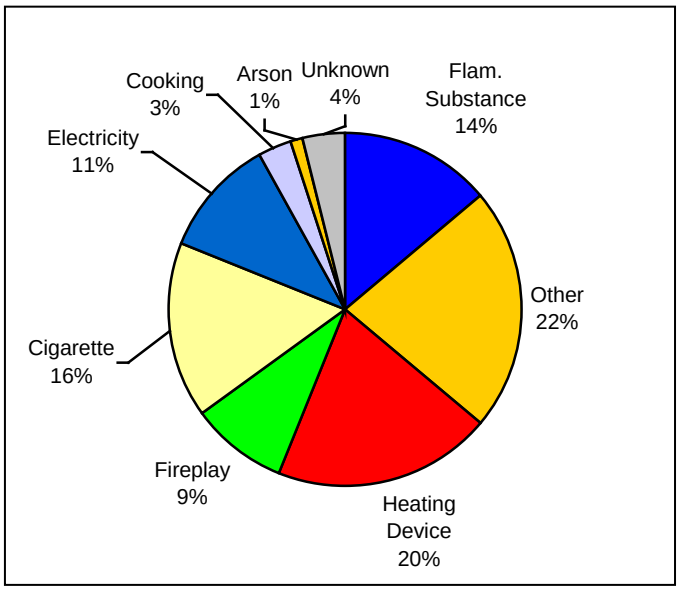
- Alcohol use was highest among persons injured by flame/fire.
- 46% of all persons positive for alcohol were 25 to 44 years of age.
- The odds of death from a burn were over 4 times higher for persons using alcohol than persons not using alcohol.
- The case-fatality rate among persons using alcohol was 54%, compared to 22% among non-alcohol users.

Figure 3. Leading Causes of Non-Residential Flame/Fire-Related Burns, Oklahoma, 1988-2004



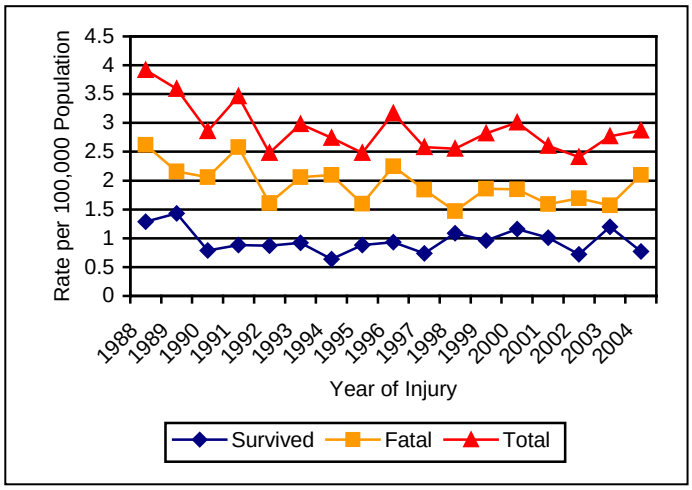
- Flammable substances accounted for almost half of non-residential flame/fire-related burns.
- Gasoline made up two-thirds of the flammable substance category.
- Propane, natural gas, and diesel fuel combined, accounted for another 10% of flammable substances.
- The "other" category included flame/fire injuries such as stepping or falling into a fire.

Figure 4. Leading Causes of Residential Flame/Fire-Related Burns, Oklahoma, 1988-2004



- Wood burning stoves/heaters accounted for 21% of heating device burns, followed by propane and gas stoves/heaters (20%), and space heaters (17%).
- Gasoline accounted for 38% of flammable substance burns.
- 50% of injuries resulting from fire play began with a lighter and 27% with matches. Various items such as fireworks, stoves, and other open flame sources started the rest.

Figure 5. Residential Fire-Related Injury Rates by Year & Outcome, Oklahoma, 1988-2004



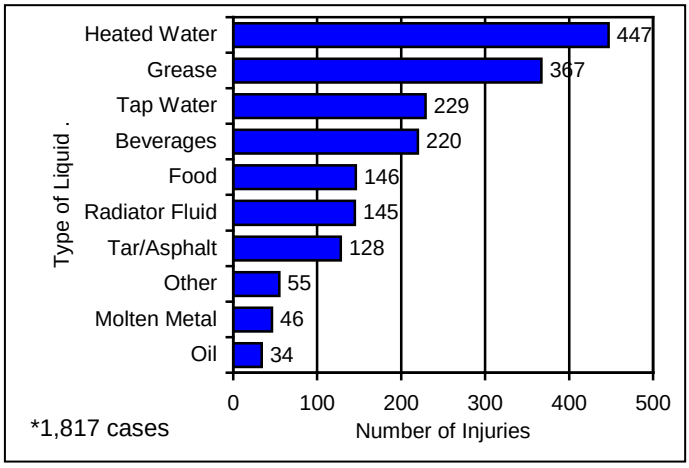
- There were 1,639 residential fire-related burns for the 17-year period.
- The overall rate of residential fire injuries decreased 23% from the first 3-year period (1988-1990) compared to the last 3-year period (2002-2004).
- There was an average of 96 residential fire injuries per year.
- The male to female ratio for residential fire injuries was 1.7:1.

Table 5. Residential Fire-Related Injuries by Smoke Alarm Status, Sleep Status & Outcome, Oklahoma, 1988-2004

Smoke Alarm Present	Asleep		Awake	
	Fatal/Total	%	Fatal/Total	%
No	329/428	77%	186/324	57%
Yes	42/78	54%	49/97	51%
Sleep status unknown for 321. Smoke alarm status unknown for 529.				

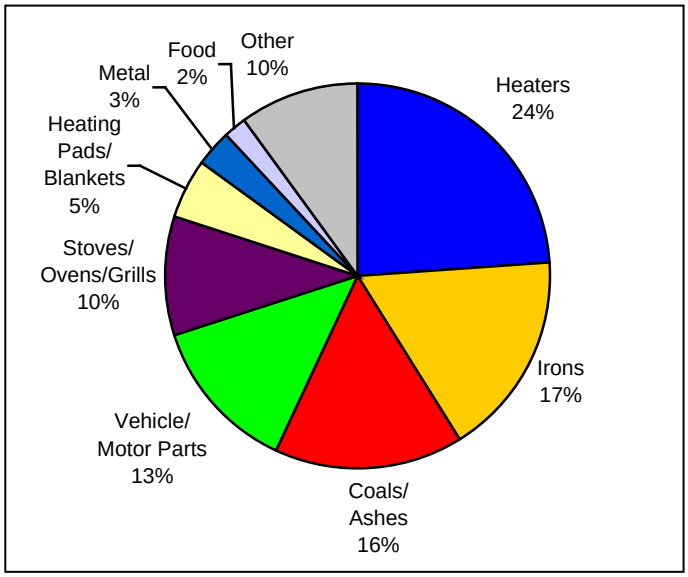
- The odds of a person dying if they were asleep at the time of a fire and did not have a smoke alarm were almost 3 times greater than persons that were asleep and did have a smoke alarm.
- The case-fatality rate for all persons injured in a house fire without a smoke alarm was higher than persons with a smoke alarm (72% and 56%, respectively).

Figure 6. Scald Burns by Type of Liquid, Oklahoma, 1988-2004



- 37% of scald burns were caused by water from the tap or water heated on the stove or in a microwave.
- 39% of scalds were among children under the age of 5.
- 38% of scalds among persons 18 years and older occurred at work and involved tar/asphalt, grease, molten metals, or hot water/steam.

Figure 7. Burns from Hot Solids by Contact Source, Oklahoma, 1988-2004



- 53% of hot solid burns were among children under the age of 5.
- Hot solid burns among children under the age of 5 were most commonly due to heaters (26%), irons (26%), coals/ashes (22%), and stoves/ovens (12%).
- 89% of persons with burns from hot solids had burns on less than 10% of their body.

Figure 8. Burn Injury Rates by County of Residence, Oklahoma, 1988-2004

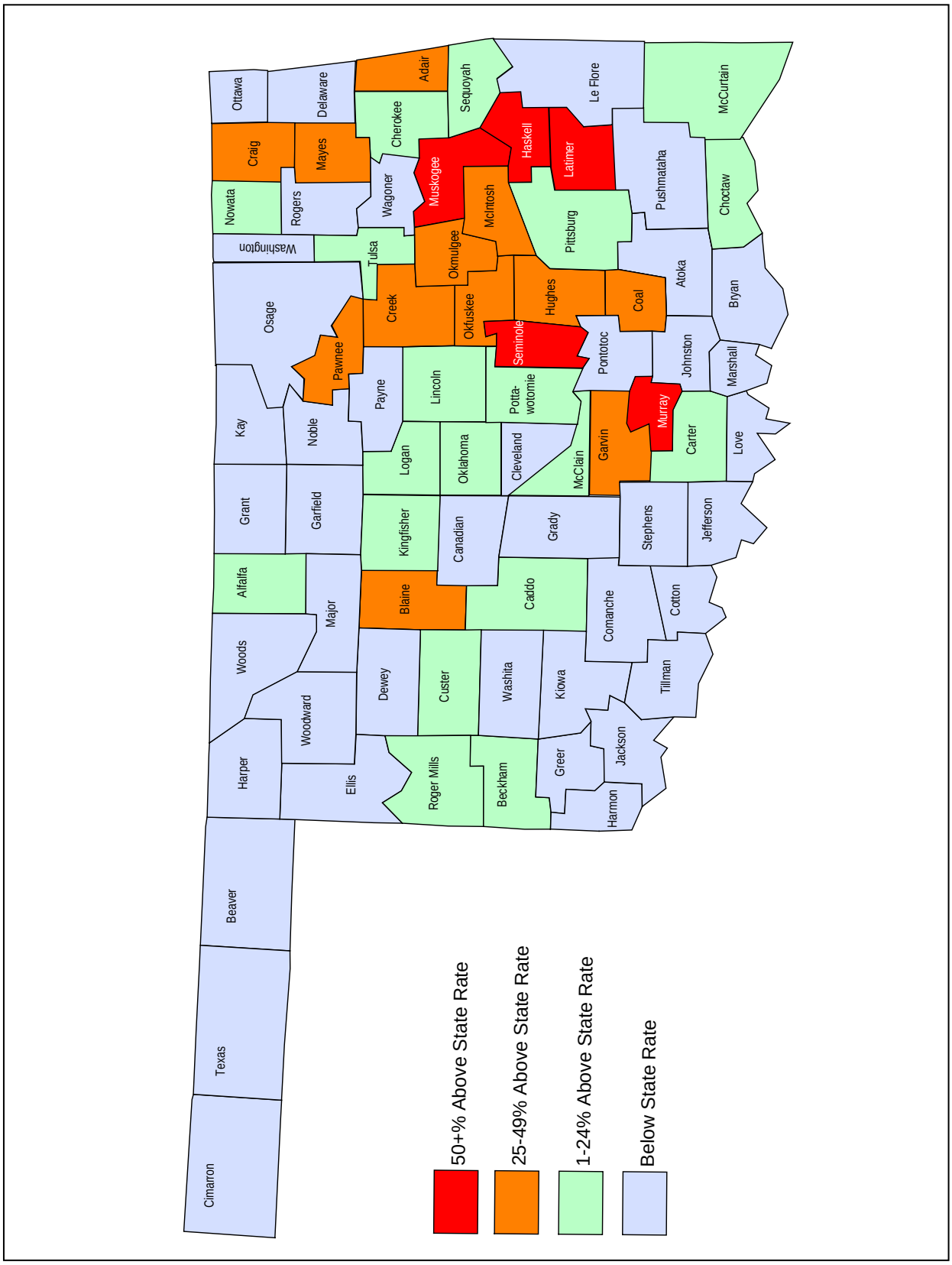


Table 6. Burn Injury Rates by County of Residence, Oklahoma, 1988-2004

County	Average Annual Population	Number of Cases 1988-2004	Average Annual Rate*
Latimer	10,511	56	31.3
Murray	12,413	60	28.4
Haskell	11,447	49	25.2
Seminole	25,089	99	23.2
Muskogee	69,203	259	22.0
Creek	64,957	229	20.7
Okmulgee	38,441	135	20.7
Pawnee	16,115	56	20.4
Blaine	11,728	40	20.1
Coal	5,923	20	19.9
Mayes	36,292	121	19.6
Craig	14,581	48	19.4
Adair	20,124	66	19.3
McIntosh	18,394	60	19.2
Hughes	13,535	44	19.1
Garvin	26,941	87	19.0
Okfuskee	11,612	37	18.7
Logan	32,171	95	17.4
Lincoln	30,740	90	17.2
Nowata	10,298	30	17.1
McCurtain	33,982	99	17.1
Kingfisher	13,672	39	16.8
Sequoyah	36,922	105	16.7
Carter	44,716	127	16.7
Cherokee	39,091	109	16.4
Oklahoma	638,986	1,775	16.3
McClain	25,749	70	16.0
Caddo	30,074	81	15.8
Tulsa	539,185	1,425	15.5
Beckham	19,200	49	15.0
Custer	26,289	66	14.8
Pottawatomie	62,663	156	14.6
Choctaw	15,400	38	14.5
Pittsburg	42,932	106	14.5
Roger Mills	3,699	9	14.3
Alfalfa	6,224	15	14.2
State of Oklahoma	3,335,178	8,074	14.2
Woodward	18,773	45	14.1
Noble	11,296	27	14.1
Pushmataha	11,414	27	13.9
Dewey	5,064	12	13.9
Love	8,502	20	13.8
Osage	43,435	102	13.8
Jefferson	6,903	16	13.6
Harmon	3,475	8	13.5
Kay	48,204	108	13.2
Washita	11,514	25	12.8
Le Flore	46,238	99	12.6
Ottawa	31,922	68	12.5
Delaware	33,494	71	12.5
Johnston	10,314	22	12.5
Rogers	64,586	135	12.3
Grady	44,205	91	12.1
Marshall	12,312	25	11.9
Ellis	4,220	8	11.2
Canadian	82,949	156	11.1
Kiowa	10,695	20	11.0
Atoka	13,526	25	10.9
Wagoner	53,989	97	10.6
Stephens	42,992	75	10.3
Pontotoc	34,651	59	10.0
Tillman	9,715	16	9.7
Greer	6,239	10	9.4
Bryan	34,727	54	9.1
Washington	48,585	73	8.8
Garfield	57,383	82	8.4
Major	7,722	11	8.4
Grant	5,370	7	7.7
Cleveland	195,679	240	7.2
Jackson	28,729	34	7.0
Payne	65,597	78	7.0
Woods	9,017	10	6.5
Comanche	114,735	112	5.7
Texas	18,303	17	5.5
Cimarron	3,191	3	5.5
Cotton	6,590	6	5.4
Beaver	5,878	5	5.0
Harper	3,742	3	4.7

*Average annual rates per 100,000 population were computed using bridge-race population estimates summed for all 17 years of data with the exception of the years 1988-1989 for which regular census data were used. County of residence was unknown for 22 cases.