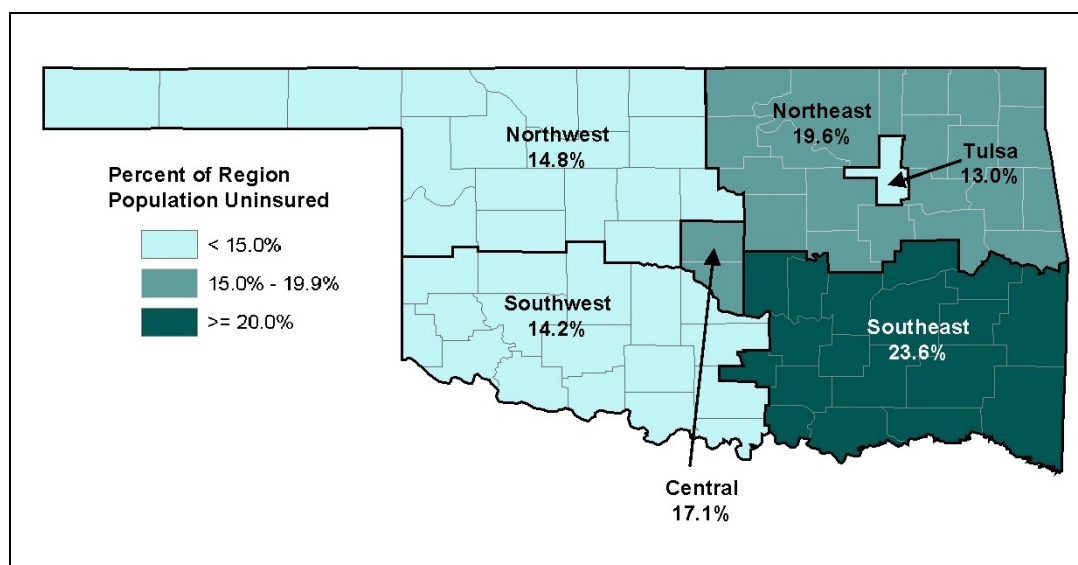**Issue 6/May 2005**

Estimates of Oklahoma County-Level Health Insurance Coverage Rates:
Results from Oklahoma's 2004 Household Survey

INTRODUCTION

The 2004 Oklahoma Health Care Insurance and Access Survey was conducted to measure the number and percentage of those without health insurance in Oklahoma. The survey sample was designed to provide estimates of health insurance coverage for the state as a whole and six different geographic regions made up of groups of counties. Survey findings indicate the overall rate of uninsurance for the state was 17.3%. This rate varied by region, ranging from a low of 13.0% in Tulsa to a high of 23.6% in the Southeast Region.

In addition to using survey data to estimate levels of uninsurance at the state level, many states are interested in generating estimates of uninsurance at the substate or county level. Most state surveys, including the 2004 Oklahoma Health Care Insurance and Access Survey, are able to yield estimates for larger regions or groups of counties, as shown in Figure 1. While the regional estimates are informative, most states would like even more detailed information including estimates at the county level to inform local policy makers.

Figure 1. Rates of Uninsurance in Oklahoma by Geographic Region, 2004

Source: 2004 Oklahoma Health Care Insurance and Access Survey

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When more targeted estimates for smaller subdivisions of a state are required, there are two basic methods of obtaining these estimates. The first approach – the direct survey method – requires that a large enough random sample is drawn from each subdivision to ensure a reliable estimate. Frequently in state surveys, the sample size in each individual county is insufficient to ensure reliable estimates. In addition, it is typically cost-prohibitive to obtain large enough sample sizes to generate reliable estimates of uninsurance in these small, substate areas.

The second approach – statistical modeling – allows analysts to generate estimates at the substate level. This issue brief presents the results of analysis using statistical modeling to generate county-level estimates of health insurance coverage in Oklahoma. The results presented here may be used to inform policy makers on how to target programs and interventions on areas of greatest need.

DATA AND METHODS

Findings from the 2004 Oklahoma Health Care Insurance and Access Survey, as well as numerous national and state studies of health coverage, suggest that an individual's age, race and ethnicity, employment status and income are all strongly associated with a person's likelihood of having health insurance coverage. To derive county-level estimates of health insurance coverage we used a small area estimation technique that took into account the direct survey estimate of uninsurance, other individual level characteristics, and county level characteristics in an Empirical Bayes modeling process.[1] The direct survey estimates of uninsurance were given very little weight in counties for which there are very few observations. This is due to the relative unreliability of estimates based on few observations. Instead, uninsurance rates for these counties were more dependent on the direct estimated overall statewide rate. For counties that had a large number of observations, more weight was given to the estimates based on a multivariate model that included individual level characteristics [2] and county level characteristics. [3] The data for our analysis came from the 2004 Oklahoma Health Care Insurance and Access Survey.

RESULTS OF ANALYSIS

Table 1 provides a distribution of the ranges of uninsurance rates across the state of Oklahoma. The lowest estimated rate of uninsurance rate was 11.7% in McClain County in the Southwest Region. Adair County, in Northeast Region had the highest estimate of 29.0%.

Table 1. Distribution of Estimates of Oklahoma Uninsurance Rates by County

Uninsurance Rate	Number of Counties	% of Counties
<15.0%	10	13.0%
15.0-16.9%	16	20.8%
17.0-18.9%	21	27.3%
19.0-20.9%	15	19.5%
21.0%+	15	19.5%

Source: Small area estimation model using the 2004 Oklahoma Health Care Insurance and Access Survey.

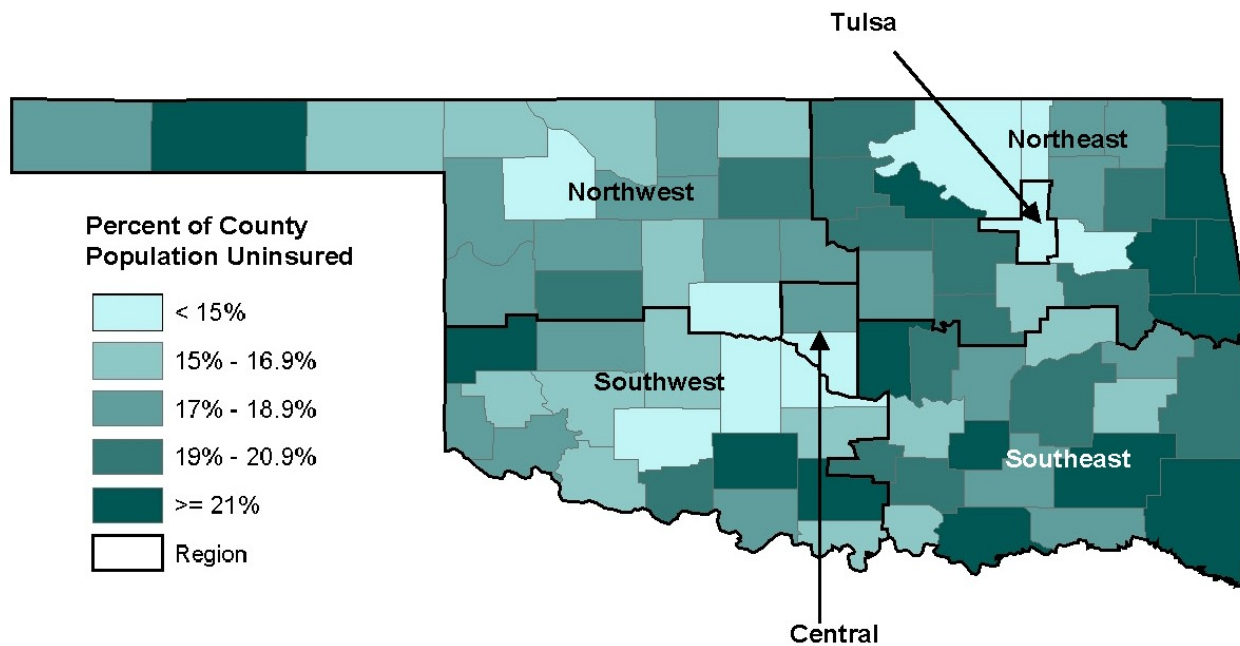## Figure 2. Estimates of Oklahoma Uninsurance Rates by County

Figure 2 shows the wide variation in uninsurance rates by county across the state of Oklahoma, with the darker shading indicating higher uninsurance rates and the lighter shading indicating lower rates. All of the counties shaded with the two lightest shades (and a portion of the counties in the middle shade) indicate uninsurance rates below the state average of 17.3%. A comparison of the map in Figure 2 with the regional estimates in Figure 1 highlights pockets of high rates of uninsurance within the larger regions.

Lower uninsurance rates are concentrated in counties with metropolitan areas, including Tulsa and the

Central Region, as well as the city of Lawton in Comanche County. Tulsa falls in the lowest range (<15%) as do many of the counties surrounding Oklahoma City. Higher uninsurance rates are scattered through the remaining regions, with the majority in the Southeast and Northeast Regions. A large majority of counties in these two regions are above 17.3%, the average rate of uninsurance in Oklahoma.

All of the individual county estimates are displayed in Table 2. [4]

Table 2. Estimates of Uninsurance by County, Oklahoma 2004

Region/County	Uninsured	Region/County	Uninsured
Central		**Southeast**	
Cleveland	14.2%	Atoka	17.4%
Oklahoma	17.8%	Bryan	23.7%
Northeast		Choctaw	17.2%
Adair	29.0%	Coal	23.5%
Cherokee	23.1%	Haskell	18.9%
Craig	18.0%	Hughes	18.8%
Creek	19.0%	Johnston	19.7%
Delaware	24.9%	Latimer	15.8%
Kay	19.7%	LeFlore	19.9%
Lincoln	17.3%	Marshall	16.7%
Mayes	19.6%	McCurtain	21.7%
Muskogee	19.5%	McIntosh	16.4%
Noble	19.5%	Murray	19.4%
Nowata	18.6%	Pittsburg	20.2%
Okfuskee	19.9%	Pontotoc	16.4%
Okmulgee	15.2%	Pottawatomie	21.9%
Osage	14.4%	Pushmataha	23.7%
Ottawa	22.0%	Seminole	20.2%
Pawnee	21.9%	**Southwest**	
Payne	19.5%	Beckham	24.6%
Rogers	18.1%	Caddo	15.6%
Sequoyah	21.8%	Carter	22.7%
Wagoner	14.8%	Comanche	13.3%
Washington	14.9%	Cotton	19.3%
Northwest		Garvin	15.9%
Alfalfa	18.6%	Grady	13.0%
Beaver	16.0%	Greer	16.0%
Blaine	16.8%	Harmon	17.4%
Canadian	12.2%	Jackson	17.3%
Cimarron	18.1%	Jefferson	18.2%
Custer	20.6%	Kiowa	16.3%
Dewey	18.7%	Love	16.9%
Ellis	17.4%	McClain	11.7%
Garfield	20.8%	Stephens	23.6%
Grant	15.6%	Tillman	16.9%
Harper	16.1%	Washita	18.3%
Kingfisher	18.0%	**Tulsa**	
Logan	18.1%	Tulsa	13.9%
Major	17.4%		
Roger Mills	17.4%		
Texas	23.6%		
Woods	15.5%		
Woodward	13.7%		

Source: Small area estimation model using the 2004 Oklahoma Health Care Insurance and Access Survey.

SUMMARY

The data presented in this brief represent model-based estimates of uninsurance rates at the county level using the data from the 2004 Oklahoma Health Care Insurance and Access Survey. The data provide additional information about the distribution of people without health insurance coverage throughout the state of Oklahoma. While the information is helpful at the local level, policy makers must use caution when using these data to compare changes in these rates over time. The data is most useful to estimate uninsurance rates during this time period and the significant variation in those rates across geographic areas of the state.

NOTES

[1] The analysis relied on a mixed model that used Empirical Bayes estimation for counties with fewer than 25 observations and a multi-variate model that included 15 individual level covariates for counties with 25 or more observations. As a final step, a raking procedure was used to ensure the weighted county-level estimates of coverage equaled the state-level estimate of coverage. Further information on the steps of the analysis is available upon request.

[2] The individual level variables used in the analysis included: age, race, gender, income as a percent of the federal poverty level (FPL), education, employment status, and employer size.

[3] The county level variables included: the percent of the county enrolled in Medicaid, percent over age 65, percent not white, percent living in poverty, percent unemployed, and the median income of the county. Exploratory work on the multivariate model indicated that as a group, these county-level covariates were *not* statistically significant. Thus, they were not used in our final modeling analysis.

[4] The methodology used to estimate county-level rates of health insurance coverage does not produce standard errors. Therefore, significance testing is not possible.