County Estimates of the Number of Uninsured in North Carolina
2005 Update

Mark Holmes and Tom Ricketts
Cecil G. Sheps Center for Health Services Research
University of North Carolina at Chapel Hill
and
The North Carolina Institute of Medicine

Introduction

According to the United States Bureau of the Census, in 2005, 44.8 million U.S. residents lacked health insurance for the entire year. Approximately 1.3 million of those uninsured Americans lived in North Carolina. Substantial policy interest has focused on the uninsured both nationally. Given the annual increases North Carolina has experienced, it is an especially important issue in this state. The percent of North Carolina residents that lack health insurance for a full year has risen from 15.3 percent in 2000 to 17.2 percent in 2005.[1] Analysis of the rate of uninsured for small areas, such as counties, is often impossible due to data limitations. Policy interventions aimed at the uninsured are likely to be most effective at local levels. For example, a health care provider interested in providing low cost or free care for uninsured individuals might consider the rate of health insurance coverage when deciding where to offer services. The lack of small area estimates on the rate of health insurance coverage substantially limits the ability to effectively target of some possible solutions to the health insurance problem.

Background

To address the absence of county-level estimates of the uninsured in North Carolina, in March 2001 the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill issued a report entitled *County-Level Estimates of the Uninsured in North Carolina, 1995-1999*. That report used data from the U.S. Census Bureau's Current Population Surveys (CPS) and other data sources to estimate the number of persons under the age of 65 years who did not have health insurance in each of North Carolina's 100 counties.[2] Because the sample size of the CPS (the source for most government estimates of health insurance coverage) is insufficient to support estimates at geographic levels smaller than the state, the approach taken by this initial report was to investigate the factors that increase the likelihood of lacking health insurance coverage and then extrapolating those relationships onto data from individual counties. For example, if 20 percent of males and 10 percent of females in North Carolina are uninsured, then these rates can be applied to county level characteristics to generate an estimate of the rate of uninsured in a particular county. The authors of the initial report considered characteristics such as gender, age, race, ethnicity, poverty status, educational attainment, and employment. This report updates that analysis to provide estimates of health insurance coverage for 2005.

Because data sources and methodology differ between the annual reports produced by the Sheps Center, direct comparison of rates from the different periods is not recommended. The data used for the estimates of health insurance coverage are drawn primarily from the U. S. Census Bureau's annual survey of insurance coverage, which reports a statewide rate. In order to make county-level estimates of the uninsured, two years of CPS data are pooled and reported in this analysis. The two-year weighted average creates an overall statewide estimate that differs slightly from the CPS estimates for any year during that period.

---

[1] The U.S. Census Bureau recently acknowledged a computer programming error has generated slightly higher estimates of uninsured since 1995. The Bureau has released revised (corrected) datasets for 2004 and 2005, which are used here. But earlier years – including 2000 – will be released later this summer. Thus, estimates of the uninsured prior to 2004 will be slightly higher than the revised estimates to be released later.

[2] Most North Carolina citizens 65 or over are eligible for Medicare.

Findings in Brief

This report provides county-level estimates of the number and percentage of people under the age of 65 who lack health insurance for 2005. The model used pooled data from the U.S. Census Bureau's CPS and population characteristics of each of North Carolina's 100 counties to estimate the proportion of a county's residents that lack health insurance for *all* of 2005.[3] Calculations were made for two subsets of the population: under age 18 years and those 18 to 64 years of age. The county level estimates ranged from a low of 13.4% in Wake County to a high of 27.5% in Tyrrell County. Along with Wake County, Orange, Mecklenburg, Union, and Cabarrus Counties appeared in the five counties with the lowest rate of uninsured persons under 65 years in 2005. Hyde, Greene, Duplin and Robeson Counties joined Tyrrell County in the counties with the largest proportion of the under age 65 population uninsured in 2005. As might be expected, the counties with the largest absolute numbers of uninsured had the largest overall populations. Approximately 110,000 residents of Mecklenburg County lacked health insurance in 2005. Other counties with large numbers of residents who were uninsured were Wake, Guilford, Cumberland, and Forsyth Counties. Tyrrell County is estimated to have had the fewest uninsured in 2005 at slightly less than 1000.

Developing County-Level Estimates

The goal of this study was to develop county-level estimates of health insurance coverage. The process involved pooling data for two years of CPS statewide surveys and applying those state level estimates to individual county-level data for each of the three years. This procedure adjusts for the specific characteristics prevailing in each county for each of those years. Summing the county level estimates to a statewide number creates a slightly different overall estimate of the number of uninsured in the state from what is reported in the

Census Bureau CPS estimates. This difference is then used to adjust the county-level estimates to ensure internal consistency. Because the CPS sampling is structured to create a state-level estimate, we sought to reconcile our county-level estimates with the CPS. To do this, we adjust the county-level estimates appropriately.[4] If factors increasing the risk of being uninsured have larger effects if other risk factors exist, then the approach we take will underestimate the number of uninsured. For example, it may be the case that being unemployed increases the risk of being uninsured more for those with less education. In other words, the adjustment accounts for the fact that we do not observe multiplicative effects of having multiple risk factors leading to the lack of health insurance.

Data Sources and Assumptions

The 2005 and 2006 Annual Social and Economic Supplement to the Current Population Surveys[5] contained roughly 4000 North Carolina residents each year who were under age 65 and not members of the armed forces. Like the earlier studies, several individual level characteristics were used to quantify the extent to which individual characteristics influence a person's likelihood of having health insurance coverage. The most recent data source was used to update this information, but data sources for some characteristics differed from the earlier reports. The selection of variables that are used to make the estimates was limited by the availability of corresponding county-level variables used to make predictions of the number of uninsured in each county in North Carolina. The model for respondents under age 18 included race, ethnicity, and poverty variables. Age, sex, race, ethnicity , poverty, and income, as well as sector of employment (or lack of employment) were

---

[3] Although the estimates purport to capture full-year uninsurance, the magnitude is closer to "point-in-time" estimates. Thus, most researchers interpret CPS estimates as the percent of the population who is uninsured at any given moment.

[4] Rao (*Small Area Estimation*, 2003) suggests this method to ensure consistent estimates. For further details on this and other technical or modeling questions, please contact the authors.

[5] Note that the year of the CPS refers to the previous year of data. That is, the 2006 CPS describes the 2005 circumstances of the household.

included in the model for persons age 18 to 64.[6] The data were gathered from several sources:

- Information on race, age, gender, and ethnicity were obtained from the U.S. Census Bureau, Population Division for 2005.
- Poverty estimates for 2004 were provided by the U.S. Census Bureau, Housing and Household Economic Statistics Division, Small Area Estimates Branch
- Data from Claritas, a marketing group, provide estimates on family income for 2003.

For adults aged 18-64, we also used the following employment characteristics.

- The North Carolina Employment Security Commission publishes information on 2005 unemployment rates as well as industry employment patterns.
- Information on employer size – a key determinant of employment sponsored insurance — was obtained for 2004 from County Business Patterns, published by the U.S. Census Bureau. These data are based on the county of employment, however. This year, we included Census estimates on commuting patterns to account for cross-county commuting.

Methods
Linear probability regression models were used to quantify the extent to which individual characteristics influence a person's likelihood of having health insurance coverage. Two separate models were estimated. One model estimated the effect of the characteristics on respondents under age 18, and another model examined the population between ages 18 and 64. For respondents over age 65, Medicare coverage was assumed; hence respondents over age 65 were excluded from the analysis. Members of the armed forces were also excluded. The coefficients derived from the regression were applied to county-level

---

[6] For further details, consult earlier versions of this report.

population data. The distribution of the population in each county across the variable categories was used to identify the characteristics of an (artificial) person who is representative of the entire population in that county. For example, if females age 25-29 represent three percent of a county's population, the representative person was assigned a value for that particular variable of 0.03. Using these values and the coefficients obtained from the regression model a probability of being uninsured was calculated for this representative person. The probability of being uninsured was then multiplied by the number of persons in that particular county to estimate the total number of uninsured. This process was repeated for every county and for each of the two population subgroups (0 – 17 years; 18 - 64 years). The estimated total number of uninsured between the ages of 0 and 64 for each county and year was obtained by adding the estimated number of uninsured across the two age groups.

For the estimates presented in this report, our weights were 2005 (.766) and 2004 (.234). That is, the observations from CPS 2005 contributed to the overall estimates but the modeling put more weight on data from recent years. This allows recent developments to be captured by our models.

Results
Table 1 presents the county-specific estimates of the number and percent of children, adults, and individuals below age 65 who lacked health insurance in 2005. The estimates reveal substantial variation across counties in the percentage of the population without insurance.

For more information on the uninsured in North Carolina, visit our websites at
http://www.shepscenter.unc.edu
and
http://www.nciom.org

Table 1: North Carolina County-Level Estimates of Uninsured, 2005

County Name	Ages 0-17			Ages 18-64			Ages 0-64		
	Number	Percent	Rank*	Number	Percent	Rank*	Number	Percent	Rank*
Alamance	4,221	12.4%	64	17,271	19.8%	36	21,493	17.7%	40
Alexander	842	10.3%	14	3,925	17.3%	5	4,767	15.4%	7
Alleghany	265	13.2%	79	1,623	24.1%	84	1,888	21.6%	90
Anson	738	12.1%	59	3,767	23.7%	80	4,506	20.5%	75
Ashe	562	11.6%	43	3,409	21.7%	56	3,970	19.3%	59
Avery	398	11.7%	47	2,622	23.2%	74	3,020	20.6%	76
Beaufort	1,338	12.7%	70	6,085	21.9%	60	7,423	19.3%	61
Bertie	645	13.5%	86	2,936	25.4%	92	3,581	21.9%	93
Bladen	1,117	13.7%	89	4,830	23.9%	81	5,948	21.0%	82
Brunswick	2,078	11.4%	36	11,935	21.7%	57	14,013	19.2%	58
Buncombe	5,110	10.8%	21	25,874	18.7%	19	30,984	16.7%	17
Burke	2,467	11.9%	55	10,207	18.3%	14	12,675	16.5%	16
Cabarrus	3,983	10.3%	15	16,301	17.1%	4	20,284	15.2%	5
Caldwell	1,977	11.0%	25	9,068	18.1%	12	11,046	16.2%	12
Camden	177	8.8%	2	1,231	20.7%	44	1,407	17.7%	38
Carteret	1,214	10.0%	10	7,884	20.0%	39	9,098	17.7%	36
Caswell	603	11.5%	37	3,167	21.1%	50	3,770	18.6%	47
Catawba	4,073	11.2%	29	17,040	17.8%	9	21,112	16.0%	11
Chatham	1,554	12.2%	62	6,959	18.7%	18	8,513	17.0%	26
Cherokee	599	11.6%	42	3,480	22.6%	66	4,079	19.8%	67
Chowan	429	12.6%	68	1,996	23.5%	76	2,425	20.4%	74
Clay	179	10.3%	17	1,324	22.5%	63	1,502	19.7%	65
Cleveland	2,715	11.2%	31	11,442	19.0%	21	14,157	16.8%	20
Columbus	1,837	13.4%	84	8,030	24.3%	86	9,867	21.1%	86
Craven	2,611	10.9%	24	10,955	20.5%	42	13,567	17.5%	34
Cumberland	11,247	12.5%	66	40,996	21.8%	58	52,244	18.8%	56
Currituck	492	9.3%	4	3,329	21.8%	59	3,821	18.6%	49
Dare	641	9.1%	3	4,710	21.3%	52	5,351	18.3%	45
Davidson	4,126	11.3%	34	17,858	18.2%	13	21,984	16.3%	14
Davie	915	10.2%	13	4,273	17.4%	8	5,188	15.5%	8
Duplin	2,312	17.2%	100	8,571	27.0%	96	10,883	24.1%	97
Durham	6,963	11.6%	44	31,222	19.6%	31	38,185	17.4%	31
Edgecombe	1,946	13.8%	91	7,914	23.6%	77	9,860	20.7%	79
Forsyth	9,537	11.8%	53	37,472	18.3%	15	47,010	16.5%	15
Franklin	1,517	11.6%	41	7,307	20.6%	43	8,825	18.1%	44
Gaston	5,091	10.7%	19	22,855	18.4%	16	27,946	16.3%	13
Gates	293	10.9%	22	1,599	22.8%	71	1,892	19.5%	62
Graham	205	11.8%	50	1,170	24.1%	83	1,375	20.8%	80
Granville	1,468	11.7%	48	6,806	19.3%	30	8,273	17.3%	30
Greene	747	15.7%	97	3,524	27.2%	97	4,271	24.1%	98
Guilford	11,620	10.7%	18	50,513	17.9%	11	62,133	15.9%	10
Halifax	1,852	13.2%	80	8,317	24.9%	90	10,169	21.4%	89
Harnett	3,513	12.8%	75	14,777	22.3%	62	18,290	19.5%	63
Haywood	1,248	11.0%	27	6,646	19.6%	32	7,894	17.5%	32
Henderson	2,408	11.9%	56	10,997	19.6%	33	13,405	17.6%	35
Hertford	752	13.6%	88	3,625	24.9%	91	4,378	21.8%	91
Hoke	1,704	13.9%	93	6,402	24.9%	89	8,106	21.3%	88
Hyde	131	12.7%	72	1,052	30.0%	99	1,183	26.1%	99

County Name	Ages 0-17			Ages 18-64			Ages 0-64		
	Number	Percent	Rank*	Number	Percent	Rank*	Number	Percent	Rank*
Iredell	3,477	10.0%	9	15,383	17.4%	7	18,860	15.3%	6
Jackson	830	11.2%	32	5,059	21.9%	61	5,889	19.3%	60
Johnston	4,502	11.8%	51	19,209	20.3%	40	23,711	17.8%	42
Jones	314	13.4%	83	1,503	23.9%	82	1,817	21.1%	85
Lee	2,040	13.9%	94	6,974	20.8%	46	9,014	18.7%	52
Lenoir	1,869	13.0%	78	7,822	22.5%	65	9,691	19.8%	66
Lincoln	1,969	11.6%	45	8,540	19.1%	27	10,509	17.1%	27
McDowell	1,132	11.8%	52	5,365	19.8%	34	6,497	17.7%	37
Macon	730	11.6%	46	4,222	22.8%	70	4,952	20.0%	69
Madison	479	11.0%	26	2,508	20.0%	38	2,987	17.7%	39
Martin	768	12.9%	77	3,491	23.7%	79	4,259	20.6%	78
Mecklenburg	20,981	10.1%	11	89,108	17.1%	3	110,088	15.1%	3
Mitchell	372	11.9%	54	2,020	21.0%	49	2,392	18.7%	53
Montgomery	1,077	15.7%	98	3,851	22.9%	73	4,928	20.8%	81
Moore	1,966	11.2%	30	8,948	19.2%	28	10,914	17.0%	25
Nash	2,629	11.5%	40	11,225	19.9%	37	13,853	17.5%	33
New Hanover	3,731	9.6%	6	22,549	19.2%	29	26,280	16.9%	24
Northampton	634	12.9%	76	2,882	22.8%	72	3,516	20.0%	70
Onslow	5,828	12.8%	74	25,039	26.2%	95	30,867	21.9%	92
Orange	2,472	9.6%	5	13,632	16.7%	2	16,104	15.0%	2
Pamlico	266	11.2%	33	1,679	21.5%	54	1,945	19.1%	57
Pasquotank	1,159	12.1%	60	5,853	24.6%	88	7,013	21.1%	84
Pender	1,223	12.2%	61	6,756	22.7%	68	7,979	20.1%	71
Perquimans	305	11.9%	57	1,706	23.7%	78	2,011	20.6%	77
Person	959	10.9%	23	4,488	19.1%	24	5,447	16.8%	22
Pitt	4,100	11.5%	39	19,903	21.4%	53	24,003	18.6%	51
Polk	413	11.1%	28	2,100	19.1%	26	2,513	17.1%	28
Randolph	4,222	12.5%	65	16,628	19.1%	25	20,851	17.2%	29
Richmond	1,618	13.3%	81	6,562	23.2%	75	8,180	20.2%	72
Robeson	5,463	15.1%	95	21,734	27.7%	98	27,197	23.7%	96
Rockingham	2,473	11.7%	49	11,709	20.4%	41	14,182	18.0%	43
Rowan	3,729	11.5%	38	15,876	18.9%	20	19,606	16.9%	23
Rutherford	1,802	12.0%	58	8,140	21.2%	51	9,942	18.6%	48
Sampson	2,572	15.8%	99	10,007	25.8%	94	12,579	22.9%	95
Scotland	1,215	12.4%	63	4,984	21.5%	55	6,199	18.8%	55
Stanly	1,517	10.7%	20	6,915	19.0%	23	8,432	16.7%	18
Stokes	1,066	10.2%	12	5,207	17.9%	10	6,273	15.8%	9
Surry	2,313	13.5%	87	9,137	20.8%	45	11,450	18.8%	54
Swain	394	12.5%	67	1,783	22.5%	64	2,177	19.7%	64
Transylvania	593	10.3%	16	3,228	19.0%	22	3,822	16.8%	21
Tyrrell	128	15.5%	96	844	31.2%	100	972	27.5%	100
Union	4,287	9.7%	7	18,248	17.3%	6	22,534	15.1%	4
Vance	1,670	13.8%	92	6,434	24.5%	87	8,103	21.1%	87
Wake	16,532	8.6%	1	76,377	15.3%	1	92,909	13.4%	1
Warren	586	13.7%	90	3,066	25.6%	93	3,652	22.4%	94
Washington	437	13.5%	85	1,901	24.1%	85	2,338	21.0%	83
Watauga	777	9.9%	8	6,171	20.9%	48	6,947	18.6%	50
Wayne	3,819	12.8%	73	14,759	20.9%	47	18,578	18.5%	46
Wilkes	1,716	11.3%	35	7,847	18.6%	17	9,563	16.7%	19
Wilson	2,563	13.3%	82	10,658	22.6%	67	13,221	19.9%	68
Yadkin	1,121	12.6%	69	4,605	19.8%	35	5,726	17.8%	41
Yancey	464	12.7%	71	2,538	22.8%	69	3,002	20.3%	73
North Carolina	**241,763**	**11.3%**		**1,072,475**	**19.5%**		**1,314,238**	**17.2%**	

Rank based on estimated percentage of residents who lack health insurance, with lower numbers implying higher rates of health insurance coverage.

County-level Estimates of the North Carolina Uninsured: 2005 Update