

County-level Estimates of the Number of Uninsured in North Carolina 2004 Update

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

Introduction

According to the United States Bureau of the Census, in 2004, 45.8 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 and, given 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 17.5 percent in 2004 (Figure 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.

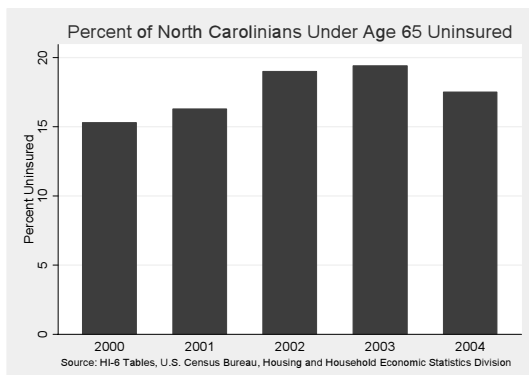


Figure 1: Percent of North Carolinians Uninsured 2000-2004

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.¹ 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 2004.

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

¹ Most North Carolina citizens 65 or over are eligible for Medicare.

Appendix C County-level Estimates of the Number of Uninsured in North Carolina 2004 Update

Cecil G. Sheps Center for Health Services Research

insurance coverage, which reports a statewide rate. In order to make county-level estimates of the uninsured, three years of CPS data are pooled and reported in this analysis. The three-year weighted average creates an overall statewide estimate that differs slightly from the CPS estimates for any year during that period.

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 2004. 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 2004. 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 13.9% in Wake County to a high of 28.3% in Tyrrell County. Along with Wake County, Mecklenburg, Granville, Swain, and Durham Counties appeared in the five counties with the lowest rate of uninsured persons under 65 years in 2004. Onslow, Sampson, Hyde, and Duplin Counties joined Tyrrell County in the counties with the largest proportion of the under age 65 population uninsured in 2004. As might be expected, the counties with the largest absolute numbers of uninsured had the largest overall populations. Approximately 104,000 residents of Mecklenburg County lacked health insurance in 2004. 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 2004 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 three 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.² 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 2004 and 2005 Annual Social and Economic Supplement to the Current Population Surveys³ 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,

² 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.

³ Note that the year of the CPS refers to the previous year of data. That is, the 2005 CPS describes the 2004 circumstances of the household.

Appendix C County-level Estimates of the Number of Uninsured in North Carolina 2004 Update

Cecil G. Sheps Center for Health Services Research

ethnicity, poverty, and income, as well as sector of employment (or lack of employment) were included in the model for persons age 18 to 64.⁴ 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 2004.
- Poverty estimates for 2002 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 2004 unemployment rates as well as industry employment patterns.
- Information on employer size – a key determinant of employment sponsored insurance – was obtained for 2003 from County Business Patterns, published by the U.S. Census Bureau.

Employer size is a notable addition this year and is responsible for some notable geographic patterns. For example, Swain and Washington Counties had marked decreases in the proportion of their residents that are uninsured because large firms (who are more likely to cover employees than small firms) employ a large number of employees in the county.

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

⁴ For further details, consult earlier versions of this report.

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 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.

We employed a new weighting technique this year. In order to put more weight on recent observations, we developed an algorithm that determined the optimal weight to place on each year's data. For the estimates presented in this report, our weights were 2004 (.766) and 2003 (.234). That is, the observations from CPS 2003 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 2004. 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 website at <http://www.shepscenter.unc.edu>

Appendix C County-level Estimates of the Number of Uninsured in North Carolina 2004 Update

Cecil G. Sheps Center for Health Services Research

Table 1: North Carolina County-Level Estimates of Uninsured, 2004

County Name	Ages 0-17			Ages 18-64			Ages 0-64		
	Number	Percent	Rank*	Number	Percent	Rank*	Number	Percent	Rank*
Alamance	4,243	12.5%	58	18,192	21.3%	37	22,434	18.8%	38
Alexander	928	11.3%	21	4,409	19.8%	18	5,337	17.5%	20
Alleghany	282	13.6%	91	1,806	27.1%	91	2,088	23.9%	94
Anson	745	12.1%	44	3,453	22.4%	51	4,198	19.5%	49
Ashe	638	13.3%	82	3,882	24.6%	76	4,520	22.0%	81
Avery	454	13.4%	85	2,806	24.5%	75	3,260	22.0%	80
Beaufort	1,339	12.5%	62	6,820	24.7%	78	8,159	21.3%	76
Bertie	622	12.7%	70	2,467	21.5%	40	3,089	18.9%	41
Bladen	1,116	13.7%	93	4,727	23.3%	62	5,843	20.5%	66
Brunswick	2,063	11.7%	32	12,045	23.2%	60	14,108	20.3%	61
Buncombe	5,438	11.5%	24	27,238	20.1%	24	32,676	17.8%	24
Burke	2,612	12.3%	53	10,440	18.7%	10	13,052	17.0%	11
Cabarrus	4,013	10.6%	8	17,494	19.0%	11	21,507	16.5%	10
Caldwell	2,182	11.9%	38	9,940	20.0%	23	12,122	17.9%	25
Camden	204	10.9%	11	1,504	27.3%	93	1,709	23.1%	91
Carteret	1,352	11.1%	12	9,039	23.3%	61	10,391	20.4%	63
Caswell	629	11.8%	34	3,269	21.6%	42	3,899	19.1%	43
Catawba	4,155	11.4%	22	18,349	19.4%	14	22,504	17.2%	14
Chatham	1,550	12.2%	50	7,331	20.2%	26	8,881	18.1%	30
Cherokee	681	13.2%	80	3,888	25.6%	84	4,568	22.4%	86
Chowan	414	11.9%	36	2,095	24.9%	79	2,509	21.1%	74
Clay	201	11.6%	30	1,353	23.8%	68	1,554	20.9%	71
Cleveland	2,846	11.6%	28	12,091	20.1%	25	14,937	17.6%	21
Columbus	1,847	13.5%	88	8,475	25.6%	83	10,322	22.0%	83
Craven	2,662	11.1%	14	11,059	20.3%	27	13,721	17.5%	19
Cumberland	10,494	11.5%	25	41,988	22.0%	47	52,482	18.6%	35
Currituck	578	11.2%	15	3,505	24.3%	73	4,083	20.8%	68
Dare	753	10.8%	9	5,285	24.1%	72	6,039	20.9%	70
Davidson	4,312	11.8%	33	19,757	20.4%	29	24,069	18.0%	28
Davie	1,023	11.6%	27	4,834	20.4%	28	5,857	18.0%	27
Duplin	2,215	16.3%	100	9,940	31.4%	99	12,155	26.9%	99
Durham	6,160	10.4%	6	28,814	18.3%	6	34,974	16.1%	5
Edgecombe	1,795	12.4%	55	7,442	22.1%	49	9,236	19.2%	46
Forsyth	8,948	11.2%	17	36,781	18.3%	7	45,729	16.3%	8
Franklin	1,535	11.6%	29	8,022	23.1%	57	9,557	19.9%	53
Gaston	5,312	11.1%	13	24,174	19.8%	17	29,485	17.3%	17
Gates	324	12.1%	45	1,653	24.7%	77	1,977	21.1%	73
Graham	237	13.6%	90	1,231	25.3%	82	1,468	22.2%	85
Granville	1,488	12.0%	41	5,566	16.1%	2	7,054	15.0%	3
Greene	743	15.2%	98	3,634	27.9%	94	4,377	24.4%	95
Guilford	10,886	10.1%	4	51,839	18.6%	8	62,725	16.2%	6
Halifax	1,799	12.6%	63	9,084	27.3%	92	10,883	22.9%	90
Harnett	3,485	12.8%	71	15,492	24.0%	71	18,977	20.7%	67
Haywood	1,373	12.1%	47	7,238	21.5%	39	8,611	19.1%	44
Henderson	2,436	12.2%	51	11,842	21.5%	41	14,278	19.0%	42
Hertford	690	12.5%	57	3,566	24.5%	74	4,256	21.2%	75
Hoke	1,589	13.4%	87	5,377	21.9%	45	6,966	19.1%	45
Hyde	143	13.3%	83	1,062	30.2%	97	1,205	26.2%	98

County-level Estimates of the North Carolina Uninsured: 2004 Update

Page 4 of 5

Appendix C County-level Estimates of the Number of Uninsured in North Carolina 2004 Update

Cecil G. Sheps Center for Health Services Research
Ages 0-17

County Name	Ages 0-17			Ages 18-64			Ages 65+		
	Number	Percent	Rank*	Number	Percent	Rank*	Number	Percent	Rank*
Iredell	3,723	10.8%	10	17,035	19.9%	21	20,758	17.3%	16
Jackson	885	12.0%	39	5,391	23.7%	67	6,275	20.9%	69
Johnston	4,411	11.8%	35	21,813	23.9%	69	26,224	20.4%	64
Jones	347	14.2%	95	1,656	26.1%	87	2,003	22.8%	88
Lee	1,695	13.1%	78	6,205	21.1%	33	7,901	18.6%	36
Lenoir	1,790	12.2%	49	8,194	23.4%	64	9,984	20.1%	57
Lincoln	2,064	12.5%	61	9,498	21.9%	46	11,561	19.3%	47
McDowell	1,264	13.0%	76	5,892	21.7%	43	7,156	19.4%	48
Macon	798	12.9%	75	4,565	25.1%	80	5,363	22.0%	82
Madison	555	12.8%	73	2,299	18.7%	9	2,853	17.1%	13
Martin	788	13.0%	77	3,782	25.6%	85	4,570	21.9%	79
Mecklenburg	19,009	9.4%	2	85,338	16.9%	3	104,347	14.8%	2
Mitchell	432	13.4%	86	1,999	20.6%	31	2,431	18.8%	39
Montgomery	1,031	15.1%	96	4,064	24.0%	70	5,095	21.4%	77
Moore	1,982	11.3%	20	9,017	19.8%	19	10,998	17.5%	18
Nash	2,578	11.3%	19	12,236	21.8%	44	14,814	18.8%	37
New Hanover	3,762	10.1%	3	23,990	21.1%	34	27,753	18.4%	31
Northampton	602	12.3%	52	2,829	22.2%	50	3,431	19.5%	51
Onslow	5,823	12.7%	66	29,740	30.6%	98	35,563	24.8%	96
Orange	2,754	10.4%	7	14,602	18.2%	5	17,356	16.3%	7
Pamlico	292	12.0%	42	1,745	22.4%	52	2,037	20.0%	55
Pasquotank	1,129	12.5%	56	5,343	23.4%	63	6,472	20.3%	60
Pender	1,265	12.6%	64	7,442	26.1%	88	8,707	22.6%	87
Perquimans	319	12.7%	69	1,600	23.1%	58	1,919	20.3%	62
Person	1,014	11.5%	23	4,508	19.5%	15	5,521	17.2%	15
Pitt	3,927	11.2%	18	20,929	22.8%	54	24,856	19.6%	52
Polk	451	12.2%	48	2,163	19.9%	22	2,615	17.9%	26
Randolph	4,315	12.8%	74	18,122	21.2%	36	22,438	18.8%	40
Richmond	1,603	13.2%	81	7,090	25.2%	81	8,693	21.6%	78
Robeson	4,911	13.5%	89	21,857	28.2%	95	26,768	23.5%	93
Rockingham	2,669	12.5%	60	12,612	22.1%	48	15,280	19.5%	50
Rowan	3,903	11.9%	37	15,768	19.0%	13	19,671	17.0%	12
Rutherford	1,900	12.7%	68	9,013	23.5%	65	10,913	20.5%	65
Sampson	2,455	15.2%	97	11,221	29.2%	96	13,676	25.1%	97
Scotland	1,184	12.0%	40	4,739	21.4%	38	5,923	18.5%	33
Stanly	1,662	11.5%	26	7,436	20.6%	30	9,098	18.0%	29
Stokes	1,239	11.7%	31	6,634	23.0%	55	7,873	19.9%	54
Surry	2,383	14.0%	94	9,878	22.6%	53	12,262	20.2%	58
Swain	405	12.8%	72	1,363	17.3%	4	1,768	16.0%	4
Transylvania	658	11.2%	16	3,557	21.0%	32	4,215	18.5%	34
Tyrrell	126	15.4%	99	863	32.3%	100	989	28.3%	100
Union	4,369	10.3%	5	18,667	19.0%	12	23,036	16.4%	9
Vance	1,542	12.7%	67	6,944	26.5%	89	8,485	22.1%	84
Wake	16,878	9.1%	1	75,788	15.8%	1	92,666	13.9%	1
Warren	572	13.2%	79	3,257	27.1%	90	3,829	23.4%	92
Washington	414	12.6%	65	1,565	19.9%	20	1,979	17.7%	22
Watauga	965	12.1%	46	6,917	23.5%	66	7,881	21.1%	72
Wayne	3,605	12.1%	43	14,922	21.1%	35	18,527	18.4%	32
Wilkes	1,877	12.4%	54	8,305	19.8%	16	10,182	17.8%	23
Wilson	2,422	12.5%	59	10,861	23.2%	59	13,283	20.1%	56
Yadkin	1,186	13.3%	84	5,287	23.0%	56	6,474	20.3%	59
Yancey	508	13.6%	92	2,867	25.9%	86	3,376	22.8%	89

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: 2004 Update

Page 5 of 5

