

# County-level Estimates of the Number of Uninsured in North Carolina

## 2003 Update

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### Introduction

According to the United States Bureau of the Census, in 2003, 45.0 million people lacked health insurance for the entire year. Approximately 1.4 million of those uninsured Americans lived in North Carolina. A great deal of policy interest has focused on uninsured individuals both nationally and at the state level, especially given annual increases North Carolina has experienced. The percent of North Carolina residents that lack health insurance for a full year has risen from 14.6 percent in 2000 to 19.4 percent in 2003 (Figure 1). Analysis of the rate of uninsured for small areas, such as counties, is often impossible due to data limitations. A number of 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 effectiveness 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.<sup>1</sup> 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 2003.

Because data sources and methodology differ between the reports, direct comparison of rates from the different periods should be viewed with caution. The data used for the estimates of health insurance coverage are drawn primarily from the U. S. Census

<sup>1</sup> Most North Carolina citizens 65 or over are eligible for Medicare.

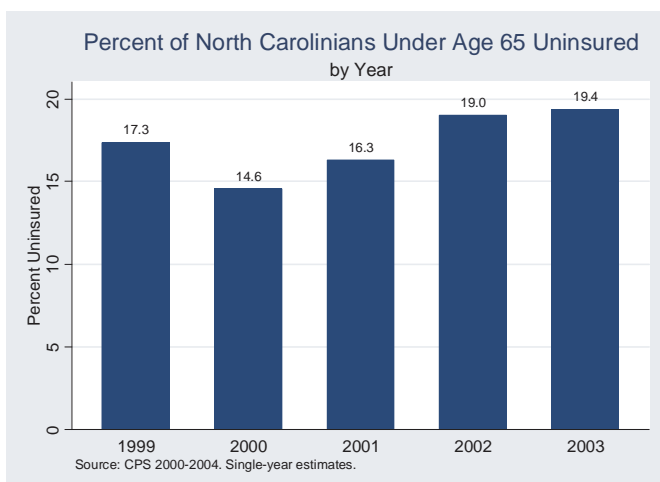


Figure 1: Percent North Carolinians Uninsured: 1999-2003

Bureau's annual survey of 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 annual county-level estimates of the number and percentage of people under the age of 65 who lack health insurance for 2003. 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 2003. 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 16.5% in Dare County to a high of 27.0% in Duplin County. Along with Dare County, Wake, New Hanover, Carteret and Cabarrus Counties appeared in the five counties with the lowest rate of uninsured persons under 65 years in 2003.<sup>2</sup> Montgomery, Tyrrell, Greene, and Sampson Counties joined Duplin County in the counties with the largest proportion of the under age 65 population uninsured in 2003. As might be expected, the counties with the largest absolute numbers of uninsured had the largest overall populations. Approximately 120,000 residents of Mecklenburg County lacked health insurance for the entire year in 2003. 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 2003 at slightly less than 900.

### Developing County-Level Estimates

The goal of this study was to develop county-level estimates of health insurance coverage. The process

<sup>2</sup> Although Cabarrus County experienced a sharp increase in unemployment due to large layoffs in mid 2003, the annual unemployment rate was only slightly higher than the state average.

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.<sup>3</sup> 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 2002 through 2004 Current Population Surveys<sup>4</sup> contained responses from between 3,906 and 3,941 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

<sup>3</sup> 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.

<sup>4</sup> Note that the year of the CPS refers to the previous year of data. That is, the 2003 CPS describes the 2002 circumstances of the household.

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. Demographic characteristics, educational attainment, and income at varying degrees of poverty, as well as sector of employment (or lack of employment) were included in the model for persons age 18 to 64.<sup>5</sup> The data were gathered from several sources:

- The Log Into North Carolina (LINC) database was used to obtain county-level data on the population distribution by age and gender for each county in North Carolina for 2003. These data are based on Census Bureau county-level population estimates by age, gender, and race.
- Information on educational attainment was obtained from the 2000 Census. These data reflect educational attainment for the population 25 years and older. These rates have not been adjusted for the 18 and older population, but are assumed to be the same proportion for the 25 and older population.
- Information on the number of individuals in each county with annual incomes at varying percentages of the Federal Poverty Guidelines in 1999 was derived from the 2000 Census. Cut points for percent of poverty level differed from the earlier report. The percentages of the population falling into various poverty and education categories were assumed to have remained constant throughout the study period.
- Information on unemployment rates and sector of employment were obtained from the Employment Security Commission.

## 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

<sup>5</sup> For further details, consult earlier versions of this report.

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 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 2003 (.67), 2002 (.20) and 2001 (.13). That is, the observations from CPS 2002 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 2003. The estimates reveal substantial variation across counties in the percentage of the population without insurance.

**Table 1: North Carolina County-Level Estimates of Uninsured, 2003**

County	Ages 0-17			Ages 18-64			Ages 0-64		
	Uninsured	Percent	Rank*	Uninsured	Percent	Rank*	Uninsured	Percent	Rank*
Alamance	4,106	12.1%	52	18,872	22.8%	36	22,978	19.7%	34
Alexander	915	11.0%	11	4,811	22.3%	29	5,727	19.1%	28
Alleghany	282	13.7%	91	1,825	26.5%	83	2,107	23.5%	91
Anson	704	11.5%	25	3,988	26.0%	76	4,693	21.8%	72
Ashe	629	13.0%	87	4,160	25.7%	70	4,789	22.8%	85
Avery	472	13.3%	89	3,069	26.0%	75	3,542	23.0%	86
Beaufort	1,289	12.5%	77	7,050	25.0%	66	8,339	21.6%	69
Bertie	592	12.3%	61	3,334	28.3%	95	3,926	23.6%	93
Bladen	996	12.6%	83	5,526	27.6%	90	6,523	23.4%	88
Brunswick	2,056	12.3%	65	12,002	22.8%	35	14,057	20.2%	42
Buncombe	5,405	11.6%	30	26,738	20.0%	6	32,143	17.8%	8
Burke	2,566	12.0%	44	11,861	21.7%	24	14,427	18.9%	23
Cabarrus	3,924	10.5%	1	17,989	20.6%	13	21,914	17.5%	5
Caldwell	1,985	10.9%	10	10,528	21.5%	22	12,513	18.6%	20
Camden	197	10.8%	8	1,060	21.4%	19	1,258	18.5%	19
Carteret	1,367	11.6%	29	7,535	19.2%	3	8,902	17.5%	4
Caswell	643	12.0%	47	3,626	24.1%	55	4,269	20.9%	56
Catawba	4,255	11.8%	38	19,462	21.5%	21	23,717	18.7%	21
Chatham	1,685	14.0%	96	7,849	23.3%	42	9,534	20.8%	55
Cherokee	612	12.3%	70	3,886	24.3%	58	4,498	21.4%	65
Chowan	378	11.3%	23	2,008	23.4%	43	2,387	20.0%	40
Clay	203	12.5%	78	1,366	22.6%	30	1,569	20.4%	44
Cleveland	2,607	10.7%	4	13,566	22.9%	38	16,174	19.3%	32
Columbus	1,664	12.4%	73	9,166	27.6%	91	10,830	23.2%	87
Craven	2,600	11.5%	26	12,011	21.0%	17	14,611	18.3%	15
Cumberland	10,150	11.8%	36	42,254	22.6%	31	52,404	19.2%	29
Currituck	546	11.0%	12	3,205	24.7%	64	3,751	20.9%	57
Dare	773	11.2%	17	3,994	18.2%	1	4,767	16.5%	1
Davidson	4,099	11.3%	18	20,757	21.9%	25	24,855	19.0%	24
Davie	984	11.0%	14	4,929	21.4%	20	5,913	18.5%	18
Duplin	2,138	16.1%	100	9,662	31.8%	100	11,800	27.0%	100
Durham	7,991	13.7%	93	32,163	21.5%	23	40,154	19.3%	31
Edgecombe	1,626	11.6%	27	8,815	27.2%	88	10,441	22.5%	82
Forsyth	9,228	11.8%	37	39,051	20.0%	5	48,279	17.6%	6
Franklin	1,562	12.0%	46	8,049	25.1%	69	9,611	21.3%	64
Gaston	5,020	10.8%	7	24,168	20.4%	12	29,188	17.7%	7
Gates	303	11.1%	15	1,492	22.8%	34	1,794	19.4%	33
Graham	212	12.5%	76	1,403	28.0%	93	1,615	24.1%	95
Granville	1,525	12.3%	71	7,550	22.7%	33	9,076	19.9%	37
Greene	689	13.9%	94	3,590	29.4%	97	4,279	24.9%	98
Guilford	12,475	11.6%	28	54,272	20.3%	10	66,747	17.8%	9
Halifax	1,660	11.8%	35	9,157	26.9%	84	10,818	22.5%	81
Harnett	3,207	12.0%	49	15,475	26.2%	80	18,682	21.8%	71
Haywood	1,271	11.3%	21	7,112	20.3%	9	8,383	18.1%	13
Henderson	2,406	12.4%	72	11,742	20.2%	7	14,148	18.2%	14
Hertford	701	12.4%	74	3,723	25.9%	74	4,424	22.1%	76
Hoke	1,363	12.3%	63	5,903	27.1%	85	7,266	22.1%	74
Hyde	148	13.7%	92	982	26.3%	82	1,130	23.5%	90
Iredell	3,614	10.7%	3	17,131	21.0%	16	20,745	18.0%	10
Jackson	962	12.2%	58	5,187	23.4%	44	6,149	20.5%	45
Johnston	4,400	12.3%	67	20,963	24.9%	65	25,362	21.1%	61
Jones	301	12.4%	75	1,614	26.1%	77	1,915	22.2%	77

County	Ages 0-17			Ages 18-64			Ages 0-64		
	Uninsured	Percent	Rank*	Uninsured	Percent	Rank*	Uninsured	Percent	Rank*
Lee	1,763	14.0%	95	7,595	25.0%	68	9,358	21.8%	70
Lenoir	1,679	11.7%	32	8,547	24.0%	53	10,226	20.5%	46
Lincoln	1,953	11.9%	42	9,656	22.9%	37	11,609	19.8%	36
Macon	759	12.3%	66	4,516	23.2%	40	5,275	20.5%	47
Madison	536	12.1%	56	2,962	23.6%	47	3,498	20.6%	51
Martin	723	12.0%	48	3,903	26.1%	78	4,627	22.1%	75
McDowell	1,172	12.1%	50	6,502	24.0%	52	7,674	20.8%	54
Mecklenburg	23,969	12.3%	68	95,748	20.4%	11	119,717	18.0%	11
Mitchell	399	12.3%	69	2,452	24.5%	61	2,851	21.5%	67
Montgomery	969	14.5%	99	4,809	28.7%	96	5,779	24.7%	96
Moore	1,978	11.9%	39	9,929	20.8%	14	11,907	18.5%	17
Nash	2,533	11.3%	22	12,862	23.4%	45	15,394	19.9%	39
New Hanover	4,234	11.4%	24	21,223	19.4%	4	25,457	17.4%	3
Northampton	608	12.3%	64	3,674	27.8%	92	4,282	23.6%	92
Onslow	5,424	12.3%	62	26,128	27.1%	86	31,552	22.4%	80
Orange	3,998	13.3%	90	16,420	21.3%	18	20,418	19.1%	27
Pamlico	318	12.6%	84	1,960	23.5%	46	2,278	21.0%	58
Pasquotank	1,057	11.7%	33	5,128	23.2%	41	6,185	19.9%	38
Pender	1,234	12.6%	81	6,840	24.5%	62	8,075	21.4%	66
Perquimans	302	12.1%	57	1,737	24.0%	54	2,040	21.0%	59
Person	955	11.0%	13	5,295	23.0%	39	6,249	19.7%	35
Pitt	4,392	12.1%	53	20,947	24.5%	60	25,339	20.8%	53
Polk	447	12.1%	55	2,430	20.9%	15	2,877	18.8%	22
Randolph	4,093	12.2%	60	19,755	23.7%	48	23,848	20.4%	43
Richmond	1,399	11.7%	31	7,173	25.8%	72	8,572	21.5%	68
Robeson	4,493	12.5%	80	21,921	29.6%	98	26,414	24.1%	94
Rockingham	2,479	11.7%	34	13,654	23.8%	50	16,133	20.5%	48
Rowan	3,698	11.2%	16	17,980	22.1%	27	21,678	19.0%	25
Rutherford	1,656	11.3%	19	9,354	24.1%	56	11,010	20.6%	49
Sampson	2,260	14.1%	97	11,213	29.8%	99	13,473	25.1%	99
Scotland	1,028	10.8%	6	5,292	25.0%	67	6,321	20.6%	50
Stanly	1,582	10.9%	9	8,123	22.6%	32	9,705	19.2%	30
Stokes	1,166	10.8%	5	6,342	22.2%	28	7,507	19.0%	26
Surry	2,148	12.7%	85	11,510	26.1%	79	13,658	22.4%	79
Swain	385	12.1%	51	2,012	24.7%	63	2,397	21.2%	62
Transylvania	657	11.3%	20	3,718	20.3%	8	4,375	18.1%	12
Tyrrell	130	14.4%	98	757	28.2%	94	887	24.7%	97
Union	4,312	10.6%	2	19,214	22.0%	26	23,526	18.4%	16
Vance	1,397	11.9%	41	7,158	27.6%	89	8,555	22.7%	84
Wake	21,767	12.0%	45	81,845	18.5%	2	103,612	16.6%	2
Warren	593	13.1%	88	3,351	27.2%	87	3,944	23.4%	89
Washington	394	12.1%	54	2,099	25.9%	73	2,492	21.9%	73
Watauga	1,233	12.6%	82	6,687	24.2%	57	7,920	21.2%	63
Wayne	3,519	11.9%	40	16,358	23.7%	49	19,877	20.1%	41
Wilkes	1,798	11.9%	43	10,059	23.8%	51	11,857	20.7%	52
Wilson	2,380	12.5%	79	12,067	26.3%	81	14,448	22.2%	78
Yadkin	1,070	12.2%	59	5,548	24.4%	59	6,619	21.0%	60
Yancey	473	12.8%	86	2,914	25.8%	71	3,388	22.6%	83

Rank based on estimated percentage of residents 0-64 who lack health insurance.

For more information, visit our website at <http://www.shepscenter.unc.edu>