Racial and Ethnic Differences in Health in North Carolina

A Special Report from the Center for Health Informatics and Statistics and Office of Minority Health
North Carolina Division of Public Health
November 2000

Executive Summary

The purpose of this study is to document health differences among the major racial and ethnic groups in North Carolina. Race is considered as a marker of health problems not as a risk factor or cause. Describing racial and ethnic differences in health allows targeting of resources and health improvement programs toward populations most in need.

This report presents descriptive statistics by race and ethnicity for Whites, African Americans, American Indians, Asians, and Hispanics/Latinos. The following topics are included: population, risk factors among adults, deaths, cancer incidence, live births, risk factors around the time of pregnancy, and infant deaths. There are some potentially serious problems in the reporting of health data for the smaller minority groups. Health events for these groups are likely to be under-reported and the population data used for the denominators of rates may be inaccurate.

The results of this study show generally poorer health among African Americans and American Indians in North Carolina, compared to Whites, across a variety of measures. For American Indians, however, there is concern about the accuracy of the reporting of race on health records, so that the published statistics may substantially underestimate the level of health problems among American Indians. This underreporting is also likely an issue for Hispanic ethnicity. The measures of health problems for Hispanics are generally much lower than those for Whites, especially for chronic diseases. However, the very young age of the Hispanic/Latino population in North Carolina, the "healthy migrant effect," and other factors may also contribute to low rates for many of the causes of death and for other health problems in this group.

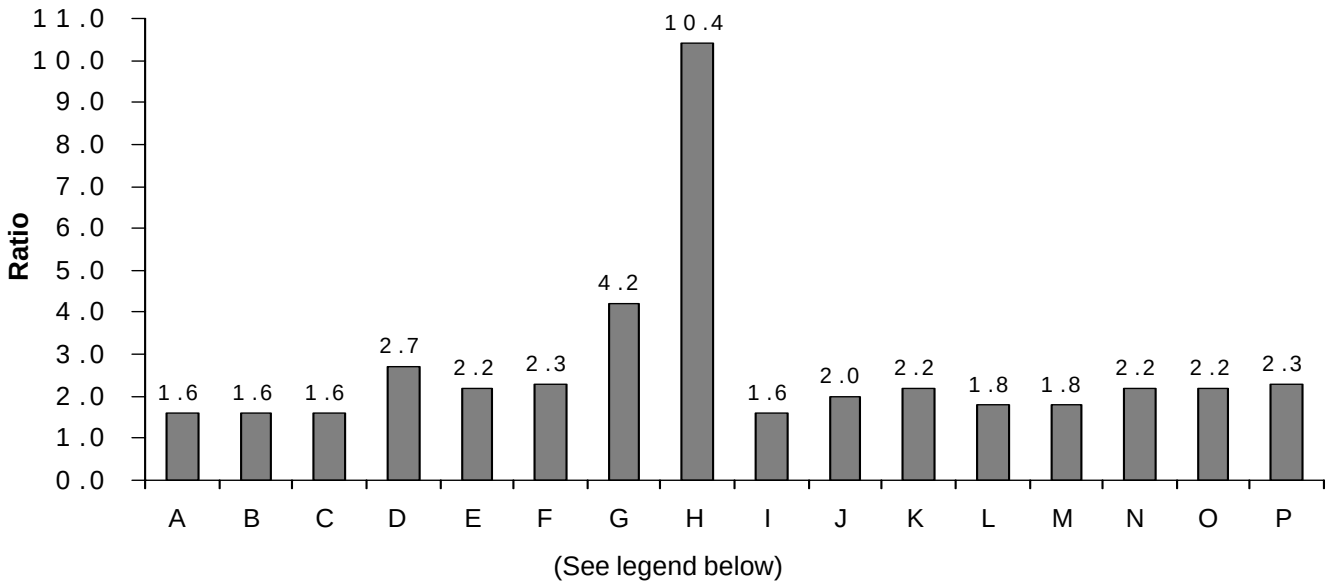
Figures 1, 2, and 3 show areas where there are large disparities in the health indicators for African Americans, American Indians, and Hispanics/Latinos, compared to Whites. These charts summarize the data presented in the tables of the main report. The ratio of the measure for the minority group to the measure for Whites is shown in these figures if it is greater than 1.5. African Americans exhibit a large number of substantial health disparities (Figure 1). American Indians have elevated rates of death from diabetes, motor vehicle injury, and homicide, as well as higher rates of smoking during pregnancy, late or no prenatal care, and infant mortality (Figure 2). Hispanics have substantially higher rates of death from motor vehicle injury, homicide, and AIDS, and a higher rate of late or no prenatal care (Figure 3). Health indicators for Asians in North Carolina are much better than those for Whites in almost every case. One exception is that Asians have a higher percentage of births where the prenatal care was begun after the first trimester (ratio = 1.6).

The results presented in this report emphasize areas where minority groups have worse health problems than Whites. Notable areas where minority groups are better off than Whites in North Carolina are: smoking is lower among African Americans – in the general population of adults and particularly during pregnancy, chronic lung disease and suicide death rates are lower among African Americans, the percentages for smoking during pregnancy and for low birthweight are lower among Hispanics/Latinos, and the infant mortality rate is lower among Hispanic/Latino births.

It is hoped that the information presented in this report will inform North Carolina citizens about racial and ethnic disparities in health, and assist in the formulation of policies and programs in North Carolina to reduce these disparities.

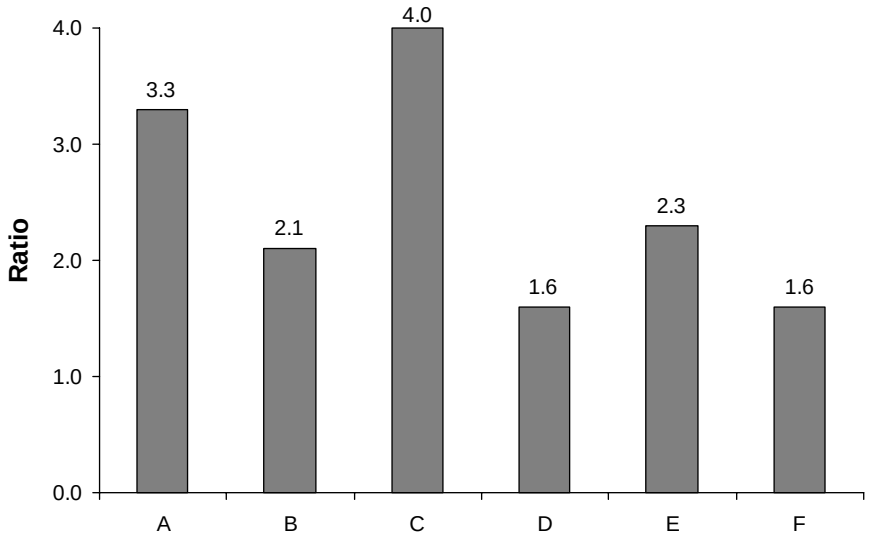
For a copy of the full report on *Racial and Ethnic Differences in Health in North Carolina*, contact the Center for Health Informatics and Statistics at (919) 733-4728 or go to the Center Web site at http://www.schs.state.nc.us/SCHS/pubs/

Figure 1
Areas of Large Health Disparities between African Americans and Whites: Ratio of African-American Measure to White Measure North Carolina Residents



A Percentage with no health care coverage, from Table 3, 1997-99.
B Percentage ever told by a doctor that they had diabetes, from Table 3, 1997-99.
C Percentage who never had their blood cholesterol checked, from Table 3, 1997 and 1999.
D Diabetes death rate, from Table 4, 1996-98.
E Septicemia death rate, from Table 4, 1996-98.
F Nephritis/Nephrosis death rate, from Table 4, 1996-98.
G Homicide death rate, from Table 4, 1996-98.
H AIDS death rate, from Table 4, 1996-98.
I Prostate cancer incidence rate, from Table 5, 1995-97.
J Percentage low birthweight, from Table 6, 1996-98.
K Percentage who began prenatal care after the first trimester, from Table 6, 1996-98.
L Percentage reporting pregnancy was unintended, from Table 7, 1997-98.
M Percentage where mother did not breastfeed at all, from Table 7, 1997-98.
N Percentage with family income less than $14,000, from Table 7, 1997-98.
O Percentage where mother reported physical abuse during pregnancy, from Table 7, 1997-98.
P Infant death rate, from Table 8, 1996-98.

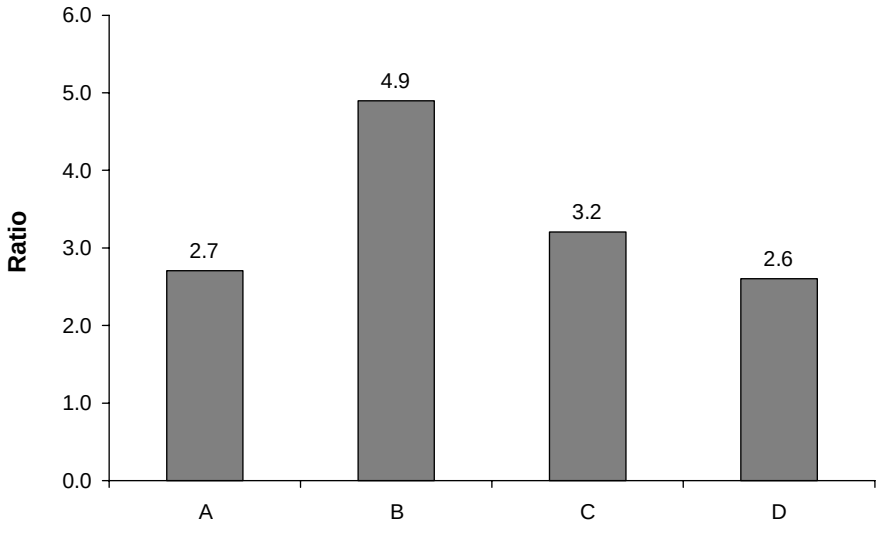
Figure 2
Areas of Large Health Disparities between American Indians and Whites: Ratio of American Indian Measure to White Measure North Carolina Residents



(See legend to right)

A Diabetes death rate, from Table 4, 1996-98.
B Motor vehicle death rate, from Table 4, 1996-98.
C Homicide death rate, from Table 4, 1996-98.
D Percentage who smoked during pregnancy, from Table 6, 1996-98.
E Percentage who began prenatal care after the first trimester, from Table 6, 1996-98.
F Infant mortality rate, from Table 8, 1996-98.

Figure 3
Areas of Large Health Disparities between Hispanics/Latinos and Whites: Ratio of Hispanic/Latino Measure to White Measure North Carolina Residents



(See legend to right)

A Motor vehicle death rate, from Table 4, 1996-98.
B Homicide death rate, from Table 4, 1996-98.
C AIDS death rate, from Table 4, 1996-98.
D Percentage who began prenatal care after the first trimester, from Table 6, 1996-98.

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Introduction

Health measures vary significantly along various demographic dimensions. Death rates increase dramatically with age and older people are more likely to experience health problems. Males have higher death rates than females for most of the leading causes of death. Persons of lower socioeconomic status (as measured by income, education, or occupation) generally have higher death rates and more health problems than persons of higher socioeconomic status.[1] Death rates and other health measures also vary substantially across racial and ethnic groups. The purpose of this study is to document health differences among the major racial and ethnic groups in North Carolina.

There has been considerable controversy about the appropriateness of examining racial differences in health. Some have gone so far as to call for abandoning race as a variable in public health research. They argue that race is an arbitrary system of visual classification without biological merit, and that demarcations by race largely reflect racism in our society.[2] The position taken here is that, though racial classification is imprecise and often based on self identification, there is some utility in describing racial differences in health. This allows targeting of resources and health improvement programs toward populations most in need.

Race is considered as a **marker** of health problems, not as a risk factor or cause. We do not have a complete understanding of why race is associated with health problems, but low socioeconomic status, stress, and racism are among the underlying causes of the poorer health status of minorities (on average) compared to Whites. However, few of our health data systems gather information on these other factors, while most do have information on race. Thus, race often serves as a surrogate measure for a variety of other factors.

It should not be concluded, however, that socioeconomic factors completely explain racial differences in health. It is well known that the low birth weight percentage for African Americans in North Carolina is roughly twice the percentage for Whites. Also, the low birth weight percentage generally decreases with increasing years of mother's education: e.g., the low birth weight percentage for mothers with less than a high school education is nearly twice that for mothers with 16 or more years of education. One might therefore expect that differences in educational attainment between White and African American mothers would explain much of the racial difference in low birth weight. However, as Table 1 shows, the difference in the percentage low birth weight between Whites and African Americans persists at each level of education, with the racial difference still being about 2:1 at the highest educational category. Mother's education is the only socioeconomic measure available on the birth certificates (from which these statistics were derived), and the pattern by income might be different. Nevertheless, these data indicate that there is much that we do not understand about the interaction of race and socioeconomic status in relation to health.

Table 1

Percentage Low Birthweight by Race/Ethnicity and Education of Mother
1996-98 North Carolina Resident Live Births

Mother's Education In Years	White	African American	American Indian	Asian	Hispanic/ Latino	Total
<9	7.7	15.6	13.5	9.1	6.0	8.9
9-11	9.4	15.4	12.6	10.4	6.3	11.6
12	7.3	13.9	9.9	7.2	6.3	9.4
13-15	6.4	12.9	7.0	7.1	6.0	8.1
16+	5.7	11.6	8.1	6.9	5.6	6.5
TOTAL	7.0	13.8	10.2	7.6	6.1	8.8

This descriptive study presents various health statistics for major racial and ethnic groups in North Carolina: White, African American, American Indian, Asian, and Hispanic/Latino. The term African American is used in this report for all people who identify themselves as Black. Though some Black people in North Carolina may not identify themselves as African American (e.g., someone from Haiti), we use the terms interchangeably in this report.

We do not attempt to determine the reasons for the racial and ethnic differences that are observed here. The formulation of policies or programs that might reduce disparities in health, while certainly needed and important, is also not addressed here. We hope that the information presented in this report will inform North Carolina citizens about racial and ethnic disparities in health, and assist in the development of measures to improve the health of minority populations in North Carolina and thus reduce the disparities.

Methods

The Center for Health Informatics and Statistics (formerly, State Center for Health Statistics) has typically published data by race for only two groups: White and minority. We appreciate the need for more detail on race, such as for American Indians and Asians. But several obstacles have hampered efforts to obtain accurate health measures for these populations. A small number of health events in the numerator of a rate leads to unstable rates, a situation frequently encountered for the smaller minority groups. Also, detailed population data by race are collected only every ten years in the Census. In other years, the North Carolina Office of State Planning produces official annual population estimates only for "White" and "other." Therefore, the appropriate denominators to produce rates for small racial groups have not been routinely available. Hispanic/Latino is an ethnic group, rather than a racial group, and Hispanics may be counted in any of the racial categories. Even in Census years there is concern about under-counting this population. With recent rapid growth of the Hispanic/Latino population in North Carolina, estimates for years between Censuses are even more problematic.

In this publication, we have tried to address these problems. In order to increase the numbers of health events in the numerators of the rates, most analyses are done only for the state as a whole. Also, several years of data are combined to compute multi-year (average annual) rates. In general, we look at trends from 1990-92 to 1996-98. For the denominators, we have used a series of population estimates for North Carolina developed by the United States Bureau of the Census, available from 1990 to 1998. For each county, the population is estimated by sex and age for the following racial and ethnic groups: White; African American; American Indian, Eskimo, and Aleut; Asian and Pacific Islander; and Hispanic (of any race).

There are serious concerns about the accuracy of the data for the smaller minority groups. A study by the National Center for Health Statistics found that rates tend to be biased in two directions: upward due to undercounting of the population in the denominator, and downward due to undercounting of health events in the numerator. This study found that the net effect of these two biases was fairly small for Whites and African Americans, but that officially reported rates for American Indians and Asians were too low by 20 and 10 percent, respectively.[3] No attempt is made in the present study to adjust the calculated rates for underreporting. But the reader should keep in mind the potential inaccuracies of the data.

Several statewide health databases are used in this study to portray racial and ethnic differences in health in North Carolina. A requirement for inclusion was that there be codes for both race and ethnicity in the database, with a small percentage of missing values. With death certificates we compute death rates for the leading causes of death. Cancer incidence records are used to produce rates of new cases of cancer for the major cancer sites. With birth certificates we compare measures such as the percentage low birth weight, the percentage who smoked during pregnancy, and the percentage who began prenatal care after the first trimester. Infant death records are used to produce infant mortality rates by race and ethnicity. We considered using hospital discharge data to compute hospitalization rates, but with more than 20 percent of those records missing information on race, the data were not deemed reliable enough for this study.

As a general rule, rates or percentages are not computed for this study if the numerator has less than 20 events. Therefore, for some of the less frequent causes of death, for example, rates are shown only for Whites and African Americans. The numbers are not large enough to produce reliable rates for American Indians, Asians, and Hispanics/Latinos, even when combining several years of data. Though the rates are based on a

complete count of events rather than a sample, there is still random error with small numbers.[4] A few events added or deleted could result in important rate changes, not necessarily indicative of a real change in the situation. With 20 events in the numerator, a rate or percentage will have a margin of error of approximately plus or minus 45 percent of the rate or percentage. For example, with 20 deaths from suicide out of a population of 150,000, the suicide death rate would be 13.3 per 100,000 population. The 95 percent confidence interval for this rate would be 13.3 plus or minus 5.8. Stated another way, we are 95 percent sure that the true suicide death rate for this population is between 7.5 and 19.1.

We have used two additional databases for this study, but due to the low numbers of American Indian, Asian, and Hispanic/Latino respondents, data is shown only for Whites and African Americans. The Behavioral Risk Factor Surveillance System (BRFSS) is a random telephone survey of approximately 3,000 North Carolina adults each year. The BRFSS asks questions about behaviors and health issues that affect the major causes of illness and death. The Pregnancy Risk Assessment Monitoring System (PRAMS) is a statewide random mail and telephone survey of approximately 1,800 women each year who have recently given birth. Questions are asked about maternal and infant health risks. For the BRFSS, the numbers of respondents for the three-year period 1997-1999 was only 201 for Hispanics/Latinos, 101 for American Indians, and 65 for Asians. For PRAMS, the number of respondents from July 1997 through December 1998 (the data currently available) was 111 for Hispanics/Latinos, 56 for American Indians, and 38 for Asians.

In comparing the death rates and cancer incidence rates among racial and ethnic groups, it is very important to adjust for age.[5] Chronic diseases occur with much higher frequency in the older age groups, and the age distribution of a population will have a strong influence on these rates. For example, the African American population in North Carolina has proportionately more persons in the younger age groups than the White population. As a result, the unadjusted death rate for African Americans (for total deaths) is approximately equal to that for Whites, despite the fact that the death rates are higher for African Americans in each age category. After adjustment for age, the African American death rate is 35 percent higher than that for Whites. The Hispanic/Latino population in North Carolina is especially young, and so it is important to age-adjust rates before making comparisons. In this report, the projected 2000 United States population is used as the standard for age adjustment, in keeping with the conventions of the National Center for Health Statistics. The age-adjusted rates show what the rates **would be** if the racial or ethnic group had the same age distribution (in percentage terms) as that for the United States in 2000, without changing the age-specific death rates for that population.

In North Carolina each infant death certificate is matched to the live birth certificate for that baby. The rate of successful matches is more than 99 percent. This linked birth/infant death file permits analysis of infant mortality by items present on the birth certificate, such as mother's age, mother's education, or maternal smoking during pregnancy (information not on the death certificate). Race and ethnicity are captured independently on both the birth and infant death records. For Whites and African Americans, the agreement between the race codes is good (less than 5 percent discrepancy), but for other racial and ethnic groups the agreement is poor. During 1996-98 for example, among the 66 infant deaths where the mother's race was recorded as American Indian on the birth certificate, 15 (or 23 percent) had a different race recorded on the matching infant death certificate (usually White). Mother's race on the birth certificate is likely to be more accurate since it is usually reported by the mother at the time of delivery. Race on the death certificate is reported by a funeral director based on information supplied by a family member or other informant, or in the absence of an informant, based on observation. Using the linked birth/infant death file for infant mortality analyses, we have assigned mother's race from the birth certificate to both the births (denominator) and infant deaths (numerator), thus reducing the problem of misclassification of race and ethnicity on the infant death certificates.

There is serious concern about the accuracy of the recording of Hispanic/Latino ethnicity on the death and cancer incidence records. For example, the age-adjusted death rate (all causes) for the Hispanic/Latino population in 1998 was only one-fourth the age-adjusted death rate for the total North Carolina population. This suggests potentially serious under-reporting of Hispanic/Latino deaths. One factor may be that as Hispanic/Latino persons in North Carolina become seriously ill, particularly if they are of Mexican origin,

they may return to their country of origin for the final period of life. Thus no death certificate would be recorded in North Carolina. Another factor that may lower death rates and cancer incidence rates among Hispanics (and perhaps among Asians) in North Carolina is the "healthy migrant effect." This results from the fact that persons who emigrate tend to be healthier than persons who stay in their community of origin.

In an attempt to improve the ascertainment of Hispanic/Latino health events, we have used the approach of Hispanic surname matching. From the United States Bureau of the Census, we obtained a list of the 639 most frequently occurring heavily Hispanic surnames.[6] The Census Bureau determined that persons with those surnames represent more than two-thirds of the Hispanic origin population, and that nearly 95 percent of persons with those surnames identify themselves as Hispanic. By matching these names to the death and cancer incidence records, we are able to identify additional Hispanic health events. We then treated as Hispanic those records where there was either a Hispanic ethnicity code on the record **or** where there was a matching Hispanic surname. Rates based on this method are compared to the rates derived from using only the Hispanic/Latino ethnicity indicators on the health records. There are some limitations of matching Hispanic surnames. A Hispanic/Latino woman who married a non-Hispanic/Latino may not have a Hispanic surname on her cancer incidence record or death certificate, and thus may not be identified as Hispanic/Latino. Also, some women who have a Hispanic surname only through marriage will be identified as Hispanic.

For the death, cancer incidence, and birth data, we have produced measures by race and ethnicity for selected counties and county groups, as well as for the state as a whole. Counties with relatively large populations of American Indians, Asians, or Hispanics were chosen so that there would be enough events to produce reliable rates for the smaller minority groups: Cumberland, Durham, Forsyth, Guilford, Johnston, Mecklenburg, Onslow, Orange, and Wake. Counties were included if they had more than 3,000 population in any one of these three groups, according to the 1998 Census Bureau estimates. In addition, data is presented for two groups of counties with relatively large American Indian populations: Jackson/Swain (primarily Cherokee Indians) and Cumberland/Hoke/Robeson/Columbus/Scotland (primarily Lumbee Indians).

Results

Population

Table 2 shows the population in North Carolina by race and ethnicity for 1990 and 1998, as estimated by the Census Bureau. These estimates, stratified into ten age groups for the age-adjustment process, were used in the denominators of the death and cancer incidence rates (in most cases three years of data are combined). The Asian and Hispanic/Latino populations, in particular, increased substantially from 1990 to 1998.

Table 2

Estimated North Carolina Population by Race and Ethnicity, 1990 and 1998

	1990	1998
Race		
White	5,052,436	5,684,208
African American	1,469,503	1,665,271
American Indian	81,199	97,505
Asian	53,871	99,509
Ethnicity		
Hispanic/Latino	77,480	161,223
TOTAL	6,657,009	7,546,493

Risk Factors Among Adults (BRFSS)

Table 3 presents selected measures from the BRFSS, a random telephone survey of adults in North Carolina. The number of respondents is too small to produce reliable data for racial and ethnic groups other than Whites and African Americans. In general, African Americans report higher levels of risk factors than Whites, particularly for no health care coverage, diabetes, had permanent teeth removed, lack of exercise, high blood pressure, overweight, and never had their blood cholesterol checked. Though not shown in Table 3, the percentage of the adult population that was obese (Body Mass Index >= 30) was about twice as high among African Americans compared to Whites. In contrast, African Americans reported that they were more likely than Whites to have visited a doctor for a routine checkup in the past 2 years, less likely to smoke (though this difference was small), more likely to use seatbelts, and somewhat less likely to have been told by a doctor that they had arthritis.

Table 3

Percentages of Survey Respondents with Selected Risk Factors From the Behavioral Risk Factor Surveillance System (BRFSS) By Race North Carolina Adults, 1997-1999

	Year(s)	White	African American	All Races
Health was fair or poor	97-99	16.1	20.7	16.9
No health care coverage	97-99	11.2	17.7	13.0
There was a time during the last 12 months when they needed to see a doctor but could not because of the cost	97-99	11.2	15.8	12.3
Did not visit a doctor for a routine checkup in the past 2 years	97-99	14.7	9.3	13.7
Ever told by a doctor that they had diabetes (excluding women told only during pregnancy)	97-99	5.2	8.3	5.8
Had one or more permanent teeth removed because of tooth decay or gum disease	99	68.1	81.8	71.0
Current smoker	97-99	25.7	23.8	25.2
Engaged in no physical activities or exercise in past month	98	25.2	33.4	27.7
Overweight (Body Mass Index > = 25)	97-99	53.4	66.3	58.4
Ever told by a doctor that they had high blood pressure	97 & 99	22.5	29.7	23.7
Never had their blood cholesterol checked	97 & 99	20.7	32.5	23.6
Among sexually active women, percent who are not using birth control now	99	28.6	34.5	30.3
Women age 50+ who did not have a mammogram within the past 2 years	97-99	21.9	23.7	22.0
Women age 18+ who did not have a Pap smear within the past 2 years	97-99	14.3	13.0	14.2
Did not always use seatbelts when driving or riding in a car	97	15.9	13.7	15.2
Ever told by a doctor that they had arthritis	98	23.3	20.3	22.6
Someone ever forced or tried to force them to engage in unwanted sexual activity	97 & 99	10.6	12.4	11.0
Percent with some type of disability (self-perceived, activity limitation, special equipment, or problem learning etc.)	98-99	21.9	23.7	22.0

Note: All numerators of these percentages are greater than 50. Percentages are weighted to reflect the total population of North Carolina adults.

Deaths

Table 4 shows average annual age-adjusted death rates for 1990-92 and 1996-98 for the leading causes of death by race and ethnicity. In the first panel of the table, for all causes of death combined, several general patterns are apparent. With the exception of American Indians, death rates have decreased somewhat over time. African Americans have the highest death rates, followed by American Indians, Whites, Asians, and Hispanics/Latinos. Even after using the expanded definition of Hispanic/Latino, which increases the number of deaths by approximately 50 percent, Hispanics have a very low overall age-adjusted death rate. Note that the death rates for all causes are per 1,000 population and thus are not directly comparable to the cause-specific death rates in Table 4, which are per 100,000 population.

Considering the particular causes of death in Table 4, the following patterns stand out.

- There were substantial declines over time in death rates for heart disease and homicide, while death rates increased substantially for chronic lung disease and diabetes.
- African American death rates are particularly elevated for diabetes, septicemia, nephritis, homicide, and AIDS. African American death rates are relatively low for chronic lung disease and suicide.
- American Indian death rates are especially high for diabetes, motor vehicle injuries, and homicide.
- Hispanics have very low death rates for all of the chronic diseases, but relatively high death rates for motor vehicle injuries, homicide, and AIDS.

For comparison to the AIDS death rates, we obtained data by race and ethnicity on new cases of HIV/AIDS from the HIV/STD Prevention and Care Branch. During 1996-98, the number of new cases per 100,000 population was 7.0 for White non-Hispanics, 70.6 for African American non-Hispanics, 11.5 for American Indians, 5.0 for Asians, and 24.7 for Hispanics. (Their data excludes Hispanics from the White and African American groups, unlike the other data in this report.) There were nearly three new HIV/AIDS cases in 1996-98 for every AIDS death. This incidence data shows racial differences very similar to those found in the mortality data: the rate for African Americans is 10 times the rate for Whites and the rate for Hispanics is more than three times the rate for Whites. While there were not enough American Indian AIDS deaths during 1996-98 to produce a reliable rate, the 1996-98 HIV/AIDS incidence rate for American Indians (based on 33 cases) was 1.6 times the rate for Whites.

Appendix 1 presents 1996-98 death rates for the selected urban counties in North Carolina, and for the two groups of counties in the eastern and western parts of the state that contain relatively large numbers of American Indians. Only the overall death rates (all causes) are presented due to small numbers of deaths for the smaller minority groups. The general pattern is the same as that for the state as a whole: the highest death rates are among African Americans and American Indians, with the lowest overall death rates among Asians and Hispanics. A comparison of the American Indian death rates in Jackson/Swain counties versus Cumberland/Hoke/Robeson/Columbus/Scotland counties shows that the rates are the same (11.2), suggesting that overall age-adjusted mortality is similar among the Cherokee and Lumbee Indian groups.

Cancer Incidence

Table 5 shows age-adjusted cancer incidence rates by race and ethnicity for 1995-97, the latest period of available data. These are the average annual rates of new cases of cancer during this time period. For 1990-92, the percentage of cancer incidence records with missing information on Hispanic ethnicity was 29 percent, which was considered too high to produce reliable rates. Therefore only the 1995-97 data, where the percentage missing is much lower (8%), is shown here.

The general pattern is that Whites and African Americans have the highest cancer incidence rates, with much lower rates for the American Indian, Asian, and Hispanic/Latino groups. However, this pattern may be due in part to failure to accurately record race on the cancer incidence records of persons in these smaller minority groups. This problem of undercounting health events in the smaller racial and ethnic groups was discussed earlier.

The cancer incidence rates of Whites and African Americans are generally very similar in magnitude, with the exception of prostate cancer where the African American rate is 56 percent higher than the White rate. Though the age-adjusted incidence rate for total cancer for African Americans was only two percent higher than the rate for Whites, the age-adjusted **death** rate for total cancer for African Americans was 32

Table 4

Number of Deaths and Age-Adjusted Death Rates By Race/Ethnicity and Cause of Death North Carolina Resident Deaths, 1990-92 and 1996-98

Causes of Death	Race/Ethnicity	# Deaths 1990-92	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1990-92	Average Annual Age-Adjusted Death Rate** 1996-98
All Causes (Rates are per 1,000 population)	White	132,672	152,652	9.0	8.9
	African American	41,228	45,067	12.3	12.1
	American Indian	1,341	1,671	9.5	9.7
	Asian	273	476	4.7	4.4
	TOTAL	175,514	199,866	9.6	9.4
	Hispanic/Latino	402	711	2.8	2.1
	Hispanic/Latino II†	595	1,136	4.4	4.0
Heart Disease (All cause-specific rates are per 100,000 population)	White	44,302	45,952	306.7	268.3
	African American	11,668	12,051	370.9	336.9
	American Indian	393	464	320.7	303.1
	Asian	48	77	123.8	92.7
	TOTAL	56,411	58,544	317.7	279.8
	Hispanic/Latino	57	52	70.1	30.5
	Hispanic/Latino II†	88	119	111.5	75.9
Cancer	White	31,440	35,536	203.8	200.1
	African American	8,711	9,682	266.3	264.7
	American Indian	249	303	183.1	181.9
	Asian	78	126	131.2	105.5
	TOTAL	40,478	45,647	214.2	210.7
	Hispanic/Latino	40	50	46.1	27.7
	Hispanic/Latino II†	79	129	88.6	73.6
Stroke	White	10,093	12,152	72.9	72.3
	African American	3,434	3,686	110.3	104.7
	American Indian	66	113	57.1	74.8
	Asian	19	32	*	40.7
	TOTAL	13,612	15,983	79.3	77.8
	Hispanic/Latino	13	17	*	*
	Hispanic/Latino II†	24	37	29.5	25.1
Chronic Lung Disease	White	5,907	8,207	38.7	46.3
	African American	764	1,122	23.5	31.3
	American Indian	37	65	28.7	41.4
	Asian	1	11	*	*
	TOTAL	6,709	9,405	36.0	43.8
	Hispanic/Latino	1	2	*	*
	Hispanic/Latino II†	3	12	*	*

*Rate does not meet statistical standards of precision.
†Expanded definition, including a Hispanic/Latino ethnicity code on the death certificate **or** a matching commonly Hispanic surname.
**Standard for age adjustment is U.S. 2000 population.

Table 4 (continued)

Number of Deaths and Age-Adjusted Death Rates By Race/Ethnicity and Cause of Death North Carolina Resident Deaths, 1990-92 and 1996-98

Causes of Death	Race/Ethnicity	# Deaths 1990-92	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1990-92	Average Annual Age-Adjusted Death Rate** 1996-98
Pneumonia and Influenza	White	4,581	6,266	33.9	37.6
	African American	1,143	1,353	36.7	38.3
	American Indian	37	38	30.3	26.2
	Asian	5	11	*	*
	TOTAL	5,766	7,668	34.5	37.7
	Hispanic/Latino	7	7	*	*
	Hispanic/Latino II†	11	18	*	*
Diabetes	White	2,649	3,522	17.5	20.1
	African American	1,486	1,977	46.0	54.5
	American Indian	59	103	44.0	65.4
	Asian	9	10	*	*
	TOTAL	4,203	5,612	22.6	26.2
	Hispanic/Latino	5	6	*	*
	Hispanic/Latino II†	12	14	*	*
Motor Vehicle Injuries	White	3,061	3,376	19.3	20.0
	African American	989	1,147	22.8	23.8
	American Indian	92	103	41.0	41.2
	Asian	23	35	13.3	15.3
	TOTAL	4,165	4,661	20.1	20.9
	Hispanic/Latino	69	204	27.0	44.6
	Hispanic/Latino II†	92	255	34.4	54.2
Other Unintentional Injuries	White	3,015	3,578	20.6	21.1
	African American	1,143	1,013	29.7	24.4
	American Indian	44	62	24.7	26.5
	Asian	10	19	*	*
	TOTAL	4,212	4,672	22.5	21.8
	Hispanic/Latino	47	85	20.9	16.3
	Hispanic/Latino II†	54	106	23.3	20.4
Suicide	White	2,282	2,321	14.5	13.4
	African American	308	289	7.3	5.9
	American Indian	24	31	9.1	11.7
	Asian	6	10	*	*
	TOTAL	2,620	2,651	13.0	11.8
	Hispanic/Latino	12	32	*	6.9
	Hispanic/Latino II†	17	43	*	9.2

*Rate does not meet statistical standards of precision.
†Expanded definition, including a Hispanic/Latino ethnicity code on the death certificate **or** a matching commonly Hispanic surname.
**Standard for age adjustment is U.S. 2000 population.

Table 4 (continued)

Number of Deaths and Age-Adjusted Death Rates By Race/Ethnicity and Cause of Death North Carolina Resident Deaths, 1990-92 and 1996-98

Causes of Death	Race/Ethnicity	# Deaths 1990-92	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1990-92	Average Annual Age-Adjusted Death Rate** 1996-98
Septicemia	White	1,192	1,422	8.5	8.3
	African American	476	648	14.7	17.9
	American Indian	10	15	*	*
	Asian	3	6	*	*
	TOTAL	1,681	2,091	9.6	10.0
	Hispanic/Latino	0	3	*	*
	Hispanic/Latino II†	1	9	*	*
Nephritis/Nephrosis	White	1,084	1,401	7.6	8.3
	African American	635	677	20.1	19.3
	American Indian	17	17	*	*
	Asian	0	5	*	*
	TOTAL	1,736	2,100	9.8	10.1
	Hispanic/Latino	0	4	*	*
	Hispanic/Latino II†	1	5	*	*
Chronic Liver Disease And Cirrhosis	White	1,494	1,538	9.6	8.6
	African American	588	487	17.1	12.2
	American Indian	22	21	11.6	9.4
	Asian	5	6	*	*
	TOTAL	2,109	2,052	11.0	9.3
	Hispanic/Latino	4	6	*	*
	Hispanic/Latino II†	7	13	*	*
Homicide	White	1,024	853	6.4	5.0
	African American	1,374	1,075	29.1	21.0
	American Indian	50	58	19.9	20.1
	Asian	17	16	*	*
	TOTAL	2,465	2,002	11.5	8.8
	Hispanic/Latino	60	107	19.9	19.7
	Hispanic/Latino II†	76	134	26.0	24.3
AIDS	White	624	456	3.9	2.6
	African American	926	1,272	21.3	27.0
	American Indian	11	8	*	*
	Asian	1	2	*	*
	TOTAL	1,562	1,738	7.5	7.7
	Hispanic/Latino	13	14	*	*
	Hispanic/Latino II†	19	24	*	8.2

*Rate does not meet statistical standards of precision.
†Expanded definition, including a Hispanic/Latino ethnicity code on the death certificate **or** a matching commonly Hispanic surname.
**Standard for age adjustment is U.S. 2000 population.

Table 5

Number of Cancer Cases and Age-Adjusted Cancer Incidence Rates (per 100,000 population) By Race/Ethnicity and Major Cancer Sites North Carolina Residents, 1995-97

	Race/Ethnicity	# Cases	Average Annual Age-Adjusted Incidence Rate**
Total Cancer	White	76,260	435.5
	African American	16,493	445.8
	American Indian	497	281.6
	Asian	341	265.0
	TOTAL	94,059	436.8
	Hispanic/Latino	353	210.3
	Hispanic/Latino II†	481	282.3
Female Breast Cancer (denominator = female population)	White	13,259	140.5
	African American	2,731	124.0
	American Indian	87	84.0
	Asian	77	86.7
	TOTAL	16,217	137.3
	Hispanic/Latino	53	60.3
	Hispanic/Latino II†	86	98.1
Prostate Cancer (denominator = male population)	White	9,951	129.7
	African American	2,862	202.6
	American Indian	71	99.4
	Asian	29	74.7
	TOTAL	13,033	141.9
	Hispanic/Latino	38	70.3
	Hispanic/Latino II†	49	90.1
Lung Cancer	White	12,699	71.3
	African American	2,476	67.9
	American Indian	86	50.1
	Asian	31	30.7
	TOTAL	15,326	70.6
	Hispanic/Latino	37	26.6
	Hispanic/Latino II†	47	33.7
Cancer of Colon/Rectum	White	8,706	50.1
	African American	1,972	54.8
	American Indian	51	31.4
	Asian	38	30.9
	TOTAL	10,807	50.9
	Hispanic/Latino	34	23.4
	Hispanic/Latino II†	48	32.6

Note: The numbers by race add up to less than the TOTAL due to cases of unknown race.
†Expanded definition, including a Hispanic/Latino ethnicity code on the cancer incidence record **or** a matching commonly Hispanic surname.
**Standard for age adjustment is U.S. 2000 population.

percent higher than the rate for Whites (see Table 4). This is due in part to cancer being diagnosed at a later stage of the disease among African Americans, on average, with survival being lower when diagnosis occurs at the later stages.

Appendix 2 presents 1995-97 cancer incidence rates for the selected urban counties in North Carolina, and for the two groups of counties in the eastern and western parts of the state that contain relatively large numbers of American Indians. Only the overall cancer incidence rates (total cancer) are presented due to small numbers of cases for the smaller minority groups. The general pattern is the same as that for the state as a whole: the cancer incidence rates for Whites and African Americans are similar in magnitude, while the rates for American Indians, Asians, and Hispanics/Latinos are generally much lower. A comparison of the American Indian death rates in Jackson/Swain counties versus Cumberland/Hoke/Robeson/Columbus/Scotland counties shows that the rate for Cherokee Indians is 23 percent higher than the rate for Lumbee Indians. It is not known how much of this difference is due to reporting factors.

Live Births

Figures A and B show moderate increases from 1990 to 1998 in total births, White births, and American Indian births; a moderate decline in the number of births to African Americans; and sharp increases in the numbers of births to Asians and Hispanics. Asian births more than doubled during this period, and Hispanic/Latino births more than quadrupled.

Table 6 shows data from the live birth certificates on maternal smoking during pregnancy, percentage low birthweight, and initiation of prenatal care. Smoking during pregnancy declined substantially from 1990-92 to 1996-98 among all of the racial and ethnic groups. American Indians have a particularly high rate of smoking during pregnancy. African Americans, Asians, and Hispanics have rates lower than average. The percentage low birthweight increased over time in all of the groups. African Americans and American Indians have the highest rates of low birthweight, while Hispanics have the lowest rate. Despite having the lowest percentage low birthweight, Hispanics have the highest percentage beginning prenatal care after the first trimester (including no prenatal care). All of the racial groups except Whites have percentages higher than average, especially African Americans and American Indians. For all groups the percentage with late or no prenatal care decreased from 1990-92 to 1996-98.

Figure A
Trends in North Carolina Resident Live Births
By Race and Ethnicity, 1990-1998

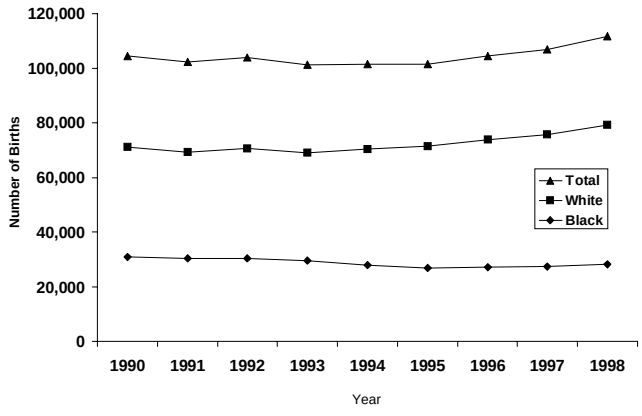

Figure B
Trends in North Carolina Resident Live Births
By Race and Ethnicity, 1990-1998

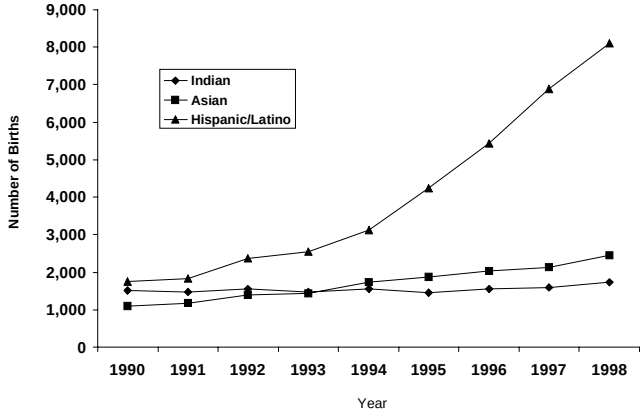

Table 6

Selected Health Indicators from Birth Certificates By Race and Ethnicity North Carolina Resident Live Births, 1990-92 and 1996-98

	Number		Percent	
	1990-92	1996-98	1990-92	1996-98
Percentage Who Smoked *During Pregnancy*				
White	45,005	38,463	21.3	16.8
African American	14,356	9,238	15.7	11.2
American Indian	1,417	1,304	31.2	26.8
Asian	166	222	4.6	3.4
TOTAL	60,944	49,227	19.6	15.2
Hispanic/Latino	289	438	4.9	2.1
Percentage Low Birthweight				
White	13,133	15,985	6.2	7.0
African American	11,955	11,463	13.1	13.8
American Indian	390	497	8.6	10.2
Asian	244	502	6.7	7.6
TOTAL	25,722	28,447	8.3	8.8
Hispanic/Latino	354	1,253	5.9	6.1
Percentage Who Began Prenatal Care After the First Trimester *(Including Those with No Prenatal Care)*				
White	33,427	27,035	15.8	11.8
African American	34,992	21,842	38.3	26.4
American Indian	1,421	1,326	31.3	27.2
Asian	775	1,208	21.3	18.3
TOTAL	70,615	51,411	22.7	15.9
Hispanic/Latino	2,003	6,319	33.6	31.0

Appendix 3 presents the 1996-98 birth certificate indicators for the selected urban counties in North Carolina, and for the two groups of counties in the eastern and western parts of the state that contain relatively large numbers of American Indians. The general pattern is the same as that for the state as a whole. In Johnston County in 1996-98, prenatal care was begun after the first trimester for half of the Hispanic births. A comparison of the American Indian percentages in Jackson/Swain counties versus Cumberland/Hoke/Robeson/Columbus/Scotland counties shows that these birth-related measures are generally worse among the Lumbee Indians. This difference could be in part related to the prenatal care system provided by the Indian Health Service in the western counties.

Risk Factors Around the Time of Pregnancy (PRAMS)

Selected indicators of maternal and infant health risks are shown in Table 7. This information is from the PRAMS survey (described earlier), where women are interviewed 2-5 months after the birth of a baby. The number of respondents is too small to produce reliable data for racial and ethnic groups other than Whites and African Americans. In general, African Americans report higher levels of health risks than Whites, particularly for unintended pregnancy, no breastfeeding, low family income, and physical abuse. In contrast, African American women reported substantially lower levels of smoking during and after pregnancy.

Table 7

Percentages of Survey Respondents with Selected Maternal and Infant Health Risk Factors From the Pregnancy Risk Assessment Monitoring System (PRAMS) By Race North Carolina New Mothers, July 1997 – December 1998

	White	African American	All Races
Pregnancy was unintended (wanted later or not at all)	38.3	70.3	47.3
Mother did not take folic acid every day before pregnancy	73.1	84.6	76.2
Usual sleeping position for baby was on stomach or side	51.2	67.2	55.2
Mother did not breastfeed at all	32.4	58.0	39.4
Annual family income was less than $14,000	22.2	48.0	28.7
Moderate or serious postpartum depression was reported	19.4	20.0	19.8
Mother smoked during last three months of pregnancy	17.7	7.8	14.9
Mother reported smoking at time of survey (2-5 months after delivery)	24.0	14.5	21.2
Mother reported physical abuse:			
before pregnancy	6.2	10.8	7.5
during pregnancy	4.8	10.4	6.3
Total number of survey respondents	1,753	800	2,648

Note: All numerators of these percentages are greater than 50. Percentages are weighted to reflect the total population of North Carolina births.

Infant Deaths

Table 8 shows infant death rates by race and ethnicity for 1990-92 and 1996-98. Rates decreased over time for each group, though there was very little change for American Indians. Rates are substantially higher than average for African Americans and American Indians. Infant death rates are generally higher in North Carolina compared to the United States average for each racial and ethnic group. This suggests that the higher overall infant mortality in North Carolina compared to the nation is not due just to the higher percentage of African American births in North Carolina.

Discussion

The results of this study show generally poorer health among African Americans and American Indians in North Carolina, compared to Whites, across a variety of measures. For American Indians, however, there is concern about the accuracy of the reporting of race on health records, so that the published statistics may substantially underestimate the level of health problems among American Indians. This underreporting is also likely an issue for Hispanic ethnicity. The measures of health problems for Hispanics are generally much lower than those for whites, especially for chronic diseases. However, the very young age of the Hispanic/Latino population in North Carolina, the

Table 8

Infant Death Rates† by Race and Ethnicity Among North Carolina Resident Live Births, 1990-92 and 1996-98 With 1996-98 United States Comparison

Race/Ethnicity	North Carolina Infant Deaths 1990-92	North Carolina Infant Deaths 1996-98	North Carolina Infant Death Rates 1990-92	North Carolina Infant Death Rates 1996-98	United States Infant Death Rates 1996-98
White	1,627	1,558	7.7	6.8	6.0
African American	1,509	1,292	16.5	15.6	13.9
American Indian	62	66	13.7	13.6	9.3
Asian	22	36	6.0	5.5	5.2
TOTAL	3,220	2,952	10.4	9.1	7.2
Hispanic/Latino	42	121	7.1	5.9	5.9

†Infant deaths per 1,000 live births.
Note: 1990-92 data based on year of birth; 1996-98 data based on year of death.

"healthy migrant effect," and other factors may also contribute to low rates for many of the causes of death and for other health problems in this group.

Figures 1, 2, and 3 show areas where there are large disparities in the health measures for African Americans, American Indians, and Hispanics/Latinos, compared to Whites. These charts summarize the data presented in the tables. The ratio of the measure for the minority group to the measure for Whites is shown in these figures if it is greater than 1.5. African Americans exhibit a large number of substantial health disparities (Figure 1). American Indians have elevated rates of death from diabetes, motor vehicle injury, and homicide, as well as higher rates of smoking during pregnancy, late prenatal care, and infant mortality (Figure 2). Hispanics have substantially higher rates of death from motor vehicle injury, homicide, and AIDS, and a higher rate of late prenatal care (Figure 3). Health measures for Asians in North Carolina are much better than those for Whites in almost every case. One exception is that Asians have a higher percentage of births where the prenatal care was begun after the first trimester (ratio = 1.6).

The results from this report pertaining to American Indians in North Carolina are generally consistent with those from a recent report by the North Carolina Commission of Indian Affairs.[7] That report also found that the infant mortality rate was higher among American Indians, compared to the state average. It indicated that American Indians have a shorter life expectancy than the population as a whole and are more likely to have inadequate health care, poor nutrition, and high adult mortality rates. The report also indicated that, compared to Whites, the American Indian population in North Carolina has higher death rates from heart disease, diabetes, and motor vehicle injuries.[7]

The results presented here have emphasized areas where minority groups have worse health problems than Whites. Notable areas where minority groups are better off than Whites in North Carolina are: smoking is lower among African Americans – in the general population of adults and particularly during pregnancy, chronic lung disease and suicide death rates are lower among African Americans, the percentages for smoking during pregnancy and for low birthweight are lower among Hispanics/Latinos, and the infant mortality rate is lower among Hispanic/Latino births.

Several potential limitations of the data presented in this study were mentioned earlier in the Methods section. Another issue is the inconsistency in the way race and ethnicity are reported in the population data (denominator) versus the health data (numerator). Census data, on which the population estimates are based, rely on self-identification for race and ethnicity. For public

health surveillance data, race and ethnicity are collected in a variety of methods, including direct interview, interviewer's observation, and reporting by health providers. For deaths, reporting may be based on observation by funeral directors or information from surviving family members or other informants. Although numbers obtained through self-identification and enumerator observation for White and African American populations generally agree, there are substantial differences for the smaller minority groups.[8] The results based on the birth certificate and infant mortality data may be more reliable since race in both the numerator and denominator of the measures are normally self-reported by the mother at the time of delivery.

We hope that the information presented in this report will inform North Carolina citizens about racial and ethnic disparities in health, and assist in the formulation of policies and programs in North Carolina to reduce these disparities.

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Acknowledgments: We would like to thank Steve Sherman and Mary Bobbitt-Cooke for reviewing this report and offering important suggestions for improvement.

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Glossary

Age-adjustment: A statistical procedure that makes death or other rates more comparable. This procedure adjusts for differences in age between the populations that are being compared. The populations are assumed to have the same age distribution as that of a "standard population," so that any differences in the rates can be attributed to factors other than age. For details on age adjustment, see reference number 6.

BMI: Body Mass Index. This measure is used to determine over- or under-weight and is based on a calculation involving weight and height (weight in kilograms divided by the square of height in meters, or kg/m^2).

Cirrhosis: A disease of the liver, involving hardening of the tissue, often associated with excessive alcohol consumption.

Incidence: The number or rate of new cases of a disease in a population during a specified time period (often one year). This may be contrasted with *prevalence*, which is the total number of people with a disease in a population at a particular time.

Marker: Race or ethnicity is said to be a "marker" of certain health problems rather than a risk factor or cause. This means that race or ethnicity (defined by physical or cultural characteristics) is often *associated* with certain health problems, though the underlying causes lie elsewhere (e.g. socioeconomic status, stress, racism). We may use race or ethnicity to identify or target groups with higher levels of some health problems.

Nephritis/Nephrosis: Acute or chronic diseases of the kidney.

Random error: Variation in health events or health measures (e.g. over time or between geographic areas) that does not constitute a meaningful difference, but rather indicates normal random fluctuation. For more information on this topic, see reference number 5.

Septicemia: Infection of the bloodstream, also known as blood poisoning.

Appendix 1

Number of Deaths and Age-Adjusted Death Rates (per 1,000 population) For All Causes of Death, 1996-98 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1996-98	Estimated 1998 County Population
Cumberland	White	3,379	9.3	179,854
	African American	1,931	12.2	89,611
	American Indian	82	9.9	5,269
	Asian	49	4.9	9,895
	TOTAL	5,445	10.0	284,629
	Hispanic/Latino	33	1.4	24,572
	Hispanic/Latino II†	63	3.3	NA
Durham	White	3,112	8.8	120,477
	African American	1,995	12.3	75,726
	American Indian	3	*	592
	Asian	19	*	5,616
	TOTAL	5,133	9.9	202,411
	Hispanic/Latino	34	3.1	4,103
	Hispanic/Latino II†	43	5.4	NA
Forsyth	White	5,742	8.1	211,556
	African American	2,037	12.1	72,514
	American Indian	5	*	668
	Asian	9	*	2,963
	TOTAL	7,796	8.9	287,701
	Hispanic/Latino	31	2.3	4,406
	Hispanic/Latino II†	51	4.9	NA
Guilford	White	7,414	8.2	275,670
	African American	2,508	12.0	103,175
	American Indian	16	*	2,082
	Asian	46	5.9	6,795
	TOTAL	9,989	9.0	387,722
	Hispanic/Latino	25	1.7	6,068
	Hispanic/Latino II†	39	3.2	NA
Johnston	White	2,288	10.5	86,266
	African American	501	11.6	19,654
	American Indian	1	*	271
	Asian	3	*	391
	TOTAL	2,794	10.6	106,582
	Hispanic/Latino	20	2.5	3,214
	Hispanic/Latino II†	31	6.7	NA

Appendix 1 (continued)

Number of Deaths and Age-Adjusted Death Rates (per 1,000 population) For All Causes of Death, 1996-98 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1996-98	Estimated 1998 County Population
Mecklenburg	White	8,813	8.0	443,589
	African American	3,661	12.4	167,337
	American Indian	18	*	2,842
	Asian	73	4.4	17,080
	TOTAL	12,572	8.9	630,848
	Hispanic/Latino	51	2.0	15,917
	Hispanic/Latino II†	95	3.9	NA
Onslow	White	1,733	9.7	108,871
	African American	367	10.1	27,497
	American Indian	6	*	1,086
	Asian	14	*	4,904
	TOTAL	2,122	9.7	142,358
	Hispanic/Latino	12	*	13,174
	Hispanic/Latino II†	31	5.1	NA
Orange	White	1,412	6.9	87,410
	African American	458	11.2	17,965
	American Indian	1	*	394
	Asian	9	*	4,347
	TOTAL	1,880	7.6	110,116
	Hispanic/Latino	8	*	2,976
	Hispanic/Latino II†	10	*	NA
Wake	White	6,840	8.1	431,541
	African American	2,356	10.8	119,197
	American Indian	17	*	1,837
	Asian	49	2.9	18,040
	TOTAL	9,269	8.5	570,615
	Hispanic/Latino	60	2.2	14,156
	Hispanic/Latino II†	100	5.5	NA
Jackson/Swain	White	1,103	9.0	34,586
	African American	27	15.0	726
	American Indian	144	11.2	6,946
	Asian	0	*	252
	TOTAL	1,274	9.3	42,510
	Hispanic/Latino	0	*	479
	Hispanic/Latino II†	4	*	NA

Appendix 1 (continued)

Number of Deaths and Age-Adjusted Death Rates (per 1,000 population) For All Causes of Death, 1996-98 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Deaths 1996-98	Average Annual Age-Adjusted Death Rate** 1996-98	Estimated 1998 County Population
Cumberland/Hoke/ Robeson/Columbus/ Scotland	White	6,919	9.9	286,385
	African American	4,044	12.6	160,559
	American Indian	1,194	11.2	61,374
	Asian	54	4.5	10,760
	TOTAL	12,218	10.7	519,078
	Hispanic/Latino	73	2.0	27,339
	Hispanic/Latino II†	121	3.8	NA

Note: The numbers of deaths by race may add up to slightly less than the TOTAL due to a few cases of unknown race.

*Rate does not meet statistical standards of precision.

†Expanded definition, including a Hispanic/Latino ethnicity code on the death certificate **or** a matching commonly Hispanic surname.

**Standard for age adjustment is U.S. 2000 population.

Appendix 2

Number of Cancer Cases and Age-Adjusted Cancer Incidence Rates (per 100,000 population) For Total Cancer, 1995-97 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Cases 1995-97	Average Annual Age-Adjusted Incidence Rate** 1995-97
Cumberland	White	1,814	455.4
	African American	796	509.1
	American Indian	23	257.9
	Asian	27	174.0
	TOTAL	2,719	470.2
	Hispanic/Latino	35	239.4
	Hispanic/Latino II†	44	291.8
Durham	White	1,604	462.8
	African American	793	498.7
	American Indian	1	*
	Asian	17	*
	TOTAL	2,419	472.3
	Hispanic/Latino	9	*
	Hispanic/Latino II†	18	*
Forsyth	White	3,737	539.8
	African American	864	521.9
	American Indian	0	*
	Asian	13	*
	TOTAL	4,633	535.9
	Hispanic/Latino	16	*
	Hispanic/Latino II†	22	346.2
Guilford	White	4,458	499.0
	African American	1,091	532.0
	American Indian	3	*
	Asian	26	223.2
	TOTAL	5,625	504.4
	Hispanic/Latino	5	*
	Hispanic/Latino II†	14	*
Johnston	White	970	406.8
	African American	179	421.7
	American Indian	0	*
	Asian	0	*
	TOTAL	1,156	410.3
	Hispanic/Latino	4	*
	Hispanic/Latino II†	7	*

Appendix 2 (continued)

Number of Cancer Cases and Age-Adjusted Cancer Incidence Rates (per 100,000 population) For Total Cancer, 1995-97 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Cases 1995-97	Average Annual Age-Adjusted Incidence Rate** 1995-97
Mecklenburg	White	4,985	429.1
	African American	1,270	429.6
	American Indian	18	*
	Asian	42	225.5
	TOTAL	6,351	428.8
	Hispanic/Latino	30	164.0
	Hispanic/Latino II†	49	256.1
Onslow	White	889	468.9
	African American	127	368.1
	American Indian	0	*
	Asian	13	*
	TOTAL	1,040	451.5
	Hispanic/Latino	12	*
	Hispanic/Latino II†	14	*
Orange	White	969	479.5
	African American	190	465.4
	American Indian	0	*
	Asian	10	*
	TOTAL	1,171	472.0
	Hispanic/Latino	6	*
	Hispanic/Latino II†	7	*
Wake	White	4,654	495.1
	African American	977	454.0
	American Indian	3	*
	Asian	54	259.3
	TOTAL	5,727	485.8
	Hispanic/Latino	19	*
	Hispanic/Latino II†	33	296.5
Jackson/Swain	White	522	439.1
	African American	10	*
	American Indian	50	377.0
	Asian	0	*
	TOTAL	583	435.9
	Hispanic/Latino	2	*
	Hispanic/Latino II†	3	*

Appendix 2 (continued)

Number of Cancer Cases and Age-Adjusted Cancer Incidence Rates (per 100,000 population) For Total Cancer, 1995-97 By Race/Ethnicity and Selected Counties of Residence

County	Race/Ethnicity	# Cases 1995-97	Average Annual Age-Adjusted Incidence Rate** 1995-97
Cumberland/Hoke/ Robeson/Columbus/ Scotland	White	3,287	436.5
	African American	1,450	451.3
	American Indian	343	307.2
	Asian	44	252.0
	TOTAL	5,197	432.2
	Hispanic/Latino	44	233.8
	Hispanic/Latino II†	57	284.2

Note: The numbers by race add up to less than the TOTAL due to cases of unknown race.

*Rate does not meet statistical standards of precision.

†Expanded definition, including a Hispanic/Latino ethnicity code on the cancer incidence record **or** a matching commonly Hispanic surname.

**Standard for age adjustment is U.S. 2000 population.

Appendix 3

Selected Health Indicators from Birth Certificates By Race/Ethnicity and Selected Counties of Residence 1996-98

County	Race/Ethnicity	Percentage Who Smoked During Pregnancy	Percentage Low Birthweight	Percentage Who Began Prenatal Care After the First Trimester†
Cumberland	White	15.8	6.7	10.1
	African American	8.4	13.0	22.1
	American Indian	25.3	12.4	19.1
	Asian	12.1	6.1	10.9
	TOTAL	13.2	9.0	14.4
	Hispanic/Latino	5.0	6.7	12.8
Durham	White	7.4	6.4	6.0
	African American	10.4	15.8	20.8
	American Indian	*	*	*
	Asian	*	8.9	5.6
	TOTAL	8.6	10.8	12.8
	Hispanic/Latino	*	6.3	13.3
Forsyth	White	15.5	7.5	8.9
	African American	17.0	15.8	17.1
	American Indian	*	*	*
	Asian	*	*	13.4
	TOTAL	15.7	9.9	11.3
	Hispanic/Latino	1.8	8.0	24.6
Guilford	White	13.9	6.7	9.2
	African American	11.2	13.3	20.8
	American Indian	37.8	*	*
	Asian	*	8.1	23.0
	TOTAL	12.7	9.1	13.8
	Hispanic/Latino	*	4.9	25.0
Johnston	White	13.6	6.5	18.2
	African American	10.9	14.9	34.3
	American Indian	*	*	*
	Asian	*	*	*
	TOTAL	12.9	8.0	21.1
	Hispanic/Latino	*	4.6	50.2
Mecklenburg	White	9.7	6.6	7.2
	African American	10.5	13.9	20.1
	American Indian	31.5	*	*
	Asian	*	8.0	14.2
	TOTAL	9.7	9.0	11.6
	Hispanic/Latino	1.3	6.4	22.7

Appendix 3 (continued)

Selected Health Indicators from Birth Certificates By Race/Ethnicity and Selected Counties of Residence 1996-98

County	Race/Ethnicity	Percentage Who Smoked During Pregnancy	Percentage Low Birthweight	Percentage Who Began Prenatal Care After the First Trimester†
Onslow	White	15.7	6.5	7.9
	African American	7.0	11.7	16.0
	American Indian	*	*	*
	Asian	9.6	7.9	12.7
	TOTAL	14.0	7.4	9.5
	Hispanic/Latino	6.4	6.8	11.3
Orange	White	11.1	5.3	7.6
	African American	17.2	15.8	23.3
	American Indian	*	*	*
	Asian	*	*	*
	TOTAL	11.7	7.2	10.3
	Hispanic/Latino	*	*	26.4
Wake	White	5.9	5.6	8.4
	African American	10.7	13.2	23.1
	American Indian	*	*	*
	Asian	*	6.9	9.5
	TOTAL	6.8	7.4	11.9
	Hispanic/Latino	1.2	6.2	33.8
Jackson/Swain	White	19.6	5.4	8.8
	African American	*	*	*
	American Indian	24.5	5.7	21.6
	Asian	*	*	*
	TOTAL	20.8	5.5	11.9
	Hispanic/Latino	*	*	*
Cumberland/Hoke/ Robeson/Columbus/ Scotland	White	17.3	6.7	13.9
	African American	9.7	13.3	28.1
	American Indian	27.5	11.1	30.5
	Asian	11.7	6.9	13.2
	TOTAL	15.8	9.4	20.6
	Hispanic/Latino	4.3	6.0	21.1

*Rate does not meet statistical standards of precision.

†Including those with no prenatal care.

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