



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/

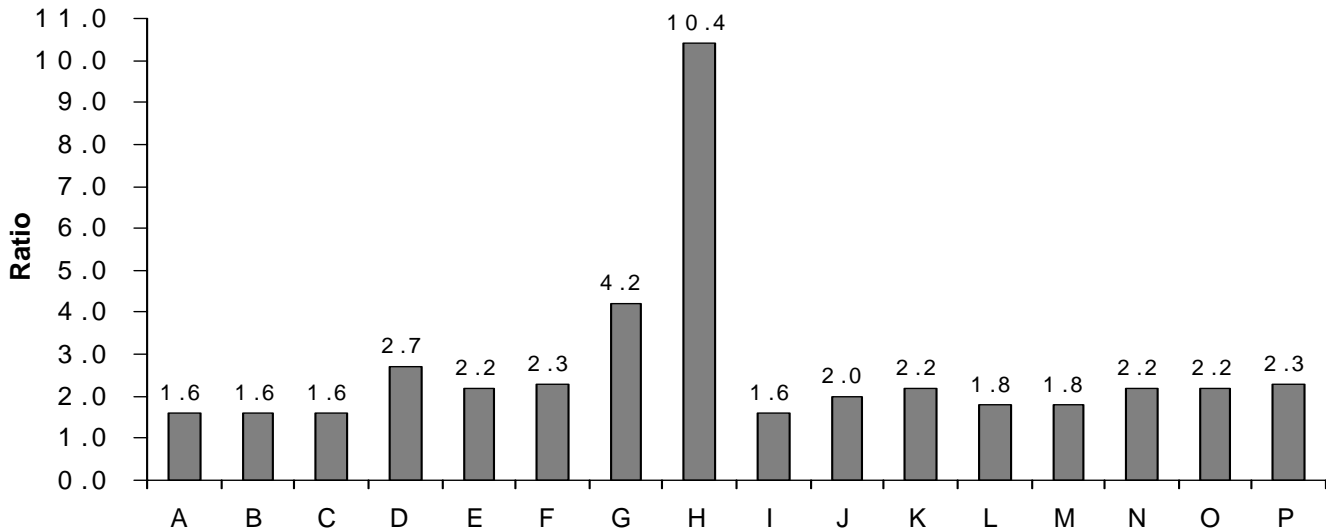
Latinos, compared to Whites. These charts summarize the data presented in the tables of the main report. The ratio of the measure for the minority group to the measure for Whites is shown in these figures if it is greater than 1.5. African Americans exhibit a large number of substantial health disparities (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/>

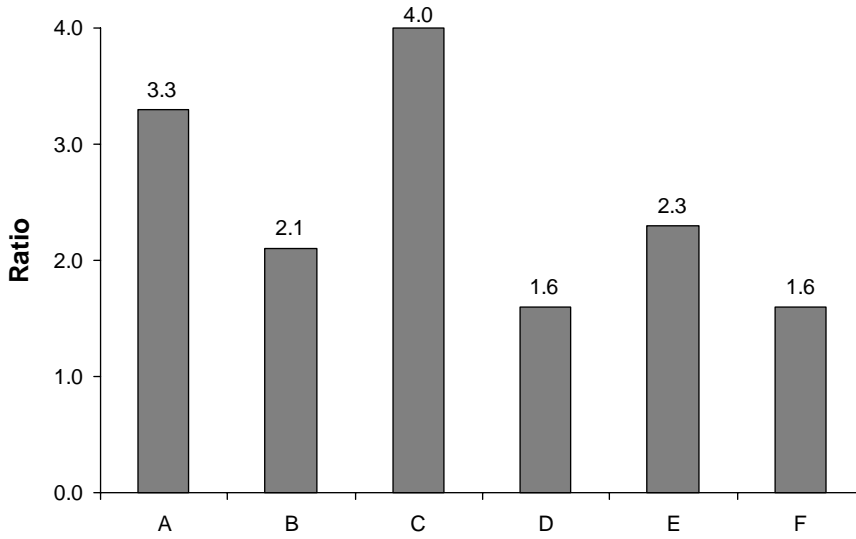
Figure 1
Areas of Large Health Disparities between African Americans and Whites:
Ratio of African-American Measure to White Measure
North Carolina Residents



(See legend below)

- 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.

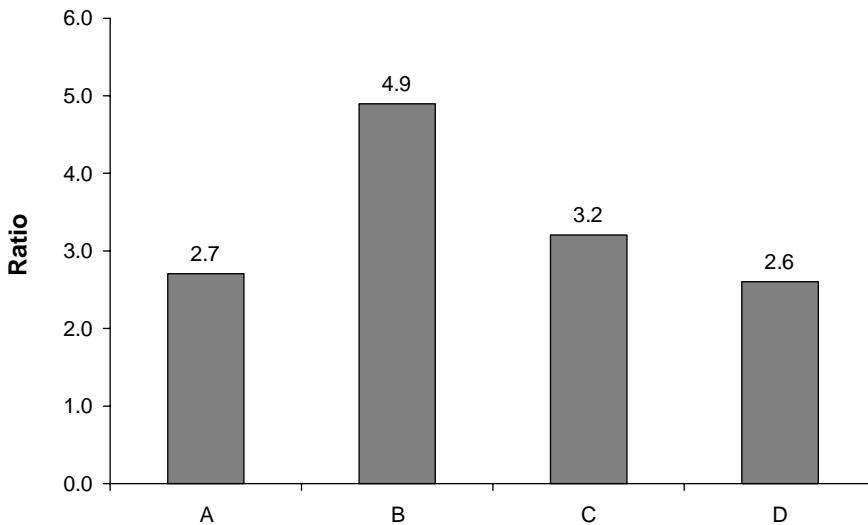
Figure 2
Areas of Large Health Disparities between American Indians and Whites:
Ratio of American Indian Measure to White Measure
North Carolina Residents



- 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.

(See legend to right)

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



- 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.

(See legend to right)



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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.

| 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 under-reporting. 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.

| | 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 | | Average Annual Age-Adjusted Death Rate** | |
|--|---------------------|----------|---------|--|---------|
| | | 1990-92 | 1996-98 | 1990-92 | 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 | | Average Annual Age-Adjusted Death Rate** | |
|------------------------------|---------------------|----------|---------|--|---------|
| | | 1990-92 | 1996-98 | 1990-92 | 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 | | Average Annual Age-Adjusted Death Rate** | |
|--|---------------------|----------|---------|--|---------|
| | | 1990-92 | 1996-98 | 1990-92 | 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.

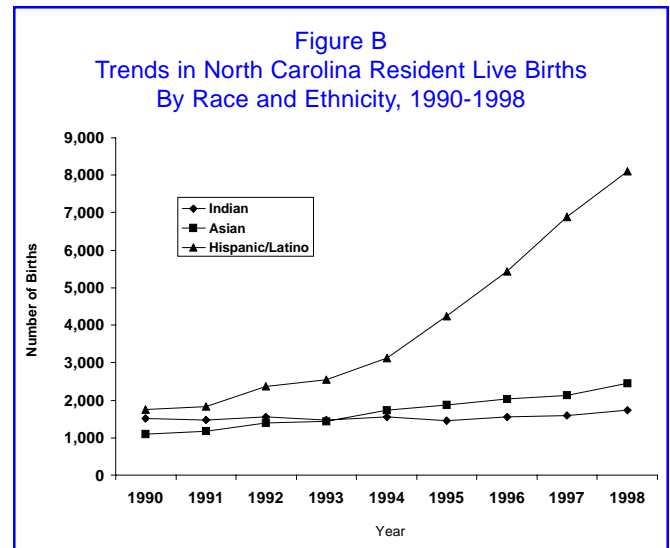
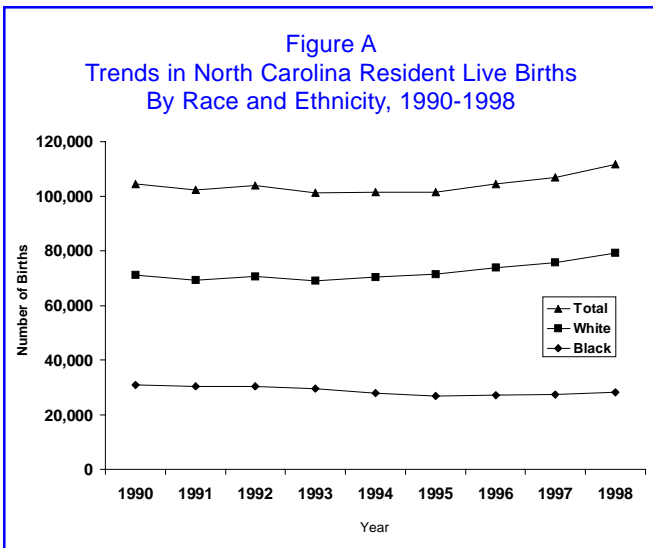


Table 6

**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 | | North Carolina Infant Death Rates | | United States Infant Death Rates |
|------------------|---------------------------------|---------|--------------------------------------|---------|-------------------------------------|
| | 1990-92 | 1996-98 | 1990-92 | 1996-98 | 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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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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