Mortality Trends in Cumberland County, NC
All Causes of Death, All Causes of Premature Mortality and
Ten Leading Causes of Death; 1979-2003

A Resource for Healthy Communities

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# Table of Contents

List of Tables ................................................................................................................................................................................................... 3

List of Figures ................................................................................................................................................................................................. 3

1. Introduction ................................................................................................................................................................................................ 6

2. Data Highlights ........................................................................................................................................................................................... 7

3. Methods, Interpretation, and References .............................................................................................................................................. 11
   Data Sources ............................................................................................................................................................................................. 11
   Measures ................................................................................................................................................................................................... 11
   Interpreting the Pie Charts ......................................................................................................................................................................... 12
   Interpreting the Trend Figures ................................................................................................................................................................... 13
   Caveats about the Concepts of Race, Gender, and Geography ................................................................................................................. 14
   References .............................................................................................................................................................................................. 15

4. Leading Causes of Death (Top 5) ........................................................................................................................................................... 17


6. Appendix .................................................................................................................................................................................................. 100
List of Tables

Table 1. Leading contributors to age-adjusted mortality in Cumberland County by race and gender, 1999-2003

List of Figures

Figure 1. Leading causes of death for the US, NC, ENC, and Cumberland County, 1999-2003
Figure 2. Leading causes of death for the US, NC, ENC, and Cumberland County, using age-adjusted mortality, 1999-2003
Figure 3a. Leading causes of death for Cumberland County by race and gender, 1999-2003
Figure 3b. Leading causes of death for Cumberland County by race and gender, using age-adjusted mortality, 1999-2003
Figure 4a. Leading causes of death for Cumberland County by race, 1999-2003
Figure 4b. Leading causes of death for Cumberland County by race, using age-adjusted mortality, 1999-2003
Figure 5. Population Pyramid for Cumberland County, 2000
Figure 6. All causes of death: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010
Figure 7. All causes of death: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010
Figure 8. All causes of death: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 9. All causes of death: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010
Figure 10. All causes of death: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010
Figure 11. All causes of premature mortality: Trends in premature mortality rates by county, region and state, 1979-2003 with projections to 2010
Figure 12. All causes of premature mortality: Trends in age-adjusted premature mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010
Figure 13. All causes of premature mortality: Trends in age-adjusted premature mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 14. All causes of premature mortality: Trends in age-adjusted premature mortality rates by race, 1979-2003 with projections to 2010
Figure 15. All causes of premature mortality: Measuring disparity in premature mortality rates by race, 1979-2003 with projections to 2010
Figure 16. Heart Disease: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010
Figure 17. Heart Disease: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010
Figure 18. Heart Disease: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 19. Heart Disease: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010
Figure 20. Heart Disease: Measuring disparity in mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 21. Cancer—Trachea, Bronchus, and Lung: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010
Figure 22. Cancer—Trachea, Bronchus, and Lung: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010
Figure 23. Cancer—Trachea, Bronchus, and Lung: Trends in age-adjusted mortality rates by race and gender,
Figure 48. Influenza and Pneumonia: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010 ......................................................... 79
Figure 49. Influenza and Pneumonia: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 80
Figure 50. Influenza and Pneumonia: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 81
Figure 51. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010 ......................................................... 83
Figure 52. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010 ......................................................... 84
Figure 53. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010 ......................................................... 85
Figure 54. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 86
Figure 55. All Other Unintentional Injuries and Adverse Effects: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 87
Figure 56. Cancer - Colon, Rectum, and Anus: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010 ......................................................... 89
Figure 57. Cancer - Colon, Rectum, and Anus: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010 ......................................................... 90
Figure 58. Cancer - Colon, Rectum, and Anus: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010 ......................................................... 91
Figure 59. Cancer - Colon, Rectum, and Anus: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 92
Figure 60. Cancer - Colon, Rectum, and Anus: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010 ......................................................... 93
Figure 61. Cancer - Breast: Trends in mortality rates by county, region and state, 1979-2003 with projections to 2010* .............................................................................. 95
Figure 62. Cancer - Breast: Trends in age-adjusted mortality rates by county, region, state and nation, 1979-2003 with projections to 2010* .............................................................................. 96
Figure 63. Cancer - Breast: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010* .............................................................................. 97
Figure 64. Cancer - Breast: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010* .............................................................................. 98
Figure 65. Cancer - Breast: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010* .............................................................................. 99
Introduction

Health Indicators Series:
A Resource for Healthy Communities
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Report Series #2: Mortality Trends for Cumberland County

Health Indicators is a series of reports describing community health at the state and county level. Health Indicators supplements the Eastern North Carolina Health Care Atlas published by the Center for Health Services Research and Development at East Carolina University. These reports are intended to provide state policy makers, local health departments, hospitals, and community-based health planning groups with a wide range of information useful for diagnosing the health of North Carolina and its local communities, evaluating the effectiveness of existing services, and envisioning and planning new interventions. The reports in this periodically published series can be used in conjunction with the County Health Data Book, produced by the North Carolina Office of Healthy Carolinians, as part of the Community Health Assessment Process. Individual reports in ECU’s Health Indicator Series are custom made for the counties of North Carolina. Reports in this series will describe trends in mortality, including premature mortality for all causes of death, true (crude) and age-adjusted mortality for leading causes of death, and measures of rate disparities or inequalities.

Report Series #2 of the series focuses attention on the two overarching goals of Healthy People 2010, the national blueprint for health improvement. The first goal is to increase the span and quality of life and the second is to eliminate health disparities. North Carolina’s companion plan Healthy Carolinians 2010 has also embraced these two goals.

Report Series #2 is a tool to help evaluate how well Beaufort County and North Carolina are doing in relation to the goals set forth in Healthy People 2010 and Healthy Carolinians 2010 as well as important differences in life span. Using rate comparisons, this report describes the inequalities between Beaufort County and North Carolina, between whites and non-whites, and between males and females. Premature mortality, the focus of Report Series #1, is included in the death from all causes section located at the beginning of this report. The measure used to quantify premature mortality is described in more detail in the Methods and Interpretations section.

This report describes the leading contributors to mortality, provides a geographic context, and examines trends and inequalities over twenty years. The report begins with data highlights, provided as an introduction to the data, rather than a summary of it. Readers are encouraged to draw their own conclusions from the data and pose new questions suggested by what they see. The second section presents overall and five leading contributors to mortality for the state as a whole and by race and gender. Pie charts describe the relative contribution of each of five leading contributors to the overall rate. The charts also provide comparisons to the nation. Making the area of each pie chart equivalent to the rate for the population group conveys the dimension of disparity across population groups. The last section charts recent trends in mortality and disparities in early death and provides projections to the year 2010. These charts place Beaufort County health status in a historical context and provide a glimpse into the future.
Data Highlights

Leading causes of death in Cumberland County, 1999-2003
The five leading causes of death are:

1. Heart Disease
2. Cancer (all sites)
3. Stroke
4. Diabetes
5. COPD

(Unless otherwise noted, trends are considered reliable if $R^2 \geq 0.35$, moderately reliable if $0.35 > R^2 \geq 0.10$, and unreliable if $R^2 < 0.10$.)

Twenty-five year trends in mortality rates:

- Cumberland County’s mortality rate was below regional and state levels.
- Cumberland County’s age-adjusted mortality rate trend was above regional, state, and national levels, but all exhibited similar decreases over the 25-year time period.
- In a moderately reliable trend, non-white males exhibited the highest mortality rate and white females exhibited the lowest.
- The non-white mortality rate increased to 8% greater than the white rate from 1979 to 2003.
- The trend for racial disparity was not reliable.

All Causes of Premature Mortality

- Decreasing by 12%, Cumberland County had a lower decrease in premature mortality than the region and state.
- Cumberland County also experienced a lower decrease in its age-adjusted mortality than the region, state and nation.
- All demographic groups saw decreases in their age-adjusted mortality rates. White males experienced the greatest decrease (35%).
- The rate of premature mortality for non-whites increased from 37% to 51% greater than the white rate from 1979 to 2003, respectively.
- In a moderately reliable trend, Cumberland County experienced an increase of 34% in disparity for premature mortality.

Comparison of county to state rates of age-adjusted mortality by 10 leading contributors in 2003

Higher than the state rate
- Diabetes – 47%
- COPD – 35%
- Heart Disease – 22%
- Cancer: Trachea, Bronchus, Lung – 17%
- Cancer: Breast – 7%
- Influenza and Pneumonia – 4%

Lower than the state rate
- Stroke – 26%
- All Other Unintentional Injury – 9%
- Cancer: Colon, Rectum, Anus – 7%
- Unintentional Motor Vehicle Injuries – 4%

Heart Disease
- In an unreliable trend, Cumberland County’s rate of mortality due to heart disease was 30% less than the Eastern region and 26% less than
the state in 2003.

- Cumberland County’s age-adjusted mortality rate trend was above regional, state and national levels, but all exhibited similar decreases over the 25-year time period.
- In a reliable trend, white males had the greatest decrease (50%), and in a moderately reliable trend non-white females had the lowest decrease (30%) in age-adjusted mortality due to heart disease.
- Non-whites experienced a transition from a lower rate of mortality than whites to a higher rate of mortality, following a 21% increase over the time period.
- The trend for racial disparity was not reliable.

Cancer- Trachea, Bronchus, and Lung

- Cumberland County’s mortality rate for TBL cancer was lower than that of the state and region, but it exhibited a higher rate of increase.
- In a moderately reliable trend, Cumberland County had a higher age-adjusted rate of TBL cancer than the state and region.
- The demographic trends that experienced the largest increases were white females (142%) and non-white females (128%). The trends for non-white and white males were not reliable.
- In a moderately reliable trend, whites experienced a higher rate of TBL cancer than non-whites. The white rate of TBL cancer increased 7% over the 25-year time period.
- The trend for racial disparity was not reliable.

Chronic Lower Respiratory Disease

- Cumberland County’s mortality rate trend for CLRD increased 500% over the 25-year time period, but its mortality rate remained below the region and state.
- Cumberland County experienced a 35% increase in its rate of age-adjusted mortality from 1979 to 2003.
- Non-white females experienced a dramatic increase of 4471% in their mortality rate trend. White females also saw a large increase (712%).
- Both whites and non-whites experienced large mortality rate trend increases of 277% and 182%, respectively.
- Racial disparities in CLRD death showed a 137% increase, in a moderately reliable trend.

Stroke

- Cumberland County’s mortality rate was below the region and state, and it also exhibited a greater decrease than the region and state.
- In 1979, Cumberland County’s age-adjusted rate of mortality was 16% greater than the region; in 2003, Cumberland’s age-adjusted rate of mortality was 32% less than the region.
- All demographic groups experienced a decrease in their age-adjusted mortality rate trend; white females had the greatest decrease (72%).
- The non-white rates were 12% greater than the white rates in 1979; they increased to 41% greater than white rates by 2003.
- The trend for racial disparity was not reliable.

Diabetes Mellitus

- Cumberland County’s mortality rate trend for diabetes has dramatically increased 841% over 25 years.
- The trend for Cumberland County’s age-adjusted mortality due to diabetes was two times greater than the region.
- White and non-white males saw large increases (705% and 299%, respectively) in their propensity to die due to diabetes, in a reliable trend.
• The age-adjusted mortality trends for both non-whites and whites experienced more than a 200% increase.
• The trend for racial disparity was not reliable.

Unintentional Motor Vehicle Injuries
• Mortality resulting from unintentional motor vehicle injuries for Cumberland County changed from 10% lower than the regional rate in 1979 to 27% lower than the regional rate in 2003.
• In a moderately reliable trend, Cumberland County’s age-adjusted mortality was below that of the region and state.
• In a moderately reliable trend, non-white (44%) and white males (33%) experienced a decrease in unintentional motor vehicle injury. The trends for non-white and white females were not reliable.
• The non-white rate remained 8% greater than the white rate over the 25 year time period.
• The trend for racial disparity experienced a 213% decrease, in a moderately reliable trend.

Pneumonia and Influenza
• Increasing by 102%, Cumberland County had a higher increase in its mortality rate trend than the region and state.
• Cumberland County experienced a transition from a lower rate of mortality than that of the Eastern region to a higher rate of mortality, following a 24% increase over the 25-year time period.
• White males experienced a 38% decrease and white females saw a 70% increase, in a moderately reliable trend. The trends for non-white males and females were not reliable.
• The trends for age-adjusted mortality by race and racial disparity were not reliable.

All Other Unintentional Injury
• In a moderately reliable trend, Cumberland County’s mortality rate was below regional and state levels; it also decreased at a faster rate.
• Cumberland County’s age-adjusted rate of unintentional injury was lower than that of the region, but it exhibited a similar rate of decrease.
• Non-white males experienced a large mortality rate trend decrease (61%) in age-adjusted mortality due to unintentional injury. The trends for all other demographic groups were not reliable.
• Non-white rates were 38% greater than white rates in 1979; they decreased to 21% less than white rates by 2003.
• The trend for racial disparity was not reliable.

Cancer- Colon, Rectum, Anus
• In a moderately reliable trend, Cumberland County’s mortality rate was below that of the region and the state, but it exhibited the fastest rate of increase.
• Cumberland County experienced a 17% decrease in its age-adjusted mortality rate over the 25-year time period.
• White females have experienced a 53% decrease in a moderately reliable age-adjusted mortality rate trend. All other demographic groups had unreliable trends.
• Non-whites experienced a transition from a lower rate of mortality than that for whites to a higher rate of mortality, following a 65% increase from 1979 to 2003.
• The trend for racial disparity experienced a 205% increase, in a moderately reliable trend.
Cancer-Breast
- Cumberland County’s rate of mortality due to breast cancer remained below the region and state over the 25-year time period.
- The trends for all age-adjusted mortality rates were not reliable.
- In a moderately reliable trend, racial disparities in breast cancer death showed a 610% increase.
Methods, Interpretation, and References

Data Sources
The data for mortality and premature mortality in Cumberland County were obtained from death certificate data from the North Carolina State Center for Health Statistics and population data from the North Carolina Office of State Planning. For the US, data were obtained from the Compressed Mortality File compiled by the National Center for Health Statistics.

Measures
Two types of mortality measures are covered in this report. The first type is based on the density of deaths per population for a given area over a specified time interval. This type includes the true or “crude” mortality and age-adjusted mortality rates. These mortality rates are typically used in discerning where deaths are occurring and for comparing mortality among areas. The second type of mortality measure is years of life lost before age 75 (YLL-75). The YLL-75 measures include the death density component of both types of mortality rate measures, but they are further weighted by the number of years of life lost before age 75. Like mortality rates, they can either be true (crude) or age-adjusted. These measures provide an indication of the burden of premature mortality in a population or community, much like a count of the number of deaths. In this report the first type of mortality measures—true and age-adjusted rates—are emphasized. Premature mortality (YLL-75) is considered only for general mortality or deaths by all causes. Premature mortality is the focus of report #1.

A simple count of the number of deaths occurring within an area for a given time period is useful for identifying potential problems or issues of public concern—particularly if the deaths result from a rare cause or are deemed an emerging problem for at-risk socio-demographic groups. In this sense, simple count data act as harbingers. Because nothing is known about the underlying population base from which health events arise, the analytical or even political utility of simple count data is limited. The size of the underlying population will have a natural influence on the observed number of health events. The observed influence can be measured as the density of deaths per underlying population. When measured over a given unit of time (usually 1 to 5 years), the density becomes a rate. (The rate is typically multiplied by 100,000 for ease in interpreting the usually small resultant value.) This is the actual observed or true rate for an area and it is an improvement over simple count data because it accounts for the relative size of the underlying population. The chief advantage of the true rate is that it useful for focusing attention on potential public health problems more rigorously than simple counts data. However, the number of health events such as mortality are influenced by more than just the underlying size of the population. The composition of the population will have additional effects on the number of health events that occur and for the analysis of mortality the most important effect is that of the population’s age structure.

Because aging is the greatest risk for mortality, the age structure (composition) of a population will have an effect on the true mortality rate. For example, two counties may have similar population sizes but one has a larger proportion of people over the age of 45 than the other. It is more likely that the older population will experience more deaths over the course of time, which will be reflected in a higher true mortality rate. Age structure, therefore, has a direct effect on the true mortality rate and in order to make meaningful comparisons population age structures need to be controlled.

Age-adjustment or controlling for a population’s age structure requires an external reference or standard to weight the comparison populations by age groups. (Currently, the US 2000 Standard Million Population is used in age adjusting populations for comparisons.) The weighting scheme redistributes the age group sizes of the observed population as if it had the same structure as the standard reference population. The standardized age group population is then applied the number of deaths found in the corresponding age group of the observed population to
produce an expected number of deaths for that age group. The expected number of deaths are summed and then divided by the weighted total population yielding an age-adjusted death rate. Once age structure is controlled, analysis of the effects of selected diseases on mortality is more tractable and the effects of race and gender can be studied more effectively.

The study of premature mortality focuses on the burden of disease and death in a population. The amount of burden is measured in the accumulated amount of years of life lost (YLL) before a benchmark age. We use 75 years of age as a benchmark because it approximates current life expectancy at birth in the United States and gives weight to deaths from chronic disease occurring in later life. To calculate the number of years each person who dies before age 75 is subtracted from 75 and the lost years are summed. The YLL for each person who dies before age 75 is first aggregated and then the result divided by the population under 75 years of age. Again, the value will be relatively small and so a further multiplication of 10,000 magnifies the number into a more understandable rate. The true YLL for an area, like the true mortality rate, is not readily comparable to other areas but it is useful for assessing community health, evaluating health services, and for health planning. Comparisons are possible when age-adjustment with a standard reference population is used.

Age-adjusted rates for both mortality and premature mortality have little intrinsic meaning, however, and can mask the burden and trends of health events that may be of local importance. A casual inspection of adjusted rates may divert attention from the actual health problems of a population and inappropriately guide interventions or resource allocation. Thus, it is important to consider the actual number of deaths (count data) in conjunction with the true rate first, and then use the adjusted rate only if one wishes to factor out age in understanding the health of a population. All of the statistics presented are for the five-year period (1999 to 2003). A five-year period was used because it provides a useful summary of the mortality experience while minimizing wide year-to-year fluctuations in the rate due to the effect of small numbers.

**Interpreting the Pie Charts**

Pie charts are provided as a visual representation of the burden of mortality and they also depict the proportion of mortality accounted for by each of the leading contributors. (The leading causes of death are found in the table preceding the pie chart section.) The pie charts compare the relative levels of burden and proportions by region and demographic groups. With the exception of the second pie chart figure, all rates are true (or crude). The area of each pie is based on the true mortality rate for the population over a five-year period (1999-2003), with larger pie charts representing higher true mortality rates. For purposes of presentation, we set a limit on the smallest possible area of a circle and assigned this area to the population with the smallest rate. (This lower limit is based on the age-adjusted rate for white females in North Carolina.) We then scaled up the circles for all other groups proportionately based on their rates.

The first two pie chart figures compare the proportions of leading causes of death across regions at the national, state, and county level. The first figure in this set allows comparisons using true rates, which illustrates the relative burden of disease intrinsic to each region. The second figure, which is age-adjusted, allows for direct comparisons among regions. The following two figures use proportions based on true mortality rates to show the relative burden of disease intrinsic within race/gender groups and within two major racial groups.

While comparing the pie charts, the reader should remember that the slices of the pie show differences in how much of the total true or age-adjusted mortality rate is accounted for by a specific contributor, not the absolute differences in magnitude of the disease-specific true mortality rate. Finally, the reader will see that some pies are composed of different leading contributors to mortality, so they have different colored slices. The variable sizes of pie slices demonstrate differences in the mortality patterns across populations and are of significant importance in studying inequalities and disparities in population health.
Interpreting the Trend Figures

Four different types of figures are created to show trends in mortality by all causes and for each of the leading causes in the county over a twenty-five year period. True and age-adjusted mortality rate trends are shown for deaths by all causes in addition to the ten leading causes of death. Premature mortality is described for deaths by all causes only. The first figure in the trend series illustrates the true mortality rates for the county, region, and state. Here, the magnitude of each region's mortality pattern for each time interval can be examined. The second figure shows age-adjusted mortality rates for the county, region, state, and nation. In this figure, these geographical entities can be compared directly, because their age structures have been controlled. The third figure compares trends in age-adjusted mortality rates by race and gender. Again, age structure is controlled for each group, which permits observation of the effects of race and gender on these groups. The last figure depicts racial differentials based on true mortality over the twenty-five year time period. True mortality is used here so that the percent differences of the actual number of deaths, or the relative mortality experience for, can be examined for potential disparities. Trend lines provide historical depth to mortality processes as well as a basis for future comparisons and action.

The trend line concept is borrowed from statistical modeling. However, unlike true modeling, we are not assuming the statistical independence of each sequential observation (the rate at time interval x). Instead, our assumption is that each observation is dependent to some degree on previous observations, forming a trend. If the degree of dependence is high, then the observations (rates) should lie close to the trend line. If observations appear to bounce around the fitted line in a random fashion, then there is less dependence and less of a trend in the observations. The purpose of trend lines is to uncover patterns in the data, which will assist the investigator in determining and understanding the underlying processes which generate them.

Mathematically, an equation of the line can be derived from a set of observation points. This line is an estimate of where each observed rate would be if the previous observation could predict with 100% accuracy the value of the next observation. In nature, this situation seldom arises and the degree to which individual observations deviate from this linear trend line is an indication of how well they "fit" or conform to the trend. The linear trend lines in the time series figures project theoretical rates to the year 2010 from historical values (1979 to 2003) to provide a general idea about where mortality trends are heading.

The equation of the line allows the user to calculate an expected or fitted rate—a rate on the trend line—for a given year. The variable “x” is the equation of the line represents the ordinal year in the series. For example, 1990 represents the 12th year in the time series. When the number 12 is substituted for x in the equation of the line describing ENC’s age-adjusted mortality rate for cancer of lung, trachea, and bronchus for the years 1979 to 2003, the calculated fitted rate approaches 63 persons dying per 100,000 people from this disease. The observed age-adjusted rate for 1990 is 69 deaths per 100,000 people. (The observed rates are the values found in the table that runs along the x-axis of the time series chart.) For the year 1990, the expected mortality rate is 63 per 100,000 people compared to the observed rate of 69—an underestimate of six people for that year. Each previous and subsequent year’s difference between the expected and observed rates will vary by a greater or lesser degree. The amount of variation can be measured to determine how well the line fits or models the observed data.

The time series figures include coefficients of determination (R^2), to note when the trend lines are significant, and the percent increase or decrease from 1979 to 2003. The coefficients of determination are included in order to show how well the trend lines fit the data. R-square can range from 0 to 1, with higher scores representing a better fit. The trend lines are generally unreliable when R^2 is less than 0.10, moderately reliable when R^2 is between 0.10 and 0.35, and most reliable when R^2 is equal to or greater than 0.35. Graphically, data points, data lines and trend lines are weighted according to their significance. The thinnest, dotted trend lines are for those where R^2 is less than 0.10 and should be
considered non-significant. The thickest dotted lines are used for trends where the R² is equal to or greater than 0.35. In some cases, the trend lines do not fit the data well (i.e. small R²). In other words, the presentation of a trend line does not necessarily indicate a linear trend in the data line. In some instances a non-linear trend may be present; however, the theoretical basis with which to explore non-linear trends is beyond the scope of this publication.

The percent change provides a quantitative measure of the projected rate of change as well as an indication of whether the trend is increasing or decreasing. Percentage increase or decrease is provided on the graphs for trends where R² is greater than 0.10. The reader should evaluate all available data carefully before drawing conclusions about mortality patterns.

The reader will notice that some data lines in the trend figures fluctuate widely. This fluctuation is due to two main factors. In a small population, the number of deaths may vary widely from year-to-year and lead to large changes in annual mortality and premature mortality rates, a phenomenon known as the effect of small numbers. In addition, because mortality is based on the age of death, any fluctuation in the distribution of deaths across age groups from year-to-year can cause rates to change dramatically. Both the number of deaths and the age of decedents influence trends in mortality.

Each figure, with the exception of the one showing disparity, is accompanied by two comparison tables located in the lower portion of the page. These tables are structured so that the reader can compare the rates derived from the equation of the line (i.e., the fitted rates) among different regions or demographic groups. The 1979 and 2003 tables compare the fitted rates calculated for the beginning and end of the observed time series in terms of percent difference. For example, ENC’s fitted rate for cancer of the lung, trachea, and bronchus in 1979 is 65% greater than (GT) Cumberland County’s fitted rate. In 2003, ENC’s fitted rate is 31% greater than (GT) Cumberland County’s fitted rate. The tables permit a quick assessment of trends calculated from observed time series data.

**Caveats about the Concepts of Race, Gender, and Geography**

We also offer several caveats about the concepts of race, gender, and geography as they apply to the analysis of mortality patterns. While we do intend to bring attention to the stark racial inequalities in mortality across North Carolina, we do not mean to imply that this is a biological phenomenon. Other factors such as differences in socioeconomic status, educational attainment, occupation, and lifestyle probably account for the large racial gaps in mortality rates. Likewise, gender inequalities may have less to do with biological differences between men and women than with socially structured gender roles, health behaviors, occupational exposures, and use of health services. Finally, it is important to consider that county borders may not always be the most appropriate way to look at specific health problems. Few of our health care problems begin or end at political boundary lines and many of our health problems in North Carolina are common to large groups of counties. Counties are convenient units of data collection and readers should not jump to conclusions about health problems or possible solutions based solely on the way data appear when aggregated to this level. In some cases, data at multi-county, zip code, or minor civil division levels are a better way to understand problems and solutions. Similarly, as indicated in *Healthy Carolinians 2010*, consideration needs to be given to whether or not a county is characterized as rural or urban, as this can be an indication to the level of development and amount of resources available in a county.
References


Leading Causes of Death in Cumberland County, NC
Figure 1. Leading causes of death for the United States, North Carolina, Eastern North Carolina, and Cumberland County, (1999-2003). Mortality rate per 100,000 population.

- **United States**: 848 deaths/100,000
- **North Carolina**: 840 deaths/100,000
- **Eastern North Carolina**: 951 deaths/100,000
- **Cumberland County**: 899 deaths/100,000

Pie Charts are proportionately scaled using the state age-adjusted mortality rate of white-females (535 deaths/100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.

- **Heart Disease**
- **Cancer**
- **Stroke**
- **Diabetes Mellitus**
- **Chronic Lower Respiratory Diseases**
- **All Other Deaths**
- **All Other Unintentional Injuries**

NC rate is 1% lower than US rate.
ENC rate is 13% higher than NC rate.
Cumberland rate is 5% lower than ENC rate.
Cumberland rate is 7% higher than NC rate.
Cumberland rate is 6% higher than US rate.
Figure 2. Leading causes of death for the United States, North Carolina, Eastern North Carolina, and Cumberland County (1999-2003). Age-Adjusted Mortality rate per 100,000 population.

United States
- Heart Disease: 32%
- Cancer: 5%
- Stroke: 7%
- Diabetes Mellitus: 8%
- All Other Deaths: 23%
- Other: 29%

North Carolina
- Heart Disease: 35%
- Cancer: 5%
- Stroke: 8%
- Diabetes Mellitus: 5%
- All Other Deaths: 22%
- Other: 27%

Eastern North Carolina
- Heart Disease: 35%
- Cancer: 5%
- Stroke: 7%
- Diabetes Mellitus: 7%
- All Other Deaths: 22%
- Other: 27%

Cumberland County
- Heart Disease: 35%
- Cancer: 6%
- Stroke: 6%
- Diabetes Mellitus: 6%
- All Other Deaths: 22%
- Other: 27%

855 deaths/100,000
828 deaths/100,000
944 deaths/100,000
948 deaths/100,000

NC rate is 3% lower than US rate.
ENC rate is 14% higher than NC rate.
Cumberland rate is <1% higher than ENC rate.
Cumberland rate is 14% higher than NC rate.
Cumberland rate is 11% higher than US rate.

Pie charts are proportionally scaled using the state age-adjusted mortality rate of white-females (535 deaths / 100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.
Figure 3a. Leading causes of death for Cumberland County by race and gender, (1999-2003). Mortality rate per 100,000 population.

The Non-White Male rate is 44% lower than the White Male rate, and 49% lower than Non-White Female rate.

1307 deaths/100,000

Non-White Males

Non-White Females

The Non-White Female rate is 33% higher than the Non-White Male rate, and 52% higher than the White Female rate.

878 deaths/100,000

White Males

578 deaths/100,000

White Females

Pie Charts are proportionately scaled using the state age-adjusted mortality rate of white-females (535 deaths/100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.
Figure 3b. Leading causes of death for Cumberland County by race and gender, (1999-2003).
Age-Adjusted Mortality rate per 100,000 population.

*Non-White Males*
- Cancer: 43
- Heart Disease: 23
- Stroke: 20
- Pneumonia and Influenza: 5
- Alzheimer's Disease: 5
- Diabetes Mellitus: 43
- All Other Diseases: 36
- Chronic Lower Respiratory Diseases: 28
- All Other Unintentional Injuries: 19
- Other: 19

*Non-White Females*
- Cancer: 36
- Heart Disease: 28
- Stroke: 19
- Pneumonia and Influenza: 6
- Alzheimer's Disease: 8
- Diabetes Mellitus: 32
- All Other Diseases: 32
- Chronic Lower Respiratory Diseases: 28
- All Other Unintentional Injuries: 7
- Other: 7

*White Males*
- Cancer: 35
- Heart Disease: 27
- Stroke: 24
- Pneumonia and Influenza: 6
- Alzheimer's Disease: 6
- Diabetes Mellitus: 35
- All Other Diseases: 35
- Chronic Lower Respiratory Diseases: 28
- All Other Unintentional Injuries: 22
- Other: 22

*White Females*
- Cancer: 32
- Heart Disease: 28
- Stroke: 22
- Pneumonia and Influenza: 7
- Alzheimer's Disease: 8
- Diabetes Mellitus: 32
- All Other Diseases: 32
- Chronic Lower Respiratory Diseases: 28
- All Other Unintentional Injuries: 22
- Other: 22

The Non-White Male rate is 47% lower than the White Male rate, and 54% lower than Non-White Female rate.

1437 deaths/100,000
976 deaths/100,000

The Non-White Female rate is 35% higher than the Non-White Male rate, and 65% higher than the White Female rate.

931 deaths/100,000
563 deaths/100,000

Pie Charts are Proportionately scaled using the state age-adjusted mortality rate of white-females (535 deaths/100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.
Figure 4a. Leading causes of death for Cumberland County by race (1999-2003). Mortality rate per 100,000 population.

The Non-White rate is 45% lower than the White rate.

Pie Charts are proportionately scaled using the state age-adjusted mortality rate of white-females (535 deaths/100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.
Figure 4b. Leading causes of death for Cumberland County by race (1999-2003).
Age-Adjusted Mortality rate per 100,000 population.

The Non-White rate is 50% higher than the White rate.

Pie Charts are Proportionately scaled using the state age-adjusted mortality rate of white-females (535 deaths/100,000 pop) as a standard. The areas are proportional to the rates. Slices without percentages constitute less than 5% of the deaths within that chart.
Figure 5. Population Pyramid for Cumberland County, 2000.
(Total 302,963; M-153,221; F-149,742)
Percentages of total population

Population by Age and Sex

Under 5 years
5 to 9 years
10 to 14 years
15 to 19 years
20 to 24 years
25 to 29 years
30 to 34 years
35 to 39 years
40 to 44 years
45 to 49 years
50 to 54 years
55 to 59 years
60 to 64 years
65 to 69 years
70 to 74 years
75 to 79 years
80 to 84 years
85 to 89 years
90 years and over

Male
Female
Table 1. Leading contributors to age-adjusted mortality in Cumberland County by race and gender, 1999-2003.

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<td>Heart Disease</td>
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<td>Pneumonia and Influenza</td>
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<td>COPD and Allied Conditions</td>
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Ten Leading Causes of Death

Heart Disease
Cancer - Trachea, Bronchus, and Lung
Chronic Lower Respiratory Disease
Stroke
Diabetes Mellitus
Unintentional Motor Vehicle Injuries
Influenza and Pneumonia
Unintentional Injuries
Cancer – Colon, Rectum, and Anus
Cancer – Breast
All Causes of Death
Figure 6. All Causes of Death:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

1979 Cumberland rate is 40% less than ENC
2003 Cumberland rate is 28% less than ENC

Comparison of Fitted Rates in 1979
- Cumberland: 35% increase
  - $R^2 = 0.90$
  - $y = 7.20x + 492$
- ENC: 14% increase
  - $R^2 = 0.84$
  - $y = 4.76x + 814$
- NC: 9% increase
  - $R^2 = 0.57$
  - $y = 3.19x + 824$

Comparison of Fitted Rates in 2003
- Cumberland: 40% GT
- ENC: 35% GT
- NC: 3% LT
Figure 7. All Causes of Death:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

Cumberland
15% decrease
$R^2 = 0.54$
$y = -7.19x + 1168$

ENC
14% decrease
$R^2 = 0.91$
$y = -6.91x + 1144$

NC
15% decrease
$R^2 = 0.92$
$y = -6.42x + 1058$

US
16% decrease
$R^2 = 0.96$
$y = -7.50x + 1033$

700 800 900 1000 1100
1200 1300

Age-adjusted mortality rate per 100,000 population

1979 Cumberland rate is 2% greater than ENC
2003 Cumberland rate is 2% greater than ENC
Figure 8. All Causes of Death: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

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Figure 9. All Causes of Death: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

NW
12% decrease
$R^2 = 0.24$
y = -6.01x + 1222

W
18% decrease
$R^2 = 0.60$
y = -8.42x + 1151

1979 Non-white rate is 6% greater than White
2003 Non-white rate is 14% greater than White
Figure 10. All Causes of Death:  
Measuring disparity in mortality rates by race,  
1979-2003 with projections to 2010

Cumberland  
127% increase  
$R^2 = 0.08$  
y = 0.32x + 6
All Causes of Premature Mortality
Figure 11. All Causes of Premature Mortality:
Trends in premature mortality rates by county, region, and state,
1979-2003 with projections to 2010

Cumberland
- 12% decrease
- \( R^2 = 0.53 \)
- \( y = -5.17x + 1021 \)

ENC
- 18% decrease
- \( R^2 = 0.89 \)
- \( y = -8.98x + 1177 \)

NC
- 21% decrease
- \( R^2 = 0.89 \)
- \( y = -9.636x + 1082 \)

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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1979 Cumberland rate is 13% less than ENC
2003 Cumberland rate is 7% less than ENC
Figure 12. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

Cumberland: 21% decrease, $R^2 = 0.81$, $y = -10.66x + 1200$
ENC: 25% decrease, $R^2 = 0.93$, $y = -13.20x + 1267$
NC: 27% decrease, $R^2 = 0.94$, $y = -12.89x + 1141$
US: 27% decrease, $R^2 = 0.95$, $y = -13.14x + 1054$

1979 Cumberland rate is 5% less than ENC
2003 Cumberland rate is 1% less than ENC

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Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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Figure 13. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates by race and gender, 1979-2003 with projections to 2010

NWM 23% decrease  
$R^2 = 0.41$  
$y = -19.03x + 1986$

WM 35% decrease  
$R^2 = 0.88$  
$y = -21.64x + 1467$

NWF 17% decrease  
$R^2 = 0.25$  
$y = -7.38x + 1060$

WF 14% decrease  
$R^2 = 0.28$  
$y = -4.20x + 701$
Figure 14. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 37% greater than White
2003 Non-white rate is 51% greater than White

NW
20% decrease
$R^2 = 0.51$
y = -12.51x + 1482

W
28% decrease
$R^2 = 0.87$
y = -12.39x + 1079
Figure 15. All Causes of Premature Mortality:
Measuring disparity in premature mortality rates by race,
1979-2003 with projections to 2010

Cumberland
34\% increase
$R^2 = 0.10$
$y = 0.53x + 37$
Heart Disease
Figure 16. Heart Disease:
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Cumberland
4% increase
$R^2 = 0.02$
$y = 0.29x + 171$

ENC
19% decrease
$R^2 = 0.81$
$y = -2.46x + 312$

NC
26% decrease
$R^2 = 0.87$
$y = -3.50x + 323$

1979 Cumberland rate is 45% less than ENC
2003 Cumberland rate is 30% less than ENC

1979 Cumberland rate is 45% less than ENC
2003 Cumberland rate is 30% less than ENC
Figure 17. Heart Disease:
Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

<table>
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<th>1979</th>
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<th>Change</th>
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<td>488</td>
<td>379</td>
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<td>430</td>
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<td>402</td>
<td>389</td>
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Comparison of Fitted Rates in 1979

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<th>1979</th>
<th>2003</th>
<th>Change</th>
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<tr>
<td>Cumberland</td>
<td>3%</td>
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<td>US</td>
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Comparison of Fitted Rates in 2003

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<th>Change</th>
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<td>3%</td>
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<tr>
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<td>8%</td>
<td>11%</td>
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<tr>
<td>NC</td>
<td>12%</td>
<td>18%</td>
<td>6%</td>
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<tr>
<td>US</td>
<td>13%</td>
<td>22%</td>
<td>9%</td>
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R-squared values:
- Cumberland: 0.71
- ENC: 0.98
- NC: 0.99
- US: 0.99

Equations:
- Cumberland: $y = -7.67x + 473$
- ENC: $y = -7.99x + 457$
- NC: $y = -7.87x + 425$
- US: $y = -7.54x + 421$
Figure 18. Heart Disease:
Trends in age-adjusted mortality rates by race and gender,
1979-2003 with projections to 2010
Figure 19. Heart Disease:
Trends in age-adjusted mortality rates by race,
1979-2003 with projections to 2010

NW
30% decrease
$R^2 = 0.35$
$y = -5.67x + 448$

W
43% decrease
$R^2 = 0.75$
$y = -8.66 + 485$

1979 Non-white rate is 8% less than White
2003 Non-white rate is 13% greater than White
Figure 20. Heart Disease:
Measuring disparity in mortality rates by race,
1979-2003 with projections to 2010

Cumberland
1273% decrease
R² = 0.01
y = -1.93x + 3.64
Cancer - Trachea, Bronchus, and Lung
Figure 21. Cancer - Trachea, Bronchus, and Lung:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

Cumberland
94% increase
\( R^2 = 0.66 \)
y = 1.04x + 27

ENC
54% increase
\( R^2 = 0.75 \)
y = 0.96x + 44

NC
49% increase
\( R^2 = 0.72 \)
y = 0.89x + 43

1979 Cumberland rate is 39% less than ENC
2003 Cumberland rate is 24% less than ENC

Comparison of Fitted Rates in 1979

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<thead>
<tr>
<th>Cumberland</th>
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Comparison of Fitted Rates in 2003

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Figure 22. Cancer - Trachea, Bronchus, and Lung:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

- Cumberland: 31% increase, \( R^2 = 0.23 \), \( y = 0.75x + 57 \)
- ENC: 28% increase, \( R^2 = 0.49 \), \( y = 0.62x + 54 \)
- NC: 31% increase, \( R^2 = 0.59 \), \( y = 0.63x + 49 \)
- US: 14% increase, \( R^2 = 0.48 \), \( y = 0.34x + 52 \)

Cumberland 1979 rate is 6% greater than ENC
2003 Cumberland rate is 9% greater than ENC

Comparison of Fitted Rates in 1979
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<th>US</th>
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Comparison of Fitted Rates in 2003
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Comparison of Fitted Rates in 2003
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<td>17% GT</td>
<td>8% LT</td>
<td>3% LT</td>
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1979 Cumberland rate is 6% greater than ENC
2003 Cumberland rate is 9% greater than ENC
Figure 23. Cancer - Trachea, Bronchus, and Lung: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

- NWM: 6% increase, R² = 0.00, y = 0.26x + 99
- WM: 3% increase, R² = 0.00, y = 0.13x + 116
- NWF: 128% increase, R² = 0.35, y = 0.79x + 15
- WF: 141% increase, R² = 0.52, y = 1.44x + 25
Figure 24. Cancer - Trachea, Bronchus, and Lung:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 19% less than White
2003 Non-white rate is 26% less than White
Figure 25. Cancer - Trachea, Bronchus, and Lung: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland
127% increase
$R^2 = 0.09$
y = 1.90x - 36
Chronic Lower Respiratory Disease
Figure 26. Chronic Lower Respiratory Disease:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

Cumberland 500% increase
$R^2 = 0.91$
y = 1.34x + 6

ENC 185% increase
$R^2 = 0.96$
y = 1.26x + 16

NC 156% increase
$R^2 = 0.96$
y = 1.19x + 18

1979 Cumberland rate is 61% less than ENC
2003 Cumberland rate is 17% less than ENC
Figure 27. Chronic Lower Respiratory Disease: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

Cumberland
192% increase
$R^2 = 0.85$
y = 1.78x + 22

ENC
112% increase
$R^2 = 0.94$
y = 1.11x + 24

NC
105% increase
$R^2 = 0.96$
y = 1.02x + 23

US
63% increase
$R^2 = 0.96$
y = 0.79x + 27

1979 Cumberland rate is 6% less than ENC
2003 Cumberland rate is 29% greater than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<tr>
<td>46% GT</td>
<td>13% GT</td>
<td>8% GT</td>
<td>US</td>
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</table>
Figure 28. Chronic Lower Respiratory Disease: Trends in mortality rates by race and gender, 1979-2003 with projections to 2010

- NW M: 143% increase, $R^2 = 0.20$, $y = 1.87x + 31$
- WM: 51% increase, $R^2 = 0.22$, $y = 1.26x + 59$
- NWF: 447% increase, $R^2 = 0.72$, $y = 1.25x + 1$
- WF: 712% increase, $R^2 = 0.88$, $y = 2.41x + 8$
Figure 29. Chronic Lower Respiratory Disease:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 53% less than White
2003 Non-white rate is 38% less than White

NW 277% increase
$R^2 = 0.59$
y = 1.41x + 12

W 182% increase
$R^2 = 0.83$
y = 1.98x + 26
Figure 30. Chronic Lower Respiratory Disease:
Measuring disparity in mortality rates by race,
1979-2003 with projections to 2010

Cumberland
137% increase
$R^2 = 0.22$
y = 6.21x - 109
Stroke
Figure 31. Stroke: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010.

1979 Cumberland rate is 41% greater than ENC
2003 Cumberland rate is 50% greater than ENC

Comparison of Fitted Rates in 1979

<table>
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<tbody>
<tr>
<td>70% GT</td>
<td>62% GT</td>
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<tr>
<td>41% LT</td>
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<td>38% LT</td>
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Comparison of Fitted Rates in 2003

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<td>100% GT</td>
<td>98% GT</td>
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</tr>
<tr>
<td>50% LT</td>
<td>1% LT</td>
<td>ENC</td>
</tr>
<tr>
<td>49% LT</td>
<td>1% GT</td>
<td>NC</td>
</tr>
</tbody>
</table>

Cumberland
- 31% decrease
- $R^2 = 0.45$
- $y = -0.61x + 48$

ENC
- 18% decrease
- $R^2 = 0.62$
- $y = -0.62x + 82$

NC
- 15% decrease
- $R^2 = 0.58$
- $y = -0.50x + 78$
**Figure 32. Stroke:**
Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

Cumberland County

- **68% decrease**
  - $R^2 = 0.80$
  - $y = -4.32x + 152$

ENC
- **46% decrease**
  - $R^2 = 0.92$
  - $y = -2.51x + 130$

NC
- **42% decrease**
  - $R^2 = 0.90$
  - $y = -1.97x + 113$

US
- **39% decrease**
  - $R^2 = 0.85$
  - $y = -1.62x + 90$

1979 Cumberland rate is 16% greater than ENC
2003 Cumberland rate is 32% less than ENC

### Comparison of Fitted Rates in 1979

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<th>US</th>
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<tr>
<td>58% GT</td>
<td>44% GT</td>
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### Comparison of Fitted Rates in 2003

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<tr>
<td>12% LT</td>
<td>28% GT</td>
<td>19% GT</td>
<td>US</td>
</tr>
</tbody>
</table>
Figure 33. Stroke:
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

- NWM: 62% decrease
  \( R^2 = 0.44 \)
  \( y = -4.37x + 169 \)
- WM: 70% decrease
  \( R^2 = 0.59 \)
  \( y = -4.45x + 151 \)
- NWF: 64% decrease
  \( R^2 = 0.63 \)
  \( y = -4.27x + 160 \)
- WF: 72% decrease
  \( R^2 = 0.72 \)
  \( y = -4.25x + 142 \)
Figure 34. Stroke:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 12% greater than White
2003 Non-white rate is 41% greater than White

NW 64% decrease
\[ R^2 = 0.68 \]
\[ y = -4.40x + 165 \]

W 71% decrease
\[ R^2 = 0.79 \]
\[ y = -4.39x + 1479 \]
Figure 35. Stroke: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland
388% increase
$R^2 = 0.04$
y = 4.18x + 26
Diabetes Mellitus
Figure 36. Diabetes Mellitus:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

Sacramento ENC
196% increase
$R^2 = 0.94$
$y = 0.90x + 11$

Sacramento NC
144% increase
$R^2 = 0.94$
$y = 0.69x + 11$

Cumberland ENC
841% increase
$R^2 = 0.92$
$y = 1.02x + 3$

Cumberland rate is 74% less than ENC
2003 Cumberland rate is 18% less than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<td>75% LT</td>
<td>16% GT</td>
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<td>5% LT</td>
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Figure 37. Diabetes Mellitus:
Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

- Cumberland: 240% increase
  \[ R^2 = 0.83 \]
  \[ y = 1.25x + 13 \]

- ENC: 114% increase
  \[ R^2 = 0.91 \]
  \[ y = 0.77x + 16 \]

- NC: 90% increase
  \[ R^2 = 0.89 \]
  \[ y = 0.56x + 15 \]

- US: 61% increase
  \[ R^2 = 0.90 \]
  \[ y = 0.43x + 15 \]

Cumberland 1979 rate is 23% less than ENC
2003 Cumberland rate is 23% greater than ENC

Comparison of Fitted Rates in 1979
<table>
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<th>Cumberland</th>
<th>ENC</th>
<th>NC</th>
<th>US</th>
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Comparison of Fitted Rates in 2003
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<td>61% GT</td>
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Figure 38. Diabetes Mellitus: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

NWM 299% increase
\[ R^2 = 0.44 \]
\[ y = 2.18x + 17 \]

WM 705% increase
\[ R^2 = 0.70 \]
\[ y = 1.66x + 6 \]

NWF 172% increase
\[ R^2 = 0.47 \]
\[ y = 1.59x + 22 \]

WF 92% increase
\[ R^2 = 0.27 \]
\[ y = 0.48x + 12 \]
Figure 39. Diabetes Mellitus:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

- **NW**: 231% increase
  - $R^2 = 0.68$
  - $y = 1.88x + 20$
- **W**: 215% increase
  - $R^2 = 0.70$
  - $y = 0.91x + 10$

1979 Non-white rate is 91% greater than White
2003 Non-white rate is 101% greater than White
Figure 40. Diabetes Mellitus: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland County

65% increase

$R^2 = 0.01$

$y = 4.26x + 156$
Unintentional Motor Vehicle Injuries
Figure 41. Unintentional Motor Vehicle Injuries: 
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Cumberland 32% decrease  
R² = 0.37  
y = -0.35x + 26

ENC 17% decrease  
R² = 0.48  
y = -0.20x + 29

NC 26% decrease  
R² = 0.66  
y = -0.28x + 26

Mortality rate per 100,000 population

1979 Cumberland rate is 10% less than ENC
2003 Cumberland rate is 27% less than ENC

Comparison of Fitted Rates in 1979
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Comparison of Fitted Rates in 2003
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Figure 42. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

- **Cumberland**: 23% decrease, $R^2 = 0.21$, $y = -0.23x + 24$
- **ENC**: 13% decrease, $R^2 = 0.35$, $y = -0.15x + 28$
- **NC**: 21% decrease, $R^2 = 0.60$, $y = -0.22x + 24$
- **US**: 31% decrease, $R^2 = 0.84$, $y = -0.30x + 21$

1979 Cumberland rate is 14% less than ENC
2003 Cumberland rate is 24% less than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<td>14% LT</td>
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<td>14% GT</td>
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10 15 20 25 30 35
Age-adjusted mortality rate per 100,000 population

- 1979 Cumberland rate is 14% less than ENC
- 2003 Cumberland rate is 24% less than ENC
Figure 43. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

Comparison of Fitted Rates in 1979

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<td>91% GT</td>
<td>91% GT</td>
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Figure 44. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 8% greater than White
2003 Non-white rate is 8% greater than White

NW
24% decrease
$R^2 = 0.09$
y = -0.25x + 25

W
24% decrease
$R^2 = 0.19$
y = -0.23x + 24
Figure 45. Unintentional Motor Vehicle Injuries: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland
213% decrease
$R^2 = 0.10$
y = -1.86x + 21
Influenza and Pneumonia
Figure 46. Influenza and Pneumonia:
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Cumberland 102% increase
\[ R^2 = 0.56 \]
\[ y = 0.37x + 8 \]

ENC 23% increase
\[ R^2 = 0.12 \]
\[ y = 0.21x + 22 \]

NC 23% increase
\[ R^2 = 0.12 \]
\[ y = 0.23x + 24 \]
Figure 47. Influenza and Pneumonia: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

1979 Cumberland rate is 20% less than ENC
2003 Cumberland rate is 4% greater than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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Figure 48. Influenza and Pneumonia:
Trends in age-adjusted mortality rates by race and gender,
1979-2003 with projections to 2010

NWM 6% decrease
R² = 0.00
y = -0.11x + 43

WM 38% decrease
R² = 0.18
y = -0.83x + 52

NWF 44% increase
R² = 0.05
y = 0.29x + 16

WF 70% increase
R² = 0.19
y = 0.57x + 20
Figure 49. Influenza and Pneumonia: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

- NW: 10% increase
  - $R^2 = 0.01$
  - $y = 0.11x + 26$

- W: 8% increase
  - $R^2 = 0.01$
  - $y = 0.10x + 31$

1979 Non-white rate is 16% less than White
2003 Non-white rate is 14% less than White
Figure 50. Influenza and Pneumonia: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland
347% decrease
$R^2 = 0.04$
y = -2.26x + 16
All Other Unintentional Injuries and Adverse Effects
Figure 51. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

1979 Cumberland rate is 19% less than ENC
2003 Cumberland rate is 27% less than ENC

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Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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Figure 52. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

1979 Cumberland rate is 4% less than ENC
2003 Cumberland rate is 10% less than ENC
Figure 53. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

NWM 61% decrease
$R^2 = 0.40$
$y = -1.68x + 66$

WM 29% decrease
$R^2 = 0.09$
$y = -0.49x + 40$

NWF 34% decrease
$R^2 = 0.06$
$y = -0.26x + 18$

WF 27% decrease
$R^2 = 0.07$
$y = -0.21x + 18$
Figure 54. All Other Unintentional Injuries and Adverse Effects:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

- NW: 58% decrease
  - $R^2 = 0.55$
  - $y = -0.96x + 40$
- W: 27% decrease
  - $R^2 = 0.15$
  - $y = -0.32x + 29$

1979 Non-white rate is 38% greater than White
2003 Non-white rate is 21% less than White
Figure 55. All Other Unintentional Injuries and Adverse Effects:
Measuring disparity in mortality rates by race,
1979-2003 with projections to 2010

23% increase
$R^2 = 0.04$
y = 0.70x + 72
Cancer - Colon, Rectum, and Anus
Figure 56. Cancer - Colon, Rectum, and Anus: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

- Cumberland: 28% increase, $R^2 = 0.11$, $y = 0.12x + 10$
- ENC: 21% increase, $R^2 = 0.40$, $y = 0.15x + 17$
- NC: 8% increase, $R^2 = 0.13$, $y = 0.06x + 19$

1979 Cumberland rate is 42% greater than ENC
2003 Cumberland rate is 38% greater than ENC

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Figure 57. Cancer - Colon, Rectum, and Anus:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

Cumberland
26% decrease
$R^2 = 0.12$
y = -0.27x + 25

ENC
11% decrease
$R^2 = 0.23$
y = -0.11x + 24

NC
16% decrease
$R^2 = 0.57$
y = -0.15x + 24

US
27% decrease
$R^2 = 0.97$
y = -0.34x + 28

1979 Cumberland rate is 4% greater than ENC
2003 Cumberland rate is 13% less than ENC
Figure 58. Cancer - Colon, Rectum, and Anus: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

- NWM: 13% decrease  \( R^2 = 0.01 \)
  \[ y = -0.14x + 26 \]
- WM: 22% decrease  \( R^2 = 0.04 \)
  \[ y = -0.28x + 30 \]
- NWF: 28% increase  \( R^2 = 0.02 \)
  \[ y = 0.21x + 18 \]
- WF: 53% decrease  \( R^2 = 0.26 \)
  \[ y = -0.56x + 25 \]
Figure 59. Cancer - Colon, Rectum, and Anus: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 21% less than White
2003 Non-white rate is 44% greater than White

NW
9% increase
$R^2 = 0.01$
y = 0.08x + 21

W
40% decrease
$R^2 = 0.26$
y = -0.45x + 27
Figure 60. Cancer - Colon, Rectum, and Anus: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Cumberland
205% increase
$R^2 = 0.23$
y = 3.58x - 42
Cancer - Breast
Figure 61. Cancer - Breast:
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010*
*Graph reflects female mortality rates only

**Cumberland**
- 46% increase
- $R^2 = 0.38$
- $y = 0.33x + 17$

**ENC**
- 28% increase
- $R^2 = 0.40$
- $y = 0.30x + 25$

**NC**
- 10% increase
- $R^2 = 0.10$
- $y = 0.12x + 28$

1979 Cumberland rate is 32% less than ENC
2003 Cumberland rate is 22% less than ENC

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Cumberland ENC NC
Figure 62. Cancer - Breast:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010*

*Graph reflects female mortality rates only

Cumberland ENC NC US
1% decrease 1% increase 10% decrease 10% decrease
$R^2 = 0.00$ $R^2 = 0.00$ $R^2 = 0.11$ $R^2 = 0.34$
y = -0.01x + 30 y = 0.01x + 30 y = -0.13x + 31 y = -0.15x + 33

Comparison of Fitted Rates in 1979

Comparison of Fitted Rates in 2003

Cumberland ENC NC US Cumberland ENC NC US Cumberland ENC NC US
1% LT 3% LT 11% LT 1% LT 9% LT 1% LT
1% GT 4% GT 12% GT 1% GT 9% GT 1% GT
3% LT 4% LT 9% GT 3% LT 7% LT 3% LT
10% LT 10% LT 7% LT 10% LT 7% LT 10% LT

1% LT 3% LT 11% LT 1% LT 9% LT 1% LT
1% GT 4% GT 12% GT 1% GT 9% GT 1% GT
3% LT 4% LT 9% GT 3% LT 7% LT 3% LT
10% LT 10% LT 7% LT 10% LT 7% LT 10% LT

1979 Cumberland rate is 1% greater than ENC
2003 Cumberland rate is 1% less than ENC
Figure 63. Cancer - Breast:
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010*

*Graph reflects female mortality rates only

DO NOT USE THIS GRAPH, IT'S REDUNDANT!

NWF
- 21% increase
- $R^2 = 0.05$
- $y = 0.24x + 27$

WF
- 14% decrease
- $R^2 = 0.03$
- $y = -0.19x + 32$
Figure 64. Cancer - Breast:
Trends in age-adjusted mortality rates by race,
1979-2003 with projections to 2010*

*Graph reflects female mortality rates only

1979 Non-white rate is 13% less than White
2003 Non-white rate is 23% greater than White

NW
21% increase
$R^2 = 0.05$
y = 0.24x + 27

W
14% decrease
$R^2 = 0.03$
y = -0.19x + 32

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Figure 65. Cancer - Breast:
Measuring disparity in mortality rates by race,
1979-2003 with projections to 2010*
*Graph reflects female mortality rates only

Cumberland
610% increase
$R^2 = 0.14$
y = 6.10x - 24
Appendix

Heart Disease
Stroke
Atherosclerosis
Cancer - Lip, Oral Cavity, and Pharynx
Cancer - Stomach
  Cancer - Colon, Rectum, and Anus
  Cancer - Liver
  Cancer - Pancreas
  Cancer - Larynx
  Cancer - Trachea, Bronchus, and Lung
  Cancer - Malignant Melanoma of Skin
  Cancer - Breast
  Cancer - Cervix Uteri
  Cancer - Ovary
  Cancer - Prostate
  Cancer - Bladder
  Cancer - Brain
  Cancer - Non-Hodgkin's Lymphoma
  Cancer - Leukemia
  Human Immunodeficiency Virus (HIV) Disease
Septicemia
Diabetes Mellitus
Influenza and Pneumonia
Chronic Lower Respiratory Disease
Chronic Liver Disease and Cirrhosis
Nephritis, Nephrotic Syndrome, and Nephrosis
Unintentional Motor Vehicle Injuries
All Other Unintentional Injuries and Adverse Effects
Suicide
Homicide
Legal Intervention
Alzheimer's Disease