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

A Resource for Healthy Communities

Health Indicator Series - Report #2.055
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Center for Health Services Research and Development
East Carolina University
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Introduction

Health Indicators Series:
A Resource for Healthy Communities
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Report Series #2: Mortality Trends for Dare 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 Dare 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 Dare 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-five 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 Dare County health status in a historical context and provide a glimpse into the future.
Data Highlights

**Leading causes of death in Dare County, 1999-2003**
The five leading causes of death are:
1. Cancer (all sites)
2. Heart Disease
3. Stroke
4. Pneumonia and Influenza
5. COPD and All Other Unintentional Injuries (Tied)

(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 (1979-2003):**
- Dare County’s mortality rate was below regional and state levels; the trend for Dare County was not reliable due to small numbers.
- Dare County had a smaller percentage decrease (10%) in its age-adjusted mortality rate than did the Eastern region (14%), the state (15%), and the nation (16%); however, due to small numbers, this trend was unreliable.
- In a moderately reliable trend, white males experienced a 24% decrease in age-adjusted mortality rates over the 25-year time period. The trend for all other demographic groups was unreliable.
- In a moderately reliable trend, deaths due to all causes of disease decreased by 11% for whites. The trend was unreliable for non-whites.
- There was a moderately reliable, increasing trend in racial disparity over the 25-year time period.

**All Causes of Premature Mortality**
- Dare County’s premature mortality rate trend was below that of the region and state and decreased by a larger percentage over the 25-year time period, in a moderately reliable trend.
- A smaller percentage decrease in age-adjusted mortality rate was seen for Dare County (21%) than for the Eastern region (25%), state (27%), and nation (27%).
- All demographic groups saw decreases in their age-adjusted rates of premature mortality. Reliable trends occurred in white males, but not in any other demographic group.
- The trend for racial disparity was not reliable.

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

<table>
<thead>
<tr>
<th>Higher than the state rate</th>
<th>Lower than the state rate</th>
</tr>
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<tr>
<td>Pneumonia and Influenza – 94%</td>
<td>Unintentional Motor Vehicle Injuries – 26%</td>
</tr>
<tr>
<td>Septicemia – 47%</td>
<td>Stroke – 21%</td>
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<tr>
<td>Cancer: Trachea, Bronchus, Lung – 30%</td>
<td>Alzheimer’s Disease – 13%</td>
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<tr>
<td>All Other Unintentional Injuries – 30%</td>
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</tr>
<tr>
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Heart Disease
- Dare County’s mortality rate due to heart disease decreased by 45% in the 25-year time period, resulting in a change from a mortality rate that was 4% greater than that of Eastern North Carolina in 1979 to a one that was 30% less in 2003.
- The trend for Dare County's age-adjusted rate was below the trends for the region, state, and nation, and showed a similar percentage decrease over the 25-year time period.
- All demographic groups saw decreases in their age-adjusted mortality rates. White males experienced the largest decrease (61%), in a reliable trend; white females had a 30% decrease, in a moderately reliable trend. The trends for non-white males and females were unreliable.
- Whites experienced a 48% decrease in age-adjusted mortality due to heart disease. The trend for non-whites was not reliable.
- The trend for racial disparity was not reliable.

Cancer – Trachea, Bronchus, and Lung
- Dare County’s mortality rate for TBL cancer was greater than that of the state and region, but exhibited a similar percentage increase, in a moderately reliable trend.
- Increasing by 62% over the 25-year time span, Dare County’s age-adjusted mortality rate for TBL cancer changed from being 4% less than the regional rate in 1979 to 21% greater that the regional rate in 2003.
- White females showed a 135% increase in their propensity to die due to TBL cancer, in a moderately reliable trend. The trends for all other demographic groups were not reliable.
- In moderately reliable trends, whites had a 53% increase in age-adjusted mortality, while non-whites had a 317% increase.
- The trend for racial disparity was not reliable.

Stroke
- The trend for Dare County’s mortality rate due to stroke was below that of the region and state, but was unreliable.
- Dare County had a moderately reliable, decreasing trend in age-adjusted mortality rate due to stroke that was comparable to trends in the region, state, and nation.
- In moderately reliable trends, both white males (49%) and females (51%) saw decreases in age-adjusted mortality. The trends for non-white males and females were not reliable.
- Overall, whites experienced a 51% decrease in age-adjusted mortality while non-whites experienced a 298% increase.
- There was a 645% increase in the disparity of mortality rates between whites and non-whites in Dare County. The trend was moderately reliable.

Influenza and Pneumonia
- In a moderately reliable trend, Dare County’s mortality rate due to influenza and pneumonia increased by 135%, as compared with a 23% increase for both the region and state.
- The age-adjusted mortality rate increased by 112%, in a moderately reliable trend, compared to slight decreases seen in the regional, state, and national rates.
- White females showed a moderately reliable trend of increasing influenza and pneumonia (172%) during the 25-year time period. All other demographic groups showed unreliable trends.
• There was a 97% increase in age-adjusted mortality rates for whites, in a moderately reliable trend. The non-white trend was unreliable.
• The trend for racial disparities in influenza and pneumonia was moderately reliable and showed a 303% increase. However, the increase is most likely a mathematical artifact resulting from a combination of small numbers and rate spikes at the end points of the time series.

All Other Unintentional Injuries and Adverse Effects
• Due to the small numbers problem of Dare County, the trends were not statistically reliable.
• Conclusions drawn from the comparison of these trends would be spurious.

Chronic Lower Respiratory Disease
• Dare County’s mortality rate due to COPD was slightly lower than that of the region and state, but exhibited a similar percentage increase, in a moderately reliable trend.
• Dare County experienced a 200% increase in age-adjusted mortality rate due to COPD over the 25-year period, changing from 33% less than Eastern North Carolina in 1979 to 5% less in 2003.
• White males experienced the largest increase (252%) in age-adjusted mortality rate from COPD, and white females had a 125% increase, in moderately reliable trends. The trends for non-white males and females were not reliable.
• Overall, whites had a 221% increase in age-adjusted mortality rate, in a moderately reliable trend. The non-white trend was unreliable.
• The trend for racial disparity was not reliable.

Septicemia
• In a moderately reliable trend, the mortality rate due to septicemia in Dare County was greater than that of the region and state.
• Dare County’s age-adjusted mortality rate increased by 181% over the 25-year period, changing from 1% greater than Eastern North Carolina in 1979 to 25% greater in 2003.
• While the trend for white females had statistical significance, the small number of data for each demographic group resulted in trends that were difficult to describe.
• The trend for racial disparity was not reliable.

Alzheimer’s Disease
• The increasing trend in Dare County’s mortality rate due to Alzheimer’s Disease is similar to that seen in the region and state.
• The increasing age-adjusted mortality rate trend is similar to that of the region, state, and nation.
• While the trend for white males and both non-white and white females had statistical significance, the small number of data for each demographic group resulted in trends that were difficult to describe.
• The statistically reliable trend in racial disparity is a mathematical artifact resulting from only two data points.

Cancer – Breast (females only)
• Dare County’s mortality rate due to breast cancer increased by 135%, changing it from 34% less than the Eastern North Carolina rate in 1979 to 23% greater in 2003.
• The age-adjusted mortality rate for breast cancer for Dare County increased by 141%, whereas the regional rate stayed the same and the state and nation rates decreased.
Whites had a 140% increase in breast cancer. The trend for non-whites was unreliable.

The trend for racial disparity was not reliable.

Unintentional Motor Vehicle Injuries

Mortality resulting from unintentional motor vehicle injuries for Dare County experienced a moderately reliable, 54% decrease over the 25-year period, as compared with 26% and 17% for the state and region, respectively.

In a moderately reliable trend, the age-adjusted mortality rate for unintentional motor vehicle injuries decreased by 50% over the 35-year period, as compared with 13%, 21%, and 31% decreases for the region, state, and nation, respectively.

White males experienced a 54% decrease in unintentional motor vehicle accident mortality, with a moderately reliable trend. The trends for all other demographic groups were unreliable.

The percentage decrease for whites as a whole was 52%, in a moderately reliable trend. The non-white trend was unreliable.

The trend in racial disparities was not reliable.
Methods, Interpretation, and References

Data Sources
The data for mortality and premature mortality in Dare 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 lost, the age of 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 (R²), 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 R² is less than 0.10, moderately reliable when R² is between 0.10 and 0.35, and most reliable when R² 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 R² is less than 0.10 and should be
considered non-significant. The thickest dotted lines are used for trends where the $R^2$ is equal to or greater than 0.35. In some cases, the trend lines do not fit the data well (i.e. small $R^2$). 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 $R^2$ 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 19% less than (LT) Dare County’s fitted rate. In 2003, ENC’s fitted rate is 20% less than (LT) Dare 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 Dare County, NC
Figure 1. Leading causes of death for the United States, North Carolina, Eastern North Carolina, and Dare County, (1999-2003). Mortality rate per 100,000 population.

**United States**
- Heart Disease: 32%
- Cancer: 29%
- Stroke: 23%
- Chronic Lower Respiratory Disease: 7%
- Diabetes Mellitus: 5%
- All Other Deaths: 8%
- All Other Unintentional Injuries: 5%

848 deaths/100,000

**North Carolina**
- Heart Disease: 35%
- Cancer: 27%
- Stroke: 22%
- Chronic Lower Respiratory Disease: 8%
- Diabetes Mellitus: 5%
- All Other Deaths: 7%
- All Other Unintentional Injuries: 5%

840 deaths/100,000

**Eastern North Carolina**
- Heart Disease: 35%
- Cancer: 27%
- Stroke: 22%
- Chronic Lower Respiratory Disease: 7%
- Diabetes Mellitus: 5%
- All Other Deaths: 6%
- All Other Unintentional Injuries: 5%

951 deaths/100,000

**Dare County**
- Heart Disease: 28%
- Cancer: 23%
- Stroke: 22%
- Chronic Lower Respiratory Disease: 5%
- Diabetes Mellitus: 5%
- All Other Deaths: 28%
- All Other Unintentional Injuries: 6%

706 deaths/100,000

NC rate is 1% higher than US rate.

ENC rate is 13% higher than NC rate.

Dare rate is 26% lower than ENC rate.

Dare rate is 16% lower than NC rate.

Dare rate is 17% lower than US 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 2. Leading causes of death for the United States, North Carolina, Eastern North Carolina, and Dare County (1999-2003). Age-Adjusted Mortality rate per 100,000 population.

United States: 855 deaths/100,000
North Carolina: 828 deaths/100,000
Eastern North Carolina: 944 deaths/100,000
Dare County: 646 deaths/100,000

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.

NC rate is 3% lower than US rate. ENC rate is 14% higher than NC rate. Dare rate is 32% lower than ENC rate. Dare rate is 22% lower than NC rate. Dare rate is 24% lower than US rate.
Figure 3a. Leading causes of death for Dare County by race and gender, (1999-2003). Mortality rate per 100,000 population.

The Non-White Male rate is 89% lower than the White Male rate, and 92% lower than Non-White Female rate.

Non-White Males

93 deaths/100,000

The Non-White Female rate is 1232% higher than the Non-White Male rate, and 136% higher than the White Female rate.

Non-White Females

1239 deaths/100,000

White Males

885 deaths/100,000

30

31

5

6

10

19

24

47

White Males

32

6

7

23

28

526 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 3b. Leading causes of death for Dare County by race and gender, (1999-2003). Age-Adjusted Mortality rate per 100,000 population.

**Non-White Males**

The Non-White Male rate is 84% lower than the White Male rate, and 91% lower than Non-White Female rate.

- **125 deaths/100,000**
  - Cancer: 31
  - Heart Disease: 30
  - Stroke: 5
  - Pneumonia and Influenza: 5
  - Alzheimer’s Disease: 6
  - Diabetes Mellitus: 7
  - All Other Unintentional Injuries: 6
  - Chronic Lower Respiratory Diseases: 19
  - All Other Deaths: 24

**White Males**

- **801 deaths/100,000**
  - Cancer: 30
  - Heart Disease: 23
  - Stroke: 5
  - Pneumonia and Influenza: 5
  - Alzheimer’s Disease: 23
  - Diabetes Mellitus: 6
  - All Other Unintentional Injuries: 19
  - Chronic Lower Respiratory Diseases: 10
  - All Other Deaths: 24

**Non-White Females**

The Non-White Female rate is 981% higher than the Non-White Male rate, and 173% higher than the White Female rate.

- **1351 deaths/100,000**
  - Cancer: 32
  - Heart Disease: 28
  - Stroke: 7
  - Pneumonia and Influenza: 6
  - Alzheimer’s Disease: 23
  - Diabetes Mellitus: 15
  - All Other Unintentional Injuries: 12
  - Chronic Lower Respiratory Diseases: 8
  - All Other Deaths: 19

**White Females**

- **495 deaths/100,000**
  - Cancer: 28
  - Heart Disease: 23
  - Stroke: 7
  - Pneumonia and Influenza: 6
  - Alzheimer’s Disease: 23
  - Diabetes Mellitus: 12
  - All Other Unintentional Injuries: 5
  - Chronic Lower Respiratory Diseases: 15
  - All Other Deaths: 19

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 Dare County by race (1999-2003). Mortality rate per 100,000 population.

The Non-White rate is 10% lower than the White rate.

641 deaths/100,000

709 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 4b. Leading causes of death for Dare County by race (1999-2003).
Age-Adjusted Mortality rate per 100,000 population.

The Non-White rate is 17% higher than the White rate.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Non-Whites</th>
<th>Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Mellitus</td>
<td>29</td>
<td>28</td>
</tr>
<tr>
<td>Cancer</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>Stroke</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Pneumonia and Influenza</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Alzheimer's Disease</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>All Other Unintentional Injuries</td>
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<td>1</td>
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<tr>
<td>Chronic Lower Respiratory Diseases</td>
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<td>0</td>
</tr>
<tr>
<td>All Other Deaths</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

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 Dare County, 2000.
( Total 29,967; M-15,098; F-14,869)
Table 1. Leading contributors to age-adjusted mortality in Dare County by race and gender, 1999-2003.

<table>
<thead>
<tr>
<th>Race and Gender</th>
<th>Non-White Males</th>
<th>White Males</th>
<th>Non-White Females</th>
<th>White Females</th>
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<tr>
<td>1st (Tie)</td>
<td>Heart Disease</td>
<td>Cancer (all sites)</td>
<td>Heart Disease</td>
<td>Cancer (all sites)</td>
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<tr>
<td>1st (Tie)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>Cancer (all sites)</td>
<td>Heart Disease</td>
<td>Cancer (all sites)</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>3rd</td>
<td>Stroke</td>
<td>All Other Unintentional Injuries</td>
<td>Pneumonia and Influenza</td>
<td>Stroke</td>
</tr>
<tr>
<td>4th (Tie)</td>
<td>All Other Unintentional Injuries</td>
<td>COPD and Allied Conditions</td>
<td>Diabetes Mellitus</td>
<td>Pneumonia and Influenza</td>
</tr>
<tr>
<td>4th (Tie)</td>
<td>COPD and Allied Conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th (Tie)</td>
<td>Motor Vehicle Injuries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th (Tie)</td>
<td>Diabetes Mellitus</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4th (Tie)</td>
<td>Benign Neoplasms</td>
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<tr>
<td>4th (Tie)</td>
<td>Homicide</td>
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<td>4th (Tie)</td>
<td>Perinatal Conditions</td>
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<tr>
<td>4th (Tie)</td>
<td>Congenital Anomalies</td>
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</tr>
<tr>
<td>5th (Tie)</td>
<td>Stroke</td>
<td>Alzheimers Disease</td>
<td>Alzheimers Disease</td>
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</tr>
<tr>
<td>5th (Tie)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5th (Tie)</td>
<td>Suicide</td>
<td>Nephritis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th (Tie)</td>
<td></td>
<td></td>
<td></td>
<td>Essential Hypertension</td>
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</table>
Ten Leading Causes of Death

Heart Disease

Cancer - Trachea, Bronchus, and Lung

Stroke

Influenza and Pneumonia

Unintentional Injuries

Chronic Lower Respiratory Disease

Septicemia

Alzheimer’s Disease

Cancer – Breast

Unintentional Motor Vehicle Injuries
Trends and Disparities in Mortality in Dare County, NC:
All Causes of Death,
All Causes of Premature Mortality, and
Ten Leading Causes of Death;
1979-2003
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

Comparison of Fitted Rates in 1979

<table>
<thead>
<tr>
<th>County</th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>4% decrease</td>
<td>14% increase</td>
<td>9% increase</td>
</tr>
<tr>
<td>$R^2 = 0.02$</td>
<td>$R^2 = 0.84$</td>
<td>$R^2 = 0.57$</td>
<td></td>
</tr>
<tr>
<td>$y = -1.30x + 810$</td>
<td>$y = 4.76x + 814$</td>
<td>$y = 3.19x + 824$</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of Fitted Rates in 2003

<table>
<thead>
<tr>
<th>County</th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>16% LT</td>
<td>3% GT</td>
<td>14% LT</td>
</tr>
<tr>
<td>$R^2 = 0.02$</td>
<td>$R^2 = 0.84$</td>
<td>$R^2 = 0.57$</td>
<td></td>
</tr>
<tr>
<td>$y = -1.30x + 810$</td>
<td>$y = 4.76x + 814$</td>
<td>$y = 3.19x + 824$</td>
<td></td>
</tr>
</tbody>
</table>

1979 Dare rate is 1% less than ENC
2003 Dare rate is 16% less than ENC
Dare County

Figure 7. All Causes of Death:
Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

1979 Dare rate is 16% less than ENC
2003 Dare rate is 11% less than ENC

Comparison of Fitted Rates in 1979

Dare
- 19% GT
- 16% LT
- 7% LT
ENC
- 10% GT
- 8% LT
- 2% LT
NC
- 7% GT
- 8% GT
- 11% LT
US
- 10% GT
- 10% LT
- 11% LT

Comparison of Fitted Rates in 2003

Dare
- 12% GT
- 11% LT
- 0
ENC
- 4% GT
- 8% LT
- 4% LT
NC
- 4% LT
- 4% LT
- 13% GT
US
- 4% GT
- 11% LT
- 0
Figure 8. All Causes of Death: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

Comparison of Fitted Rates in 1979

<table>
<thead>
<tr>
<th>NWM</th>
<th>WM</th>
<th>NWF</th>
<th>WF</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%  decrease</td>
<td>24% decrease</td>
<td>40% increase</td>
<td>5% increase</td>
</tr>
<tr>
<td>$R^2 = 0.01$</td>
<td>$R^2 = 0.23$</td>
<td>$R^2 = 0.03$</td>
<td>$R^2 = 0.01$</td>
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<tr>
<td>$y = -7.26x + 1506$</td>
<td>$y = -12.44x + 1264$</td>
<td>$y = 13.63x + 814$</td>
<td>$y = 1.43x + 729$</td>
</tr>
</tbody>
</table>

Comparison of Fitted Rates in 2003

<table>
<thead>
<tr>
<th>NWM</th>
<th>WM</th>
<th>NWF</th>
<th>WF</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%  decrease</td>
<td>24% decrease</td>
<td>40% increase</td>
<td>5% increase</td>
</tr>
<tr>
<td>$R^2 = 0.01$</td>
<td>$R^2 = 0.23$</td>
<td>$R^2 = 0.03$</td>
<td>$R^2 = 0.01$</td>
</tr>
<tr>
<td>$y = -7.26x + 1506$</td>
<td>$y = -12.44x + 1264$</td>
<td>$y = 13.63x + 814$</td>
<td>$y = 1.43x + 729$</td>
</tr>
</tbody>
</table>

Note: The table and graph show the trends in age-adjusted mortality rates by race and gender from 1979 to 2003 with projections to 2010. The rates are adjusted for age and show significant variations by race and gender, with some rates decreasing and others increasing over time. The regression lines and coefficients illustrate the trends and projections.
Figure 9. All Causes of Death: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

- NW: 27% increase, $R^2 = 0.04$, $y = 11.51x + 1028$
- W: 11% decrease, $R^2 = 0.12$, $y = -4.46x + 964$

1979 Non-white rate is 7% greater than the White
2003 Non-white rate is 52% greater than the White
Figure 10. All Causes of Death: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare County

763% increase

$R^2 = 0.11$

$y = 2.68x - 8$
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

1979 Dare rate is 20% less than ENC
2003 Dare rate is 24% less than ENC

### Comparison of Fitted Rates in 1979

<table>
<thead>
<tr>
<th>County</th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20% LT</td>
<td>8% LT</td>
<td>ENC</td>
</tr>
<tr>
<td></td>
<td>13% LT</td>
<td>9% GT</td>
<td>NC</td>
</tr>
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</table>

### Comparison of Fitted Rates in 2003

<table>
<thead>
<tr>
<th>County</th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>24% LT</td>
<td>11% LT</td>
<td>ENC</td>
</tr>
<tr>
<td></td>
<td>15% LT</td>
<td>13% GT</td>
<td>NC</td>
</tr>
</tbody>
</table>

**Dare**
- 23% decrease
- $R^2 = 0.19$
- $y = -8.95x + 941$

**ENC**
- 18% decrease
- $R^2 = 0.88$
- $y = -8.98x + 1177$

**NC**
- 21% decrease
- $R^2 = 0.90$
- $y = -9.64x + 1082$
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

Dare 21% decrease  ENC 25% decrease  NC 27% decrease  US 27% decrease
\[ R^2 = 0.16 \quad R^2 = 0.93 \quad R^2 = 0.94 \quad R^2 = 0.95 \]
\[ y = -7.97x + 900 \quad y = -13.20x + 1267 \quad y = -12.89x + 1141 \quad y = -13.14x + 1054 \]
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**
- 41% decrease
- $R^2 = 0.03$
- $y = -39.56x + 2342$

**WM**
- 26% decrease
- $R^2 = 0.13$
- $y = -12.75x + 1175$

**NWF**
- 28% decrease
- $R^2 = 0.01$
- $y = -11.97x + 1011$

**WF**
- 9% decrease
- $R^2 = 0.01$
- $y = -2.12x + 572$

---

**Comparison of Fitted Rates in 1979**

<table>
<thead>
<tr>
<th></th>
<th>NWM</th>
<th>WM</th>
<th>NWF</th>
<th>WF</th>
</tr>
</thead>
<tbody>
<tr>
<td>99% GT</td>
<td>50% LT</td>
<td>57% LT</td>
<td>76% LT</td>
<td>NWM</td>
</tr>
<tr>
<td>93% GT</td>
<td>14% LT</td>
<td>51% LT</td>
<td>43% LT</td>
<td>WM</td>
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<tr>
<td>51% GT</td>
<td>100% GT</td>
<td>77% GT</td>
<td>NWF</td>
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</table>

**Comparison of Fitted Rates in 2003**

<table>
<thead>
<tr>
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<th>NWM</th>
<th>WM</th>
<th>NWF</th>
<th>WF</th>
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<tbody>
<tr>
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<td>46% LT</td>
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<tr>
<td>93% GT</td>
<td>17% LT</td>
<td>40% LT</td>
<td>WM</td>
<td></td>
</tr>
<tr>
<td>51% GT</td>
<td>20% GT</td>
<td>28% LT</td>
<td>NWF</td>
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<tr>
<td>100% GT</td>
<td>97% GT</td>
<td>96% GT</td>
<td>WF</td>
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</table>
Figure 14. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates by race,
1979-2003 with projections to 2010

NW 29% decrease
R² = 0.02
y = -18.92x + 1557

W 20% decrease
R² = 0.14
y = -7.30x + 871

1979 Non-white rate is 79% greater than White
2003 Non-white rate is 59% greater than White
Figure 15. All Causes of Premature Mortality: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

\[ R^2 = 0.03 \]
\[ y = 5.64x - 36 \]
Heart Disease
Figure 16. Heart Disease:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

Comparison of Fitted Rates in 1979

<table>
<thead>
<tr>
<th></th>
<th>Dare</th>
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<tr>
<td>1979</td>
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</tr>
<tr>
<td>1% GT</td>
<td>3% LT</td>
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Comparison of Fitted Rates in 2003

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<td>2003</td>
<td>42% GT</td>
<td>35% GT</td>
<td>Dare</td>
</tr>
<tr>
<td>30% LT</td>
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<td>5% LT</td>
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</tr>
<tr>
<td>26% LT</td>
<td>6% GT</td>
<td></td>
<td>NC</td>
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</table>
Figure 17. Heart Disease:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

<table>
<thead>
<tr>
<th></th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>14%</td>
<td>9%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>2003</td>
<td>21%</td>
<td>11%</td>
<td>4%</td>
<td>7%</td>
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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 18. Heart Disease:  
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

NWM 42% decrease  
\[ R^2 = 0.02 \]  
\[ y = -9.86x + 565 \]

WM 61% decrease  
\[ R^2 = 0.63 \]  
\[ y = -13.63x + 534 \]

NWF 10% decrease  
\[ R^2 = 0.00 \]  
\[ y = -1.54x + 382 \]

WF 30% decrease  
\[ R^2 = 0.31 \]  
\[ y = -3.46x + 276 \]
Figure 19. Heart Disease:
Trends in age-adjusted mortality rates by race,
1979-2003 with projections to 2010

NW 18% decrease
\[ R^2 = 0.01 \]
\[ y = -3.35x + 447 \]

W 48% decrease
\[ R^2 = 0.65 \]
\[ y = -7.77x + 389 \]

1979 Non-white rate is 15% greater than White
2003 Non-white rate is 81% greater than White
Figure 20. Heart Disease: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare
1073% increase
$R^2 = 0.04$
y = 1.19x + 2.65
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

Dare
55% increase
$R^2 = 0.20$
y = 1.24x + 54

ENC
54% increase
$R^2 = 0.75$
y = 0.99x + 44

NC
49% increase
$R^2 = 0.72$
y = 0.89x + 44

1979 Dare rate is 23% greater than ENC
2003 Dare rate is 24% greater than ENC
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, 1979-2003 with projections to 2010

Comparison of Fitted Rates in 1979

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<td>82% GT</td>
<td>244% GT</td>
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Comparison of Fitted Rates in 2003

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<td>91% GT</td>
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NWM : 451% increase  
WM : 24% increase  
NWF : 125% increase  
WF : 135% increase

$R^2 = 0.06$  
y = 8.85x + 47  

$R^2 = 0.02$  
y = 0.89x + 89  

$R^2 = 0.02$  
y = 2.19x + 42  

$R^2 = 0.32$  
y = 1.46x + 26
Figure 24. Cancer - Trachea, Bronchus, and Lung: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

NW
317% increase
$R^2 = 0.10$
y = 5.14x + 39

W
53% increase
$R^2 = 0.15$
y = 1.17x + 53

1979 Non-white rate is 27% less than White
2003 Non-white rate is 100% greater than White
Figure 25. Cancer - Trachea, Bronchus, and Lung: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare County

58% increase

\[ R^2 = 0.01 \]

\[ y = 3.50x + 144 \]
Stroke
Figure 26. Stroke:
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

1979 Dare rate is 17% less than ENC
2003 Dare rate is 32% less than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<td>LT</td>
<td>31%</td>
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Dare
33% decrease
$R^2 = 0.09$
y = -0.92x + 68

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

NC
15% decrease
$R^2 = 0.58$
y = -0.50x + 78
Figure 27. Stroke:
Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

Dare 47% decrease  
$R^2 = 0.19$  
y = -1.89x + 97

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

NC 42% decrease  
$R^2 = 0.90$  
y = -1.98x + 113

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

1979 Dare rate is 26% less than ENC  
2003 Dare rate is 27% less than ENC
Figure 28. Stroke:
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

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Comparison of Fitted Rates in 1979

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<th>NWF</th>
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Comparison of Fitted Rates in 2003

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The table shows the comparison of fitted rates in 1979 and 2003 for different races and genders. The trends indicate significant variations in mortality rates over the years.
Figure 29. Stroke:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

1979 Non-white rate is 63% less than White
2003 Non-white rate is 206% greater than White
Dare County

Figure 30. Stroke:
Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare

645% increase

$R^2 = 0.10$

$y = 4.30x - 16$
Influenza and Pneumonia
Figure 31. Influenza and Pneumonia:
Trends in mortality rates by county, region, and state,
1979-2003 with projections to 2010

Dare
135% increase
$R^2 = 0.29$
y = 1.06x + 19

ENC
23% increase
$R^2 = 0.12$
y = 0.21x + 22

NC
23% increase
$R^2 = 0.12$
y = 0.23x + 24

1979 Dare rate is 14% less than ENC
2003 Dare rate is 63% greater than ENC

Comparison of Fitted Rates in 1979
Dare ENC NC
14% LT 17% GT 27% GT
21% LT 9% GT ENC

Comparison of Fitted Rates in 2003
Dare ENC NC
63% GT 39% LT 33% LT
50% GT 9% GT ENC
8% LT NC
Figure 32. Influenza and Pneumonia: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

1979 Dare rate is 23% less than ENC
2003 Dare rate is 95% greater than ENC
Figure 33. Influenza and Pneumonia:
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

- NWM: 33% decrease, $R^2 = 0.00$, $y = -1.36x + 99$
- WM: 54% increase, $R^2 = 0.04$, $y = 0.81x + 36$
- NWF: 77% decrease, $R^2 = 0.04$, $y = -11.46x + 357$
- WF: 172% increase, $R^2 = 0.25$, $y = 1.57x + 22$

Comparison of Fitted Rates in 1979

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<th>NWF</th>
<th>WF</th>
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Comparison of Fitted Rates in 2003

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<td>8% LT</td>
<td>37% GT</td>
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Figure 34. Influenza and Pneumonia:
Trends in age-adjusted mortality rates by race,
1979-2003 with projections to 2010
Figure 35. Influenza and Pneumonia: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010.

Dare
304% increase
$R^2 = 0.12$
y = 28.98x - 229
All Other Unintentional Injuries and Adverse Effects
Figure 36. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Dare 5% decrease
R² = 0.00
y = -0.06x + 30

ENC 26% decrease
R² = 0.56
y = -0.30x + 28

NC 12% decrease
R² = 0.22
y = -0.13x + 24

1979 Dare rate is 6% greater than ENC
2003 Dare rate is 35% greater than ENC
Figure 37. 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.
Figure 38. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 39. All Other Unintentional Injuries and Adverse Effects:
Trends in age-adjusted mortality rates by race,
1979-2003 with projections to 2010

- NW: 53% decrease, $R^2 = 0.01$
  $y = -0.90x + 41$

- W: 27% decrease, $R^2 = 0.04$
  $y = -0.44x + 39$

1979 Non-white rate is 5% greater than White
2003 Non-white rate is 32% less than White
Figure 40. All Other Unintentional Injuries and Adverse Effects: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare
64% increase
$R^2 = 0.02$
$y = 3.00x + 113$
Chronic Lower Respiratory Disease
Figure 41. Chronic Lower Respiratory Disease: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Dare
- 187% increase
- $R^2 = 0.23$
- $y = 1.14x + 15$

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

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

Comparison of Fitted Rates in 1979
- Dare: 12% LT, 12% GT
- ENC: 12% LT, 26% GT
- NC: 11% LT, 11% LT

Comparison of Fitted Rates in 2003
- Dare: 11% LT, 12% GT
- ENC: 11% GT, 12% GT
- NC: 1% LT, 1% LT

1979 Dare rate is 11% less than ENC
2001 Dare rate is 10% less than ENC

1979-2003 mortality rates by county, region, and state.
Figure 42. Chronic Lower Respiratory Disease:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

Dare 200% increase
ENC 112% increase
NC 105% increase
US 63% increase

Comparison of Fitted Rates in 1979

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</tbody>
</table>

Comparison of Fitted Rates in 2003

<table>
<thead>
<tr>
<th></th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
<th>US</th>
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<tbody>
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<td>2003</td>
<td></td>
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<tr>
<td>LT</td>
<td>5%</td>
<td>5%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>GT</td>
<td>95%</td>
<td>97%</td>
<td>11%</td>
<td>90%</td>
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</table>
**Figure 43. Chronic Lower Respiratory Disease:**
Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010

<table>
<thead>
<tr>
<th>Race/Gender</th>
<th>1979-2003 Trend</th>
<th>2003 Projections</th>
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<tbody>
<tr>
<td>NWM</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>WM</td>
<td>252% increase</td>
<td></td>
</tr>
<tr>
<td>NWF</td>
<td>125% increase</td>
<td></td>
</tr>
<tr>
<td>WF</td>
<td>99% decrease</td>
<td></td>
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</tbody>
</table>

**Regression Equations:**
- WM: $y = -5.25x + 127$
- WM: $y = 1.98x + 19$
- WM: $y = 0.86x + 17$

**Comparison of Fitted Rates in 1979:**

<table>
<thead>
<tr>
<th>Race/Gender</th>
<th>1979 % LT</th>
<th>1979 % GT</th>
<th>2003 % LT</th>
<th>2003 % GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWM</td>
<td>85%</td>
<td>127%</td>
<td>87%</td>
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<tr>
<td>WM</td>
<td>12%</td>
<td>100%</td>
<td>12%</td>
<td>100%</td>
</tr>
<tr>
<td>NWF</td>
<td>100%</td>
<td>44%</td>
<td>100%</td>
<td>44%</td>
</tr>
<tr>
<td>WF</td>
<td>79%</td>
<td>252%</td>
<td>79%</td>
<td>252%</td>
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**Comparison of Fitted Rates in 2003:**

<table>
<thead>
<tr>
<th>Race/Gender</th>
<th>2003 % LT</th>
<th>2003 % GT</th>
<th>2003 % LT</th>
<th>2003 % GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWM</td>
<td>4578% GT</td>
<td>100%</td>
<td>2519% GT</td>
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<tr>
<td>WM</td>
<td>100%</td>
<td>44%</td>
<td>100%</td>
<td>44%</td>
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<tr>
<td>NWF</td>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
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<tr>
<td>WF</td>
<td>96%</td>
<td>79% GT</td>
<td>100%</td>
<td>79% GT</td>
</tr>
</tbody>
</table>
Figure 44. Chronic Lower Respiratory Disease: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010.

- Non-white rate is 157% greater than White in 1979.
- Non-white rate is 94% less than White in 2003.

Regression equations:
- NW: 93% decrease, $R^2 = 0.04$, $y = -1.51x + 39$
- W: 221% increase, $R^2 = 0.26$, $y = 1.40x + 15$
Figure 45. Chronic Lower Respiratory Disease:
Measuring disparity in mortality rates by race,
1979-2003 with projections to 2010

Dare
67% increase
$R^2 = 0.01$
y = 2.19x - 79
Septicemia
Figure 46. Septicemia: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Dare
- 205% increase
- $R^2 = 0.22$
- $y = 0.45x + 5$

ENC
- 260% increase
- $R^2 = 0.80$
- $y = 0.42x + 4$

NC
- 178% increase
- $R^2 = 0.78$
- $y = 0.34x + 5$

1979 Dare rate is 35% greater than ENC
2003 Dare rate is 15% greater than ENC
Figure 47. Septicemia: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

### Comparison of Fitted Rates in 1979

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<tr>
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<th>Dare</th>
<th>ENC</th>
<th>NC</th>
<th>US</th>
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<tbody>
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<td>1% LT</td>
<td>6</td>
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<td>6</td>
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<td>3% LT</td>
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<td>14%</td>
<td>9</td>
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<td>32% LT</td>
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<tr>
<td>72% LT</td>
<td>23</td>
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### Comparison of Fitted Rates in 2003

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<th>NC</th>
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<tbody>
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<tr>
<td>3% LT</td>
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<tr>
<td>19% LT</td>
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<td>14%</td>
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<tr>
<td>32% LT</td>
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<tr>
<td>72% LT</td>
<td>23</td>
<td>8</td>
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### Mortality Rates by County, Region, State, and Nation

- **Dare**: 181% increase, $R^2 = 0.15$, $y = 0.52x + 7$
- **ENC**: 126% increase, $R^2 = 0.64$, $y = 0.36x + 7$
- **NC**: 97% increase, $R^2 = 0.61$, $y = 0.27x + 7$
- **US**: 88% increase, $R^2 = 0.67$, $y = 0.22x + 6$
Figure 48. Septicemia: Trends in age-adjusted mortality rates by race and gender, 1979-2003 with projections to 2010
Figure 49. Septicemia:
Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

- NW: 39% increase, \( R^2 = 0.00 \), \( y = 0.19x + 12 \)
- W: 177% increase, \( R^2 = 0.13 \), \( y = 0.52x + 7 \)

1979 Non-white rate is 70% greater than White
2003 Non-white rate is 15% less than White
Figure 50. Septicemia: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare
28% decrease
$R^2 = 0.02$
y = -15.32x + 1298

Percentage difference - Nonwhite to White
Alzheimer’s Disease
Figure 51. Alzheimer’s Disease:
Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

*Negative y-intercepts distort percentage change calculations

Comparison of Fitted Rates in 1979

<table>
<thead>
<tr>
<th>County</th>
<th>Dare</th>
<th>ENC</th>
<th>NC</th>
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<tr>
<td>LT</td>
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<td>61%</td>
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<tr>
<td>LT</td>
<td>1%</td>
<td>38%</td>
<td>NC</td>
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Comparison of Fitted Rates in 2003

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<tr>
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<td>ENC</td>
<td>30%</td>
<td>34%</td>
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1979 Too few data to compare trends
2003 Dare rate is 6% greater than ENC

R² = 0.51
y = 0.71x - 4

R² = 0.85
y = 0.62x - 2

R² = 0.84
y = 0.94x - 4
Figure 52. Alzheimer’s Disease:
Trends in age-adjusted mortality rates by county, region, state, and nation,
1979-2003 with projections to 2010

*Negative y-intercepts distort percentage change calculations

R² = 0.51
y = 0.95x - 5

R² = 0.87
y = 0.72x - 2

R² = 0.85
y = 1.01x - 3

R² = 0.83
y = 0.69x - 1

Comparison of Fitted Rates in 1979

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<th>County</th>
<th>ENC</th>
<th>NC</th>
<th>US</th>
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<tr>
<td>Dare</td>
<td>118% LT</td>
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<td>ENC</td>
<td>43% GT</td>
<td>54% LT</td>
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<td>NC</td>
<td>230% GT</td>
<td>52% GT</td>
<td>131% GT</td>
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Comparison of Fitted Rates in 2003

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<tbody>
<tr>
<td>Dare</td>
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<td>US</td>
<td>52% GT</td>
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Figure 53. Alzheimer’s Disease:
Trends in age-adjusted mortality rates by race and gender,
1979-2003 with projections to 2010

*Negative y-intercepts distort percentage change calculations

<table>
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Comparison of Fitted Rates in 1979
- NWM: 3432% LT, 1164% GT
- WM: 1032% GT
- NWF: 84% LT
- WF: 179% GT

Comparison of Fitted Rates in 2003
- NWM: 1032% GT, 418% GT
- WM: 1032% GT
- NWF: 54% LT
- WF: 119% GT
Figure 54. Alzheimer’s Disease: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010

*Negative y-intercepts distort percentage change calculations
Figure 55. Alzheimer’s Disease: Measuring disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare
80% decrease
\( R^2 = 1.00 \)
\( y = -161x + 4809 \)
Cancer - Breast
Figure 56. Cancer - Breast:
Trends in mortality rates by county, region, and state*,
1979-2003 with projections to 2010
*Graph reflects females mortality rates only

Dare
135% increase
$R^2 = 0.16$
y = 0.95x + 17

ENC
26% increase
$R^2 = 0.42$
y = 0.28x + 26

NC
5% increase
$R^2 = 0.03$
y = 0.06x + 29

1979 Dare rate is 34% less than ENC
2003 Dare rate is 23% greater than ENC

Comparison of Fitted Rates in 1979

<table>
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<th>Dare</th>
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Comparison of Fitted Rates in 2003

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

*Graph reflects females mortality rates only

Dare 141% increase  R^2 = 0.18
y = 0.86x + 15

ENC 0% change  R^2 = 0.00
y = 0.00x + 30

NC 13% decrease  R^2 = 0.20
y = -0.16x + 31

US 17% decrease  R^2 = 0.58
y = -0.15x + 19

1979 Dare rate is 51% less than ENC
2003 Dare rate is 18% greater than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<td>119% GT</td>
<td>85% GT</td>
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Figure 58. Cancer - Breast:
Trends in age-adjusted mortality rates by race and gender*,
1979-2003 with projections to 2010
*Graph reflects females mortality rates only

Data is redundant!
Figure 59. Cancer - Breast:
Trends in age-adjusted mortality rates by race*,
1979-2003 with projections to 2010
*Graph reflects females mortality rates only

NW 21% increase
$R^2 = 0.00$
y = 0.18x + 20

W 140% increase
$R^2 = 0.19$
y = 0.87x + 15

Age-adjusted mortality rate per 100,000 population

1979 Non-white rate is 35% greater than White
2003 Non-white rate is 32% less than White
Figure 60. Cancer - Breast:
Measuring disparity in mortality rates by race*,
1979-2003 with projections to 2010
*Graph reflects females mortality rates only

Dare
631% increase
$R^2 = 0.04$
y = 25.07x + 95

Percentage difference - Nonwhite to White

-500
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10

Dare County
Center for Health Services Research and Development, ECU
93
Unintentional Motor Vehicle Injuries
Figure 61. Unintentional Motor Vehicle Injuries: Trends in mortality rates by county, region, and state, 1979-2003 with projections to 2010

Dare
- 54% decrease
- $R^2 = 0.22$
- $y = -0.65x + 29$

ENC
- 17% decrease
- $R^2 = 0.48$
- $y = -0.20x + 29$

NC
- 26% decrease
- $R^2 = 0.66$
- $y = -0.28x + 26$

1979 Dare rate is 1% less than ENC
1993 Dare rate is 44% less than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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Figure 62. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by county, region, state, and nation, 1979-2003 with projections to 2010

Dare 50% decrease
$R^2 = 0.19$
y = -0.59x + 28

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 Dare rate is 2% greater than ENC
2003 Dare rate is 42% less than ENC

Comparison of Fitted Rates in 1979

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Comparison of Fitted Rates in 2003

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<td>64% GT</td>
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- **NWM**: 106% increase, $R^2 = 0.01$, $y = 1.25x + 28$
- **WM**: 54% decrease, $R^2 = 0.15$, $y = -0.91 + 40$
- **NWF**: 117% decrease, $R^2 = 0.04$, $y = -1.75x + 36$
- **WF**: 57% decrease, $R^2 = 0.09$, $y = -0.46x + 19$

Comparison of Fitted Rates in 1979:

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<th>NWF</th>
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Comparison of Fitted Rates in 2003:

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Figure 64. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race, 1979-2003 with projections to 2010.

- NW: 27% decrease, $R^2 = 0.00$, $y = -0.41x + 36$
- W: 52% decrease, $R^2 = 0.25$, $y = -0.61x + 28$

1979 Non-white rate is 25% greater than White
2003 Non-white rate is 88% greater than White
Figure 65. Unintentional Motor Vehicle Injuries: Disparity in mortality rates by race, 1979-2003 with projections to 2010

Dare
46% decrease
$R^2 = 0.01$
y = -4.09x + 215
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