Trends and Disparities in Mortality in Robeson County
Total Deaths, Premature Mortality and Deaths for Ten Leading Causes; 1979-2008

A Resource for Healthy Communities
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1. Introduction

Health Indicators Series:
A Resource for Healthy Communities
November 2011

Report Series #2: Mortality Trends for Robeson County - (1979 to 2008)

Health Indicators is a series of reports describing community health at the state, regional, 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 Eastern North Carolina’s population 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, mortality (crude) and age-adjusted mortality for leading causes of death, and measures of race disparities or inequalities in mortality rate.

Report Series #2 of the series focuses attention on the two overarching goals of Healthy People 2020, 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 2020, has also embraced these two goals. Using rate comparisons, this report describes the inequalities in mortality among Eastern North Carolina and other regions, and among four demographic groups. 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 a 29-year period (1979-2008), as well as the most recent ten year period (1999 to 2008). 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 following section presents both the overall and five leading contributors to mortality for the state by race and gender. In this section, pie charts describe the relative contribution of each of five leading contributors to the overall, general rate. These charts also make regional and demographic comparisons. Making the area of each pie chart equivalent to the rate for the population group helps convey the dimension of disparity across population groups. The next section charts recent trends and disparities in mortality and provides projections to the year 2020. These charts place Eastern North Carolina’s health status in a historical context and provide a glimpse into the future.
2. Data Highlights

Trends and Disparities in Mortality in Robeson County

The following highlights of mortality in Robeson County describe current status and trends in the causes of death from major diseases and how they vary across different population groups. The graphs, charts, and tables paint a picture of the county’s health with a broad brush. The study of mortality in populations should include consideration of time and geographic space as well as underlying demographic, political-economic, and socio-cultural conditions. Readers are encouraged to think of these factors as they consider the data presented in this report, formulate their own questions about the causes of mortality, and think about strategies to reduce mortality in the population described.

The figures in this report show mortality trend lines for each of the ten leading causes of death in Robeson County over a 29 year period. In some instances, there are substantial year to year variations in the death rates, which makes it difficult to establish reliable trend lines for these diseases. In such instances, the data for each individual year is meaningful, but the data pattern is not sufficiently reliable to establish a clear trend line. For additional information on trend lines and reliability see the Methods, Interpretations and References Section beginning on page 3.1.

Current Disparities in Mortality by Geography, Race, and Gender

In 2008, the age-adjusted mortality rate for Robeson County is 1039 deaths per 100,000. This rate is 26% higher than the state rate. Within Robeson County, the non-White rate is 8.6% higher than the White rate. The non-White male rate is 8.6% higher than the rate for White males. The non-White female rate is 9.6% higher than the rate for White females.

The five general leading causes of mortality in Robeson County (2004-2008) are:
1. Diseases of Heart
2. Cancer - All Sites
3. Cerebrovascular Disease
4. Diabetes Mellitus
5. Unintentional Motor Vehicle Injuries

The five general leading causes of mortality in Robeson County by race and gender (2004-2008) are:

<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>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Diseases of Heart</td>
<td>Diseases of Heart</td>
<td>Diseases of Heart</td>
<td>Diseases of Heart</td>
</tr>
<tr>
<td>2nd</td>
<td>Cancer - All Sites</td>
<td>Cancer - All Sites</td>
<td>Cancer - All Sites</td>
<td>Cancer - All Sites</td>
</tr>
<tr>
<td>3rd</td>
<td>Unintentional Motor Vehicle Injuries</td>
<td>Unintentional Motor Vehicle Injuries</td>
<td>Diabetes Mellitus</td>
<td>Cerebrovascular Disease</td>
</tr>
<tr>
<td>4th</td>
<td>Homicide</td>
<td>Chronic Lower Respiratory Diseases</td>
<td>Cerebrovascular Disease</td>
<td>Chronic Lower Respiratory Diseases</td>
</tr>
<tr>
<td>5th</td>
<td>Cerebrovascular Disease</td>
<td>Diabetes Mellitus</td>
<td>Alzheimers Disease</td>
<td>Diabetes Mellitus</td>
</tr>
</tbody>
</table>
Trends and Disparities in Mortality in Robeson County

Trends in Mortality from All Causes
- Robeson County’s mortality rate trend over the 9 year period is higher than the trend for the state or RNC71, but is declining slightly faster.
- Robeson County’s age-adjusted mortality rate trend is higher than the trend for RNC71, the state, and the US, but is declining faster.
- Age-adjusted mortality rate trends for all subgroups are declining. The mortality rate for non-White males is the highest. The mortality rate for White females is the lowest.
- The rate for age-adjusted mortality for non-Whites is higher than that for Whites. Both decreased by a similar percentage.
- The trend for racial disparity was not reliable.

Trends in Premature Mortality from All Causes of Death
- The trend for premature mortality for Robeson county was not reliable.
- The trend for age-adjusted premature mortality was also not reliable.
- Non-White males had the highest rate for age-adjusted premature mortality. White females had the lowest rate, but the trend is increasing, whereas the trend for non-White females is decreasing. The trend for White males is not reliable.
- The trend for Whites for age-adjusted premature mortality is increasing. The trend for non-Whites is not reliable.
- A moderately reliable trend showed a decrease in racial disparity.

Diseases of the Heart
- Robeson County’s crude heart disease mortality rate trend is higher than that of the state or RNC71, but has declined a bit faster than the others.
- Robeson County’s age-adjusted heart disease mortality rate is higher than the state, RNC71, or the US rate but is declining and is projected to converge with the others.
- Rates for non-White males and White males are above those for non-White females and White females. All rates are declining but rates for non-White males are declining the most, and are projected to converge with the rates for non-White and White females.
- Both the non-White rate and the White rate are declining. Over the period the non-White rate remained 8-10% higher than the white rate.
- The trend for racial disparity is not reliable.

Cancer – Trachea, Bronchus, Lung
- Robeson County’s trend line for mortality due to lung cancer is not reliable.
- The age-adjusted rate trend for lung cancer also was not reliable.
- The age-adjusted trends for all demographic groups were not reliable.
- The trend in racial disparities was not reliable.

Cerebrovascular Disease
- Robeson County’s mortality rate trend due to Cerebrovascular disease is declining and has dropped blow the rate for RNC71 and the state.
- The age-adjusted mortality rate for Robeson County is also declining and is projected to drop below the rates for RNC71 and the state.
- The age-adjusted rate for non-White males is higher than the rates for White males, non-White females and White females. Rates for all groups are declining but the rates for White males are declining the fastest.
The trend in age-adjusted mortality for non-Whites is higher than the rate for Whites but both are declining.
The trend in racial disparity is increasing (favoring Whites) in a moderately reliable trend.

Diabetes Mellitus
- The mortality rate for Robeson County in 2008 was 97% higher than the rate for RNC71 and the trend is increasing (in a moderately reliable trend), whereas the trends for RNC71 and the state are decreasing.
- The age-adjusted mortality rate trend for Robeson County is not reliable.
- The age-adjusted rate trends for White males and non-White males were not reliable. The trend for non-White females was moderately reliable and increasing. The trend for White females was moderately reliable and decreasing.
- The age-adjusted rate trends by race were not reliable.
- The racial disparity trend was not reliable.

Unintentional Motor Vehicle Injuries
- The mortality rate for Unintentional Motor Vehicle Injuries for Robeson County was higher than the RNC71 and the state rates and decreasing in a moderately reliable trend.
- The age-adjusted mortality rate for Robeson County is 138% higher than the rate for RNC71. It is decreasing in a moderately reliable trend.
- The trends in age-adjusted rates for White males and non-White females are decreasing. The trends for non-White males and White females are not reliable.
- The trend for Whites is decreasing in a moderately reliable trend. The trend for non-Whites is not reliable.
- The trend for racial disparities was not reliable.

Chronic Lower Respiratory Disease
- Robeson County’s mortality rate due to Chronic Lower Respiratory Disease is declining. It is significantly lower than the rates for RNC71 and the state, both of which show flat trend lines.
- The age-adjusted mortality rate trend for Robeson County is also showing a steep decline. Trends for RNC71, and the state are flat. The trend for the US shows a slight decline.
- The age-adjusted trend for non-White males is declining quickly and is now below the rate for White males, which is also declining, but not as quickly. The trends for non-White females and White females are not reliable.
- The age-adjusted mortality rate for non-Whites is below the rate for Whites and is decreasing. The trend for Whites is moderately reliable, and is also decreasing, but not as quickly.
- A reliable trend showed a steep decrease in racial disparity favoring non-Whites.

Nephritis, Nephrotic Syndrome, and Nephrosis
- The mortality rate trend for Robeson County for kidney disease was not reliable.
- The age-adjusted mortality rate trend for Robeson County was also not reliable.
- The age-adjusted mortality rate trend for White males is increasing rapidly, in a moderately reliable trend. The trends for other demographic groups were not reliable.
- The age-adjusted mortality rate for Whites is increasing in a moderately reliable trend. The rate for non-Whites is not reliable.
Trends and Disparities in Mortality in Robeson County

- The racial disparity is decreasing in a moderately reliable trend.

**Homicide**
- The mortality rate trend for homicide for Robeson County was not reliable.
- The age-adjusted mortality rate trend for Robeson County was also not reliable.
- The age-adjusted mortality rate for White males is increasing quickly in a moderately reliable trend. The rate for White females is decreasing and the rate for non-White females is increasing slightly. The rate for non-White males was not reliable.
- The age-adjusted rate trend for Whites and non-Whites were not reliable.
- The trend for racial disparity was not reliable.

**Alzheimer’s Disease**
- The mortality rate for Robeson County for Alzheimer’s disease is increasing in a moderately reliable trend, and is projected to rise above the rates for RNC71 and the state, which are also increasing, but not as quickly.
- The age-adjusted rate trend for Robeson County is increasing more quickly than those for RNC71, the state, and the US. The Robeson County rate already exceeds these other rates and is projected to continue upward.
- The age-adjusted mortality rate for non-White females is trending upward steeply. The trends for other demographic groups are not reliable.
- The age-adjusted rate trend for non-Whites is increasing quickly. The trend for Whites is not reliable.
- The trend for racial disparities is increasing.

**All Other Injuries and Adverse Effects**
- The mortality rate trend for Robeson County for All Other Injuries and Adverse Effects was not reliable.
- The age-adjusted mortality rate trend was also not reliable.
- The age-adjusted mortality rate for White females is increasing and has exceeded the rate for non-White females. The rate trend for non-White females is decreasing slightly. The rate trends for non-White males and White males were not reliable.
- The age-adjusted mortality rate trend for Whites and non-Whites were not reliable.
- The trend for racial disparities was not reliable.

**Cancer – All Sites**
- The mortality rate trend for Robeson County for Cancer-All was even with the rates for RNC and the state. All three show a modest decrease.
- The age-adjusted mortality rate trend for Robeson County is higher than the rates for RNC, the state, and the US but is decreasing and is projected to merge with the state and RNC rates.
- The age-adjusted mortality rates for non-White males and White males are even and are decreasing in similar trends. The rate for non-White females is lower and is decreasing in a shallower trend. The trend for White females is not reliable.
- The age-adjusted mortality rates for Whites and non-Whites are similar and are decreasing in similar trends.
- The trend for racial disparity is not reliable.
**HIV Disease**
- The mortality rate trend for Robeson County for HIV disease is increasing steeply, in contrast to the trends for RNC and the state, which are declining.
- The age-adjusted mortality rate trend is also increasing. The rate trends for RNC, the state, and the US are declining.
- The age-adjusted mortality rate trend for non-White males is the highest, but is decreasing, while the trend for White males is increasing. The rate trends for non-White females and White females are not reliable.
- The age-adjusted mortality rate trend for non-Whites is significantly higher that the rate trend for Whites. Both are increasing.
- Racial disparity is increasing in a moderately reliable trend.
3. Methods, Interpretation, and References

Data Sources
The data for mortality and premature mortality in Robeson 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, called mortality rate, is a rate based on the number of deaths per population (or, deaths normalized by the population that produced them) for a given unit area, such as the county, region, or state over a specified time interval. The mortality rate is expressed in two ways, the basic true (actual or observed) rate, and an age-adjusted rate (see below). Mortality rates are used to evaluate the impact and burden of mortality on a population and to make comparisons, where appropriate, among populations. Like the mortality rate, the second type, called premature mortality rate, is also a density measure, but instead of deaths, it is the number of person-years lost in a population before a specified age. In this report mortality rates are emphasized with premature mortality (YLL–75) shown only for the total number of deaths from all causes (general mortality). Premature mortality in detail is the focus of Report Series #1.

A simple count of deaths occurring in an area for a given time interval is useful for identifying potential problems or issues of public concern—particularly if the deaths result from a rare cause or they are believed to be an emerging problem for at-risk socio-demographic groups. In this sense, count data are used for sentinel surveillance. Because counts reveal nothing about the underlying population base from which deaths arise, the analytical or practical utility of count data is limited. The size of the underlying population will have an expected effect on the numbers of deaths that occur. Deaths measured in relation to a population, are an expression of density. When measured over a given interval of time (usually 1 to 5 years), the density is called a rate. (The rate is typically multiplied by 100,000 for ease in interpreting the usually small resultant value.) The mortality rate is an improvement over simple count data because it accounts for the relative size and effect of the underlying population. The chief advantage of the mortality rate is that it is useful for focusing attention on the burden of public health problems more rigorously than simple counts. However, the mortality rate is also affected by the age structure of the population, which can confound interpretation when making comparisons of rates among different areas.

Because aging is the greatest risk factor for death, the age structure of a population will have a substantial effect on the mortality rate. For example, two counties may have similar population sizes but one has a larger number of people over the age of 45 than the other. It is more likely that the older population will generate more deaths over an interval of time and this will be reflected in a higher mortality rate. Differing age structures among populations will confound any comparisons of mortality rates among those populations. Therefore, a method for controlling the effects of age structure on the mortality rate is required if any meaningful comparisons are to be made.

Age-adjustment to control 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 (SMP) is used as the external reference. The US 2000 SMP is divided into a number of age groups whose sizes or proportions serve as weights to be applied to the corresponding age groups of the study population. This proportional redistribution generates new numbers of expected deaths in each of the corresponding age groups of the study population. These expected deaths are the number of deaths we would expect if the study population had the same age structure as the US 2000 SMP. The
The expected number of deaths are summed and normalized by the total population yielding an age-adjusted death rate. Once the effects of age structure are controlled, the way is paved for making comparisons among populations (Buescher, 1998).

The second measure, premature mortality, focuses on the burden of disease and death expressed in terms of accumulated person years lost 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. It considers only deaths of people who die before age 75. To calculate the number of years lost, the mid-point age of the age group to which each decedent belongs is subtracted from 75 and the differences (the lost years) are summed. After all lost years are summed; the result is normalized by the population under age 75 and multiplied by 10,000. Premature mortality is expressed as a rate measured over a time interval, and it can also be age-adjusted.

Age-adjusted rates for both mortality and premature mortality have little intrinsic meaning, however, and can mask the burden and trends of mortality (or health event) 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 basic non-adjusted mortality rate first, and then use the adjusted rate only if one wishes to factor out age in understanding the pattern of mortality among populations and regions. For regions with larger populations the statistics presented here are for the year 2008. Smaller areas like counties will usually be aggregated into 5-year intervals (e.g., 2004 to 2008). A five-year interval is 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. They 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. Each regional and demographic set of pie charts is based on the observed mortality rate and the age-adjusted (expected) mortality rate. The area of each pie is based on the age-adjusted mortality rate for the period 2004-2008, larger pie charts will represent larger mortality rates. For purposes of presentation, we set the smallest area of a circle on the lowest meaningful rate as a benchmark, 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 regional/county level. The first figure in this set compares absolute mortality (the burden) using mortality rates, which sheds light on any differences in the burden of mortality by disease intrinsic to each region. The second figure, which is age-adjusted, allows for direct comparisons among regions. The same pattern is repeated in the following figures that show differences among demographic groups.

While comparing the pie charts, the reader should remember that the slices of the pie show differences in how much of the mortality rate (including age-adjusted) is accounted for by a specific cause. Finally, the reader will see that some pies are composed of different leading causes of 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 types of figures are used to show trends in mortality, for all causes combined, and for each of the ten leading causes in the region/county over a 29-year period and a 10-year period. Premature mortality is described for deaths by all causes only. The first of the four types of figures depicts the observed mortality rates for the region/county and state. The second figure type shows age-adjusted mortality rates for the region/county, state, and nation allowing comparisons among geographical areas. The third figure type compares trends in age-adjusted mortality rates by race and gender. Adjustment is made for age structure differences among demographic groups, which permits observation on the effects of race and gender on these groups. The last figure type depicts racial differences (or disparities) expressed as a ratio (in percent) of age-adjusted mortality for non-Whites to the age-adjusted rates for Whites over the 29 year time series. Trend lines provide historical depth to mortality processes and a basis for prediction, 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 (indicating high variability), then there is less dependence and less of a trend in the observations. We use trend lines to uncover any general patterns found in the data for the purpose of assisting the investigator in understanding the underlying processes which generate them.

The equation of the line is 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 expected rates to the year 2020 from known historical values (1979 to 2008) 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 for any given year, $x$. For example, in figure 6.4 ii the year 2004 is the 5th year in the series, so 5 would be substituted for $x$ in the equation of the line derived from Robeson County’s age-adjusted mortality rate series for a selected cause of death. For Diabetes Mellitus (1999 to 2008), the 2004 expected or fitted age-adjusted rate is calculated to be a little more than 53 deaths per 100,000 people. The observed age-adjusted rate for 1990 is 60 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.) The numeric difference between the expected and observed rates for 2004 is 7—the model (the equation of the line) underestimates the observed value by 7 deaths. Each previous and subsequent year’s difference between the expected and observed rates will vary to a greater or lesser degree depending on the size of the population under study (see below). This variation can be measured to determine how well the line fits or models the observed data.

In the time series figures, the investigator will find several statistical tools to assist in the analyses of trend lines and fitted rates. These tools include the coefficient of determination, percent change values, and slope coefficients. These tools enable the investigator to form not only a mental picture of the comparative impact of mortality by cause on a region and population but to also gain insight into what the near demographic future holds for them.

Coefficients of determination ($R^2$) are provided to indicate how well the fitted line predicts or explains the observed rates. When variation in the observed rates is relatively high (the fitted trend line does not correspond well to the observed trend line) $R^2$ approaches 0.0, when the variation
is low, $R^2$ approaches 1.0. A low $R^2$ implies low reliability and a larger $R^2$ indicates that a greater degree of confidence can be placed in the trend line. 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 reliability and significance. The thinnest, dashed trend lines are for those where $R^2$ is less than 0.10 and should be considered not reliable. 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 several instances a non-linear trend may be present. It should be noted that the linear trend modeling undertaken here is a major simplification of real world processes. These processes are dynamical in nature and can be modeled and fitted with certain limitations and assumptions. Time series of epidemic infectious disease mortality rates typically exhibit a curvilinear pattern. A marked curvilinear pattern is seen in the mortality series for HIV/AIDS mortality, general cancer mortality, and several others which can be approximated into at least two sequential linear segments. Each segment is joined to another in the sequence at a point in time or year. In this series (#2), we begin to explore alternative methods for examining trends that show discontinuities and reversals within the set of time series observations, particularly within the mortality time series for HIV/AIDS.

Percent change provides a measure of the estimated change in mortality over the most recent ten year period (1999-2008). The percent value is followed by the term increase or decrease to help denote the direction of the overall trend. This information is in boldface and included with the $R^2$ value and the equation of the line. Percent change and the direction of that change is provided on the graphs for trends where $R^2$ is greater than 0.10.

Another tool is the equation of the line that fits a trend among the observed data point (the rates). The slope coefficient of this equation, $b$, is the estimated/expected number of deaths per unit of time ($x$) or the rate of change in deaths per annum. The direction of change is indicated with a negative sign preceding the $b$ and if positive, $b$ is unsigned. Visually, a negative slope shows a trend decreasing in annual rates from left to right and a positive slope will be rising (increasing) from left to right. An examination of the different slopes for regional or demographic group trends will quickly reveal that they are not equal. Visual inspection combined with slope coefficients also provides a means for making comparisons between any two trend line series in the time series figure. Trends will diverge, converge, or run parallel with one another indicating, respectively, increasing separation, decreasing separation, or very little change in rates between two trend lines. Setting two equations of the line equal to one another can yield an estimated year of convergence in the future (or the year the two trends diverged in the past). However, the investigator is cautioned to not put too much stock in the results if the forward or backward projections are very distant in time, especially when $R^2$ is low. Recent (or temporally adjacent) short term trends with good correspondence between the fitted trend line and observed trend line will be better indicators of rates in the near future or past (if historical rates are unknown).

The final tool is the pair of comparison tables located in the lower portion of the page. The tables, found in every time series figure (except the ones showing comparisons by race and disparity) are structured so that the reader can make comparisons of rates derived from the equation of the line (i.e., the fitted rates) among all regions or demographic groups portrayed in the figure. The 1999 and 2008 tables compare the fitted rates calculated for the beginning and end of the observed time series in terms of percent difference. Returning to figure 6.4 ii, Robeson County’s age-adjusted fitted rate for diabetes in 1999 is 84% greater than (GT) RNC’s fitted rate. In 2008, Robeson County’s fitted rate is 141% less than (LT) RNC’s fitted rate. The tables permit a quick assessment of trends calculated from observed time series data.

The reader should 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. The reader should evaluate all available data carefully before drawing conclusions about current, past and future mortality patterns.

Caveats about the Concepts of Race, Gender, and Geography

Several caveats are offered 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 and larger regions composed of 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 2020, 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.
General References


Cited References

4. Current Disparities in Mortality by Geography, Race and Gender, and Race: Total and Five Leading Causes of Death
Figure 4.1 i. General leading causes of death for Robeson County (2004-2008), NC (2008), and US (2006). Mortality rate per 100,000 population.

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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.

2008 NC rate is 3% higher than 2006 US rate
Figure 4.1 ii. General leading causes of death for Robeson County (2004-2008), NC (2008), and US (2006). Age-adjusted mortality rate per 100,000 population.

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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.

2008 NC age-adjusted rate is 6% higher than 2006 US age-adjusted rate

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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 4.2 i. General leading causes of death for Robeson County (2004-2008) by race and gender. Mortality rate per 100,000 population.

**Non-White Males**
- Diseases of Heart: 23%
- Cancer - All Sites: 18%
- Cerebrovascular Disease: 6%
- Chronic Lower Respiratory Diseases: 6%
- Diabetes Mellitus: 7%
- Homicide: 7%
- Alzheimers Disease: 6%
- Unintentional Motor Vehicle Injuries: 6%
- All Other Deaths: 38%

2004-2008 Robeson County NWM rate is 15% lower than 2004-2008 Robeson County WM rate

**Non-White Females**
- Diseases of Heart: 23%
- Cancer - All Sites: 18%
- Cerebrovascular Disease: 6%
- Chronic Lower Respiratory Diseases: 6%
- Diabetes Mellitus: 7%
- Homicide: 7%
- Alzheimers Disease: 6%
- Unintentional Motor Vehicle Injuries: 6%
- All Other Deaths: 38%

2004-2008 Robeson County NWF rate is 27% lower than 2004-2008 Robeson County WF rate

**White Males**
- Diseases of Heart: 26%
- Cancer - All Sites: 35%
- Cerebrovascular Disease: 4%
- Chronic Lower Respiratory Diseases: 6%
- Diabetes Mellitus: 5%
- Homicide: 6%
- Alzheimers Disease: 5%
- Unintentional Motor Vehicle Injuries: 5%
- All Other Deaths: 24%

**White Females**
- Diseases of Heart: 25%
- Cancer - All Sites: 38%
- Cerebrovascular Disease: 5%
- Chronic Lower Respiratory Diseases: 7%
- Diabetes Mellitus: 5%
- Homicide: 5%
- Alzheimers Disease: 7%
- Unintentional Motor Vehicle Injuries: 7%
- All Other Deaths: 20%

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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 4.2 ii. General leading causes of death for Robeson County (2004-2008) by race and gender.
Age-adjusted mortality rate per 100,000 population.

Non-White Males

- 25% Diseases of Heart
- 20% Cancer - All Sites
- 18% Cerebrovascular Disease
- 12% Chronic Lower Respiratory Diseases
- 7% Diabetes Mellitus
- 5% Homicide
- 7% Alzheimers Disease
- 5% Unintentional Motor Vehicle Injuries
- 3% All Other Deaths

2004-2008 Robeson County NWM age-adjusted rate is 9% higher than 2008 Robeson County WM age-adjusted rate

1339 deaths/100,000

White Males

- 25% Diseases of Heart
- 20% Cancer - All Sites
- 18% Cerebrovascular Disease
- 12% Chronic Lower Respiratory Diseases
- 7% Diabetes Mellitus
- 5% Homicide
- 7% Alzheimers Disease
- 5% Unintentional Motor Vehicle Injuries
- 3% All Other Deaths

2004-2008 Robeson County NWF age-adjusted rate is 10% higher than 2008 Robeson County WF age-adjusted rate

873 deaths/100,000

Non-White Females

- 23% Diseases of Heart
- 18% Cancer - All Sites
- 15% Cerebrovascular Disease
- 12% Chronic Lower Respiratory Diseases
- 7% Diabetes Mellitus
- 5% Homicide
- 7% Alzheimers Disease
- 5% Unintentional Motor Vehicle Injuries
- 4% All Other Deaths

2004-2008 Robeson County NWF age-adjusted rate is 10% higher than 2008 Robeson County WF age-adjusted rate

796 deaths/100,000

White Females

- 25% Diseases of Heart
- 20% Cancer - All Sites
- 18% Cerebrovascular Disease
- 12% Chronic Lower Respiratory Diseases
- 7% Diabetes Mellitus
- 5% Homicide
- 7% Alzheimers Disease
- 5% Unintentional Motor Vehicle Injuries
- 3% All Other Deaths

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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 4.3 i. General leading causes of death for Robeson County (2004-2008) by race. Mortality rate per 100,000 population.

- **Non-White**: 842 deaths/100,000
- **White**: 1071 deaths/100,000

2004-2008 Robeson County NW rate is 21% lower than 2004-2008 Robeson County W rate

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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 4.3 ii. General leading causes of death for Robeson County (2004-2008) by race. Age-adjusted mortality rate per 100,000 population.

Pie charts are proportionately scaled using the state age-adjusted mortality rate of white females (796 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.
5. Trends and Disparities in Mortality in Robeson County: All Causes of Death and All Causes of Premature Mortality; 1979-2008
All Causes of Death

- Robeson County's mortality rate trend over the 9 year period is higher than the trend for the state or RNC71, but is declining slightly faster.

- Robeson County's age-adjusted mortality rate trend is higher than the trend for RNC71, the state, and the US, but is declining faster.

- Age-adjusted mortality rate trends for all subgroups are declining. The mortality rate for non-White males is the highest. The mortality rate for White females is the lowest.

- The rate for age-adjusted mortality for non-Whites is higher than that for Whites. Both decreased by a similar percentage.

- The trend for racial disparity was not reliable.

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 $R^2 < 0.10$. 
Trends and Disparities in Mortality in Robeson County

Figure 5.1 i. All Causes of Death:
Trends in mortality rates for Robeson County, RNC71, and NC
1979-2008 with projections to 2020

Robeson 10-yr trendline
RNC71 10-yr trendline
NC 10-yr trendline

10% decrease
9% decrease
9% decrease

R2 = 0.44
R2 = 0.76
R2 = 0.74

y = -10.52x + 1,016.52
y = -8.47x + 892.72
y = -8.54x + 910.85

1999 Robeson rate is 14% greater than RNC71
2008 Robeson rate is 13% greater than RNC71
Figure 5.1 ii. All Causes of Death: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

1999 Robeson rate is 31% greater than RNC71
2008 Robeson rate is 25% greater than RNC71
Figure 5.1 iii. All Causes of Death: Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020.

Comparison of Fitted Rates in 1999

- NWM: 7% LT, 35% LT, 42% LT
- WM: 7% GT, 31% LT, 38% LT
- NWF: 55% GT
- WF: 73% GT, 61% GT

Comparison of Fitted Rates in 2008

- NWM: 7% LT, 35% LT, 42% LT
- WM: 7% GT, 31% LT, 38% LT
- NWF: 55% GT
- WF: 73% GT, 61% GT

NWM 10-yr trendline: 19% decrease, $R^2 = 0.55$, $y = -29.59x + 1,597.23$.
WM 10-yr trendline: 22% decrease, $R^2 = 0.80$, $y = -32.49x + 1,488.44$.
NWF 10-yr trendline: 17% decrease, $R^2 = 0.59$, $y = -17.03x + 1,030.78$.
WF 10-yr trendline: 16% decrease, $R^2 = 0.48$, $y = -14.87x + 922.85$. 

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Figure 5.1 iv. All Causes of Death:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

1999 non-White rate is 8% greater than White
2008 non-White rate is 10% greater than White

NW 10-yr trendline

16% decrease
R2 = 0.67
y = -19.55x + 1,249.59

W 10-yr trendline

17% decrease
R2 = 0.67
y = -20.04x + 1,155.54
Figure 5.1 v. All Causes of Death: Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

R2 = 0.04

\[ y = 0.26x + 7.98 \]
All Causes of Premature Mortality

- The trend for premature mortality for Robeson county was not reliable.
- The trend for age-adjusted premature mortality was also not reliable.
- Non-White males had the highest rate for age-adjusted premature mortality. White females had the lowest rate, but the trend is increasing, whereas the trend for non-White females is decreasing. The trend for White males is not reliable.
- The trend for Whites for age-adjusted premature mortality is increasing. The trend for non-Whites is not reliable.
- A moderately reliable trend showed a decrease in racial disparity.

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 $R^2 < 0.10$. 
Figure 5.2 i. All Causes of Premature Mortality:
Trends in premature mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

1999 Robeson rate is 50% greater than RNC71
2008 Robeson rate is 62% greater than RNC71

Comparison of Fitted Rates in 1999

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Comparison of Fitted Rates in 2008

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Figure 5.2 ii. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Trends and Disparities in Mortality in Robeson County

R2 = 0.02
y = -4.24x + 1,315.58

R2 = 0.79
y = -9.23x + 853.30

R2 = 0.81
y = -9.46x + 876.22

R2 = 0.89
y = -5.69x + 768.30

1999 Robeson rate is 54% greater than RNC71
2008 Robeson rate is 66% greater than RNC71

Comparison of Fitted Rates in 1999

Comparison of Fitted Rates in 2008

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Trends and Disparities in Mortality in Robeson County

Figure 5.2 iii. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

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R2 = 0.01
y = 8.10x + 1,760.72

R2 = 0.01
y = -5.32x + 1,585.38

R2 = 0.35
y = -27.24x + 1,126.78

R2 = 0.40
y = 24.96x + 617.94

Comparison of Fitted Rates in 1999

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<th>16% LT</th>
<th>36% LT</th>
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Comparison of Fitted Rates in 2008

| Race | 10% LT | 16% LT | 36% LT | 52% LT | 65% LT | 54% LT | 19% GT | 34% GT | 43% GT | 45% GT | 108% GT | 74% GT | 45% GT | 118% GT | 82% GT | 5% GT |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| NWM  | 10% LT | 16% LT | 36% LT | 52% LT | 65% LT | 54% LT | 19% GT | 34% GT | 43% GT | 45% GT | 108% GT | 74% GT | 45% GT | 118% GT | 82% GT | 5% GT |
| WM   | 25% LT | 16% LT | 36% LT | 52% LT | 65% LT | 54% LT | 19% GT | 34% GT | 43% GT | 45% GT | 108% GT | 74% GT | 45% GT | 118% GT | 82% GT | 5% GT |
| NWF  | 61% LT | 41% LT | 45% LT | 65% LT | 54% LT | 54% LT | 45% GT | 45% GT | 45% GT | 45% GT | 45% GT | 45% GT | 45% GT | 5% GT | 82% GT | 82% GT |
| WF   | 82% GT | 5% GT  | 82% GT | 82% GT | 5% GT  | 82% GT | 5% GT  | 82% GT | 5% GT  | 82% GT | 5% GT  | 82% GT | 5% GT  | 82% GT | 5% GT  | 82% GT |
Figure 5.2 iv. All Causes of Premature Mortality:
Trends in age-adjusted premature mortality rates by race for Robeson County, 1979-2008 with projections to 2020

1999 non-White rate is 29% greater than White
2008 non-White rate is 11% greater than White

NW 10-yr trendline
W 10-yr trendline

11% increase

R² = 0.03
y = -8.01x + 1,411.93

R² = 0.22
y = 12.26x + 1,098.12
Figure 5.2 v. All Causes of Premature Mortality:
Measuring disparity in age-adjusted premature mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity
71% decrease
R² = 0.17
y = -2.08x + 29.28
Diseases of Heart

- Robeson County’s crude heart disease mortality rate trend is higher than that of the state or RNC71, but has declined a bit faster than the others.

- Robeson County’s age-adjusted heart disease mortality rate is higher than the state, RNC71, or the US rate but is declining and is projected to converge with the others.

- Rates for non-White males and White males are above those for non-White females and White females. All rates are declining but rates for non-White males are declining the most, and are projected to converge with the rates for non-White and White females.

- Both the non-White rate and the White rate are declining. Over the period the non-White rate remained 8-10% higher than the white rate.

- The trend for racial disparity is not reliable.

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 $R^2 < 0.10$. 
Figure 6.1 i. Diseases of Heart:
Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline: 32% decrease
RNC71 10-yr trendline: 30% decrease
NC 10-yr trendline: 29% decrease

R2 = 0.86
y = -9.51x + 301.73

R2 = 0.95
y = -7.49x + 252.25

R2 = 0.95
y = -7.42x + 256.90

1999 Robeson rate is 20% greater than RNC71
2008 Robeson rate is 17% greater than RNC71
Figure 6.1 ii. Diseases of Heart:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Robeson 10-yr trendline
36% decrease
R2 = 0.89
y = -13.33x + 369.54

RNC71 10-yr trendline
31% decrease
R2 = 0.98
y = -8.21x + 261.53

NC 10-yr trendline
32% decrease
R2 = 0.98
y = -8.52x + 267.74

US 8-yr trendline
27% decrease
R2 = 0.99
y = -9.12x + 274.77

1999 Robeson rate is 41% greater than RNC71
2008 Robeson rate is 33% greater than RNC71

Comparison of Fitted Rates in 1999
Robeson
38% GT
34% LT

RNC71
38% GT
34% LT

NC
33% GT
31% LT

US
30% GT
28% LT

Comparison of Fitted Rates in 2008
Robeson
41% GT
38% LT

RNC71
33% GT
31% LT

NC
31% GT
29% LT

US
30% GT
28% LT

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Center for Health Services Research and Development, ECU
Page 6.3
Figure 6.1 iii. Diseases of Heart:
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

Comparison of Fitted Rates in 1999

Comparison of Fitted Rates in 2008

Report #2.155, November 2011
Center for Health Services Research and Development, ECU
Figure 6.1 iv. Diseases of Heart: Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

NW 10-yr trendline
35% decrease
R² = 0.76
y = -13.50x + 381.14

W 10-yr trendline
37% decrease
R² = 0.83
y = -13.21x + 354.73

- 1999 non-White rate is 7% greater than White
- 2008 non-White rate is 10% greater than White
Figure 6.1 v. Diseases of Heart:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

R^2 = 0.01
y = 0.30x + 7.59
Cancer - Trachea, Bronchus, Lung

- Robeson County's trend line for mortality due to lung cancer is not reliable.
- The age-adjusted rate trend for lung cancer also was not reliable.
- The age-adjusted trends for all demographic groups were not reliable.
- The age-adjusted trends for Whites and non-Whites were not reliable.
- The trend in racial disparities was not reliable.

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 $R^2 < 0.10$. 
Figure 6.2 i. Cancer - Trachea, Bronchus, Lung: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

1999 Robeson rate is 2% less than RNC71
2008 Robeson rate is 10% greater than RNC71

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Comparison of Fitted Rates:

- Robeson: \( y = 0.50x + 58.91 \)
- RNC71: \( y = -0.26x + 59.96 \)
- NC: \( y = -0.25x + 61.01 \)

R2 values:
- Robeson: 0.05
- RNC71: 0.27
- NC: 0.23

Legend:
- Blue: Robeson
- Green: RNC71
- Red: NC
Figure 6.2 ii. Cancer - Trachea, Bronchus, Lung:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US,
1979-2008 with projections to 2020

Comparison of Fitted Rates in 1999

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Comparison of Fitted Rates in 2008

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Figure 6.2 iii. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

R2 = 0.03
y = -1.20x + 104.63

R2 = 0.09
y = -2.41x + 123.07

R2 = 0.05
y = 0.66x + 32.98

R2 = 0.05
y = 1.41x + 44.19
Figure 6.2 iv. Cancer - Trachea, Bronchus, Lung:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

1999 non-White rate is 22% less than White
2008 non-White rate is 17% less than White

NW 10-yr trendline
W 10-yr trendline

R2 = 0.00
y = 0.14x + 60.39

R2 = 0.01
y = -0.38x + 77.33
Figure 6.2 v. Cancer - Trachea, Bronchus, Lung:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

$R^2 = 0.01$

$y = 1.12x - 33.28$
Cerebrovascular Disease

- Robeson County's mortality rate trend due to Cerebrovascular disease is declining and has dropped below the rate for RNC71 and the state.

- The age-adjusted mortality rate for Robeson County is also declining and is projected to drop below the rates for RNC71 and the state.

- The age-adjusted rate for non-White males is higher than the rates for White males, non-White females and White females. Rates for all groups are declining but the rates for White males are declining the fastest.

- The trend in age-adjusted mortality for non-Whites is higher than the rate for Whites but both are declining.

- The trend in racial disparity is increasing (favoring Whites) in a moderately reliable trend.

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 $R^2 < 0.10$. 
Figure 6.3 i. Cerebrovascular Disease: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline: 52% decrease
RNC71 10-yr trendline: 40% decrease
NC 10-yr trendline: 39% decrease

Robeson 1999 rate is 19% greater than RNC71
2008 Robeson rate is the same as RNC71

Comparison of Fitted Rates in 1999
Comparison of Fitted Rates in 2008

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Figure 6.3 ii. Cerebrovascular Disease:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Robeson 10-yr trendline
58% decrease
R2 = 0.91
y = -6.65x + 114.66

RNC71 10-yr trendline
42% decrease
R2 = 0.98
y = -3.31x + 79.00

NC 10-yr trendline
42% decrease
R2 = 0.99
y = -3.42x + 80.92

US 8-yr trendline
32% decrease
R2 = 0.98
y = -2.67x + 65.79

1999 Robeson rate is 45% greater than RNC71
2008 Robeson rate is 11% greater than RNC71
**Trends and Disparities in Mortality in Robeson County**

**Figure 6.3 iii. Cerebrovascular Disease:**
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

![Graph showing trends and disparities in mortality rates](image)

<table>
<thead>
<tr>
<th>Race</th>
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<th>10-yr Trendline</th>
<th>Adjusted Rate % Decrease</th>
<th>R² Value</th>
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<td>10-yr trendline</td>
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<td>R² = 0.58</td>
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**Comparison of Fitted Rates in 1999**

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**Comparison of Fitted Rates in 2008**

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<td>10-yr trendline</td>
<td>58% decrease</td>
<td>R² = 0.78</td>
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<td>LT</td>
<td>10-yr trendline</td>
<td>59% decrease</td>
<td>R² = 0.58</td>
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*Report #2.155, November 2011*

*Center for Health Services Research and Development, ECU*
Figure 6.3 iv. Cerebrovascular Disease:
Trends in age-adjusted mortality rates by race for Robeson County,
1979-2008 with projections to 2020

1999 non-White rate is 1% greater than White
2008 non-White rate is 39% greater than White
Figure 6.3 v. Cerebrovascular Disease: Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity
867% increase
$R^2 = 0.10$
y = 3.45x + 3.98
Diabetes Mellitus

- The mortality rate for Robeson County in 2008 was 97% higher than the rate for RNC71 and the trend is increasing (in a moderately reliable trend), whereas the trends for RNC71 and the state are decreasing.

- The age-adjusted mortality rate trend for Robeson County is not reliable.

- The age-adjusted rate trends for White males and non-White males were not reliable. The trend for non-White females was moderately reliable and increasing. The trend for White females was moderately reliable and decreasing.

- The age-adjusted rate trends by race were not reliable.

- The racial disparity trend was not reliable.

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 $R^2 < 0.10$. 
Figure 6.4 i. Diabetes Mellitus: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

- 18% increase (Robeson 10-yr trendline, \( R^2 = 0.16 \), \( y = 0.76x + 42.29 \))
- 16% decrease (RNC71 10-yr trendline, \( R^2 = 0.66 \), \( y = -0.42x + 26.97 \))
- 13% decrease (NC 10-yr trendline, \( R^2 = 0.59 \), \( y = -0.37x + 28.02 \))

1979 Robeson rate is 41% greater than RNC71
2008 Robeson rate is 97% greater than RNC71
Figure 6.4 ii. Diabetes Mellitus: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

- Robeson 10-yr trendline: 17% decrease
- RNC71 10-yr trendline: 17% decrease
- NC 10-yr trendline: 6% decrease
- US 8-yr trendline: 6% decrease

1999 Robeson rate is 84% greater than RNC71
2008 Robeson rate is 141% greater than RNC71

Comparison of Fitted Rates in 1999

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<th>NC</th>
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Report #2.155, November 2011 Page 6.21
Figure 6.4 iii. Diabetes Mellitus:
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020
Figure 6.4 iv. Diabetes Mellitus:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

1999 non-White rate is 40% greater than White
2008 non-White rate is 68% greater than White

NW 10-yr trendline
W 10-yr trendline

R² = 0.06
y = 1.07x + 59.12

R² = 0.01
y = -0.15x + 42.31
### Figure 6.4 v. Diabetes Mellitus:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

#### Racial Disparity

\[ R^2 = 0.04 \]

\[ y = 3.38x + 42.63 \]

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The graph shows the percentage difference in mortality rates between non-White and White populations from 1979 to 2008, with projections to 2020.
Unintentional Motor Vehicle Injuries

- The mortality rate for Unintentional Motor Vehicle Injuries for Robeson County was higher than the RNC71 and the state rates and decreasing in a moderately reliable trend.

- The age-adjusted mortality rate for Robeson County is 138% higher than the rate for RNC71. It is decreasing in a moderately reliable trend.

- The trends in age-adjusted rates for White males and non-White females are decreasing. The trends for non-White males and White females are not reliable.

- The trend for Whites is decreasing in a moderately reliable trend. The trend for non-Whites is not reliable.

- The trend for racial disparities was not reliable.

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 $R^2 < 0.10$. 
Figure 6.5 i. Unintentional Motor Vehicle Injuries: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline: 19% decrease
RNC71 10-yr trendline: 14% decrease
NC 10-yr trendline: 13% decrease

R2 = 0.19
y = -0.94x + 50.08

R2 = 0.57
y = -0.29x + 20.25

R2 = 0.54
y = -0.27x + 20.83

1999 Robeson rate is 147% greater than RNC71
2008 Robeson rate is 136% greater than RNC71

Comparison of Fitted Rates in 1999

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<thead>
<tr>
<th>Robeson</th>
<th>RNC71</th>
<th>NC</th>
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<td>60% LT</td>
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<td>147% GT</td>
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</tr>
<tr>
<td>140% GT</td>
<td>3% LT</td>
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Comparison of Fitted Rates in 2008

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<th>Robeson</th>
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<td>56% LT</td>
<td>56% LT</td>
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<td>136% GT</td>
<td>4% GT</td>
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<tr>
<td>128% GT</td>
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</table>
Figure 6.5 ii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

- Robeson 10-yr trendline: 20% decrease
  - R2 = 0.24
  - $y = -1.04x + 51.29$
- RNC71 10-yr trendline: 14% decrease
  - R2 = 0.57
  - $y = -0.28x + 20.20$
- NC 10-yr trendline: 13% decrease
  - R2 = 0.53
  - $y = -0.27x + 20.75$
- US 8-yr trendline: 2% decrease
  - R2 = 0.25
  - $y = -0.04x + 15.45$

1999 Robeson rate is 154% greater than RNC71
2008 Robeson rate is 138% greater than RNC71
Figure 6.5 iii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

NWM 10-yr trendline

-25 0 25 50 75 100 125 150

Age-adjusted mortality rate per 100,000 population

WM 10-yr trendline

NWF 10-yr trendline

WF 10-yr trendline

R² = 0.00

y = -0.31x + 72.13

23% decrease

R² = 0.11

y = -1.95x + 83.87

49% decrease

R² = 0.28

y = -1.70x + 34.92

R² = 0.06

y = -0.65x + 24.62

Comparison of Fitted Rates in 1999

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Comparison of Fitted Rates in 2008

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<td>253% GT</td>
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<td>4% GT</td>
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23% decrease

49% decrease

R² = 0.00

y = -0.31x + 72.13

R² = 0.11

y = -1.95x + 83.87

R² = 0.28

y = -1.70x + 34.92

R² = 0.06

y = -0.65x + 24.62
Figure 6.5 iv. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

- NW 10-yr trendline
- W 10-yr trendline

24% decrease

R² = 0.07
y = -0.78x + 49.84

R² = 0.11
y = -1.35x + 55.23

1999 non-White rate is 10% less than White
2008 non-White rate is 1% less than White
Figure 6.5 v. Unintentional Motor Vehicle Injuries:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

R2 = 0.08
y = 6.33x - 34.03
Chronic Lower Respiratory Diseases

- Robeson County’s mortality rate due to Chronic Lower Respiratory Disease is declining. It is significantly lower than the rates for RNC71 and the state, both of which show flat trend lines.

- The age-adjusted mortality rate trend for Robeson County is also showing a steep decline. Trends for RNC71, and the state are flat. The trend for the US shows a slight decline.

- The age-adjusted trend for non-White males is declining quickly and is now below the rate for White males, which is also declining, but not as quickly. The trends for non-White females and White females are not reliable.

- The age-adjusted mortality rate for non-Whites is below the rate for Whites and is decreasing. The trend for Whites is moderately reliable, and is also decreasing, but not as quickly.

- A reliable trend showed a steep decrease in racial disparity favoring non-Whites.

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 \( R^2 < 0.10 \).
Figure 6.6. Chronic Lower Respiratory Diseases: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020.

- Robeson 10-yr trendline: 39% decrease
  - $R^2 = 0.53$
  - $y = -1.90x + 48.71$
- RNC71 10-yr trendline: 6% increase
  - $R^2 = 0.10$
  - $y = 0.25x + 44.32$
- NC 10-yr trendline
  - $R^2 = 0.07$
  - $y = 0.20x + 44.75$

Comparison of Fitted Rates in 1999:
- Robeson: 9% LT
- RNC71: 8% LT
- NC: 7% LT

Comparison of Fitted Rates in 2008:
- Robeson: 32% LT
- RNC71: 47% GT
- NC: 47% GT

1999 Robeson rate is 10% greater than RNC71.
2008 Robeson rate is 32% less than RNC71.
Figure 6.6 ii. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Robeson 10-yr trendline: 43% decrease
RNC71 10-yr trendline: 6% increase
NC 10-yr trendline: 10% decrease
US 8-yr trendline: R2 = 0.74

\[ y = -0.57x + 45.66 \]

Robeson 10-yr trendline: 43% decrease
RNC71 10-yr trendline: 6% increase
NC 10-yr trendline: 10% decrease
US 8-yr trendline: R2 = 0.74

\[ y = -2.60x + 60.06 \]

\[ y = 0.27x + 45.43 \]

\[ y = 0.13x + 46.08 \]

1999 Robeson rate is 32% greater than RNC71
2008 Robeson rate is 23% less than RNC71
Figure 6.6 iii. Chronic Lower Respiratory Diseases:
Trends in age-adjusted mortality rates by race and gender for Robeson County,
1979-2008 with projections to 2020

NWM 10-yr trendline
R² = 0.94
y = -11.26x + 129.94
87% decrease

WM 10-yr trendline
R² = 0.20
y = -4.78x + 101.97
47% decrease

NWF 10-yr trendline
R² = 0.08
y = 0.51x + 17.62

WF 10-yr trendline
R² = 0.00
y = -0.13x + 45.66

Comparison of Fitted Rates in 1999

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Comparison of Fitted Rates in 2008

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<td>50% LT</td>
<td>50% LT</td>
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</table>
Figure 6.6 iv. Chronic Lower Respiratory Diseases:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

NW 10-yr trendline
61% decrease
R2 = 0.88
y = -3.36x + 54.79

W 10-yr trendline
26% decrease
R2 = 0.16
y = -1.73x + 65.48

1999 non-White rate is 16% less than White
2008 non-White rate is 51% less than White
Figure 6.6 v. Chronic Lower Respiratory Diseases:
Measuring disparity in age-adjusted mortality rates by race for Robeson County,
1979-2008 with projections to 2020

Racial Disparity
5288% decrease
R² = 0.46
y = -10.98x - 2.08
Nephritis, Nephrotic Syndrome, and Nephrosis

- The mortality rate trend for Robeson County for kidney disease was not reliable.
- The age-adjusted mortality rate trend for Robeson County was also not reliable.
- The age-adjusted mortality rate trend for White males is increasing rapidly, in a moderately reliable trend. The trends for other demographic groups were not reliable.
- The age-adjusted mortality rate for Whites is increasing in a moderately reliable trend. The rate for non-Whites is not reliable.
- The racial disparity is decreasing in a moderately reliable trend.

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 $R^2 < 0.10$. 
Figure 6.7 i. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline
RNC71 10-yr trendline
NC 10-yr trendline

25% increase
R2 = 0.06
y = 0.37x + 22.18

25% increase
R2 = 0.78
y = 0.37x + 14.79

R2 = 0.83
y = 0.38x + 15.16

1999 Robeson rate is 50% greater than RNC71
2008 Robeson rate is 41% greater than RNC71

Comparison of Fitted Rates in 1999

Robeson | RNC71 | NC
---|---|---
50% GT | 33% LT | 32% LT
46% GT | 32% LT | 32% LT

Comparison of Fitted Rates in 2008

Robeson | RNC71 | NC
---|---|---
50% GT | 41% GT | 37% GT
46% GT | 3% LT | 3% LT
Figure 6.7 ii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Robeson 10-yr trendline
RNC71 10-yr trendline
NC 10-yr trendline
US 8-yr trendline

R2 = 0.04
R2 = 0.67
R2 = 0.72
R2 = 0.76

y = 0.30x + 26.68
y = 0.33x + 15.48
y = 0.31x + 15.92
y = 0.18x + 13.21

1999 Robeson rate is 72% greater than RNC71
2008 Robeson rate is 60% greater than RNC71
Figure 6.7 iii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

R2 = 0.00  
y = 0.09x + 41.59

R2 = 0.31  
y = 2.20x + 9.80

R2 = 0.01  
y = -0.44x + 33.65

R2 = 0.05  
y = -0.38x + 21.61

Comparison of Fitted Rates in 1999

NWM 32% LT  30% LT  19% LT
WM 24% LT  19% LT  30% LT
NWF 56% GT  50% GT  19% LT
WF 52% GT  24% GT  76% LT

Comparison of Fitted Rates in 2008

NWM 32% LT  30% LT  19% LT
WM 24% LT  19% LT  30% LT
NWF 56% GT  50% GT  19% LT
WF 52% GT  24% GT  76% LT

-10 0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
Age-adjusted mortality rate per 100,000 population
Age-adjusted mortality rate per 100,000 population

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 11 12 13 14 15 16 17 18 19 20
NWM 10-yr trendline  WM 10-yr trendline  NWF 10-yr trendline  WF 10-yr trendline
224% increase
Figure 6.7 iv. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020.

NW 10-yr trendline
W 10-yr trendline

R² = 0.00
y = -0.14x + 35.70

R² = 0.24
y = 0.70x + 16.86

1999 non-White rate is 112% greater than White
2008 non-White rate is 49% greater than White
Figure 6.7 v. Nephritis, Nephrotic Syndrome, and Nephrosis:
Measuring disparity in age-adjusted mortality rates by race for Robeson County,
1979-2008 with projections to 2020

Racial Disparity
65% decrease
R2 = 0.17
y = -7.70x + 117.88
Homicide

- The mortality rate trend for homicide for Robeson County was not reliable.
- The age-adjusted mortality rate trend for Robeson County was also not reliable.
- The age-adjusted mortality rate for White males is increasing quickly in a moderately reliable trend. The rate for White females is decreasing and the rate for non-White females is increasing slightly. The rate for non-White males was not reliable.
- The age-adjusted rate trend for Whites and non-Whites were not reliable.
- The trend for racial disparity was not reliable.

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 $R^2 < 0.10$. 
Figure 6.8 i. Homicide: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

1999 Robeson rate is 172% greater than RNC71
2008 Robeson rate is 247% greater than RNC71

Comparison of Fitted Rates in 1999

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<th>RNC71</th>
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<td>172% GT</td>
<td>63% LT</td>
<td>63% LT</td>
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<td>172% GT</td>
<td>0% LT</td>
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Comparison of Fitted Rates in 2008

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<tr>
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<tr>
<td>247% GT</td>
<td>71% LT</td>
<td>70% LT</td>
</tr>
<tr>
<td>238% GT</td>
<td>2% LT</td>
<td>RNC71</td>
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Figure 6.8 ii. Homicide:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

- Robeson 10-yr trendline: 15% decrease, $R^2 = 0.01$, $y = 0.14x + 22.11$
- RNC71 10-yr trendline: 13% decrease, $R^2 = 0.42$, $y = -0.12x + 8.01$
- NC 10-yr trendline: 3% increase, $R^2 = 0.34$, $y = -0.10x + 8.01$
- US 8-yr trendline: $R^2 = 0.28$, $y = 0.02x + 5.93$

1999 Robeson rate is 176% greater than RNC71
2008 Robeson rate is 239% greater than RNC71

Comparison of Fitted Rates in 1999:
- Robeson: 176% GT
- RNC71: 64% LT
- NC: 73% LT
- US: 64% LT

Comparison of Fitted Rates in 2008:
- Robeson: 239% GT
- RNC71: 3% GT
- NC: 11% LT
- US: 3% GT
Figure 6.8 iii. Homicide: Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

- NWM 10-yr trendline
- WM 10-yr trendline
- NWF 10-yr trendline
- WF 10-yr trendline

**Comparison of Fitted Rates in 1999**

<table>
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<tr>
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<th>WM</th>
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<td>74%</td>
<td>87%</td>
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<td>280% GT</td>
<td>50%</td>
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<td>660% GT</td>
<td>100%</td>
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<td>312% GT</td>
<td>8%</td>
<td>46%</td>
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**Comparison of Fitted Rates in 2008**

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<td>44%</td>
<td>78%</td>
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<td>62%</td>
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<td>364% GT</td>
<td>161%</td>
<td>60%</td>
<td>NWF</td>
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<tr>
<td>1052% GT</td>
<td>548%</td>
<td>148%</td>
<td>WF</td>
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**R2 Values**

- NWM: R2 = 0.00
- WM: R2 = 0.28
- NWF: R2 = 0.10
- WF: R2 = 0.34

**Equations**

- NWM: \( y = -0.27x + 49.34 \)
- WM: \( y = 1.49x + 12.98 \)
- NWF: \( y = 0.40x + 6.49 \)
- WF: \( y = -0.88x + 11.96 \)
Figure 6.8 iv. Homicide:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

NW 10-yr trendline
W 10-yr trendline

R2 = 0.01
y = 0.19x + 26.12

R2 = 0.03
y = 0.28x + 13.12

1999 non-White rate is 99% greater than White
2008 non-White rate is 78% greater than White
Figure 6.8 v. Homicide:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

\[ R^2 = 0.02 \]
\[ y = -5.35x + 145.82 \]
Alzheimers Disease

- The mortality rate for Robeson County for Alzheimer's disease is increasing in a moderately reliable trend, and is projected to rise above the rates for RNC71 and the state, which are also increasing, but not as quickly.

- The age-adjusted rate trend for Robeson County is increasing more quickly than those for RNC71, the state, and the US. The Robeson County rate already exceeds these other rates and is projected to continue upward.

- The age-adjusted mortality rate for non-White females is trending upward steeply. The trends for other demographic groups are not reliable.

- The age-adjusted rate trend for non-Whites is increasing quickly. The trend for Whites is not reliable.

- The trend for racial disparities is increasing.

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 $R^2 < 0.10$. 
Figure 6.9 i. Alzheimers Disease:
Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline
RNC71 10-yr trendline
NC 10-yr trendline

140% increase
R2 = 0.27
y = 1.64x + 11.70

45% increase
R2 = 0.82
y = 0.93x + 20.48

46% increase
R2 = 0.86
y = 0.90x + 19.67

1999 Robeson rate is 43% less than RNC71
2008 Robeson rate is 8% less than RNC71

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<td>20</td>
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Comparison of Fitted Rates in 1999

Robeson | RNC71 | NC
---------|-------|----
75% GT   | 68% GT| Robeson
43% LT   | 4% LT | RNC71
41% LT   | 4% GT | NC

Comparison of Fitted Rates in 2008

Robeson | RNC71 | NC
---------|-------|----
8% LT    | 4% LT | RNC71
5% LT    | 4% GT | NC
4% GT    | 5% LT | NC
Figure 6.9 ii. Alzheimers Disease:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Comparison of Fitted Rates in 1999

<table>
<thead>
<tr>
<th>Region</th>
<th>Robeson</th>
<th>RNC71</th>
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<th>US</th>
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<td>1999</td>
<td>31% GT</td>
<td>27% GT</td>
<td>6% LT</td>
<td>31% GT</td>
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<tr>
<td>2008</td>
<td>23% LT</td>
<td>3% LT</td>
<td>28% LT</td>
<td>23% LT</td>
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Comparison of Fitted Rates in 2008

<table>
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<th>Robeson</th>
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<tr>
<td>1999</td>
<td>10% GT</td>
<td>9% GT</td>
<td>13% LT</td>
<td>10% GT</td>
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<tr>
<td>2008</td>
<td>5% GT</td>
<td>5% GT</td>
<td>15% LT</td>
<td>5% GT</td>
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</table>

1999 Robeson rate is 23% less than RNC71
2008 Robeson rate is 10% greater than RNC71

103% increase
38% increase
36% increase
45% increase

R2 = 0.23
R2 = 0.70
R2 = 0.72
R2 = 0.95

y = 1.78x + 17.20
y = 0.85x + 22.45
y = 0.78x + 21.78
y = 0.91x + 16.23
Figure 6.9 iii. Alzheimers Disease:
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020
Figure 6.9 iv. Alzheimers Disease: Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

- 303% increase
- NW 10-yr trendline: R² = 0.48, y = 3.27x + 10.80
- W 10-yr trendline: R² = 0.01, y = 0.32x + 23.46

1999 non-White rate is 54% less than White
2008 non-White rate is 53% greater than White
Figure 6.9 v. Alzheimers Disease:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity
272% increase
$R^2 = 0.25$
$y = 14.11x - 51.86$
All Other Unintentional Injuries and Adverse Effects

- The mortality rate trend for Robeson County for All Other Injuries and Adverse Effects was not reliable.
- The age-adjusted mortality rate trend was also not reliable.
- The age-adjusted mortality rate for White females is increasing and has exceeded the rate for non-White females. The rate trend for non-White females is decreasing slightly. The rate trends for non-White males and White males were not reliable.
- The age-adjusted mortality rate trend for Whites and non-Whites were not reliable.
- The trend for racial disparities was not reliable.

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 $R^2 < 0.10$. 
Figure 6.10 i. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline RNC71 10-yr trendline NC 10-yr trendline
43% increase 41% increase
R2 = 0.00 R2 = 0.89 R2 = 0.89
y = 0.13x + 22.67 y = 0.89x + 20.84 y = 0.85x + 21.00

1999 Robeson rate is 9% greater than RNC71
2008 Robeson rate is 17% less than RNC71
Figure 6.10 ii. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

1999 Robeson rate is 16% greater than RNC71
2008 Robeson rate is 12% less than RNC71

R2 = 0.00
y = 0.08x + 24.91

R2 = 0.88
y = 0.85x + 21.40

R2 = 0.88
y = 0.79x + 21.66

R2 = 0.94
y = 0.75x + 18.46

Comparison of Fitted Rates in 1999

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<tr>
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Comparison of Fitted Rates in 2008

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<td>RNC71</td>
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<td>2% GT</td>
<td>15% GT</td>
<td>14% GT</td>
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**Figure 6.10 iii. All Other Unintentional Injuries and Adverse Effects:** Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020
Figure 6.10 iv. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

NW 10-yr trendline
W 10-yr trendline

R2 = 0.01
y = -0.17x + 26.70

R2 = 0.05
y = 0.53x + 20.17

1999 non-White rate is 32% greater than White
2008 non-White rate is 1% greater than White
Figure 6.10 v. All Other Unintentional Injuries and Adverse Effects:
Measuring disparity in age-adjusted mortality rates by race for Robeson County,
1979-2008 with projections to 2020

Racial Disparity

\[ R^2 = 0.02 \]
\[ y = -1.98x + 27.23 \]
7. Trends and Disparities in Mortality in Robeson County: Cancer - All Sites and HIV Disease; 1979-2008
Cancer - All Sites

- The mortality rate trend for Robeson County for Cancer-All was even with the rates for RNC and the state. All three show a modest decrease.

- The age-adjusted mortality rate trend for Robeson County is higher than the rates for RNC, the state, and the US but is decreasing and is projected to merge with the state and RNC rates.

- The age-adjusted mortality rates for non-White males and White males are even and are decreasing in similar trends. The rate for non-White females is lower and is decreasing in a shallower trend. The trend for White females is not reliable.

- The age-adjusted mortality rates for Whites and non-Whites are similar and are decreasing in similar trends.

- The trend for racial disparity is not reliable.

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 $R^2 < 0.10$. 
Figure 7.1 i. Cancer - All Sites:
Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

1999 Robeson rate is 1% greater than RNC71
2008 Robeson rate is 2% greater than RNC71
Figure 7.1 ii. Cancer - All Sites:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Figure 7.1 ii. Cancer - All Sites:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020
Figure 7.1 iii. Cancer - All Sites:
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

Comparison of Fitted Rates in 1999

<table>
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<tr>
<th>Race/Gender</th>
<th>FY99 Fitted Rate</th>
<th>FY2008 Fitted Rate</th>
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<tr>
<td>NWM</td>
<td>16% decrease</td>
<td>R2 = 0.23</td>
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Comparison of Fitted Rates in 2008

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<th>Race/Gender</th>
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<td>NWM</td>
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Figure 7.1 iv. Cancer - All Sites:
Trends in age-adjusted mortality rates by race for Robeson County, 
1979-2008 with projections to 2020

NW 10-yr trendline
13% decrease
R² = 0.29
y = -3.12x + 233.08

W 10-yr trendline
15% decrease
R² = 0.26
y = -3.62x + 239.36

1999 non-White rate is 3% less than White
2008 non-White rate is 1% less than White
Figure 7.1 v. Cancer - All Sites: Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity

\[ R^2 = 0.00 \]

\[ y = 0.29x - 3.03 \]
HIV Disease

- The mortality rate trend for Robeson County for HIV disease is increasing steeply, in contrast to the trends for RNC and the state, which are declining.
- The age-adjusted mortality rate trend is also increasing. The rate trends for RNC, the state, and the US are declining.
- The age-adjusted mortality rate trend for non-White males is the highest, but is decreasing, while the trend for White males is increasing. The rate trends for non-White females and White females are not reliable.
- The age-adjusted mortality rate trend for non-Whites is significantly higher than the rate trend for Whites. Both are increasing.
- Racial disparity is increasing in a moderately reliable trend.

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 $R^2 < 0.10$. 
Trends and Disparities in Mortality in Robeson County

Figure 7.2 i. HIV Disease:
Trends in mortality rates for Robeson County, RNC71, and NC, 1979-2008 with projections to 2020

Robeson 10-yr trendline
RNC71 10-yr trendline
NC 10-yr trendline

77% increase
37% decrease
37% decrease

R2 = 0.28
R2 = 0.96
R2 = 0.93

y = 0.38x + 4.95
y = -0.23x + 6.13
y = -0.24x + 6.44

1999 Robeson rate is 19% less than RNC71
2008 Robeson rate is 106% greater than RNC71

Comparison of Fitted Rates in 1999

Comparison of Fitted Rates in 2008
Figure 7.2 ii. HIV Disease:
Trends in age-adjusted mortality rates for Robeson County, RNC71, NC, and US, 1979-2008 with projections to 2020

Robeson 10-yr trendline: 74% increase
R2 = 0.26
y = 0.39x + 5.20

RNC71 10-yr trendline: 39% decrease
R2 = 0.96
y = -0.24x + 6.07

NC 10-yr trendline: 39% decrease
R2 = 0.94
y = -0.25x + 6.43

US 8-yr trendline: 27% decrease
R2 = 0.98
y = -0.19x + 5.55

1999 Robeson rate is 14% less than RNC71
2008 Robeson rate is 120% greater than RNC71

Comparison of Fitted Rates in 1999

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<th>Year</th>
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Comparison of Fitted Rates in 2008

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Report #2.155, November 2011
Center for Health Services Research and Development, ECU
Page 7.9
Figure 7.2 iii. HIV Disease:
Trends in age-adjusted mortality rates by race and gender for Robeson County, 1979-2008 with projections to 2020

Age-adjusted mortality rate per 100,000 population

Comparison of Fitted Rates in 1999

Comparison of Fitted Rates in 2008

Trends and Disparities in Mortality in Robeson County

Report #2.155, November 2011
Center for Health Services Research and Development, ECU
Figure 7.2 iv. HIV Disease:
Trends in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Age-adjusted mortality rate per 100,000 population

1999 non-White rate is 245% greater than White
2008 non-White rate is 160% greater than White

NW 10-yr trendline
68% increase
R2 = 0.15
y = 0.48x + 7.04

W 10-yr trendline
127% increase
R2 = 0.12
y = 0.26x + 2.04
Figure 7.2 v. HIV Disease:
Measuring disparity in age-adjusted mortality rates by race for Robeson County, 1979-2008 with projections to 2020

Racial Disparity
420% increase
\[ R^2 = 0.21 \]
\[ y = 33.74x - 80.3 \]

Percentage difference - non-White to White

% difference: 0 0 0 0 0 0 -133 -82 78 32 202 40 459 248 340 529 169 0 0 -413 0 252 219 252 396 172 115 61

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 11 12 13 14 15 16 17 18 19 20
### 8. Appendix

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<th>Disease</th>
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<td>390-398, 402, 404, 410-429</td>
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<td>Cerebrovascular Disease</td>
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<td>Atherosclerosis</td>
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<td>Cancer - All Sites</td>
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<td>Cancer - Lip, Oral Cavity, and Pharynx</td>
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