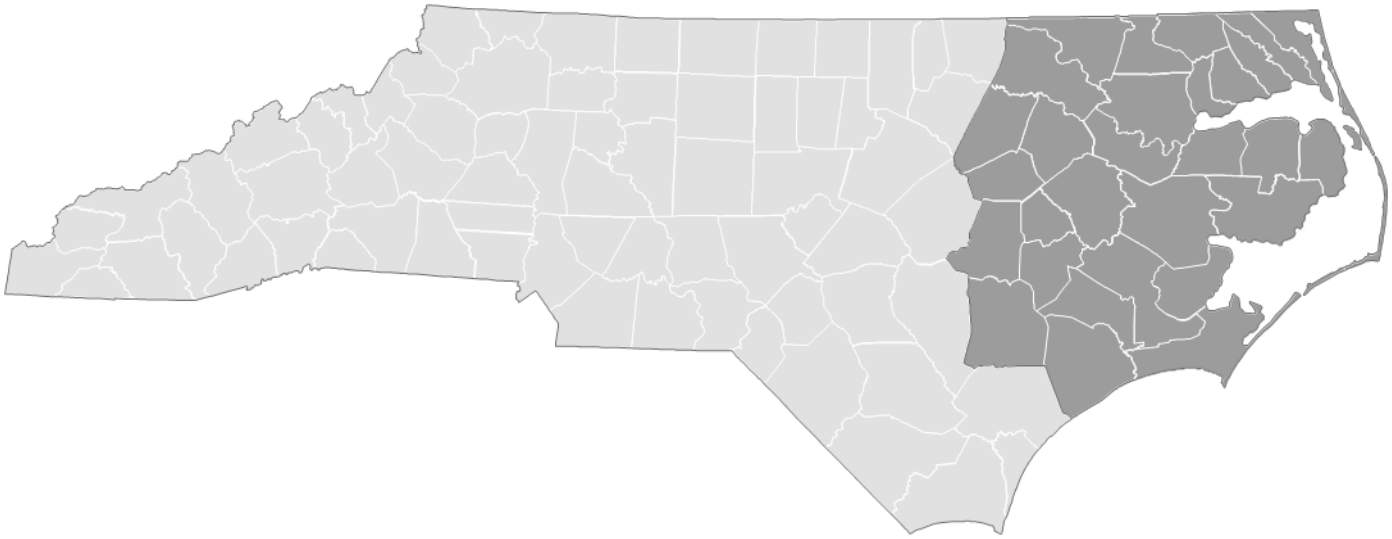
Trends and Disparities in Mortality in Eastern North Carolina

Total Deaths, Premature Mortality and Deaths for Ten Leading Causes; 1990-2019



A Resource for Healthy Communities

Health Indicator Series - Report #2.201
January 2022

Health Systems Research and Development
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1. Introduction

Health Indicators Series:
A Resource for Healthy Communities
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Report Series #2: Mortality Trends for Eastern North Carolina (1990 to 2019)

Health Indicators is a series of reports describing community health at the state, regional, and county level. 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 State Center for Health Statistics, 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 two overarching goals—to increase the span and quality of life, and to eliminate health disparities. 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 30-year period (1990-2019), as well as the most recent 15 year period (2005 to 2019). 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. The next section charts recent trends and disparities in mortality and provides projections to the year 2030. These charts place Eastern North Carolina's health status in a historical context and provide a glimpse into the future.

[*] The region *Eastern North Carolina* is comprised of 29 counties located in the extreme east of North Carolina and approximates the coastal plain physiographic province of the state. It includes the northern counties east of I-95. This region is characterized by its rurality, poverty, and some of the highest mortality rates in the nation. The name of the region is abbreviated as ENC29 or ENC. The rest of North Carolina is the remaining 71 counties; abbreviated as RNC71 or RNC.

2. Data Highlights

Trends and Disparities in Mortality in Eastern North Carolina

The following highlights of mortality in the 29 counties of Eastern North Carolina (ENC29) 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 region'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.

Current Disparities in Mortality by Geography, Race, and Gender

In 2019, the age-adjusted mortality rate for Eastern North Carolina is 840 deaths per 100,000. This rate is 9% higher than the state rate. Within Eastern North Carolina, the non-White rate is 16% higher than the White rate. The non-White male rate is 25% higher than the rate for White males. The non-White female rate is 12% higher than the rate for White females.

The five general leading causes of mortality in Eastern North Carolina (2019) are:
1. Diseases of Heart
2. Cancer—All Sites
3. Cerebrovascular Disease
4. Chronic Lower Respiratory Diseases
5. All Other Unintentional Injuries and Adverse Effects

The five general leading causes of mortality in Eastern North Carolina by race and gender (2019) are:

	Race and Gender			
	non-White Males	White Males	non-White Females	White Females
1st	Diseases of Heart	Diseases of Heart	Cancer - All Sites	Diseases of Heart
2nd	Cancer - All Sites	Cancer - All Sites	Diseases of Heart	Cancer - All Sites
3rd	Cerebrovascular Disease	All Other Unintentional Injuries and Adverse Effects	Cerebrovascular Disease	Chronic Lower Respiratory Disease
4th	Diabetes Mellitus	Chronic Lower Respiratory Disease	Diabetes Mellitus	Cerebrovascular Disease
5th	All Other Unintentional Injuries and Adverse Effects	Cerebrovascular Disease	Alzheimer's Disease	Alzheimer's Disease

Trends in Mortality from All Causes

- The 30-year ENC trend line shows all-cause mortality rates increasing. The 15-year trend shows ENC's rate has increased 13% over the period, and is 13% higher than NC.
- The age-adjusted all-cause mortality rate trend for ENC has been decreasing over the 30-year period; the 15-year trend is decreasing more slowly and remains higher than the RNC and NC rates. ENC's rate remains 8% greater than the rate for RNC.
- The non-White male mortality rate trend remains higher than other demographic groups but has decreased 19% in the 15-year period. Convergence of non-White males with White males and non-White females with White females is suggested in the future.

- The trends for all-cause mortality rates for both non-Whites and Whites are decreasing. The non-White trend is 10% greater than the White rate, but the recent 15-year trend suggests they will converge in the future.
- Over the recent 15-year period there is a 58% decrease in racial disparity.

Trends in Premature Mortality from All Causes of Death

- ENC's premature mortality rate trend is flat and not reliable.
- The age-adjusted premature mortality rate trend for ENC is 17% greater than NC, but is also flat and not reliable.
- The non-White male premature mortality rate trend has decreased 10% over the 15-year period. The non-White female rate has decreased 13% over 15 years. The White male and White female rate trends are not reliable.
- The non-White premature mortality rate is 43% greater than the White rate, and has decreased 11% over the 15 year period. The White rate trend is not reliable.
- The 15-year trend for racial disparity shows a 29% decrease in a moderately reliable trend.

Diseases of the Heart

- ENC's 15-year heart disease mortality rate is 25% greater than the RNC rate, but ENC's rate trend is flat and not reliable.
- While ENC's age-adjusted mortality rate trend is decreasing at a pace similar to RNC, NC and the US, the ENC rate remains 16% greater than the RNC rate in 2019.
- The non-White male rate trend remains slightly higher than the White male trend. The non-White female trend has converged with the White female trend and is projected to drop below it.
- The non-White rate trend remains 5% greater than for Whites, but the 15-year trends for both are decreasing and convergence is suggested in the future.
- The 15-year trend line for racial disparity is decreasing in a reliable trend .

Cerebrovascular Disease

- ENC's cerebrovascular disease mortality rate has turned up in recent years and is 31% greater than RNC. The rate trend has increased 11% over the 15 year period.
- The ENC age-adjusted cerebrovascular disease mortality rate trend has decreased 15% over the 15-year period. It remains 21% greater than the RNC rate trend.
- Non-White males have the highest mortality rate for cerebrovascular disease but the rate has decreased 20% over the 15-year period. The rate for non-White females has decreased 29% and is projected to converge with the trend for White males and White females
- The cerebrovascular disease mortality rate trend for non-Whites is decreasing but is still 34% greater than Whites in 2019.
- The 15-year trend for racial disparity is decreasing in a moderately reliable trend.

Cancer – Trachea, Bronchus, Lung

- The 15-year trend line for cancer-TBL for ENC has decreased 13% over the period. The rate for 2019 is 20% greater than the rate for RNC.
- In 2019 the age-adjusted rate for ENC is 12% higher than RNC. The 15-year trend rate for ENC has decreased 34%.
- The mortality rate trends for White and non-White males are decreasing and are projected to converge. The rate for non-White females is 33% less than the rate for White females.

- The non-White mortality rate trend for this cancer is consistently lower than the White rate. Both trends are decreasing over the 15-year period, but non-White is decreasing more quickly.
- The trend for racial disparity is not reliable.

Chronic Lower Respiratory Diseases

- The 30-year ENC trend for CLRD is increasing, as is the 15-year trend. In 2019 the ENC rate is 5% greater than the RNC rate.
- The ENC age-adjusted rate trend is lower than the RNC and NC but the trend is flat and not reliable.
- The rate for White males is the highest but is decreasing in a reliable trend. The rate for non-White males has decreased 20% over the 15-year period in a moderately reliable trend and is now below the rate for White females, which is increasing. The rate for non-White females is the lowest and is increasing in a moderately reliable trend.
- The 15-year trend for Whites is higher than the non-White rate, but both rates are flat and unreliable.
- The disparity trend between White and non-White is unreliable.

All Other Unintentional Injuries and Adverse Effects

- The mortality rate trend for unintentional injuries and adverse effects shows a sharp increase in ENC (107% over 15 years). The trends for RNC and the NC are also up sharply.
- The age-adjusted mortality rate trends for ENC, RNC, NC, and the US are all increasing. During the last 15 years the ENC rate has increased 97% and it is now 8% greater than RNC.
- The trends are increasing for all groups, but the white male rate is the highest and shows the greatest increase (125% over 15 years).
- The White rate trend has increased 110% over the 15 year period. The non-White rate is 39% less than the white rate, and increased 66% over the period.
- Over the 15-year period the racial disparity has decreased in a moderately reliable trend.

Alzheimer's Disease

- The Alzheimer's mortality rate trend for ENC shows a steep increase over the 15 year period (152%). ENC's rate of increase was larger than RNC and NC, but the rate for ENC is still 7% less than RNC.
- In 2019, the age-adjusted rate for ENC is 16% less than the rate for RNC. The ENC rate trend has increased 78% over the 15-year period and has inched above the US rate.
- Rate trends are increasing for all groups but non-White males and non-White females have the greatest increase (162% and 119% over 15 years, respectively). The rate for White females is the highest, followed by non-White females.
- The White and non-White rate trends are both increasing. They are set to converge, and the non-White trend is projected to overtake the White in the future.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future.

Diabetes Mellitus

- The 15-year rate trend for ENC has increased 28% over the period and is 43% greater than the RNC rate. .
- In 2019, the ENC rate trend for age-adjusted diabetes mellitus is 37% greater than RNC. The 15-year trend is not reliable.

- The non-White male 15-year rate has increased but the trend is not reliable. The non-White female trend has decreased 21%. The White male and White female trends are lower but are unreliable.
- The non-White mortality rate is 11% higher than the White rate. The 15-year rate trends are unreliable.
- The 15-year trend for racial disparity is not reliable .

Nephritis, Nephrotic Syndrome, and Nephrosis

- In 2019 ENC's rate trend for nephritis, nephrotic syndrome and nephrosis is 11% greater than RNC, but the trend is not reliable.
- With age-adjustment, the ENC rate trend has decreased 26% over the 15-year period. It is 2% greater than the RNC rate and NC rate. They are projected to converge soon.
- The 15-year trends for non-White males and non-White females are the highest but have decreased 25% over the 15-year period. The non-White male trend in 2019 is 119% greater than the White male trend and 217% greater than the White female trend. All trends are decreasing.
- The non-White rate in 2019 is 121% greater than the White rate. It has decreased 31% over the 15-year period. The White rate has decreased 24%. .
- The trend for racial disparity is decreasing but the trend is not reliable.

Unintentional Motor Vehicle Injuries

- The mortality rate trend for unintentional motor vehicle injuries in ENC has deceased by 26% over the 15-year period, but has recently ticked up. The rate for NC has decreased. In 2019 ENC's rate trend is 21% greater than RNC.
- With age-adjustment, the ENC rate trend has decreased 27% over the 15-year period, but has recently gone up. It is 22% greater than the RNC rate and 18% greater than the NC rate.
- The 15-year trends for non-White males and White males are the highest, but the White male trend line has experienced a 44% decrease over the 15-year period. The rate for non-White males is unreliable. Non-White females and White females are lower, with White females projected to decrease.
- The non-White rate in 2019 is 52% greater than the White rate but is unreliable. The White rate is decreasing, 43% over 15 years.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future.

Cancer—Colon, Rectum, Anus

- The mortality rate trend for unintentional motor vehicle injuries in ENC has deceased by 26% over the 15-year period, but has recently ticked up. The rate for NC has decreased. In 2019 ENC's rate trend is 21% greater than RNC.
- With age-adjustment, the ENC rate trend has decreased 27% over the 15-year period, but has recently gone up. It is 22% greater than the RNC rate and 18% greater than the NC rate.
- The 15-year trends for non-White males and White males are the highest, but the White male trend line has experienced a 44% decrease over the 15-year period. The rate for non-White males is unreliable. Non-White females and White females are lower, with White females projected to decrease.
- The non-White rate in 2019 is 52% greater than the White rate but is unreliable. The White rate is decreasing, 43% over 15 years.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future.

Cancer – All Sites

- The cancer—all sites mortality rate trends for ENC, RNC, and NC are flat and are not reliable .
- The age-adjusted cancer—all sites mortality rate trends for ENC, RNC, NC and US are all decreasing. The ENC rate is 8% greater than the NC rate.
- The rate trend is decreasing for all groups. The rate for non-White males is the highest, but it is decreasing the most and set to converge with the rate for White males. White and non-White females are lower .
- Both the White and non-White cancer mortality trends are decreasing over the15 year period. The non-White rate decreased 30% and the White rate decreased 21%. The non-White rate remains 8% greater than the White rate in 2019 but they are converging.
- The 15-year trend for racial disparity shows a 67% decrease .

HIV Disease

- The fitted HIV mortality rates for ENC have been decreasing over the past 15 years, but are still 29% greater than NC in 2019 .
- The age-adjusted rate trend for ENC, RNC, and the US are all decreasing. The ENC rate is 37% greater than NC in 2019 .
- Non-White males continue to have the highest rate of age-adjusted mortality but the rate has decreased 83% in a 15-year reliable trend. Non-White females have the second highest rate, but it has also declined. The rates for White males and non-White females are lower.
- The 15-year age-adjusted HIV mortality rates have decreased for both Whites and non-Whites by 61% and 80% respectively. The non-White rate is still 575% greater than the White rate .
- The 15-year trend for racial disparity shows a 55% decrease.

3. Methods, Interpretation, and References

Data Sources
The data for mortality and premature mortality in Eastern North Carolina 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).

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 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 2019. Smaller areas like counties will usually be aggregated into 5-year intervals (e.g., 2014 to 2019). 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 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 30-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 30 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 2030 from known historical values (2005 to 2019) 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 6.2 ii the year 2013 is the 9th year in the series, so *9* would be substituted for *x* in the equation of the line derived from ENC29's age-adjusted mortality rate series for a selected cause of death. For cerebrovascular diseases (2005 to 2019), the 2013 *expected* or *fitted* age-adjusted rate is calculated to be 50.3 deaths per 100,000 people. The *observed* age-adjusted rate for 2013 is 46 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 2013 is 4.3—the model (the equation of the line) *overestimates* the observed value by 4.3 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 trend lines are for those where R^2 is less than 0.10 and should be considered not reliable. The thickest 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 thirteen year period (2005-2019). 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 2005 and 2019 tables compare the fitted rates calculated for the beginning and end of the observed time series in terms of percent difference. Returning to figure 6.2 ii, ENC29's age-adjusted fitted rate for cerebrovascular diseases in 2005 is 8% greater than (GT) RNC's fitted rate. In 2019, ENC29's fitted rate is 21% greater than (GT) 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, 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.

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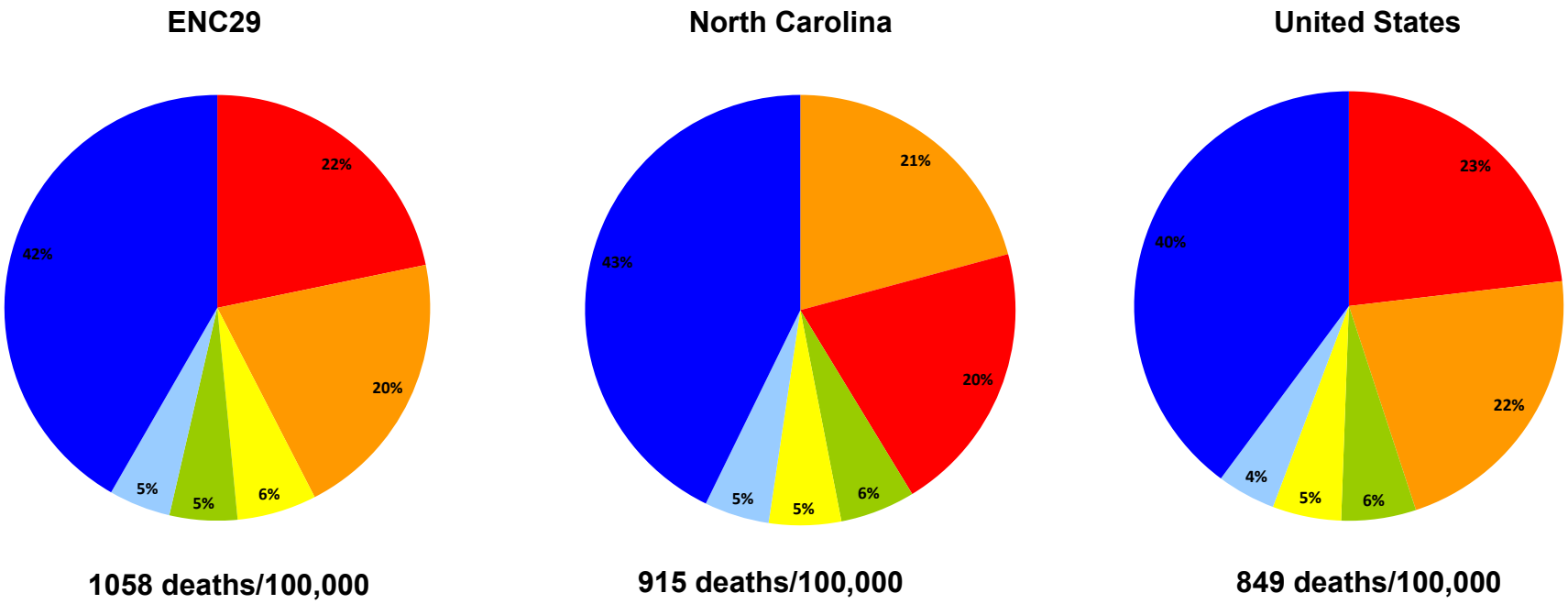
Buescher, P. A. (1998). Age-adjusted death rates (13th ed.). Raleigh, North Carolina: North Carolina Center for Health Statistics.

4. Current Disparities in Mortality by Geography, Race and Gender, and Race: Total and Five Leading Causes of Death

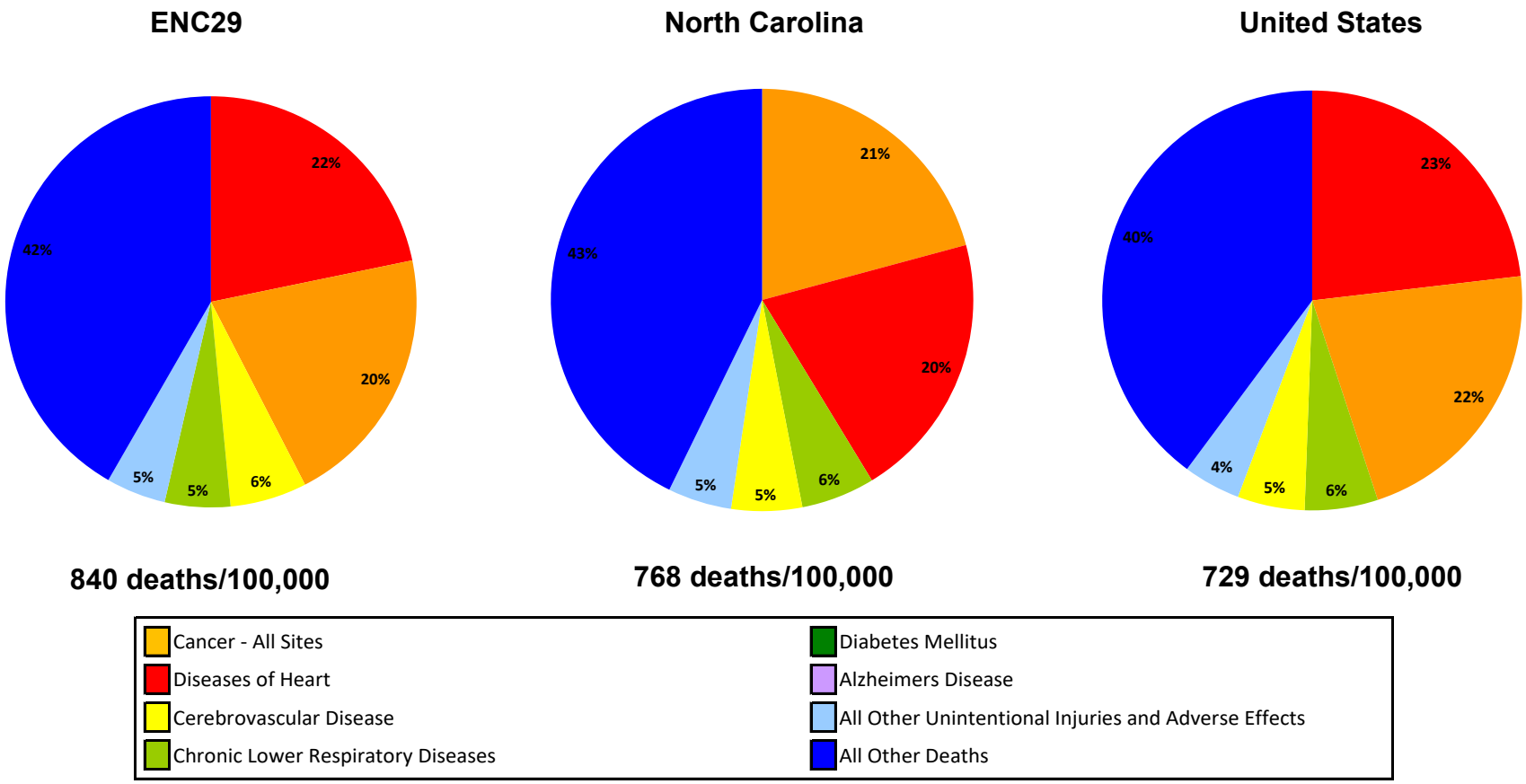
Figure 4.1 i. General leading causes of death for ENC29 (2019), NC (2019), and US (2016). Mortality rate per 100,000 population.



2019 NC rate is 8% higher than 2016 US rate

Slices without percentages constitute less than 5% of the deaths within that chart.

Figure 4.1 ii. General leading causes of death for ENC29 (2019), NC (2019), and US (2016). Age-adjusted mortality rate per 100,000 population.



2019 NC age-adjusted rate is 5% higher than 2016 US age-adjusted rate

Slices without percentages constitute less than 5% of the deaths within that chart.

Figure 4.2 i. General leading causes of death for ENC29 (2019) by race and gender. Mortality rate per 100,000 population.

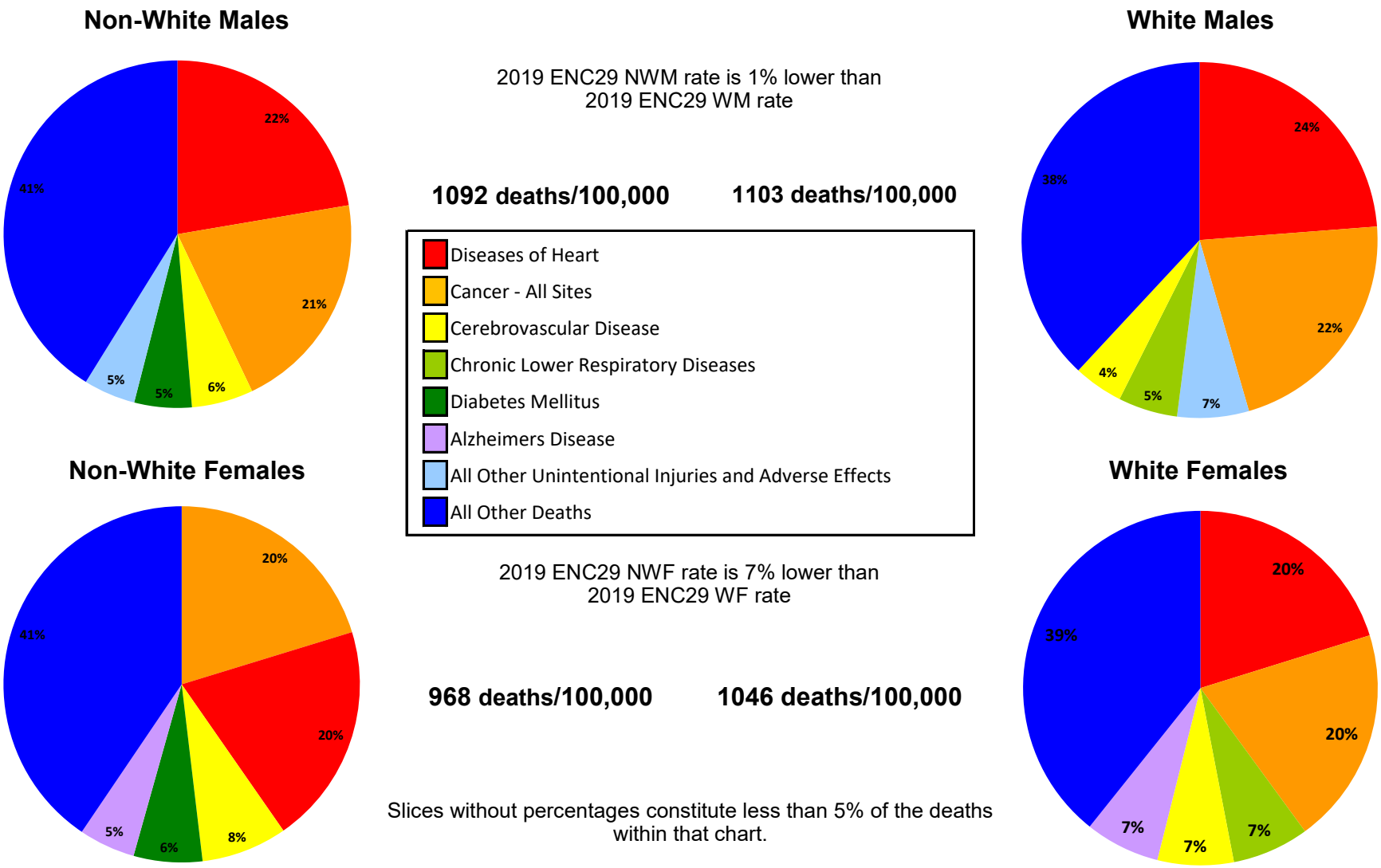
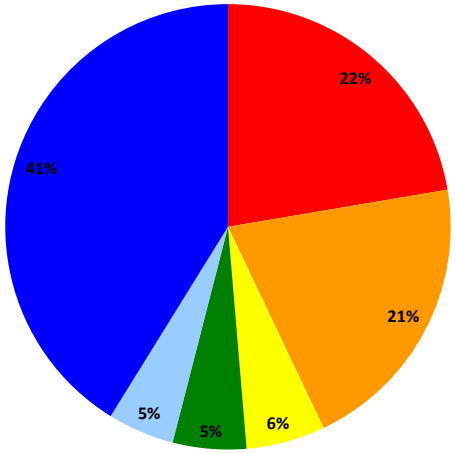
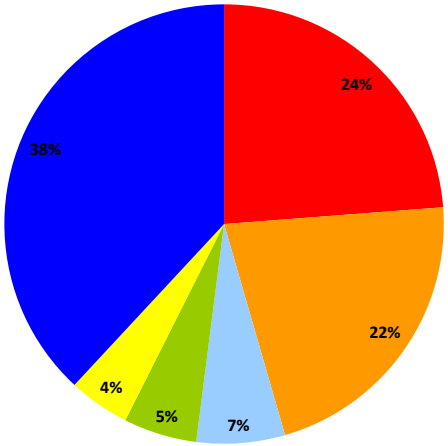


Figure 4.2 ii. General leading causes of death for ENC29 (2019) by race and gender.
Age-adjusted mortality rate per 100,000 population.

Non-White Males



White Males

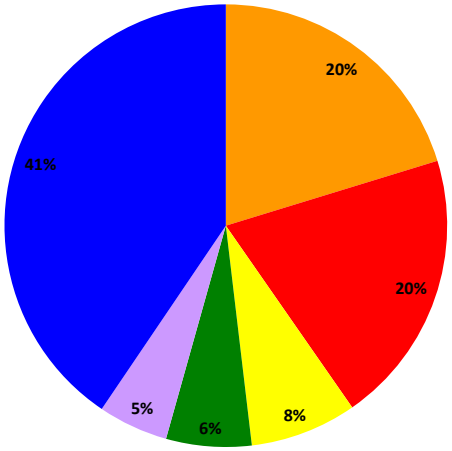


2019 ENC29 NWM age-adjusted rate is 25% higher than 2019 ENC29 WM age-adjusted rate

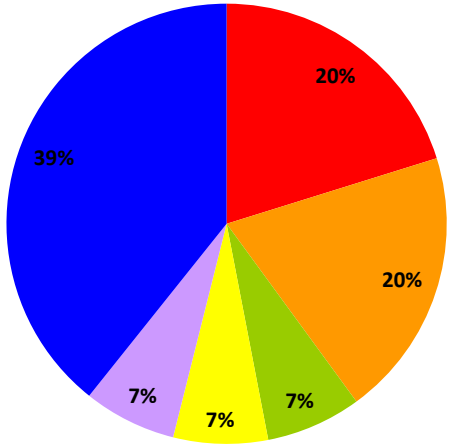
1157 deaths/100,000 **929 deaths/100,000**

- Diseases of Heart
- Cancer - All Sites
- Cerebrovascular Disease
- Chronic Lower Respiratory Diseases
- Diabetes Mellitus
- Alzheimers Disease
- All Other Unintentional Injuries and Adverse Effects
- All Other Deaths

Non-White Females



White Females

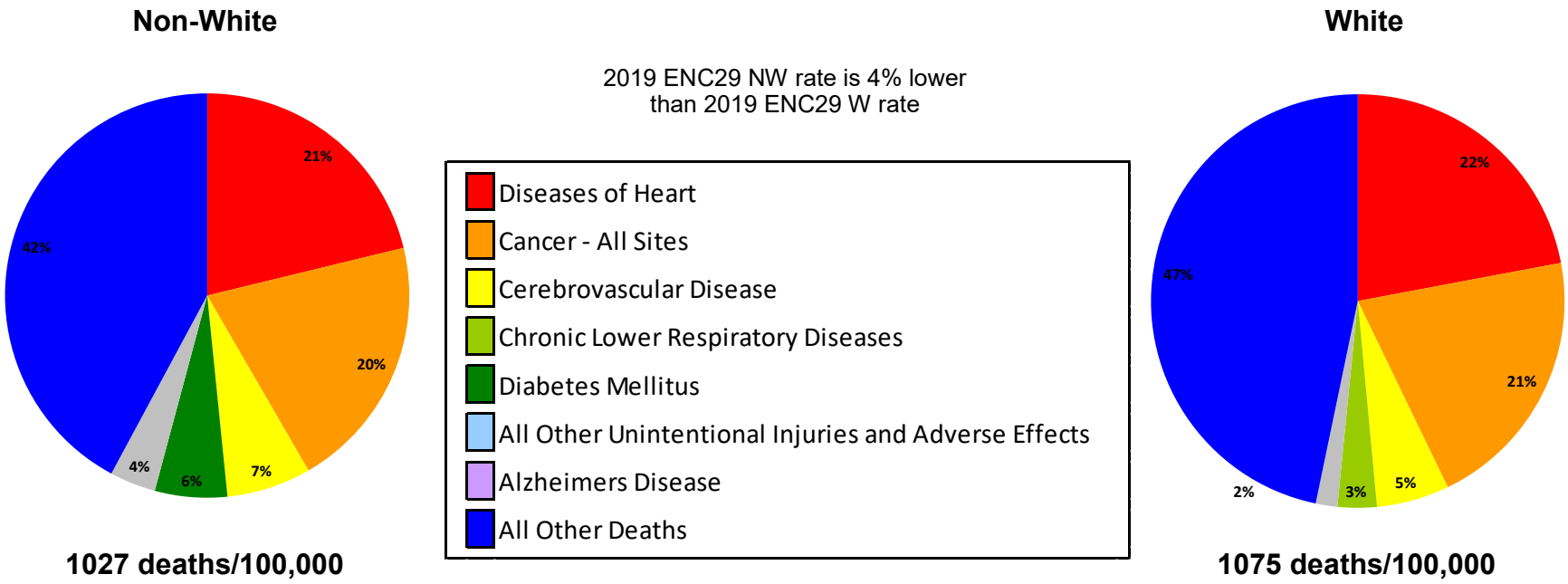


2019 ENC29 NWF age-adjusted rate is 12% higher than 2019 ENC29 WF age-adjusted rate

758 deaths/100,000 **676 deaths/100,000**

Slices without percentages constitute less than 5% of the deaths within that chart.

Figure 4.3 i. General leading causes of death for ENC29 (2017) by race. Mortality rate per 100,000 population.



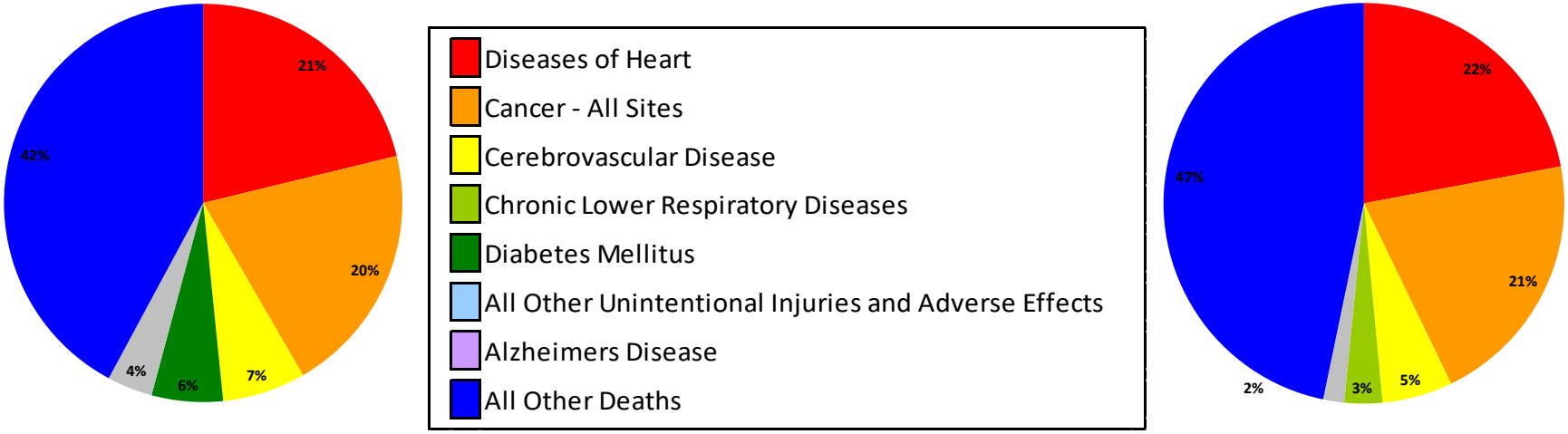
Slices without percentages constitute less than 5% of the deaths within that chart.

Figure 4.3 ii. General leading causes of death for ENC29 (2017) by race. Age-adjusted mortality rate per 100,000 population.

Non-White

White

2019 ENC29 NW age-adjusted rate is 16% higher than 2019 ENC29 W age-adjusted rate



924 deaths/100,000

796 deaths/100,000

Slices without percentages constitute less than 5% of the deaths within that chart.

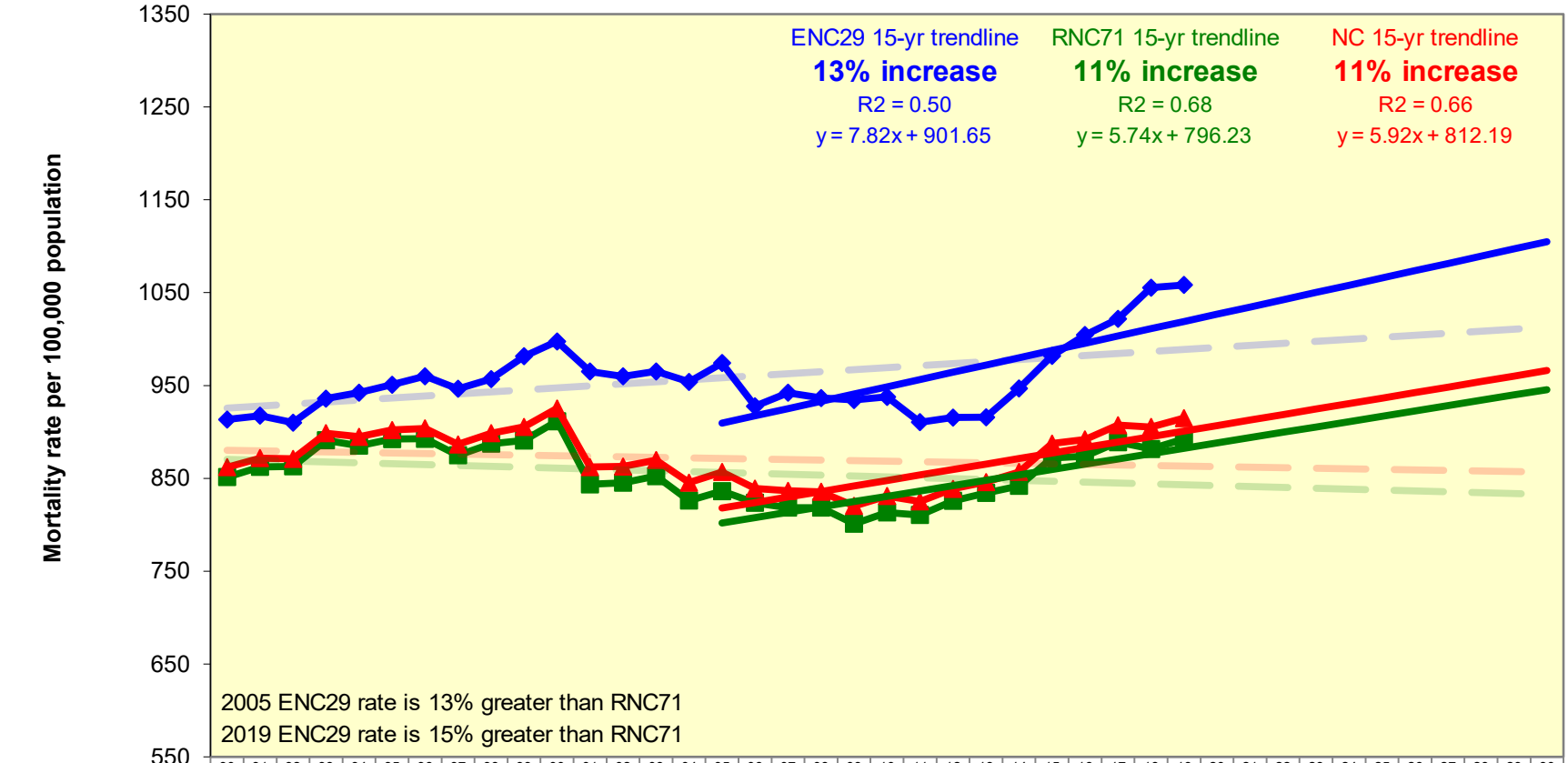
5. Trends and Disparities in Mortality in ENC29: All Causes of Death and All Causes of Premature Mortality; 1990-2019

All Causes of Death

- The 30-year ENC trend line shows all-cause mortality rates increasing. The 15-year trend shows ENC's rate has increased 13% over the period, and is 13% higher than NC.
- The age-adjusted all-cause mortality rate trend for ENC has been decreasing over the 30-year period; the 15-year trend is decreasing more slowly and remains higher than the RNC and NC rates. ENC's rate remains 8% greater than the rate for RNC.
- The non-White male mortality rate trend remains higher than other demographic groups but has decreased 19% in the 15-year period. Convergence of non-White males with White males and non-White females with White females is suggested in the future.
- The trends for all-cause mortality rates for both non-Whites and Whites are decreasing. The non-White trend is 10% greater than the White rate, but the recent 15-year trend suggests they will converge in the future.
- Over the recent 15-year period there is a 58% 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 5.1 i. All Causes of Death: Trends in mortality rates for ENC29, RNC71, and NC 1990-2019 with projections to 2030

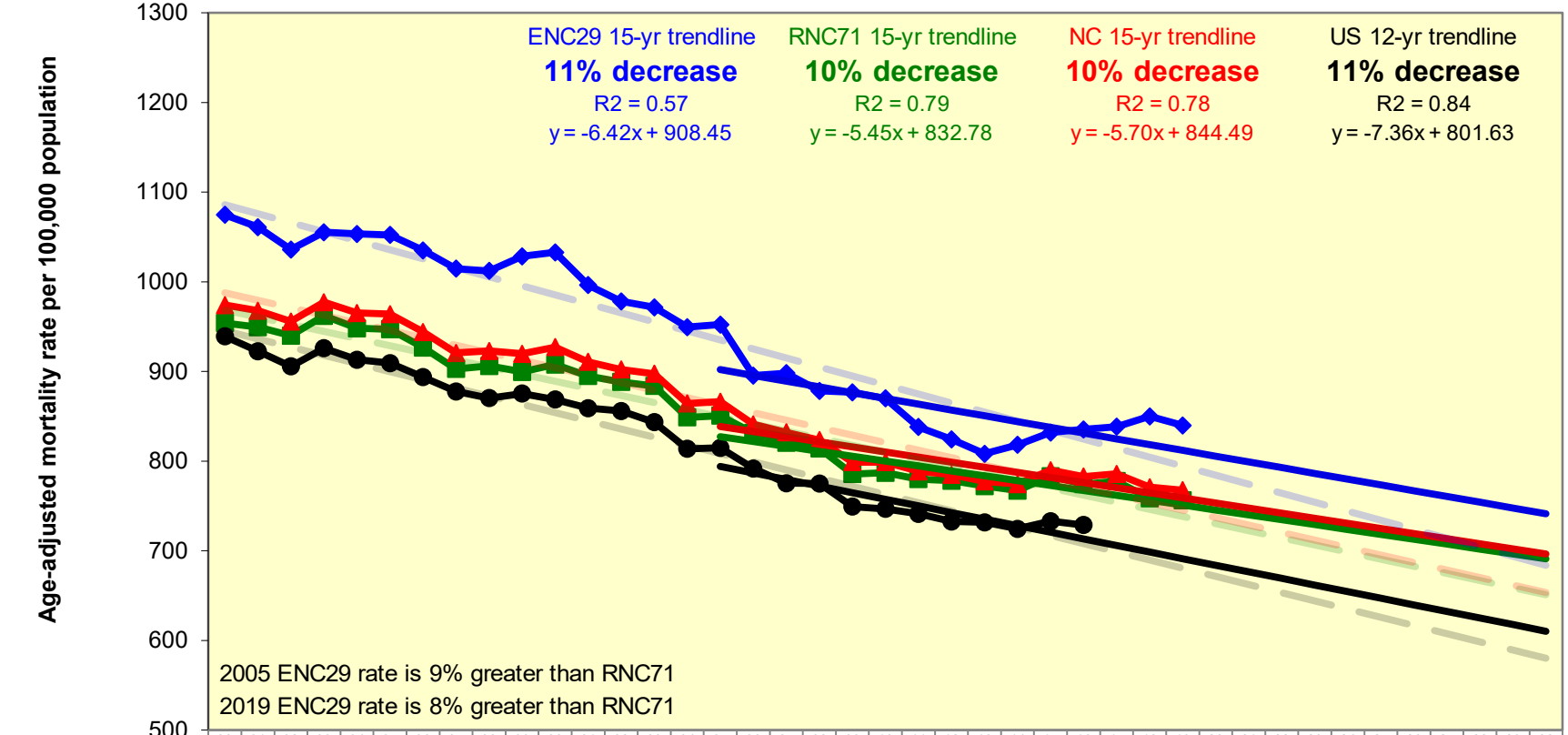


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	913	917	910	936	942	951	960	946	957	982	998	965	960	965	954	974	928	942	936	934	938	910	916	916	947	982	1004	1022	1055	1058											
RNC71	851	862	863	891	885	892	893	875	887	891	912	844	845	852	826	836	824	819	819	801	813	811	826	834	842	872	874	889	882	892											
NC	862	872	871	899	895	902	904	887	899	905	925	862	863	870	845	857	839	837	836	820	831	825	839	846	857	888	892	907	905	915											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	12% LT	10% LT	ENC29
13% GT		2% GT	RNC71
11% GT	2% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	13% LT	11% LT	ENC29
15% GT		2% GT	RNC71
13% GT	2% LT		NC

Figure 5.1 ii. All Causes of Death: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

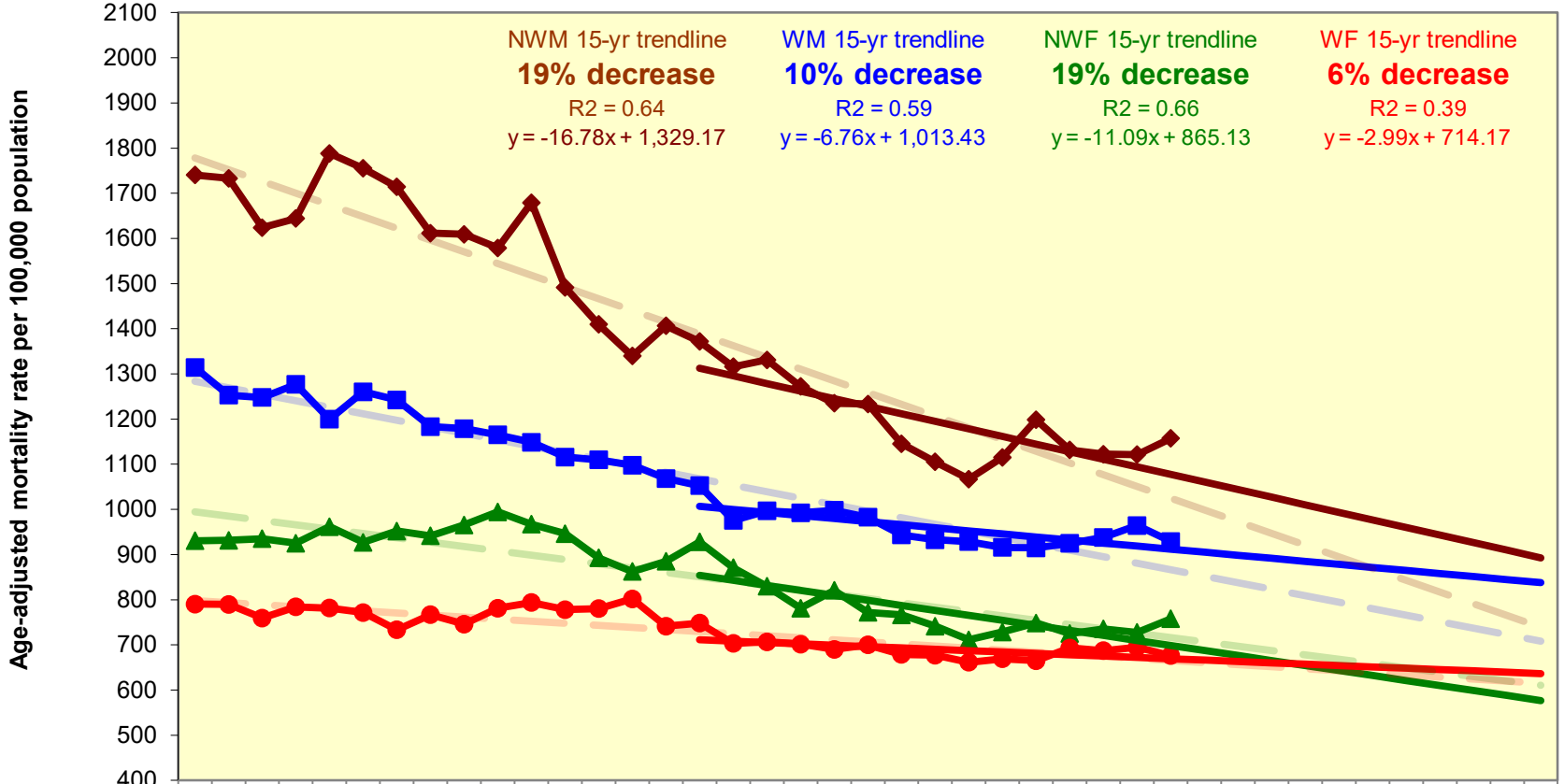


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	1075	1061	1036	1055	1053	1052	1035	1015	1012	1029	1033	996	978	972	950	952	895	898	878	877	870	838	824	808	818	832	835	838	850	840											
RNC71	954	949	940	962	948	947	927	903	906	900	908	895	888	884	849	851	832	821	814	786	787	780	778	772	767	783	774	778	759	756											
NC	974	968	956	977	965	964	944	921	923	920	927	911	902	898	864	866	841	832	824	799	799	789	785	777	774	790	783	786	771	768											
US	939	923	906	926	913	909	894	878	870	875	869	859	856	844	814	815	792	775	775	749	747	741	733	732	725	733	729														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	8% LT	7% LT	12% LT	ENC29
9% GT		1% GT	4% LT	RNC71
8% GT	1% LT		5% LT	NC
13% GT	4% GT	5% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	8% LT	7% LT	15% LT	ENC29
8% GT		1% GT	8% LT	RNC71
7% GT	1% LT		9% LT	NC
17% GT	8% GT	9% GT		US

Figure 5.1 iii. All Causes of Death: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

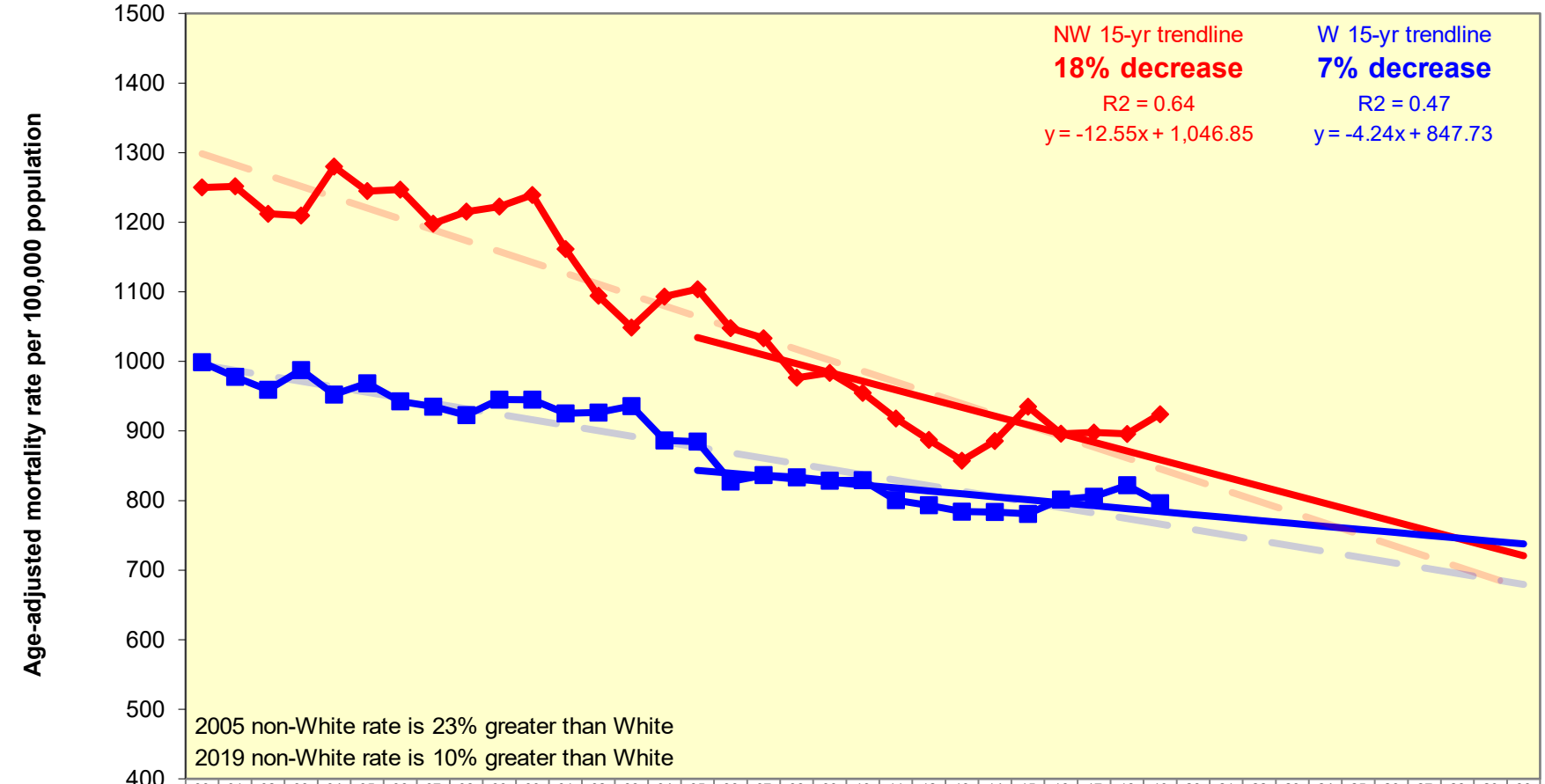


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	1741	1733	1624	1644	1788	1755	1714	1612	1609	1579	1679	1492	1410	1340	1406	1372	1316	1331	1272	1235	1233	1145	1105	1067	1115	1199	1132	1122	1121	1157											
WM	1314	1253	1248	1277	1200	1260	1242	1183	1179	1165	1148	1116	1110	1098	1068	1053	975	997	993	998	983	943	933	929	916	915	925	938	964	929											
NWF	930	932	935	925	962	927	952	941	966	995	967	946	893	863	885	928	871	830	781	821	772	766	741	711	729	749	725	735	728	758											
WF	790	790	760	784	782	772	733	767	746	781	794	778	780	802	741	748	703	707	702	690	700	679	677	662	669	665	693	687	695	676											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	24% LT	35% LT	46% LT	NWM
31% GT		15% LT	30% LT	WM
54% GT	17% GT		17% LT	NWF
86% GT	42% GT	21% GT		WF

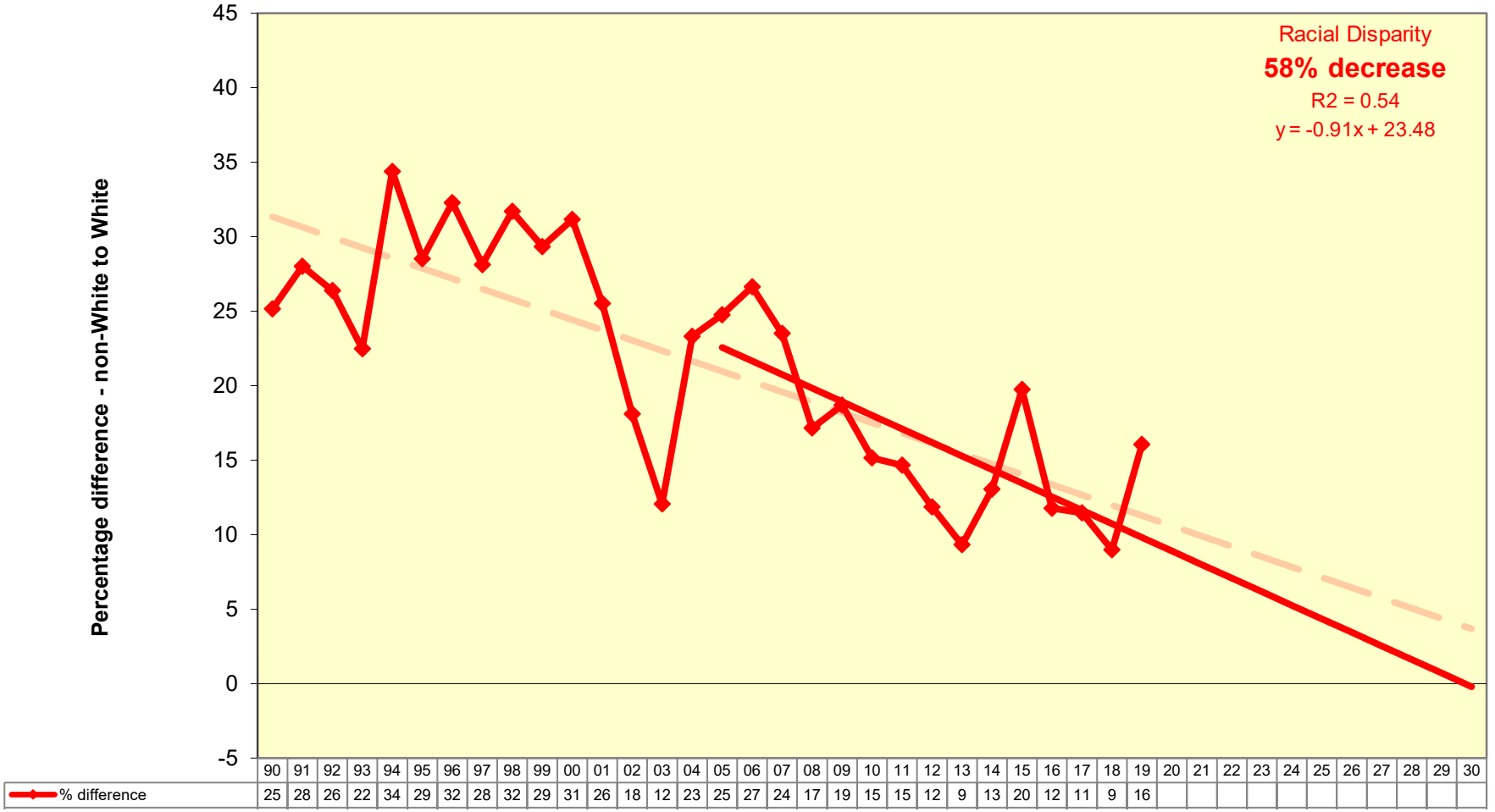
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	16% LT	35% LT	39% LT	NWM
19% GT		23% LT	27% LT	WM
54% GT	29% GT		5% LT	NWF
63% GT	37% GT	6% GT		WF

Figure 5.1 iv. All Causes of Death: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	1250	1252	1212	1210	1280	1245	1247	1198	1215	1223	1239	1162	1094	1049	1093	1104	1048	1033	976	984	955	918	887	857	886	935	896	898	896	924											
W	999	978	959	988	952	969	943	935	923	945	945	925	927	936	887	885	827	837	833	829	829	801	793	784	783	781	802	806	822	796											

Figure 5.1 v. All Causes of Death:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030

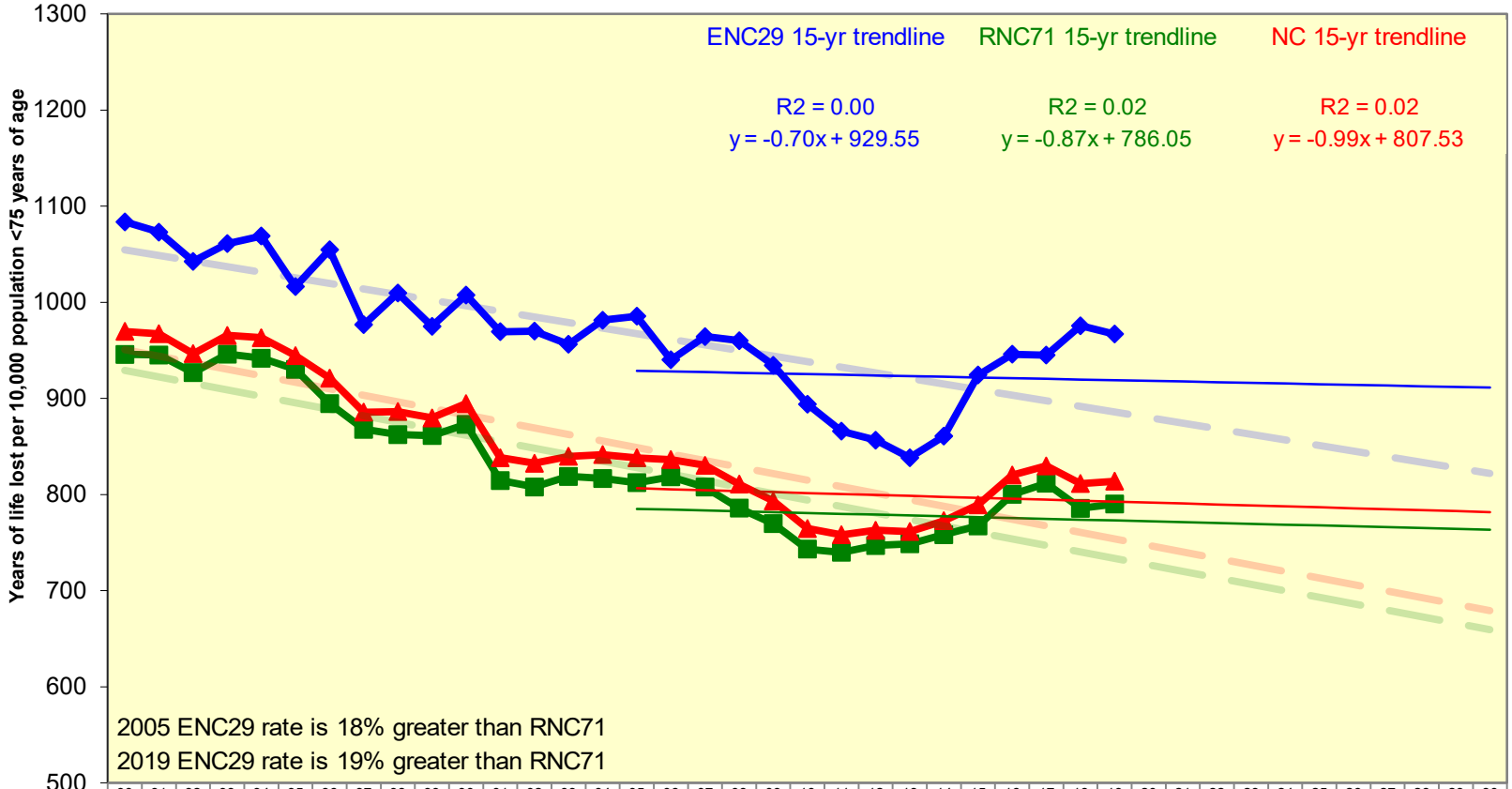


All Causes of Premature Mortality

- ENC's premature mortality rate trend is flat and not reliable.
- The age-adjusted premature mortality rate trend for ENC is 17% greater than NC, but is also flat and not reliable.
- The non-White male premature mortality rate trend has decreased 10% over the 15-year period. The non-White female rate has decreased 13% over 15 years. The White male and White female rate trends are not reliable.
- The non-White premature mortality rate is 43% greater than the White rate, and has decreased 11% over the 15 year period. The White rate trend is not reliable.
- The 15-year trend for racial disparity shows a 29% decrease 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 5.2 i. All Causes of Premature Mortality: Trends in premature mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

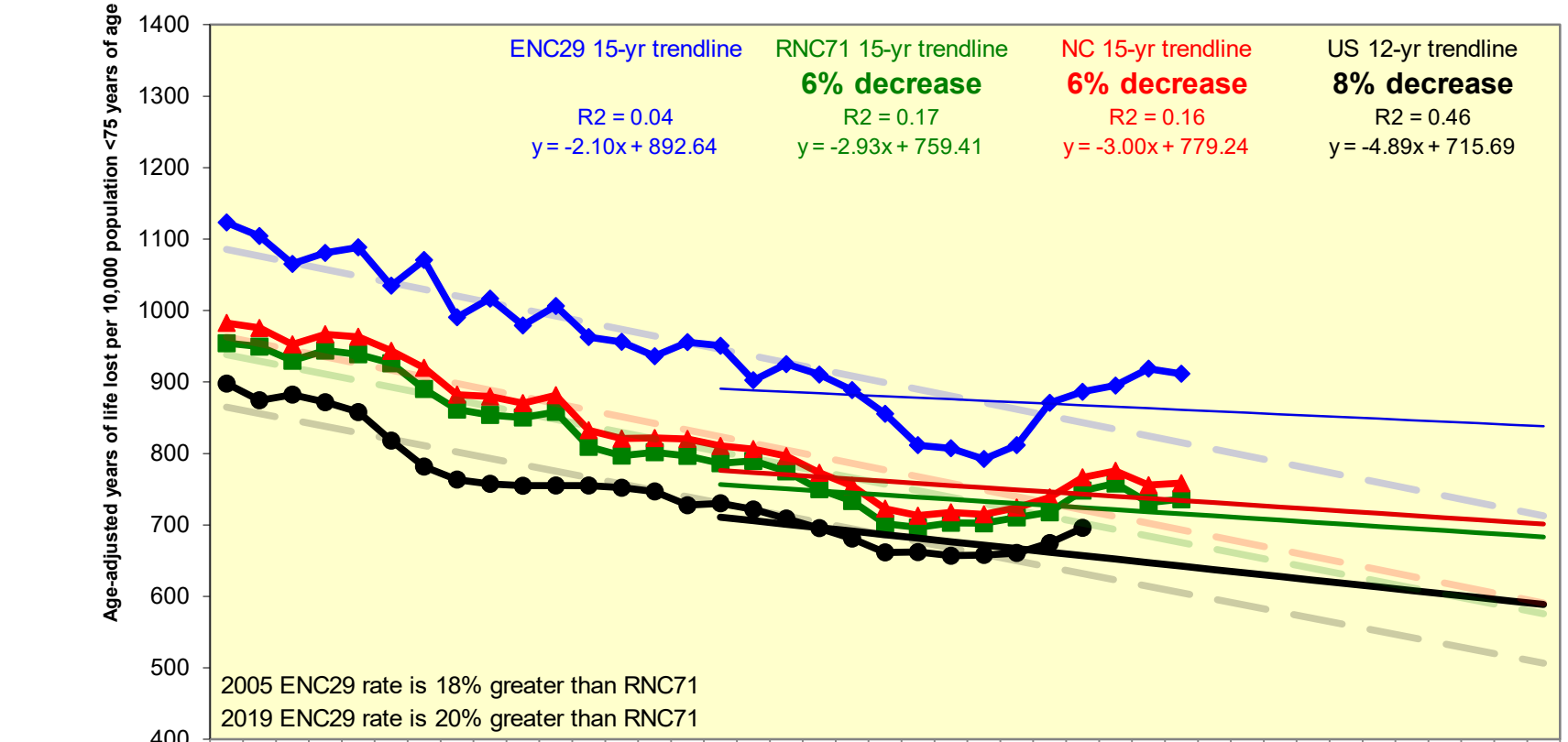


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	1084	1073	1043	1061	1069	1016	1055	977	1010	975	1008	969	970	956	981	986	940	964	960	935	894	866	857	838	861	924	946	945	976	967											
RNC71	946	945	927	946	942	930	895	868	862	861	873	815	808	819	817	812	818	808	786	770	743	740	747	749	758	768	800	812	786	790											
NC	970	967	947	966	963	945	921	886	886	880	895	838	833	840	842	838	836	830	811	793	765	758	763	762	773	789	820	830	811	814											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	15% LT	13% LT	ENC29
18% GT		3% GT	RNC71
15% GT	3% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	16% LT	14% LT	ENC29
19% GT		3% GT	RNC71
16% GT	2% LT		NC

Figure 5.2 ii. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

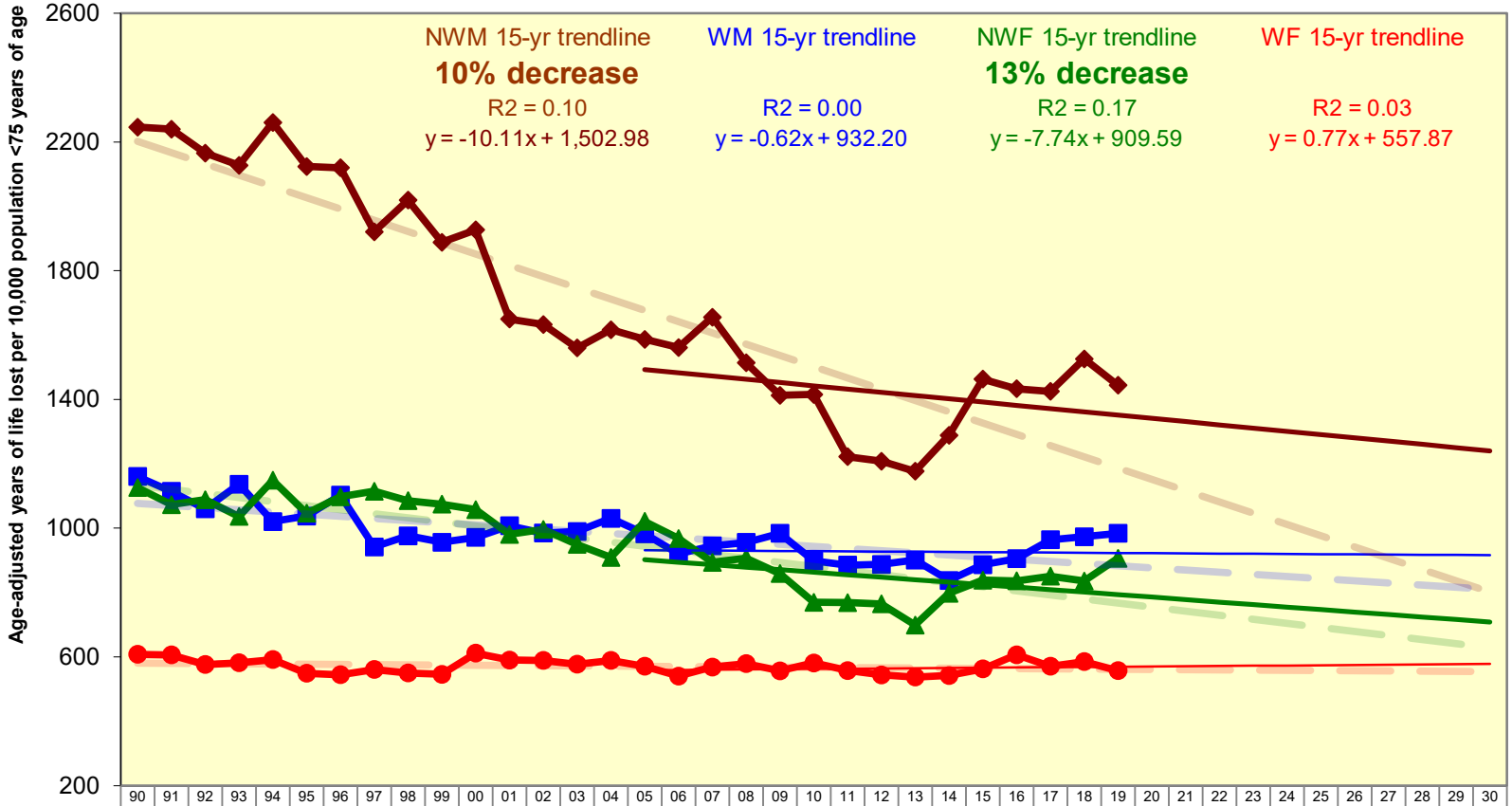


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	1123	1104	1065	1081	1088	1035	1071	991	1017	979	1007	963	956	936	956	951	903	925	911	889	856	812	807	792	812	871	886	895	919	911											
RNC71	954	950	930	944	939	926	890	862	854	850	858	809	797	802	797	786	790	775	750	733	702	697	703	702	711	718	748	758	731	736											
NC	983	976	953	967	963	944	920	882	880	871	882	833	821	822	820	811	806	796	773	755	723	713	718	715	724	738	767	776	756	758											
US	898	874	882	872	858	818	782	763	758	755	755	755	752	747	728	730	722	709	696	681	662	662	657	658	661	675	696														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	15% LT	13% LT	20% LT	ENC29
18% GT		3% GT	6% LT	RNC71
15% GT	3% LT		8% LT	NC
25% GT	6% GT	9% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	17% LT	15% LT	25% LT	ENC29
20% GT		3% GT	10% LT	RNC71
17% GT	3% LT		12% LT	NC
33% GT	11% GT	14% GT		US

Figure 5.2 iii. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

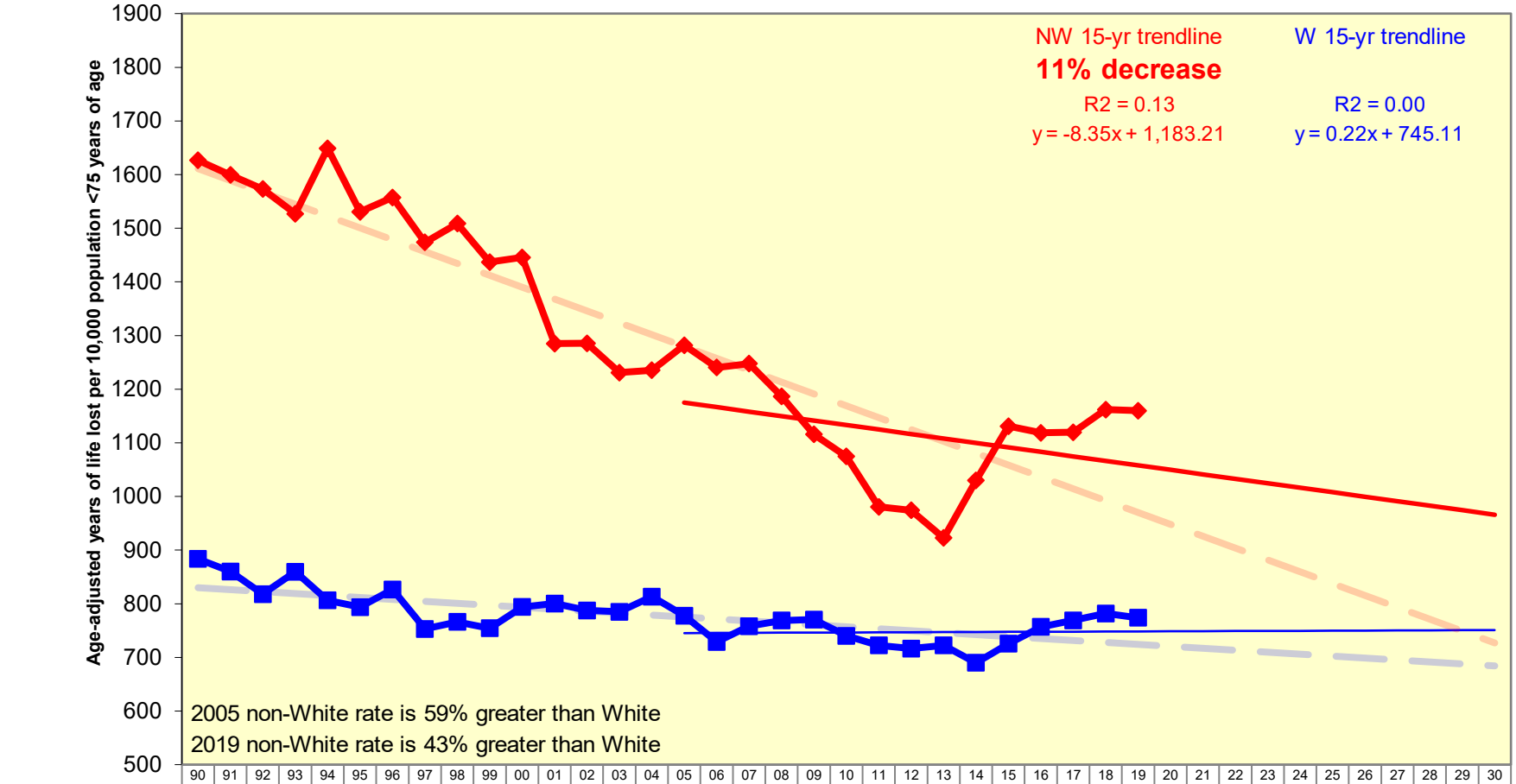


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	2246	2240	2166	2127	2260	2124	2120	1921	2019	1888	1927	1649	1633	1560	1616	1587	1561	1656	1514	1412	1415	1222	1208	1177	1289	1463	1433	1425	1526	1444											
WM	1161	1114	1060	1136	1020	1038	1102	942	976	956	971	1008	985	990	1031	982	920	945	956	984	898	885	887	901	837	887	905	964	974	984											
NWF	1126	1073	1089	1036	1149	1046	1097	1115	1085	1074	1057	980	996	949	909	1021	968	894	907	859	770	769	764	699	798	838	836	850	836	907											
WF	608	606	576	582	592	549	544	561	550	546	612	590	589	577	589	571	541	568	579	557	581	558	544	537	542	563	606	571	585	557											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	38% LT	39% LT	63% LT	NWM
61% GT		2% LT	40% LT	WM
65% GT	2% GT		39% LT	NWF
169% GT	67% GT	63% GT		WF

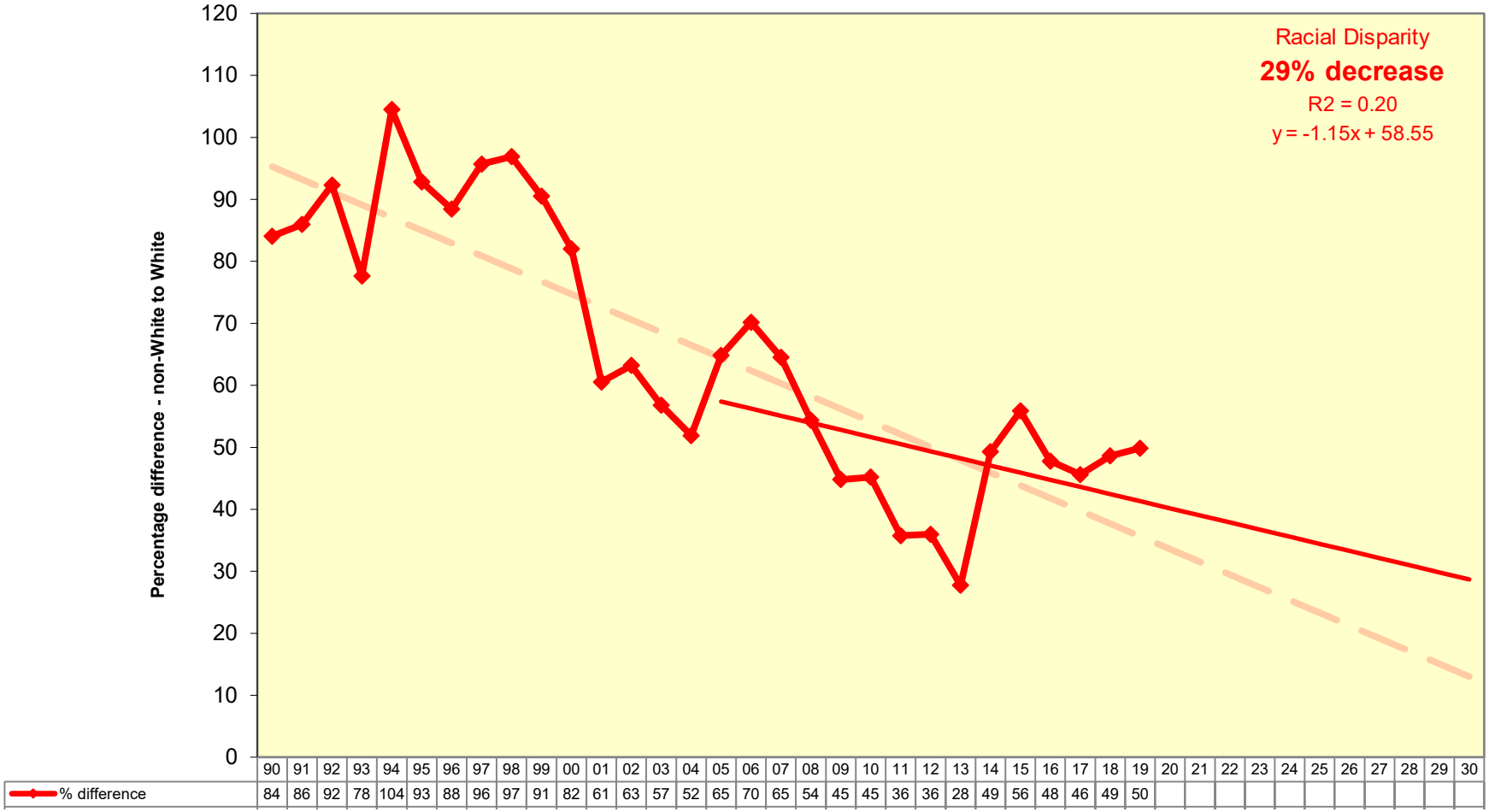
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	32% LT	41% LT	58% LT	NWM
47% GT		13% LT	38% LT	WM
70% GT	15% GT		29% LT	NWF
139% GT	62% GT	41% GT		WF

Figure 5.2 iv. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	1627	1599	1573	1527	1649	1531	1557	1474	1509	1437	1446	1285	1285	1231	1235	1282	1240	1248	1187	1116	1075	981	974	923	1030	1131	1119	1120	1162	1160											
W	884	860	818	860	806	794	827	753	766	754	794	800	788	785	813	778	729	758	769	771	740	722	717	722	690	726	757	769	782	774											

Figure 5.2 v. All Causes of Premature Mortality: Measuring disparity in age-adjusted premature mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
% difference	84	86	92	78	104	93	88	96	97	91	82	61	63	57	52	65	70	65	54	45	45	36	36	28	49	56	48	46	49	50											

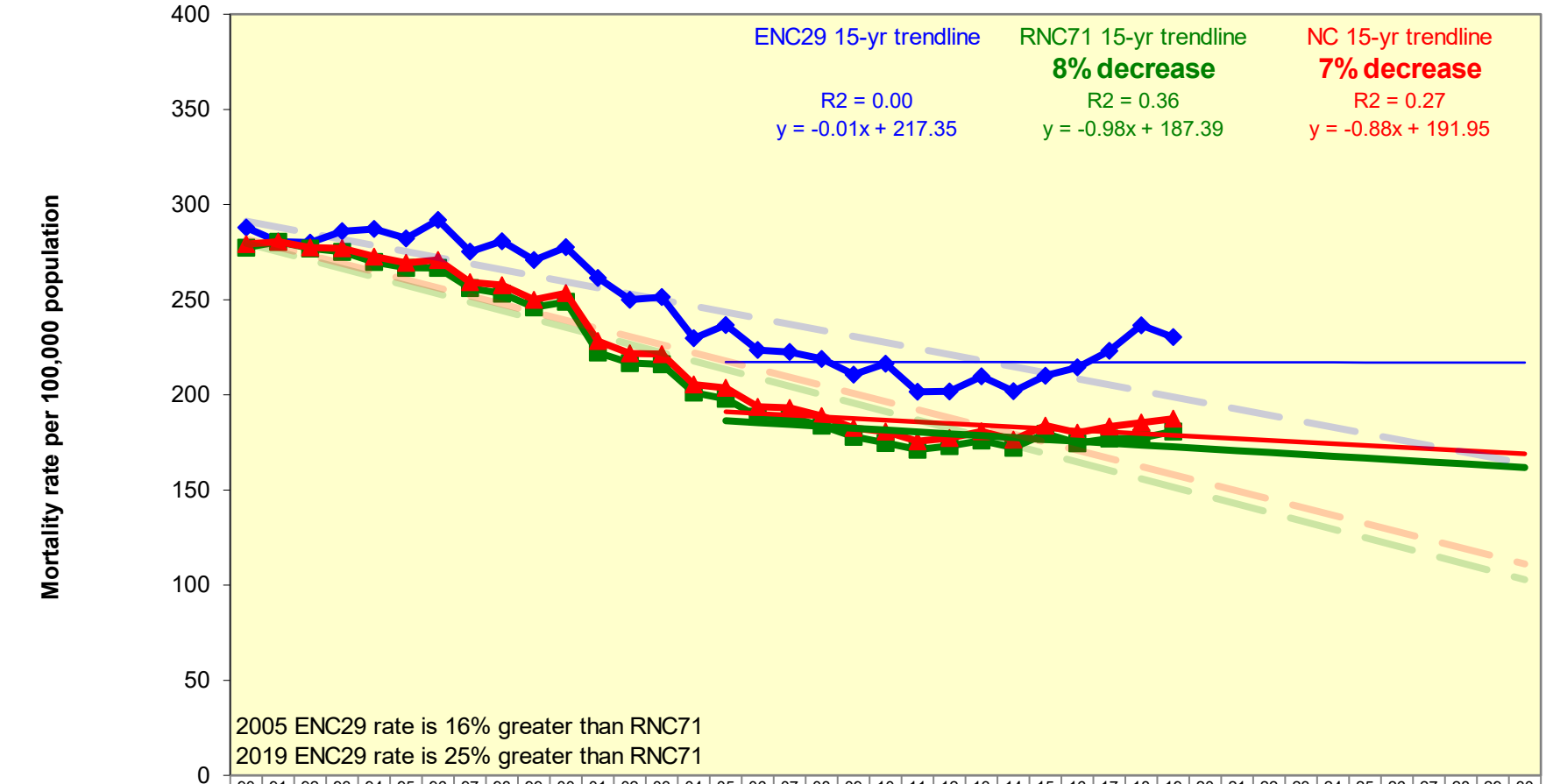
6. Trends and Disparities in Mortality in ENC29: Ten Specific Leading Causes of Death, 1990-2019

Diseases of Heart

- ENC's 15-year heart disease mortality rate is 25% greater than the RNC rate, but ENC's rate trend is flat and not reliable.
- While ENC's age-adjusted mortality rate trend is decreasing at a pace similar to RNC, NC and the US, the ENC rate remains 16% greater than the RNC rate in 2019.
- The non-White male rate trend remains slightly higher than the White male trend. The non-White female trend has converged with the White female trend and is projected to drop below it.
- The non-White rate trend remains 5% greater than for Whites, but the 15-year trends for both are decreasing and convergence is suggested in the future.
- The 15-year trend line for racial disparity is decreasing in a 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 6.1 i. Diseases of Heart: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

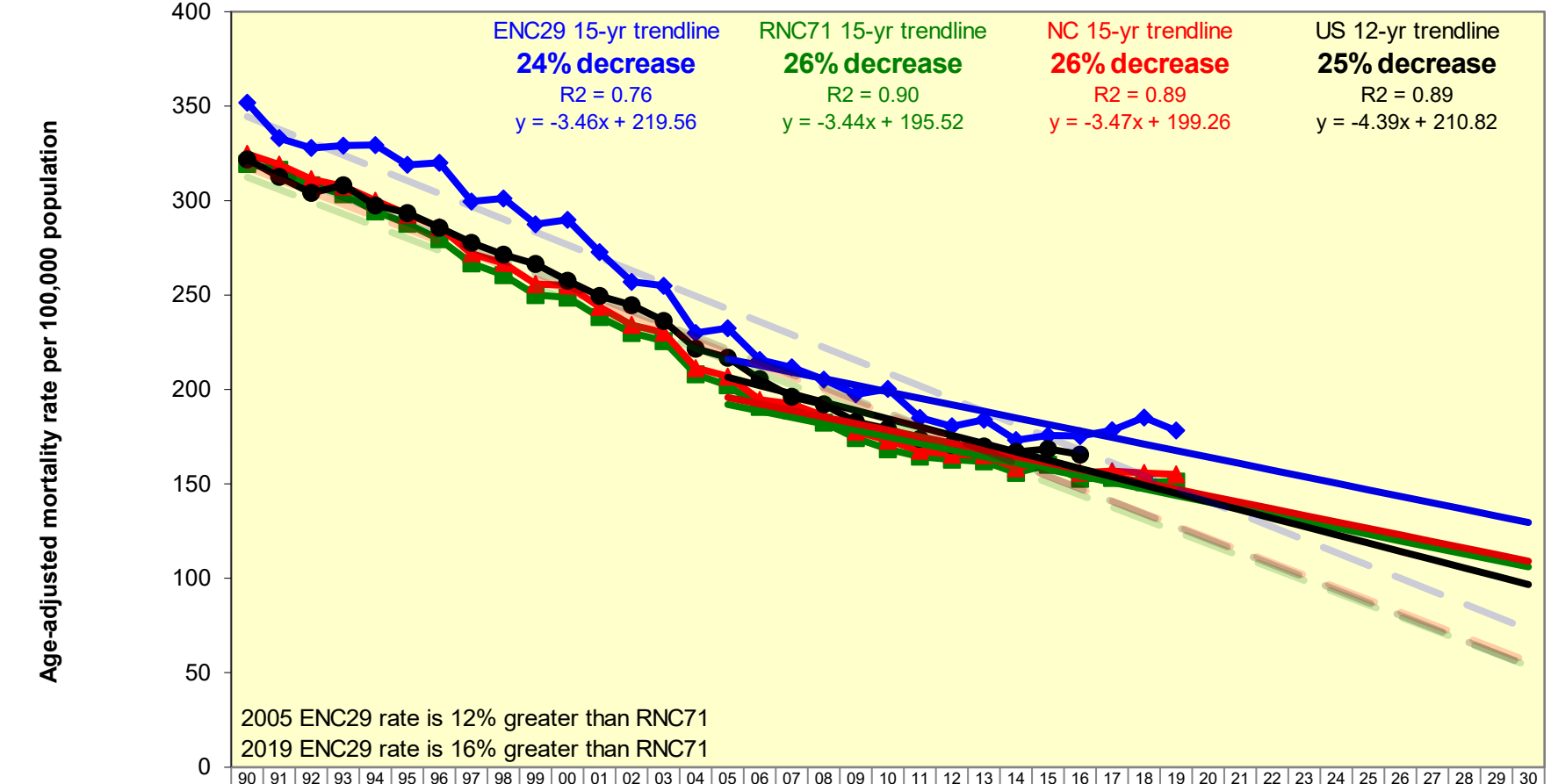


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	288	281	280	286	287	282	292	275	281	271	278	262	250	251	230	237	224	223	219	211	216	202	202	210	202	210	214	223	237	230											
RNC71	277	281	277	275	270	267	267	256	253	246	249	222	217	216	201	198	189	188	184	178	175	171	173	176	172	180	175	177	177	181											
NC	279	281	278	277	273	269	271	259	258	250	253	228	222	221	205	204	194	193	189	183	181	176	177	181	176	184	180	183	185	187											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	14% LT	12% LT	ENC29
16% GT		2% GT	RNC71
13% GT	2% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	20% LT	17% LT	ENC29
25% GT		3% GT	RNC71
21% GT	3% LT		NC

Figure 6.1 ii. Diseases of Heart: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

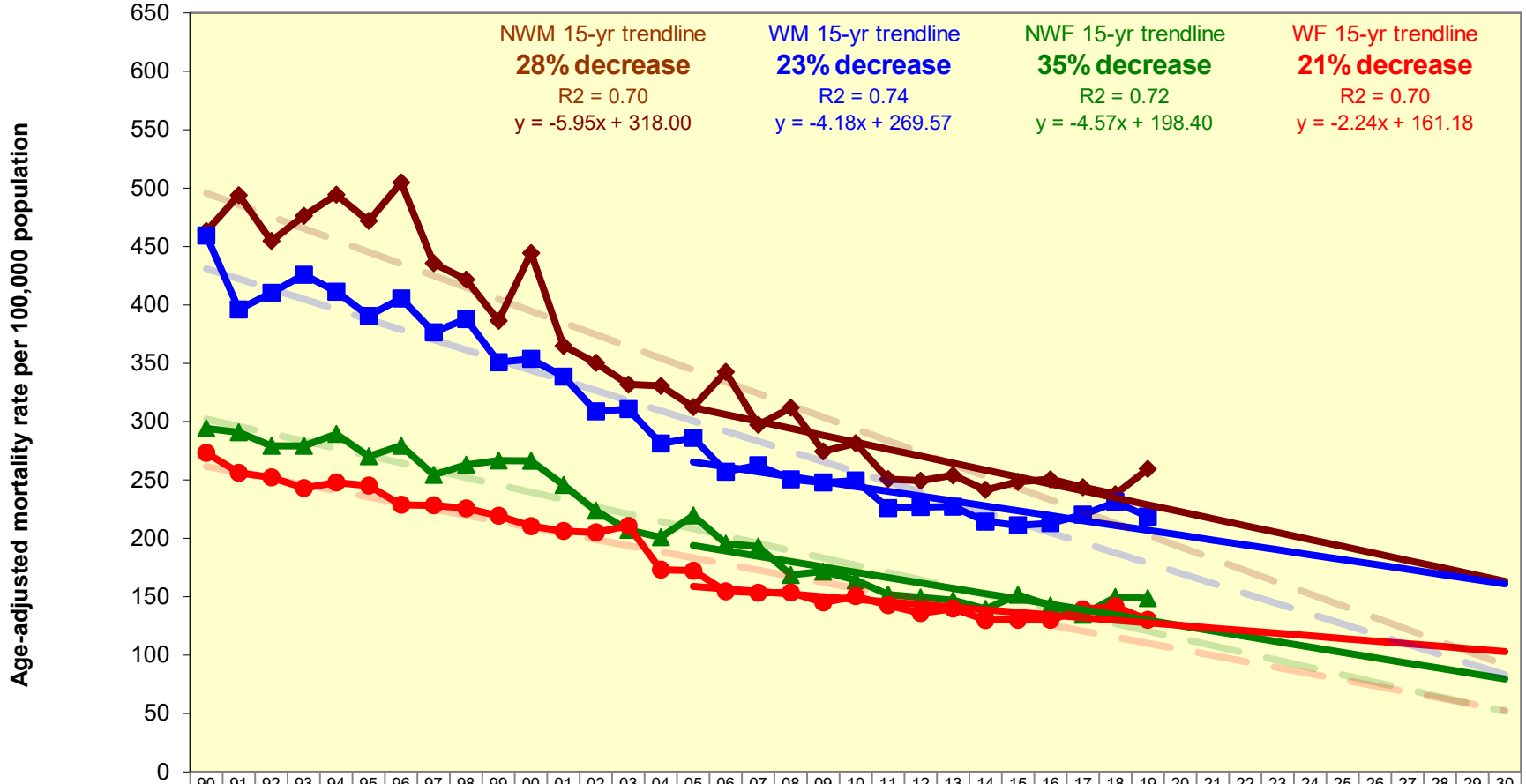


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	352	333	328	329	329	319	320	300	301	288	290	273	257	255	230	232	216	212	205	197	200	185	181	184	173	176	175	178	185	178											
RNC71	319	316	308	303	294	288	280	267	261	250	249	238	230	226	208	202	191	189	182	174	168	164	163	162	156	160	153	153	151	151											
NC	325	319	311	308	300	293	286	272	267	256	255	244	234	230	211	207	195	192	186	178	173	168	166	165	158	162	156	157	156	155											
US	322	313	304	308	297	293	286	278	271	266	258	250	245	236	222	217	205	196	192	183	179	174	171	170	167	168	166														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	11% LT	9% LT	4% LT	ENC29
12% GT		2% GT	8% GT	RNC71
10% GT	2% LT		6% GT	NC
4% GT	7% LT	5% LT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	14% LT	12% LT	13% LT	ENC29
16% GT		2% GT	1% GT	RNC71
14% GT	2% LT		1% LT	NC
15% GT	1% LT	1% GT		US

Figure 6.1 iii. Diseases of Heart: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

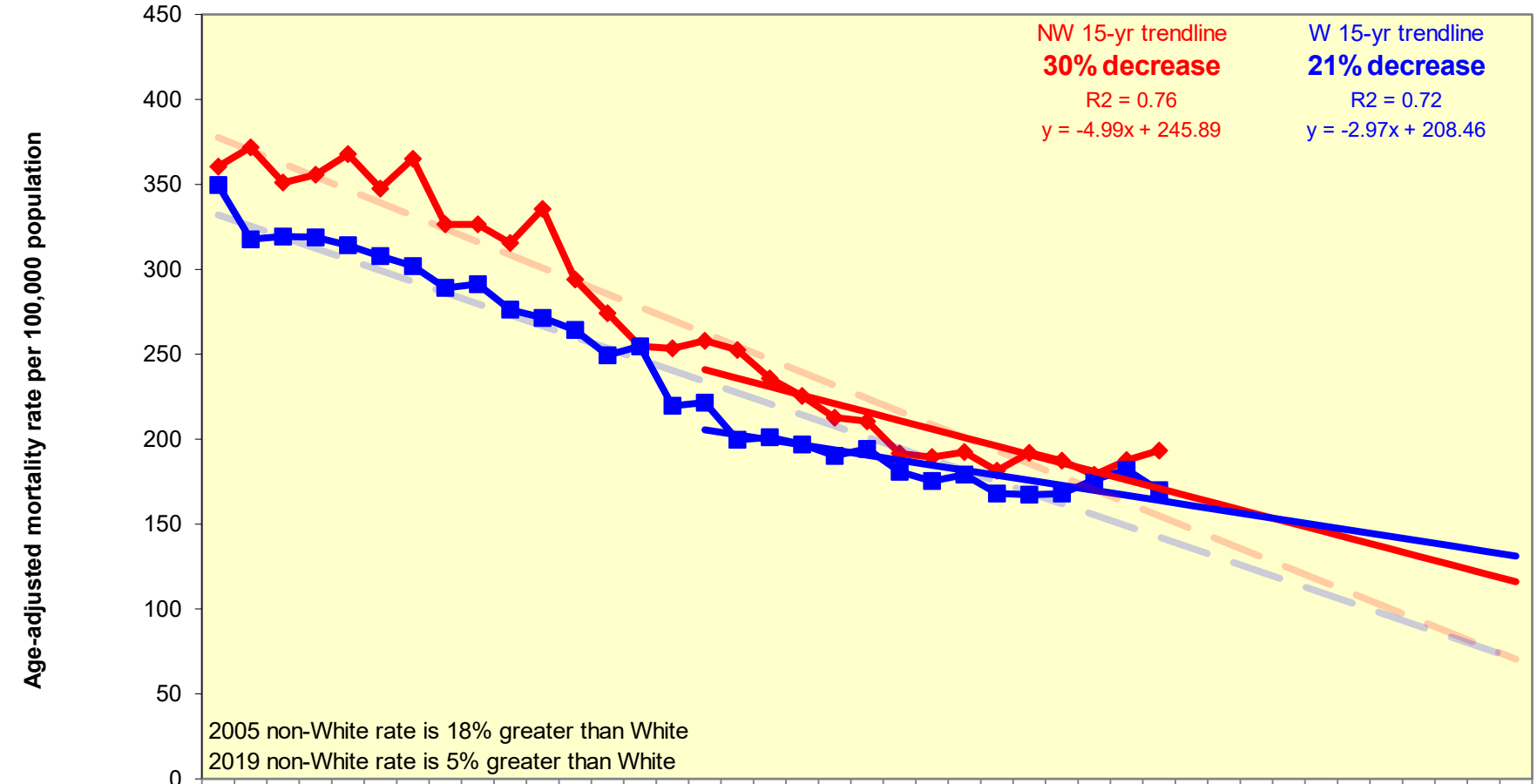


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	463	494	455	476	494	472	505	436	422	386	444	365	350	332	331	313	343	297	312	275	281	251	249	254	242	248	251	244	238	259											
WM	459	396	410	426	411	391	405	377	388	351	354	339	309	311	281	286	257	263	251	248	249	226	227	227	214	211	213	220	231	219											
NWF	294	291	279	279	289	270	279	254	263	267	266	246	224	207	201	219	195	193	169	172	164	152	149	147	140	152	142	134	150	149											
WF	273	256	252	243	248	245	229	228	226	219	210	206	205	211	173	172	155	153	154	145	150	143	136	140	130	130	130	139	142	130											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	15% LT	38% LT	49% LT	NWM
18% GT		26% LT	40% LT	WM
60% GT	36% GT		19% LT	NWF
97% GT	67% GT	23% GT		WF

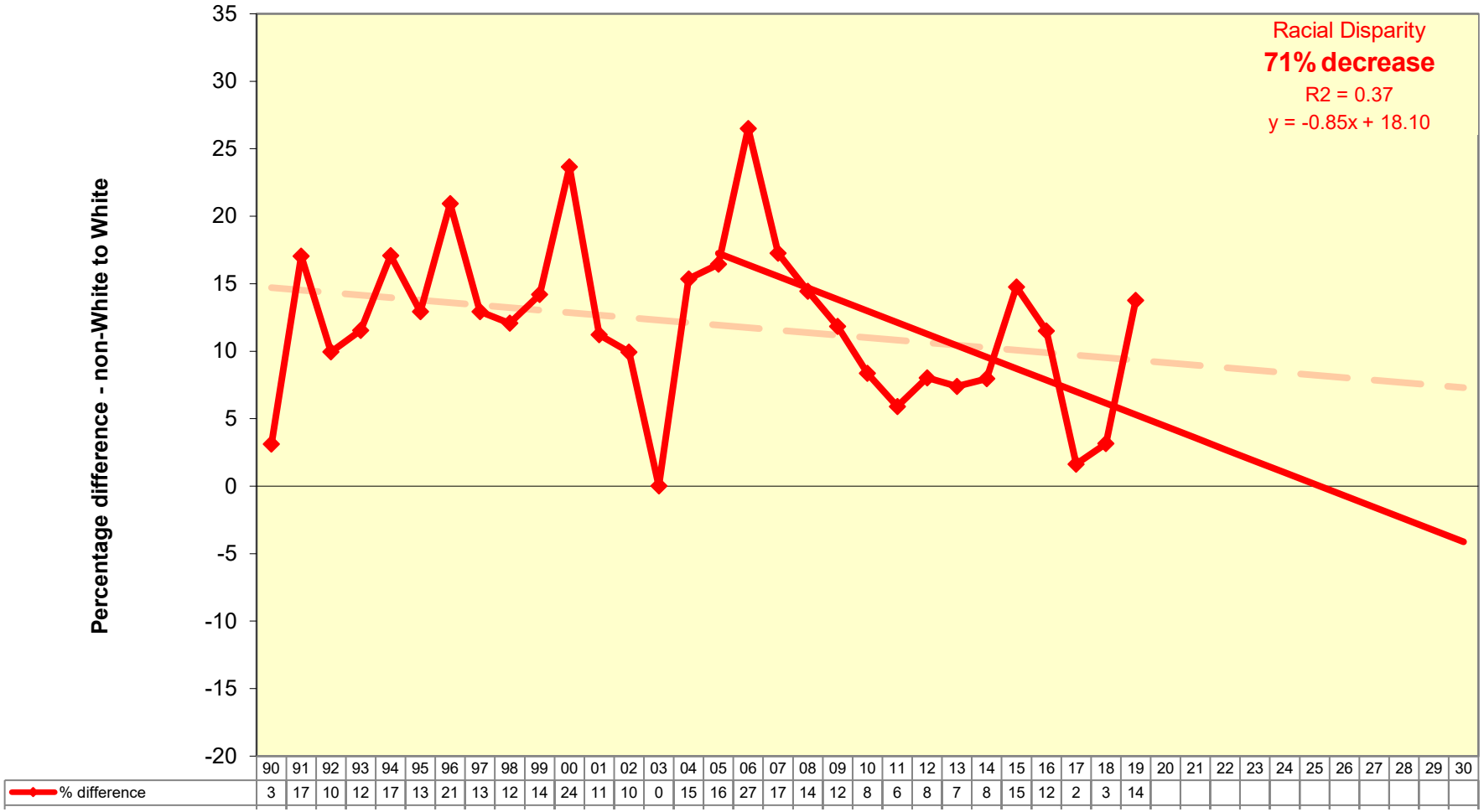
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	10% LT	43% LT	45% LT	NWM
11% GT		36% LT	38% LT	WM
75% GT	57% GT		3% LT	NWF
81% GT	63% GT	3% GT		WF

Figure 6.1 iv. Diseases of Heart: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	361	372	351	356	368	348	365	326	326	315	336	294	274	255	253	258	253	236	225	213	211	192	189	192	181	192	187	179	188	193											
W	350	318	319	319	314	308	302	289	291	276	271	264	249	255	220	222	200	201	197	190	194	181	175	179	168	167	168	176	182	170											

Figure 6.1 v. Diseases of Heart:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030

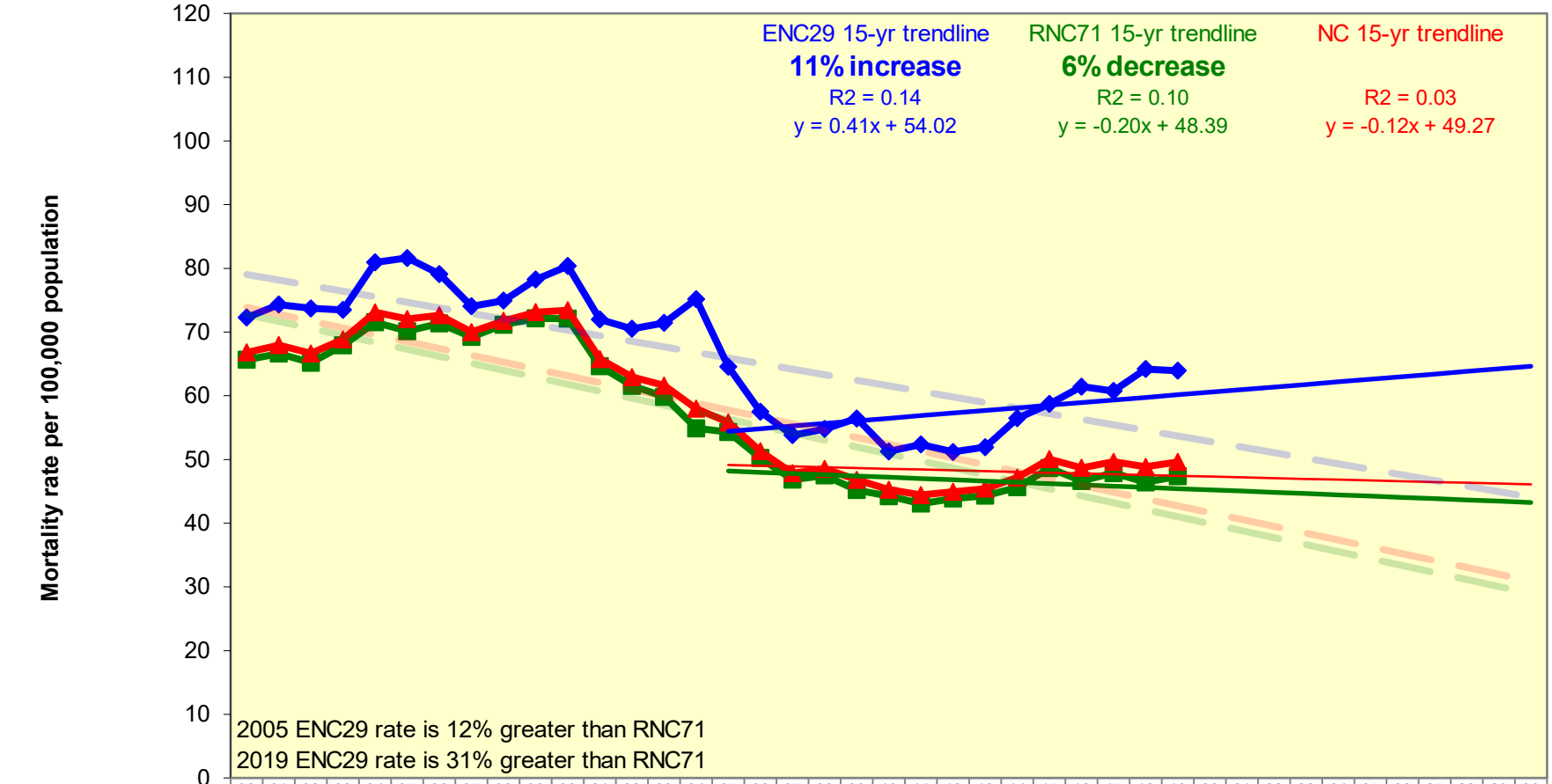


Cerebrovascular Disease

- ENC's cerebrovascular disease mortality rate has turned up in recent years and is 31% greater than RNC. The rate trend has increased 11% over the 15 year period.
- The ENC age-adjusted cerebrovascular disease mortality rate trend has decreased 15% over the 15-year period. It remains 21% greater than the RNC rate trend.
- Non-White males have the highest mortality rate for cerebrovascular disease but the rate has decreased 20% over the 15-year period. The rate for non-White females has decreased 29% and is projected to converge with the trend for White males and White females.
- The cerebrovascular disease mortality rate trend for non-Whites is decreasing but is still 34% greater than Whites in 2019.
- The 15-year trend for 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 6.2 i. Cerebrovascular Disease: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

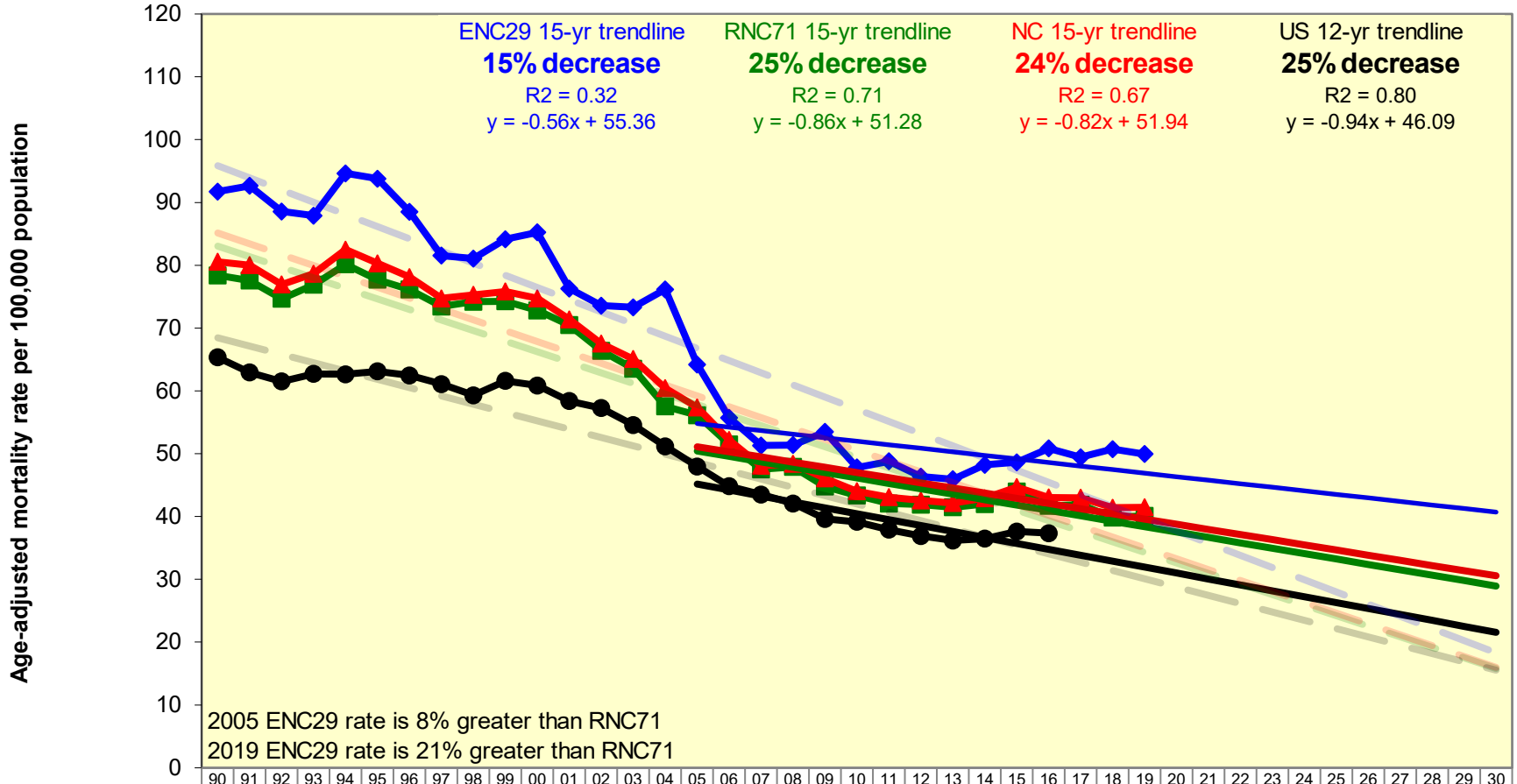


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	72	74	74	73	81	82	79	74	75	78	80	72	71	71	75	65	57	54	55	56	51	52	51	52	56	59	61	61	64	64											
RNC71	66	67	65	68	72	70	71	69	71	72	72	65	62	60	55	54	50	47	47	45	44	43	44	44	46	49	47	48	46	47											
NC	67	68	67	69	73	72	73	70	72	73	73	66	63	62	58	56	51	48	49	47	45	44	45	45	47	50	49	50	49	50											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	10% LT	9% LT	ENC29
12% GT		2% GT	RNC71
10% GT	2% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	24% LT	20% LT	ENC29
31% GT		4% GT	RNC71
26% GT	4% LT		NC

Figure 6.2 ii. Cerebrovascular Disease: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
ENC29	92	93	89	88	95	94	89	82	81	84	85	76	74	73	76	64	56	51	51	53	48	49	46	46	48	49	51	49	51	50											
RNC71	78	78	75	77	80	78	76	73	74	74	73	70	66	64	58	56	51	48	48	45	43	42	42	41	42	44	42	42	40	40											
NC	81	80	77	79	83	80	78	75	75	76	75	71	68	65	60	57	52	48	48	46	44	43	43	42	43	45	43	43	41	41											
US	65	63	61	63	63	63	62	61	59	62	61	58	57	55	51	48	45	44	42	40	39	38	37	36	36	38	37														

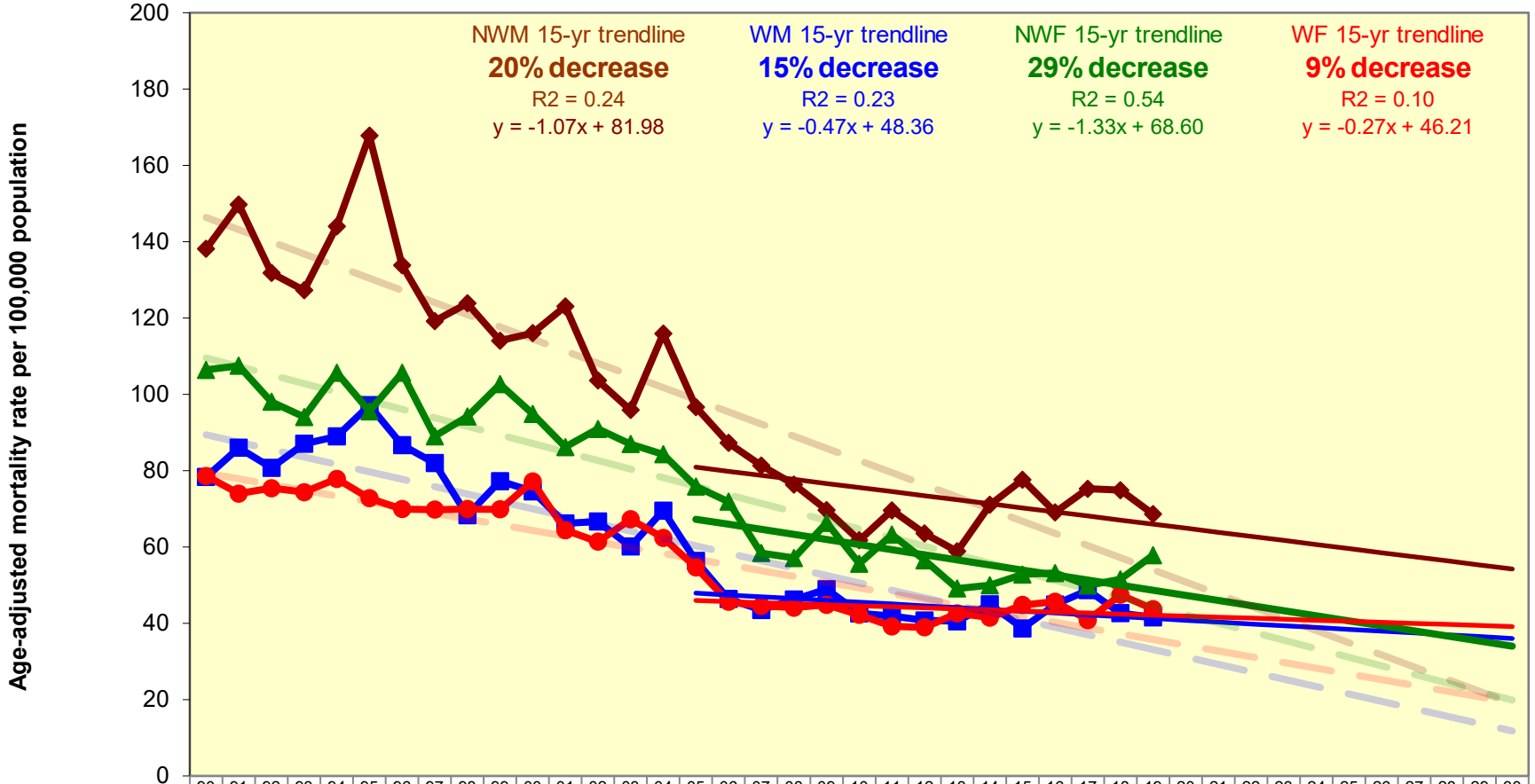
Comparison of Fitted Rates in 2005

ENC29	RNC71	NC	US	
	7% LT	6% LT	17% LT	ENC29
8% GT		1% GT	10% LT	RNC71
7% GT	1% LT		11% LT	NC
20% GT	11% GT	13% GT		US

Comparison of Fitted Rates in 2019

ENC29	RNC71	NC	US	
	17% LT	15% LT	31% LT	ENC29
21% GT		3% GT	16% LT	RNC71
17% GT	3% LT		19% LT	NC
44% GT	19% GT	23% GT		US

Figure 6.2 iii. Cerebrovascular Disease: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

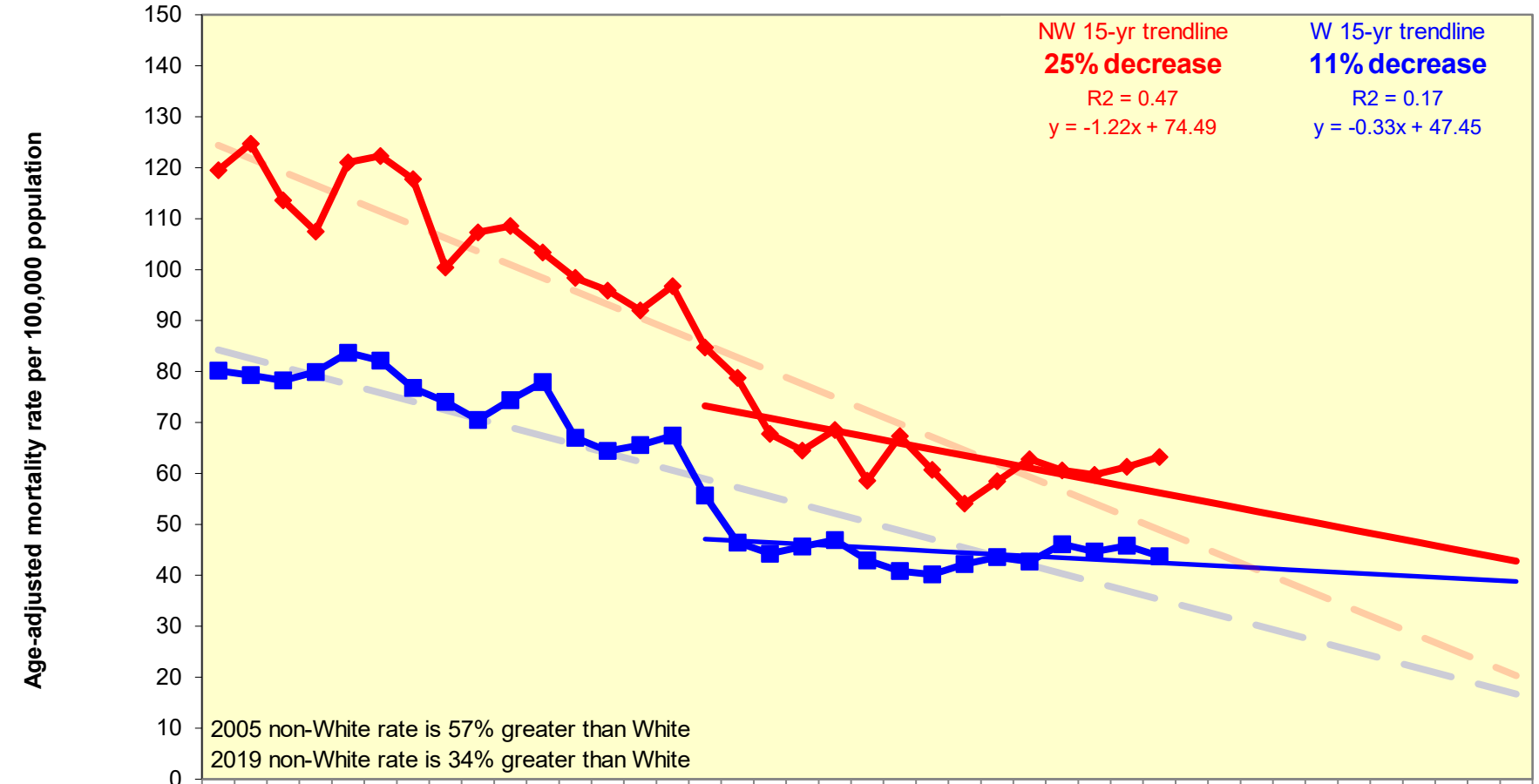


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	138	150	132	127	144	168	134	119	124	114	116	123	104	96	116	97	87	81	76	70	62	70	64	59	71	78	69	75	75	69											
WM	78	86	81	87	89	97	87	82	68	77	75	66	67	60	70	56	46	44	46	49	43	42	41	41	45	39	45	49	43	42											
NWF	106	107	98	94	106	96	106	89	94	103	95	86	91	87	84	76	72	58	57	66	56	63	57	49	50	53	53	50	52	58											
WF	79	74	75	74	78	73	70	70	70	70	77	64	61	67	62	55	46	45	44	45	42	39	39	43	41	45	46	41	47	44											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	41% LT	16% LT	44% LT	NWM
70% GT		42% GT	4% LT	WM
19% GT	30% LT		33% LT	NWF
77% GT	5% GT	48% GT		WF

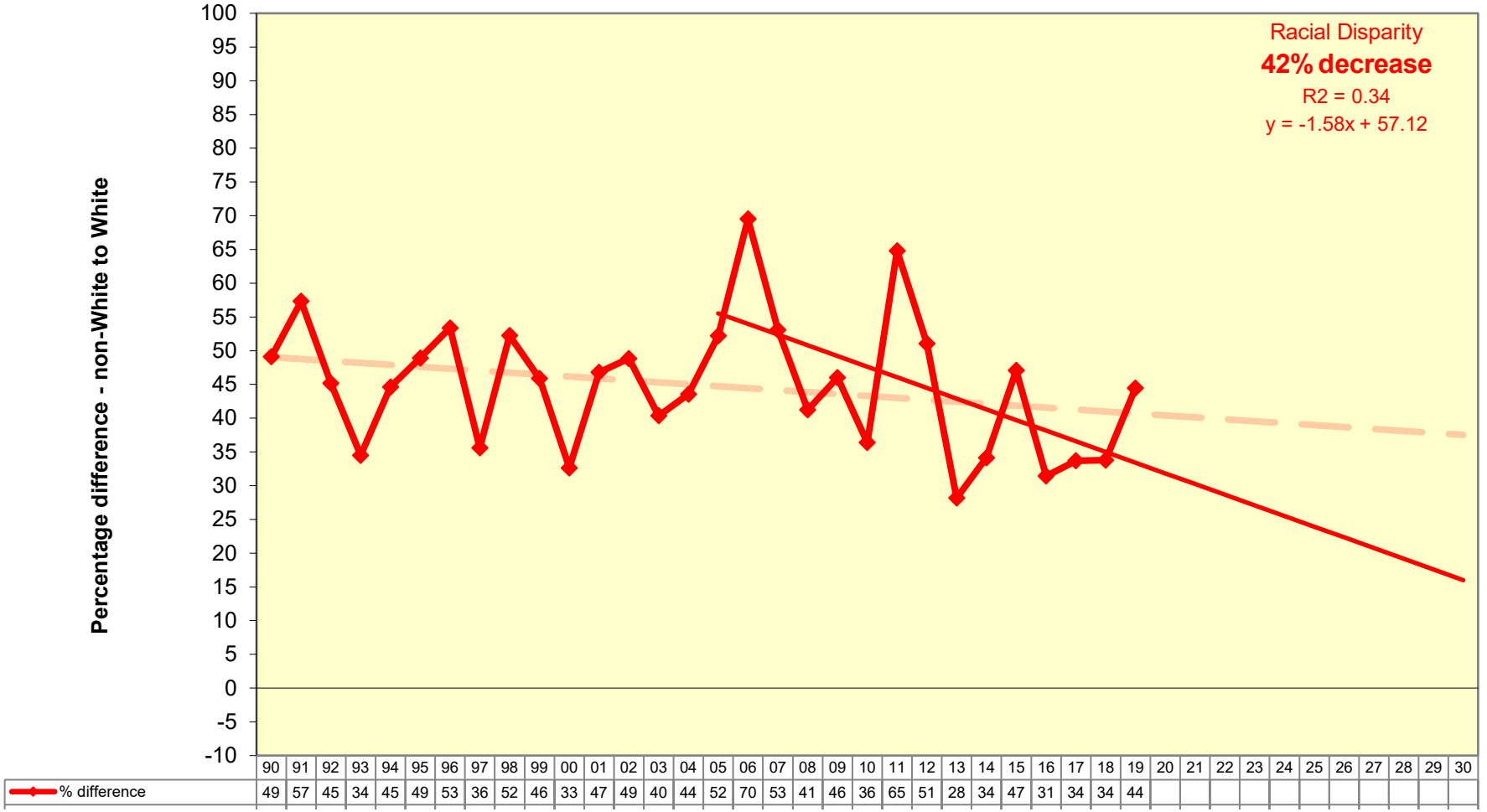
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	38% LT	25% LT	37% LT	NWM
61% GT		20% GT	2% GT	WM
34% GT	16% LT		15% LT	NWF
58% GT	2% LT	18% GT		WF

Figure 6.2 iv. Cerebrovascular Disease: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	120	125	114	107	121	122	118	100	107	109	103	98	96	92	97	85	79	68	64	69	59	67	61	54	58	63	61	60	61	63											
W	80	79	78	80	84	82	77	74	71	74	78	67	64	66	67	56	46	44	46	47	43	41	40	42	44	43	46	45	46	44											

Figure 6.2 v. Cerebrovascular Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030

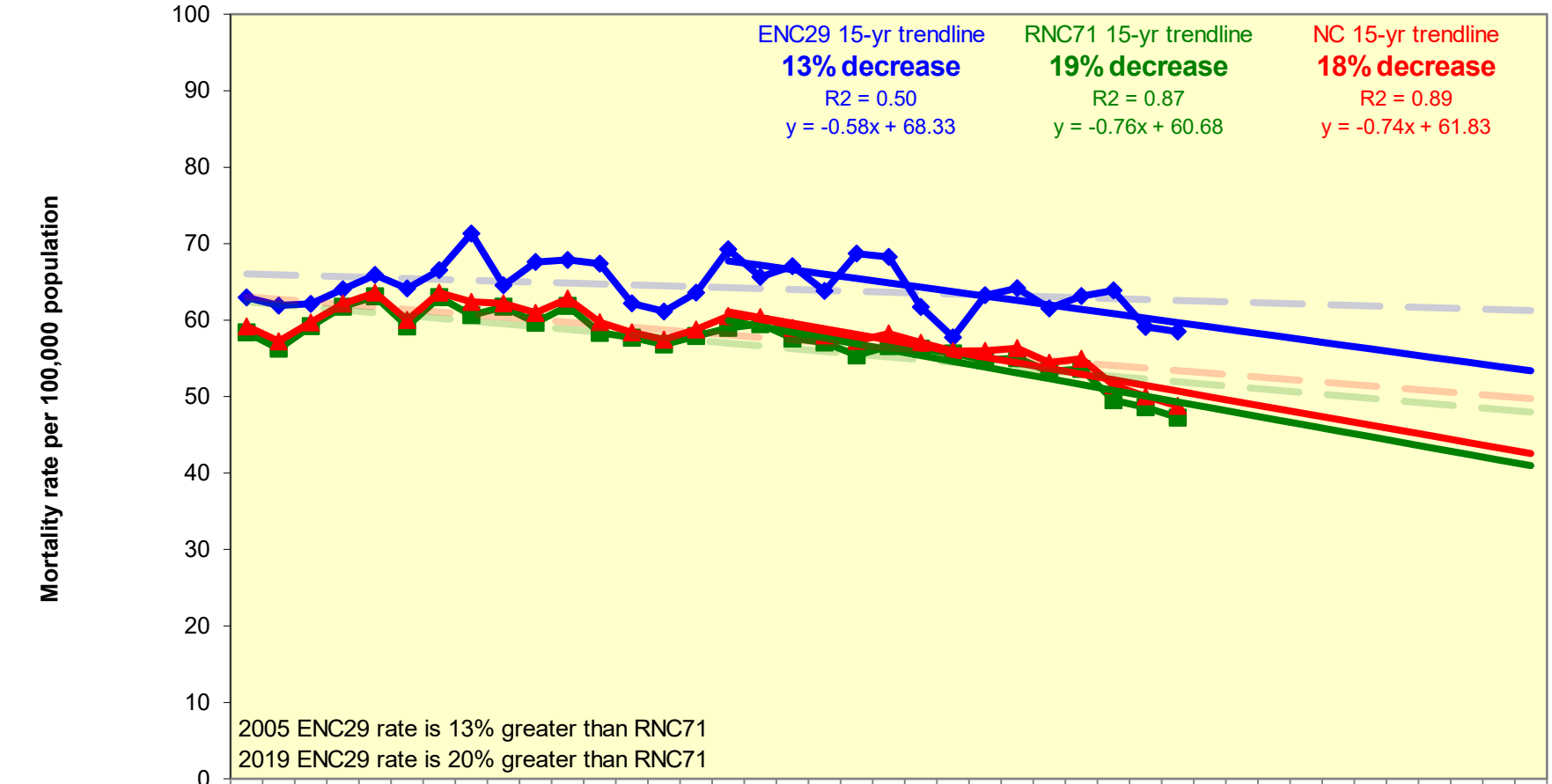


Cancer—Trachea, Bronchus, Lung

- The 15-year trend line for cancer-TBL for ENC has decreased 13% over the period. The rate for 2019 is 20% greater than the rate for RNC.
- In 2019 the age-adjusted rate for ENC is 12% higher than RNC. The 15-year trend rate for ENC has decreased 34%.
- The mortality rate trends for White and non-White males are decreasing and are projected to converge. The rate for non-White females is 33% less than the rate for White females.
- The non-White mortality rate trend for this cancer is consistently lower than the White rate. Both trends are decreasing over the 15-year period, but non-White is decreasing more quickly.
- 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 6.3 i. Cancer - Trachea, Bronchus, Lung: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

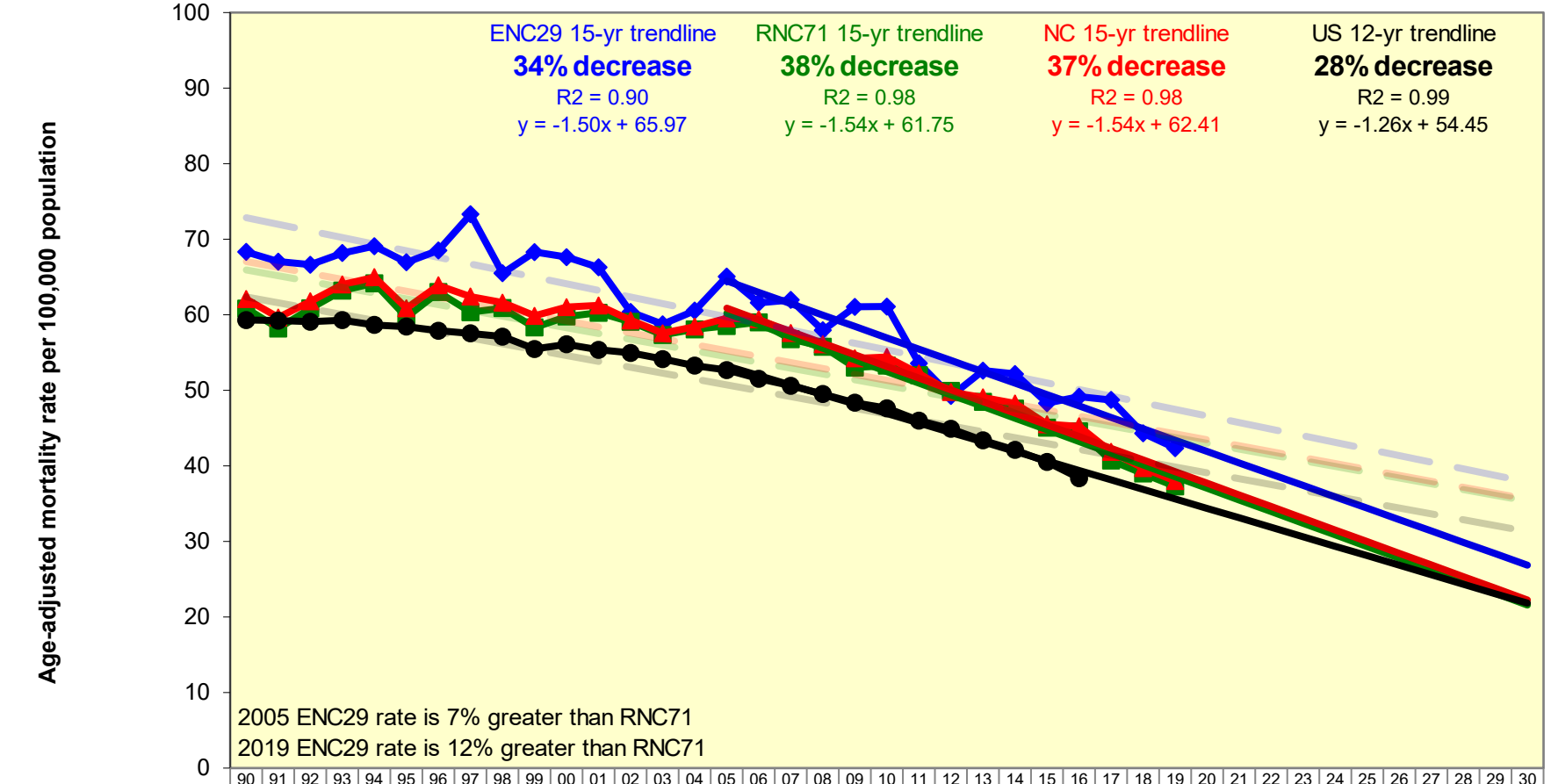


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	63	62	62	64	66	64	67	71	65	68	68	67	62	61	64	69	66	67	64	69	68	62	58	63	64	62	63	64	59	58											
RNC71	58	56	59	62	63	59	63	61	62	60	62	58	58	57	58	59	59	58	57	55	57	56	56	55	55	53	54	50	49	47											
NC	59	57	60	62	64	60	64	62	62	61	63	60	58	57	59	61	60	59	58	57	58	57	56	56	56	54	55	51	50	49											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	11% LT	10% LT	ENC29
13% GT		2% GT	RNC71
11% GT	2% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	17% LT	15% LT	ENC29
20% GT		3% GT	RNC71
17% GT	3% LT		NC

Figure 6.3 ii. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

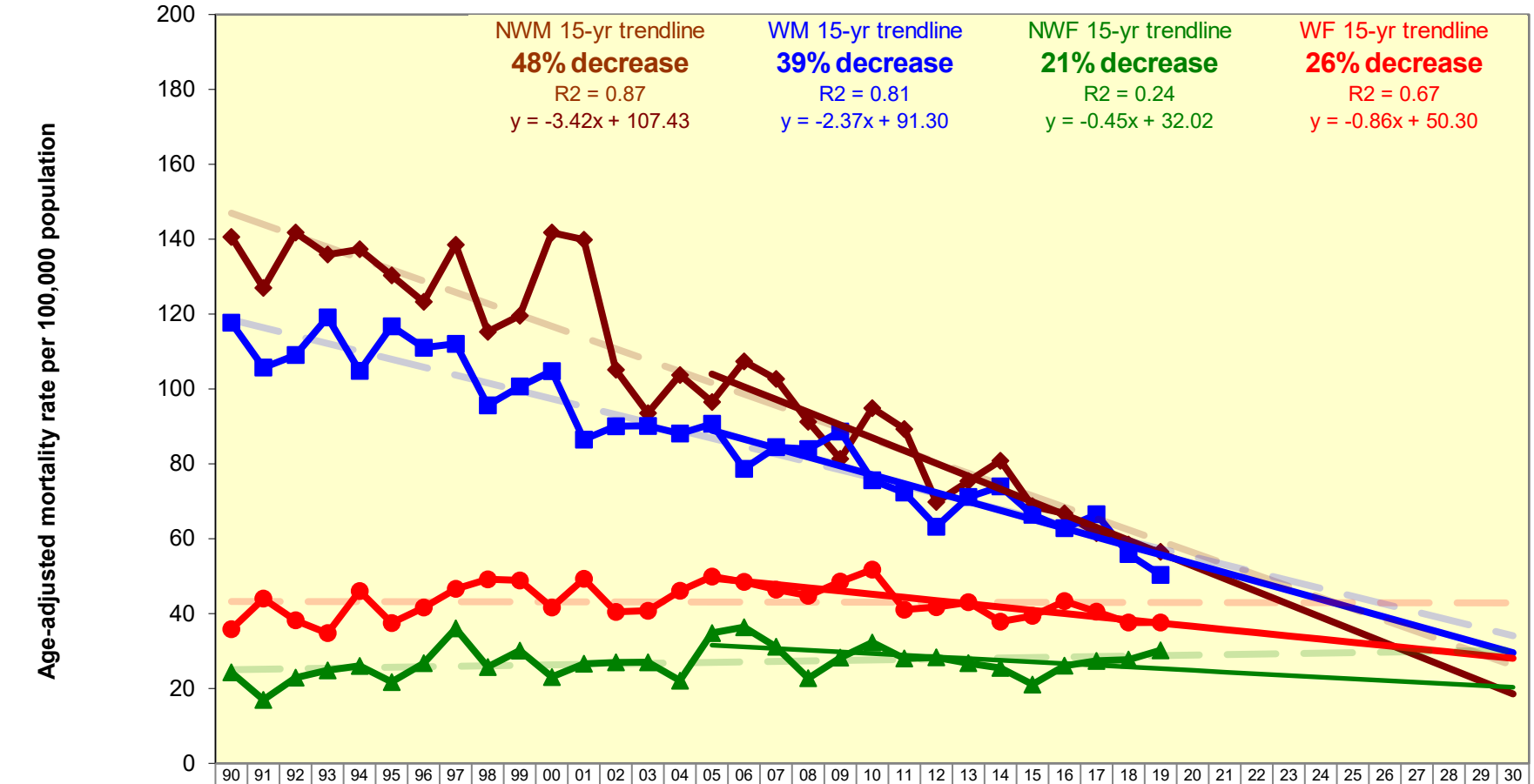


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	68	67	67	68	69	67	69	73	65	68	68	66	60	59	61	65	62	62	58	61	61	54	49	53	52	48	49	49	44	42											
RNC71	61	58	61	63	64	60	63	60	61	58	60	60	59	57	58	59	59	57	56	53	53	52	50	48	48	45	45	41	39	37											
NC	62	60	62	64	65	61	64	62	62	60	61	61	59	58	58	60	59	58	56	54	54	52	50	49	48	46	45	42	40	38											
US	59	59	59	59	59	58	58	58	57	55	56	55	55	54	53	53	52	51	50	48	48	46	45	43	42	41	38														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	6% LT	5% LT	17% LT	ENC29
7% GT		1% GT	12% LT	RNC71
6% GT	1% LT		13% LT	NC
21% GT	13% GT	15% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	11% LT	9% LT	18% LT	ENC29
12% GT		2% GT	8% LT	RNC71
10% GT	2% LT		10% LT	NC
22% GT	9% GT	11% GT		US

Figure 6.3 iii. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

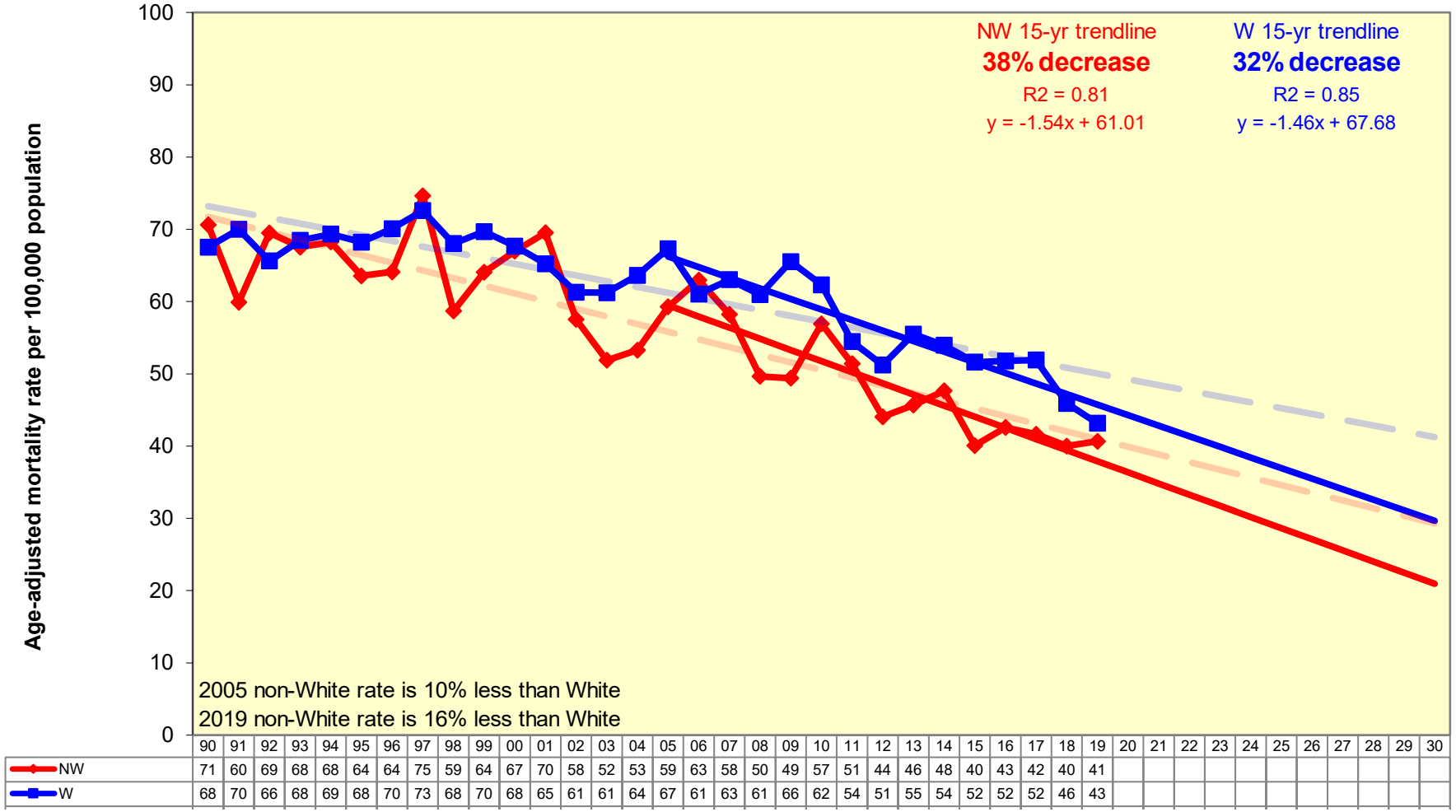


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	141	127	142	136	137	130	123	138	115	120	142	140	105	94	104	97	107	103	91	81	95	89	70	75	81	69	67	61	58	57											
WM	118	106	109	119	105	117	111	112	96	101	105	86	90	90	88	91	79	84	84	89	76	72	63	71	74	66	63	67	56	50											
NWF	24	17	23	25	26	22	27	36	26	30	23	27	27	27	22	35	36	31	23	28	32	28	28	27	25	21	26	27	28	30											
WF	36	44	38	35	46	37	42	47	49	49	42	49	40	41	46	50	48	46	45	49	52	41	42	43	38	39	43	40	38	38											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	15% LT	70% LT	53% LT	NWM
18% GT		65% LT	45% LT	WM
236% GT	185% GT		57% GT	NWF
114% GT	81% GT	36% LT		WF

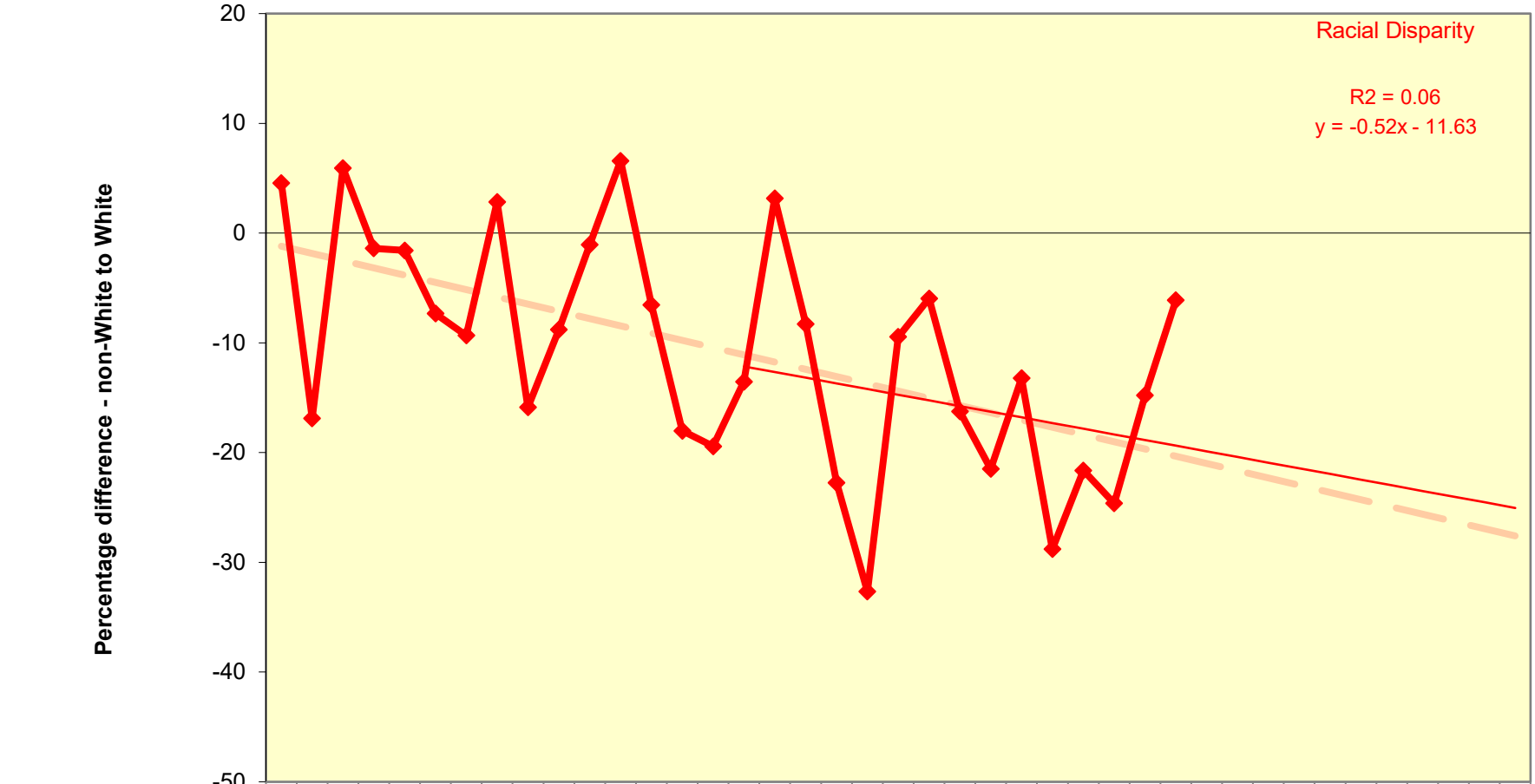
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	3% LT	57% LT	36% LT	NWM
3% GT		56% LT	34% LT	WM
132% GT	126% GT		49% GT	NWF
55% GT	52% GT	33% LT		WF

Figure 6.3 iv. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	71	60	69	68	68	64	64	75	59	64	67	70	58	52	53	59	63	58	50	49	57	51	44	46	48	40	43	42	40	41											
W	68	70	66	68	69	68	70	73	68	70	68	65	61	61	64	67	61	63	61	66	62	54	51	55	54	52	52	52	46	43											

Figure 6.3 v. Cancer - Trachea, Bronchus, Lung: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



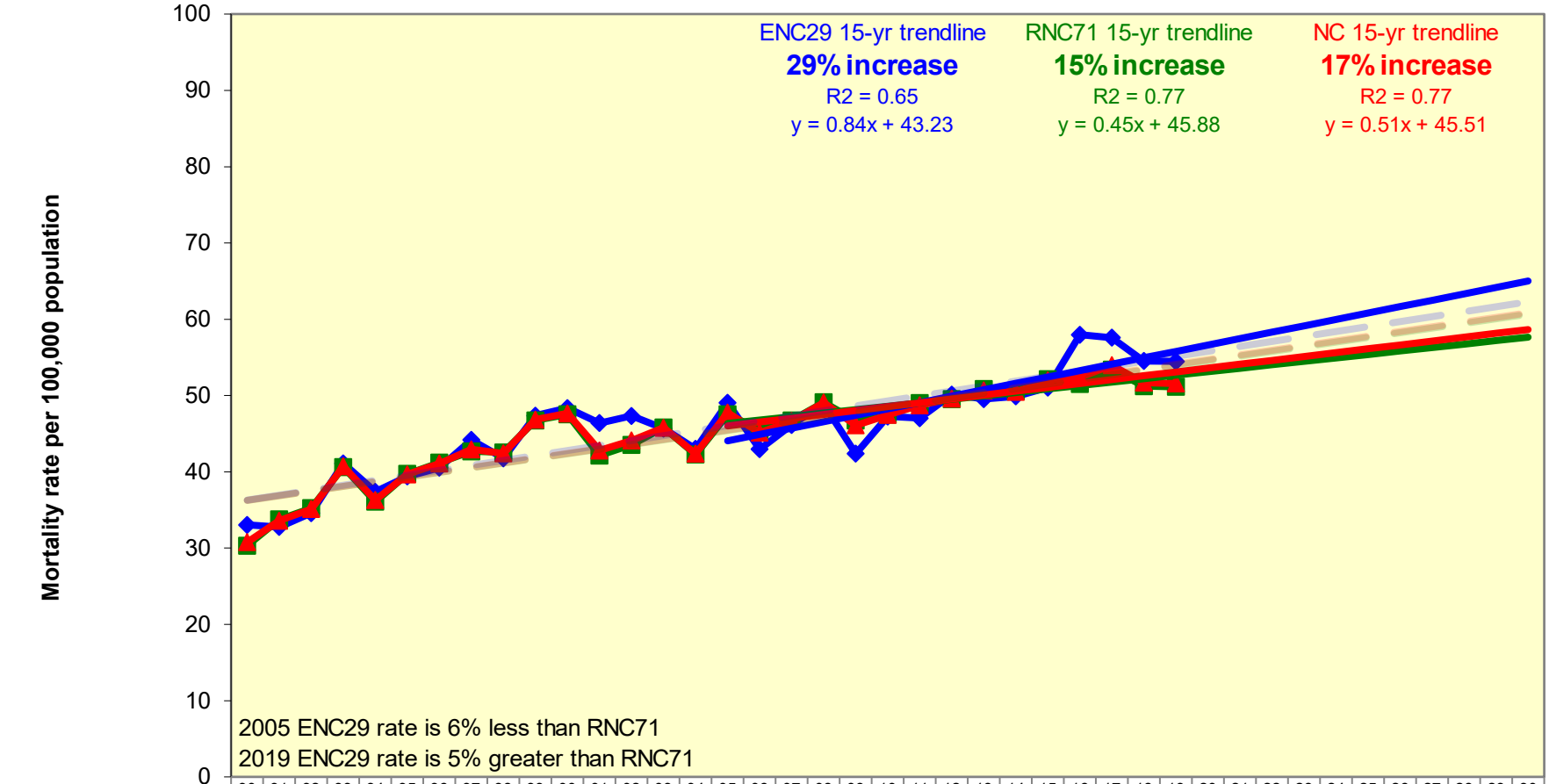
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
% difference	5	-17	6	-1	-2	-7	-9	3	-16	-9	-1	7	-7	-18	-19	-14	3	-8	-23	-33	-9	-6	-16	-21	-13	-29	-22	-25	-15	-6											

Chronic Lower Respiratory Diseases

- The 30-year ENC trend for CLRD is increasing, as is the 15-year trend. In 2019 the ENC rate is 5% greater than the RNC rate.
- The ENC age-adjusted rate trend is lower than the RNC and NC but the trend is flat and not reliable.
- The rate for White males is the highest but is decreasing in a reliable trend. The rate for non-White males has decreased 20% over the 15-year period in a moderately reliable trend and is now below the rate for White females, which is increasing. The rate for non-White females is the lowest and is increasing in a moderately reliable trend.
- The 15-year trend for Whites is higher than the non-White rate, but both rates are flat and unreliable.
- The disparity trend between White and non-White is unreliable.

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. Chronic Lower Respiratory Diseases: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

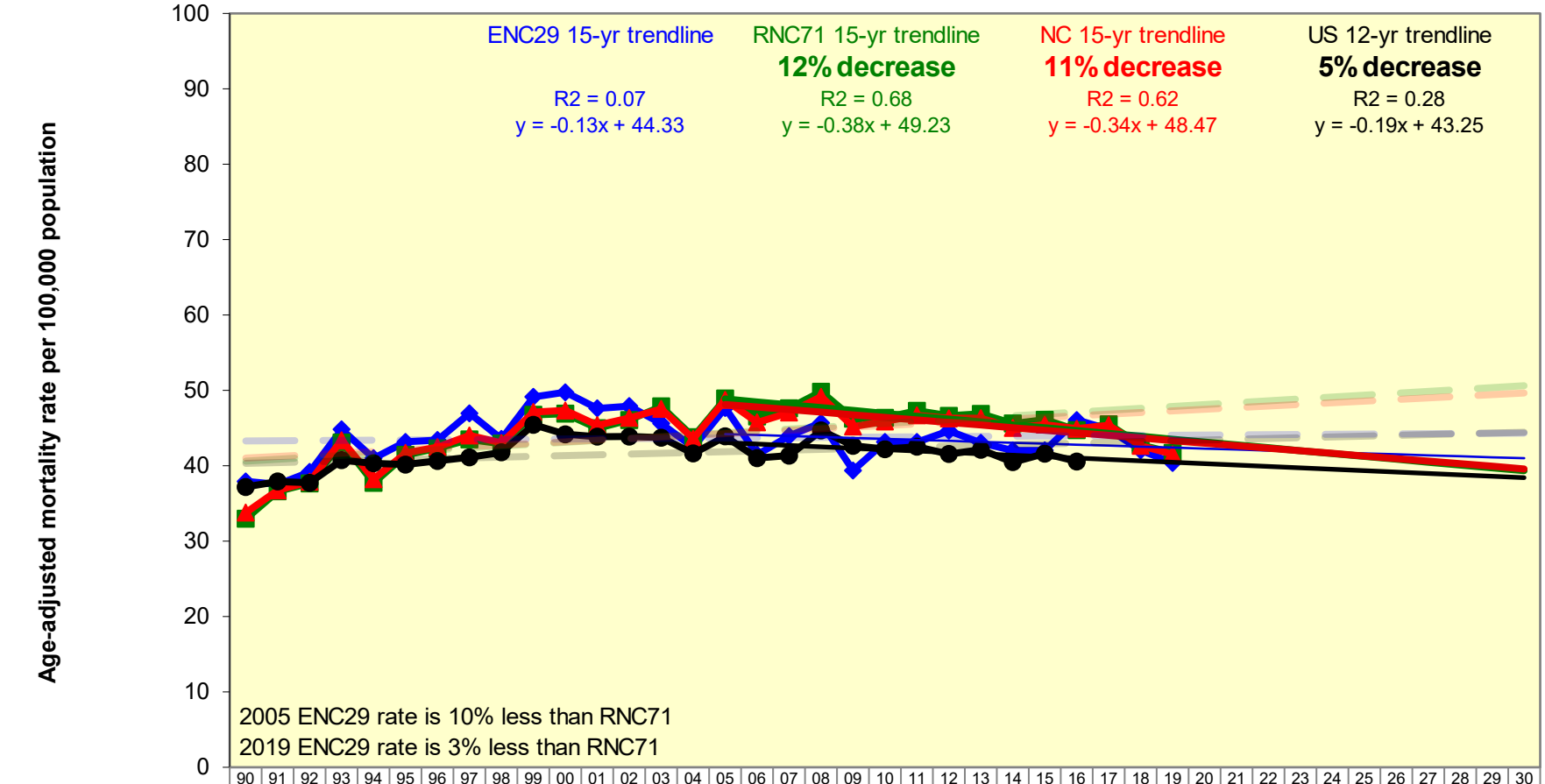


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	33	33	35	41	37	39	41	44	42	47	48	46	47	46	43	49	43	46	49	42	47	47	50	50	50	51	58	58	55	54											
RNC71	30	34	35	41	36	40	41	43	43	47	48	42	44	46	42	48	46	47	49	47	48	49	50	51	51	52	52	53	51	51											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	6% GT	5% GT	ENC29
6% LT		1% LT	RNC71
5% LT	1% GT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	5% LT	4% LT	ENC29
5% GT		1% GT	RNC71
4% GT	1% LT		NC

Figure 6.4 ii. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

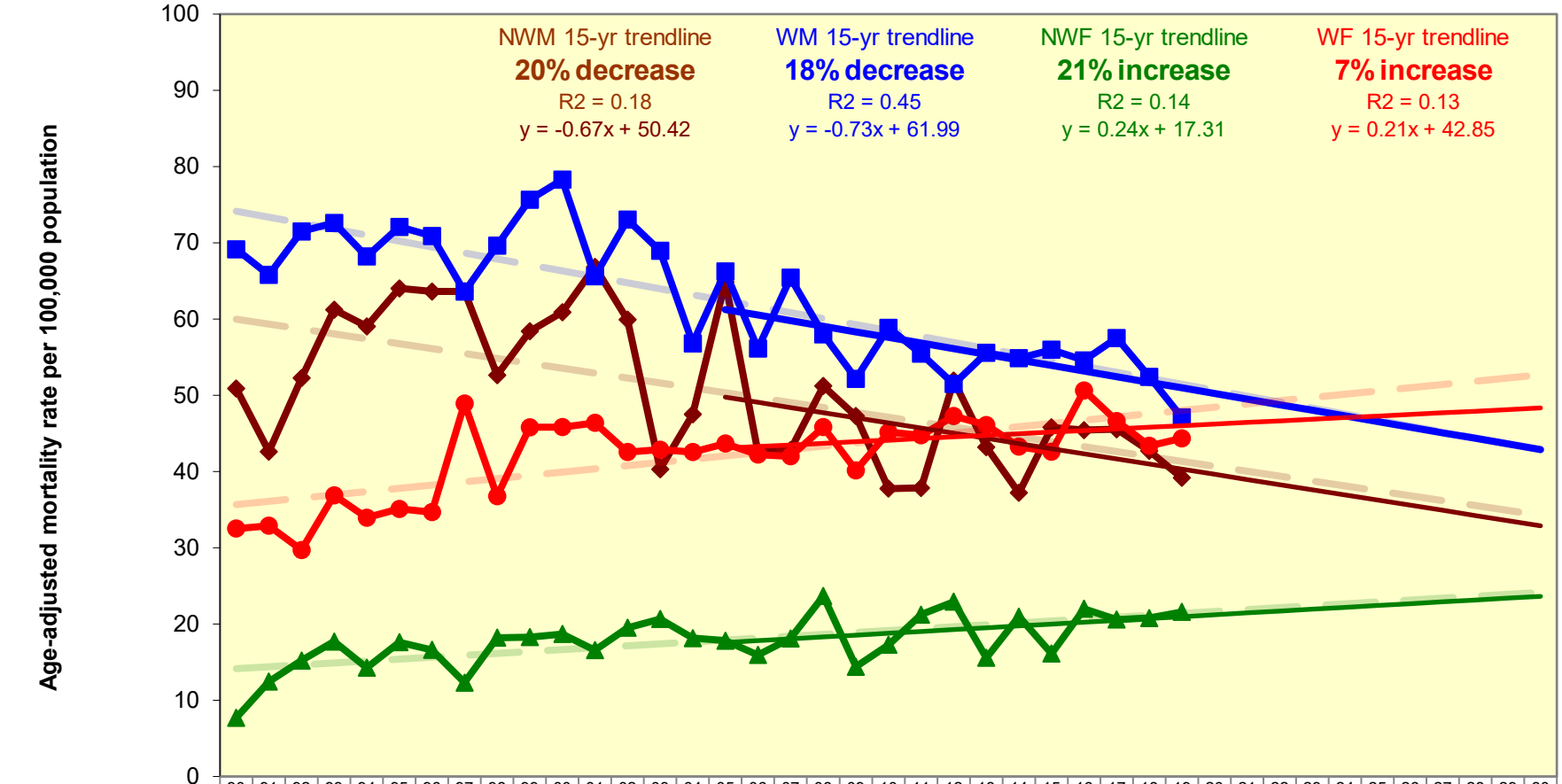


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	38	38	39	45	41	43	43	47	44	49	50	48	48	46	42	48	41	44	46	39	43	43	45	43	42	42	46	45	42	40											
RNC71	33	37	38	43	38	41	42	43	43	47	47	45	46	48	44	49	47	48	50	46	46	47	47	47	46	46	45	46	43	42											
NC	34	37	38	43	38	42	42	44	43	47	47	45	46	48	44	49	46	47	49	45	46	47	46	46	45	45	45	45	43	42											
US	37	38	38	41	40	40	41	41	42	45	44	44	44	44	42	44	41	41	45	43	42	43	42	42	40	42	41														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	11% GT	9% GT	2% LT	ENC29
10% LT		2% LT	12% LT	RNC71
9% LT	2% GT		11% LT	NC
2% GT	14% GT	12% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	3% GT	3% GT	4% LT	ENC29
3% LT		0% LT	7% LT	RNC71
3% LT	0% GT		7% LT	NC
5% GT	8% GT	7% GT		US

Figure 6.4 iii. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NWM	51	43	52	61	59	64	64	64	53	58	61	67	60	40	47	65	43	43	51	47	38	38	52	43	37	46	45	46	43	39											
WM	69	66	72	73	68	72	71	64	70	76	78	66	73	69	57	66	56	65	58	52	59	55	51	56	55	56	55	58	52	47											
NWF	8	12	15	18	14	18	17	12	18	18	19	17	20	21	18	18	16	18	24	14	17	21	23	16	21	16	22	21	21	22											
WF	33	33	30	37	34	35	35	49	37	46	46	46	43	43	43	44	42	42	46	40	45	45	47	46	43	43	51	47	43	44											

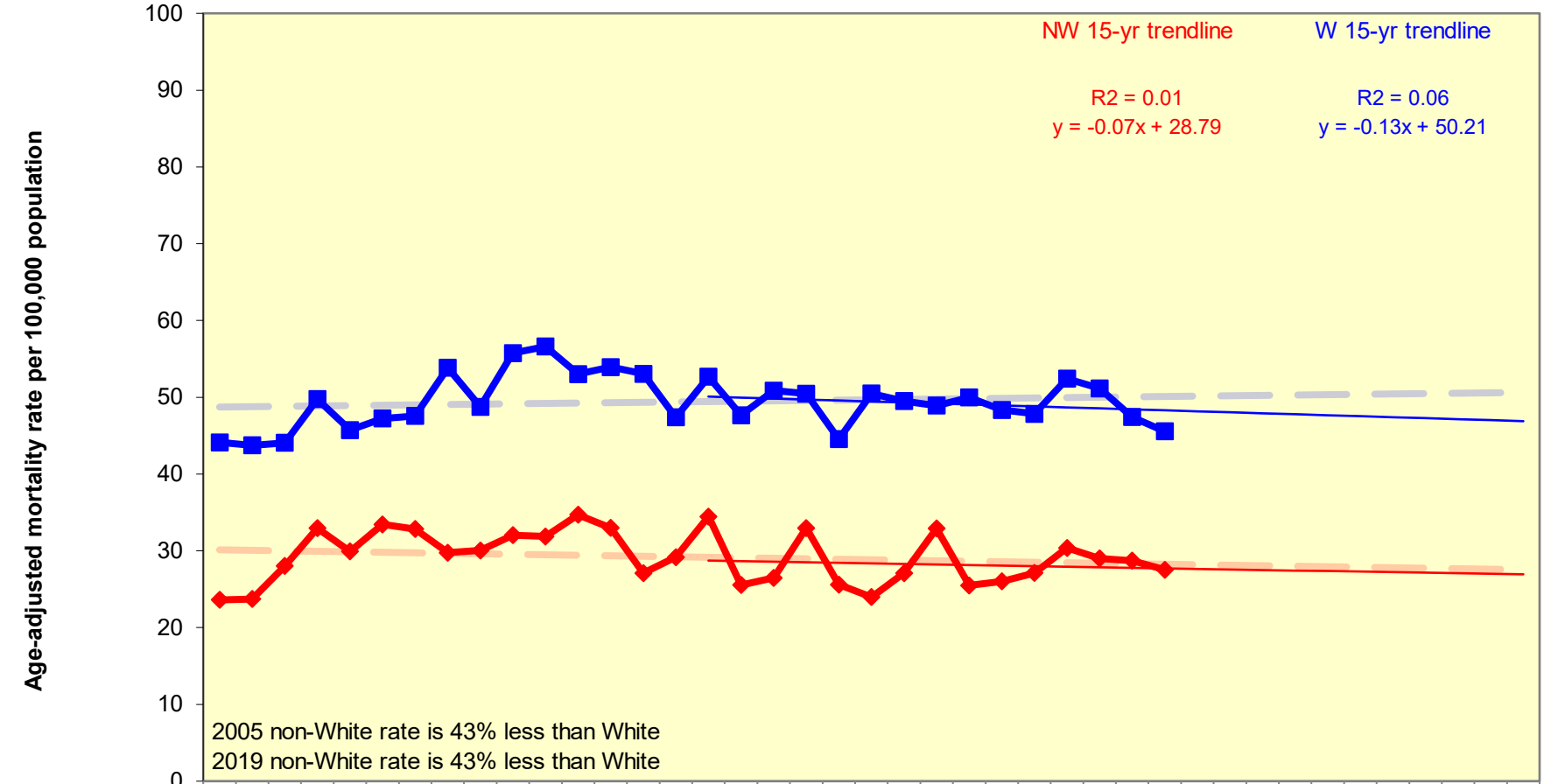
Comparison of Fitted Rates in 2005

NWM	WM	NWF	WF	
	23% GT	66% LT	15% LT	NWM
19% LT		72% LT	31% LT	WM
191% GT	258% GT		147% GT	NWF
18% GT	45% GT	60% LT		WF

Comparison of Fitted Rates in 2019

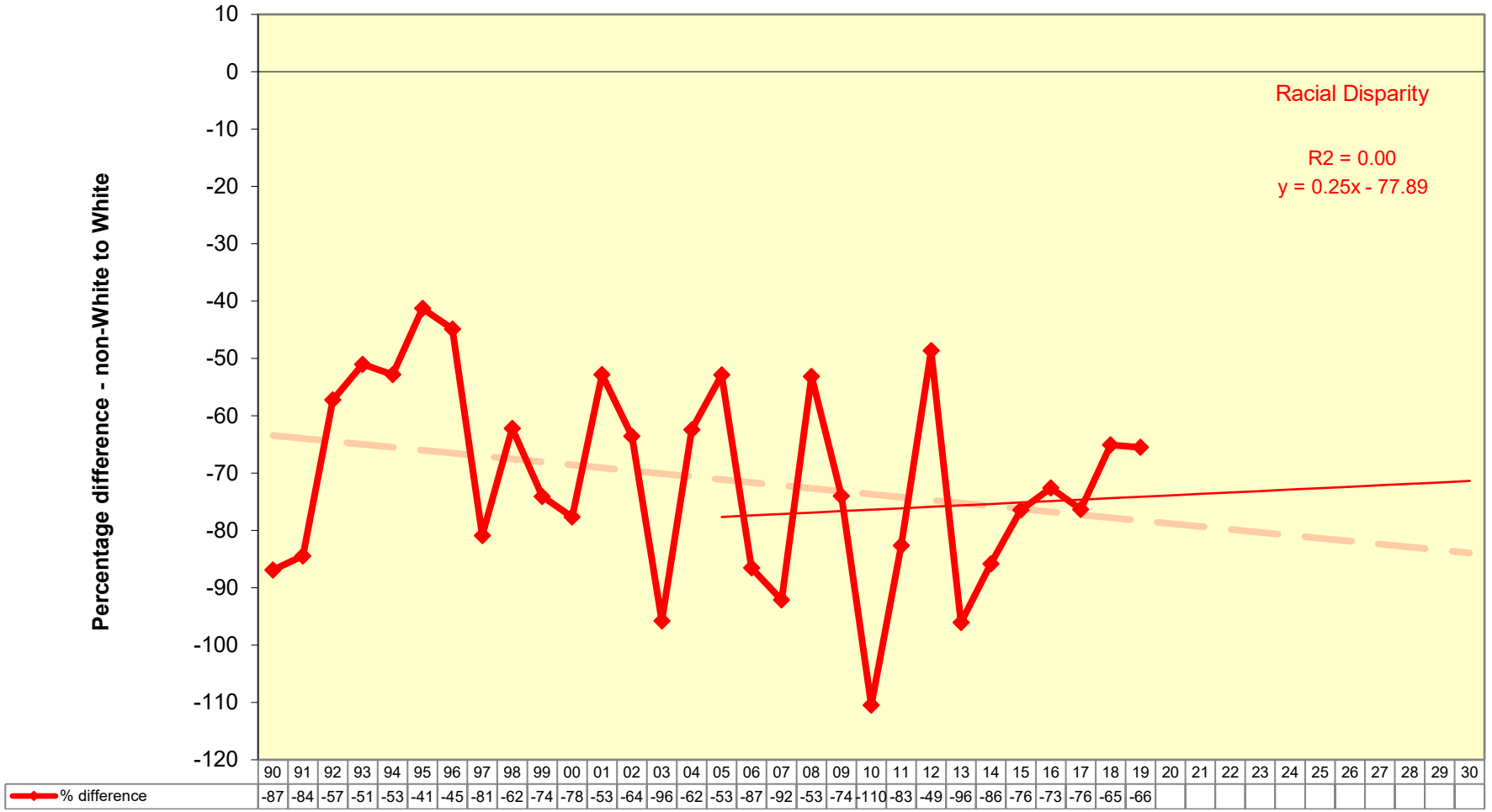
NWM	WM	NWF	WF	
	26% GT	49% LT	12% GT	NWM
21% LT		60% LT	11% LT	WM
98% GT	150% GT		121% GT	NWF
11% LT	13% GT	55% LT		WF

Figure 6.4 iv. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	24	24	28	33	30	33	33	30	30	32	32	35	33	27	29	34	26	26	33	26	24	27	33	25	26	27	30	29	29	28											
W	44	44	44	50	46	47	48	54	49	56	57	53	54	53	47	53	48	51	50	45	50	49	49	50	48	48	52	51	47	46											

Figure 6.4 v. Chronic Lower Respiratory Diseases: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



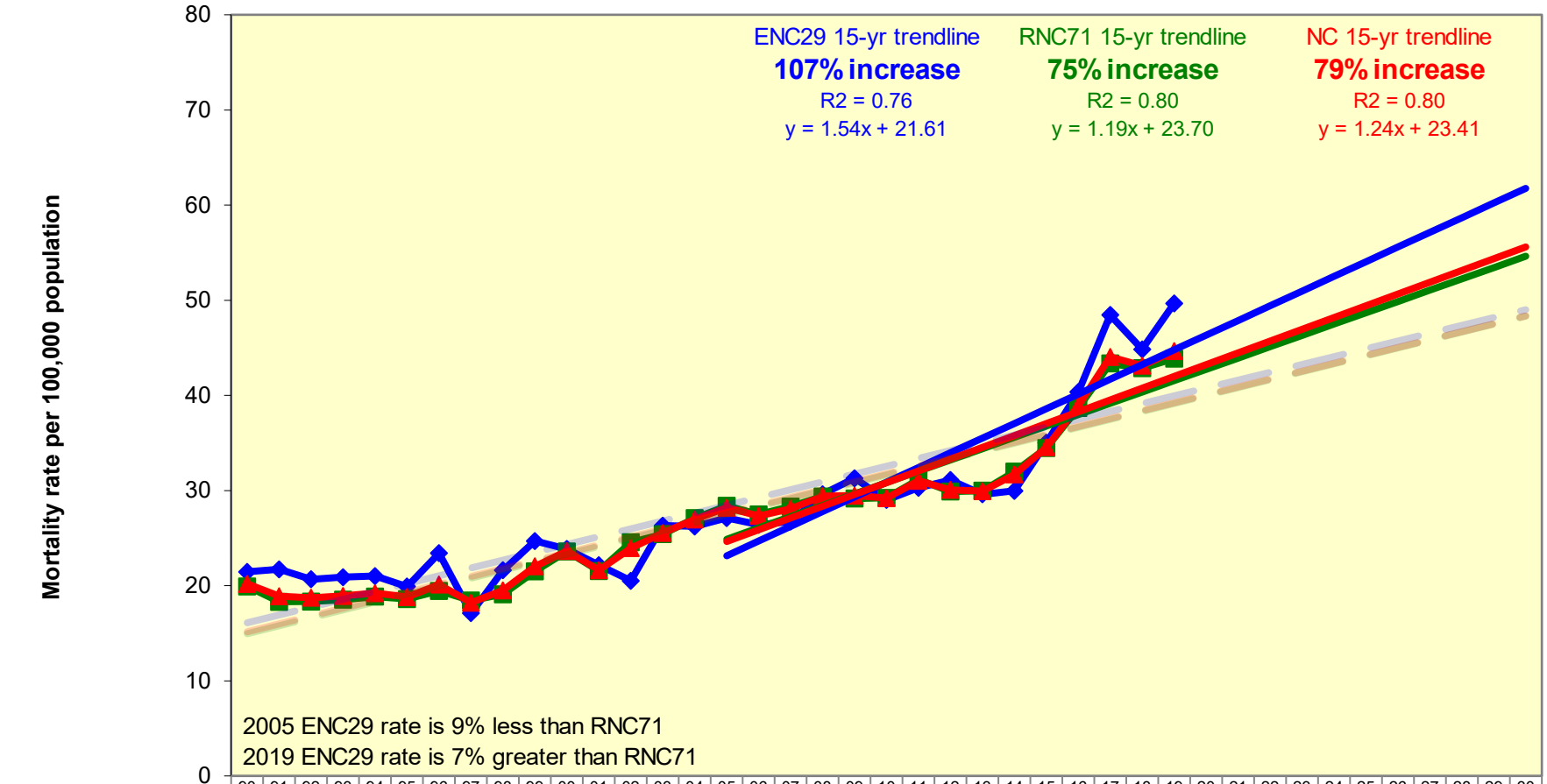
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
% difference	-87	-84	-57	-51	-53	-41	-45	-81	-62	-74	-78	-53	-64	-96	-62	-53	-87	-92	-53	-74	-110	-83	-49	-96	-86	-76	-73	-76	-65	-66											

All Other Unintentional Injuries and Adverse Effects

- The mortality rate trend for unintentional injuries and adverse effects shows a sharp increase in ENC (107% over 15 years). The trends for RNC and the NC are also up sharply.
- The age-adjusted mortality rate trends for ENC, RNC, NC, and the US are all increasing. During the last 15 years the ENC rate has increased 97% and it is now 8% greater than RNC.
- The trends are increasing for all groups, but the white male rate is the highest and shows the greatest increase (125% over 15 years).
- The White rate trend has increased 110% over the 15 year period. The non-White rate is 39% less than the white rate, and increased 66% over the period.
- Over the 15-year period the racial disparity has decreased 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 6.5 i. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

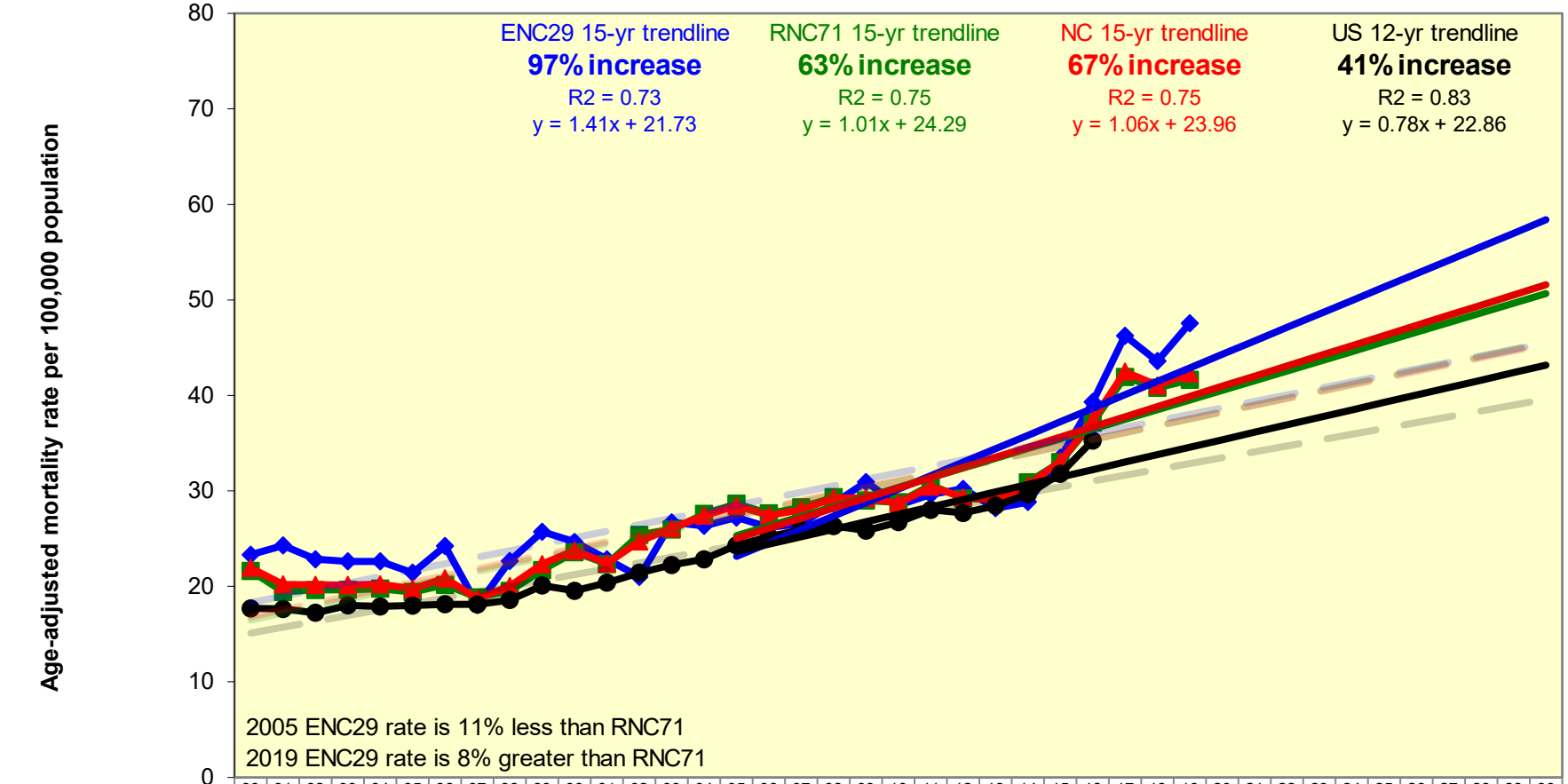


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	21	22	21	21	21	20	23	17	22	25	24	22	21	26	26	27	26	27	30	31	29	30	31	30	30	35	40	48	45	50											
RNC71	20	18	18	19	19	19	19	18	19	22	24	22	25	25	27	28	28	28	29	29	29	31	30	30	32	34	39	43	43	44											
NC	20	19	19	19	19	19	20	18	20	22	24	22	24	26	27	28	27	28	29	29	29	31	30	30	32	35	39	44	43	45											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	10% GT	8% GT	ENC29
9% LT		1% LT	RNC71
8% LT	1% GT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	7% LT	6% LT	ENC29
7% GT		1% GT	RNC71
6% GT	1% LT		NC

Figure 6.5 ii. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

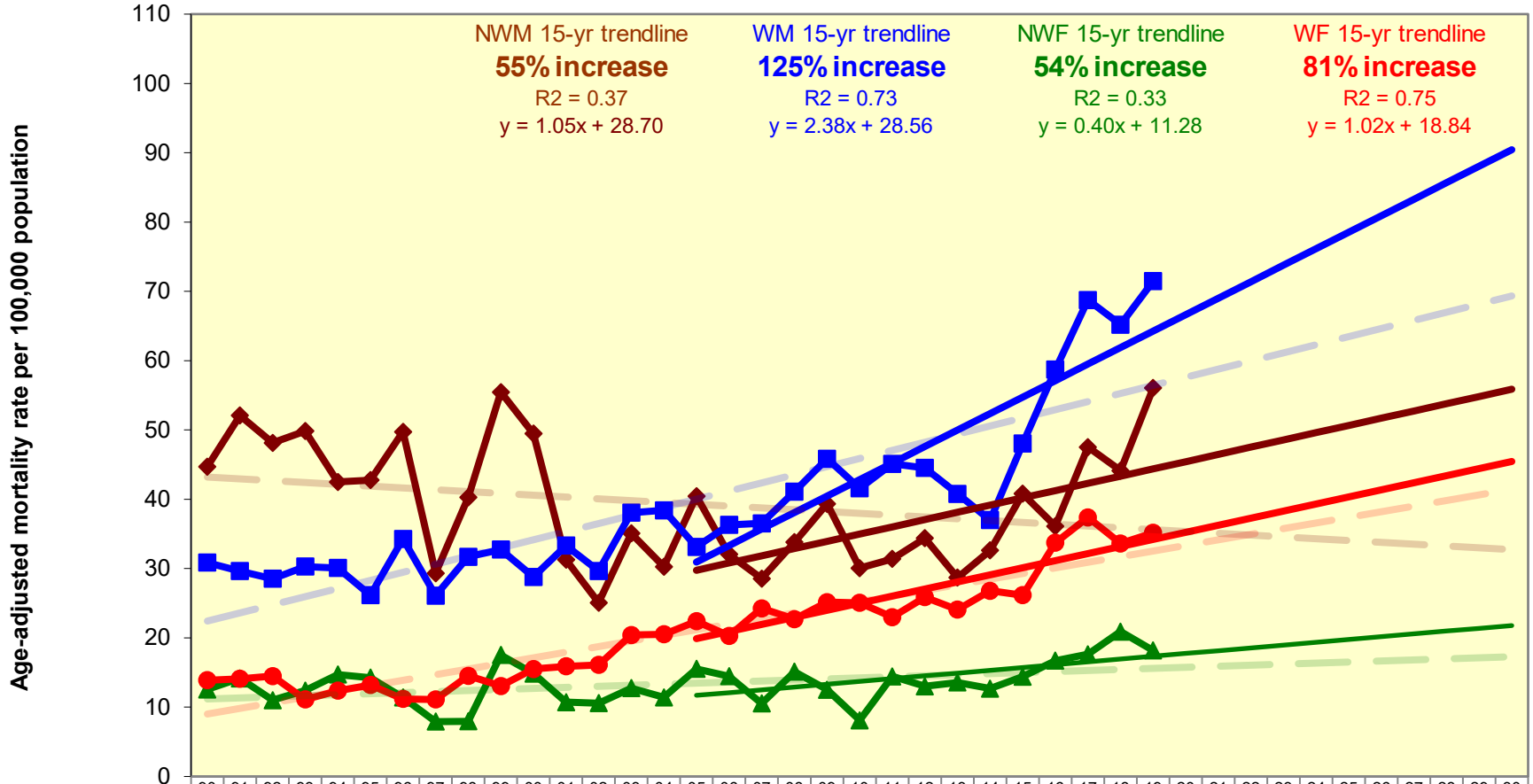


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	23	24	23	23	23	21	24	18	23	26	25	23	21	27	26	27	26	27	29	31	29	30	30	28	29	33	39	46	44	48											
RNC71	22	19	20	20	20	19	20	19	20	22	24	22	25	26	28	29	28	28	29	29	29	31	29	29	31	33	37	42	41	42											
NC	22	20	20	20	20	20	21	19	20	22	24	22	25	26	27	28	27	28	29	29	29	30	29	29	31	33	37	42	41	42											
US	18	18	17	18	18	18	18	18	19	20	20	20	21	22	23	24	25	26	26	26	27	28	28	28	30	32	35														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	12% GT	10% GT	5% GT	ENC29
11% LT		1% LT	6% LT	RNC71
9% LT	1% GT		5% LT	NC
5% LT	6% GT	5% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	7% LT	6% LT	19% LT	ENC29
8% GT		1% GT	12% LT	RNC71
7% GT	1% LT		13% LT	NC
23% GT	14% GT	15% GT		US

Figure 6.5 iii. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

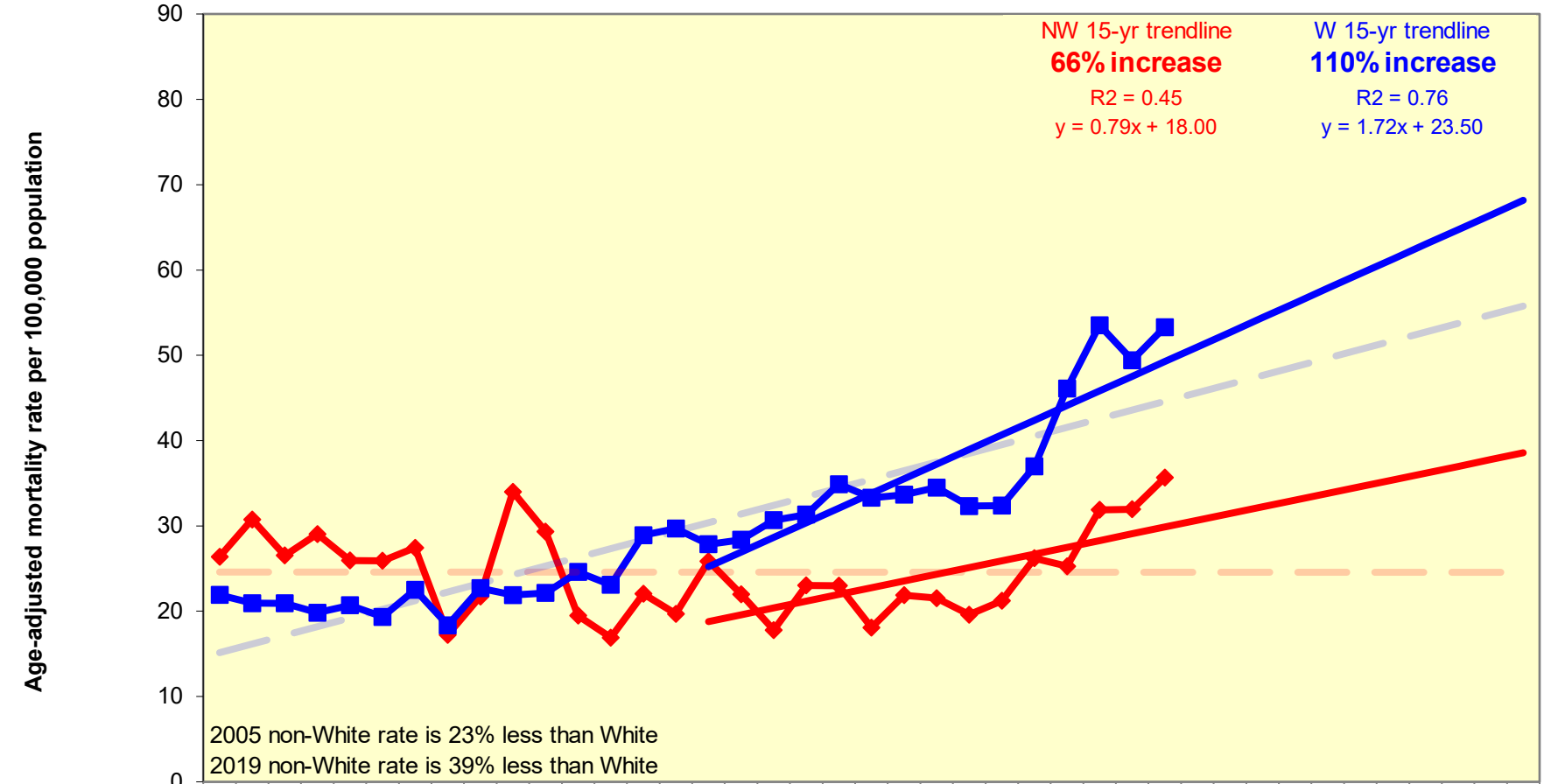


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	45	52	48	50	42	43	50	29	40	55	49	31	25	35	30	40	32	29	34	39	30	31	34	29	33	41	36	48	44	56											
WM	31	30	29	30	30	26	34	26	32	33	29	33	30	38	38	33	36	37	41	46	42	45	45	41	37	48	59	69	65	71											
NWF	13	14	11	12	15	14	11	8	8	18	15	11	11	13	11	16	14	11	15	13	8	14	13	14	13	14	17	18	21	18											
WF	14	14	14	11	12	13	11	11	15	13	15	16	16	20	21	22	20	24	23	25	25	23	26	24	27	26	34	37	34	35											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	0% LT	61% LT	34% LT	NWM
0% GT		61% LT	34% LT	WM
154% GT	153% GT		67% GT	NWF
52% GT	52% GT	40% LT		WF

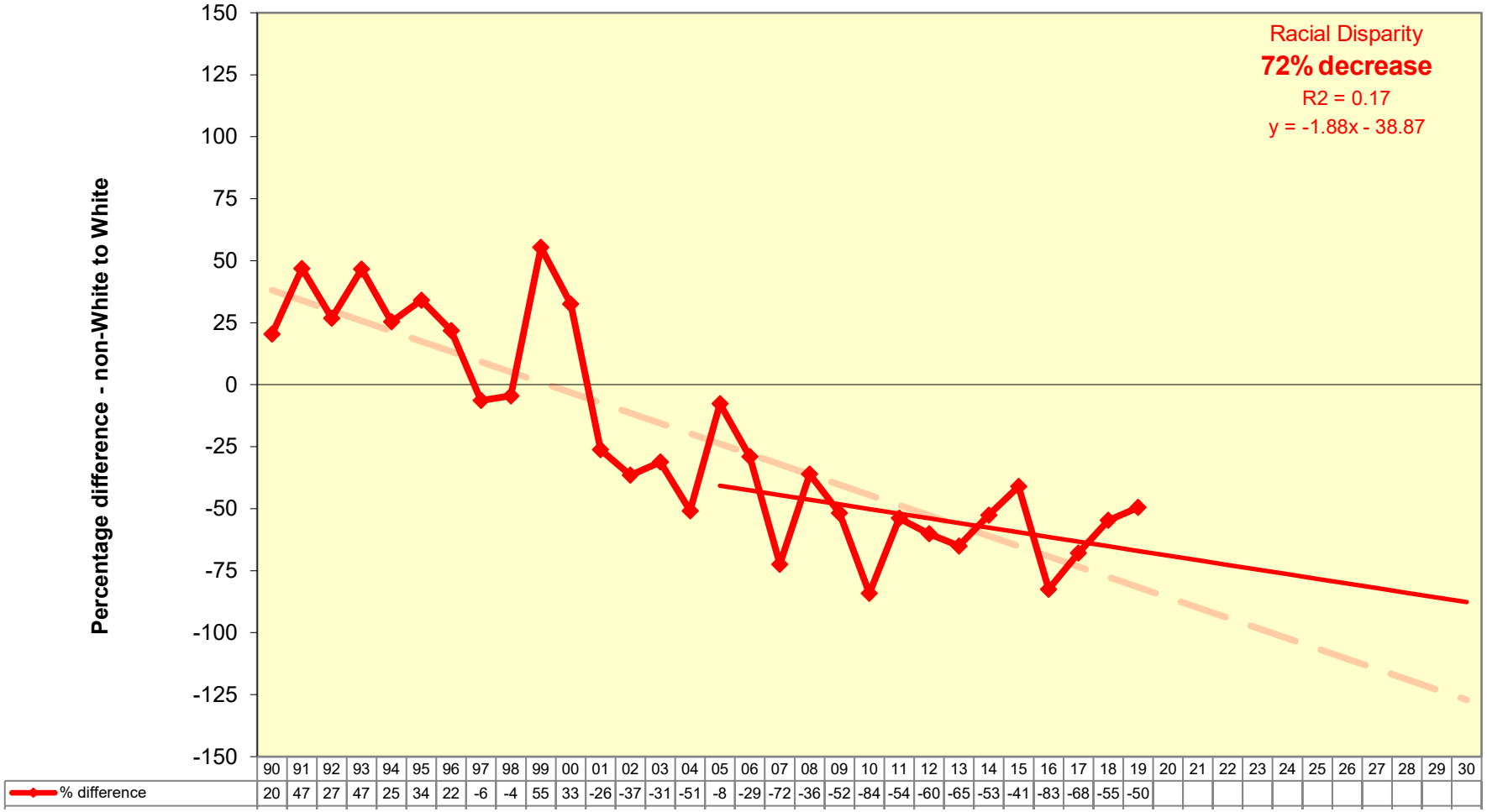
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	43% GT	61% LT	23% LT	NWM
30% LT		73% LT	46% LT	WM
156% GT	265% GT		96% GT	NWF
31% GT	87% GT	49% LT		WF

Figure 6.5 iv. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	26	31	27	29	26	26	27	17	22	34	29	19	17	22	20	26	22	18	23	23	18	22	22	20	21	26	25	32	32	36											
W	22	21	21	20	21	19	23	18	23	22	22	25	23	29	30	28	28	31	31	35	33	34	34	32	32	37	46	54	49	53											

Figure 6.5 v. All Other Unintentional Injuries and Adverse Effects: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030

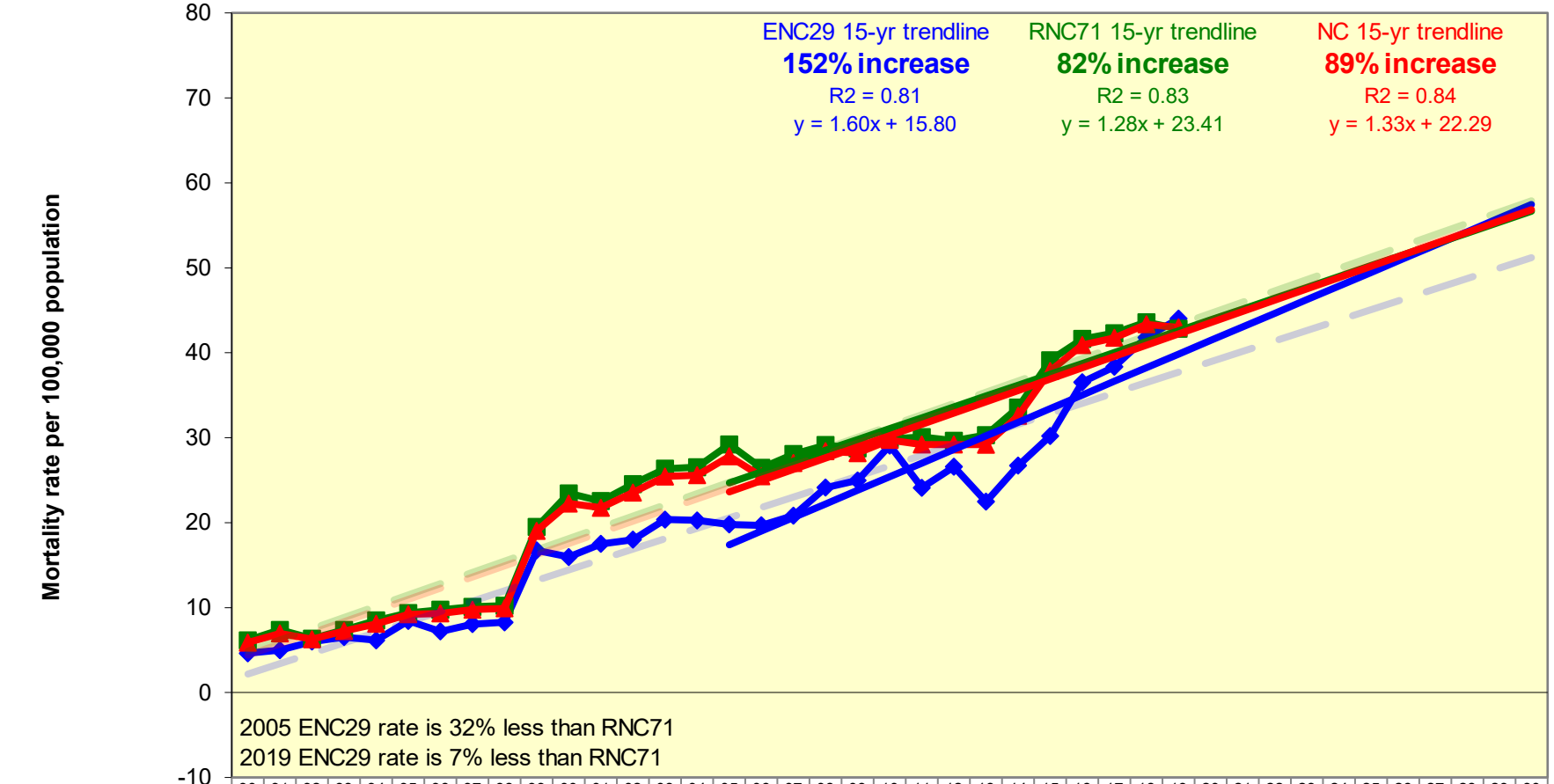


Alzheimer's Disease

- The Alzheimer's mortality rate trend for ENC shows a steep increase over the 15 year period (152%). ENC's rate of increase was larger than RNC and NC, but the rate for ENC is still 7% less than RNC.
- In 2019, the age-adjusted rate for ENC is 16% less than the rate for RNC. The ENC rate trend has increased 78% over the 15 -year period and has inched above the US rate.
- Rate trends are increasing for all groups but non-White males and non-White females have the greatest increase (162% and 119% over 15 years, respectively). The rate for White females is the highest, followed by non-White females.
- The White and non-White rate trends are both increasing. They are set to converge, and the non-White trend is projected to overtake the White in the future.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future

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 i. Alzheimer's Disease: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

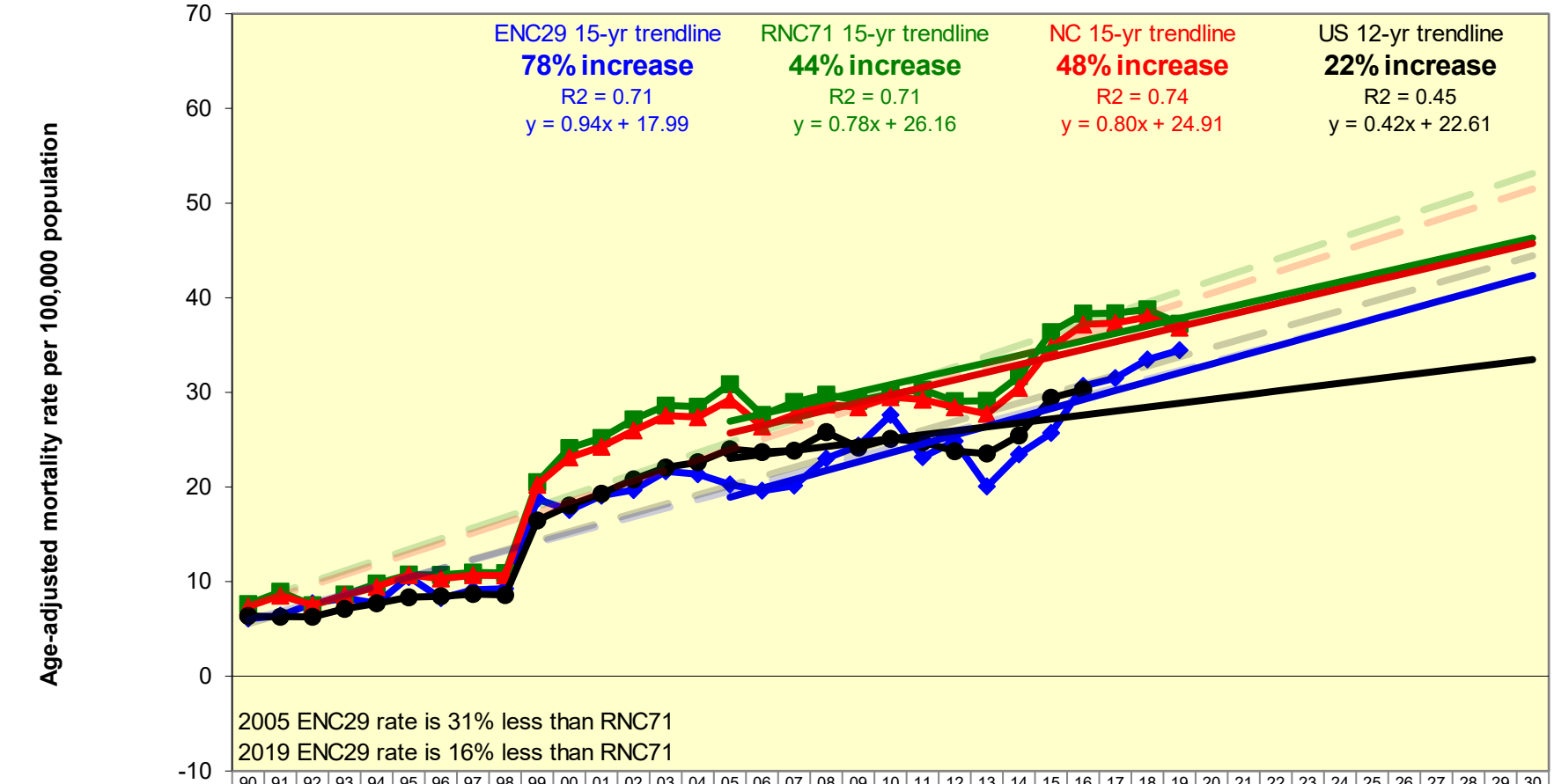


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	5	5	6	7	6	8	7	8	8	17	16	17	18	20	20	20	20	21	24	25	29	24	27	22	27	30	37	38	42	44											
RNC71	6	7	6	7	8	9	10	10	10	19	23	23	25	26	27	29	26	28	29	29	30	30	30	30	34	39	42	42	44	43											
NC	6	7	6	7	8	9	9	10	10	19	22	22	24	25	26	28	25	27	28	28	30	29	29	29	33	38	41	42	43	43											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	48% GT	41% GT	ENC29
32% LT		5% LT	RNC71
29% LT	5% GT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	8% GT	7% GT	ENC29
7% LT		1% LT	RNC71
6% LT	1% GT		NC

Figure 6.6 ii. Alzheimer's Disease: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

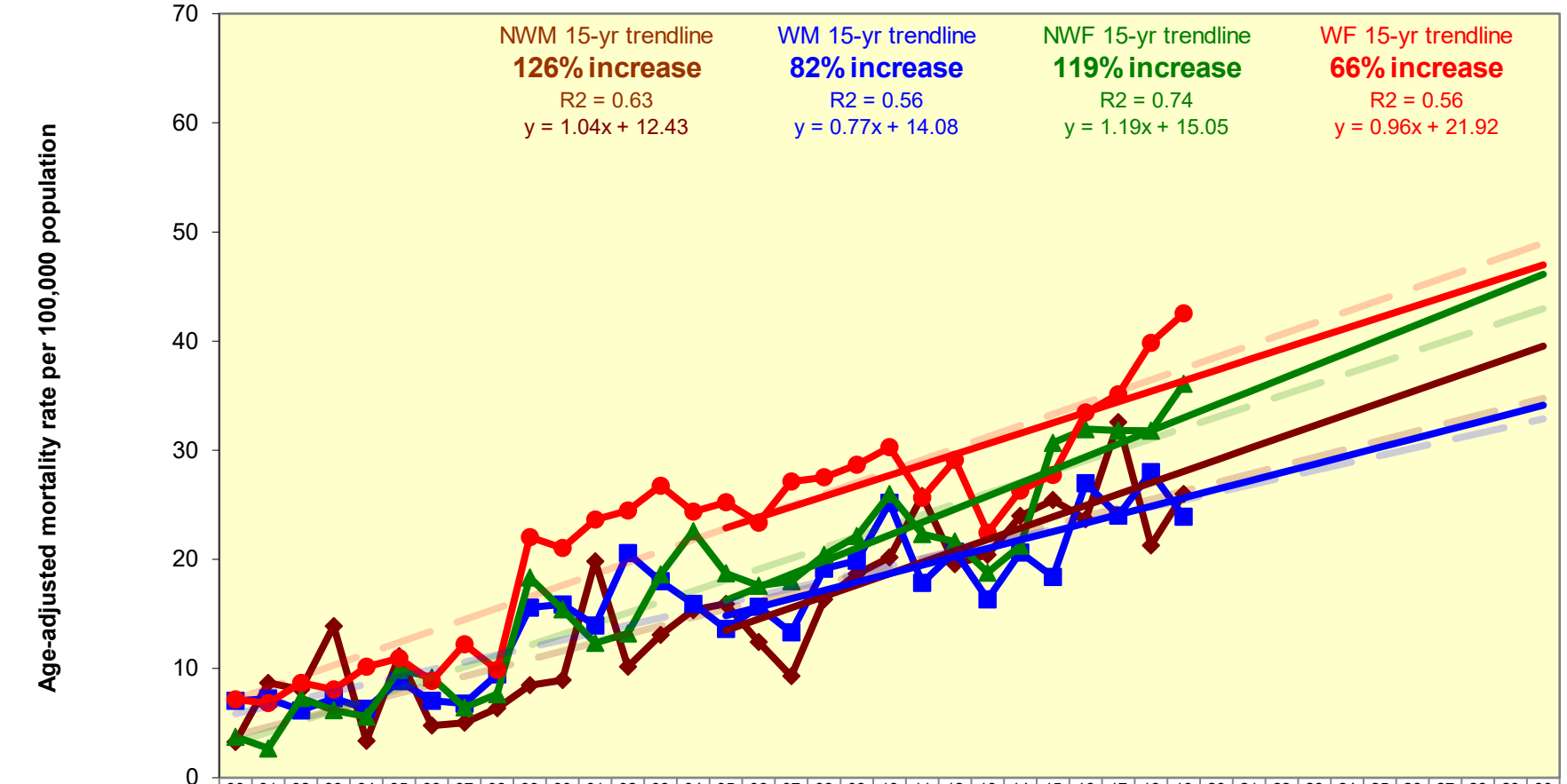


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	6	6	8	8	8	10	8	9	9	19	18	19	20	22	21	20	20	20	23	24	28	23	25	20	23	26	31	32	33	34											
RNC71	8	9	8	9	10	11	11	11	11	21	24	25	27	29	28	31	28	29	30	29	30	30	29	29	32	36	38	38	39	37											
NC	7	9	8	9	9	11	10	11	11	20	23	24	26	28	27	29	26	28	29	28	30	29	28	28	30	35	37	37	38	37											
US	6	6	6	7	8	8	8	9	9	16	18	19	21	22	23	24	24	24	26	24	25	25	24	24	25	29	30														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	45% GT	38% GT	26% GT	ENC29
31% LT		5% LT	14% LT	RNC71
28% LT	5% GT		9% LT	NC
20% LT	16% GT	10% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	19% GT	16% GT	9% LT	ENC29
16% LT		2% LT	23% LT	RNC71
14% LT	2% GT		21% LT	NC
9% GT	30% GT	27% GT		US

Figure 6.6 iii. Alzheimer's Disease: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

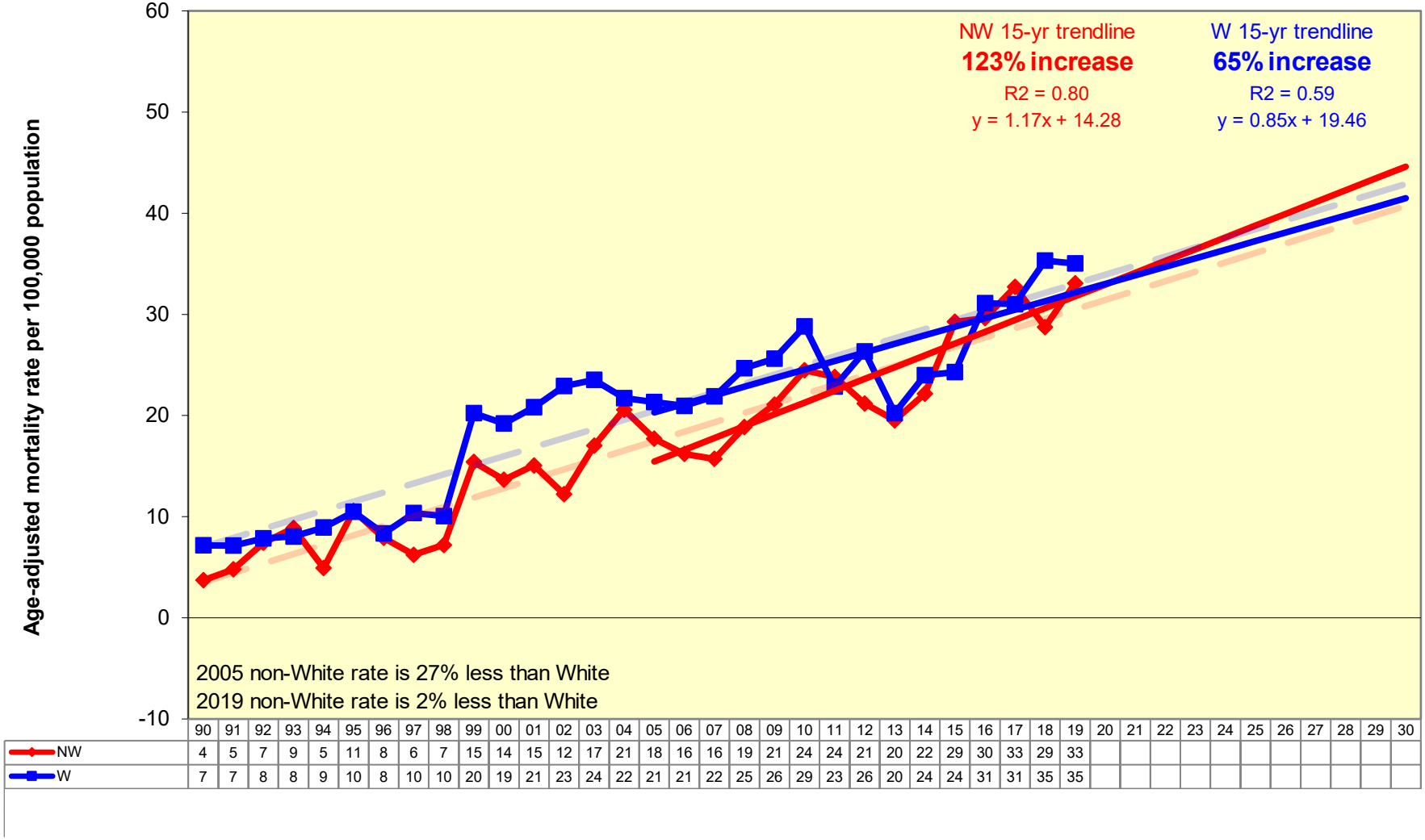


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	3	9	8	14	3	11	5	5	6	8	9	20	10	13	15	16	12	9	16	19	20	26	20	20	24	25	24	33	21	26											
WM	7	7	6	7	6	9	7	7	9	16	16	14	21	18	16	14	16	13	19	20	25	18	21	16	21	18	27	24	28	24											
NWF	4	3	7	6	6	10	9	6	8	18	15	12	13	19	23	19	18	18	20	22	26	22	22	19	21	31	32	32	32	36											
WF	7	7	9	8	10	11	9	12	10	22	21	24	24	27	24	25	23	27	28	29	30	26	29	22	26	28	33	35	40	43											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	13% GT	21% GT	76% GT	NWM
12% LT		7% GT	56% GT	WM
17% LT	6% LT		46% GT	NWF
43% LT	36% LT	31% LT		WF

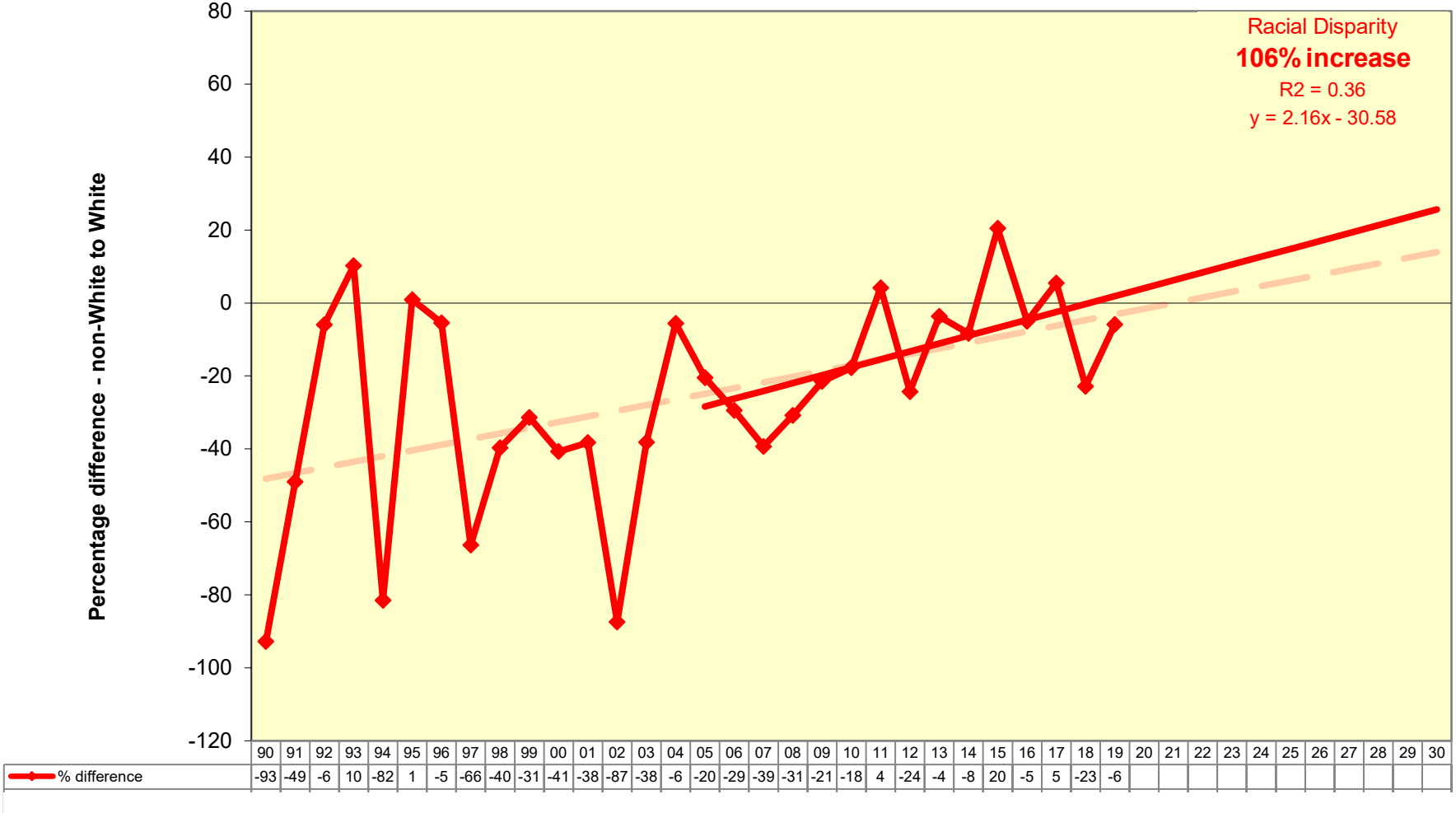
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	8% LT	18% GT	31% GT	NWM
9% GT		28% GT	42% GT	WM
15% LT	22% LT		11% GT	NWF
24% LT	30% LT	10% LT		WF

Figure 6.6 iv. Alzheimer's Disease: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	4	5	7	9	5	11	8	6	7	15	14	15	12	17	21	18	16	16	19	21	24	24	21	20	22	29	30	33	29	33											
W	7	7	8	8	9	10	8	10	10	20	19	21	23	24	22	21	21	22	25	26	29	23	26	20	24	24	31	31	35	35											

Figure 6.6 v. Alzheimer's Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030



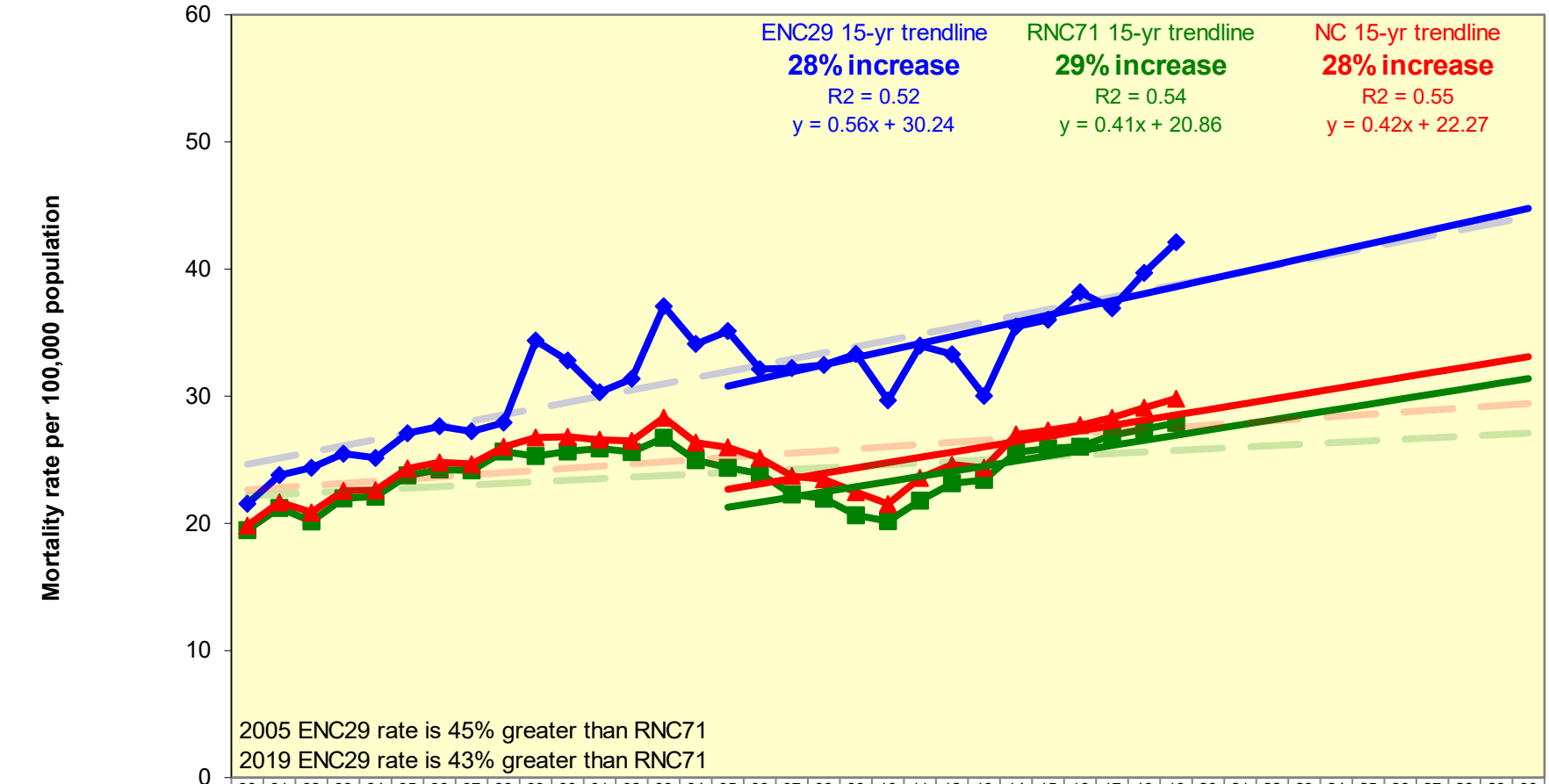
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
% difference	-93	-49	-6	10	-82	1	-5	-66	-40	-31	-41	-38	-87	-38	-6	-20	-29	-39	-31	-21	-18	4	-24	-4	-8	20	-5	5	-23	-6											

Diabetes Mellitus

- The 15-year rate trend for ENC has increased 28% over the period and is 43% greater than the RNC rate.
- In 2019, the ENC rate trend for age-adjusted diabetes mellitus is 37% greater than RNC. The 15-year trend is not reliable.
- The non-White male 15-year rate has increased but the trend is not reliable. The non-White female trend has decreased 21%. The White male and White female trends are lower but are unreliable.
- The non-White mortality rate is 11% higher than the White rate. The 15-year rate trends are unreliable.
- The 15-year 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 6.7 i. Diabetes Mellitus: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

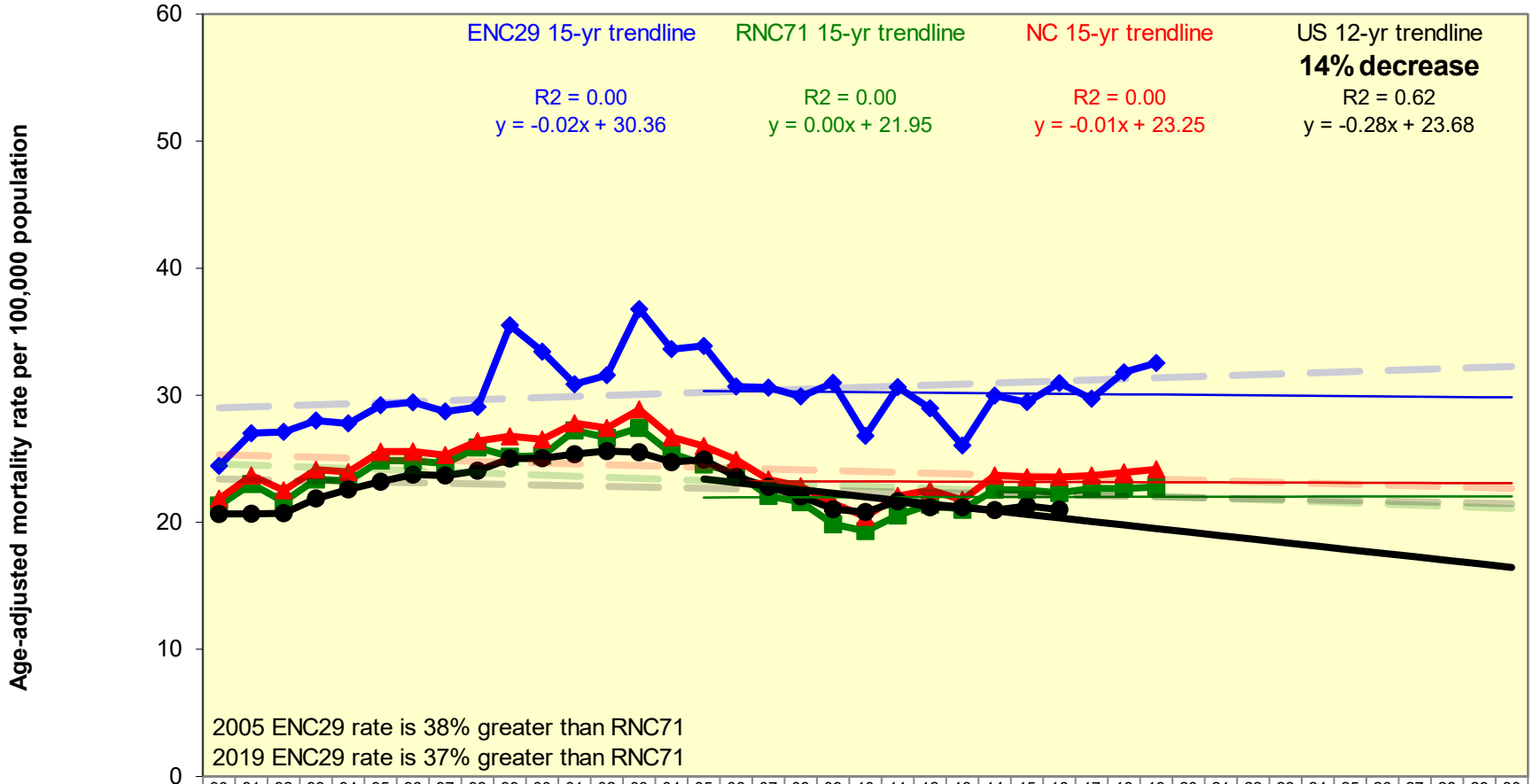


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	22	24	24	25	25	27	28	27	28	34	33	30	31	37	34	35	32	32	32	33	30	34	33	30	35	36	38	37	40	42											
RNC71	19	21	20	22	22	24	24	24	26	25	26	26	26	27	25	24	24	22	22	21	20	22	23	23	26	26	26	27	27	28											
NC	20	22	21	23	23	24	25	25	26	27	27	27	26	28	26	26	25	24	23	22	22	24	25	24	27	27	28	28	29	30											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	31% LT	26% LT	ENC29
45% GT		7% GT	RNC71
36% GT	6% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	30% LT	26% LT	ENC29
43% GT		6% GT	RNC71
35% GT	6% LT		NC

Figure 6.7 ii. Diabetes Mellitus: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

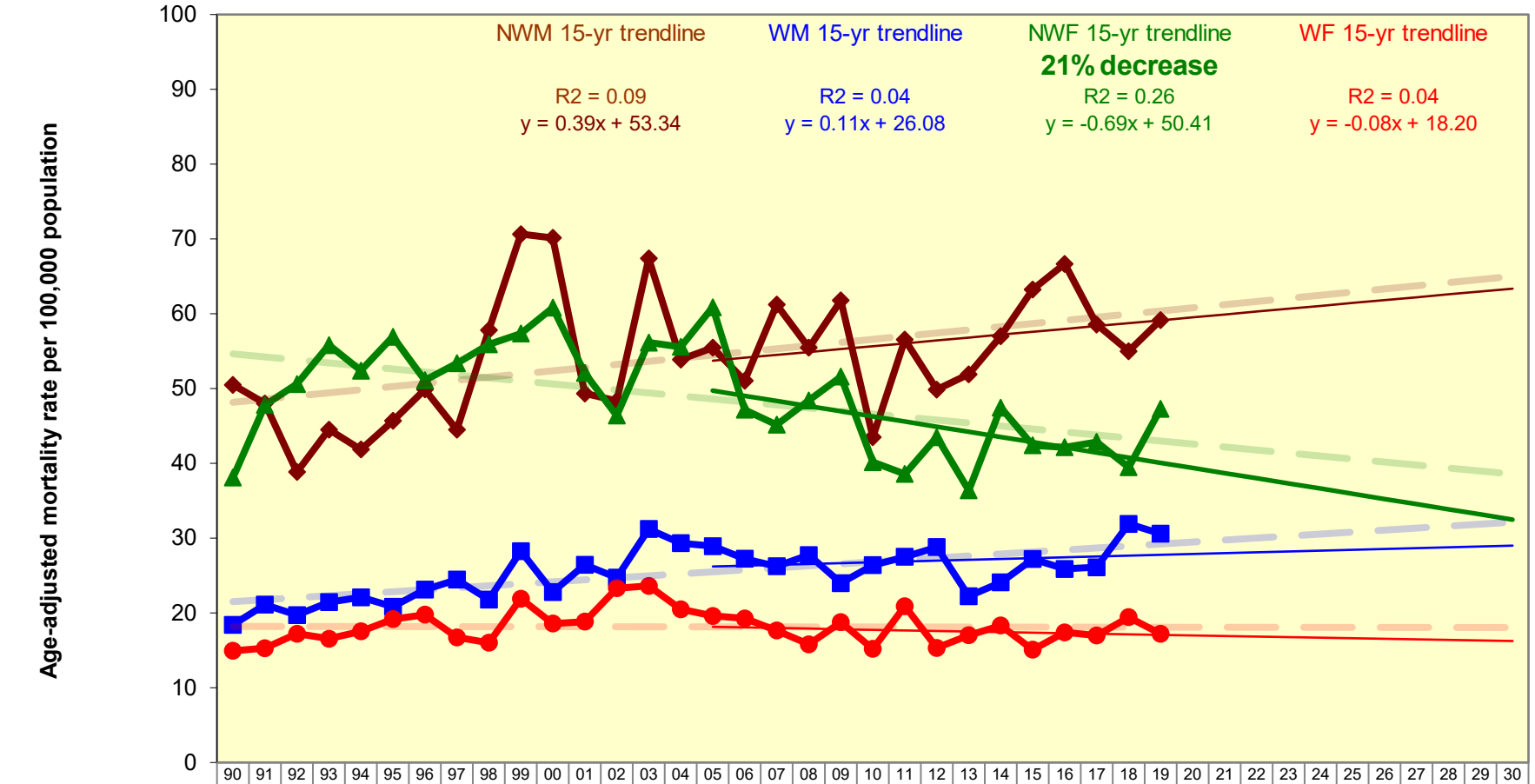


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	24	27	27	28	28	29	29	29	29	36	33	31	32	37	34	34	31	31	30	31	27	31	29	26	30	29	31	30	32	33											
RNC71	21	23	22	23	23	25	25	25	26	25	25	27	27	27	25	25	24	22	22	20	19	21	21	21	23	23	22	23	23	23											
NC	22	24	23	24	24	26	26	25	26	27	27	28	27	29	27	26	25	23	23	21	20	22	23	22	24	24	24	24	24	24											
US	21	21	21	22	23	23	24	24	24	25	25	25	26	26	25	25	24	23	22	21	21	22	21	21	21	21	21														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	28% LT	23% LT	22% LT	ENC29
38% GT		6% GT	8% GT	RNC71
31% GT	6% LT		2% GT	NC
28% GT	7% LT	2% LT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	27% LT	23% LT	34% LT	ENC29
37% GT		5% GT	10% LT	RNC71
30% GT	5% LT		15% LT	NC
52% GT	11% GT	17% GT		US

Figure 6.7 iii. Diabetes Mellitus: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

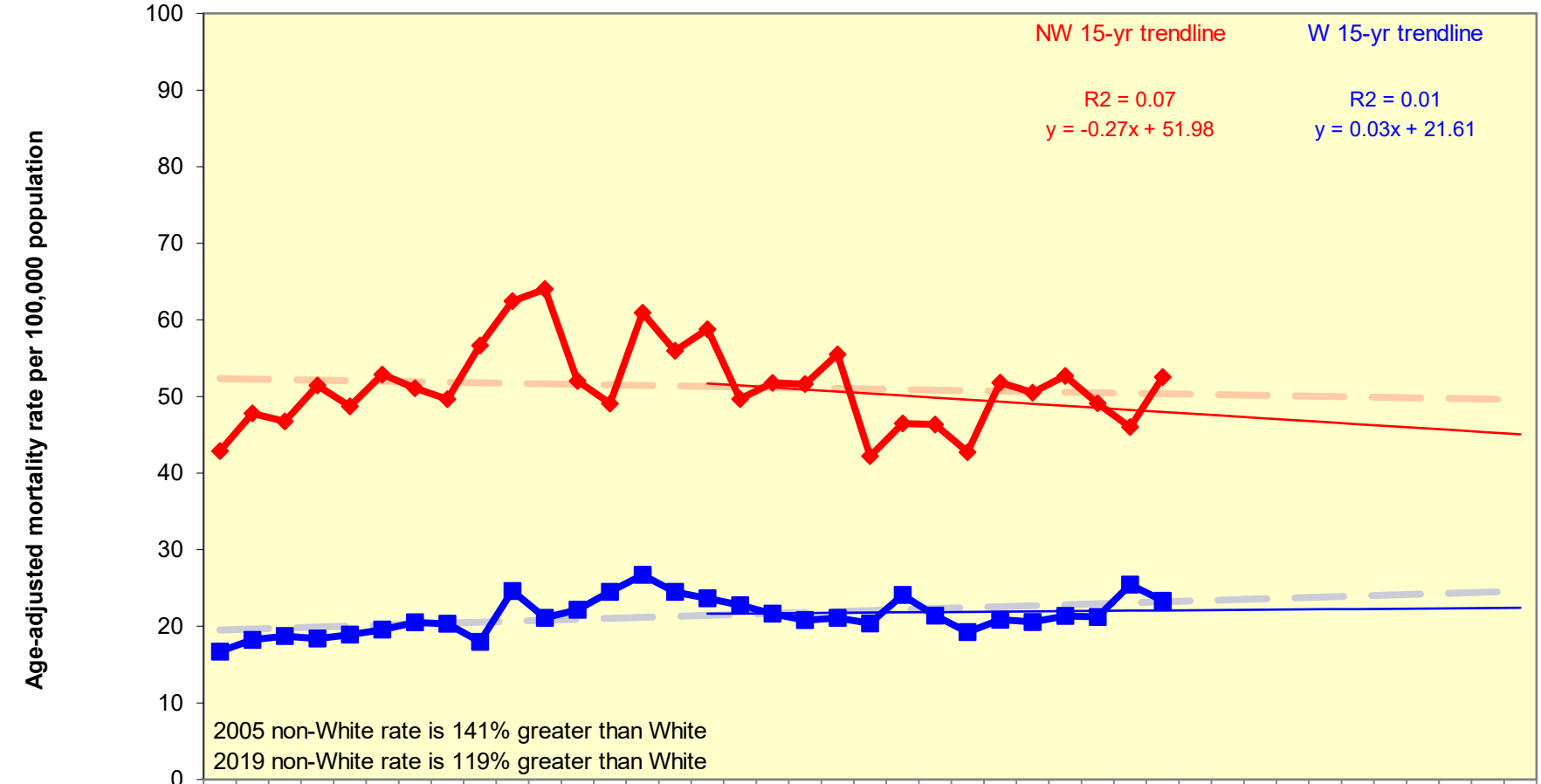


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	50	48	39	45	42	46	50	44	58	71	70	49	48	67	54	55	51	61	55	62	44	57	50	52	57	63	67	59	55	59											
WM	18	21	20	21	22	21	23	24	22	28	23	26	25	31	29	29	27	26	28	24	26	27	29	22	24	27	26	26	32	31											
NWF	38	48	51	56	52	57	51	53	56	57	61	52	46	56	56	61	47	45	48	52	40	39	43	36	47	42	42	43	39	47											
WF	15	15	17	17	18	19	20	17	16	22	19	19	23	24	20	20	19	18	16	19	15	21	15	17	18	15	17	17	19	17											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	51% LT	5% LT	66% LT	NWM
105% GT		93% GT	30% LT	WM
6% GT	48% LT		64% LT	NWF
193% GT	43% GT	177% GT		WF

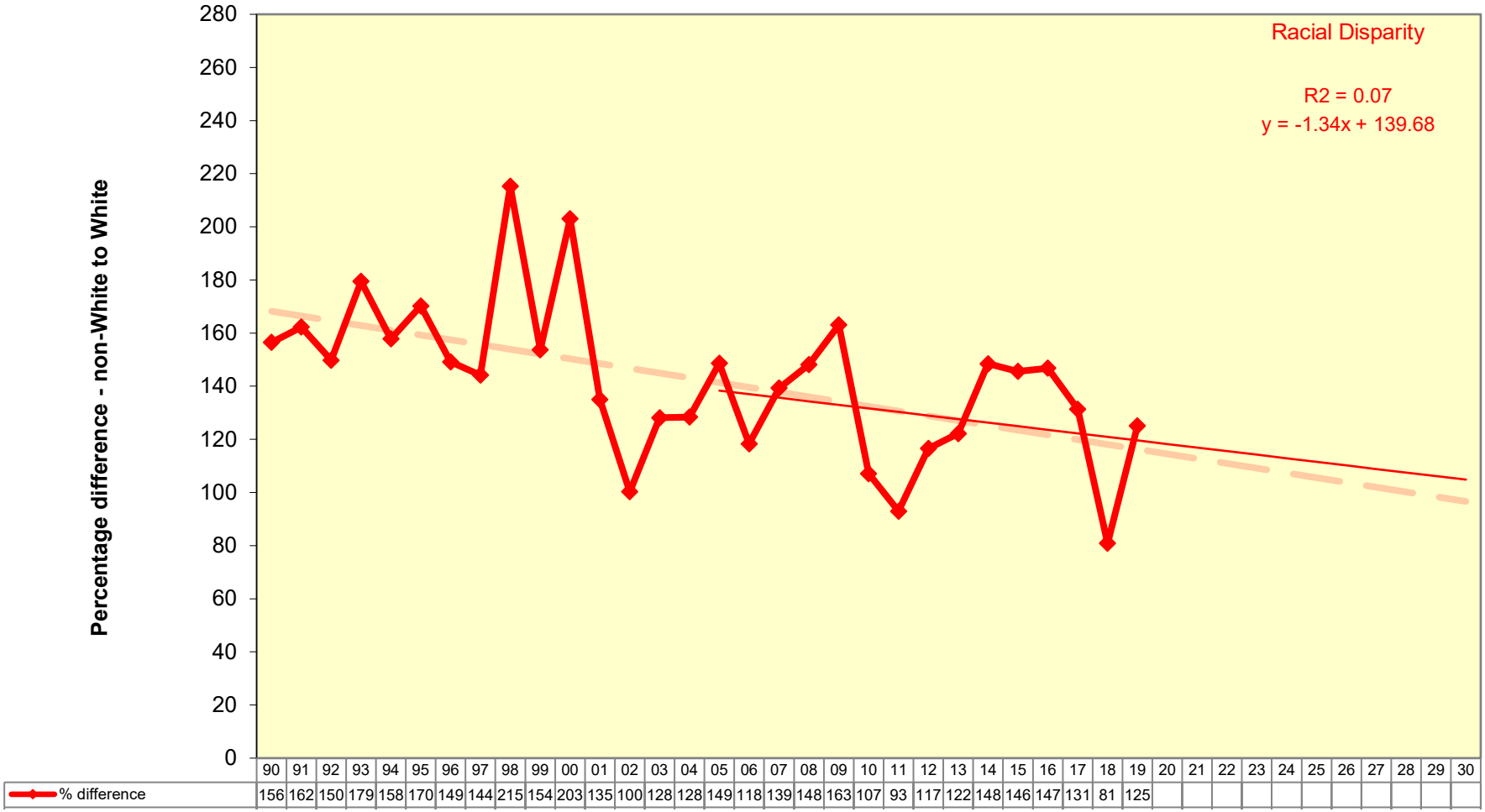
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	53% LT	31% LT	71% LT	NWM
112% GT		47% GT	38% LT	WM
44% GT	32% LT		58% LT	NWF
243% GT	61% GT	138% GT		WF

Figure 6.7 iv. Diabetes Mellitus: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	43	48	47	51	49	53	51	50	57	62	64	52	49	61	56	59	50	52	52	55	42	46	46	43	52	51	53	49	46	53											
W	17	18	19	18	19	20	21	20	18	25	21	22	25	27	24	24	23	22	21	21	20	24	21	19	21	21	21	21	25	23											

Figure 6.7 v. Diabetes Mellitus: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030

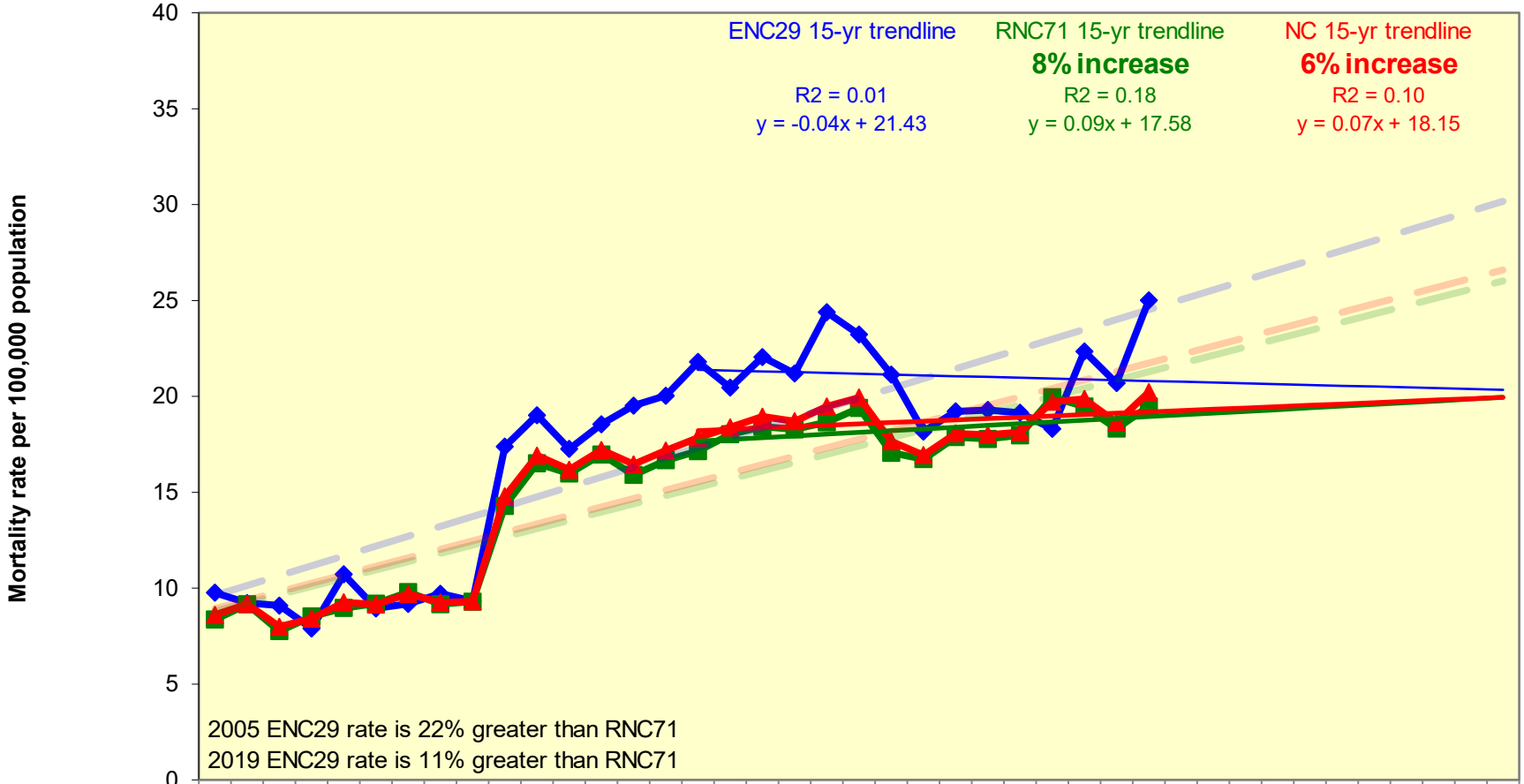


Nephritis, Nephrotic Syndrome, and Nephrosis

- In 2019 ENC's rate trend for nephritis, nephrotic syndrome and nephrosis is 11% greater than RNC, but the trend is not reliable.
- With age-adjustment, the ENC rate trend has decreased 26% over the 15-year period. It is 2% greater than the RNC rate and NC rate. They are projected to converge soon.
- The 15-year trends for non-White males and non-White females are the highest but have decreased 25% over the 15-year period. The non-White male trend in 2019 is 119% greater than the White male trend and 217% greater than the White female trend. All trends are decreasing.
- The non-White rate in 2019 is 121% greater than the White rate. It has decreased 31% over the 15-year period. The White rate has decreased 24%.
- The trend for racial disparity is decreasing but the trend 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 6.8 i. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

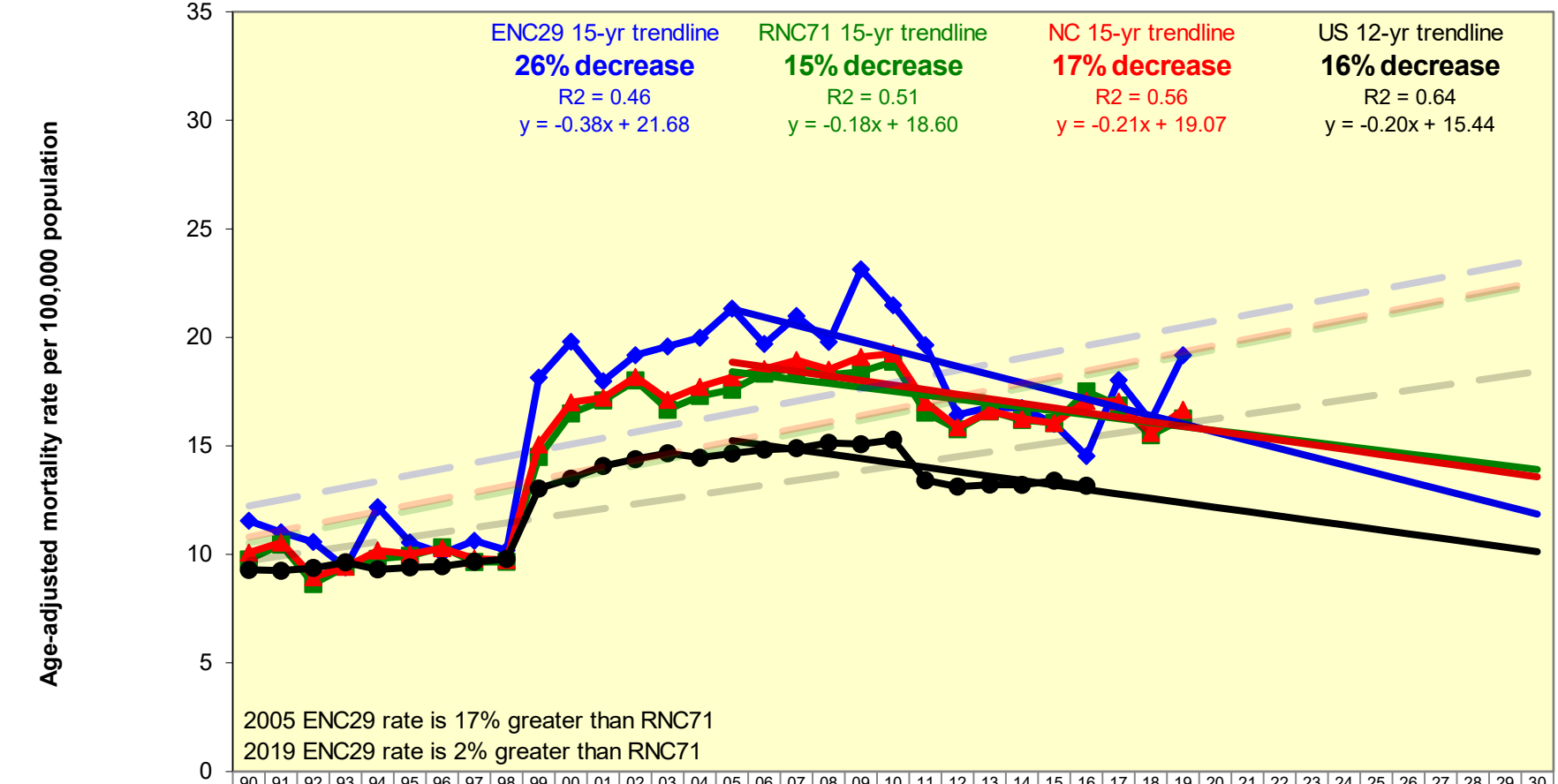


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	10	9	9	8	11	9	9	10	9	17	19	17	19	20	20	22	20	22	21	24	23	21	18	19	19	19	18	22	21	25											
RNC71	8	9	8	9	9	9	10	9	9	14	17	16	17	16	17	17	18	18	18	19	19	17	17	18	18	18	20	19	18	19											
NC	9	9	8	8	9	9	10	9	9	15	17	16	17	16	17	18	18	19	19	19	20	18	17	18	18	18	20	20	19	20											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	18% LT	15% LT	ENC29
22% GT		3% GT	RNC71
18% GT	3% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	10% LT	8% LT	ENC29
11% GT		1% GT	RNC71
9% GT	1% LT		NC

Figure 6.8 ii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

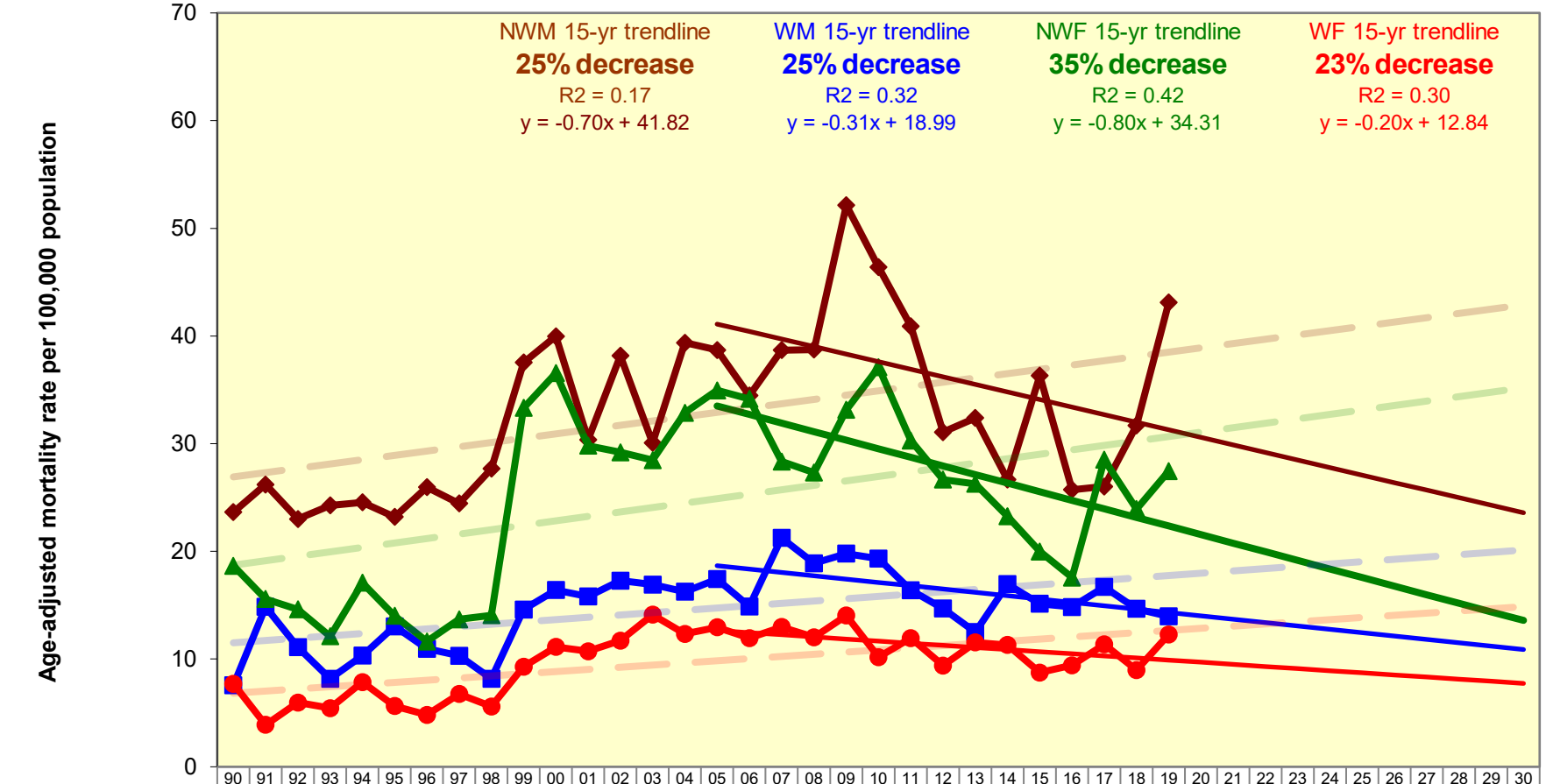


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	12	11	11	9	12	11	10	11	10	18	20	18	19	20	20	21	20	21	20	23	21	20	16	17	17	16	15	18	16	19											
RNC71	10	10	9	9	10	10	10	10	10	14	17	17	18	17	17	18	18	19	18	18	19	17	16	17	16	16	18	17	15	16											
NC	10	11	9	9	10	10	10	10	10	15	17	17	18	17	18	18	19	19	19	19	19	17	16	17	16	16	17	17	16	17											
US	9	9	9	10	9	9	9	10	10	13	13	14	14	15	14	15	15	15	15	15	15	13	13	13	13	13	13														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	14% LT	12% LT	29% LT	ENC29
17% GT		3% GT	17% LT	RNC71
14% GT	2% LT		19% LT	NC
40% GT	20% GT	23% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	2% LT	2% LT	23% LT	ENC29
2% GT		0% GT	22% LT	RNC71
2% GT	0% LT		22% LT	NC
30% GT	28% GT	28% GT		US

Figure 6.8 iii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

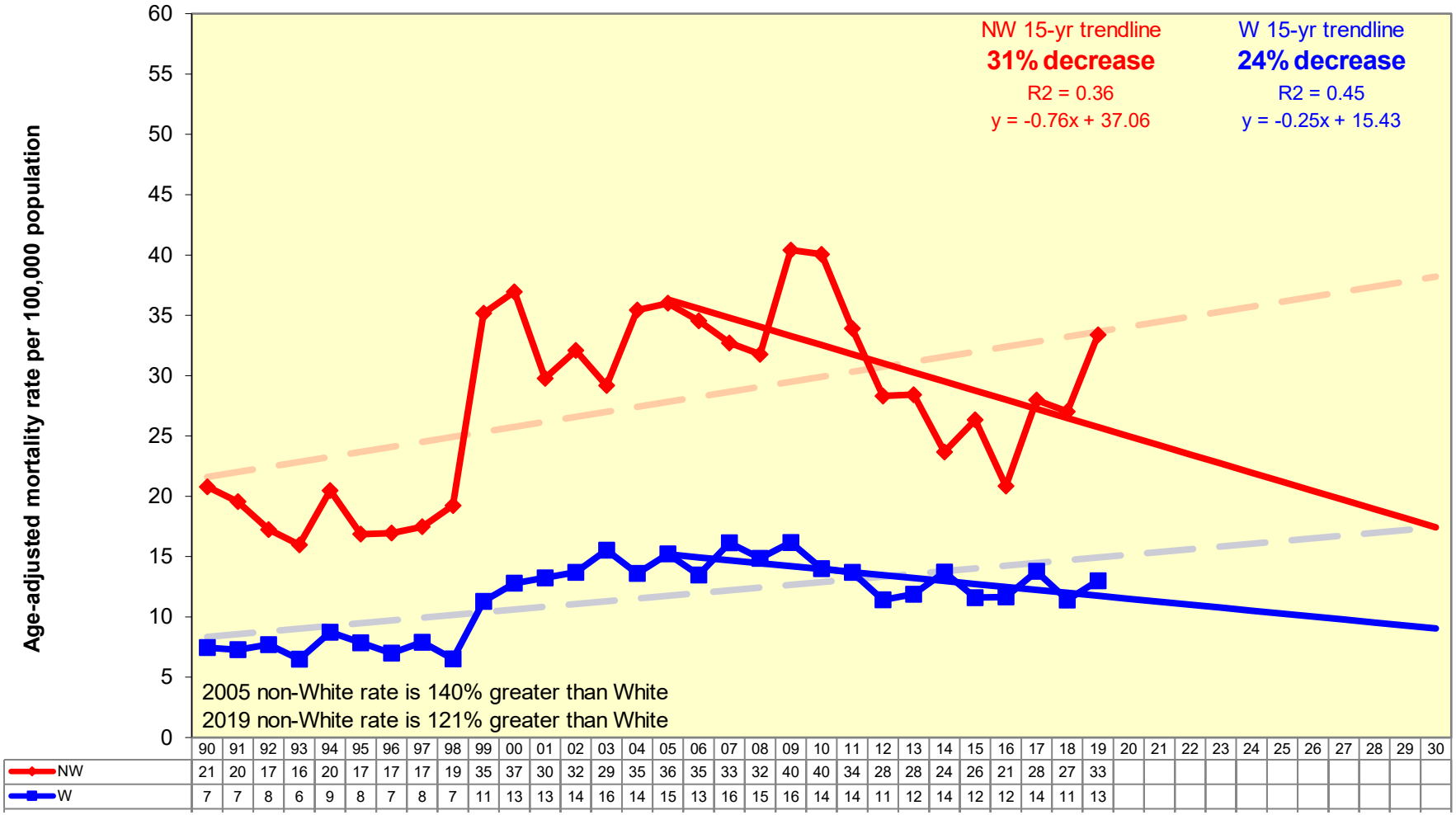


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	24	26	23	24	25	23	26	24	28	38	40	30	38	30	39	39	34	39	39	52	46	41	31	32	27	36	26	26	32	43											
WM	8	15	11	8	10	13	11	10	8	15	16	16	17	17	16	17	15	21	19	20	19	16	15	13	17	15	15	17	15	14											
NWF	19	16	15	12	17	14	12	14	14	33	37	30	29	28	33	35	34	28	27	33	37	30	27	26	23	20	18	29	24	27											
WF	8	4	6	5	8	6	5	7	6	9	11	11	12	14	12	13	12	13	12	14	10	12	9	12	11	9	9	11	9	12											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	55% LT	18% LT	69% LT	NWM
120% GT		81% GT	32% LT	WM
22% GT	45% LT		63% LT	NWF
226% GT	48% GT	167% GT		WF

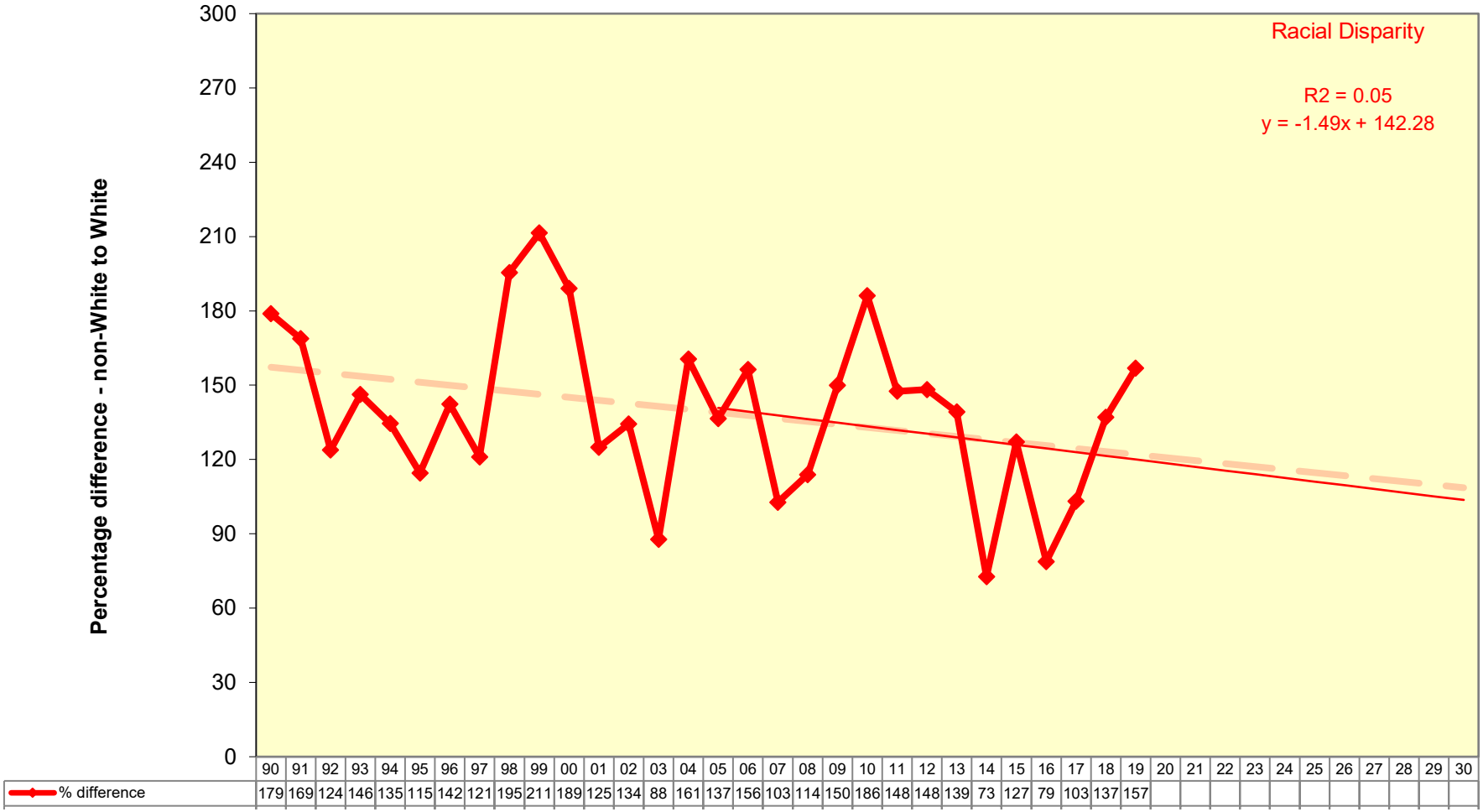
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	54% LT	28% LT	68% LT	NWM
119% GT		58% GT	31% LT	WM
38% GT	37% LT		56% LT	NWF
217% GT	45% GT	129% GT		WF

Figure 6.8 iv. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	21	20	17	16	20	17	17	17	19	35	37	30	32	29	35	36	35	33	32	40	40	34	28	28	24	26	21	28	27	33											
W	7	7	8	6	9	8	7	8	7	11	13	13	14	16	14	15	13	16	15	16	14	14	11	12	14	12	12	14	11	13											

Figure 6.8 v. Nephritis, Nephrotic Syndrome, and Nephrosis: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030

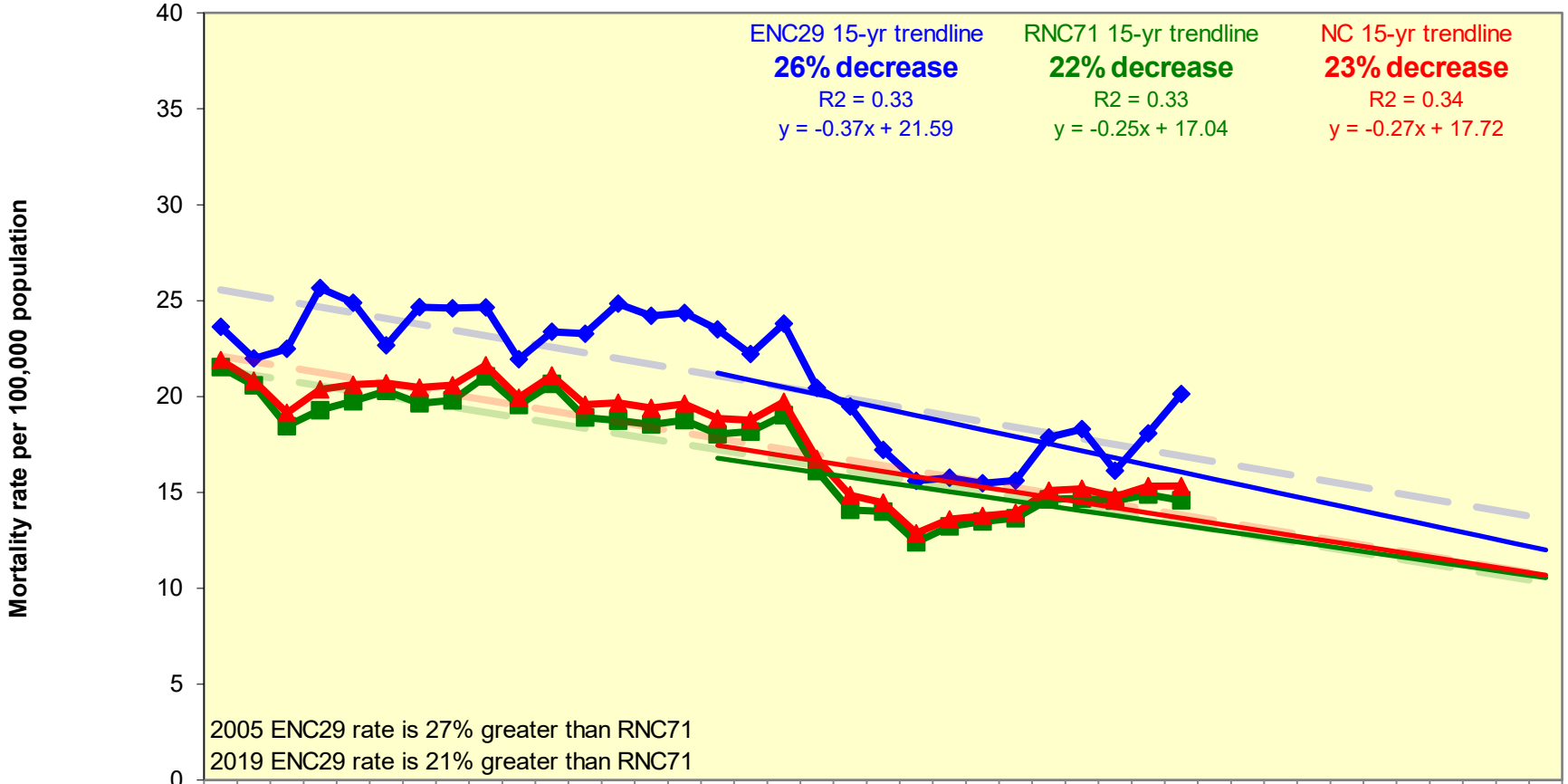


Unintentional Motor Vehicle Injuries

- The mortality rate trend for unintentional motor vehicle injuries in ENC has deceased by 26% over the 15-year period, but has recently ticked up. The rate for NC has decreased. In 2019 ENC's rate trend is 21% greater than RNC.
- With age-adjustment, the ENC rate trend has decreased 27% over the 15-year period, but has recently gone up. It is 22% greater than the RNC rate and 18% greater than the NC rate.
- The 15-year trends for non-White males and White males are the highest, but the White male trend line has experienced a 44% decrease over the 15-year period. The rate for non-White males is unreliable. Non-White females and White females are lower, with White females projected to decrease.
- The non-White rate in 2019 is 52% greater than the White rate but is unreliable. The White rate is decreasing, 43% over 15 years.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future.

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. Unintentional Motor Vehicle Injuries: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

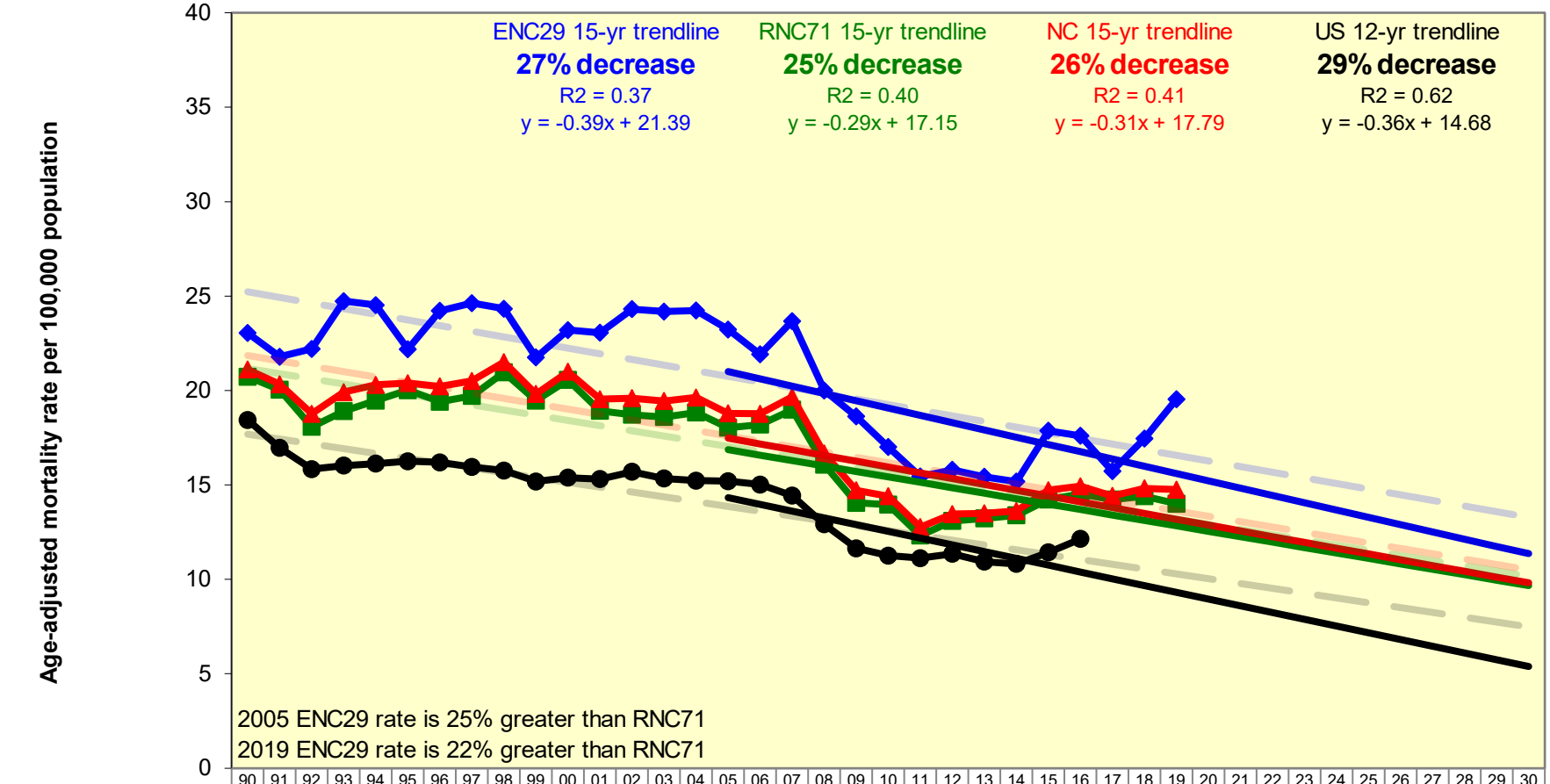


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	24	22	22	26	25	23	25	25	25	22	23	23	25	24	24	23	22	24	20	19	17	16	16	15	16	18	18	16	18	20											
RNC71	22	21	18	19	20	20	20	20	21	20	21	19	19	19	19	18	18	19	16	14	14	12	13	13	14	15	15	15	15	15											
NC	22	21	19	20	21	21	20	21	22	20	21	20	20	19	20	19	19	20	17	15	14	13	14	14	14	15	15	15	15	15											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	21% LT	18% LT	ENC29
27% GT		4% GT	RNC71
22% GT	4% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	18% LT	15% LT	ENC29
21% GT		3% GT	RNC71
18% GT	3% LT		NC

Figure 6.9 ii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

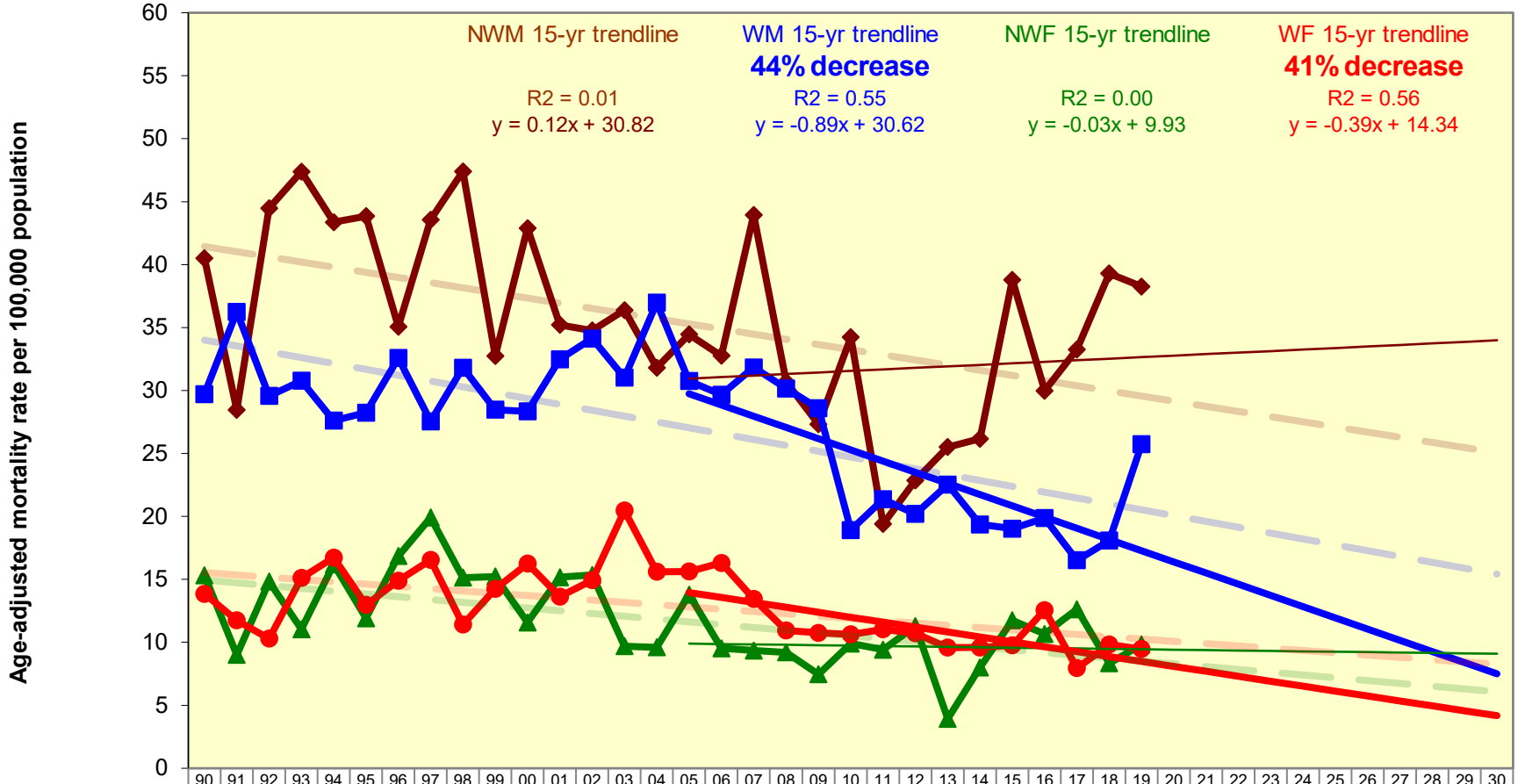


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	23	22	22	25	25	22	24	25	24	22	23	23	24	24	24	23	22	24	20	19	17	15	16	15	15	18	18	16	17	20											
RNC71	21	20	18	19	19	20	19	20	21	19	21	19	19	19	19	18	18	19	16	14	14	12	13	13	13	14	15	14	14	14											
NC	21	20	19	20	20	20	20	21	22	20	21	20	20	19	20	19	19	20	17	15	14	13	13	13	14	15	15	14	15	15											
US	18	17	16	16	16	16	16	16	16	15	15	15	16	15	15	15	15	14	13	12	11	11	11	11	11	11	12														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	20% LT	17% LT	31% LT	ENC29
25% GT		4% GT	14% LT	RNC71
20% GT	4% LT		17% LT	NC
46% GT	17% GT	21% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	18% LT	16% LT	39% LT	ENC29
22% GT		3% GT	26% LT	RNC71
18% GT	3% LT		28% LT	NC
65% GT	36% GT	39% GT		US

Figure 6.9 iii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

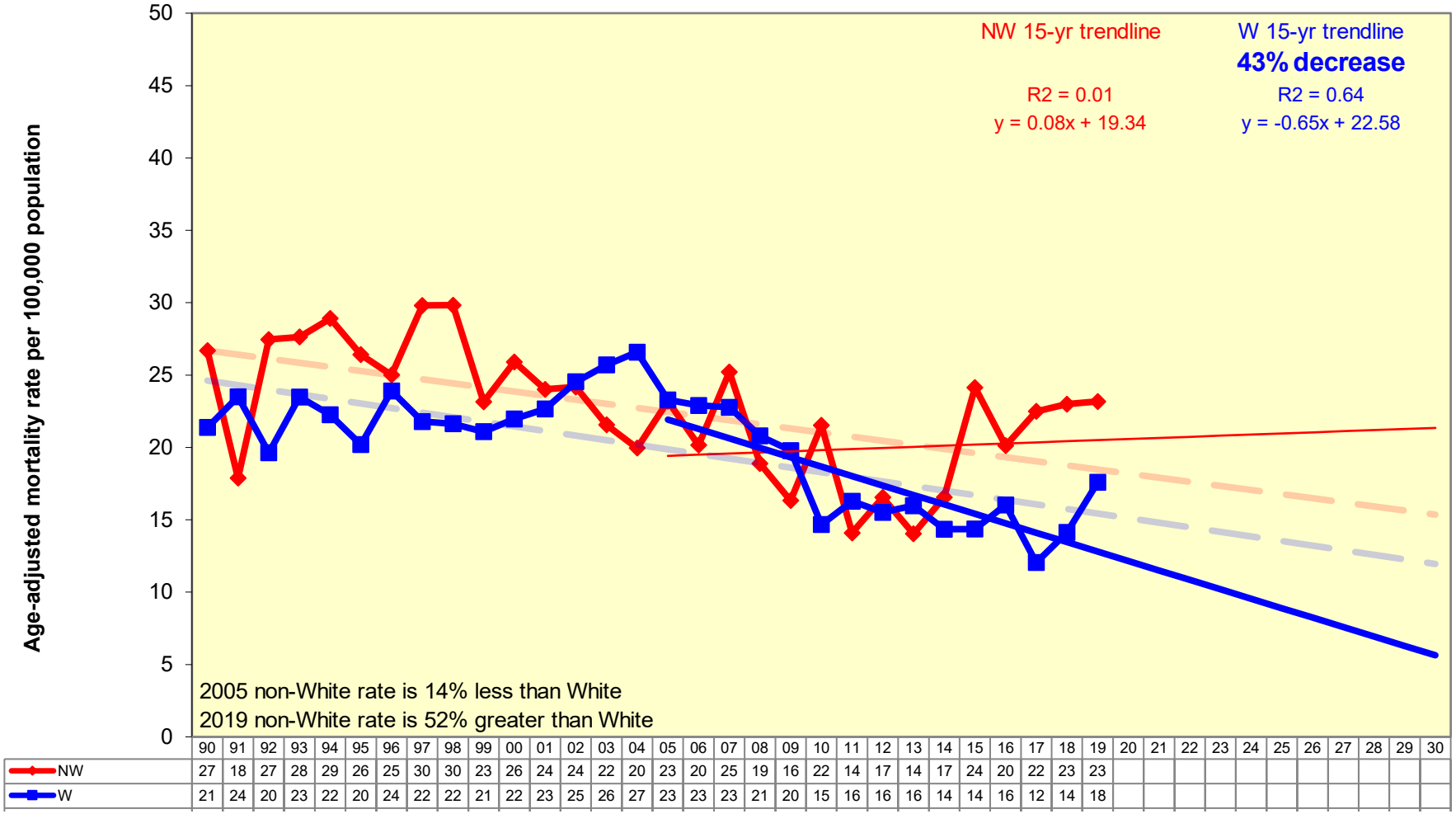


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	41	28	44	47	43	44	35	44	47	33	43	35	35	36	32	34	33	44	31	27	34	19	23	26	26	39	30	33	39	38											
WM	30	36	30	31	28	28	33	28	32	28	28	32	34	31	37	31	30	32	30	29	19	21	20	23	19	19	20	17	18	26											
NWF	15	9	15	11	16	12	17	20	15	15	12	15	15	10	10	14	10	9	9	7	10	9	11	4	8	12	11	13	8	10											
WF	14	12	10	15	17	13	15	17	11	14	16	14	15	20	16	16	16	13	11	11	11	11	11	10	10	10	13	8	10	9											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	1% LT	68% LT	53% LT	NWM
1% GT		68% LT	53% LT	WM
210% GT	208% GT		44% GT	NWF
115% GT	114% GT	31% LT		WF

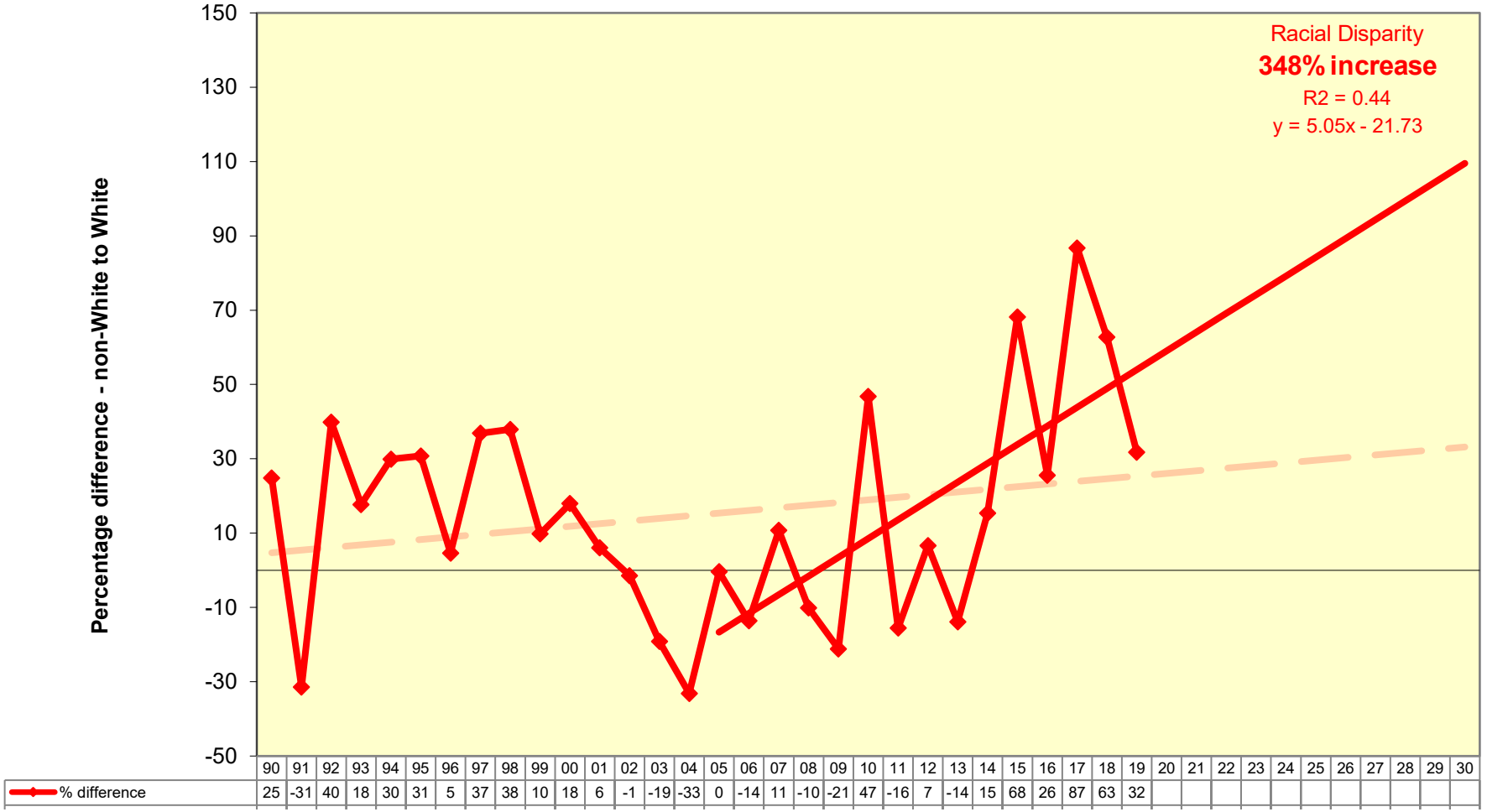
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	44% LT	71% LT	73% LT	NWM
79% GT		48% LT	51% LT	WM
243% GT	92% GT		6% LT	NWF
267% GT	105% GT	7% GT		WF

Figure 6.9 iv. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	27	18	27	28	29	26	25	30	30	23	26	24	24	22	20	23	20	25	19	16	22	14	17	14	17	24	20	22	23	23											
W	21	24	20	23	22	20	24	22	22	21	22	23	25	26	27	23	23	23	21	20	15	16	16	16	14	14	16	12	14	18											

Figure 6.9 v. Unintentional Motor Vehicle Injuries: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030

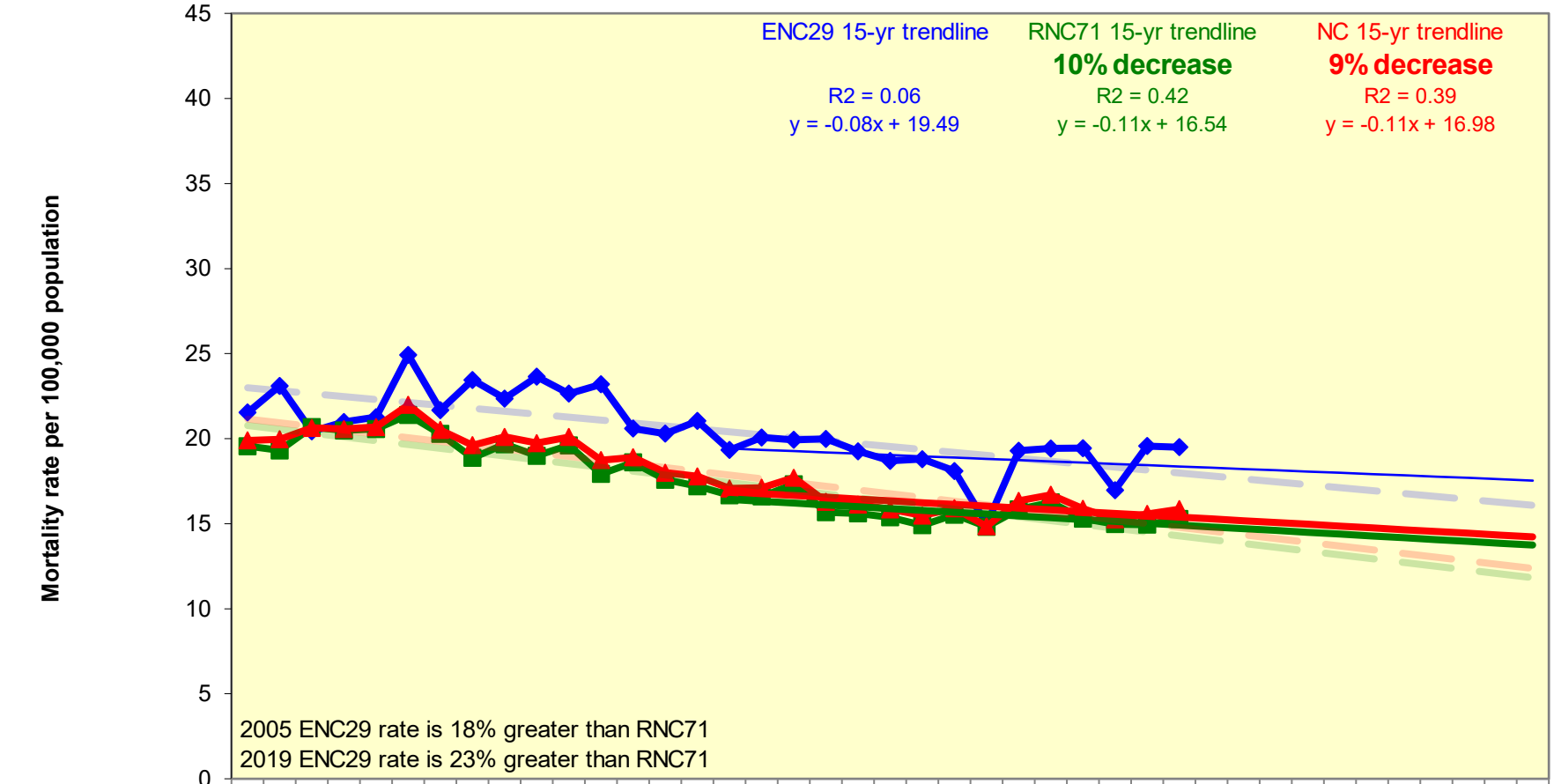


Cancer - Colon, Rectum, Anus

- The mortality rate trend for unintentional motor vehicle injuries in ENC has deceased by 26% over the 15-year period, but has recently ticked up. The rate for NC has decreased. In 2019 ENC's rate trend is 21% greater than RNC.
- With age-adjustment, the ENC rate trend has decreased 27% over the 15-year period, but has recently gone up. It is 22% greater than the RNC rate and 18% greater than the NC rate.
- The 15-year trends for non-White males and White males are the highest, but the White male trend line has experienced a 44% decrease over the 15-year period. The rate for non-White males is unreliable. Non-White females and White females are lower, with White females projected to decrease.
- The non-White rate in 2019 is 52% greater than the White rate but is unreliable. The White rate is decreasing, 43% over 15 years.
- The 15-year trend shows an increase in disparity that favors Whites and is projected to increase in the future.

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. Cancer - Colon, Rectum, Anus: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

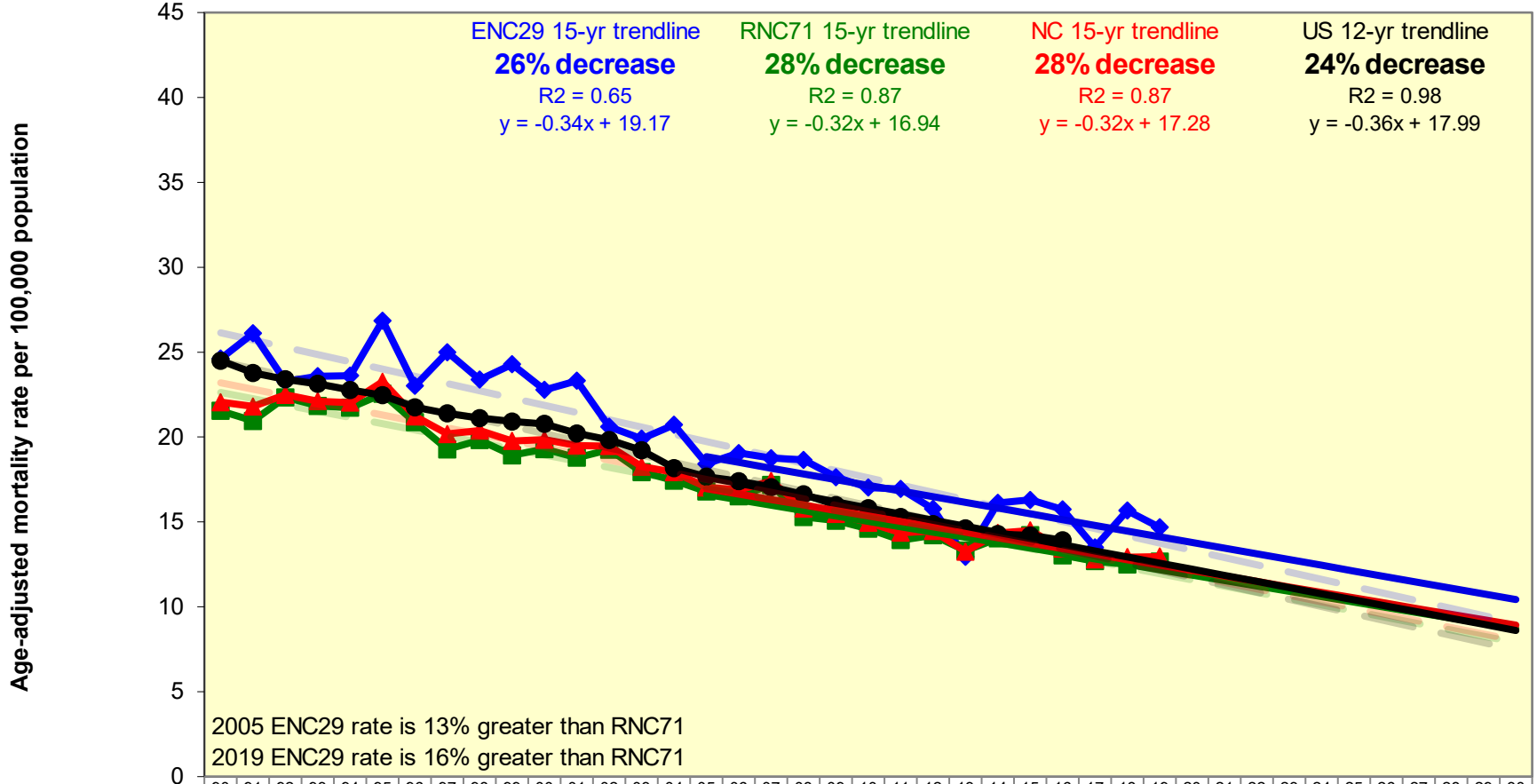


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	22	23	20	21	21	25	22	23	22	24	23	23	21	20	21	19	20	20	20	19	19	19	18	15	19	19	19	17	20	19											
RNC71	20	19	21	20	21	21	20	19	20	19	20	18	19	18	17	17	17	17	16	16	15	15	16	15	16	16	15	15	15	15											
NC	20	20	21	21	21	22	21	20	20	20	20	19	19	18	18	17	17	18	16	16	16	15	16	15	16	17	16	15	16	16											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	15% LT	13% LT	ENC29
18% GT		3% GT	RNC71
15% GT	3% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	18% LT	16% LT	ENC29
23% GT		3% GT	RNC71
19% GT	3% LT		NC

Figure 6.10 ii. Cancer - Colon, Rectum, Anus: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

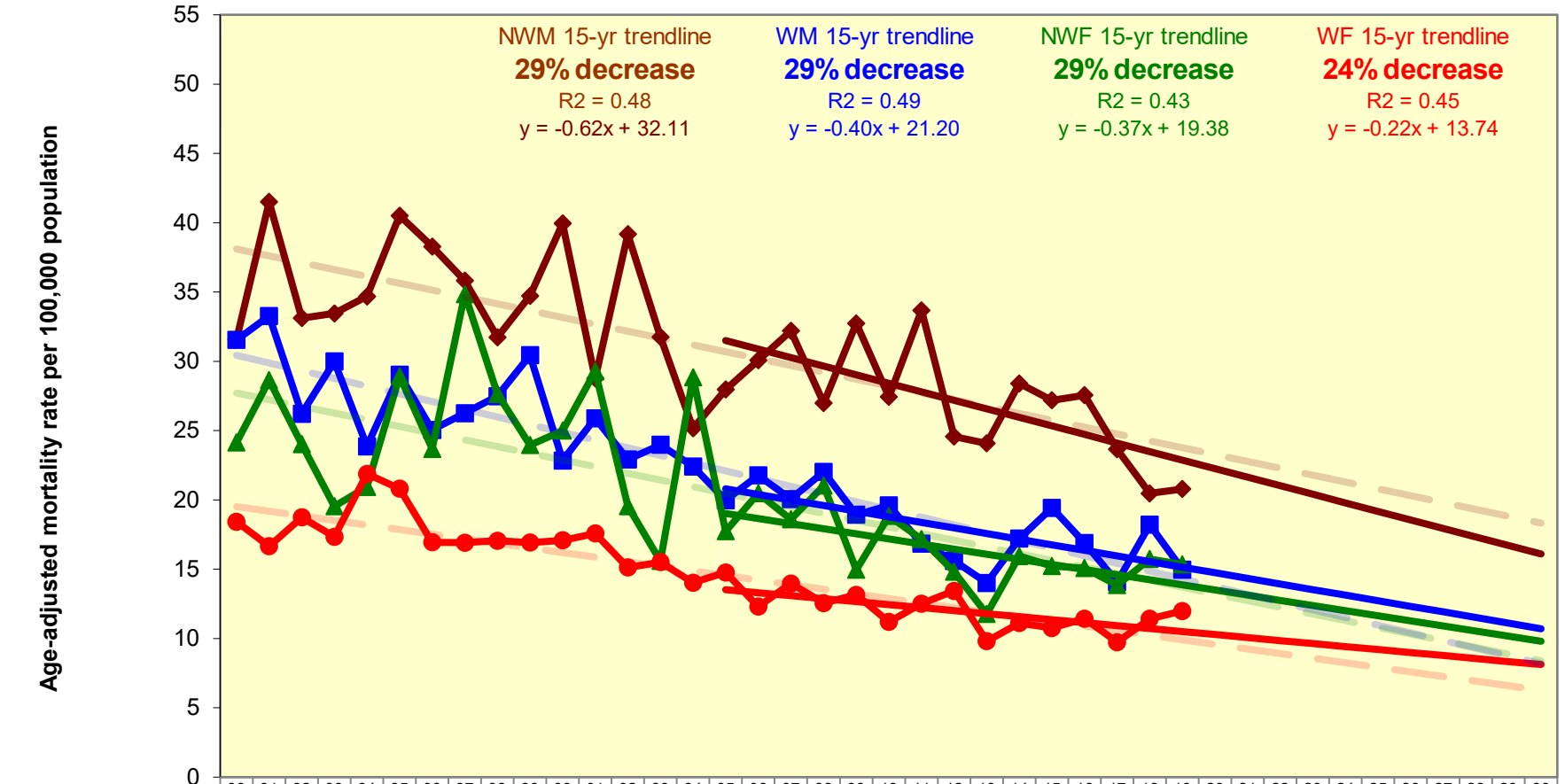


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	25	26	23	24	24	27	23	25	23	24	23	23	21	20	21	18	19	19	19	18	17	17	16	13	16	16	16	14	16	15											
RNC71	22	21	22	22	22	23	21	19	20	19	19	19	19	18	17	17	17	17	15	15	15	14	14	13	14	14	13	13	12	13											
NC	22	22	22	22	22	23	21	20	20	20	20	19	19	18	18	17	17	17	16	15	15	14	14	13	14	14	13	13	13	13											
US	24	24	23	23	23	22	22	21	21	21	21	20	20	19	18	18	17	17	17	16	16	15	15	15	14	14	14														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	12% LT	10% LT	6% LT	ENC29
13% GT		2% GT	6% GT	RNC71
11% GT	2% LT		4% GT	NC
7% GT	6% LT	4% LT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	14% LT	12% LT	11% LT	ENC29
16% GT		2% GT	3% GT	RNC71
13% GT	2% LT		1% GT	NC
12% GT	3% LT	1% LT		US

Figure 6.10 iii. Cancer - Colon, Rectum, Anus: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

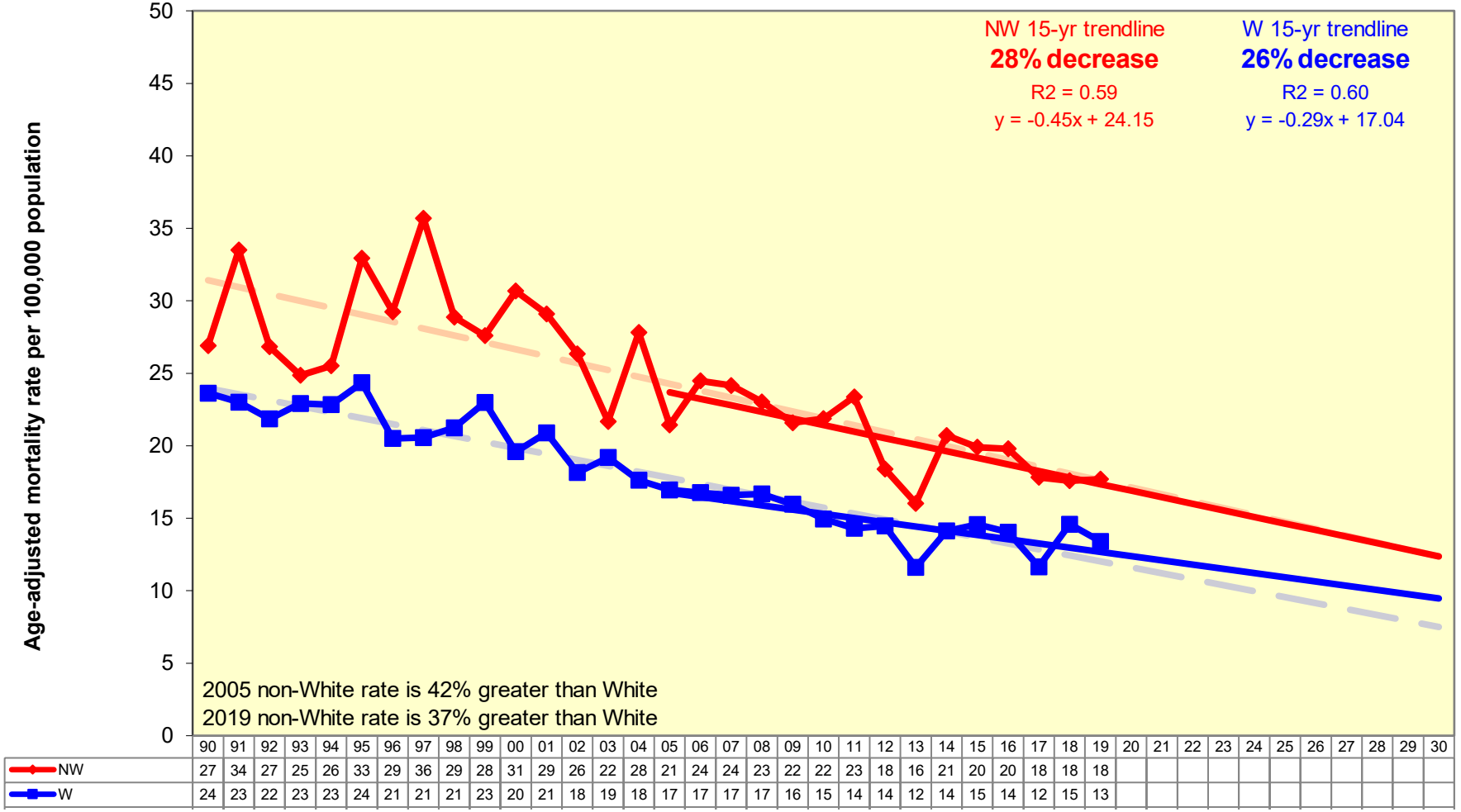


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	32	42	33	33	35	41	38	36	32	35	40	29	39	32	25	28	30	32	27	33	27	34	25	24	28	27	28	24	20	21											
WM	32	33	26	30	24	29	25	26	27	30	23	26	23	24	22	20	22	20	22	19	20	17	16	14	17	19	17	14	18	15											
NWF	24	29	24	20	21	29	24	35	28	24	25	29	20	16	29	18	20	19	21	15	19	17	15	12	16	15	15	14	16	15											
WF	18	17	19	17	22	21	17	17	17	17	17	18	15	16	14	15	12	14	13	13	11	13	13	10	11	11	11	10	11	12											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	34% LT	40% LT	57% LT	NWM
51% GT		9% LT	35% LT	WM
66% GT	9% GT		29% LT	NWF
134% GT	54% GT	41% GT		WF

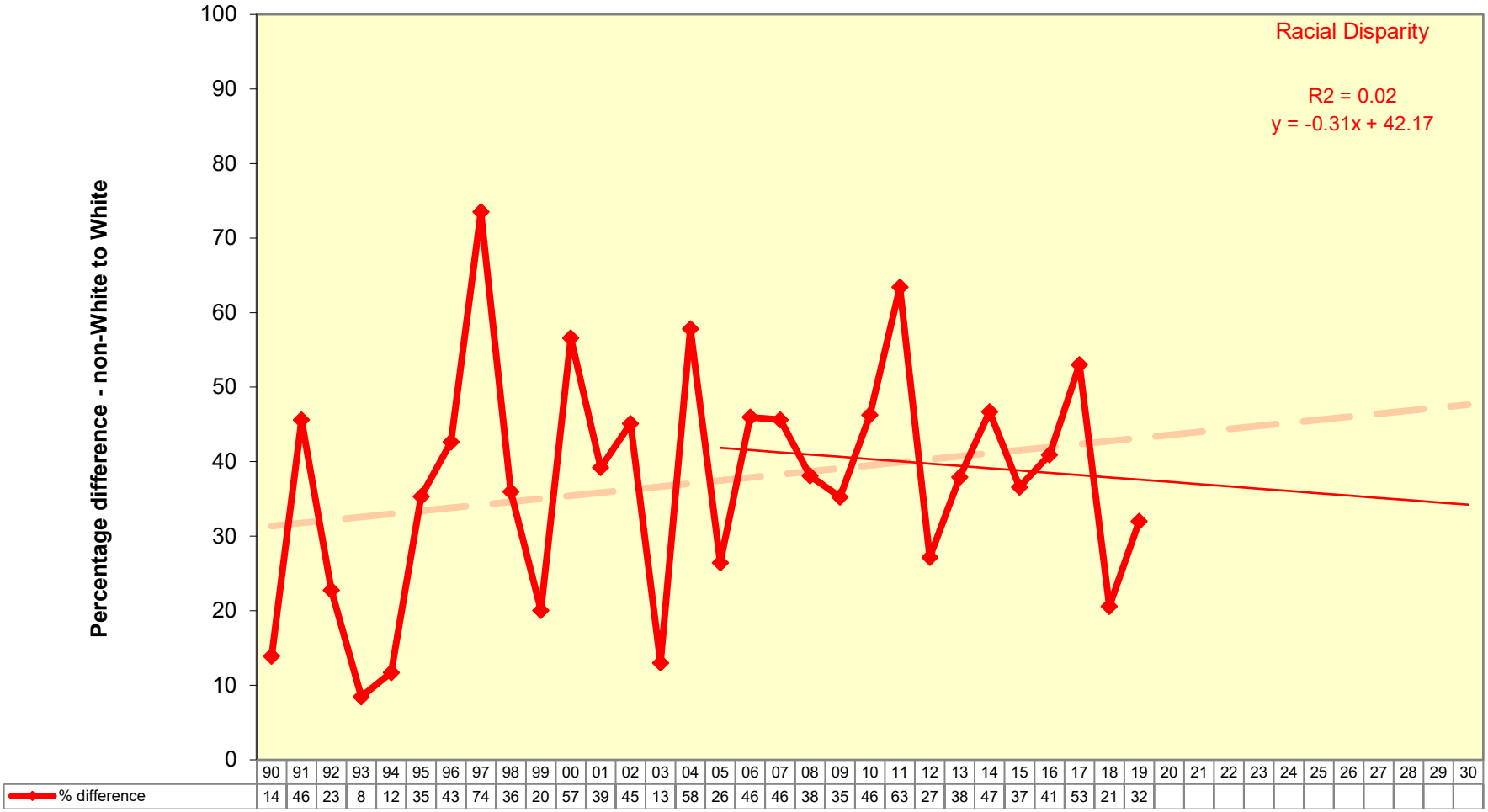
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	34% LT	39% LT	54% LT	NWM
51% GT		9% LT	31% LT	WM
65% GT	9% GT		25% LT	NWF
119% GT	45% GT	33% GT		WF

Figure 6.10 iv. Cancer - Colon, Rectum, Anus: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	27	34	27	25	26	33	29	36	29	28	31	29	26	22	28	21	24	24	23	22	22	23	18	16	21	20	20	18	18	18											
W	24	23	22	23	23	24	21	21	21	23	20	21	18	19	18	17	17	17	17	16	15	14	14	12	14	15	14	12	15	13											

Figure 6.10 v. Cancer - Colon, Rectum, Anus: Measuring disparity in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
% difference	14	46	23	8	12	35	43	74	36	20	57	39	45	13	58	26	46	46	38	35	46	63	27	38	47	37	41	53	21	32											

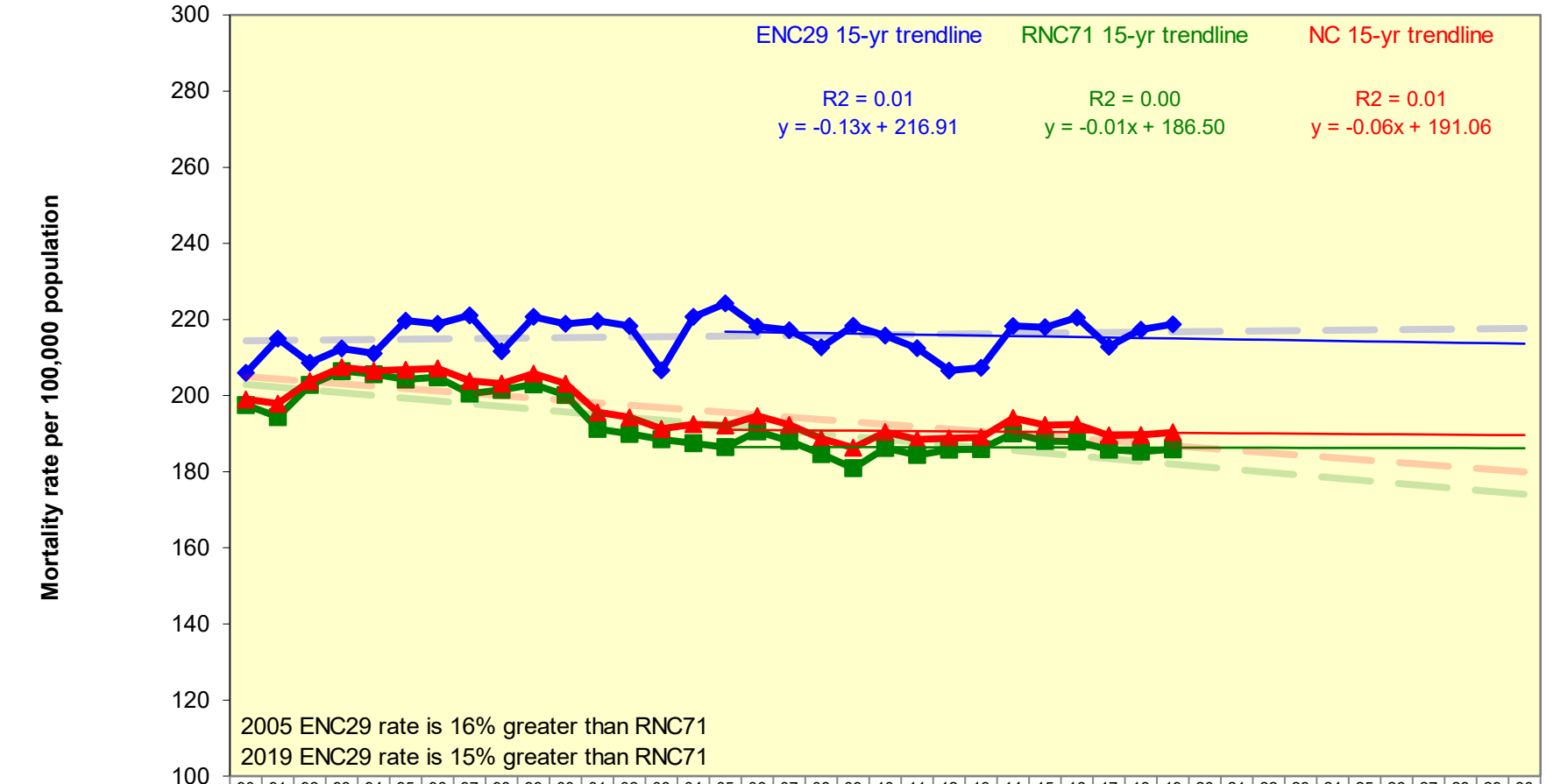
7. Trends and Disparities in Mortality in ENC29: Cancer - All Sites and HIV Disease; 1990-2019

Cancer - All Sites

- The cancer—all sites mortality rate trends for ENC, RNC, and NC are flat and are not reliable.
- The age-adjusted cancer—all sites mortality rate trends for ENC, RNC, NC and US are all decreasing. The ENC rate is 8% greater than the NC rate.
- The rate trend is decreasing for all groups. The rate for non-White males is the highest, but it is decreasing the most and set to converge with the rate for White males. White and non-White females are lower.
- Both the White and non-White cancer mortality trends are decreasing over the15 year period. The non-White rate decreased 30% and the White rate decreased 21%. The non-White rate remains 8% greater than the White rate in 2019 but they are converging.
- The 15-year trend for racial disparity shows a 67% decrease.

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 ENC29, RNC71, and NC, 1990-2019 with projections to 2030

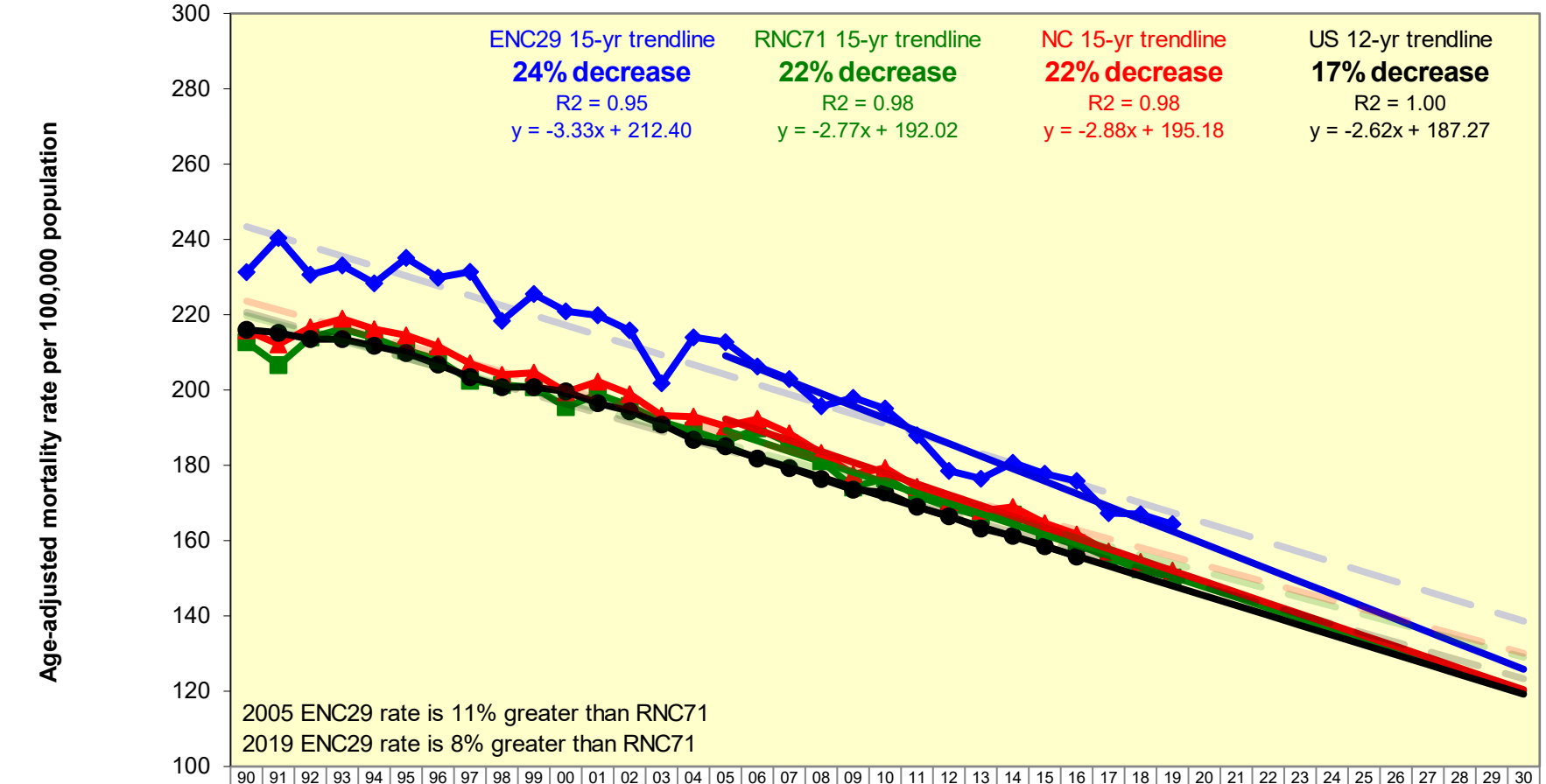


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	206	215	209	212	211	220	219	221	212	221	219	220	218	207	221	224	218	217	213	218	216	212	207	207	218	218	221	213	217	219											
RNC71	198	194	203	206	206	204	205	201	202	203	200	191	190	189	187	186	191	188	185	181	186	184	186	186	190	188	188	186	185	186											
NC	199	198	204	207	207	207	207	204	203	206	203	196	194	191	192	192	195	192	189	186	190	188	189	189	194	192	192	190	190	190											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	14% LT	12% LT	ENC29
16% GT		2% GT	RNC71
14% GT	2% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	13% LT	12% LT	ENC29
15% GT		2% GT	RNC71
13% GT	2% LT		NC

Figure 7.1 ii. Cancer - All Sites: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

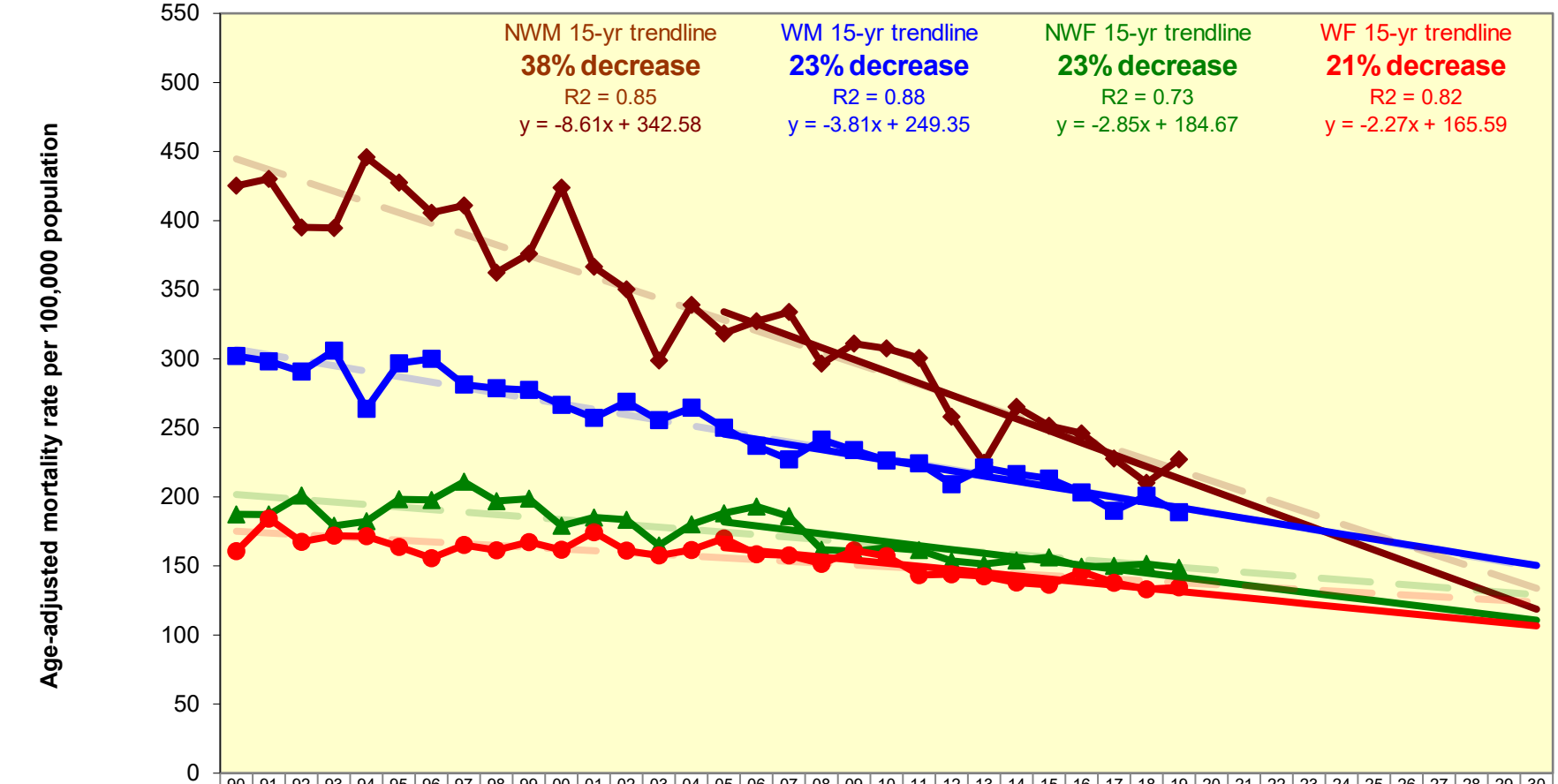


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	231	240	231	233	228	235	230	231	218	225	221	220	216	202	214	213	206	203	196	198	195	188	179	176	181	178	176	167	167	164											
RNC71	213	207	214	216	214	211	208	202	201	201	195	199	196	192	189	186	190	186	181	174	177	172	169	167	167	162	159	156	152	150											
NC	216	212	217	219	216	214	212	207	204	205	199	202	199	193	193	190	192	188	183	178	179	174	170	168	169	165	162	157	154	152											
US	216	215	214	214	212	210	207	203	201	201	200	196	194	191	187	185	182	179	176	174	173	169	166	163	161	159	156														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	10% LT	8% LT	12% LT	ENC29
11% GT		2% GT	2% LT	RNC71
9% GT	2% LT		4% LT	NC
13% GT	3% GT	4% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	8% LT	7% LT	9% LT	ENC29
8% GT		1% GT	2% LT	RNC71
7% GT	1% LT		3% LT	NC
10% GT	2% GT	3% GT		US

Figure 7.1 iii. Cancer - All Sites: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

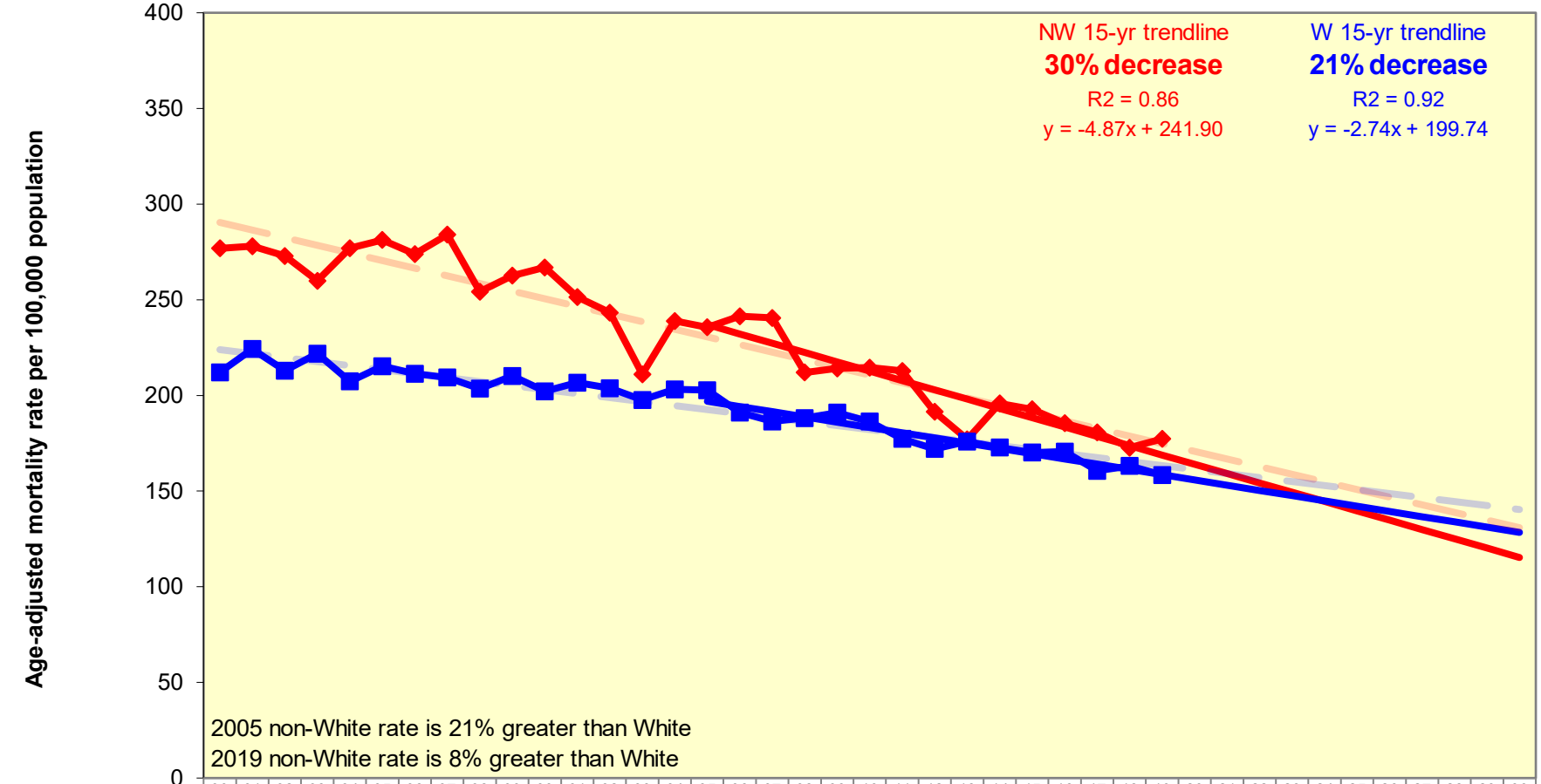


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	425	430	395	395	446	428	406	411	362	376	424	367	350	299	339	318	327	334	296	311	307	301	258	225	265	251	246	228	210	227											
WM	302	298	291	306	264	297	300	281	279	277	267	257	269	255	265	250	237	227	241	234	226	224	209	221	217	213	203	190	201	189											
NWF	187	187	201	179	182	198	198	211	197	199	179	185	183	165	180	188	193	186	162	161	163	161	154	151	154	156	149	150	151	149											
WF	161	184	167	172	171	164	156	165	161	167	162	174	161	158	162	170	159	158	152	161	157	143	144	143	138	136	146	138	133	134											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	27% LT	46% LT	52% LT	NWM
37% GT		26% LT	34% LT	WM
86% GT	35% GT		10% LT	NWF
107% GT	51% GT	12% GT		WF

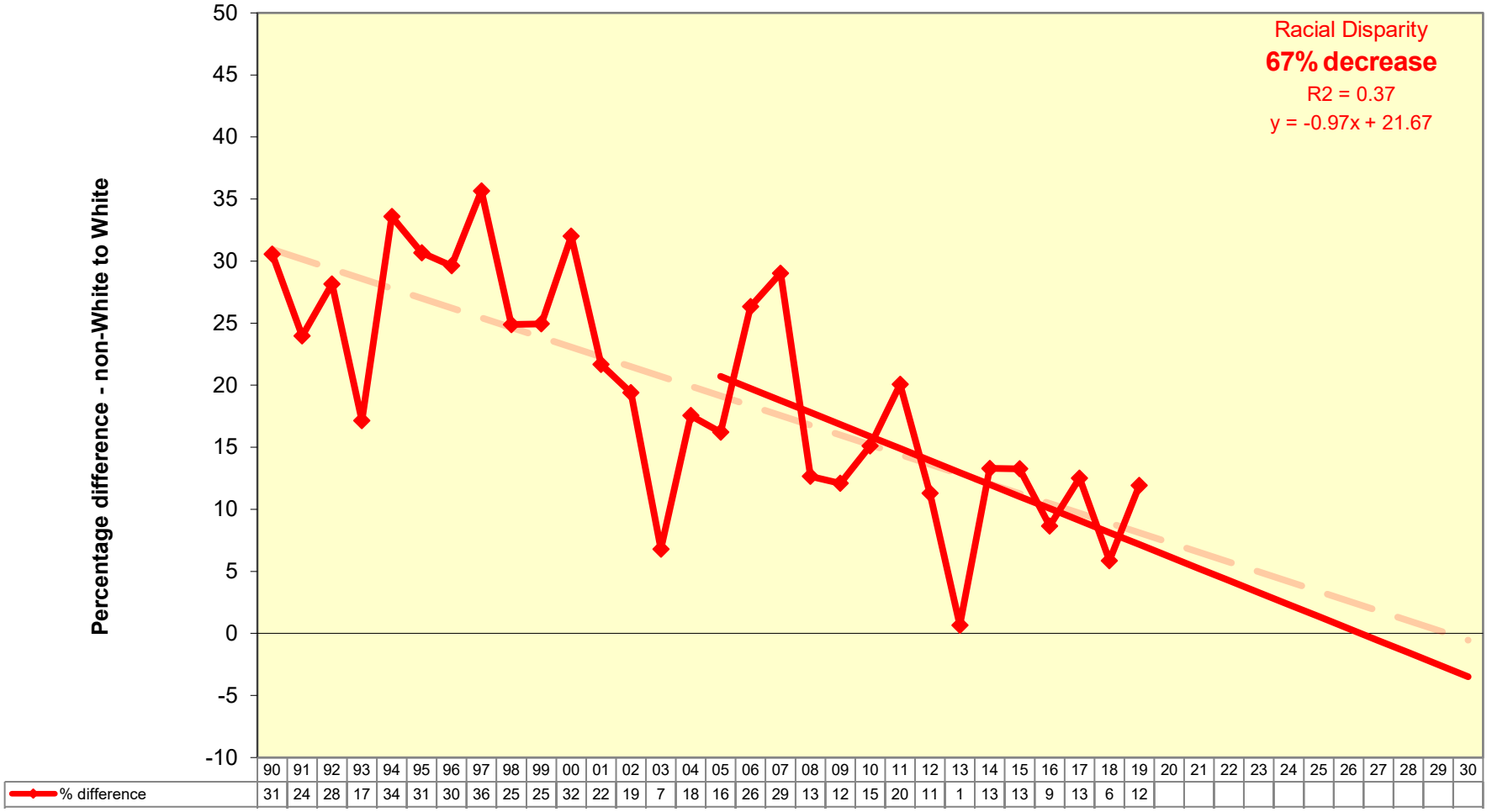
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	12% LT	35% LT	40% LT	NWM
13% GT		26% LT	32% LT	WM
53% GT	35% GT		8% LT	NWF
66% GT	47% GT	8% GT		WF

Figure 7.1 iv. Cancer - All Sites: Trends in age-adjusted mortality rates by race for ENC29, 1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	277	278	273	260	277	281	274	284	254	263	267	251	243	211	239	236	241	241	212	214	215	213	191	177	196	193	185	181	173	177											
W	212	224	213	222	207	215	211	209	204	210	202	207	204	198	203	203	191	186	188	191	186	177	172	176	173	170	171	161	163	158											

Figure 7.1 v. Cancer - All Sites:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030

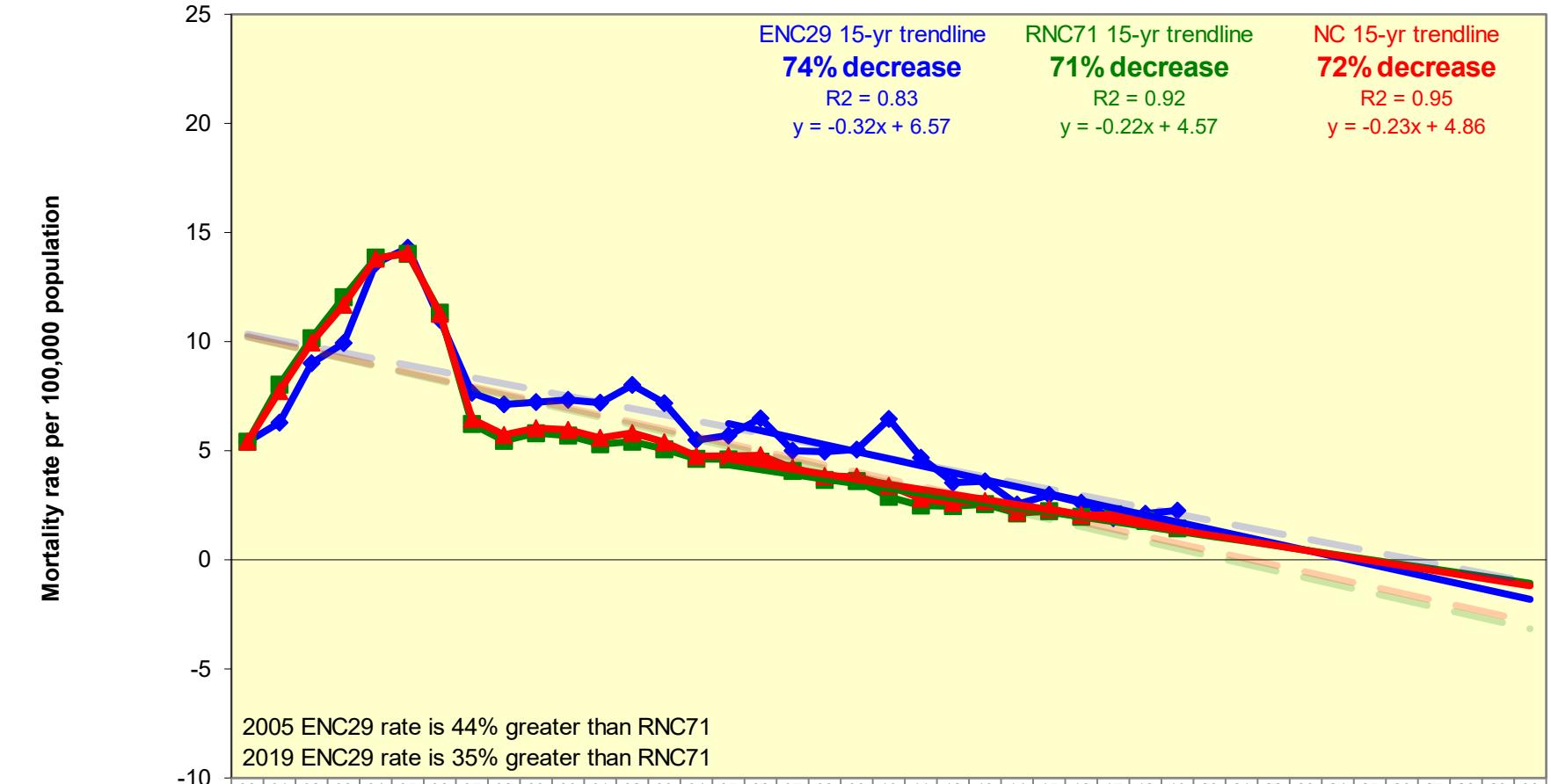


HIV Disease

- The fitted HIV mortality rates for ENC have been decreasing over the past 15 years, but are still 29% greater than NC in 2019.
- The age-adjusted rate trend for ENC, RNC, and the US are all decreasing. The ENC rate is 37% greater than NC in 2019.
- Non-White males continue to have the highest rate of age-adjusted mortality but the rate has decreased 83% in a 15-year reliable trend. Non-White females have the second highest rate, but it has also declined. The rates for White males and non-White females are lower.
- The 15-year age-adjusted HIV mortality rates have decreased for both Whites and non-Whites by 61% and 80% respectively. The non-White rate is still 575% greater than the White rate .
- The 15-year trend for racial disparity shows a 55% decrease.

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 7.2 i. HIV Disease: Trends in mortality rates for ENC29, RNC71, and NC, 1990-2019 with projections to 2030

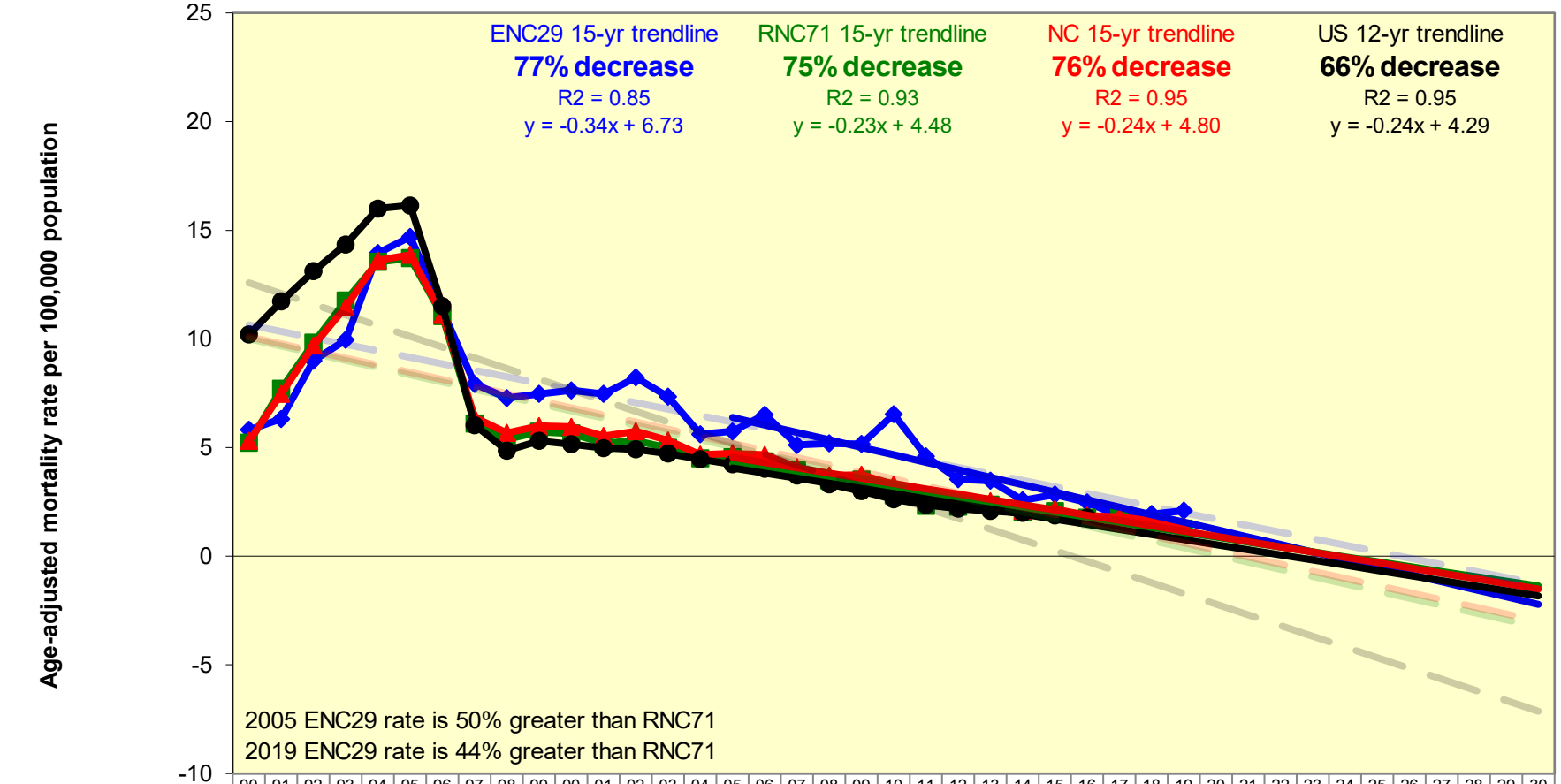


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	5	6	9	10	14	14	11	8	7	7	7	7	8	7	5	6	6	5	5	5	6	5	4	4	3	3	3	2	2	2											
RNC71	5	8	10	12	14	14	11	6	5	6	6	5	5	5	5	5	4	4	4	4	3	2	2	3	2	2	2	2	2	1											
NC	5	8	10	12	14	14	11	6	6	6	6	6	6	5	5	5	5	4	4	4	3	3	3	3	2	2	2	2	2	2											

Comparison of Fitted Rates in 2005			
ENC29	RNC71	NC	
	31% LT	26% LT	ENC29
44% GT		6% GT	RNC71
35% GT	6% LT		NC

Comparison of Fitted Rates in 2019			
ENC29	RNC71	NC	
	26% LT	22% LT	ENC29
35% GT		5% GT	RNC71
29% GT	5% LT		NC

Figure 7.2 ii. HIV Disease: Trends in age-adjusted mortality rates for ENC29, RNC71, NC, and US, 1990-2019 with projections to 2030

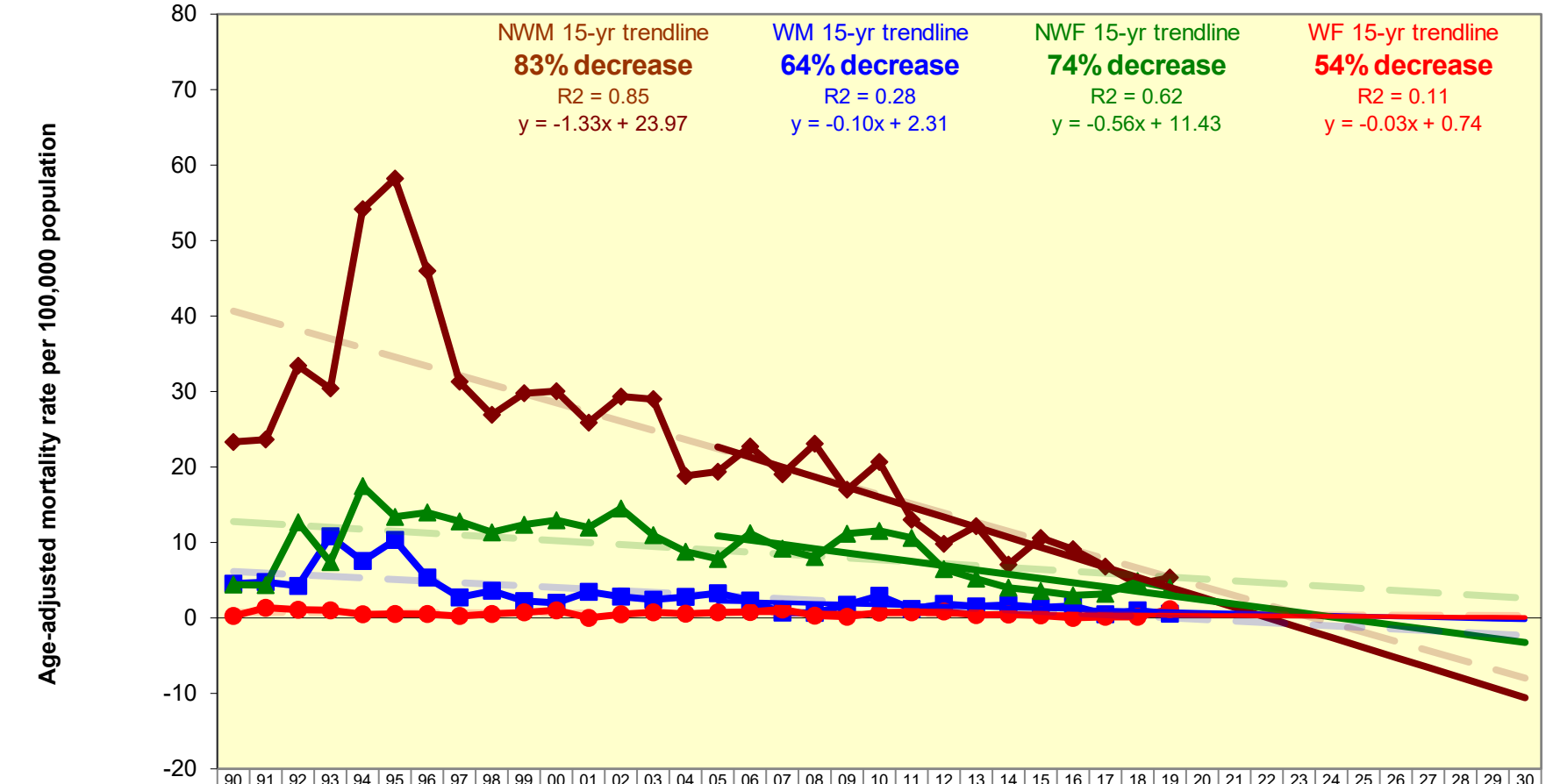


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC29	6	6	9	10	14	15	11	8	7	7	8	7	8	7	6	6	7	5	5	5	7	5	4	3	3	3	2	2	2	2											
RNC71	5	8	10	12	14	14	11	6	5	6	6	5	5	5	5	5	4	4	3	4	3	2	2	2	2	2	2	2	2	1											
NC	5	7	10	11	14	14	11	6	6	6	6	6	6	5	5	5	5	4	4	4	3	3	2	3	2	2	2	2	2	1											
US	10	12	13	14	16	16	12	6	5	5	5	5	5	5	4	4	4	4	3	3	3	2	2	2	2	2	2														

Comparison of Fitted Rates in 2005				
ENC29	RNC71	NC	US	
	33% LT	29% LT	36% LT	ENC29
50% GT		7% GT	4% LT	RNC71
40% GT	7% LT		11% LT	NC
57% GT	4% GT	12% GT		US

Comparison of Fitted Rates in 2019				
ENC29	RNC71	NC	US	
	31% LT	27% LT	48% LT	ENC29
44% GT		6% GT	25% LT	RNC71
37% GT	5% LT		29% LT	NC
92% GT	33% GT	40% GT		US

Figure 7.2 iii. HIV Disease: Trends in age-adjusted mortality rates by race and gender for ENC29, 1990-2019 with projections to 2030

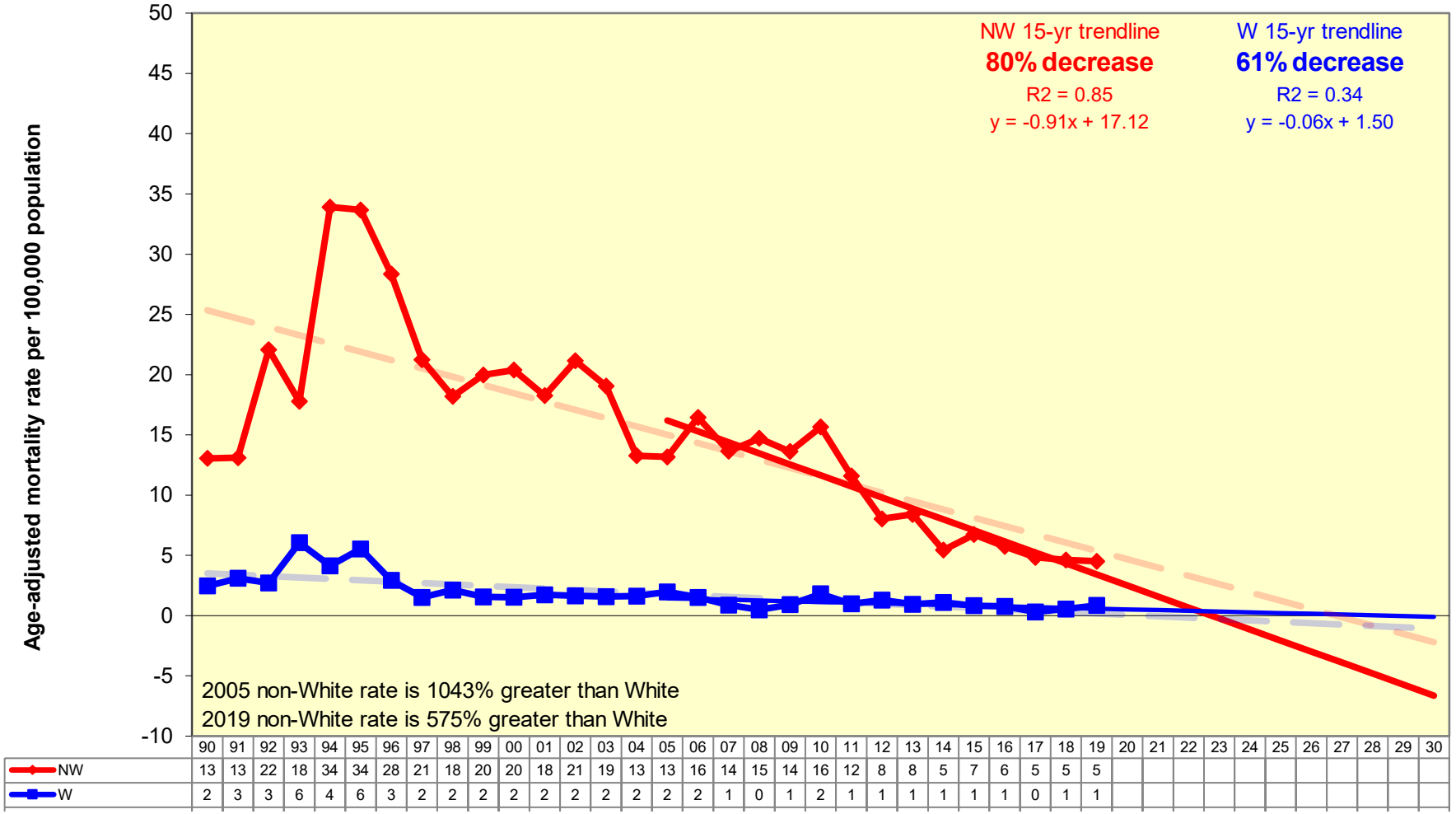


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	23	24	33	30	54	58	46	31	27	30	30	26	29	29	19	19	23	19	23	17	21	13	10	12	7	11	9	7	4	5											
WM	5	5	4	11	8	10	5	3	4	2	2	3	3	2	3	3	2	1	1	2	3	1	2	2	2	1	2	0	1	1											
NWF	4	4	13	7	17	13	14	13	11	12	13	12	15	11	9	8	11	9	8	11	12	11	6	5	4	4	3	3	5	4											
WF	0	1	1	1	0	1	0	0	1	1	1	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	1											

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	90% LT	52% LT	97% LT	NWM
936% GT		394% GT	68% LT	WM
110% GT	80% LT		94% LT	NWF
3130% GT	212% GT	1440% GT		WF

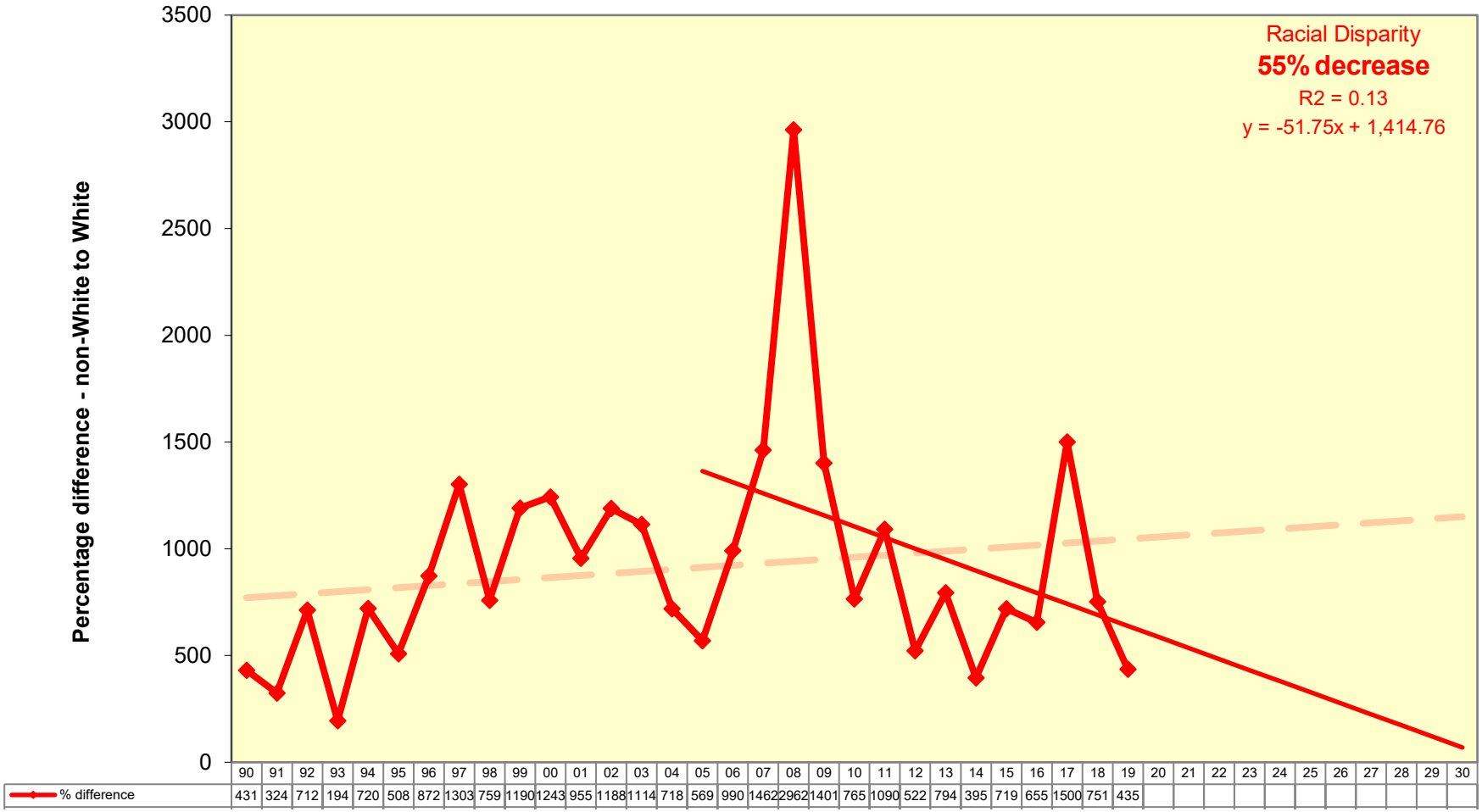
Comparison of Fitted Rates in 2019				
NWM	WM	NWF	WF	
	83% LT	34% LT	93% LT	NWM
481% GT		281% GT	60% LT	WM
52% GT	74% LT		90% LT	NWF
1355% GT	150% GT	854% GT		WF

Figure 7.2 iv. HIV Disease:
Trends in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030



	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	21	22	23	24	25	26	27	28	29	30
NW	13	13	22	18	34	34	28	21	18	20	20	18	21	19	13	13	16	14	15	14	16	12	8	8	5	7	6	5	5	5											
W	2	3	3	6	4	6	3	2	2	2	2	2	2	2	2	2	2	1	0	1	2	1	1	1	1	1	1	0	1	1											

Figure 7.2 v. HIV Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC29,
1990-2019 with projections to 2030



8. Appendix

Disease	ICD 10 Code	ICD 9 Code
Diseases of Heart	I00-I09, I11, I13, I20-I51	390-398, 402, 404, 410-429
Cerebrovascular Disease	I60-I69	430-434, 436-438
Atherosclerosis	I70	440
Cancer - All Sites	C00-C97	140-208
Cancer - Lip, Oral Cavity, and Pharynx	C00-C14	140-149
Cancer - Stomach	C16	151
Cancer - Colon, Rectum, and Anus	C18-C21	153-154
Cancer - Liver	C22	155
Cancer - Pancreas	C25	157
Cancer - Larynx	C32	161
Cancer - Trachea, Bronchus, and Lung	C33-C34	162
Cancer - Malignant Melanoma of Skin	C43	172
Cancer - Breast	C50	174-175
Cancer - Cervix Uteri	C53	180
Cancer - Ovary	C56	183.0
Cancer - Prostate	C61	185
Cancer - Bladder	C67	188
Cancer - Brain	C71	
Cancer - Non-Hodgkin's Lymphoma	C82-C85	200, 202
Cancer - Leukemia	C91-C95	204-208
HIV Disease	B20-B24	042-044
Septicemia	A40-A41	038
Diabetes Mellitus	E10-E14	250
Pneumonia and Influenza	J10-J18	480-487
Chronic Lower Respiratory Diseases	J40-J47	490-494, 496
Chronic Liver Disease and Cirrhosis	K70, K73-K74	571
Nephritis, Nephrotic Syndrome, and Nephrosis	N00-N07, N17-N19, N25-N27	580-589
Unintentional Motor Vehicle Injuries	V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2	E810-E825
All Other Unintentional Injuries and Adverse Effects	V01, V05-V06, V09.1, V09.3-V09.9, V10-V11, V15-V18, V19.3, V19.8-V19.9, V80.0-V80.2, V80.6-V80.9, V81.2-V81.9, V82.2-V82.9, V87.9, V88.9, V89.1, V89.3, V89.9, V90-V99, W00-X59, Y85, Y86	E800-E807,E826-E829,E830-E848,E929.0,E929.1,E850-E869,E880-E928,E929.2-E929.9
Suicide	X60-X84, Y87.0	E950-E959
Homicide	X85-Y09, Y87.1	E960-E969
Legal Intervention	Y35, Y89.0	E970-E978
Alzheimer's Disease	G30	331.0