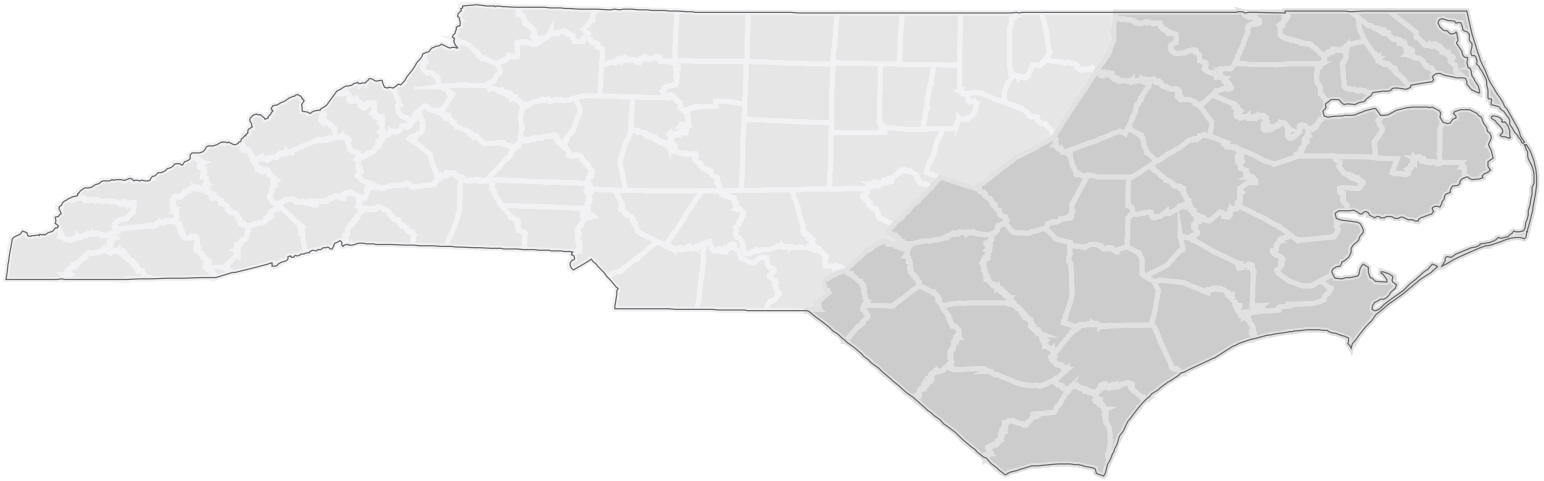
Trends and Disparities in Mortality in Eastern North Carolina

Total Deaths, Premature Mortality and Deaths for Ten Leading Causes; 1990-2017



A Resource for Healthy Communities

Health Indicator Series - Report #2.203
February 2021

Health Systems Research and Development
Department of Public Health, East Carolina University

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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 2017)

Health Indicators is a series of reports describing community health at the state, regional, and county level. *Health Indicators* supplements the *North Carolina Health Data Explorer* published by the center for Health Systems Research and Development at East Carolina University. These reports are intended to provide state policy makers, local health departments, hospitals, and community-based health planning groups with a wide range of information useful for diagnosing the health of Eastern North Carolina's population and its local communities, evaluating the effectiveness of existing services, and envisioning and planning new interventions. The reports in this periodically published series can be used in conjunction with the *County Health Data Book*, 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 28-year period (1990-2017), as well as the most recent 13 year period (2005 to 2017). 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 41 counties located in the extreme east of North Carolina and approximates the coastal plain physiographic province of the state. It includes all 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 ENC41 or ENC. The rest of North Carolina is the remaining 59 counties; abbreviated as RNC59 or RNC.

2. Data Highlights

Trends and Disparities in Mortality in Eastern North Carolina

The following highlights of mortality in the 41 counties of Eastern North Carolina (ENC41) 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 2017, age-adjusted mortality rate for Eastern North Carolina is 828 deaths per 100,000. This rate is 5% higher than the state rate. Within Eastern North Carolina, the non-White rate is 14% higher than the White rate. The non-White male rate is 23% higher than the rate for White males. The non-White female rate is 9% higher than the rate for White females.

The five general leading causes of mortality in Eastern North Carolina (2017) are:
1. Disease of Heart
2. Cancer - All Sites
3. Chronic Lower Respiratory Diseases
4. Cerebrovascular Disease
5. All Other Unintentional Injuries and Adverse Effects

The five general leading causes of mortality in Eastern North Carolina by race and gender (2017) 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 Diseases
4th	Diabetes Mellitus	Chronic Lower Respiratory Diseases	Diabetes Mellitus	Cerebrovascular Disease
5th	All Other Unintentional Injuries and Adverse Effects	Cerebrovascular Disease	Nephritis, Nephrotic Syndrome, and Nephrosis	Alzheimer's Disease

Trends in Mortality from All Causes

- ENC's all-cause mortality rate trend is increasing, and in 2017 is 8% greater than RNC and 6% greater than NC. The ENC rate has increased 9% over the 13-year period.
- The age-adjusted all-cause mortality rate for ENC had decreased 11% over the 13-year period. ENC's rate remains 8% greater than RNC for 2017.

- The non-White male rate remains higher than the other demographic groups. The non-White female rate is projected to converge with the White female rate in the near future.
- The trends for all-cause mortality rates for both non-White and White are decreasing. The non-White rate is 13% greater than the White rate in 2017. They are projected to converge in the distant future.
- Over the recent 13-year period there is a 43% decrease in racial disparity.

Trends in Premature Mortality from All Causes of Death

- ENC's premature mortality rate is 23% greater than RNC and 15% greater than NC. ENC's rate trend is unreliable.
- The ENC age-adjusted premature mortality trend for the 13-year period has decreased 6%. It is 25% higher than the RNC rate in 2017.
- The non-White male rate is higher than the rates for any other demographic group. The rate for non-White females has the greatest rate of decrease (16% over 13 years).
- The non-White rate remains 42% greater than the White rate. Both are decreasing but the non-White rate is decreasing more quickly.
- A decrease in the premature mortality rate trend for non-Whites and a leveling of the rate for Whites suggests a reduction in racial disparity.

Diseases of the Heart

- ENC's heart disease rate trend had decreased 6% over the 13-year period. The rates for NC and RNC are 13% and 19% lower respectively and are decreasing faster.
- ENC's age-adjusted heart disease rate is 13% greater than NC and 10% greater than the US rate. All 3 rates have decreased at a similar pace over the recent 13-year period.
- The rate for non-White males is the highest and is decreasing at about the same pace as the White male rate. The non-White female rate is decreasing the most and is set to converge with the White female rate.
- The non-White rate is 11% higher than the White rate in 2017. The 13-year trend for both is decreasing.
- The trend for racial disparity is not reliable.

Cancer – Trachea, Bronchus, Lung .

- The cancer-TBL rate trend for ENC has decreased 5% over the recent 13-year period. The ENC rate is 19% greater than the RNC rate. The RNC rate has decreased 16%.
- In 2017 the age-adjusted rate for ENC was 16% above the RNC rate. The ENC rate decreased 27% over the 13-year period, while the RNC rate decreased 32%.
- In 2017 the non-White male rate was the highest but is only 6% higher than the White male rate, is decreasing, and will likely converge soon. The mortality rate for White females is 48% higher than the rate for non-White females. Both are decreasing.
- The non-White mortality rate is 14% less than the White rate. Both are decreasing over the 13-year period at about the same pace.
- The 13-year rate trend for racial disparity is unreliable.

Chronic Lower Respiratory Disease

- In 2017 the CLRD morality rate for ENC, RNC and NC are virtually equal. The ENC rate trend has increased 28% over the 13-year period, compared to 14% for RNC and 18% for NC.
- The age-adjusted rate for 2017 for ENC, RNC and NC are equal. The US rate is 7% lower. The rate trend for ENC is unreliable.

- The age-adjusted rate for White males is the highest, followed by White females, then non-White males. The rates for White males and non-White males are decreasing. The rates for White females and non-White females are increasing.
- The non-White rate is 42% less than the White rate. Both rate trends are flat, but neither is reliable.
- The racial disparity trend is unreliable.

Cerebrovascular Disease

- ENC's cerebrovascular disease mortality rate trend is flat, but the trend is unreliable. It is 13% greater than the RNC rate and 9% greater than the NC rate.
- The age-adjusted rate has decreased 18% over the 13-year period. It is 13% greater than the RNC rate and 30% greater than the US rate.
- The non-White male rate is the highest and has decreased 23% over the 13-year period. The non-White female rate has decreased 35% and is converging with White males and White females.
- The non-White rate in 2017 is 27% greater than the White rate but is decreasing more rapidly (30% over the 13-year period). Both rates are projected to converge in the future.
- There is a 55% decrease in racial disparity between Whites and non-Whites over the 13-year period.

All Other Unintentional Injuries and Adverse Effects

- Mortality from unintentional injuries and adverse effects is increasing in ENC (70% increase over 13 years). The trends for RNC and NC are also increasing, but the ENC rate is increasing faster.
- The age-adjusted mortality rate trend for ENC, RNC, NC and the US are all increasing. ENC's rate trend increased the most, 59% over the 13-year trend.
- The 13-year trends for White males and White females are increasing significantly (70% and 79% respectively). The rates for non-White males and non-White females are increasing, but not as much.
- White rates have increased 71% over the 13-year period. Non-White rates have increased 24% in a moderately reliable trend.
- Racial disparity has decreased 169% over the 13-year period in a trend that favors non-Whites.

Alzheimer's Disease

- The Alzheimer's mortality rate for ENC shows a 119% increase over the recent 13-year period. ENC's rate is 22% less than RNC and 17% less than NC but ENC's rate of increase was larger than both RNC and NC.
- In 2016 the age-adjusted rate for ENC was even with the US rate. The ENC rate is lower than the NC rate, but has a higher rate of increase over the 13-year period.
- The mortality rates for females, both White and non-White, are greater than for males. Non-White males have the highest rate of increase (150% over 13 years) and are projected to converge with the White female rate in the future.
- The non-White mortality rate for Alzheimer's has increased 106% over the 13-year trend. In 2017 the non-White rate is 7% greater than the White rate.
- The racial disparity favors Whites and has increased 155% over the 13-year period.

Diabetes Mellitus

- ENC's diabetes mortality rate is 30% greater than RNC in 2017. The rate for ENC increased 9% over the 13-year period in a moderately reliable trend.
- ENC's age-adjusted rate has decreased 14% over the 13-year period. It is 30% greater than the RNC rate and 34% greater than the US rate.
- The rate for non-White males is the highest and is increasing (10% increase over the 13-year period). The non-White female rate has decreased 35% and the White female rate has decreased 17%. The White male rate is unreliable.
- The non-White mortality rate decreased 19% over the 13-year period but remains 124% greater than the White rate.
- The trend for racial disparity is moderately reliable and suggests a 14% decrease in racial disparity.

Pneumonia and Influenza

- The mortality rate trend for pneumonia and influenza for ENC has increased 11% over the 13-year period. The trends for RNC and NC are flat and unreliable. The ENC rate is 8% less than RNC.
- The age-adjusted rate trends for all NC regions are similar and are decreasing at about the same pace. The ENC rate is 19% greater than the US rate.
- The age-adjusted rate trends for White males and White females are decreasing. The trends for non-White males and non-White females are unreliable.
- The White rate trend has decreased 19% over the 13-year period. The non-White rate is unreliable.
- Racial disparity has increased 142% over the 13-year period and favors Whites in a moderately reliable trend.

Nephritis, Nephrotic syndrome, and Nephrosis

- Mortality due to nephritis, nephrotic syndrome, and nephrosis in ENC has decreased 11% over 13 years in a moderately reliable trend. The 2017 rate for ENC, NC and RNC were equal.
- The age-adjusted ENC rate is equal to the NC rate but the 13-year rate trend for ENC has decreased 29% and is set to drop below the NC rate.
- The 13-year trends for non-White males and females are higher than those for White males and females. Non-White females show the greatest decrease, 39% over 13 years. White females have the lowest rates.
- In 2017 the non-White rate was 107% greater than the White rate but declined 35% over 13 years. The White rate declined 25%.
- Racial disparity shows a 24% decrease over the 13-year period in a moderately reliable trend.

Unintentional Motor Vehicle Injuries

- ENC's unintentional motor vehicle injury mortality rate trend is decreasing but is still 39% greater than RNC in 2017.
- The ENC age-adjusted rate is 41% greater than RNC and 62% greater than the US. The rates for ENC, RNC, NC and the US are all decreasing.
- The rates for non-White males and non-White females are not reliable. The trends for White males and White females are declining.
- The White rate trend has decreased 45% over the 13-year period. The non-White rate is unreliable.
- Racial disparity has increased significantly over the 13-year period.

Caner - All Sites

- The cancer - all sites mortality rate trends for ENC, NC and RNC are unreliable.
- The age-adjusted cancer - all sites mortality rate trends for ENC, RNC, NC and the US are all decreasing at about the same pace. The ENC rate trend is 8% greater than RNC and 9% greater than the US.
- The rate for non-White males has decreased 28% over 13 years and the White male rate has decreased 21%. The non-White male and White male rates are the highest.
- Both White and non-White cancer – all sites mortality rates are decreasing over the 13-year period, although non-White rates are 9% greater than Whites.
- The moderately reliable 13-year trend for racial disparity shows a 62% decrease.

HIV Disease

- The HIV mortality rate for ENC has decreased 69% over the past 13 years but was still 30% higher than RNC in 2017.
- The 13-year age-adjusted rate trend for ENC has been decreasing over the past 13 years, but still was 38% greater than RNC.
- Non-White males continue to have the highest rate of age-adjusted mortality, but this rate has decreased 74% in a 13-year reliable trend. The rate for White males decreased 69% and non-White females decreased 77%. A convergence of the non-White and White rate is expected in the future.
- The 13-year non-White age-adjusted HIV mortality rate has decreased by 75%; the White rate has decreased by 59%. The 2 rates are expected to converge.
- Racial disparity has decreased 40% over the 13-year period in a moderately reliable trend.

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). Premature mortality in detail is the focus of Report Series #1.

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

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

Age-adjustment to control for a population's age structure requires an external reference or standard to weight the comparison populations by age groups. Currently, the US 2000 Standard Million Population (SMP) is used as the external reference. The US 2000 SMP is divided into a number of age groups whose sizes or proportions serve as weights to be applied to the corresponding age groups of the study population. This proportional redistribution generates new numbers of expected deaths in each of the corresponding age groups of the study population. These expected deaths are the number of deaths we would expect if the study population had the same age structure as the US 2000 SMP. The 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 2017. Smaller areas like counties will usually be aggregated into 5-year intervals (e.g., 2013 to 2017). 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 28-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 28 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 2017) to provide a *general* idea about where mortality trends are heading.

The equation of the line allows the user to calculate an expected or fitted rate for any given year, *x*. For example, in figure 6.4 ii the year 2013 is the 9th year in the series, so *9* would be substituted for *x* in the equation of the line derived from ENC41's age-adjusted mortality rate series for a selected cause of death. For cerebrovascular disease (2005 to 2017), the 2013 *expected* or *fitted* age-adjusted rate is calculated to be 47.4 deaths per 100,000 people. The *observed* age-adjusted rate for 2013 is 45 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 2.4—the model (the equation of the line) *overestimates* the observed value by 2.4 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 period (2005-2017). 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 2017 tables compare the fitted rates calculated for the beginning and end of the observed time series in terms of percent difference. Returning to figure 6.4 ii, ENC41's age-adjusted fitted rate for cerebrovascular disease in 2005 is 5% greater than (GT) RNC's fitted rate. In 2017, ENC41's fitted rate is 13% 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, as indicated in *Healthy Carolinians 2030*, consideration needs to be given to whether or not a county is characterized as rural or urban, as this can be an indication to the level of development and amount of resources available in a county.

General References

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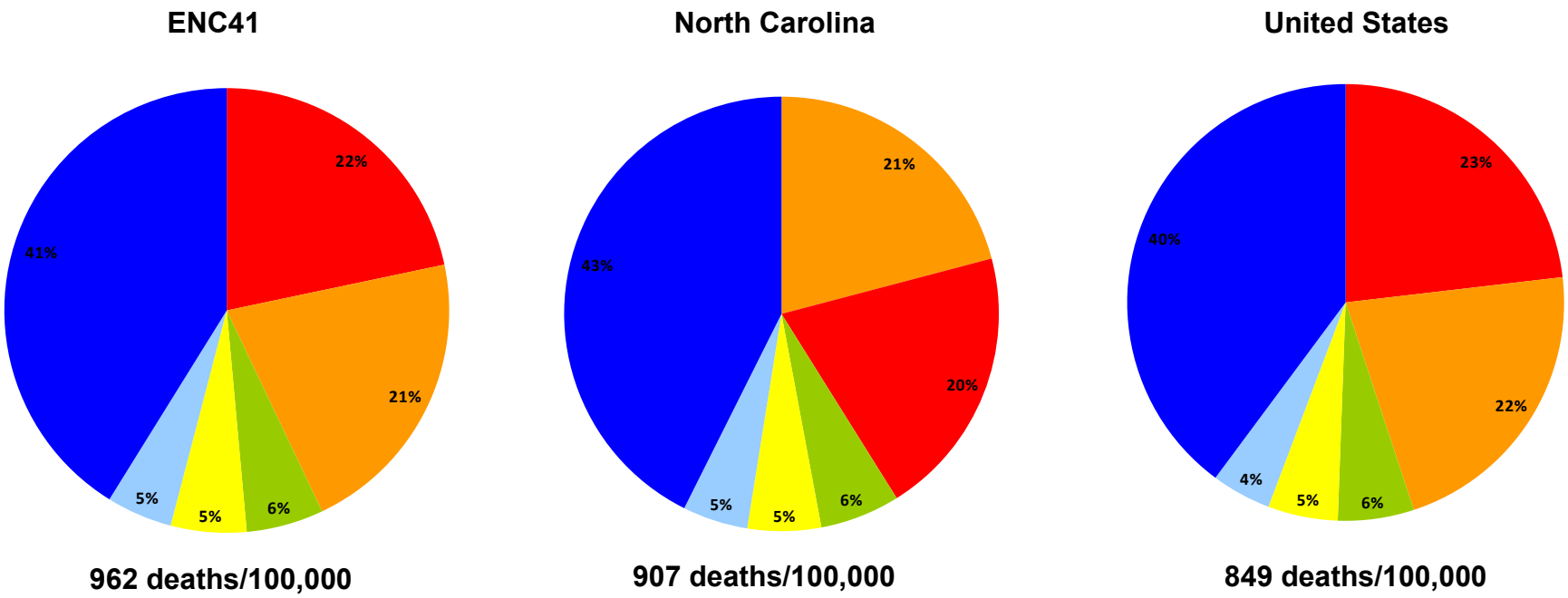
4. Current Disparities in Mortality by Geography, Race and Gender, and Race: Total and Five Leading Causes of Death

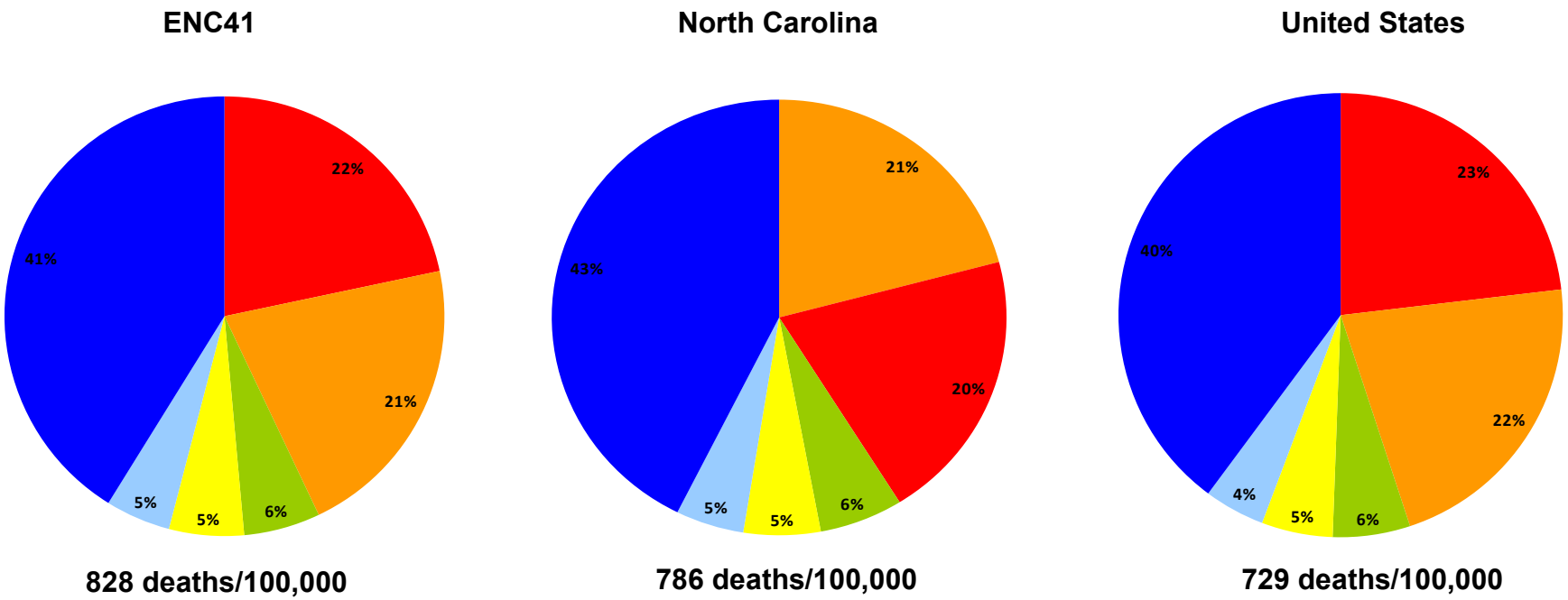
Figure 4.1 i. General leading causes of death for ENC41 (2017), NC (2017), and US (2016). Mortality rate per 100,000 population.



2017 NC rate is 7% higher than 2016 US rate

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

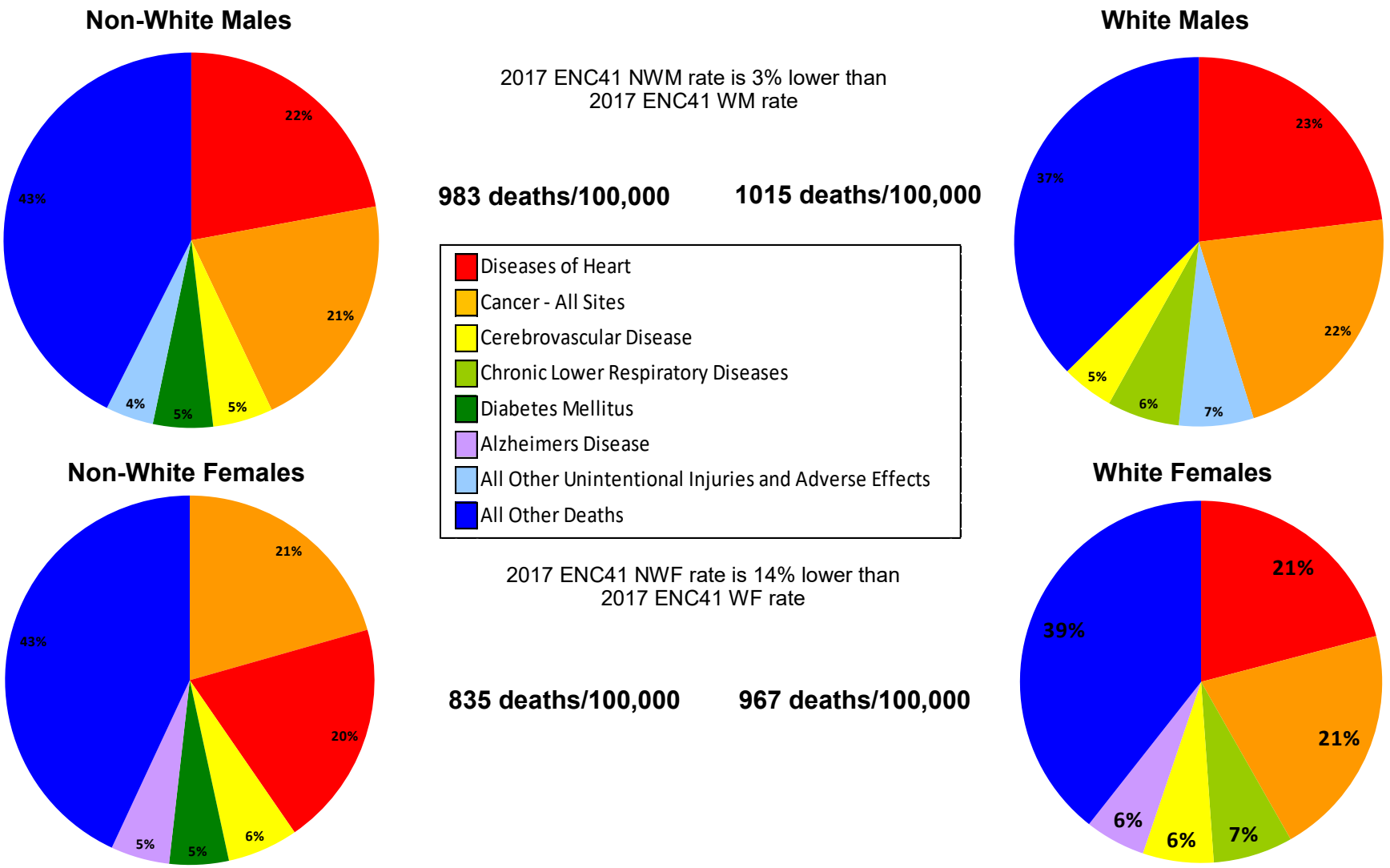
Figure 4.1 ii. General leading causes of death for ENC41 (2017), NC (2017), and US (2016). Age-adjusted mortality rate per 100,000 population.



2017 NC age-adj. rate is 8% higher than US

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

Figure 4.2 i. General leading causes of death for ENC41 (2017) by race and gender.
Mortality rate per 100,000 population.



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

Figure 4.2 ii. General leading causes of death for ENC41 (2017) by race and gender.
Age-adjusted mortality rate per 100,000 population.

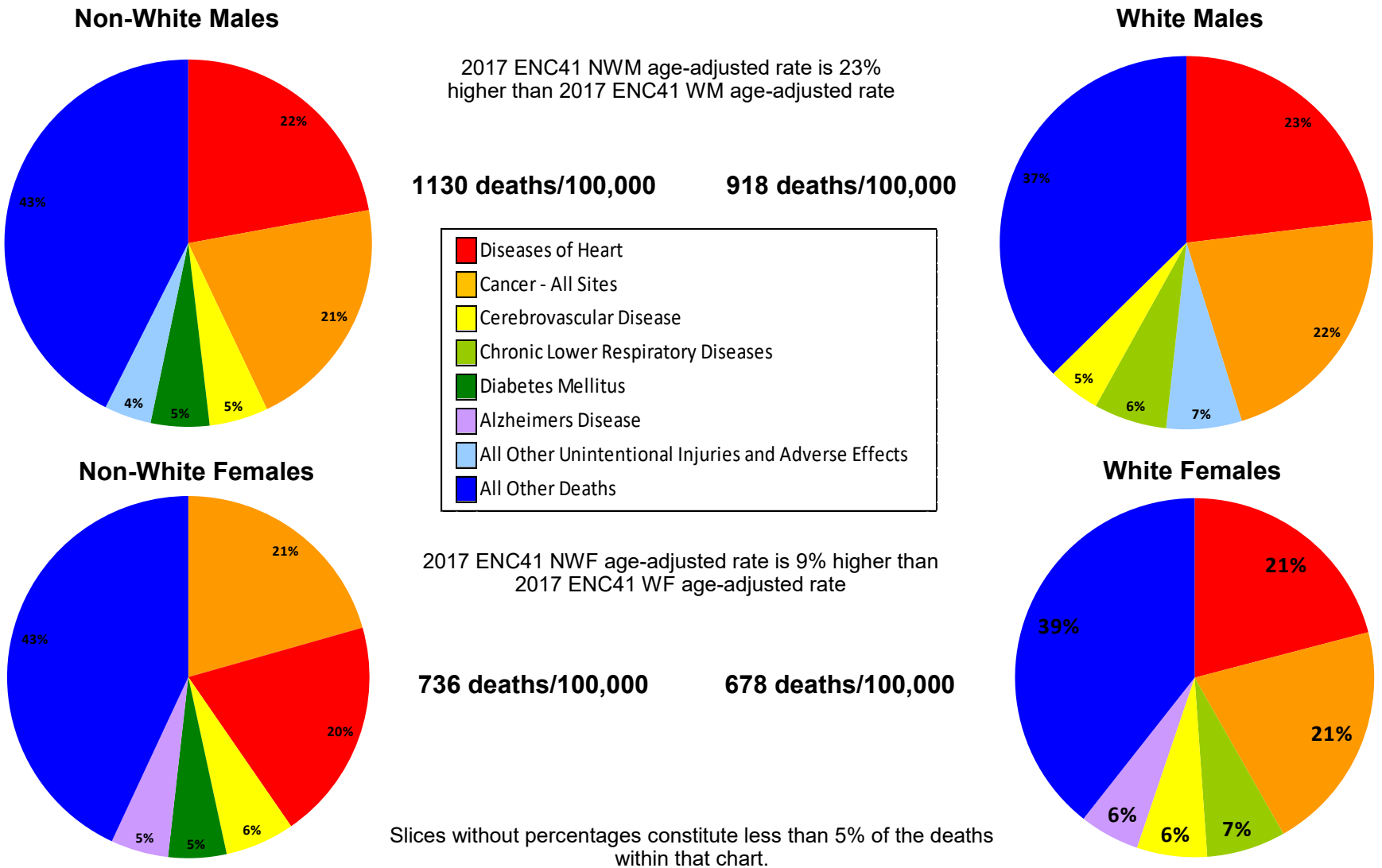
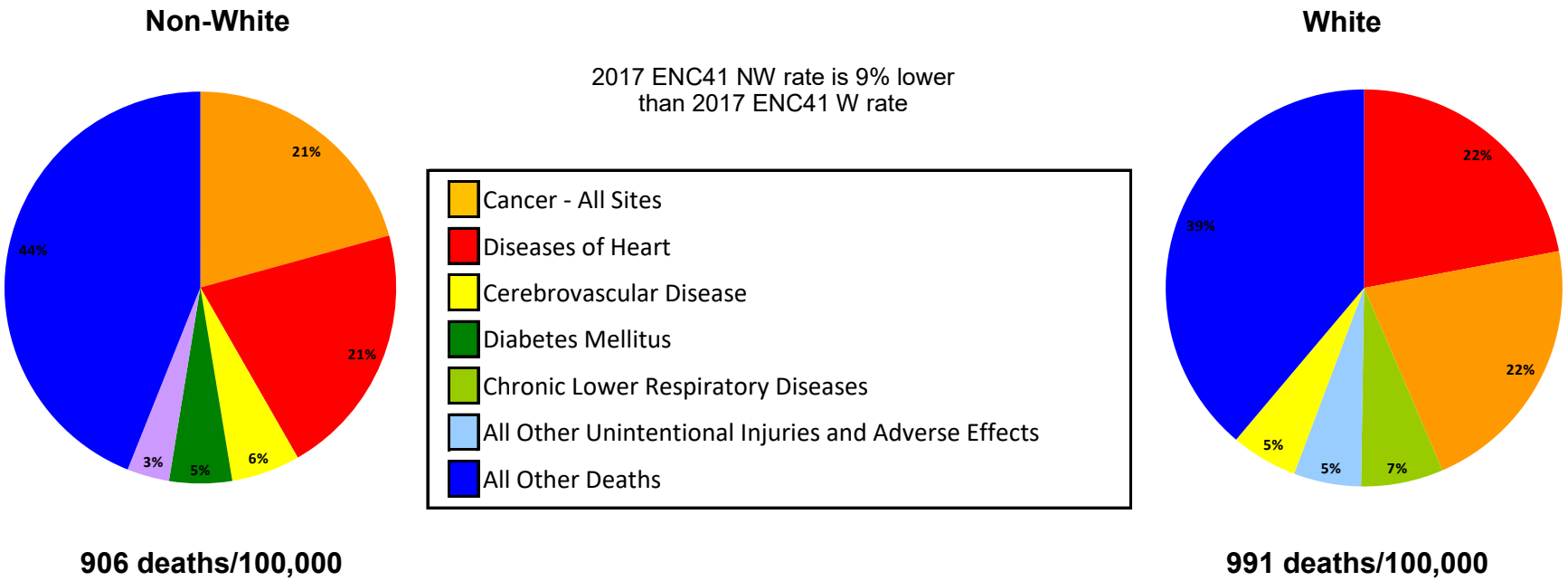


Figure 4.3 i. General leading causes of death for ENC41 (2017) by race. Mortality rate per 100,000 population.



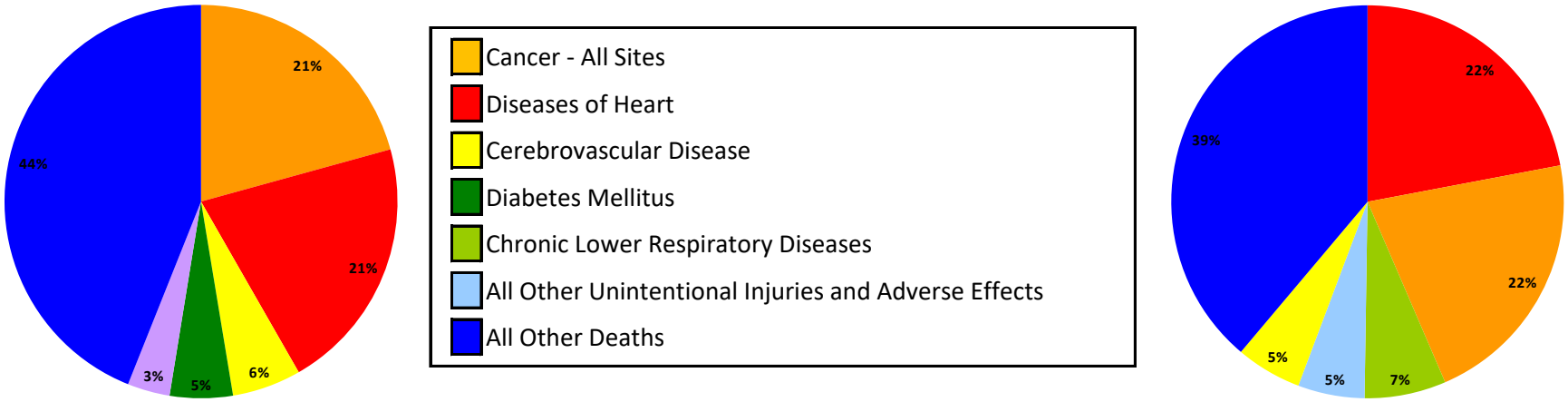
Slices without percentages constitute less than 5% of the deaths within that chart.

Figure 4.3 ii. General leading causes of death for ENC41 (2017) by race. Age-adjusted mortality rate per 100,000 population.

Non-White

White

2017 ENC41 NW age-adjusted rate is 14% higher than 2017 ENC41 W age-adjusted rate



903 deaths/100,000

790 deaths/100,000

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

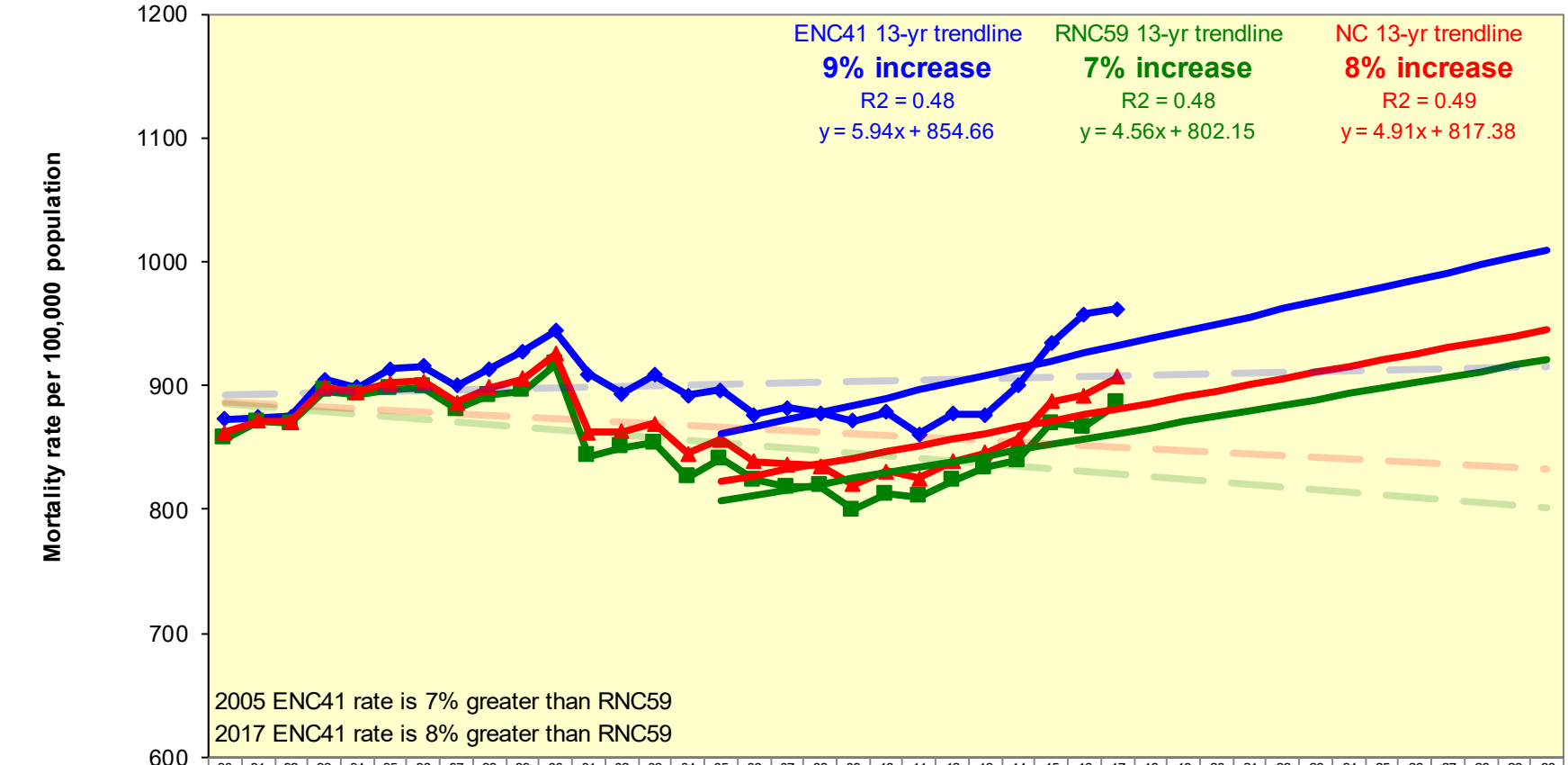
5. Trends and Disparities in Mortality in ENC41: All Causes of Death and All Causes of Premature Mortality; 1990-2017

All Causes of Death

- ENC's all-cause mortality rate trend is increasing, and in 2017 is 8% greater than RNC and 6% greater than NC. The ENC rate has increased 9% over the 13-year period.
- The age-adjusted all-cause mortality rate for ENC had decreased 11% over the 13-year period. ENC's rate remains 8% greater than RNC for 2017.
- The non-White male rate remains higher than the other demographic groups. The non-White female rate is projected to converge with the White female rate in the near future.
- The trends for all-cause mortality rates for both non-White and White are decreasing. The non-White rate is 13% greater than the White rate in 2017. They are projected to converge in the distant future.
- Over the recent 13-year period there is a 43% 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 ENC41, RNC59, and NC 1990-2017 with projections to 2030

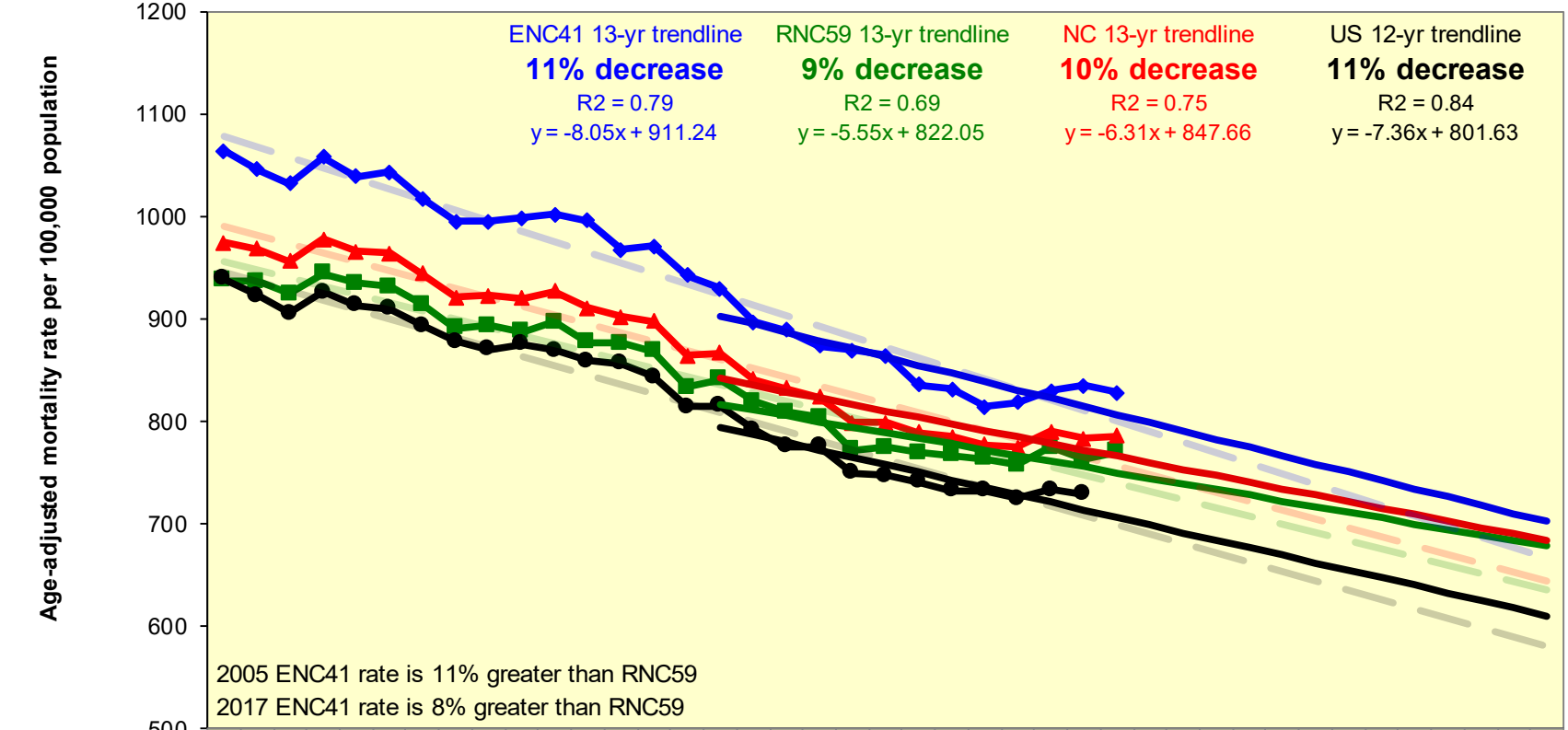


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	873	874	875	905	899	913	916	900	914	928	944	909	894	909	892	896	876	882	878	872	878	861	877	877	900	934	957	962													
RNC59	857	871	869	896	893	897	899	881	892	896	917	843	850	853	826	841	824	818	819	800	812	811	823	834	840	869	866	886													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	6% LT	4% LT	ENC41
7% GT		2% GT	RNC59
5% GT	2% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	7% LT	5% LT	ENC41
8% GT		2% GT	RNC59
6% GT	2% LT		NC

Figure 5.1 ii. All Causes of Death: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

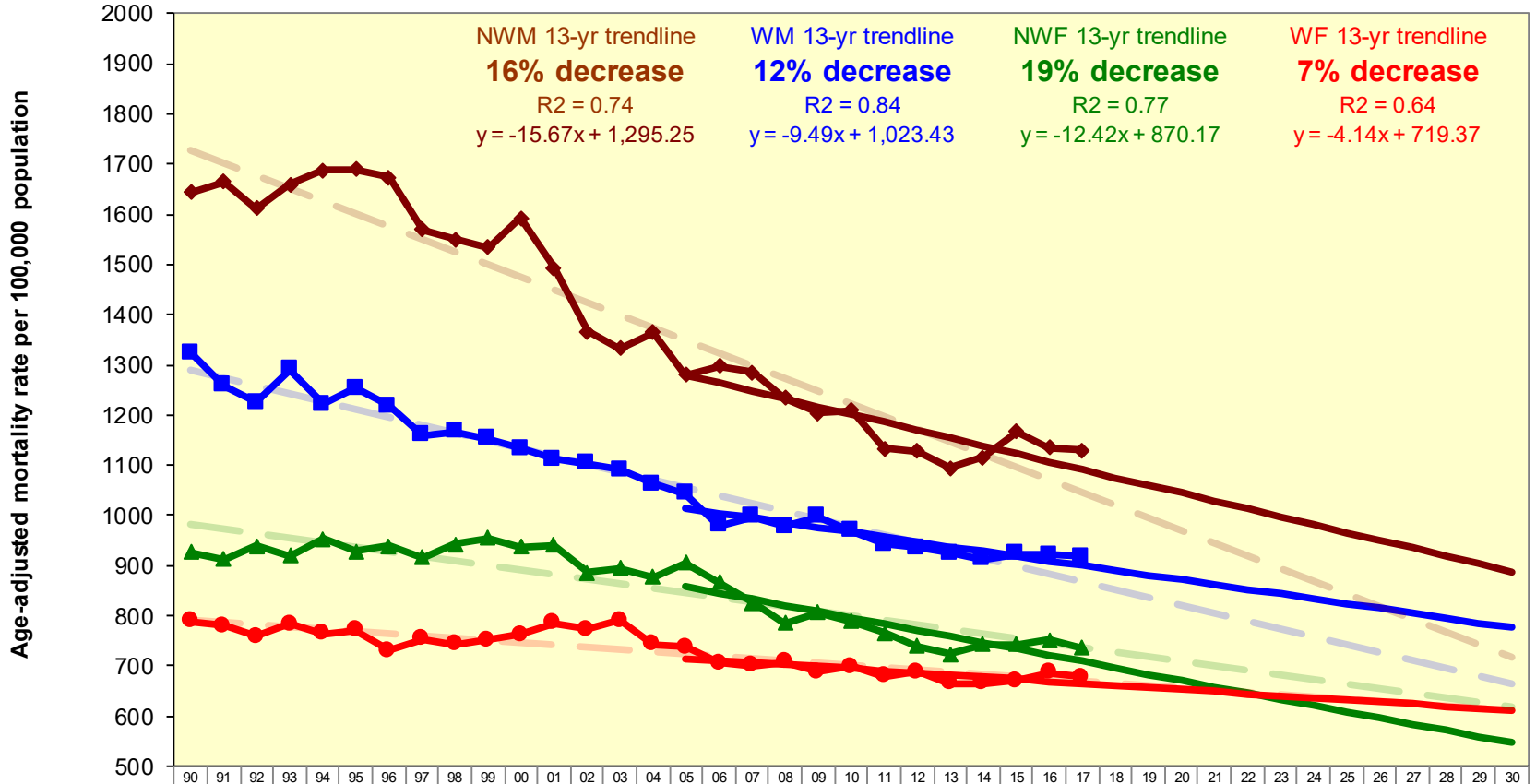


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	1064	1046	1032	1058	1039	1043	1018	995	995	998	1002	995	968	971	942	930	896	889	873	869	864	836	832	814	818	830	835	828													
RNC59	937	936	925	945	935	932	914	890	893	888	897	877	876	868	833	841	819	809	804	772	774	770	766	763	757	774	762	770													
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													
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				
ENC41	RNC59	NC	US	
	10% LT	7% LT	12% LT	ENC41
11% GT		3% GT	2% LT	RNC59
7% GT	3% LT		5% LT	NC
14% GT	3% GT	6% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	7% LT	5% LT	12% LT	ENC41
8% GT		2% GT	6% LT	RNC59
6% GT	2% LT		8% LT	NC
14% GT	6% GT	8% GT		US

Figure 5.1 iii. All Causes of Death: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

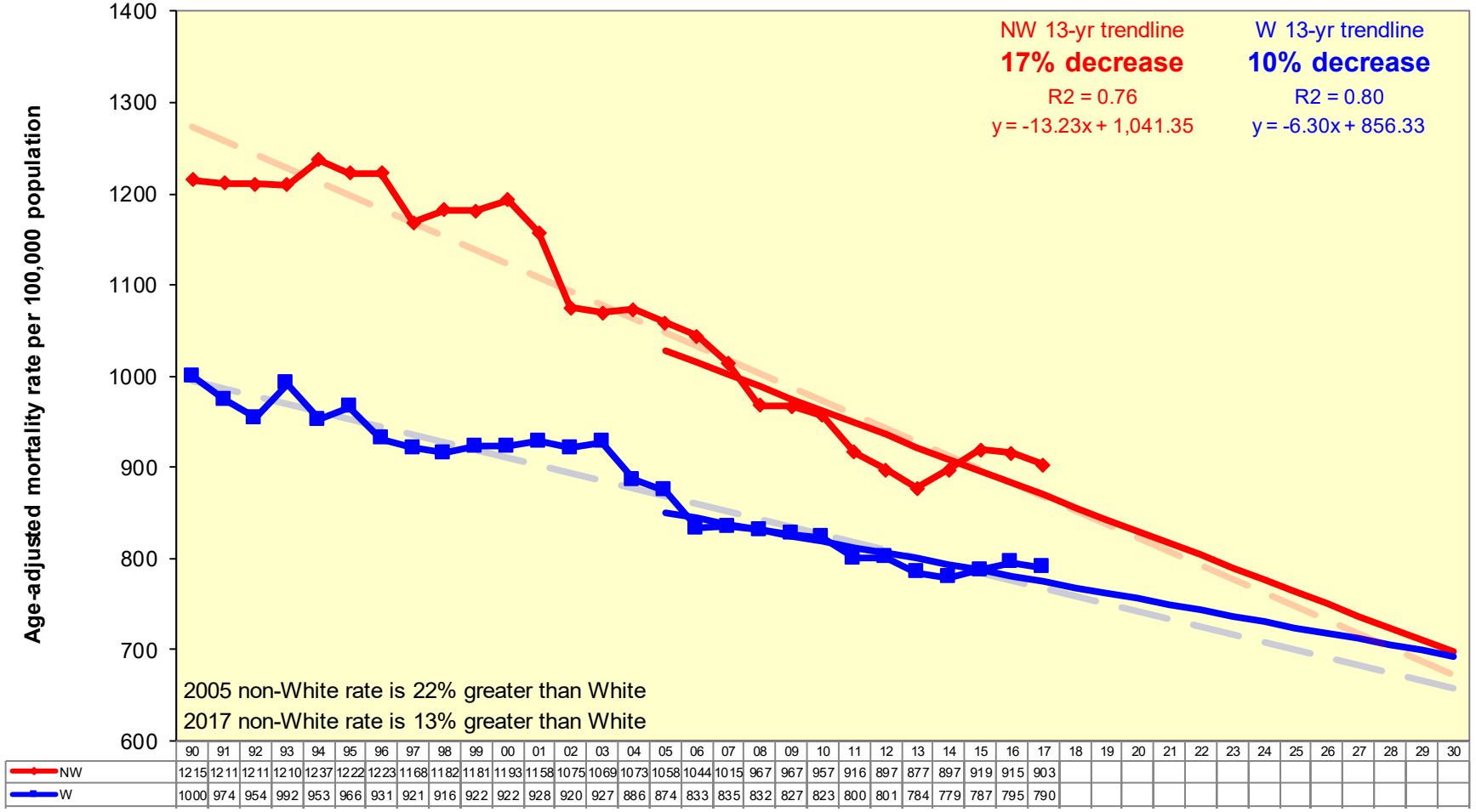


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	1643	1665	1612	1659	1687	1689	1673	1570	1550	1535	1593	1493	1367	1333	1365	1280	1298	1285	1233	1204	1210	1133	1128	1094	1116	1166	1134	1130													
WM	1324	1258	1224	1290	1222	1253	1218	1160	1166	1153	1134	1112	1104	1091	1064	1044	980	997	978	997	969	943	935	925	912	922	922	918													
NWF	927	913	940	919	953	929	939	917	942	955	938	941	885	894	877	905	867	825	786	807	790	766	739	723	743	743	753	736													
WF	789	780	760	784	765	771	731	754	742	752	763	785	773	790	743	738	706	700	707	689	698	679	689	665	666	671	687	678													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	21% LT	33% LT	44% LT	NWM
27% GT		15% LT	30% LT	WM
49% GT	18% GT		17% LT	NWF
80% GT	42% GT	21% GT		WF

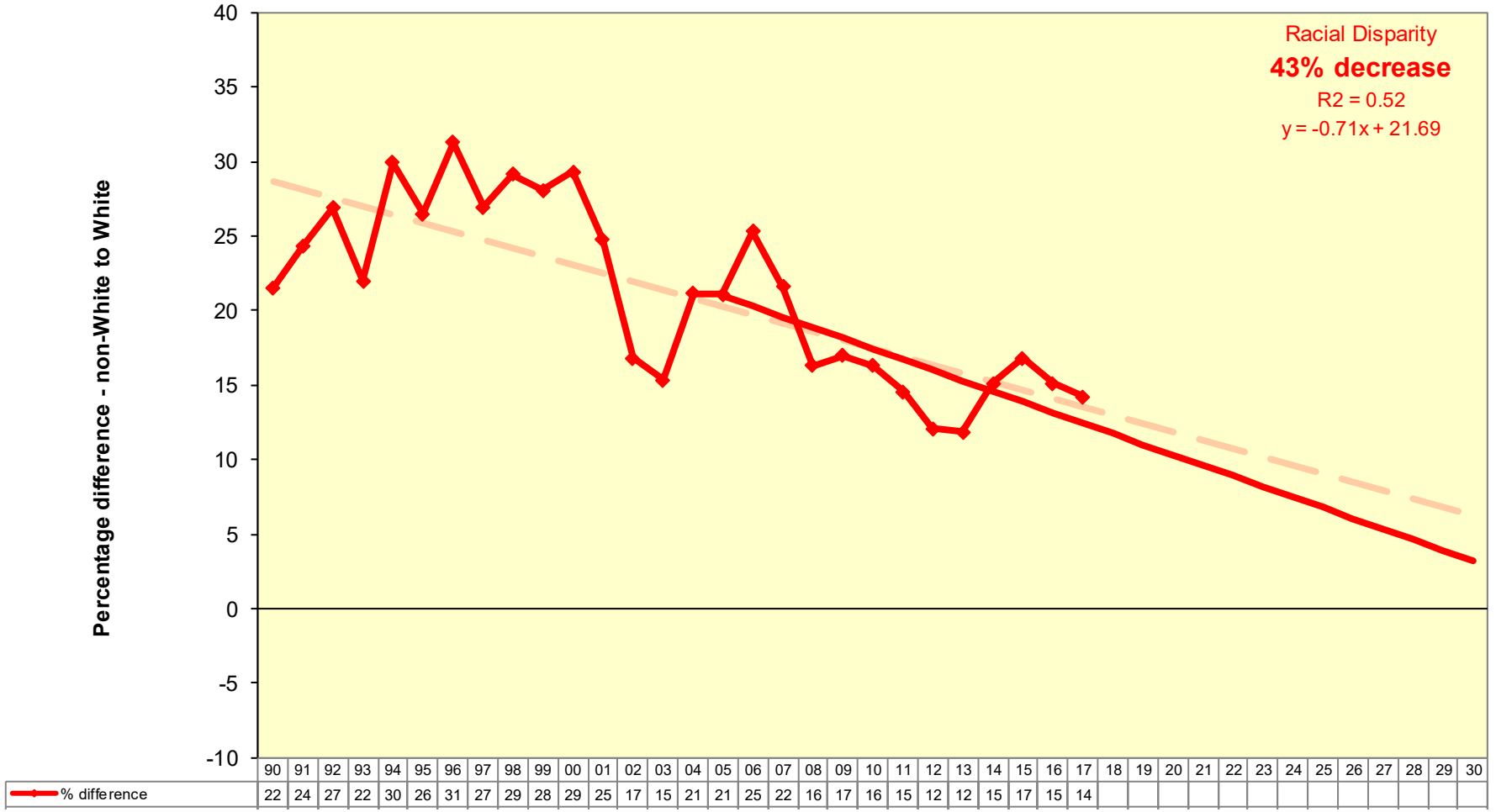
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	18% LT	35% LT	40% LT	NWM
22% GT		21% LT	26% LT	WM
54% GT	26% GT		7% LT	NWF
65% GT	36% GT	8% GT		WF

Figure 5.1 iv. All Causes of Death: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	1215	1211	1211	1210	1237	1222	1223	1168	1182	1181	1193	1158	1075	1069	1073	1058	1044	1015	967	967	957	916	897	877	897	919	915	903													
W	1000	974	954	992	953	966	931	921	916	922	922	928	920	927	886	874	833	835	832	827	823	800	801	784	779	787	795	790													

Figure 5.1 v. All Causes of Death:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030

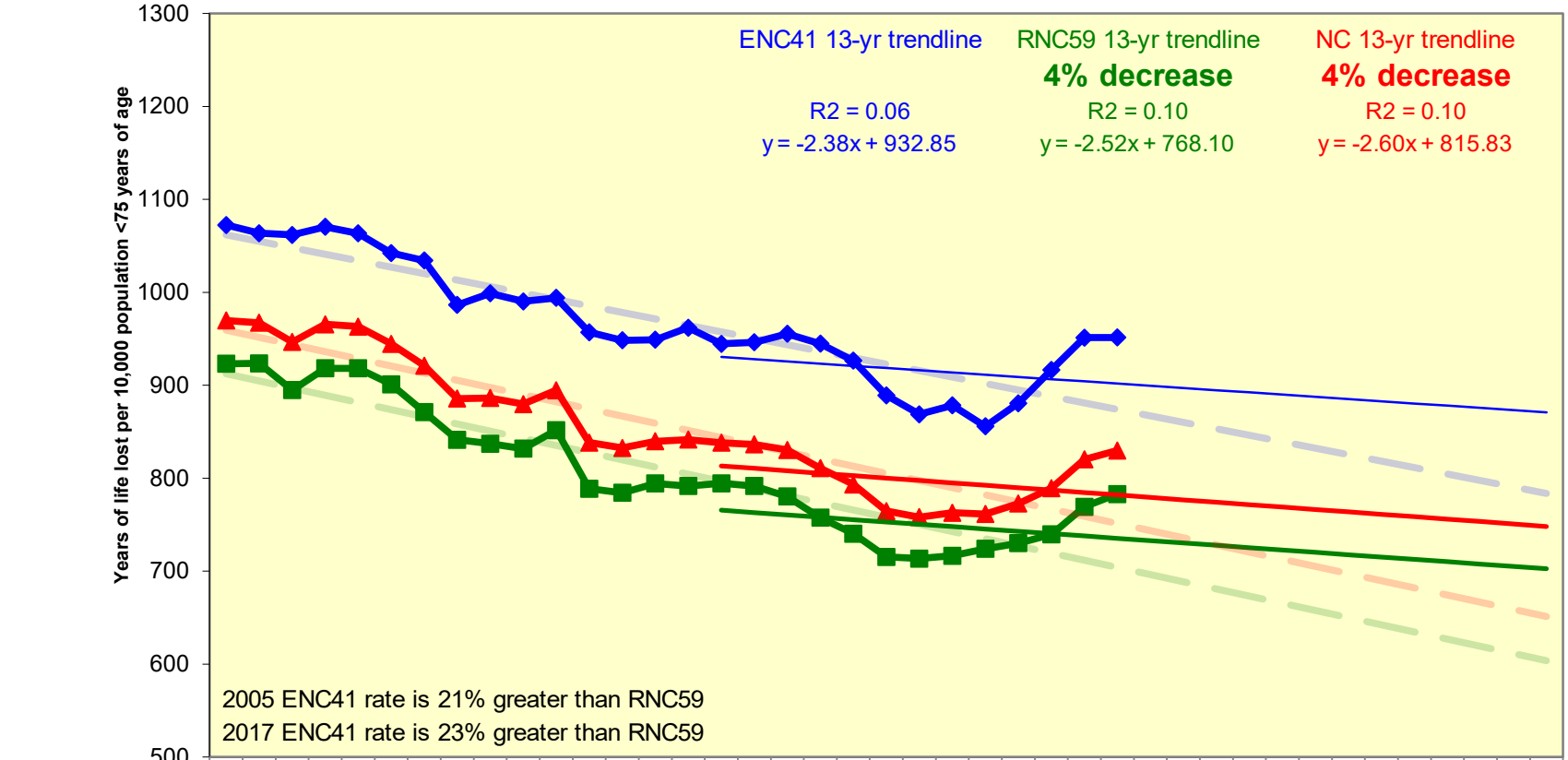


All Causes of Premature Mortality

- ENC's premature mortality rate is 23% greater than RNC and 15% greater than NC. ENC's rate trend is unreliable.
- The ENC age-adjusted premature mortality trend for the 13-year period has decreased 6%. It is 25% higher than the RNC rate in 2017.
- The non-White male rate is higher than the rates for any other demographic group. The rate for non-White females has the greatest rate of decrease (16% over 13 years).
- The non-White rate remains 42% greater than the White rate. Both are decreasing but the non-White rate is decreasing more quickly.
- A decrease in the premature mortality rate trend for non-Whites and a leveling of the rate for Whites suggests a reduction in racial disparity.

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

Figure 5.2 i. All Causes of Premature Mortality: Trends in premature mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

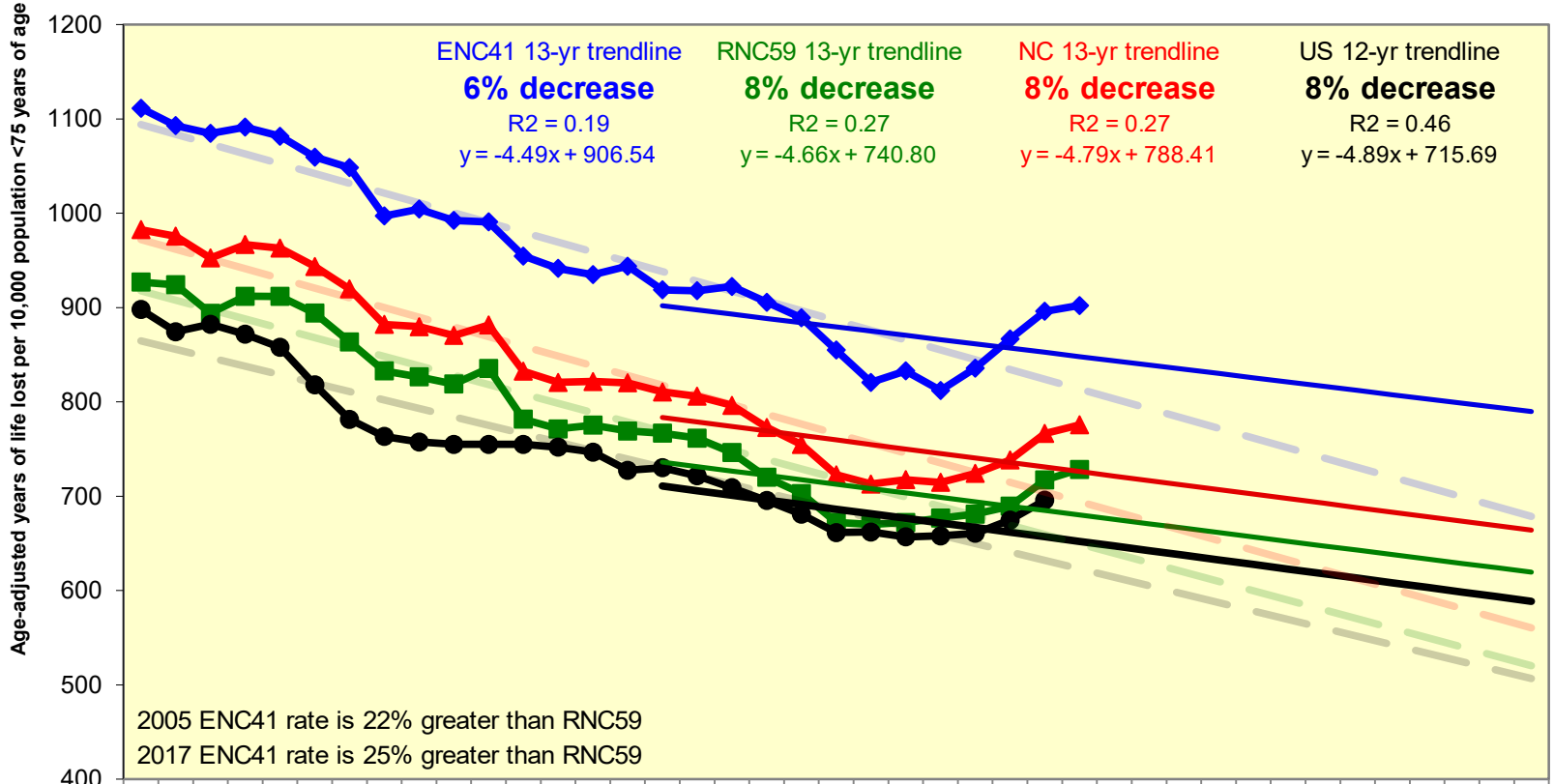


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	1072	1064	1062	1071	1064	1042	1034	986	999	990	994	957	948	949	962	945	946	955	945	927	889	869	878	856	881	917	951	951													
RNC59	923	924	895	918	918	901	871	841	837	832	852	789	784	794	792	795	792	780	758	740	715	714	717	724	730	740	769	783													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	18% LT	13% LT	ENC41
21% GT		6% GT	RNC59
14% GT	6% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	18% LT	13% LT	ENC41
23% GT		6% GT	RNC59
15% GT	6% LT		NC

Figure 5.2 ii. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

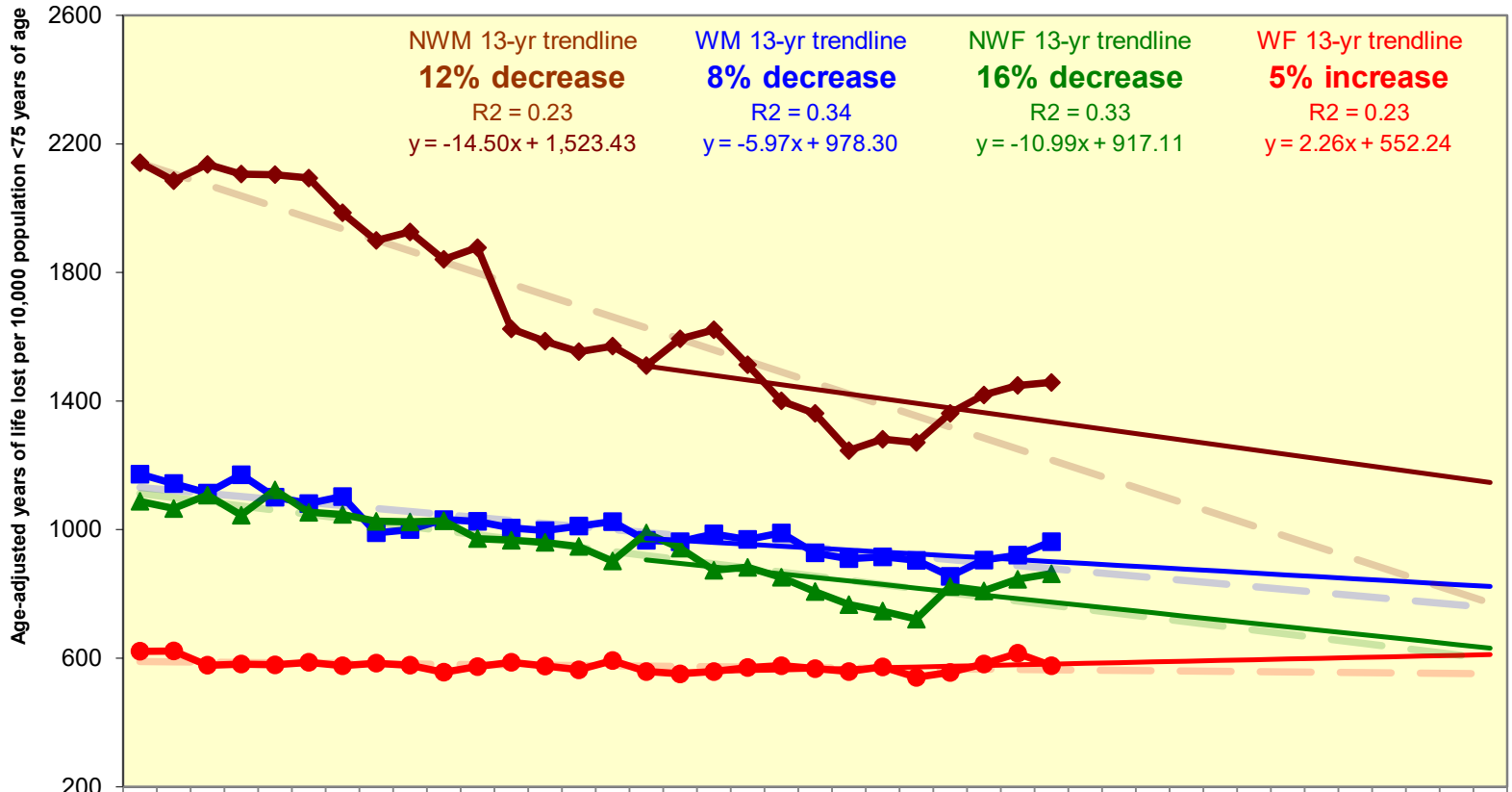


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	1111	1093	1085	1091	1082	1060	1048	997	1005	992	991	955	942	935	944	919	918	923	906	889	855	821	833	812	836	867	896	902													
RNC59	927	924	894	912	912	894	864	833	827	819	836	782	771	775	769	767	762	746	720	703	672	670	672	677	681	690	717	728													
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													
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				
ENC41	RNC59	NC	US	
	18% LT	13% LT	21% LT	ENC41
22% GT		6% GT	3% LT	RNC59
15% GT	6% LT		9% LT	NC
27% GT	4% GT	10% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	20% LT	14% LT	23% LT	ENC41
25% GT		7% GT	4% LT	RNC59
17% GT	6% LT		10% LT	NC
30% GT	4% GT	11% GT		US

Figure 5.2 iii. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

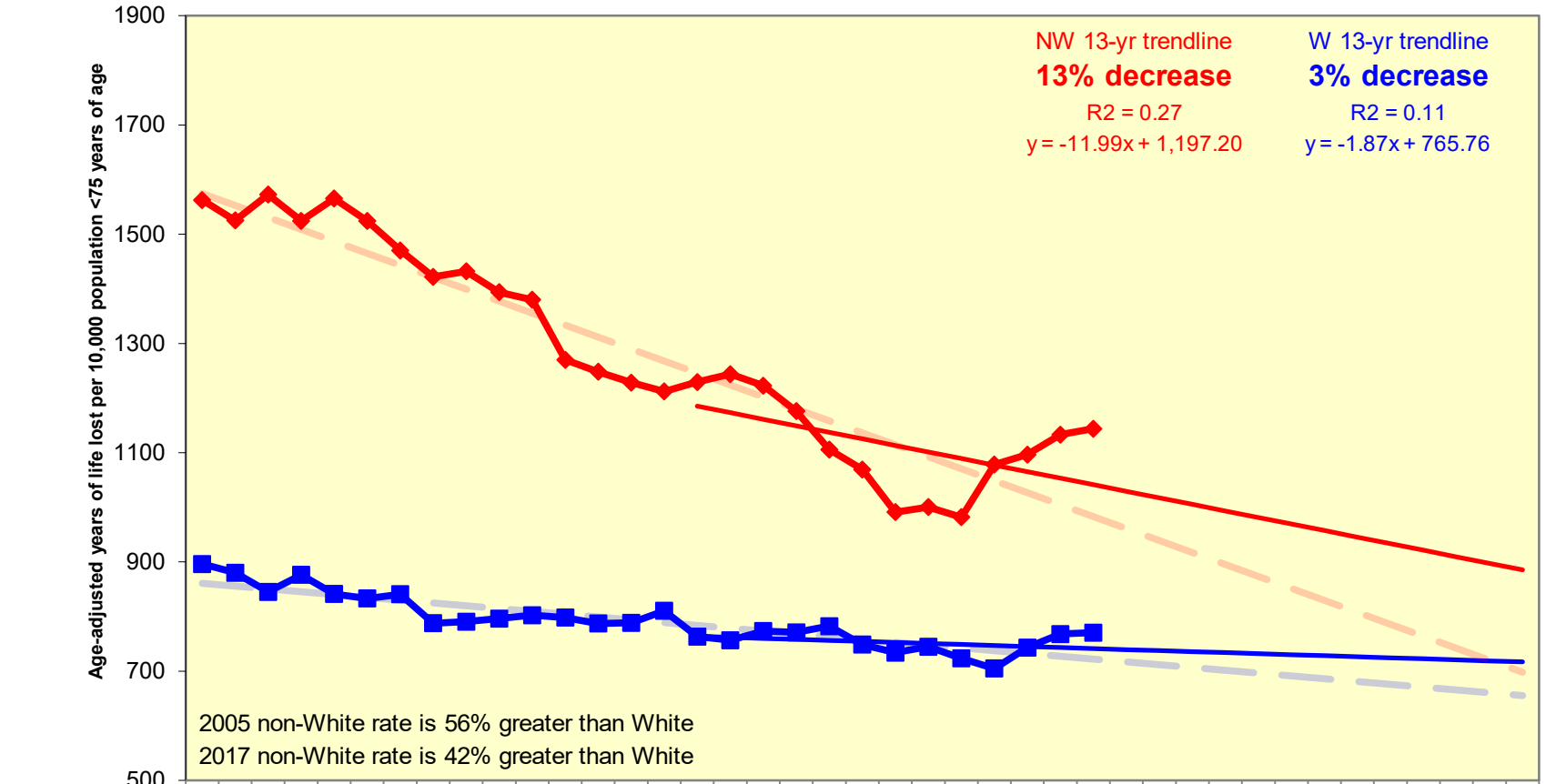


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	2142	2086	2136	2106	2104	2094	1986	1899	1926	1841	1877	1625	1586	1554	1571	1510	1593	1621	1513	1400	1362	1246	1281	1271	1362	1419	1448	1458													
WM	1173	1143	1114	1171	1101	1081	1103	990	1000	1031	1026	1005	997	1011	1025	967	962	987	969	990	928	910	915	904	855	905	920	962													
NWF	1088	1066	1107	1045	1123	1054	1047	1026	1024	1027	972	967	960	948	902	989	943	874	883	851	807	767	746	721	823	810	846	863													
WF	622	622	578	581	579	587	576	584	578	556	574	587	576	564	592	559	551	558	571	577	567	559	573	541	556	582	615	577													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	36% LT	40% LT	64% LT	NWM
56% GT		6% LT	44% LT	WM
66% GT	7% GT		40% LT	NWF
176% GT	77% GT	66% GT		WF

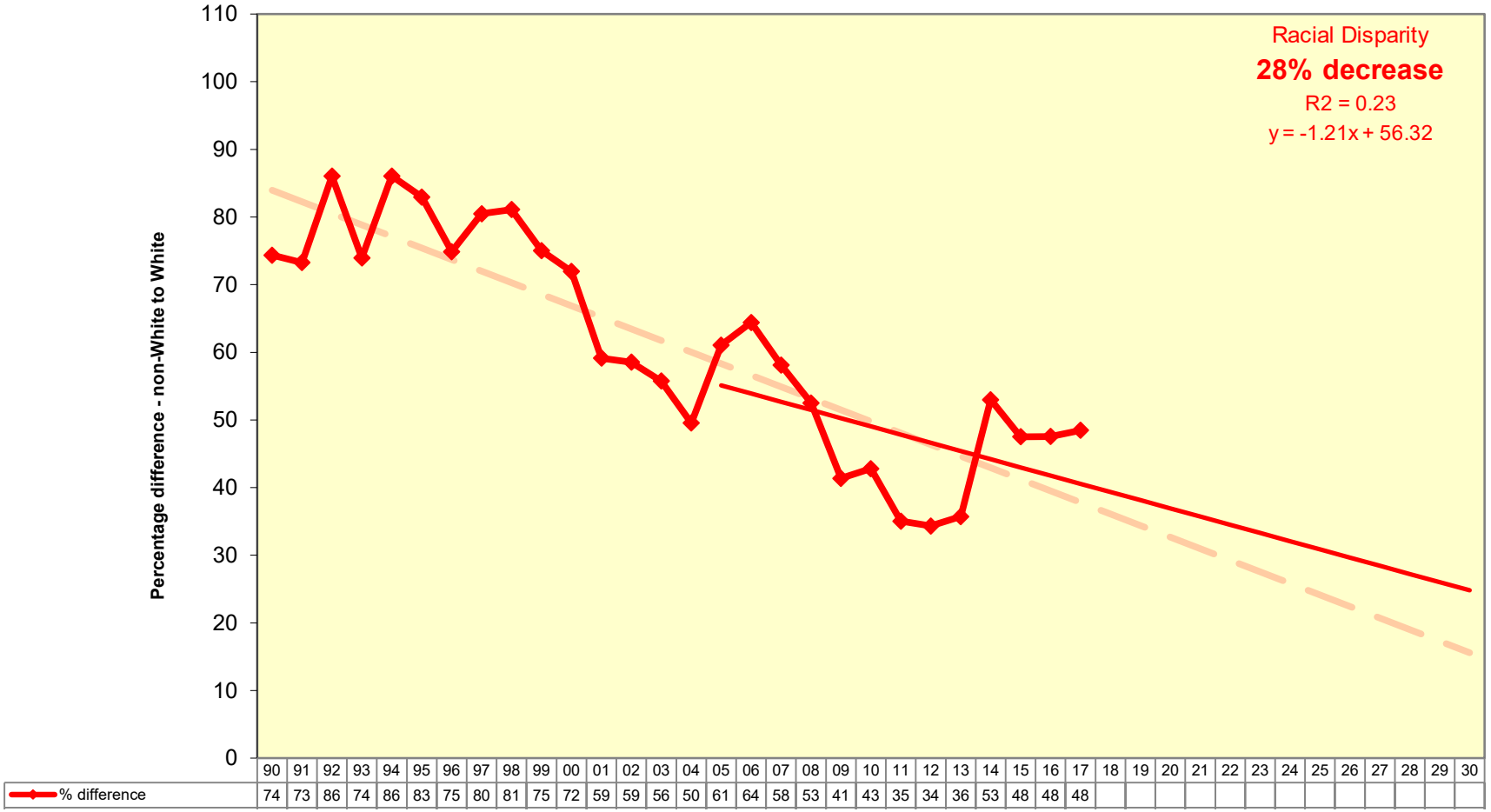
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	33% LT	42% LT	57% LT	NWM
49% GT		13% LT	36% LT	WM
72% GT	15% GT		26% LT	NWF
133% GT	56% GT	36% GT		WF

Figure 5.2 iv. All Causes of Premature Mortality: Trends in age-adjusted premature mortality rates by race for ENC41, 1990-2017 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	1563	1525	1573	1524	1565	1524	1470	1422	1432	1394	1380	1270	1248	1228	1212	1229	1244	1223	1176	1106	1069	991	1000	982	1078	1096	1133	1144													
W	896	880	845	876	841	833	841	788	791	796	803	798	787	789	811	763	757	773	771	782	749	734	745	724	705	743	768	770													

Figure 5.2 v. All Causes of Premature Mortality: Measuring disparity in age-adjusted premature mortality rates by race for ENC41, 1990-2017 with projections to 2030



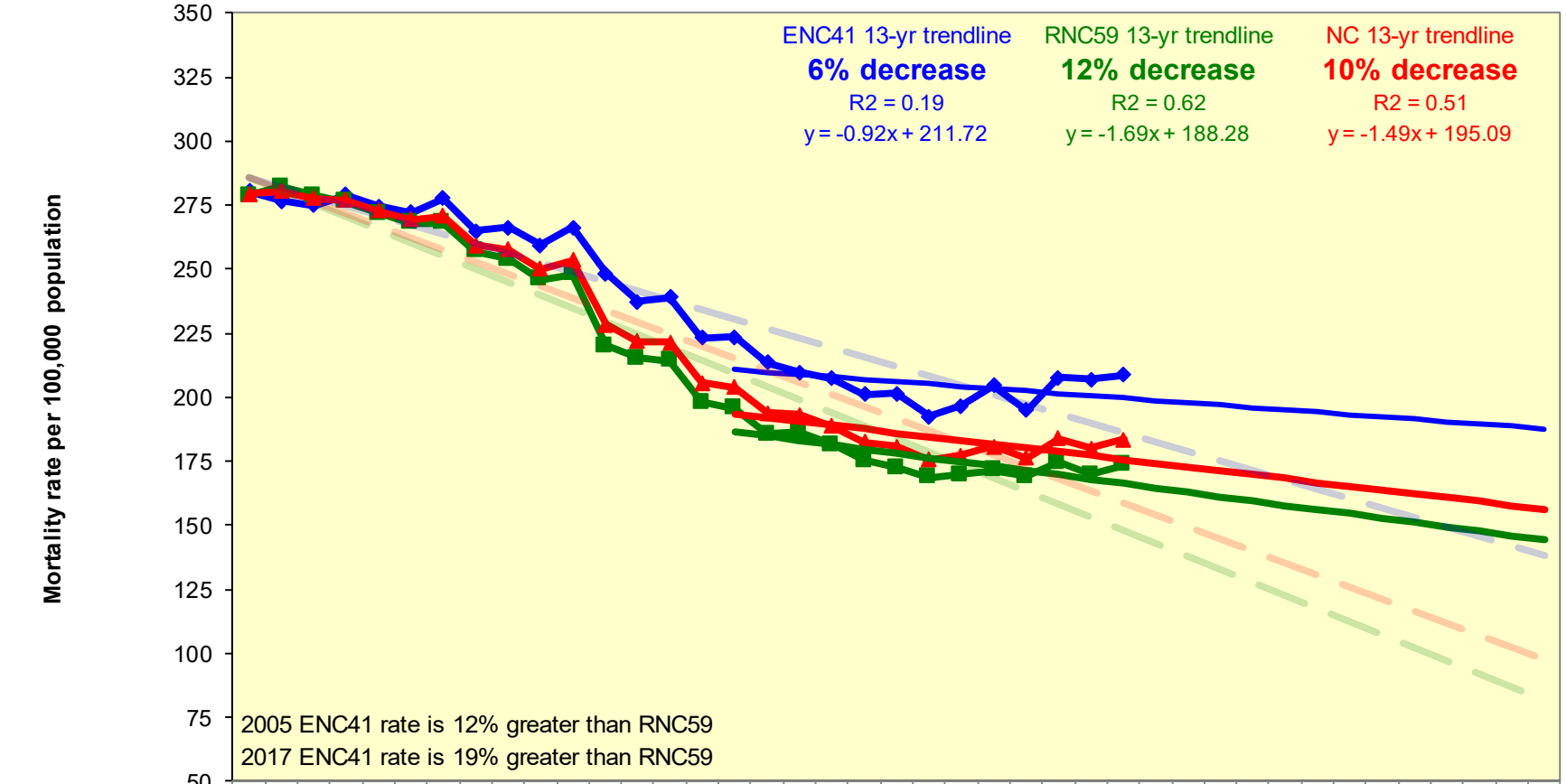
6. Trends and Disparities in Mortality in ENC41: Ten Specific Leading Causes of Death, 1990-2017

Diseases of Heart

- ENC's heart disease rate trend had decreased 6% over the 13-year period. The rates for NC and RNC are 13% and 19% lower respectively and are decreasing faster.
- ENC's age-adjusted heart disease rate is 13% greater than NC and 10% greater than the US rate. All 3 rates have decreased at a similar pace over the recent 13-year period.
- The rate for non-White males is the highest and is decreasing at about the same pace as the White male rate. The non-White female rate is decreasing the most and is set to converge with the White female rate.
- The non-White rate is 11% higher than the White rate in 2017. The 13-year trend for both is decreasing.
- The trend for racial disparity is not reliable.

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

Figure 6.1 i. Diseases of Heart: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

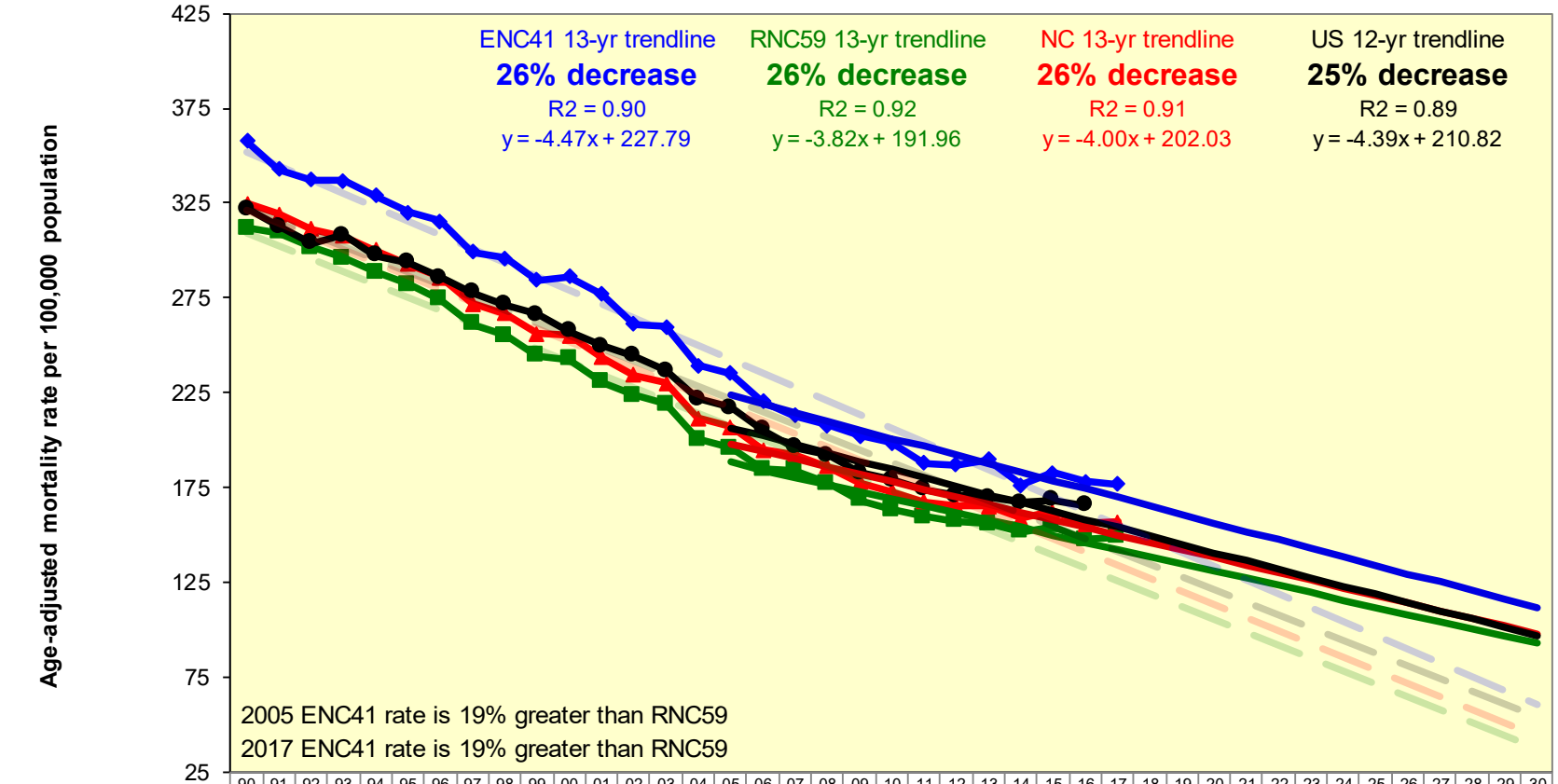


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	280	277	275	279	275	272	278	265	266	260	266	248	237	239	223	224	214	210	207	201	202	193	196	204	195	208	207	209													
RNC59	279	282	279	276	272	268	268	257	254	246	248	220	215	214	198	196	186	186	181	175	172	169	170	171	169	175	170	174													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	11% LT	8% LT	ENC41
12% GT		4% GT	RNC59
9% GT	3% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	16% LT	12% LT	ENC41
19% GT		5% GT	RNC59
13% GT	5% LT		NC

Figure 6.1 ii. Diseases of Heart: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

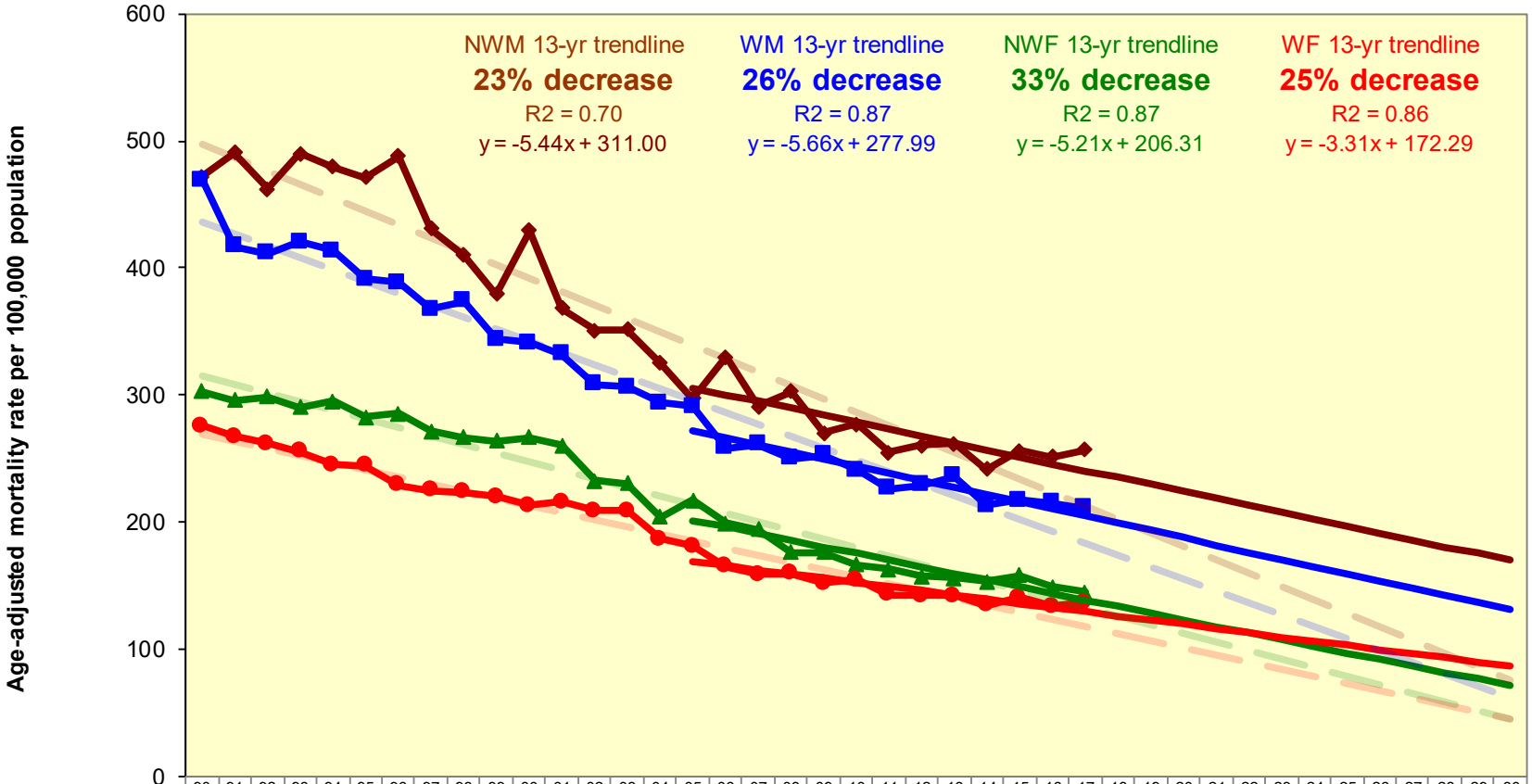


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	358	343	337	337	329	320	315	299	296	284	286	277	261	260	240	235	220	213	208	202	199	188	187	190	176	183	178	177													
RNC59	312	309	301	296	289	282	274	261	255	244	243	231	223	219	200	196	185	184	177	169	163	160	157	156	151	154	147	149													
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													
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				
ENC41	RNC59	NC	US	
	16% LT	11% LT	7% LT	ENC41
19% GT		5% GT	10% GT	RNC59
13% GT	5% LT		4% GT	NC
8% GT	9% LT	4% LT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	16% LT	12% LT	9% LT	ENC41
19% GT		5% GT	8% GT	RNC59
13% GT	5% LT		3% GT	NC
10% GT	8% LT	3% LT		US

Figure 6.1 iii. Diseases of Heart: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 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	472	490	462	490	480	471	488	431	410	379	429	368	351	351	325	297	330	291	302	270	277	255	260	261	242	256	251	257													
WM	469	417	412	420	413	391	389	368	374	344	341	332	308	306	294	291	258	261	249	253	240	226	229	236	213	217	215	211													
NWF	302	296	299	290	295	282	286	272	267	264	267	260	232	230	204	217	199	194	176	176	166	162	157	156	153	158	149	145													
WF	276	267	262	256	245	245	229	225	223	220	213	216	208	209	186	181	165	158	159	151	154	142	142	142	134	140	134	136													

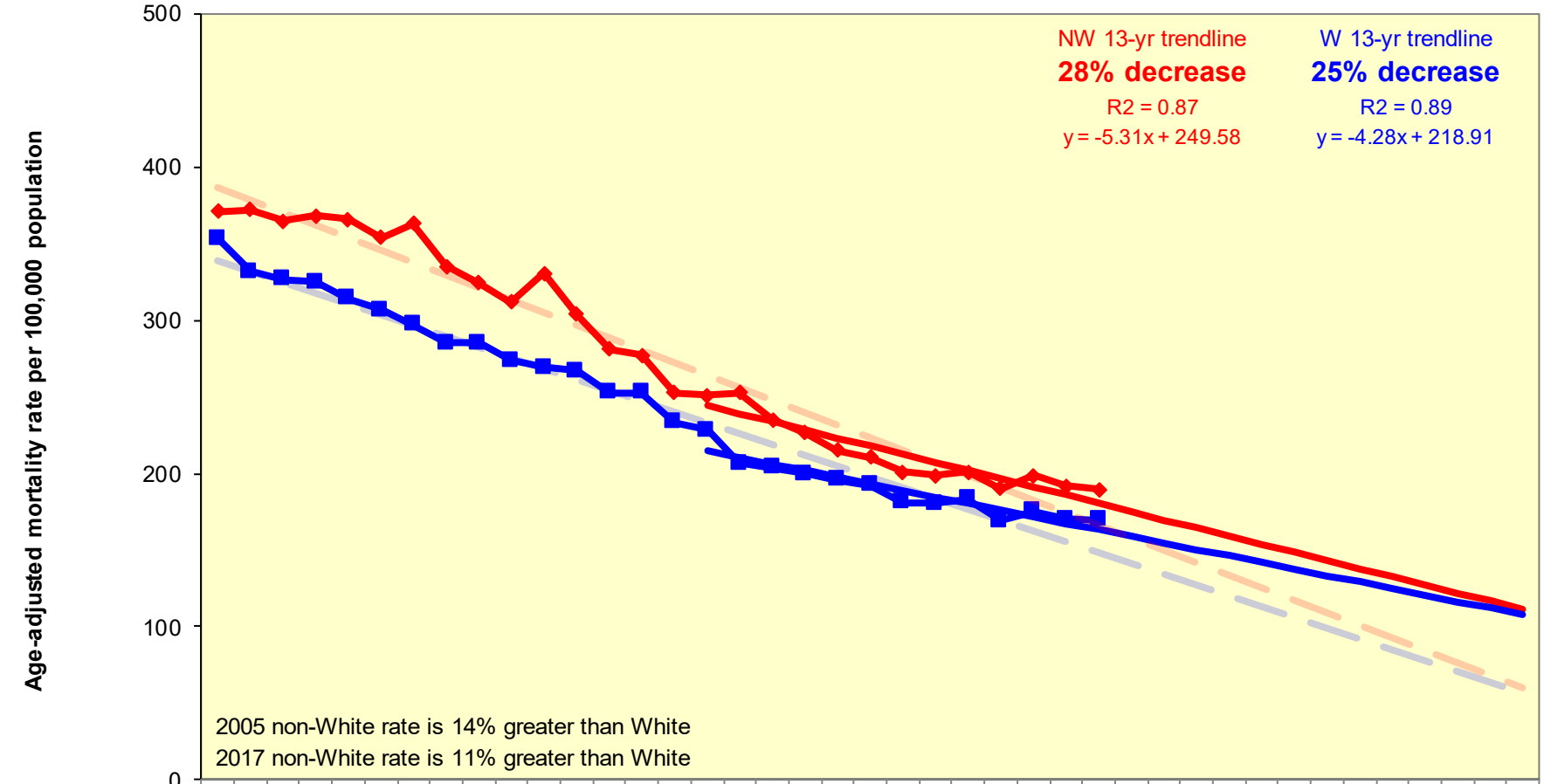
Comparison of Fitted Rates in 2005

NWM	WM	NWF	WF	
	11% LT	34% LT	45% LT	NWM
12% GT		26% LT	38% LT	WM
51% GT	35% GT		16% LT	NWF
81% GT	61% GT	20% GT		WF

Comparison of Fitted Rates in 2017

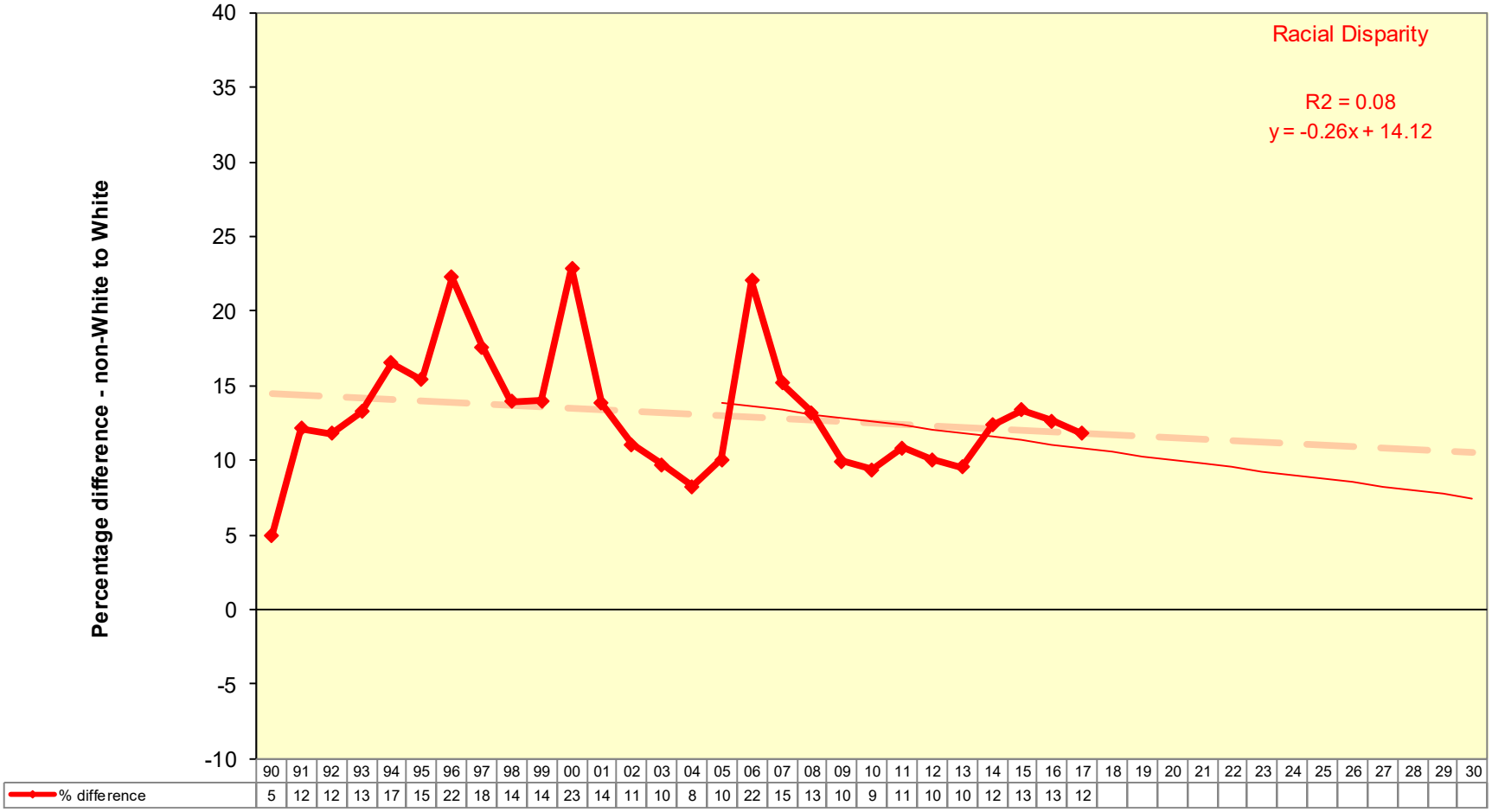
NWM	WM	NWF	WF	
	14% LT	41% LT	46% LT	NWM
17% GT		32% LT	37% LT	WM
71% GT	46% GT		8% LT	NWF
85% GT	58% GT	8% GT		WF

Figure 6.1 iv. Diseases of Heart: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	371	372	365	368	366	354	363	335	324	312	331	304	281	277	253	251	252	235	226	215	211	201	199	201	190	199	192	190													
W	353	332	326	325	314	307	297	285	285	274	269	267	253	253	233	228	207	204	200	196	193	181	181	183	169	175	170	170													

Figure 6.1 v. Diseases of Heart:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030



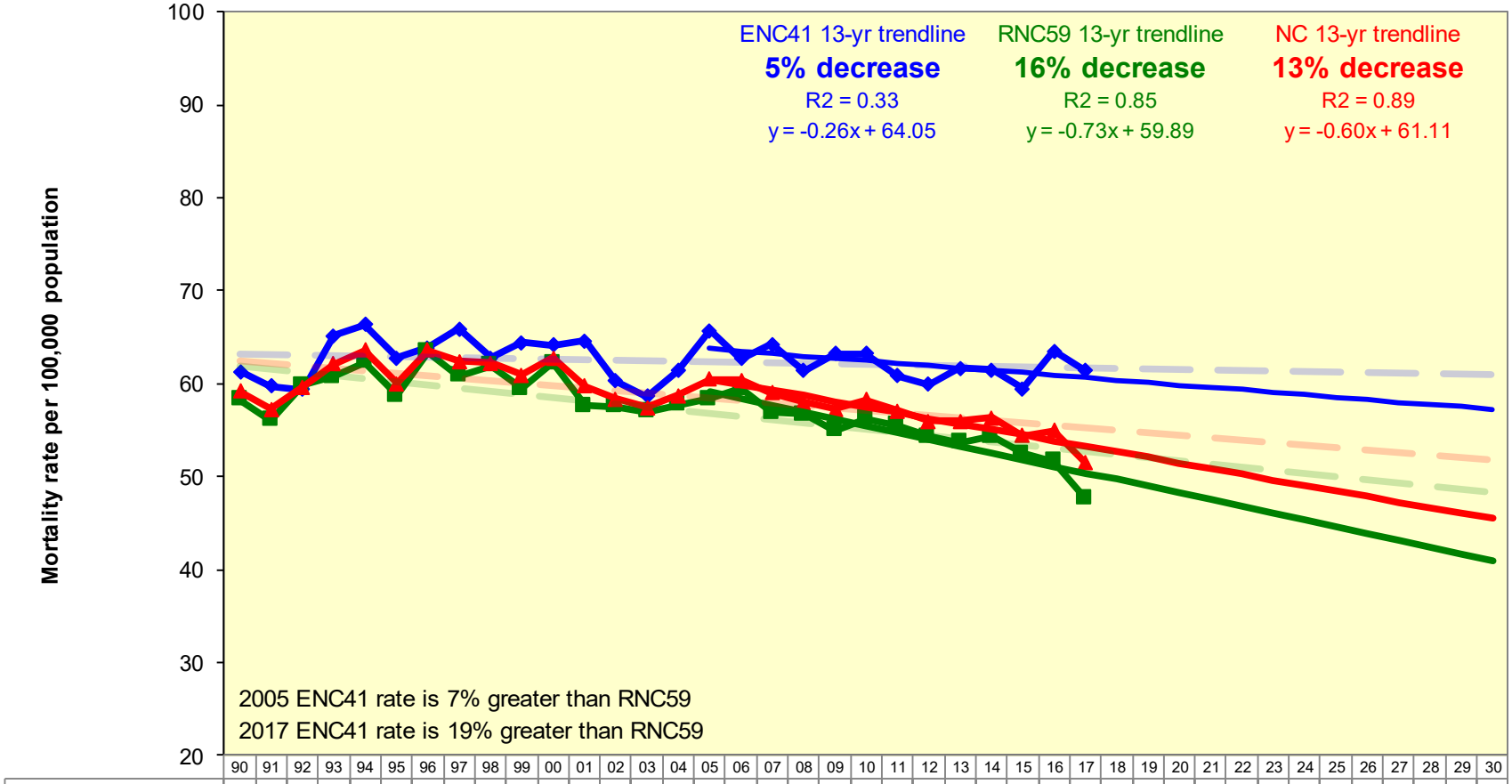
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
% difference	5	12	12	13	17	15	22	18	14	14	23	14	11	10	8	10	22	15	13	10	9	11	10	10	12	13	13	12													

Cancer - Trachea, Bronchus, Lung

- The cancer-TBL rate trend for ENC has decreased 5% over the recent 13-year period. The ENC rate is 19% greater than the RNC rate. The RNC rate has decreased 16%.
- In 2017 the age-adjusted rate for ENC was 16% above the RNC rate. The ENC rate decreased 27% over the 13-year period, while the RNC rate decreased 32%.
- In 2017 the non-White male rate was the highest but is only 6% higher than the White male rate, is decreasing, and will likely converge soon. The mortality rate for White females is 48% higher than the rate for non-White females. Both are decreasing.
- The non-White mortality rate is 14% less than the White rate. Both are decreasing over the 13-year period at about the same pace.
- The 13-year rate trend for racial disparity 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 6.2 i. Cancer - Trachea, Bronchus, Lung: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

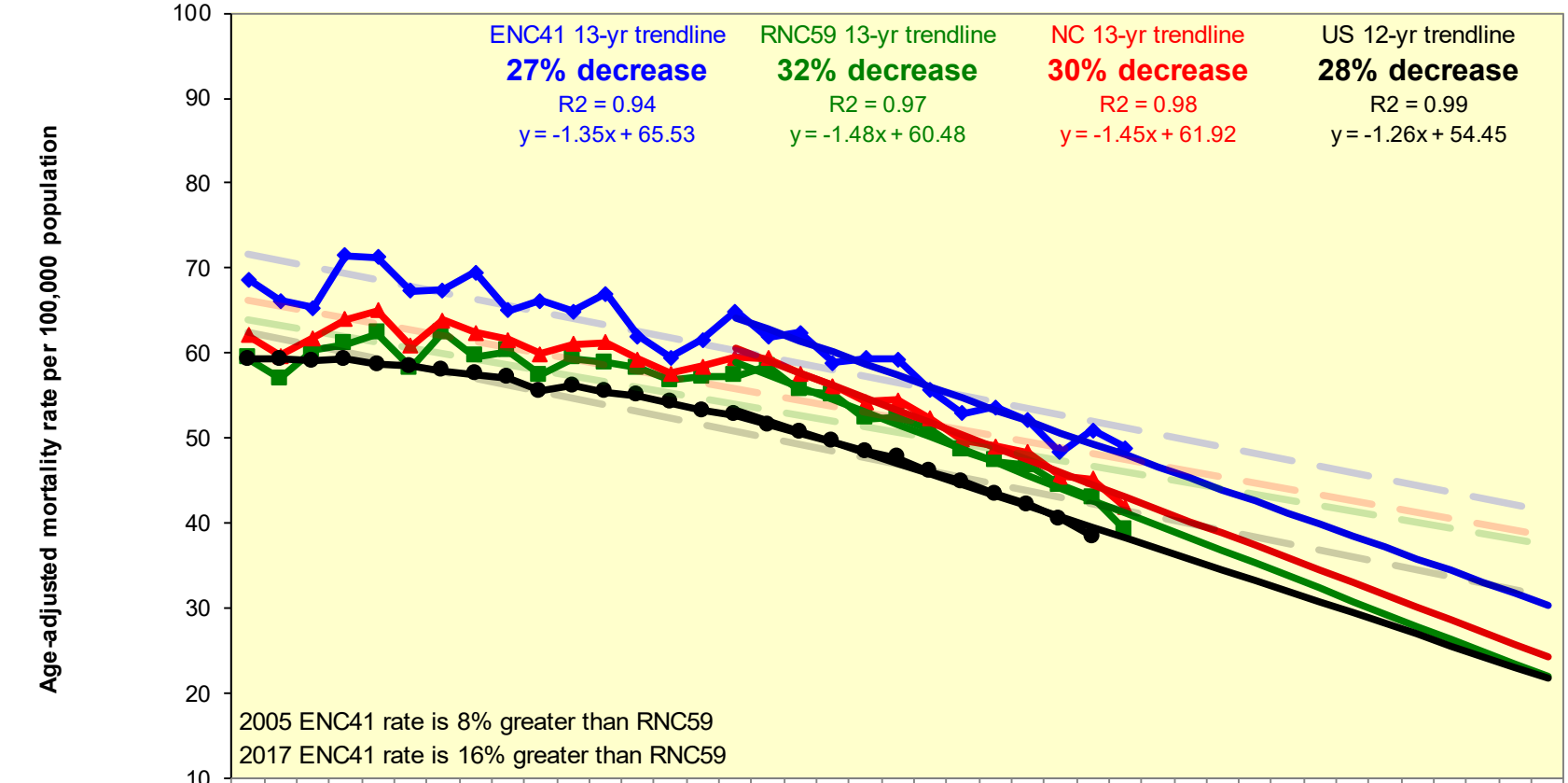


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	61	60	59	65	66	63	64	66	63	64	64	65	60	59	61	66	63	64	61	63	63	61	60	62	61	59	64	61													
RNC59	58	56	60	61	62	59	63	61	62	59	62	58	58	57	58	58	59	57	57	55	56	56	54	54	54	52	52	48													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	6% LT	5% LT	ENC41
7% GT		2% GT	RNC59
5% GT	2% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	16% LT	12% LT	ENC41
19% GT		5% GT	RNC59
13% GT	5% LT		NC

Figure 6.2 ii. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

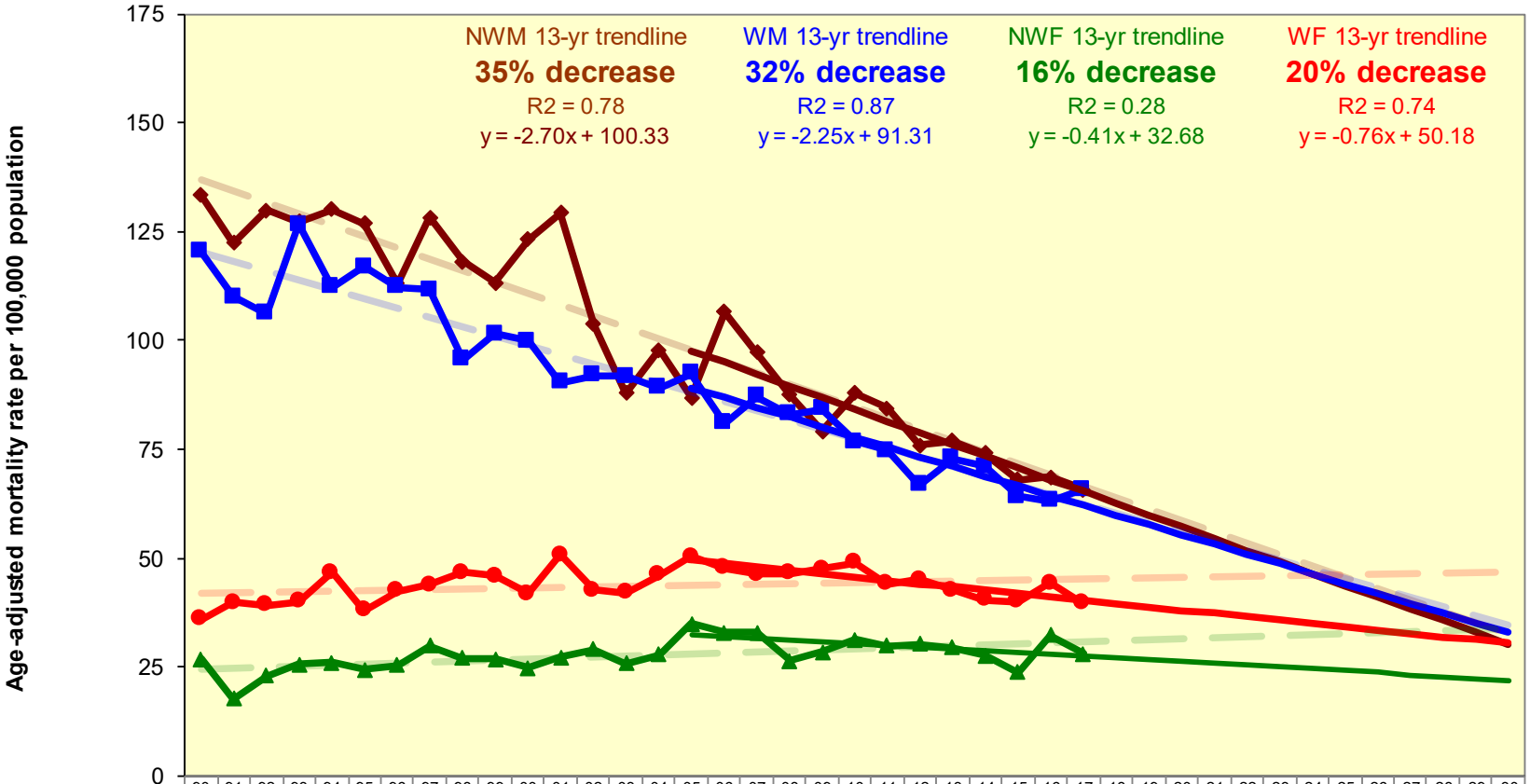


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	69	66	65	71	71	67	67	70	65	66	65	67	62	59	62	65	62	62	59	59	59	56	53	54	52	48	51	49													
RNC59	59	57	60	61	62	58	62	60	60	57	59	59	58	57	57	57	58	56	55	52	53	51	49	47	47	44	43	39													
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													
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				
ENC41	RNC59	NC	US	
	8% LT	6% LT	17% LT	ENC41
8% GT		2% GT	10% LT	RNC59
6% GT	2% LT		12% LT	NC
20% GT	11% GT	14% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	13% LT	10% LT	20% LT	ENC41
16% GT		4% GT	8% LT	RNC59
11% GT	4% LT		12% LT	NC
25% GT	8% GT	13% GT		US

Figure 6.2 iii. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 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	133	122	130	127	130	127	113	128	118	113	123	129	104	88	98	87	107	97	87	79	88	85	76	77	74	68	69	66													
WM	120	110	106	127	112	117	112	112	96	101	100	90	92	92	89	92	81	87	83	84	77	75	67	73	71	64	63	66													
NWF	27	18	23	26	26	24	25	30	27	27	25	27	29	26	28	35	33	33	26	28	31	30	30	29	28	24	32	28													
WF	36	40	39	40	47	38	42	44	47	46	42	51	43	42	46	50	48	46	46	48	49	44	45	43	40	40	44	40													

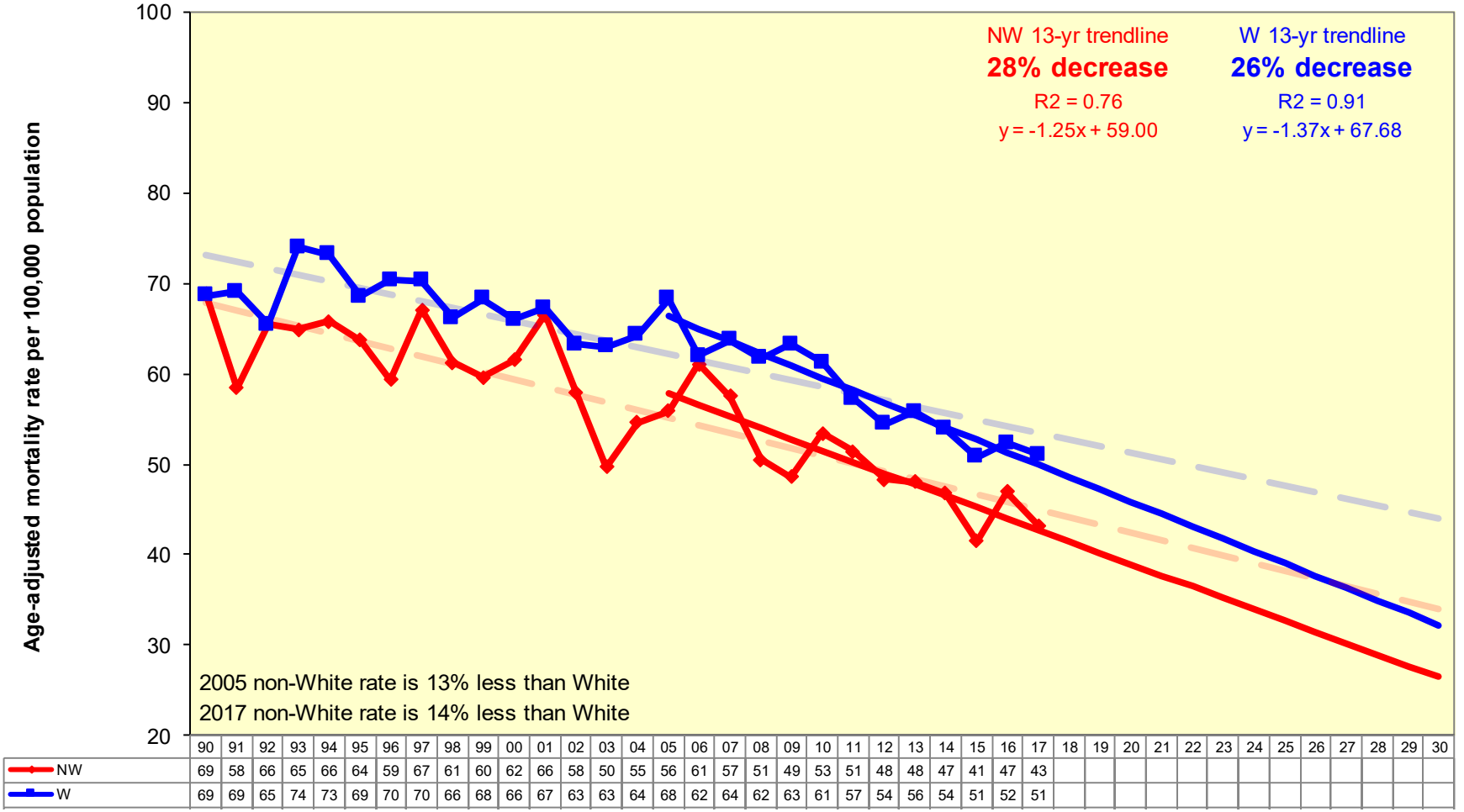
Comparison of Fitted Rates in 2005

NWM	WM	NWF	WF	
	9% LT	67% LT	50% LT	NWM
10% GT		64% LT	45% LT	WM
207% GT	179% GT		54% GT	NWF
100% GT	82% GT	35% LT		WF

Comparison of Fitted Rates in 2017

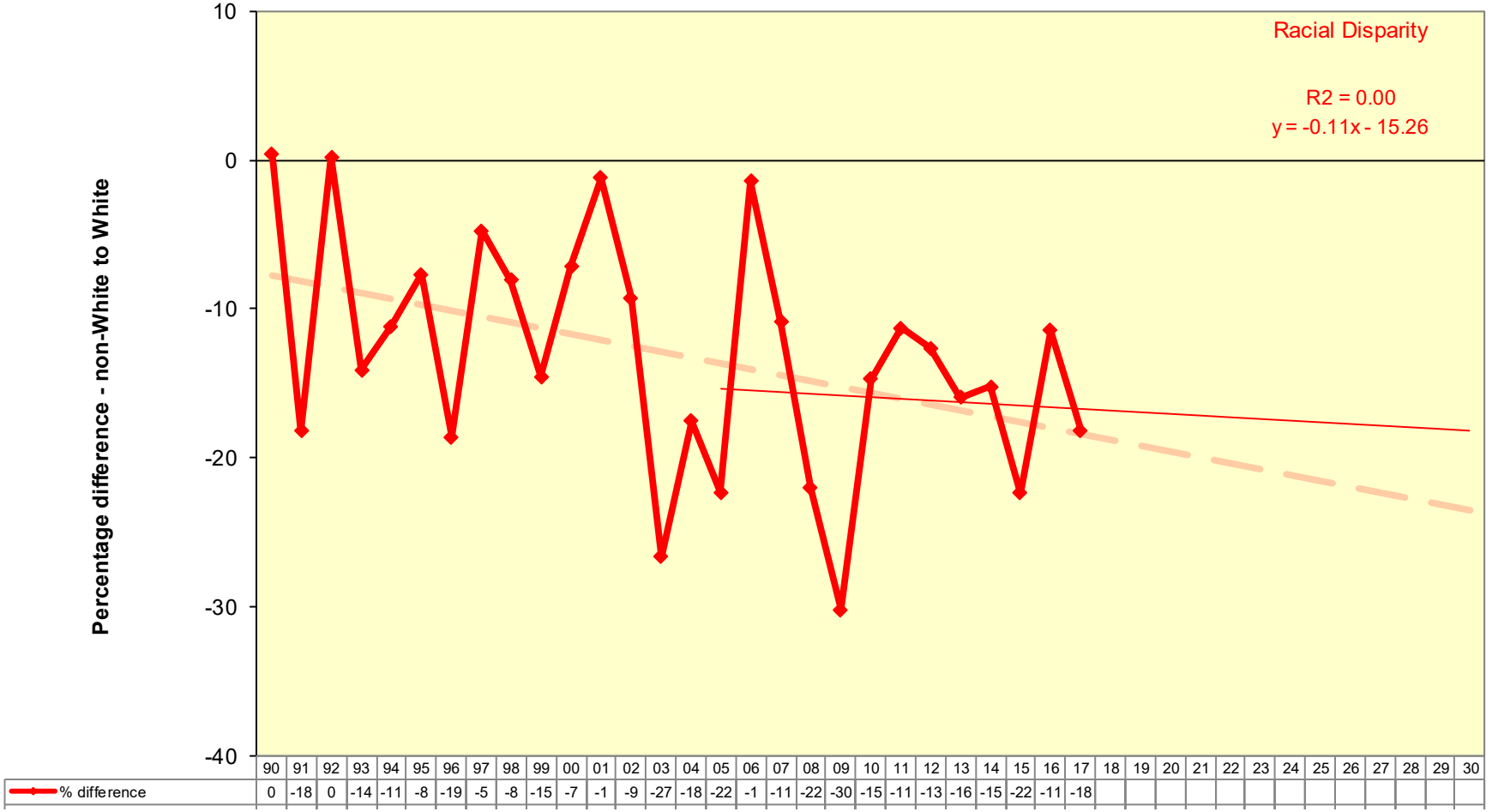
NWM	WM	NWF	WF	
	5% LT	59% LT	40% LT	NWM
6% GT		57% LT	36% LT	WM
145% GT	132% GT		48% GT	NWF
66% GT	57% GT	32% LT		WF

Figure 6.2 iv. Cancer - Trachea, Bronchus, Lung: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	69	58	66	65	66	64	59	67	61	60	62	66	58	50	55	56	61	57	51	49	53	51	48	48	47	41	47	43													
W	69	69	65	74	73	69	70	70	66	68	66	67	63	63	64	68	62	64	62	63	61	57	54	56	54	51	52	51													

Figure 6.2 v. Cancer - Trachea, Bronchus, Lung:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030



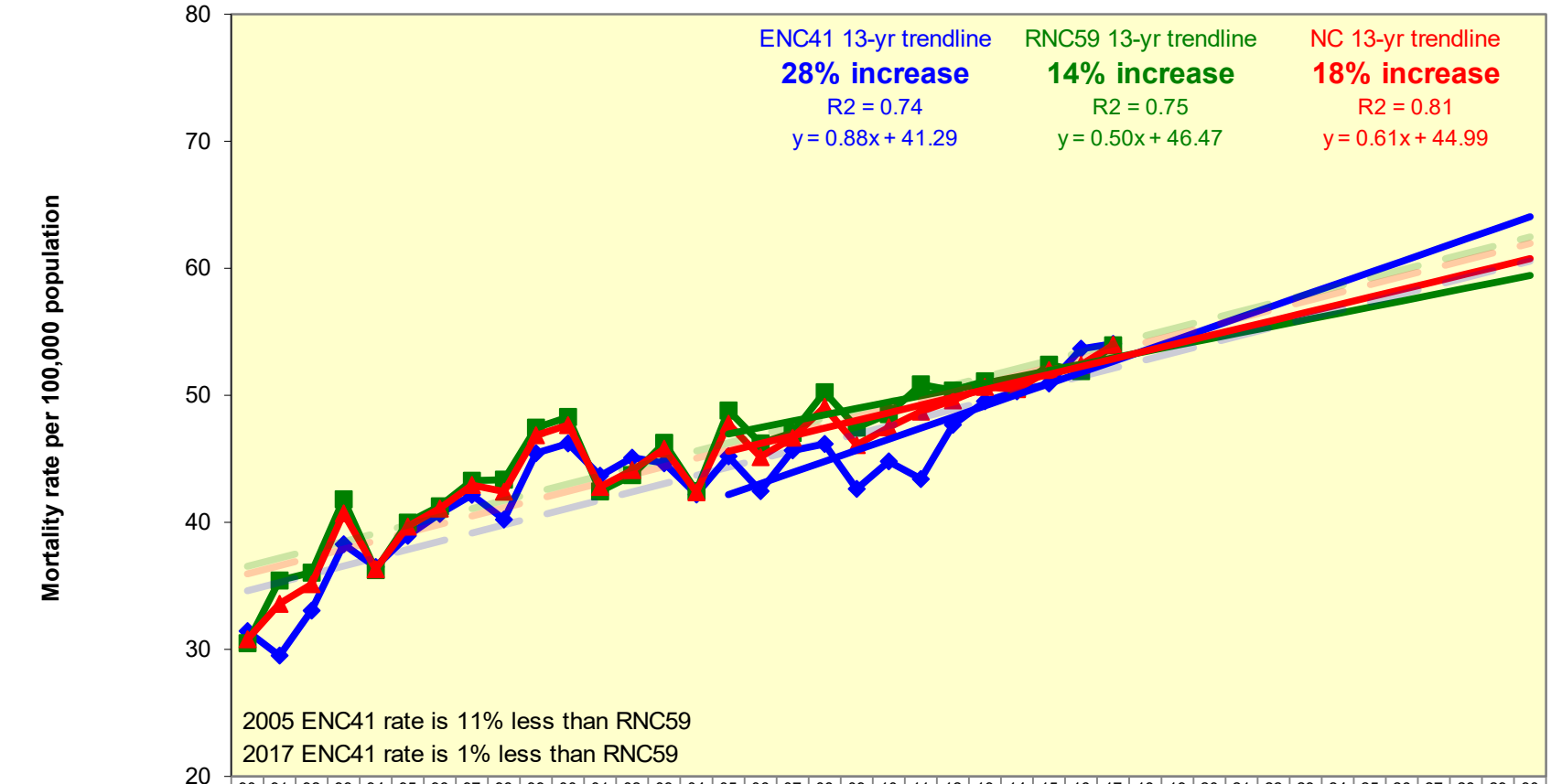
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
% difference	0	-18	0	-14	-11	-8	-19	-5	-8	-15	-7	-1	-9	-27	-18	-22	-1	-11	-22	-30	-15	-11	-13	-16	-15	-22	-11	-18													

Chronic Lower Respiratory Diseases

- In 2017 the CLRD morality rate for ENC, RNC and NC are virtually equal. The ENC rate trend has increased 28% over the 13-year period, compared to 14% for RNC and 18% for NC.
- The age-adjusted rate for 2017 for ENC, RNC and NC are equal. The US rate is 7% lower. The rate trend for ENC is unreliable.
- The age-adjusted rate for White males is the highest, followed by White females, then non-White males. The rates for White males and non-White males are decreasing. The rates for White females and non-White females are increasing.
- The non-White rate is 42% less than the White rate. Both rate trends are flat, but neither is reliable.
- The racial disparity trend 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 6.3 i. Chronic Lower Respiratory Diseases: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

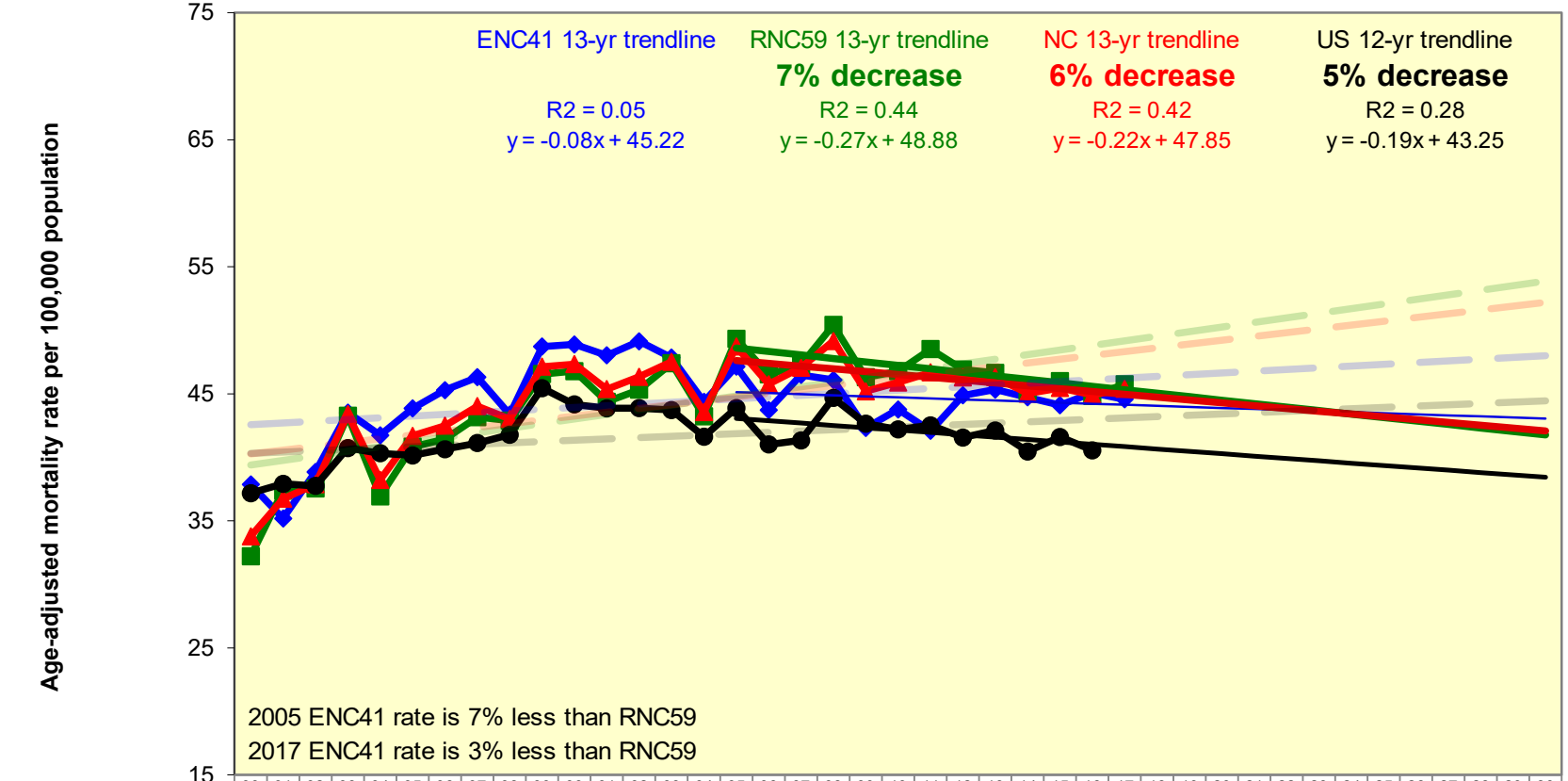


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	31	30	33	38	36	39	41	42	40	45	46	44	45	45	42	45	42	46	46	43	45	43	48	50	50	51	54	54													
RNC59	30	35	36	42	36	40	41	43	43	47	48	42	44	46	42	49	46	47	50	47	49	51	50	51	51	52	52	54													
NC	31	34	35	41	36	40	41	43	42	47	48	43	44	46	42	48	45	47	49	46	47	49	50	51	50	52	52	54													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	13% GT	9% GT	ENC41
11% LT		3% LT	RNC59
8% LT	3% GT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	1% GT	1% GT	ENC41
1% LT		0% LT	RNC59
1% LT	0% GT		NC

Figure 6.3 ii. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

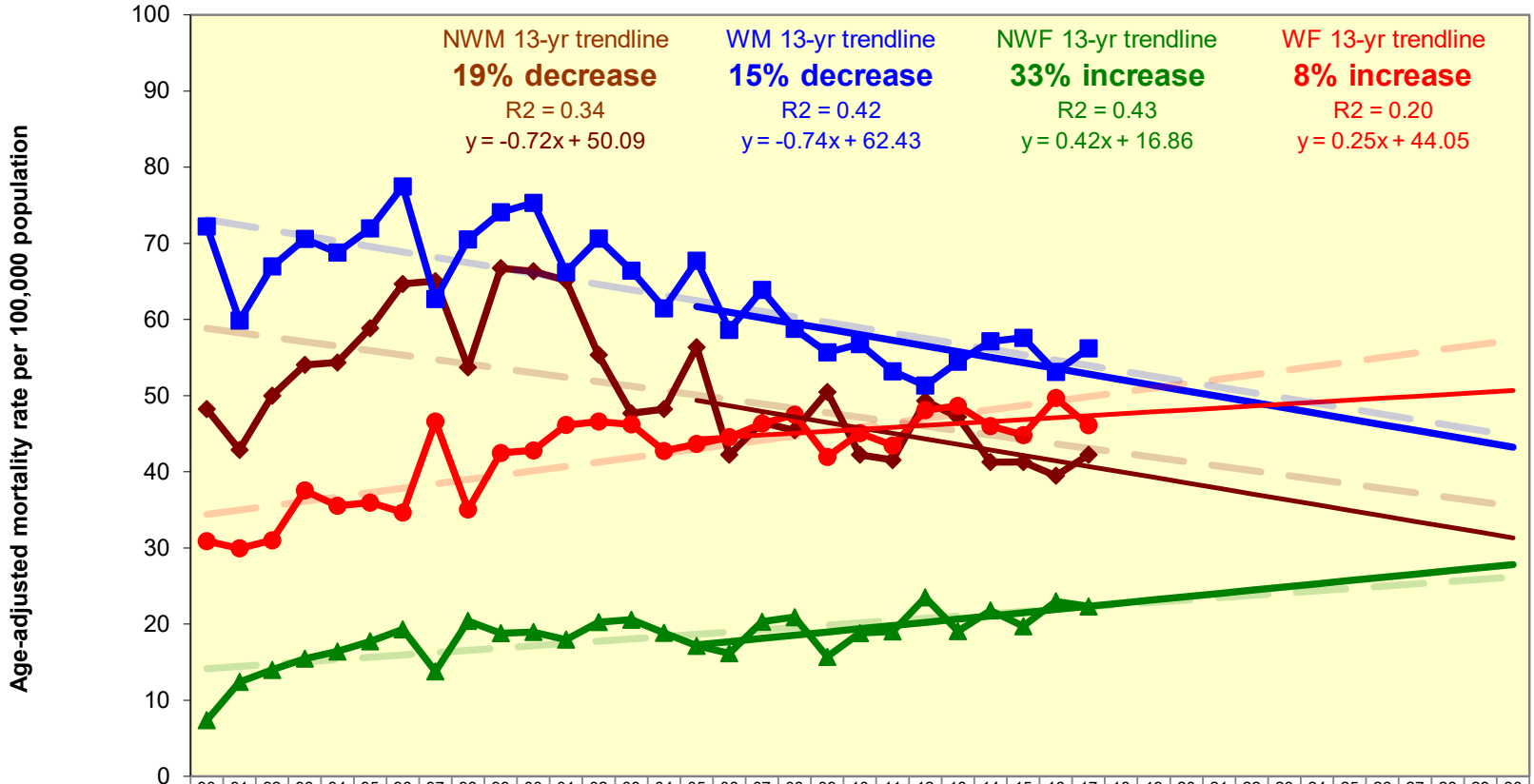


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	38	35	39	44	42	44	45	46	43	49	49	48	49	48	44	47	44	46	46	42	44	42	45	45	45	44	45	45													
RNC59	32	37	38	43	37	41	41	43	43	47	47	44	45	47	43	49	47	47	50	46	47	49	47	47	45	46	45	46													
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													
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				
ENC41	RNC59	NC	US	
	8% GT	6% GT	4% LT	ENC41
7% LT		2% LT	12% LT	RNC59
5% LT	2% GT		10% LT	NC
5% GT	13% GT	11% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	3% GT	2% GT	7% LT	ENC41
3% LT		1% LT	10% LT	RNC59
2% LT	1% GT		9% LT	NC
8% GT	11% GT	10% GT		US

Figure 6.3 iii. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 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	48	43	50	54	54	59	65	65	54	67	66	65	55	48	48	56	42	46	45	50	42	42	49	47	41	41	39	42													
WM	72	60	67	71	69	72	77	63	71	74	75	66	71	66	61	68	59	64	59	56	57	53	51	54	57	58	53	56													
NWF	7	12	14	15	16	18	19	14	20	19	19	18	20	21	19	17	16	20	21	16	19	19	24	19	22	20	23	22													
WF	31	30	31	38	36	36	35	47	35	42	43	46	47	46	43	44	45	46	48	42	45	43	48	49	46	45	50	46													

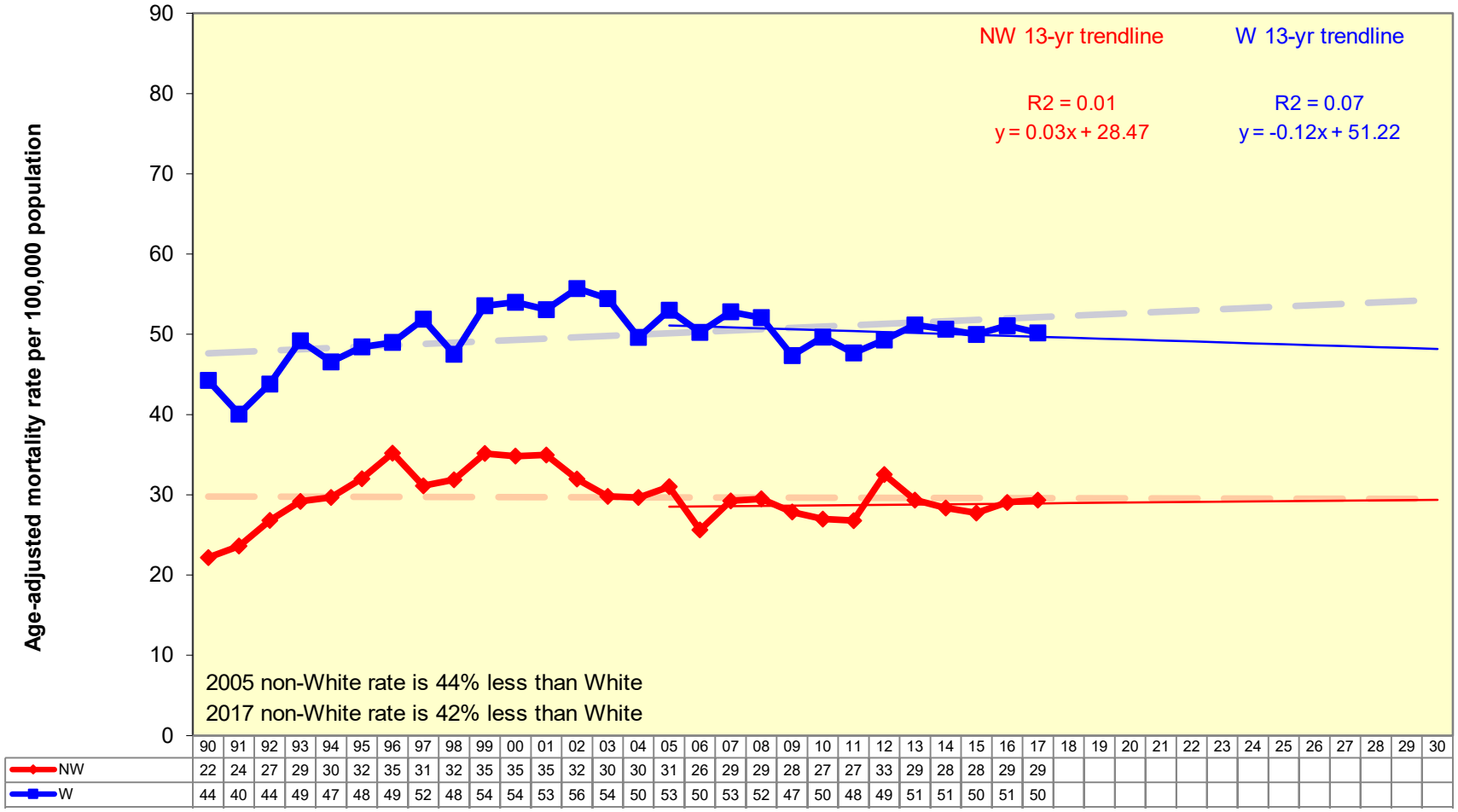
Comparison of Fitted Rates in 2005

NWM	WM	NWF	WF	
	25% GT	66% LT	12% LT	NWM
20% LT		73% LT	29% LT	WM
197% GT	270% GT		161% GT	NWF
14% GT	42% GT	62% LT		WF

Comparison of Fitted Rates in 2017

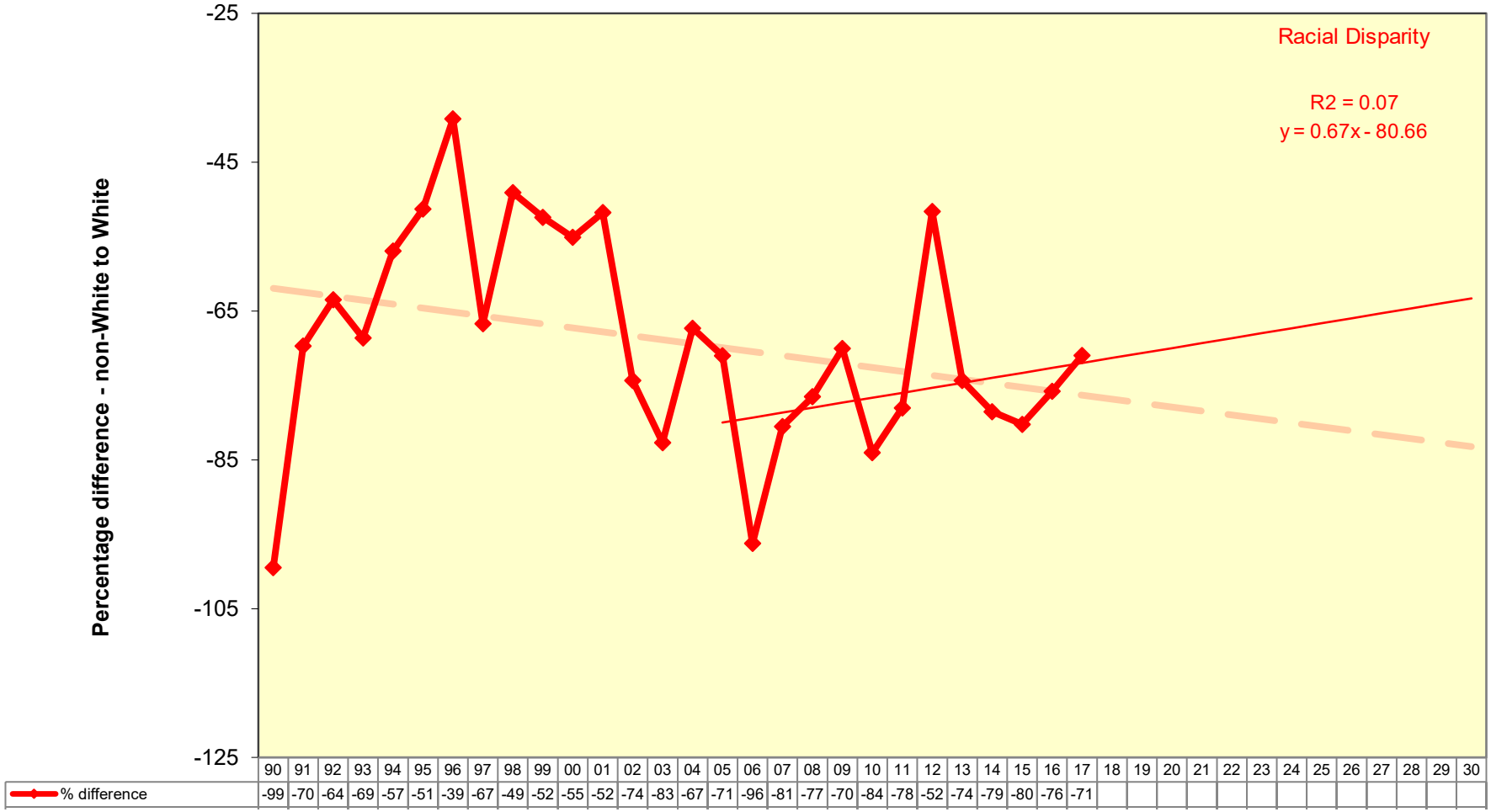
NWM	WM	NWF	WF	
	29% GT	47% LT	14% GT	NWM
23% LT		59% LT	12% LT	WM
89% GT	144% GT		115% GT	NWF
12% LT	14% GT	53% LT		WF

Figure 6.3 iv. Chronic Lower Respiratory Diseases: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	22	24	27	29	30	32	35	31	32	35	35	35	32	30	30	31	26	29	29	28	27	27	33	29	28	28	29	29													
W	44	40	44	49	47	48	49	52	48	54	54	53	56	54	50	53	50	53	52	47	50	48	49	51	51	50	51	50													

Figure 6.3 v. Chronic Lower Respiratory Diseases: Measuring disparity in age-adjusted mortality rates by race for ENC41, 1990-2017 with projections to 2030

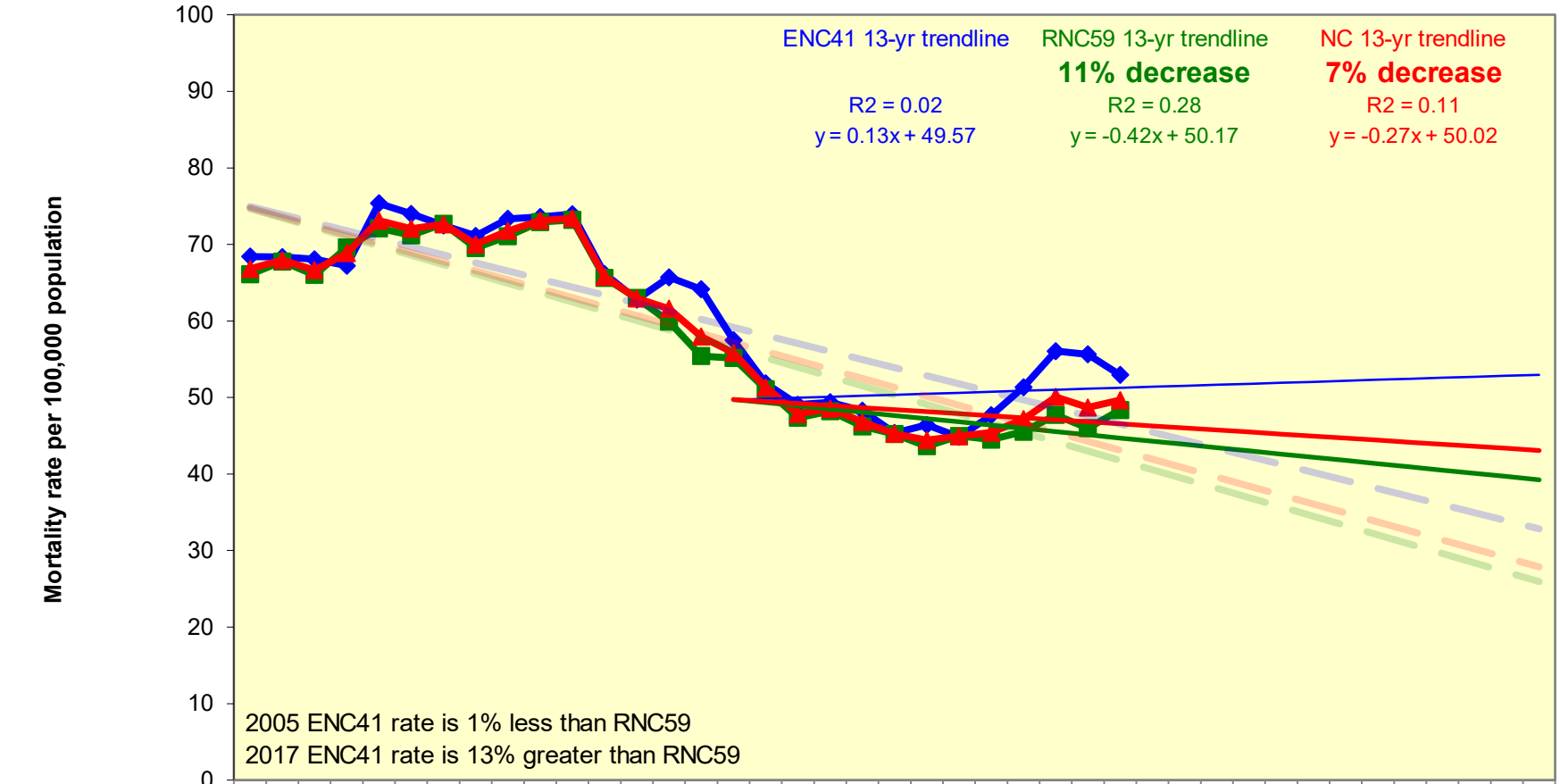


Cerebrovascular Disease

- ENC's cerebrovascular disease mortality rate trend is flat, but the trend is unreliable. It is 13% greater than the RNC rate and 9% greater than the NC rate.
- The age-adjusted rate has decreased 18% over the 13-year period. It is 13% greater than the RNC rate and 30% greater than the US rate.
- The non-White male rate is the highest and has decreased 23% over the 13-year period. The non-White female rate has decreased 35% and is converging with White males and White females.
- The non-White rate in 2017 is 27% greater than the White rate but is decreasing more rapidly (30% over the 13-year period). Both rates are projected to converge in the future.
- There is a 55% decrease in racial disparity between Whites and non-Whites over the 13-year period

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. Cerebrovascular Disease: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

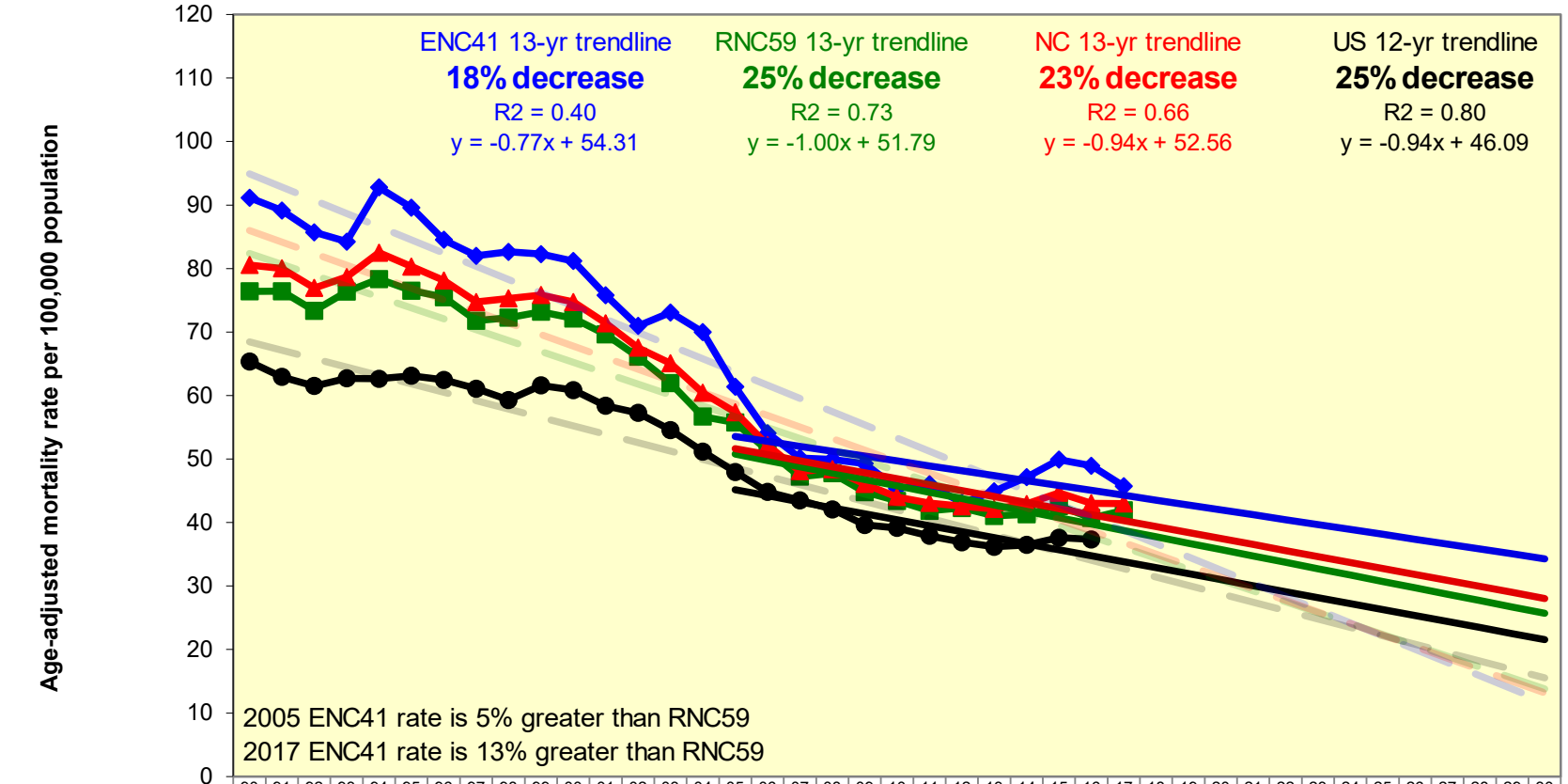


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	68	68	68	67	75	74	72	71	73	74	74	66	63	66	64	57	52	49	49	48	45	46	45	48	51	56	56	53													
RNC59	66	68	66	70	72	71	73	70	71	73	73	66	63	60	55	55	51	47	48	46	45	44	45	45	46	48	46	48													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	1% GT	1% GT	ENC41
1% LT		0% LT	RNC59
1% LT	0% GT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	12% LT	8% LT	ENC41
13% GT		4% GT	RNC59
9% GT	4% LT		NC

Figure 6.4 ii. Cerebrovascular Disease: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

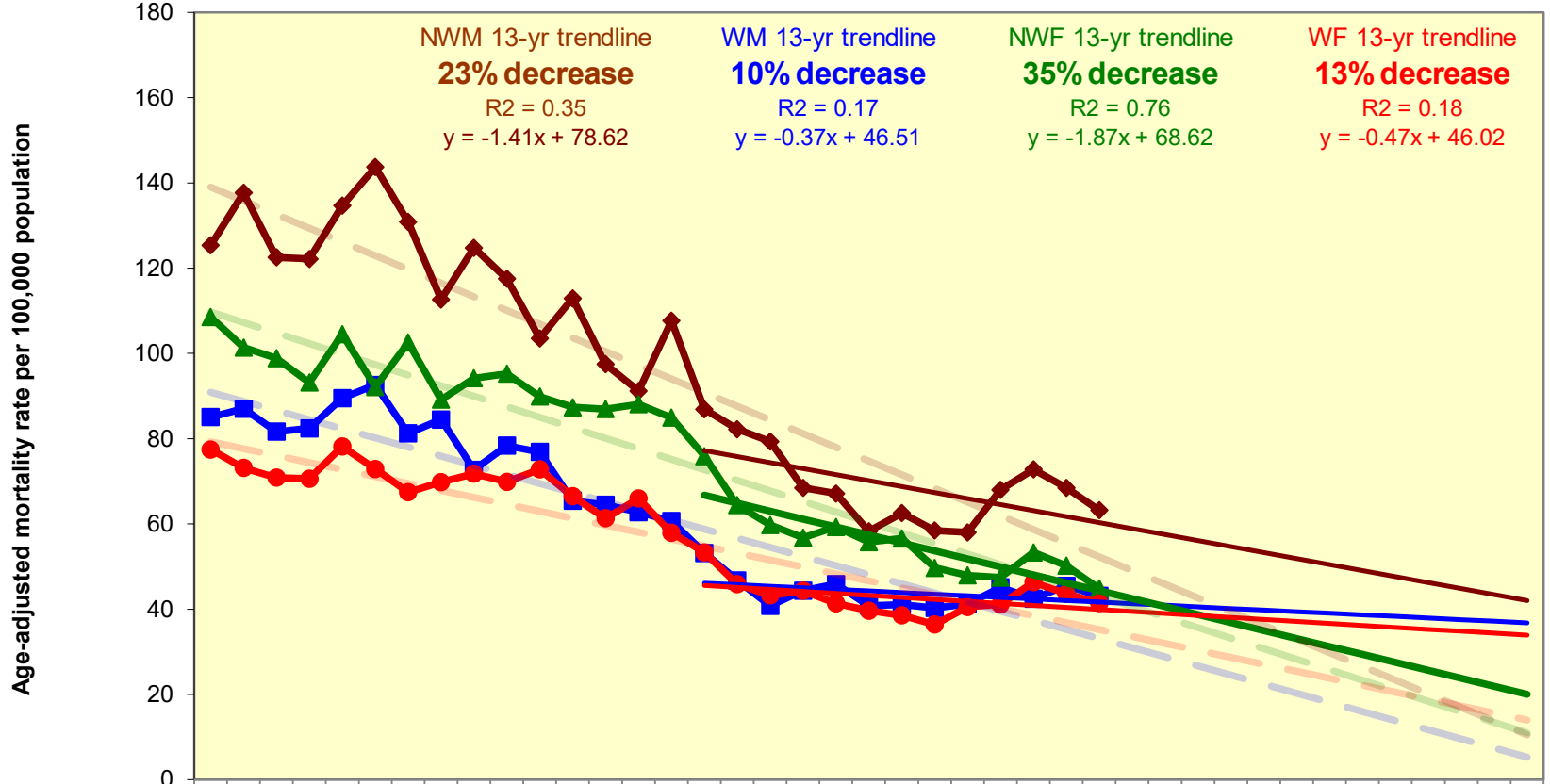


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	91	89	86	84	93	90	85	82	83	82	81	76	71	73	70	61	54	50	50	49	45	46	43	45	47	50	49	46													
RNC59	76	76	73	76	78	77	75	72	72	73	72	70	66	62	57	56	51	47	48	45	43	42	42	41	41	43	41	42													
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													
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				
ENC41	RNC59	NC	US	
	5% LT	3% LT	15% LT	ENC41
5% GT		1% GT	11% LT	RNC59
3% GT	1% LT		12% LT	NC
18% GT	12% GT	14% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	12% LT	8% LT	23% LT	ENC41
13% GT		4% GT	13% LT	RNC59
9% GT	4% LT		16% LT	NC
30% GT	14% GT	19% GT		US

Figure 6.4 iii. Cerebrovascular Disease: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 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	125	138	123	122	135	144	131	113	125	117	104	113	97	91	108	87	82	79	68	67	58	63	58	58	68	73	68	63													
WM	85	87	82	82	90	93	81	85	73	78	77	65	65	63	61	53	47	41	44	46	41	41	40	41	45	42	45	43													
NWF	109	101	99	93	105	92	103	89	94	95	90	87	87	88	85	76	64	60	57	59	56	57	50	48	47	53	50	45													
WF	77	73	71	71	78	73	67	70	72	70	73	66	61	66	58	53	46	43	44	41	40	39	36	41	41	46	44	41													

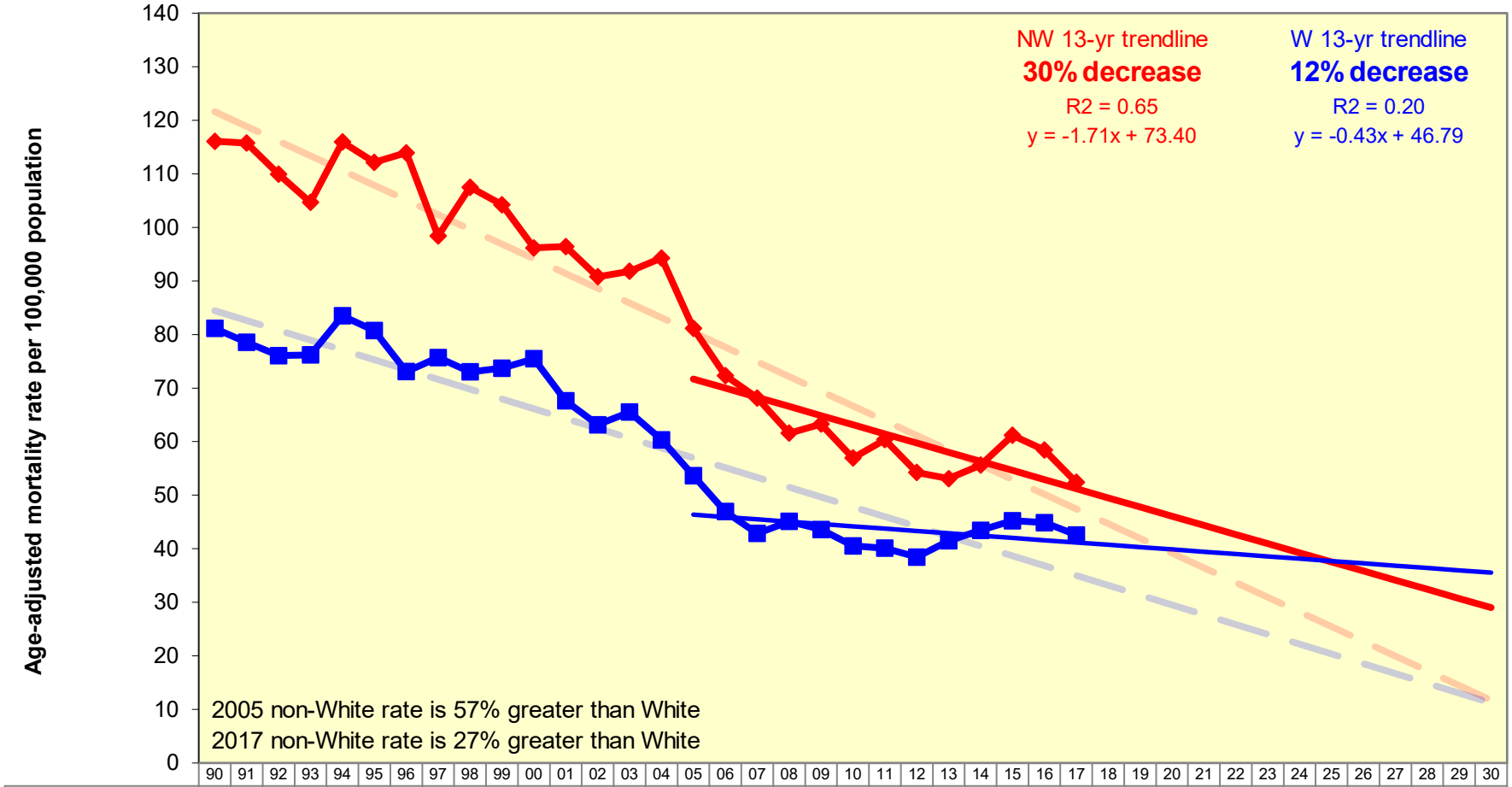
Comparison of Fitted Rates in 2005

NWM	WM	NWF	WF	
	41% LT	13% LT	41% LT	NWM
69% GT		48% GT	1% LT	WM
15% GT	32% LT		33% LT	NWF
71% GT	1% GT	49% GT		WF

Comparison of Fitted Rates in 2017

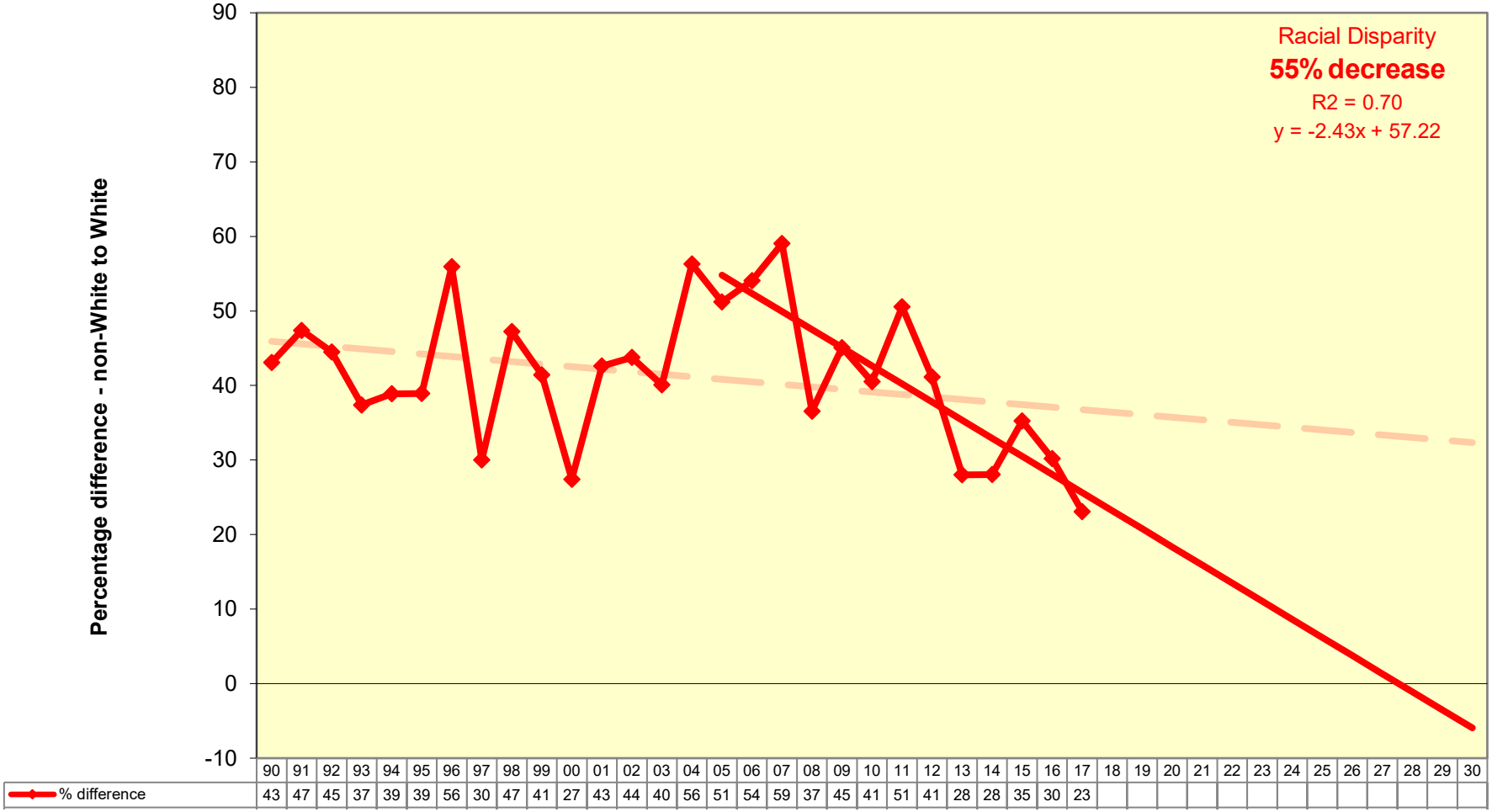
NWM	WM	NWF	WF	
	32% LT	25% LT	35% LT	NWM
47% GT		10% GT	4% LT	WM
34% GT	9% LT		13% LT	NWF
53% GT	4% GT	14% GT		WF

Figure 6.4 iv. Cerebrovascular Disease: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	116	116	110	105	116	112	114	98	108	104	96	96	91	92	94	81	72	68	62	63	57	60	54	53	56	61	58	52													
W	81	79	76	76	83	81	73	76	73	74	75	68	63	66	60	54	47	43	45	44	41	40	38	41	43	45	45	43													

Figure 6.4 v. Cerebrovascular Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030

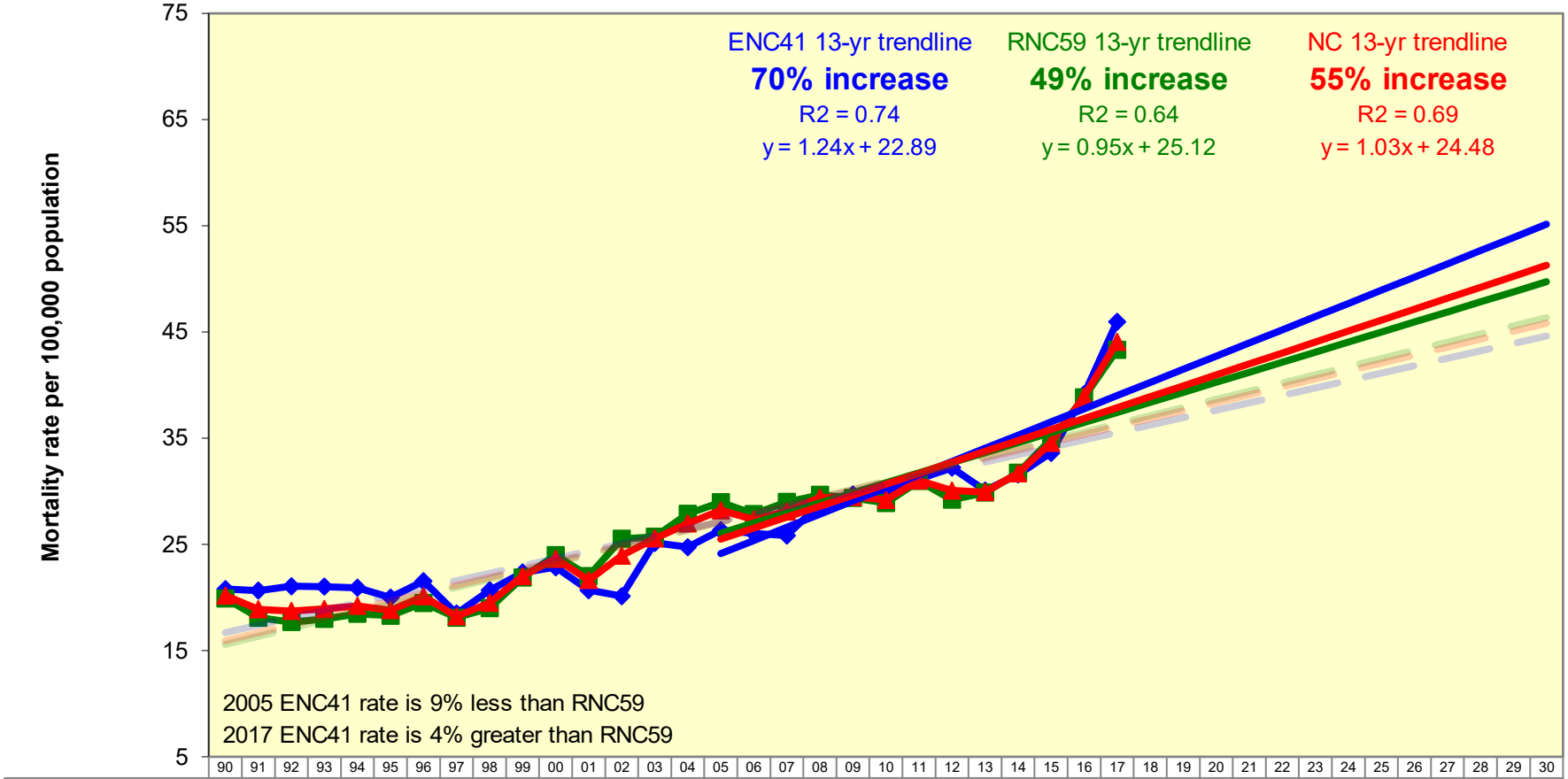


All Other Unintentional Injuries and Adverse Effects

- Mortality from unintentional injuries and adverse effects is increasing in ENC (70% increase over 13 years). The trends for RNC and NC are also increasing, but the ENC rate is increasing faster.
- The age-adjusted mortality rate trend for ENC, RNC, NC and the US are all increasing. ENC's rate trend increased the most, 59% over the 13-year trend.
- The 13-year trends for White males and White females are increasing significantly (70% and 79% respectively). The rates for non-White males and non-White females are increasing, but not as much.
- White rates have increased 71% over the 13-year period. Non-White rates have increased 24% in a moderately reliable trend.
- Racial disparity has decreased 169% over the 13-year period in a trend that favors non-Whites.

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

Figure 6.5 i. All Other Unintentional Injuries and Adverse Effects: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

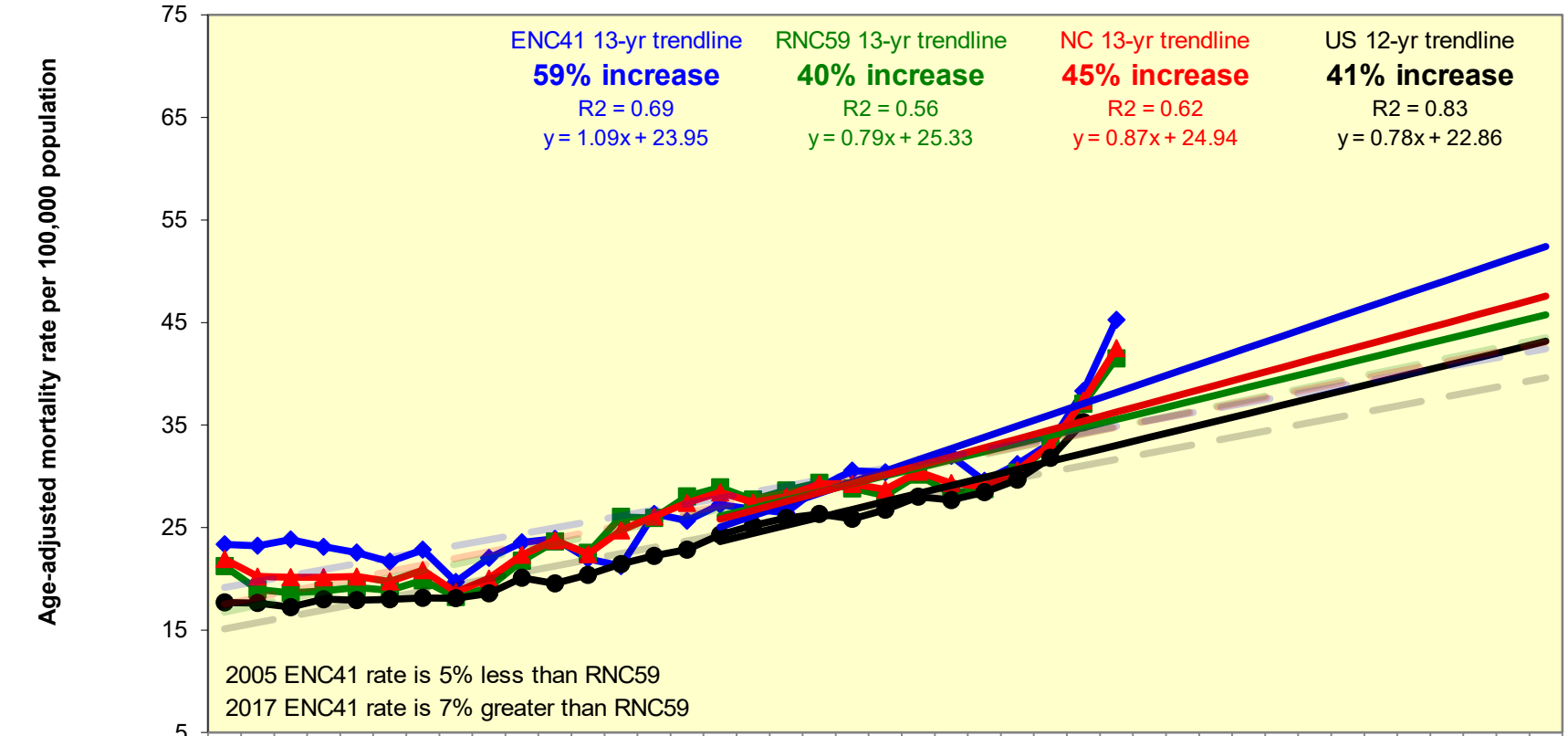


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	21	21	21	21	21	20	22	18	21	22	23	21	20	25	25	26	26	26	29	30	30	31	32	30	32	34	39	46													
RNC59	20	18	18	18	18	18	19	18	19	22	24	22	26	26	28	29	28	29	30	29	29	31	29	30	32	35	39	43													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	10% GT	7% GT	ENC41
9% LT		3% LT	RNC59
6% LT	3% GT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	3% LT	2% LT	ENC41
4% GT		1% GT	RNC59
3% GT	1% LT		NC

Figure 6.5 ii. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

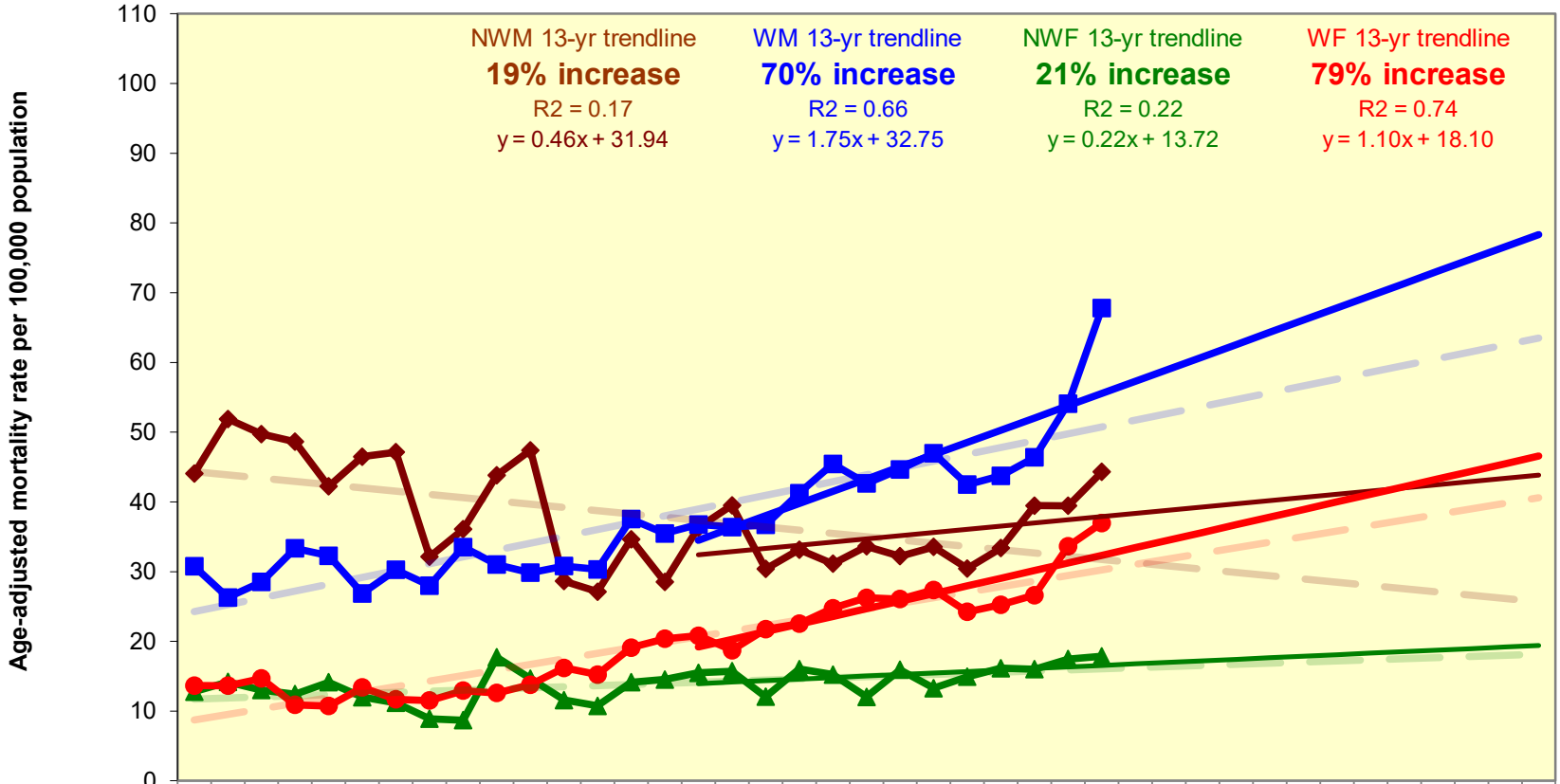


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	23	23	24	23	23	22	23	20	22	24	24	22	21	26	26	27	27	26	29	31	30	31	32	30	31	33	38	45													
RNC59	21	19	19	19	19	19	20	18	19	22	24	23	26	26	28	29	28	29	29	29	28	30	28	29	30	33	37	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													
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				
ENC41	RNC59	NC	US	
	6% GT	4% GT	5% LT	ENC41
5% LT		2% LT	10% LT	RNC59
4% LT	2% GT		8% LT	NC
5% GT	11% GT	9% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	6% LT	5% LT	13% LT	ENC41
7% GT		2% GT	7% LT	RNC59
5% GT	2% LT		9% LT	NC
15% GT	8% GT	10% GT		US

Figure 6.5 iii. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

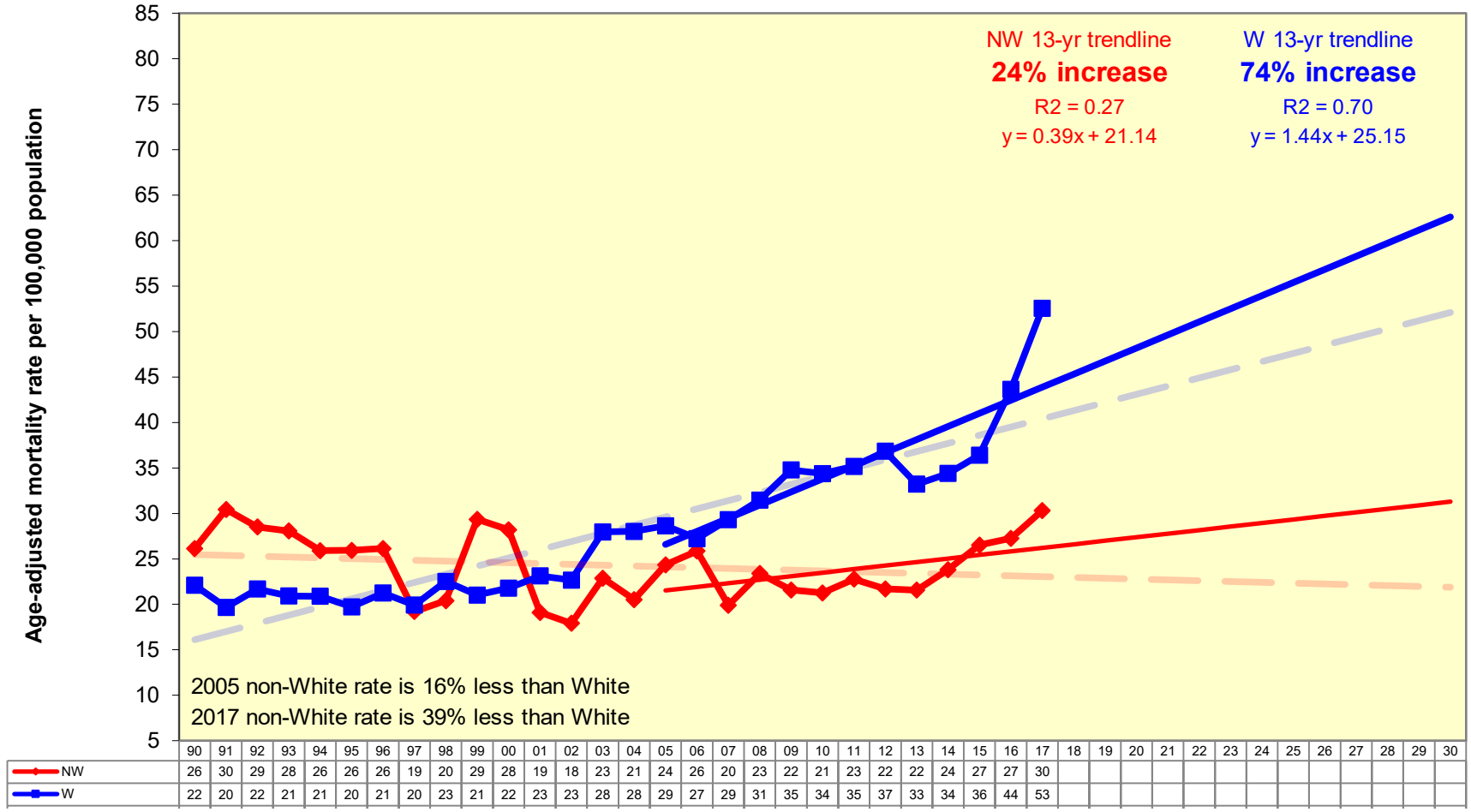


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	44	52	50	49	42	46	47	32	36	44	47	29	27	35	29	36	39	30	33	31	34	32	34	30	33	39	39	44													
WM	31	26	29	33	32	27	30	28	34	31	30	31	30	38	35	37	36	37	41	45	43	45	47	42	44	46	54	68													
NWF	13	14	13	12	14	12	11	9	9	18	15	12	11	14	15	15	16	12	16	15	12	16	13	15	16	16	17	18													
WF	14	14	15	11	11	13	12	12	13	13	14	16	15	19	20	21	19	22	23	25	26	26	27	24	25	27	34	37													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	3% GT	57% LT	43% LT	NWM
2% LT		58% LT	45% LT	WM
133% GT	139% GT		32% GT	NWF
76% GT	81% GT	24% LT		WF

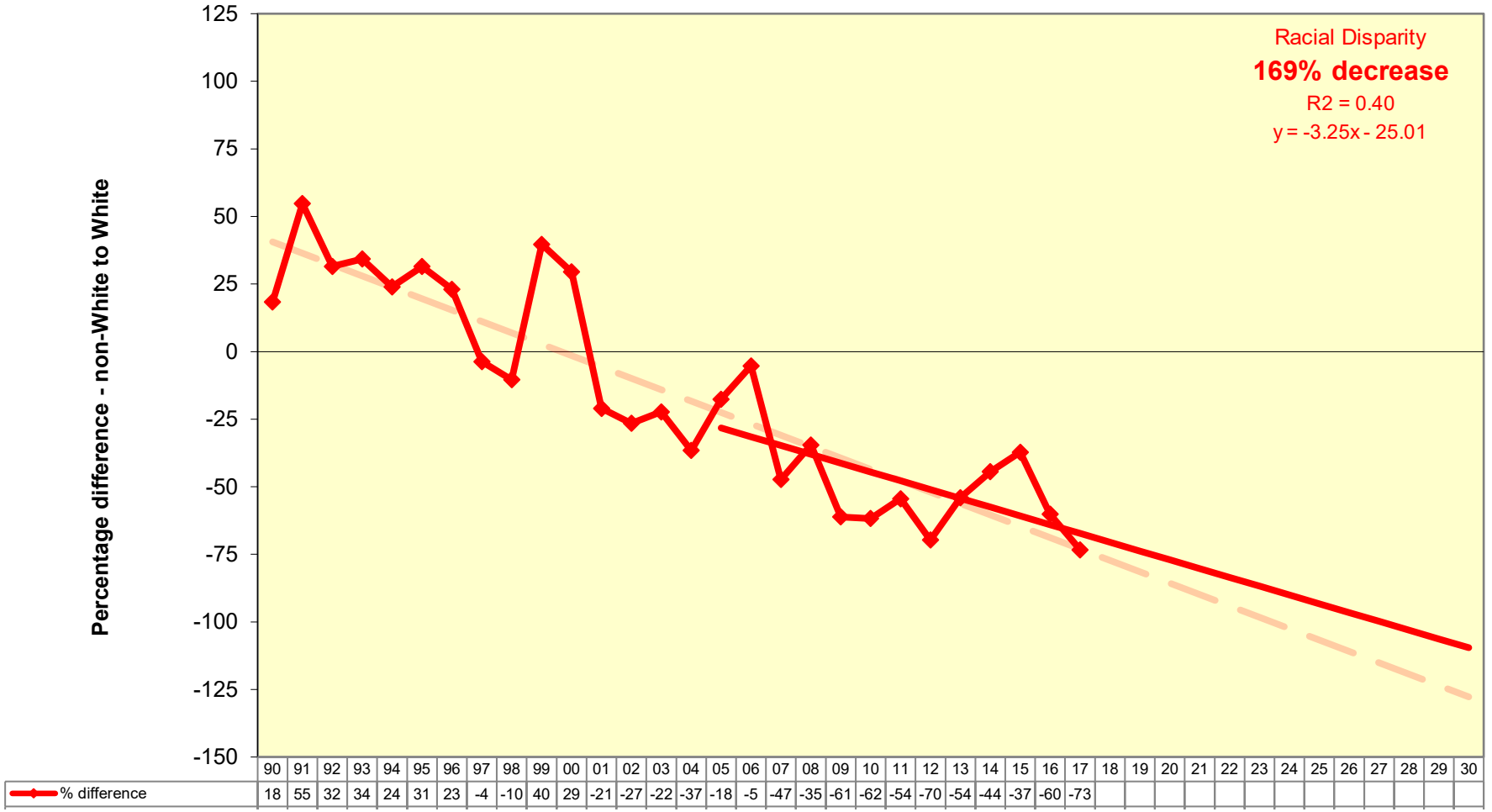
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	44% GT	56% LT	17% LT	NWM
30% LT		70% LT	42% LT	WM
129% GT	229% GT		91% GT	NWF
20% GT	72% LT	48% LT		WF

Figure 6.5 iv. All Other Unintentional Injuries and Adverse Effects: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	30	29	28	26	26	26	19	20	29	28	19	18	23	21	24	26	20	23	22	21	23	22	22	24	27	27	30													
W	22	20	22	21	21	20	21	20	23	21	22	23	23	28	28	29	27	29	31	35	34	35	37	33	34	36	44	53													

Figure 6.5 v. All Other Unintentional Injuries and Adverse Effects: Measuring disparity in age-adjusted mortality rates by race for ENC41, 1990-2017 with projections to 2030

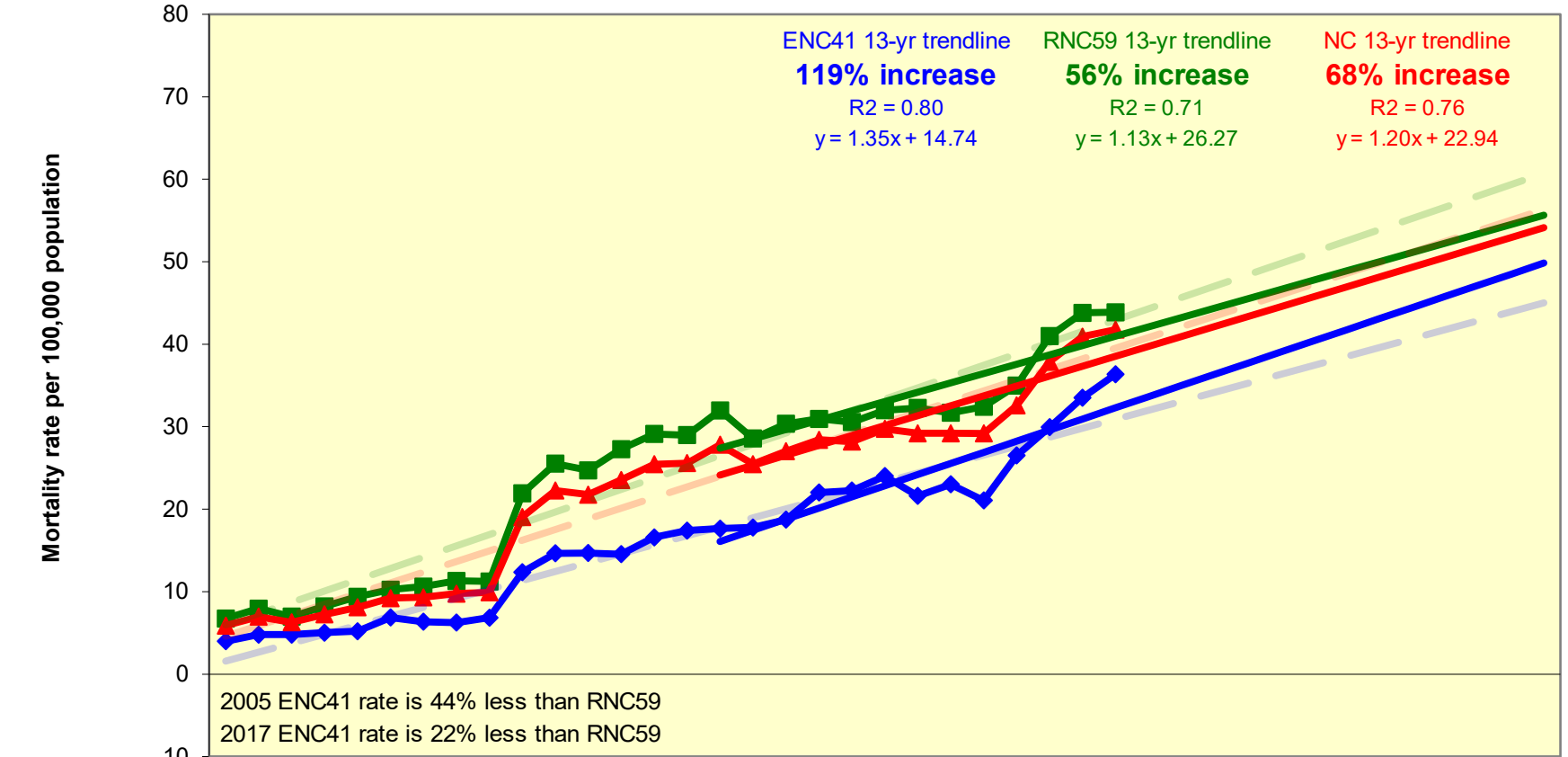


Alzheimer's Disease

- The Alzheimer's mortality rate for ENC shows a 119% increase over the recent 13-year period. ENCs rate is 22% less than RNC and 17% less than NC but ENCs rate of increase was larger than both RNC and NC.
- In 2016 the age-adjusted rate for ENC was even with the US rate. The ENC rate is lower than the NC rate, but has a higher rate of increase over the 13-year period.
- The mortality rates for females, both White and non-White, are greater than for males. Non-White males have the highest rate of increase (150% over 13 years) and are projected to converge with the White female rate in the future.
- The non-White mortality rate for Alzheimer's has increased 106% over the 13-year trend. In 2017 the non-White rate is 7% greater than the White rate.
- The racial disparity favors Whites and has increased 155% over the 13-year period.

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 ENC41, RNC59, and NC, 1990-2017 with projections to 2030

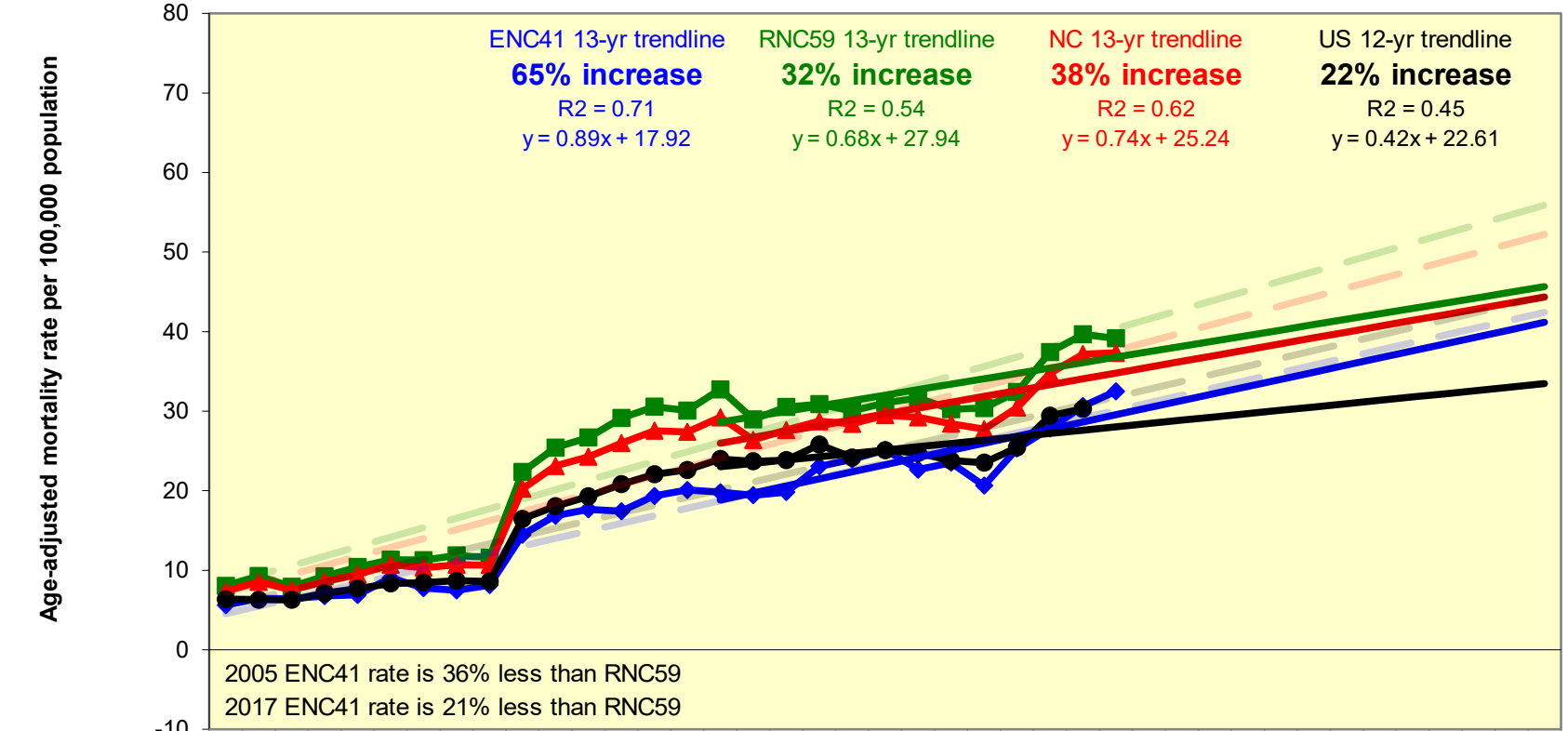


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	4	5	5	5	5	7	6	6	7	12	15	15	15	17	17	18	18	19	22	22	24	22	23	21	27	30	34	36													
RNC59	7	8	7	8	9	10	11	11	11	22	26	25	27	29	29	32	29	30	31	31	32	32	32	32	35	41	44	44													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	78% GT	56% GT	ENC41
44% LT		13% LT	RNC59
36% LT	15% GT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	29% GT	21% GT	ENC41
22% LT		6% LT	RNC59
17% LT	7% GT		NC

Figure 6.6 ii. Alzheimer's Disease: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

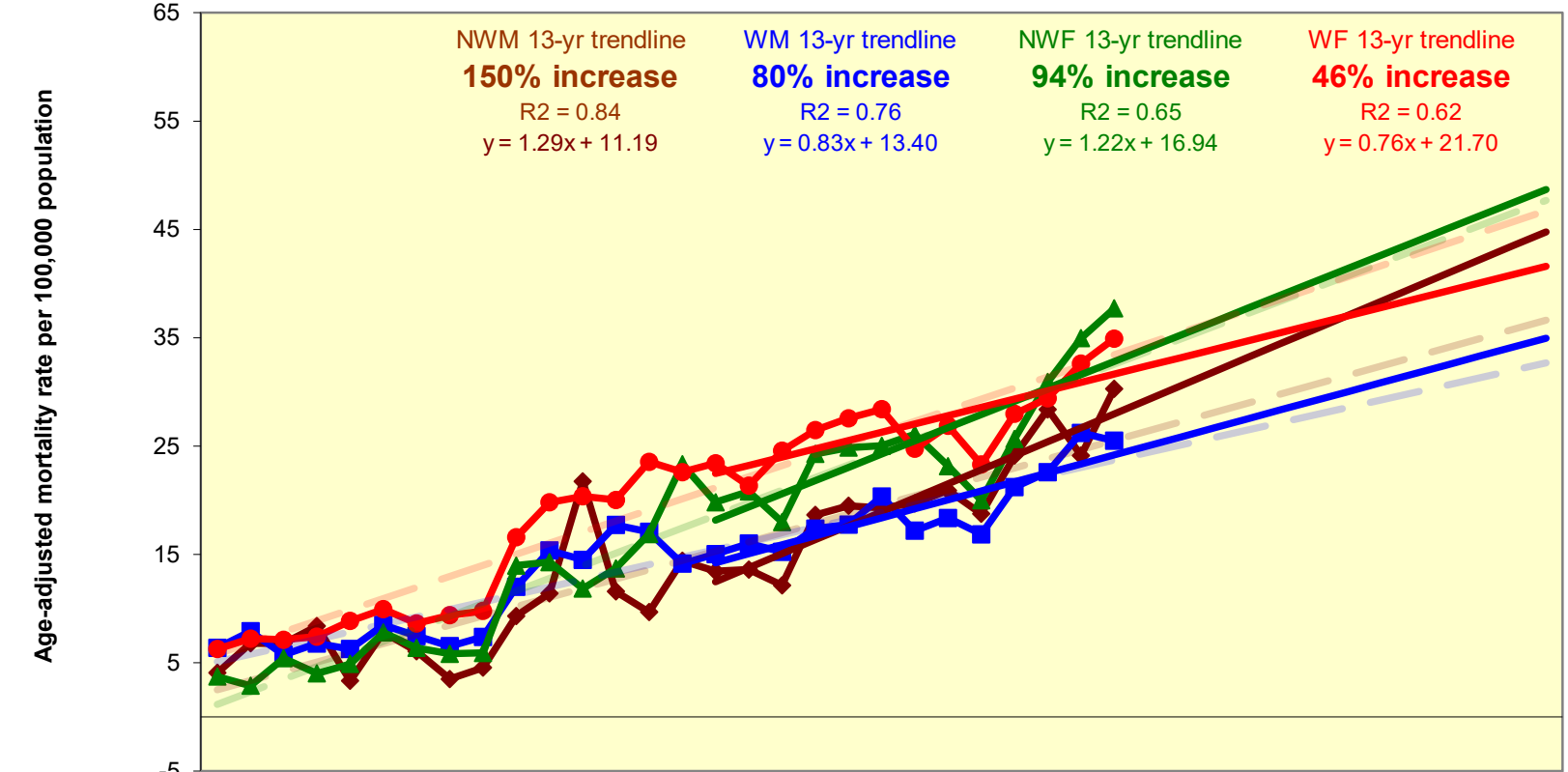


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	6	6	6	7	7	9	8	7	8	14	17	18	17	19	20	20	19	20	23	24	25	23	24	21	25	28	31	32													
RNC59	8	9	8	9	10	11	11	12	12	22	25	27	29	31	30	33	29	31	31	30	31	32	30	30	32	37	40	39													
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													
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				
ENC41	RNC59	NC	US	
	56% GT	41% GT	26% GT	ENC41
36% LT		10% LT	19% LT	RNC59
29% LT	11% GT		10% LT	NC
21% LT	24% GT	12% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	26% GT	19% GT	4% LT	ENC41
21% LT		6% LT	24% LT	RNC59
16% LT	6% GT		19% LT	NC
4% GT	31% GT	23% GT		US

Figure 6.6 iii. Alzheimer's Disease: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

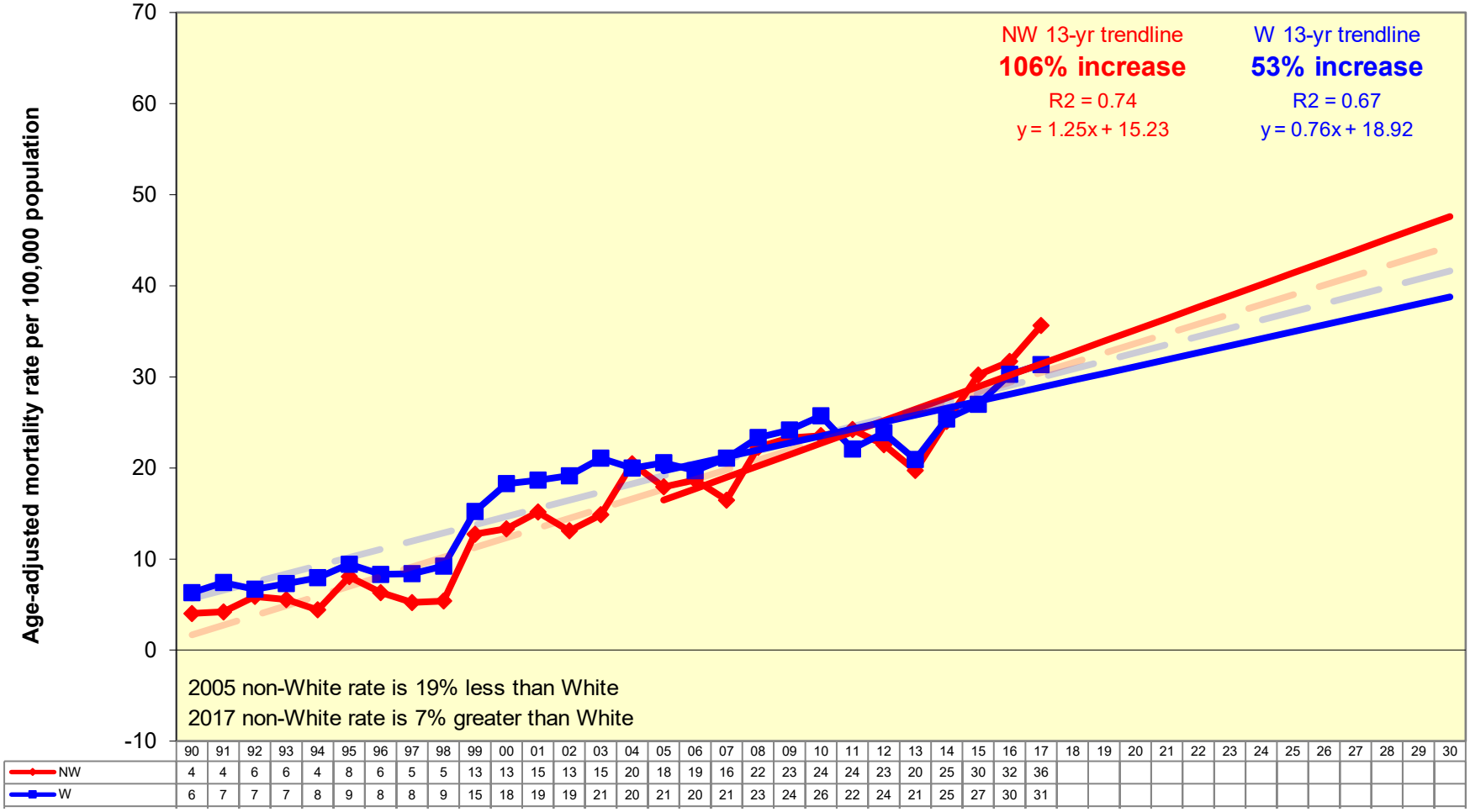


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	4	7	7	8	3	8	6	4	5	9	11	22	12	10	14	13	14	12	19	19	19	20	21	19	24	28	24	30													
WM	6	8	6	7	6	8	7	7	7	12	15	15	18	17	14	15	16	15	17	18	20	17	18	17	21	23	26	25													
NWF	4	3	5	4	5	8	6	6	6	14	14	12	14	17	23	20	21	18	24	25	25	26	23	20	26	31	35	38													
WF	6	7	7	7	9	10	9	9	10	17	20	20	20	24	23	23	21	25	26	28	28	25	27	23	28	29	33	35													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	20% GT	51% GT	94% GT	NWM
17% LT		26% GT	62% GT	WM
34% LT	21% LT		28% GT	NWF
48% LT	38% LT	22% LT		WF

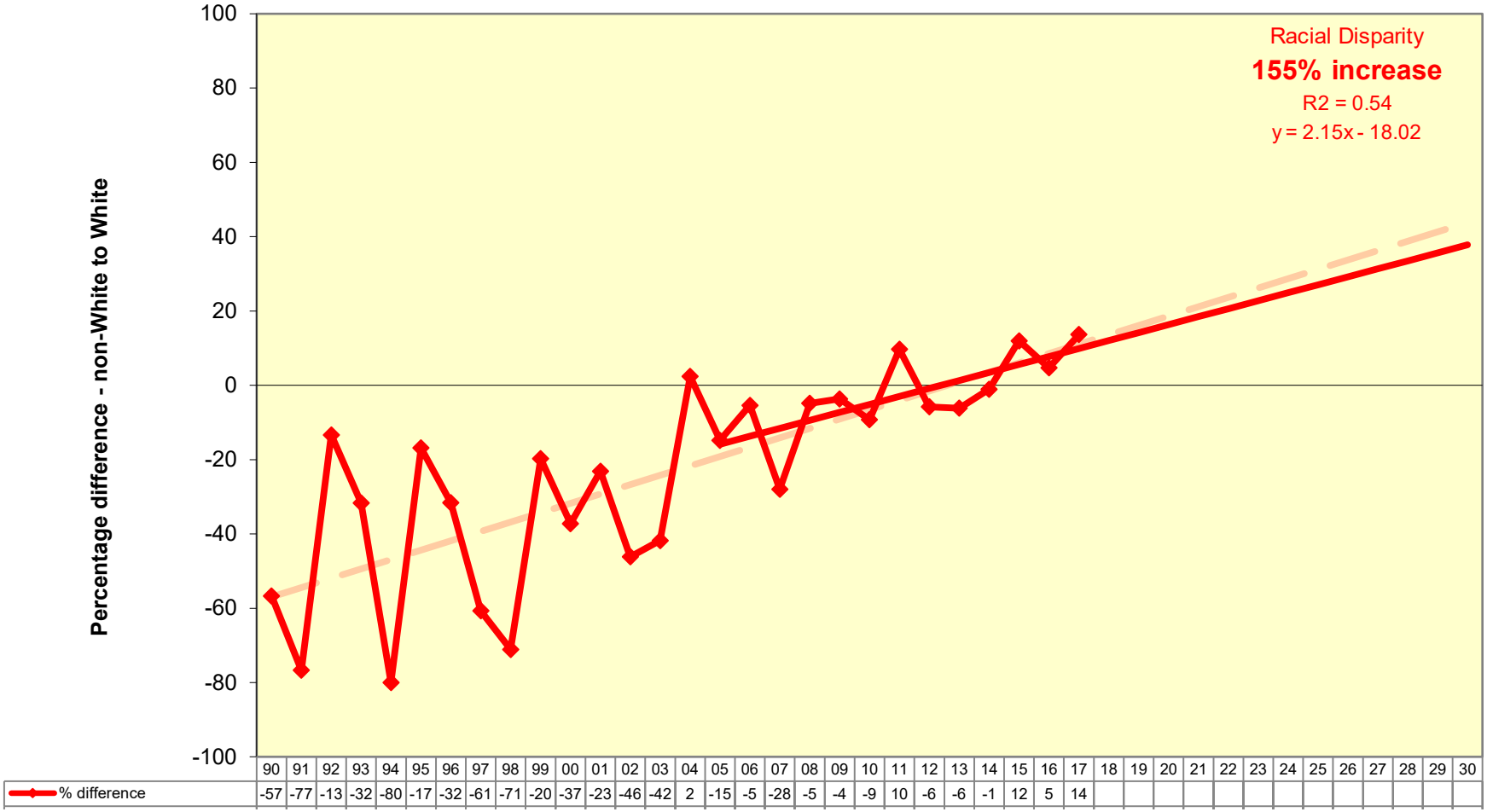
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	12% LT	18% GT	16% GT	NWM
14% GT		35% GT	32% GT	WM
16% LT	26% LT		2% LT	NWF
14% LT	24% LT	2% GT		WF

Figure 6.6 iv. Alzheimer's Disease: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	4	6	6	4	8	6	5	5	13	13	15	13	15	20	18	19	16	22	23	24	24	23	20	25	30	32	36													
W	6	7	7	7	8	9	8	8	9	15	18	19	19	21	20	21	20	21	23	24	26	22	24	21	25	27	30	31													

Figure 6.6 v. Alzheimer's Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030

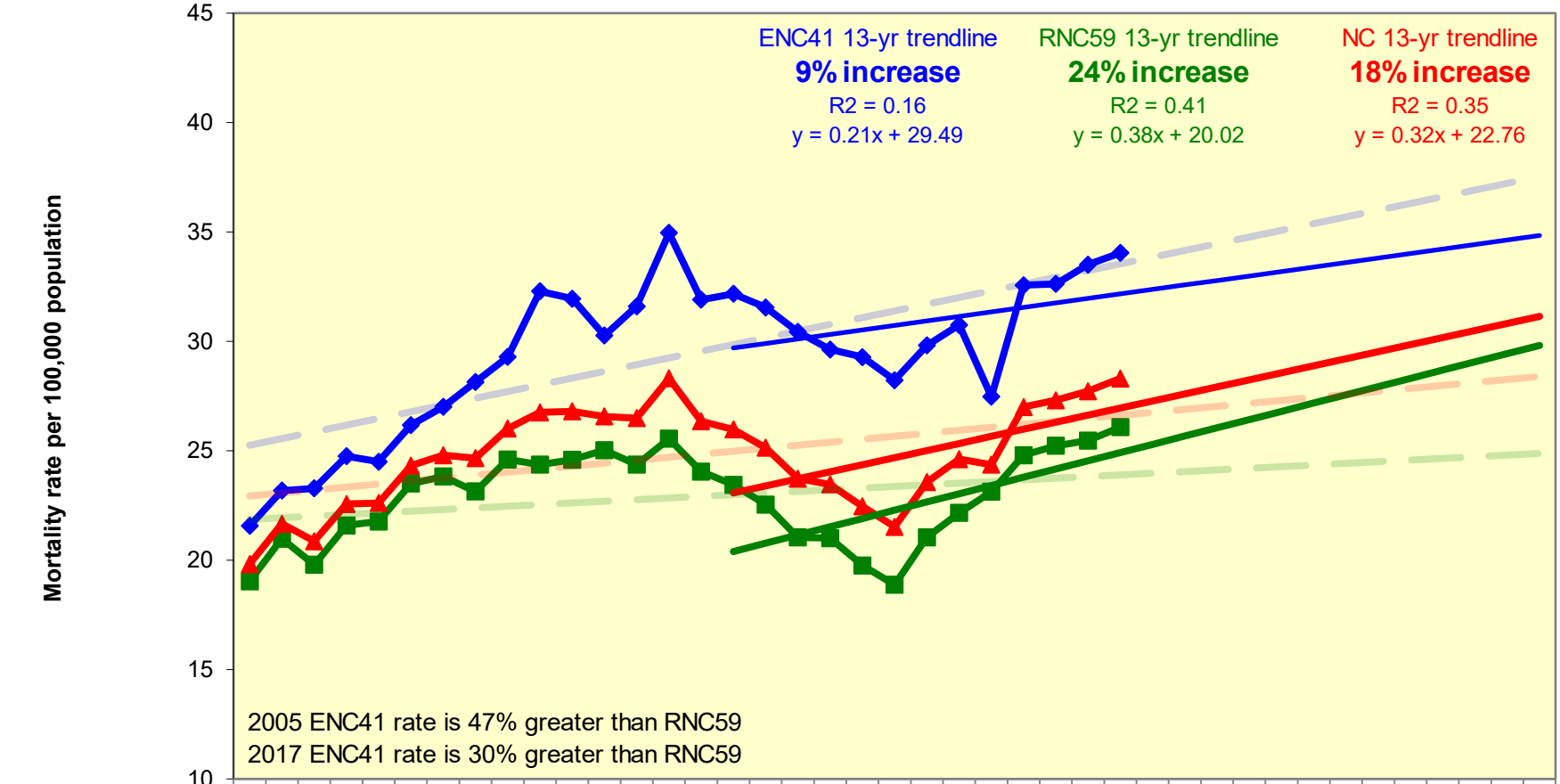


Diabetes Mellitus

- ENC's diabetes mortality rate is 30% greater than RNC in 2017. The rate for ENC increased 9% over the 13-year period in a moderately reliable trend.
- ENC's age-adjusted rate has decreased 14% over the 13-year period. It is 30% greater than the RNC rate and 34% greater than the US rate.
- The rate for non-White males is the highest and is increasing (10% increase over the 13-year period). The non-White female rate has decreased 35% and the White female rate has decreased 17%. The White male rate is unreliable.
- The non-White mortality rate decreased 19% over the 13-year period but remains 124% greater than the White rate.
- The trend for racial disparity is moderately reliable and suggests a 14% 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 6.7 i. Diabetes Mellitus: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

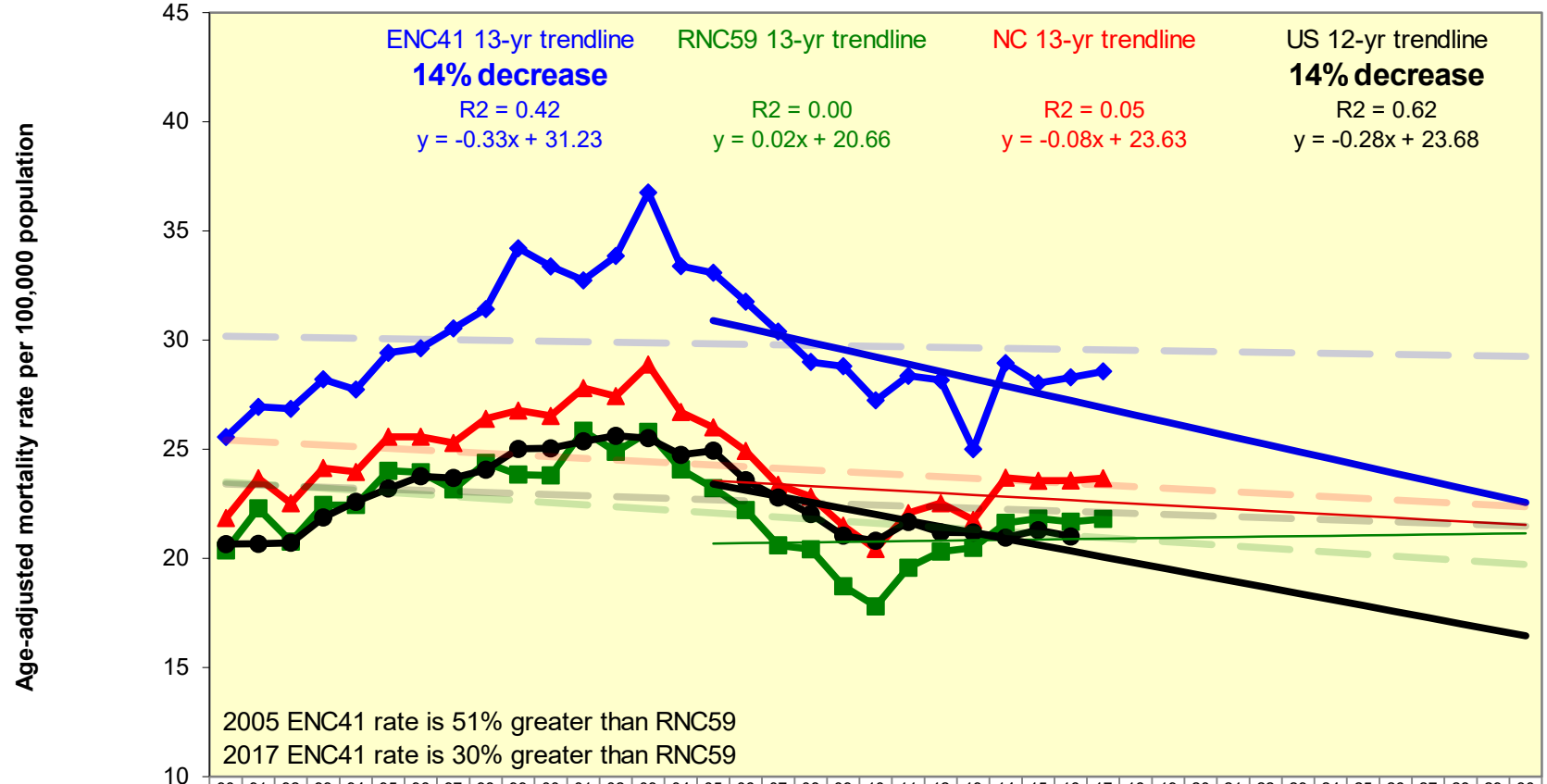


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	22	23	23	25	25	26	27	28	29	32	32	30	32	35	32	32	32	30	30	29	28	30	31	27	33	33	34	34													
RNC59	19	21	20	22	22	24	24	23	25	24	25	25	24	26	24	23	23	21	21	20	19	21	22	23	25	25	25	26													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	32% LT	23% LT	ENC41
47% GT		14% GT	RNC59
30% GT	12% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	23% LT	17% LT	ENC41
30% GT		8% GT	RNC59
20% GT	8% LT		NC

Figure 6.7 ii. Diabetes Mellitus: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

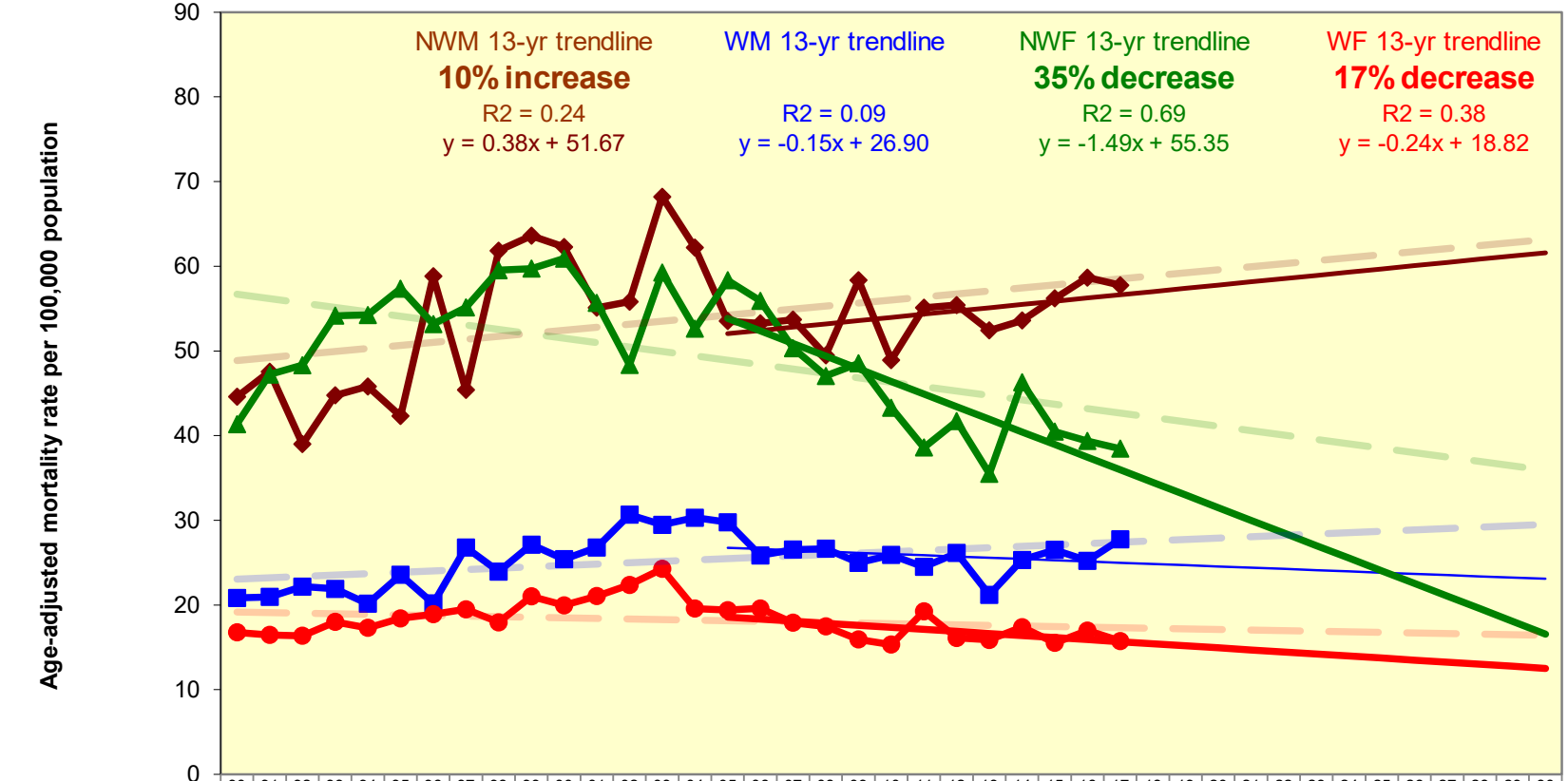


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	26	27	27	28	28	29	30	31	31	34	33	33	34	37	33	33	32	30	29	29	27	28	28	25	29	28	28	29													
RNC59	20	22	21	22	22	24	24	23	24	24	24	26	25	26	24	23	22	21	20	19	18	20	20	20	22	22	22	22													
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													
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				
ENC41	RNC59	NC	US	
	34% LT	24% LT	24% LT	ENC41
51% GT		14% GT	15% GT	RNC59
32% GT	13% LT		0% GT	NC
32% GT	13% LT	0% LT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	23% LT	17% LT	25% LT	ENC41
30% GT		9% GT	3% LT	RNC59
20% GT	8% LT		10% LT	NC
34% GT	3% GT	11% GT		US

Figure 6.7 iii. Diabetes Mellitus: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

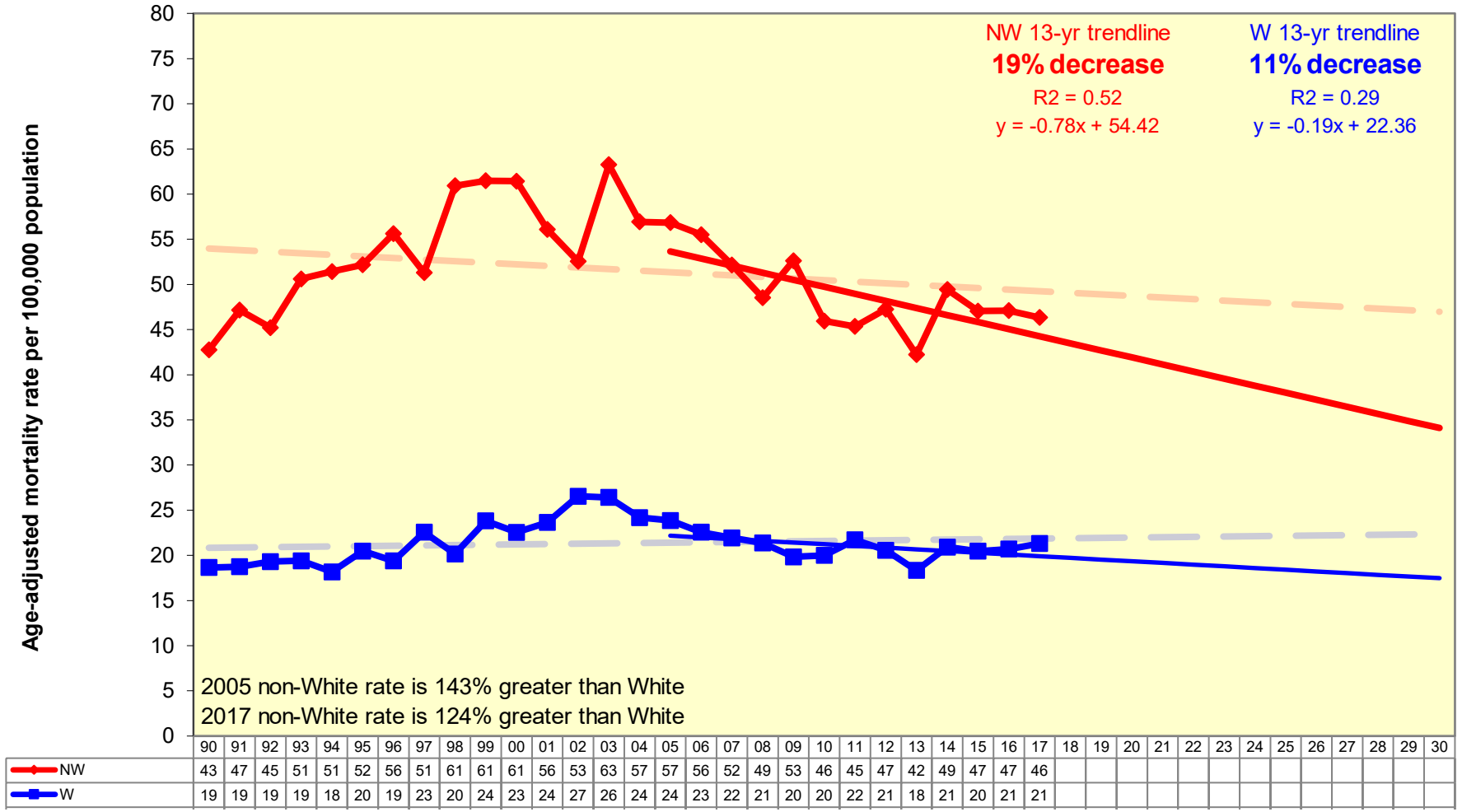


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	45	48	39	45	46	42	59	45	62	64	62	55	56	68	62	54	53	54	49	58	49	55	55	52	54	56	59	58													
WM	21	21	22	22	20	24	20	27	24	27	25	27	31	29	30	30	26	27	27	25	26	25	26	21	25	27	25	28													
NWF	41	47	48	54	54	57	53	55	60	60	61	56	48	59	53	58	56	50	47	49	43	39	42	35	46	40	39	38													
WF	17	16	16	18	17	18	19	19	18	21	20	21	22	24	20	19	20	18	17	16	15	19	16	16	17	16	17	16													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	48% LT	7% GT	64% LT	NWM
92% GT		106% GT	30% LT	WM
7% LT	51% LT		66% LT	NWF
175% GT	43% GT	194% GT		WF

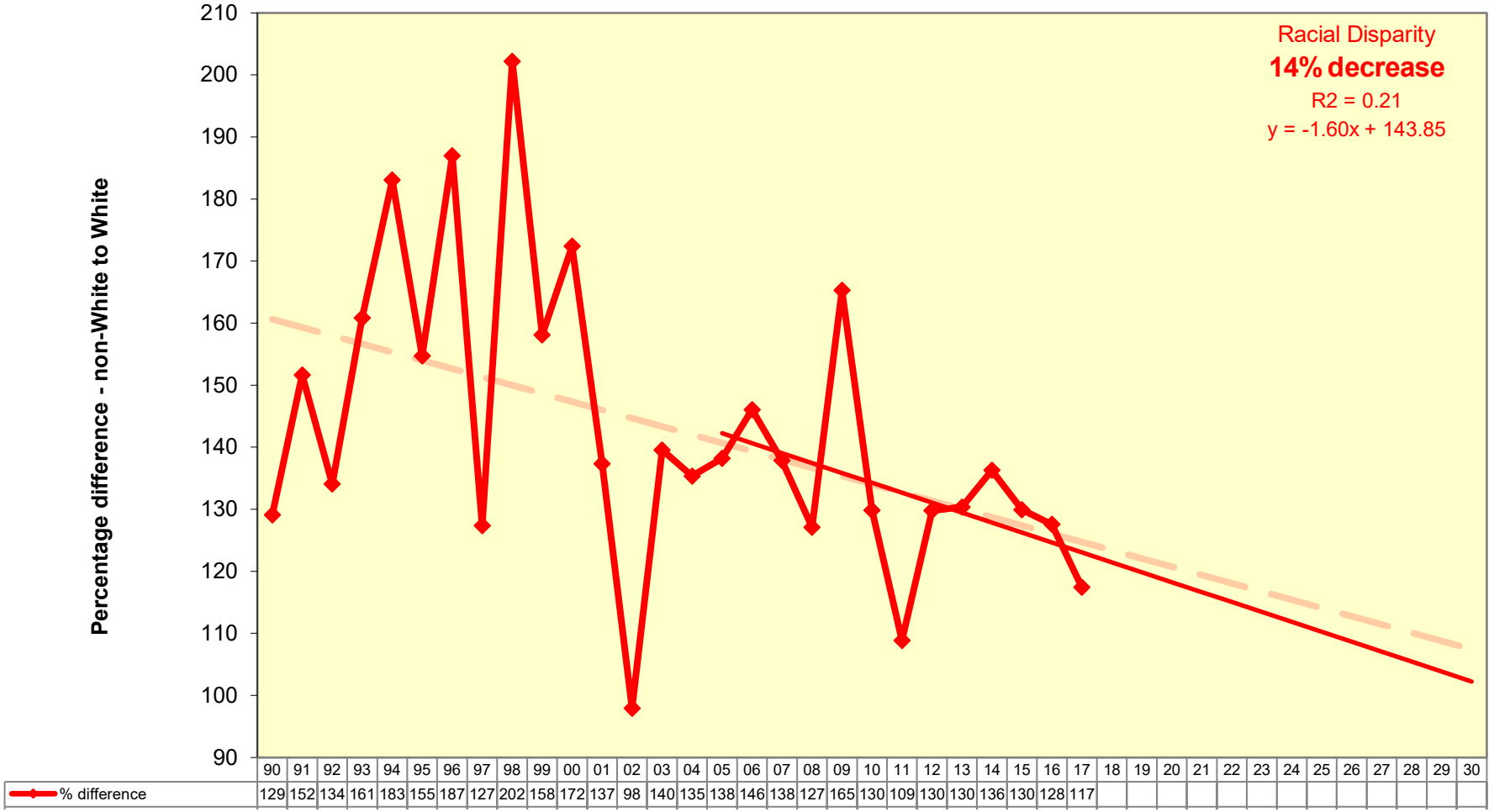
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	55% LT	33% LT	72% LT	NWM
124% GT		49% GT	37% LT	WM
50% GT	33% LT		58% LT	NWF
254% GT	58% GT	135% GT		WF

Figure 6.7 iv. Diabetes Mellitus: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	47	45	51	51	52	56	51	61	61	61	56	53	63	57	57	56	52	49	53	46	45	47	42	49	47	47	46													
W	19	19	19	19	18	20	19	23	20	24	23	24	27	26	24	24	23	22	21	20	20	22	21	18	21	20	21	21													

Figure 6.7 v. Diabetes Mellitus: Measuring disparity in age-adjusted mortality rates by race for ENC41, 1990-2017 with projections to 2030

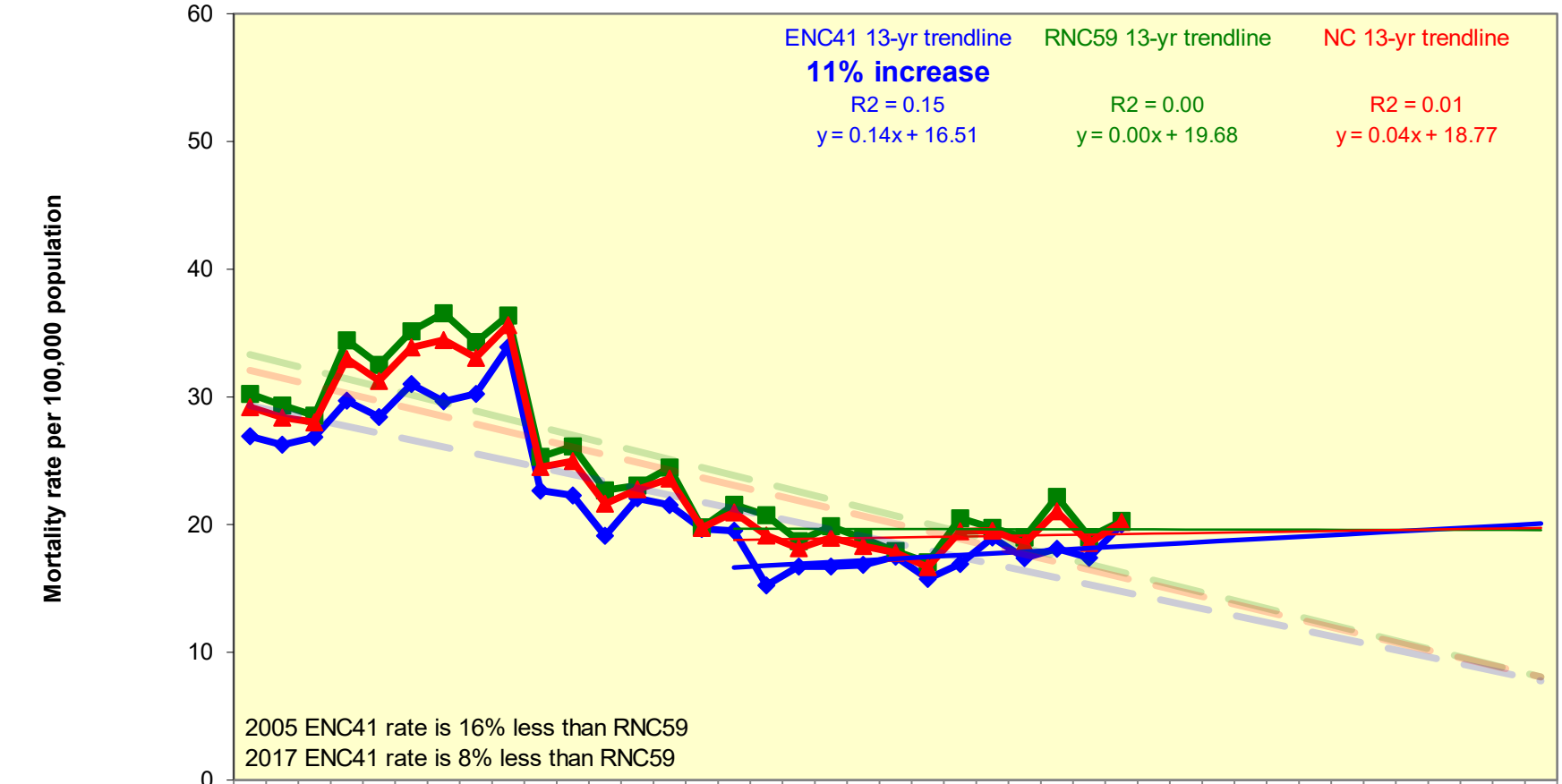


Pneumonia and Influenza

- The mortality rate trend for pneumonia and influenza for ENC has increased 11% over the 13-year period. The trends for RNC and NC are flat and unreliable. The ENC rate is 8% less than RNC.
- The age-adjusted rate trends for all NC regions are similar and are decreasing at about the same pace. The ENC rate is 19% greater than the US rate.
- The age-adjusted rate trends for White males and White females are decreasing. The trends for non-White males and non-White females are unreliable.
- The White rate trend has decreased 19% over the 13-year period. The non-White rate is unreliable.
- Racial disparity has increased 142% over the 13-year period and favors Whites in a moderately reliable trend.

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

Figure 6.8 i. Pneumonia and Influenza: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

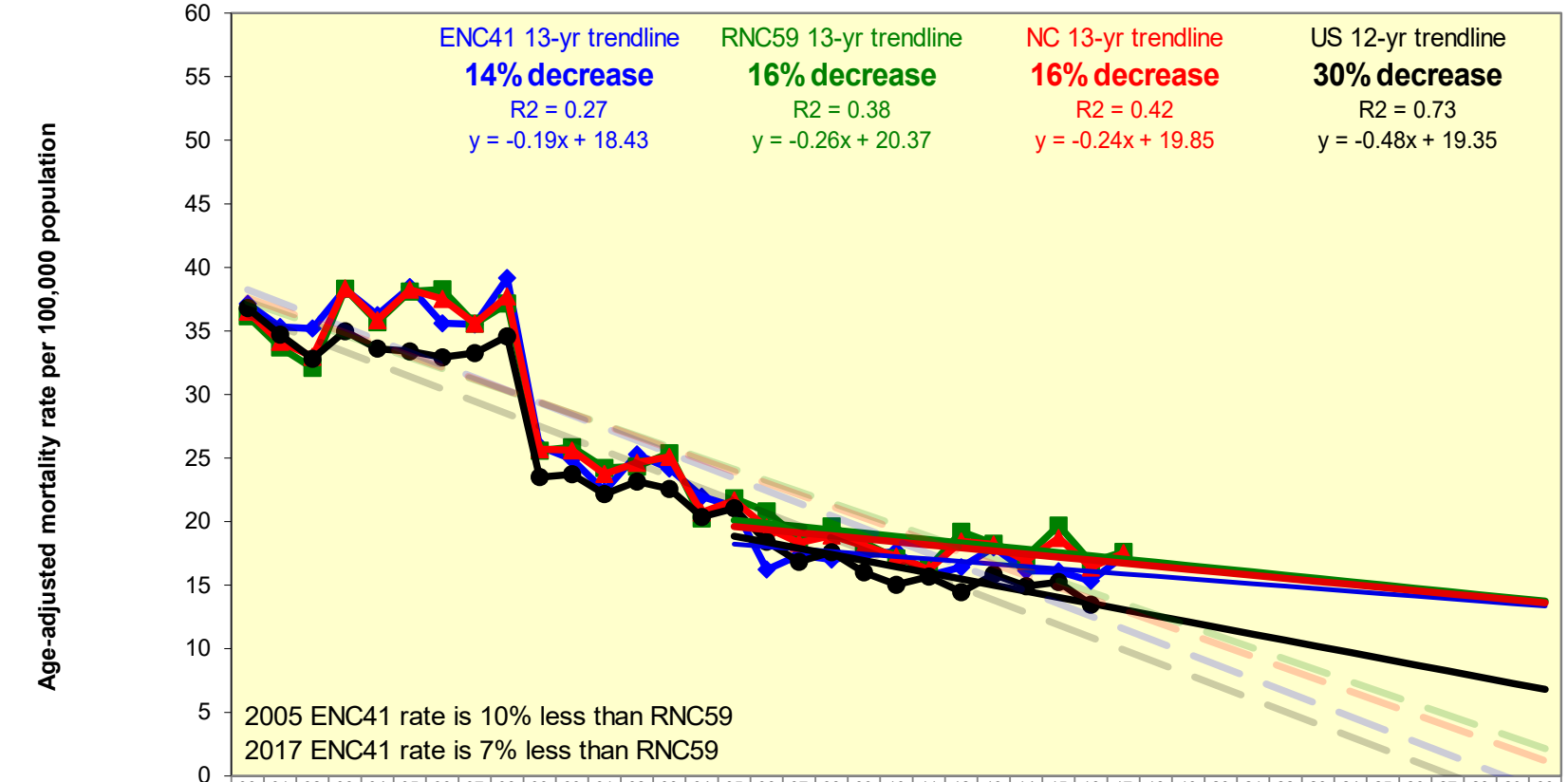


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	27	26	27	30	28	31	30	30	34	23	22	19	22	22	20	20	15	17	17	17	17	16	17	19	17	18	17	20													
RNC59	30	29	29	34	33	35	37	34	36	25	26	23	23	24	20	22	21	19	20	19	18	17	20	20	19	22	19	20													
NC	29	28	28	33	31	34	34	33	36	25	25	22	23	24	20	21	19	18	19	18	18	17	19	20	19	21	19	20													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	19% GT	14% GT	ENC41
16% LT		5% LT	RNC59
12% LT	5% GT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	8% GT	6% GT	ENC41
8% LT		2% LT	RNC59
6% LT	2% GT		NC

Figure 6.8 ii. Pneumonia and Influenza: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

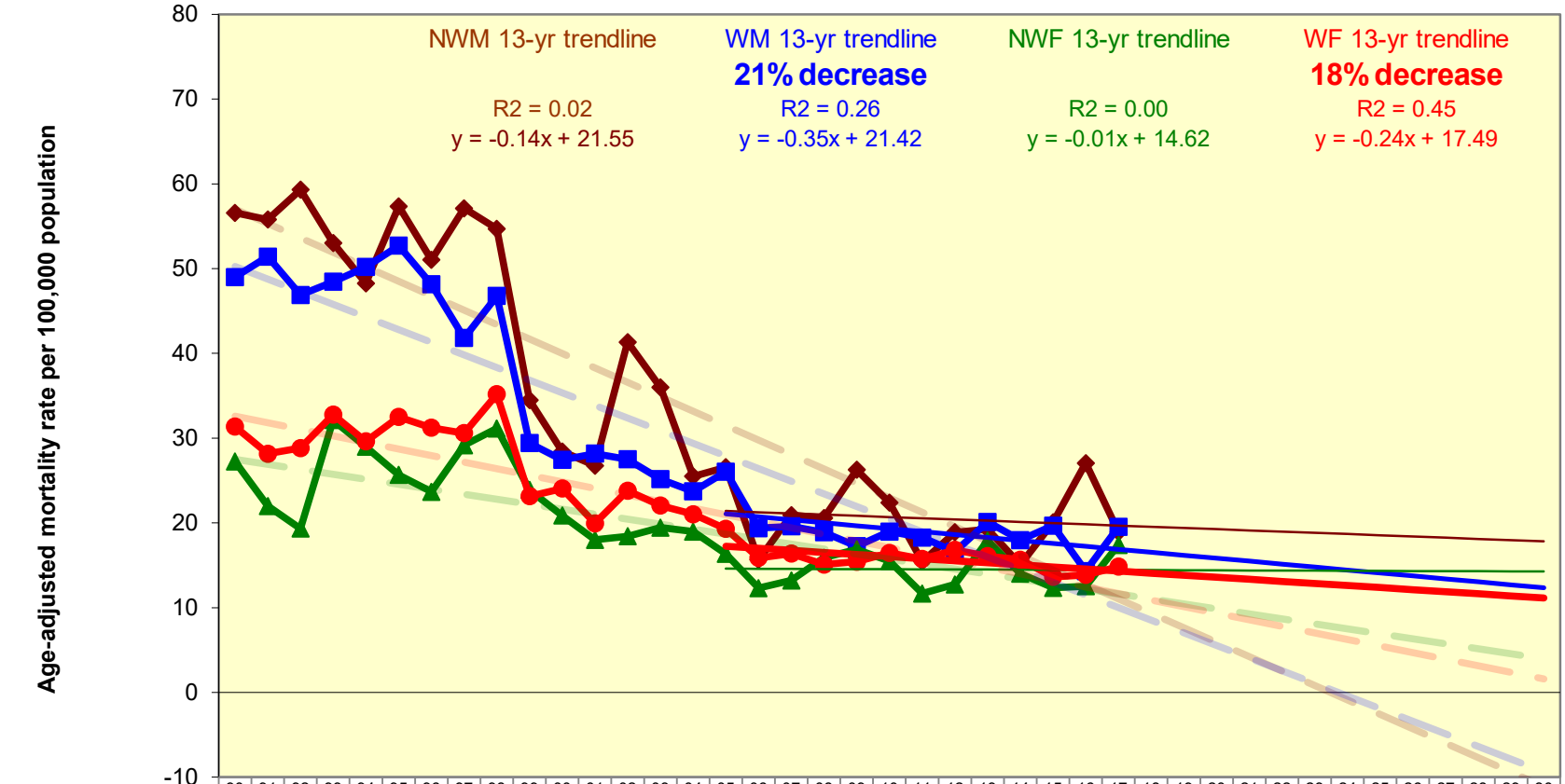


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	37	35	35	38	36	38	36	36	39	26	25	22	25	24	22	21	16	17	17	17	18	16	16	18	16	16	15	17													
RNC59	36	34	32	38	36	38	38	36	37	26	26	24	24	25	20	22	21	19	20	18	17	16	19	18	17	20	17	18													
NC	37	34	33	38	36	38	38	36	38	26	26	24	25	25	21	22	20	18	19	18	17	16	18	18	17	19	16	18													
US	37	35	33	35	34	33	33	33	35	24	24	22	23	23	20	21	18	17	18	16	15	16	14	16	15	15	13														

Comparison of Fitted Rates in 2005				
ENC41	RNC59	NC	US	
	11% GT	8% GT	5% GT	ENC41
10% LT		3% LT	5% LT	RNC59
7% LT	3% GT		3% LT	NC
5% LT	5% GT	3% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	8% GT	5% GT	16% LT	ENC41
7% LT		2% LT	22% LT	RNC59
5% LT	2% GT		20% LT	NC
19% GT	28% GT	25% GT		US

Figure 6.8 iii. Pneumonia and Influenza: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

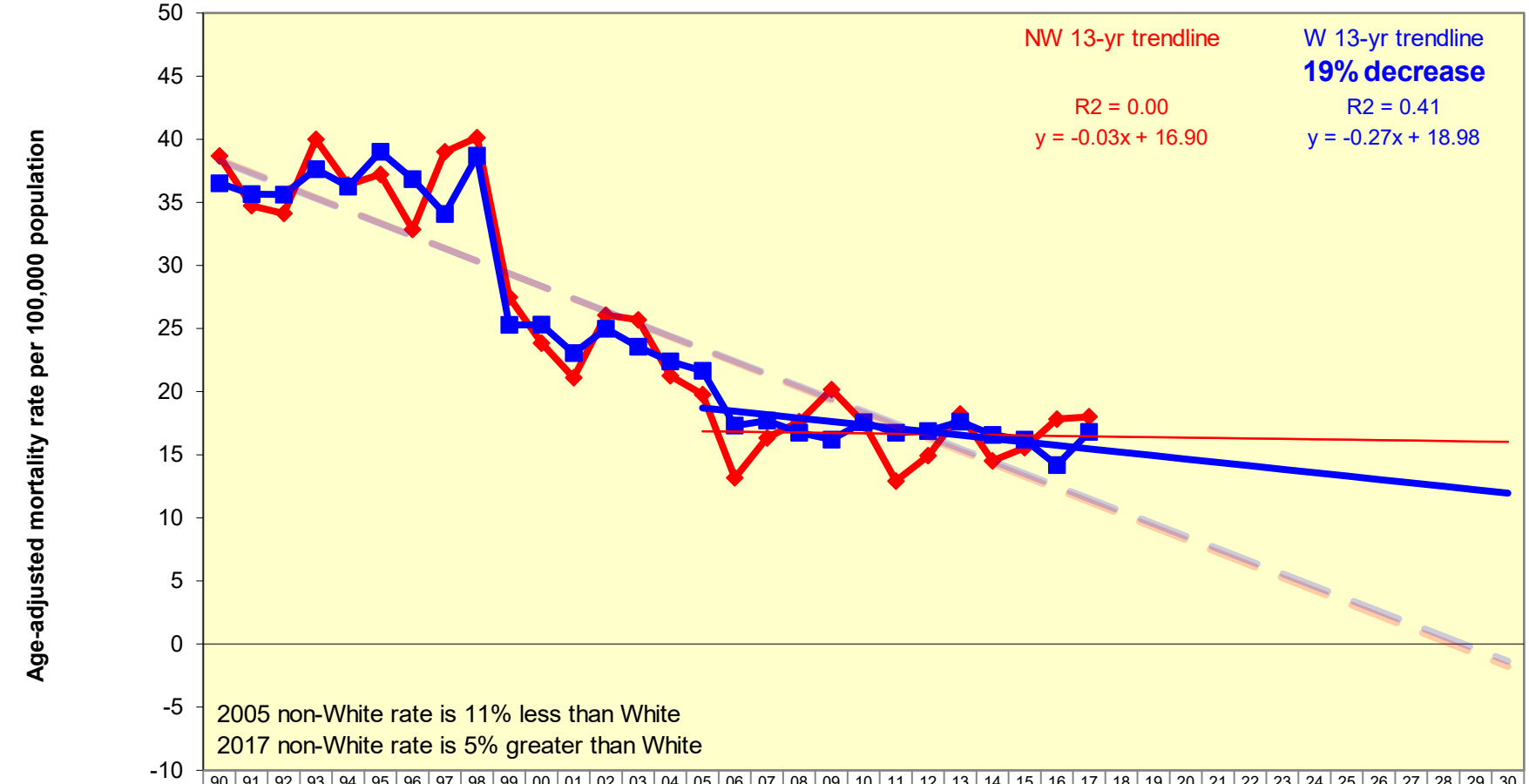


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	57	56	59	53	48	57	51	57	55	34	28	27	41	36	25	27	16	21	21	26	22	15	19	19	15	20	27	19													
WM	49	51	47	48	50	53	48	42	47	29	27	28	28	25	24	26	19	20	19	17	19	18	17	20	18	20	14	20													
NWF	27	22	19	32	29	26	24	29	31	24	21	18	18	19	19	16	12	13	16	17	16	12	13	18	14	12	13	17													
WF	31	28	29	33	30	33	31	31	35	23	24	20	24	22	21	19	16	16	15	15	15	16	16	17	16	16	14	14	15												

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	1% LT	32% LT	19% LT	NWM
1% GT		32% LT	18% LT	WM
47% GT	47% GT		20% GT	NWF
23% GT	22% GT	16% LT		WF

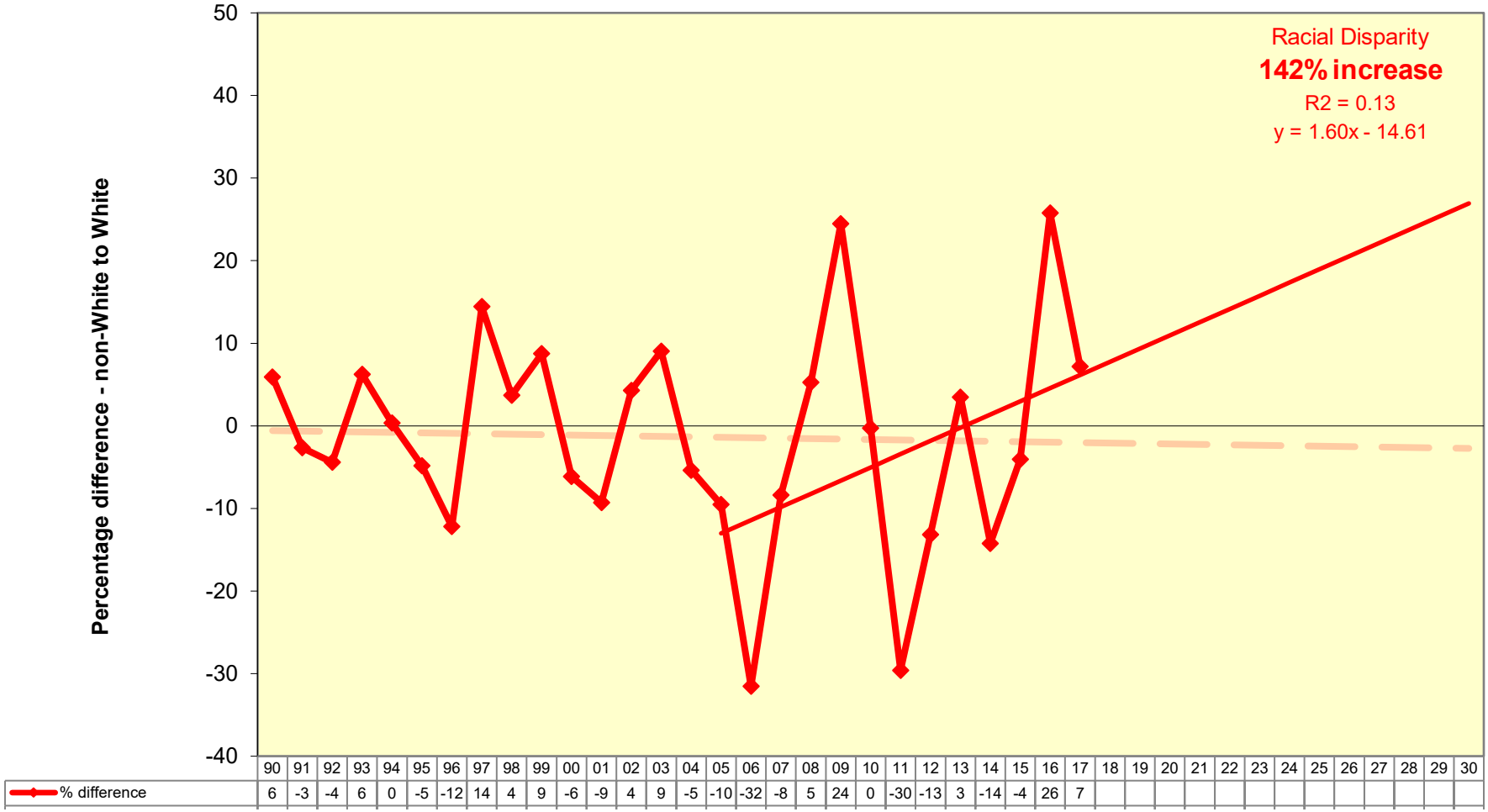
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	13% LT	27% LT	27% LT	NWM
15% GT		16% LT	15% LT	WM
37% GT	19% GT		1% GT	NWF
36% GT	18% GT	1% LT		WF

Figure 6.8 iv. Pneumonia and Influenza: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	39	35	34	40	36	37	33	39	40	27	24	21	26	26	21	20	13	16	18	20	18	13	15	18	15	16	18	18													
W	37	36	36	38	36	39	37	34	39	25	25	23	25	24	22	22	17	18	17	16	18	17	17	18	17	16	14	17													

Figure 6.8 v. Pneumonia and Influenza:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030

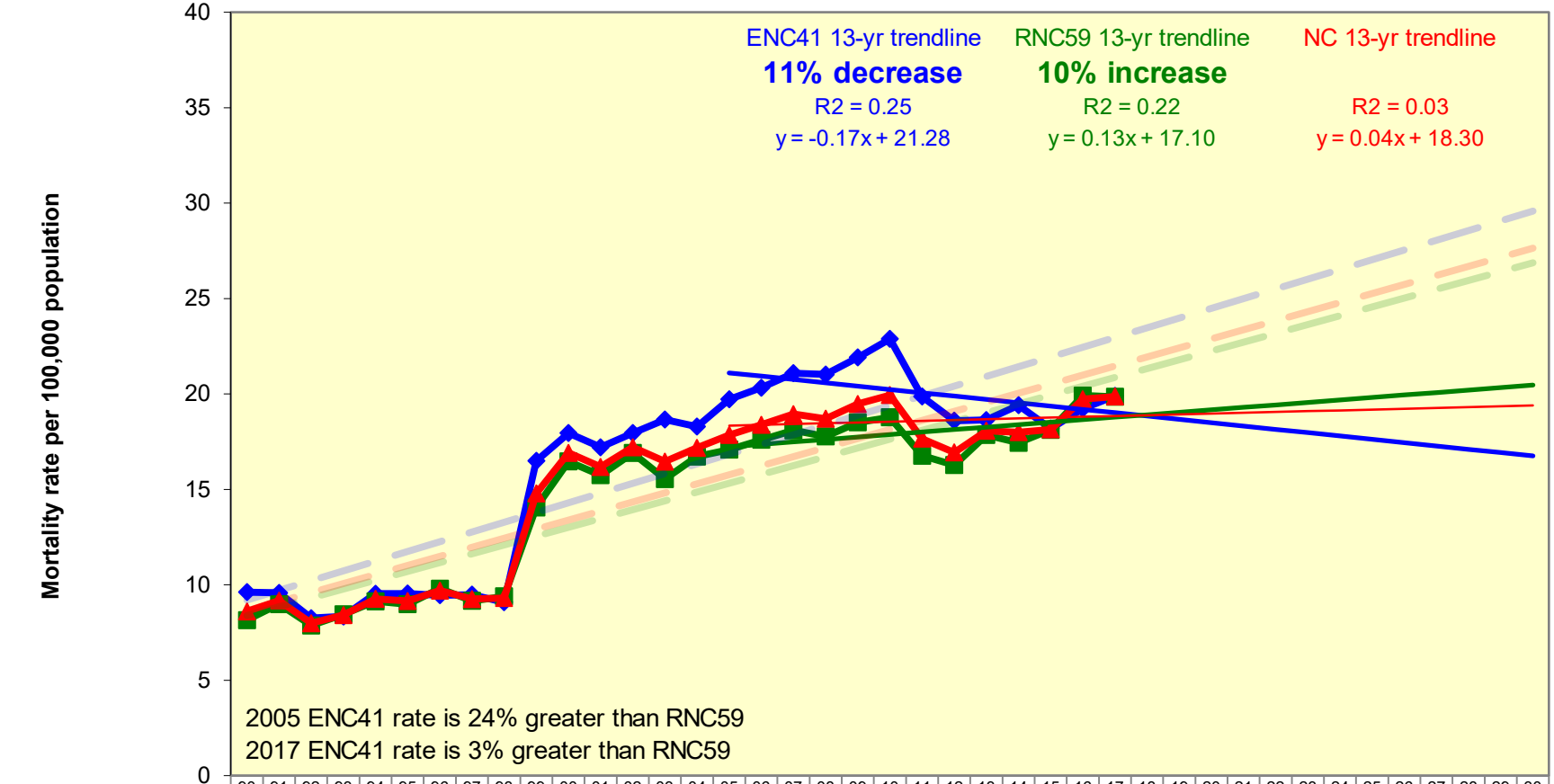


Nephritis, Nephrotic Syndrome, and Nephrosis

- Mortality due to nephritis, nephrotic syndrome, and nephrosis in ENC has decreased 11% over 13 years in a moderately reliable trend. The 2017 rate for ENC, NC and RNC were equal.
- The age-adjusted ENC rate is equal to the NC rate but the 13-year rate trend for ENC has decreased 29% and is set to drop below the NC rate.
- The 13-year trends for non-White males and females are higher than those for White males and females. Non-White females show the greatest decrease, 39% over 13 years. White females have the lowest rates.
- In 2017 the non-White rate was 107% greater than the White rate but declined 35% over 13 years. The White rate declined 25%.
- Racial disparity shows a 24% decrease over the 13-year period 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 6.9 i. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

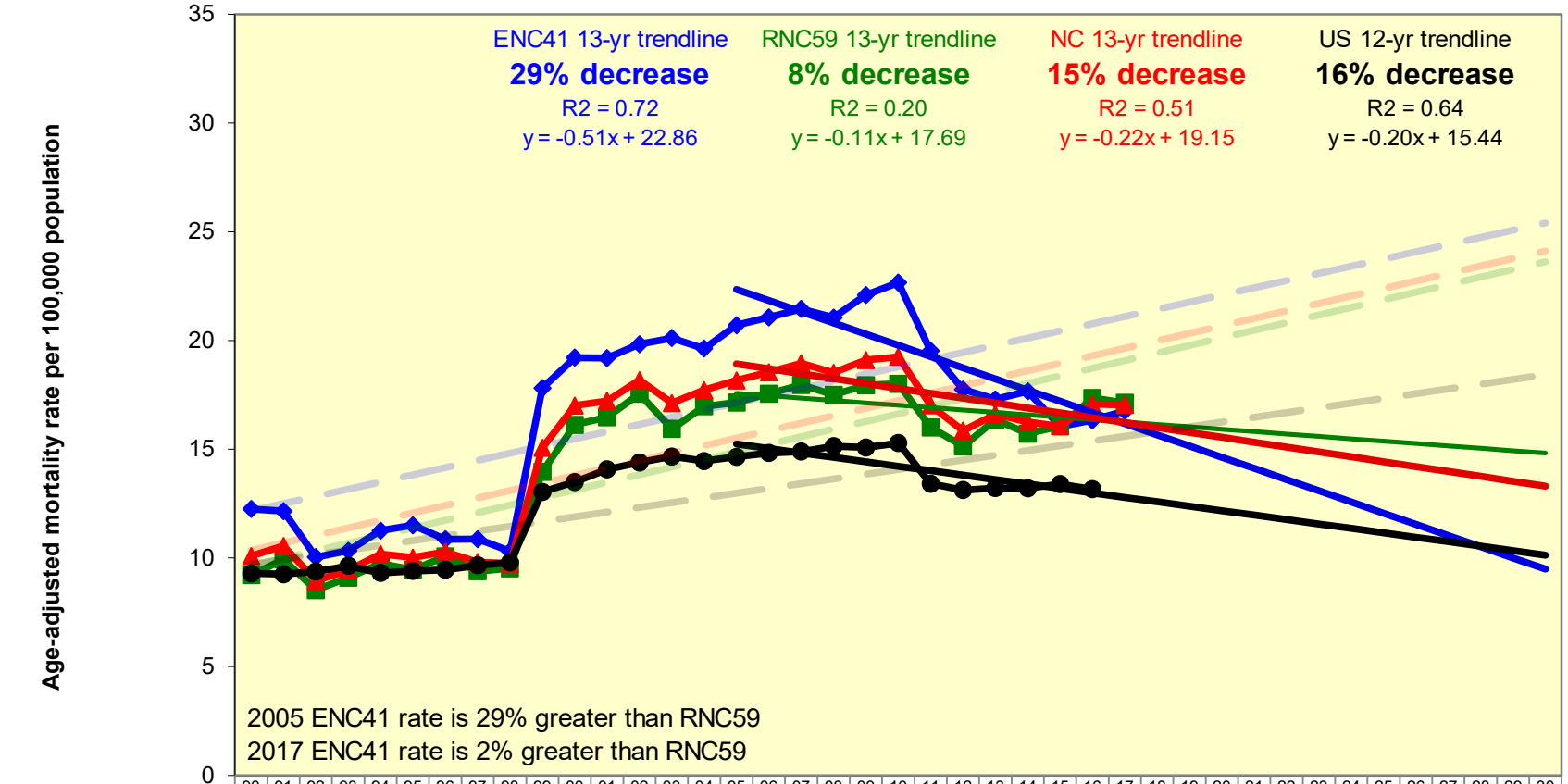


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	10	10	8	8	10	10	9	9	9	16	18	17	18	19	18	20	20	21	21	22	23	20	19	19	19	18	19	20													
RNC59	8	9	8	8	9	9	10	9	9	14	16	16	17	16	17	17	18	18	18	19	19	17	16	18	17	18	20	20													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	20% LT	14% LT	ENC41
24% GT		7% GT	RNC59
16% GT	7% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	3% LT	2% LT	ENC41
3% GT		1% GT	RNC59
2% GT	1% LT		NC

Figure 6.9 ii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

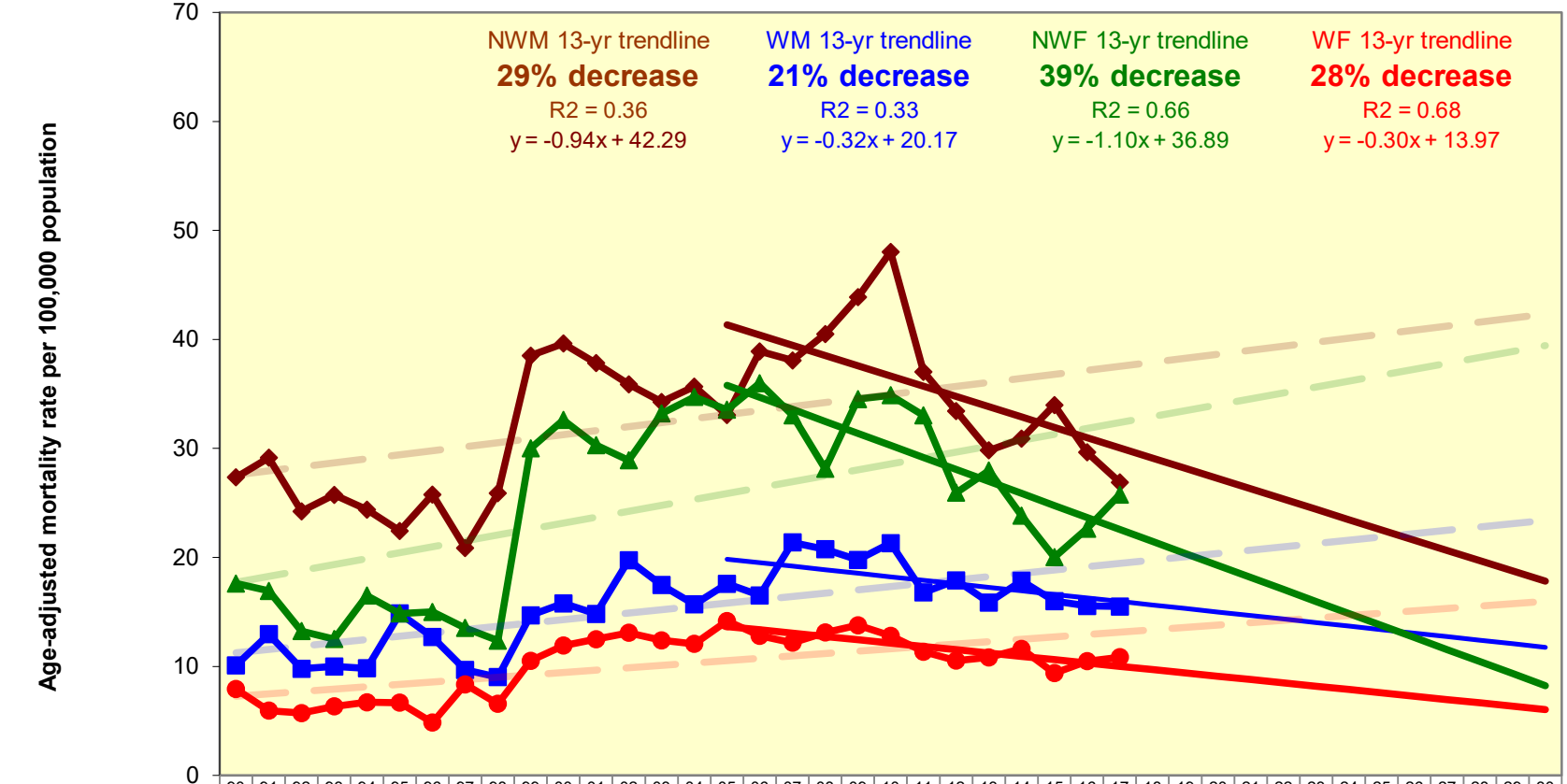


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	12	12	10	10	11	12	11	11	10	18	19	19	20	20	20	21	21	21	21	22	23	20	18	17	18	16	16	17													
RNC59	9	10	9	9	10	9	10	9	10	14	16	16	18	16	17	17	18	18	18	18	18	16	15	16	16	16	17	17													
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													
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				
ENC41	RNC59	NC	US	
	23% LT	16% LT	32% LT	ENC41
29% GT		8% GT	13% LT	RNC59
19% GT	8% LT		19% LT	NC
48% GT	15% GT	24% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	2% LT	1% LT	22% LT	ENC41
2% GT		1% GT	21% LT	RNC59
1% GT	1% LT		21% LT	NC
28% GT	26% GT	27% GT		US

Figure 6.9 iii. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

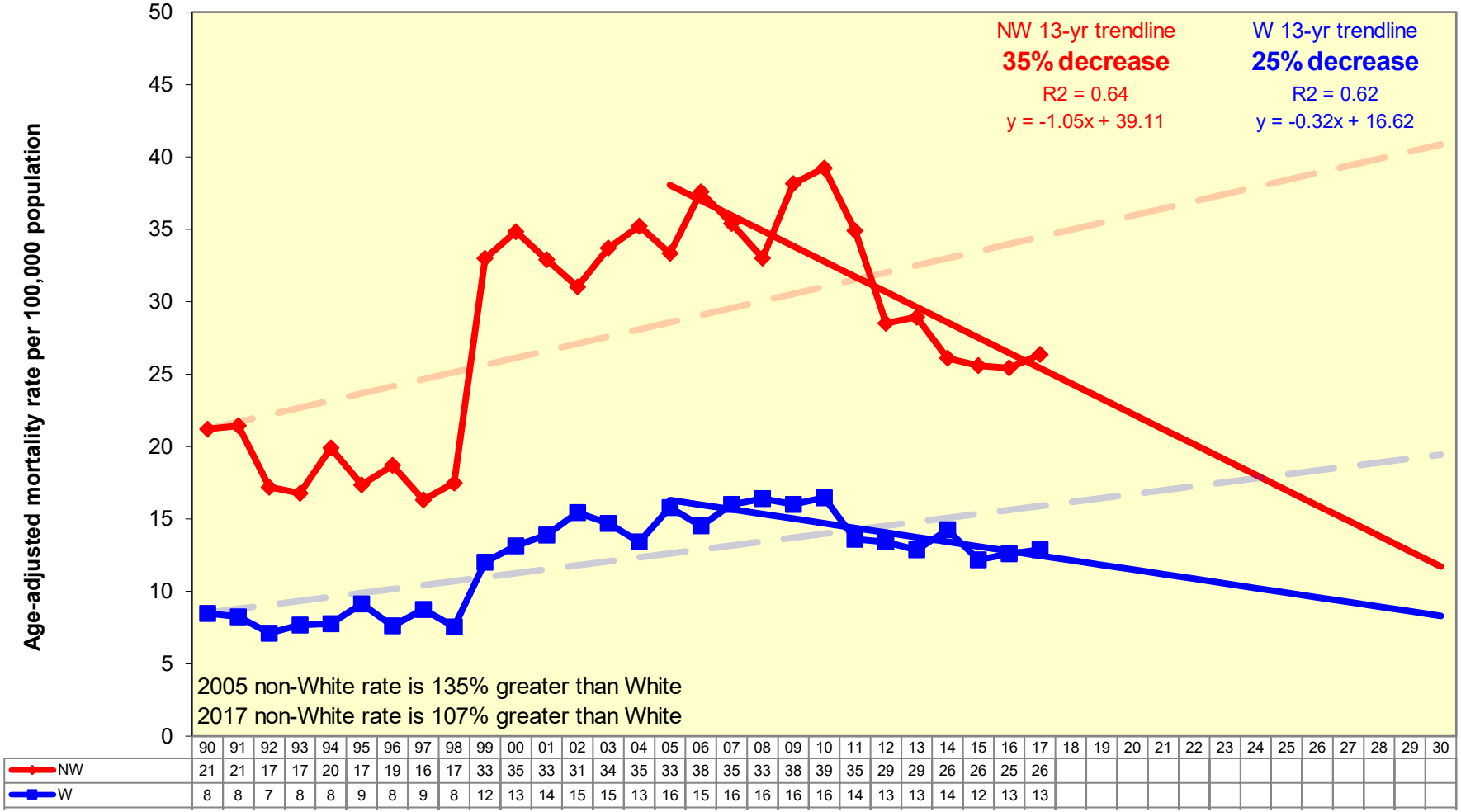


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	27	29	24	26	24	22	26	21	26	39	40	38	36	34	36	33	39	38	40	44	48	37	33	30	31	34	30	27													
WM	10	13	10	10	10	15	13	10	9	15	16	15	20	17	16	18	17	21	21	20	21	17	18	16	18	16	16	15													
NWF	18	17	13	13	17	15	15	14	12	30	33	30	29	33	35	34	36	33	28	35	35	33	26	28	24	20	23	26													
WF	8	6	6	6	7	7	5	8	7	11	12	12	13	12	12	14	13	12	13	14	13	11	11	11	12	9	10	11													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	52% LT	13% LT	67% LT	NWM
110% GT		83% GT	31% LT	WM
15% GT	45% LT		62% LT	NWF
203% GT	44% GT	164% GT		WF

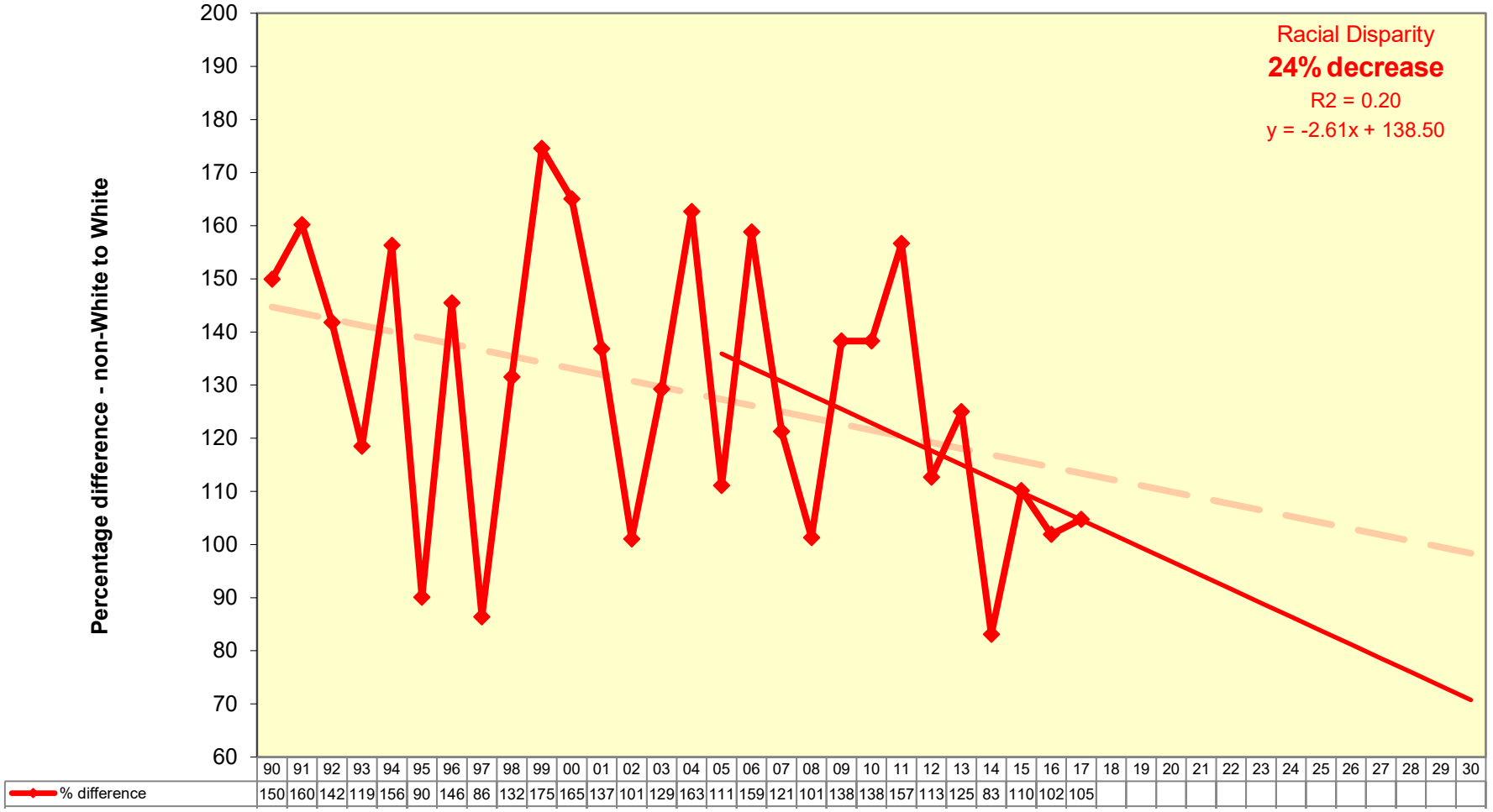
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	47% LT	24% LT	67% LT	NWM
90% GT		45% GT	37% LT	WM
31% GT	31% LT		56% LT	NWF
200% GT	58% GT	129% GT		WF

Figure 6.9 iv. Nephritis, Nephrotic Syndrome, and Nephrosis: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	21	17	17	20	17	19	16	17	33	35	33	31	34	35	33	38	35	33	38	39	35	29	29	26	26	25	26													
W	8	8	7	8	8	9	8	9	8	12	13	14	15	15	13	16	15	16	16	16	16	14	13	13	14	12	13	13													

Figure 6.9 v. Nephritis, Nephrotic Syndrome, and Nephrosis: Measuring disparity in age-adjusted mortality rates by race for ENC41, 1990-2017 with projections to 2030

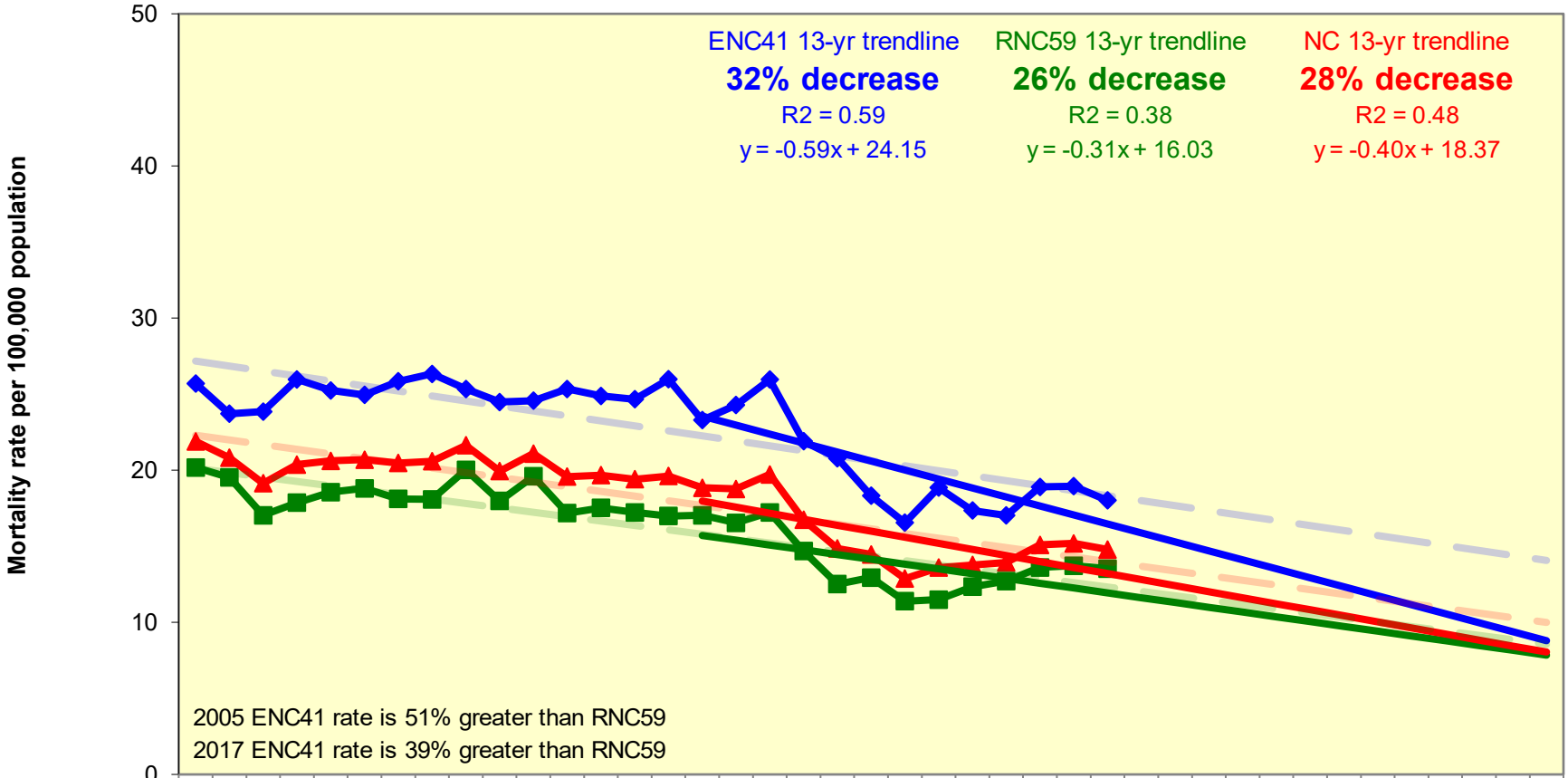


Unintentional Motor Vehicle Injuries

- ENC's unintentional motor vehicle injury mortality rate trend is decreasing but is still 39% greater than RNC in 2017.
- The ENC age-adjusted rate is 41% greater than RNC and 62% greater than the US. The rates for ENC, RNC, NC and the US are all decreasing.
- The rates for non-White males and non-White females are not reliable. The trends for White males and White females are declining.
- The White rate trend has decreased 45% over the 13-year period. The non-White rate is unreliable.
- Racial disparity has increased significantly over the 13-year period.

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. Unintentional Motor Vehicle Injuries: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

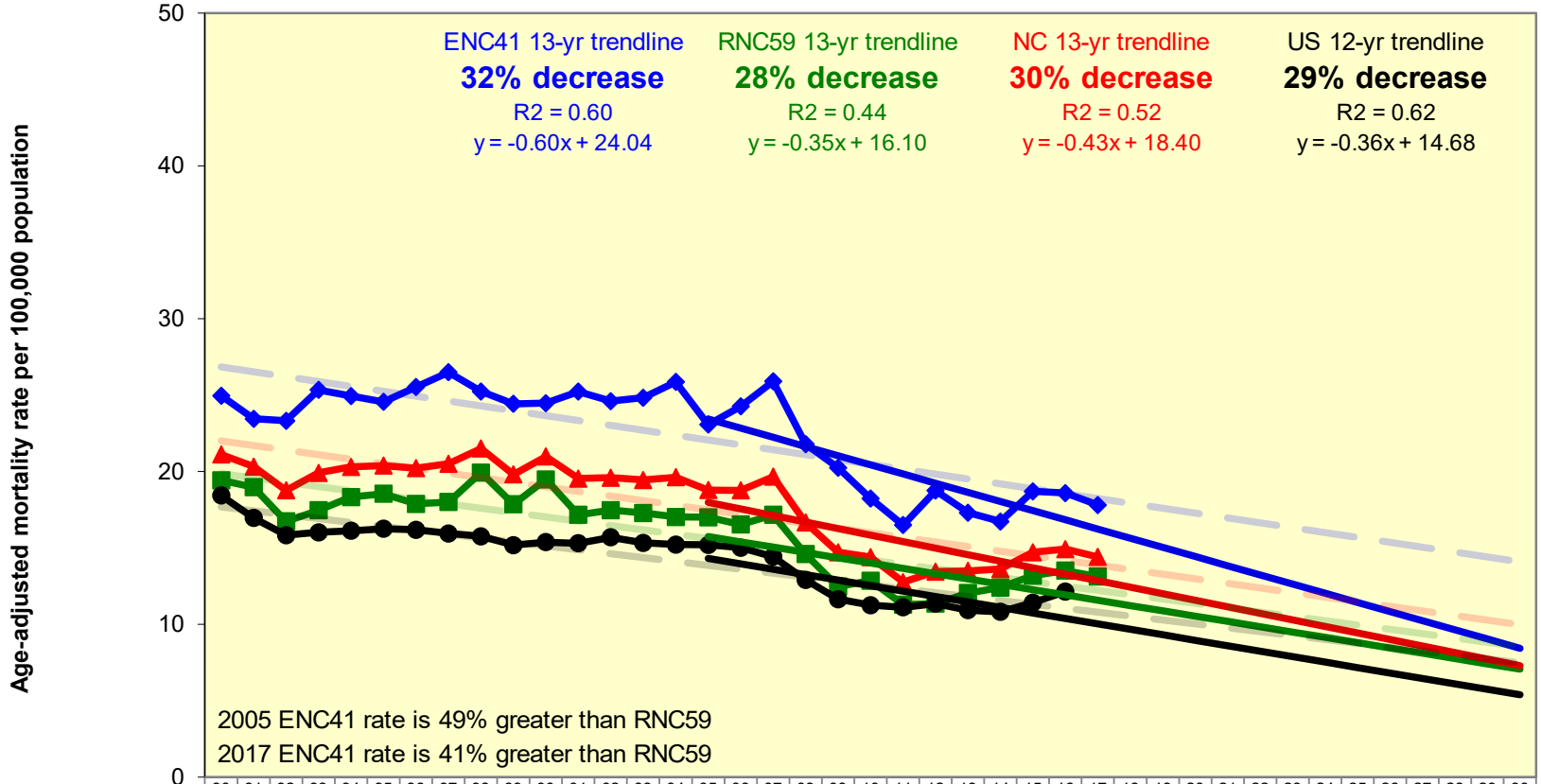


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	26	24	24	26	25	25	26	26	25	24	25	25	25	25	26	23	24	26	22	21	18	17	19	17	17	19	19	18													
RNC59	20	20	17	18	19	19	18	18	20	18	20	17	18	17	17	17	17	17	15	13	13	11	11	12	13	14	14	14													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	34% LT	24% LT	ENC41
51% GT		15% GT	RNC59
31% GT	13% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	28% LT	20% LT	ENC41
39% GT		11% GT	RNC59
25% GT	10% LT		NC

Figure 6.10 ii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

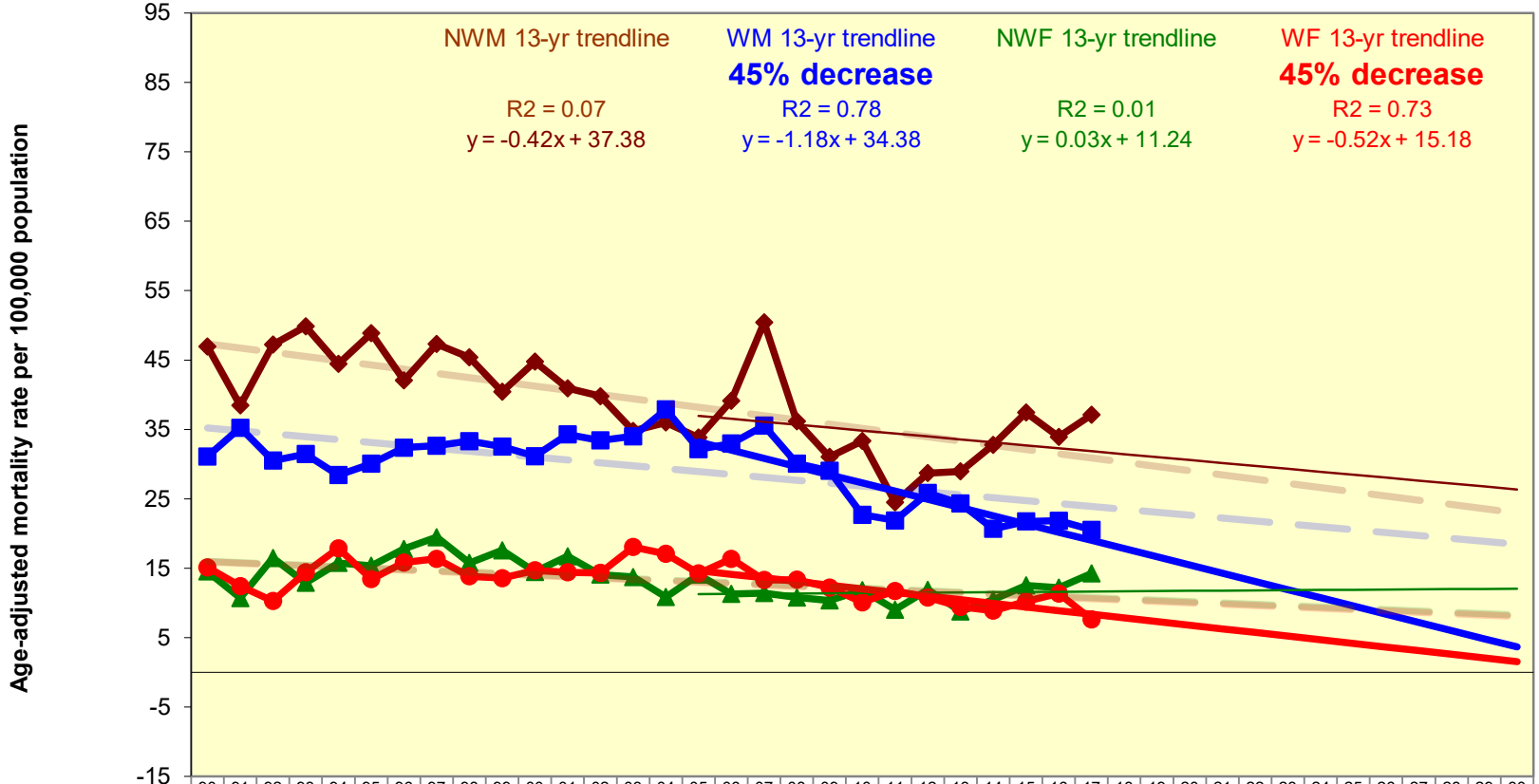


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	25	23	23	25	25	25	26	27	25	24	24	25	25	25	26	23	24	26	22	20	18	16	19	17	17	19	19	18													
RNC59	19	19	17	17	18	19	18	18	20	18	19	17	17	17	17	17	17	17	15	12	13	11	11	12	12	13	14	13													
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													
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				
ENC41	RNC59	NC	US	
	33% LT	23% LT	39% LT	ENC41
49% GT		14% GT	9% LT	RNC59
31% GT	13% LT		20% LT	NC
64% GT	10% GT	25% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	29% LT	21% LT	38% LT	ENC41
41% GT		11% GT	13% LT	RNC59
27% GT	10% LT		22% LT	NC
62% GT	15% GT	28% GT		US

Figure 6.10 iii. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

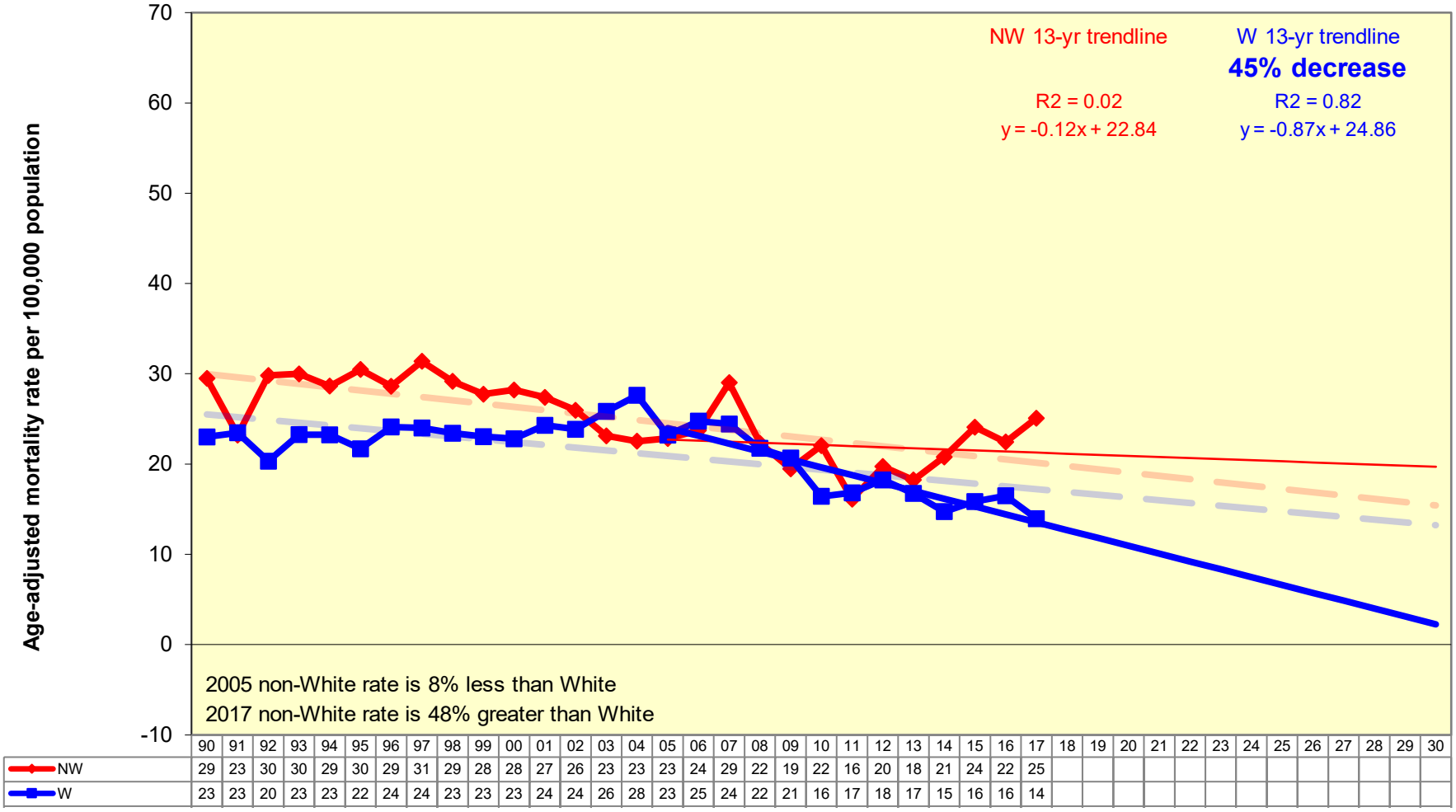


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	47	38	47	50	44	49	42	47	45	40	45	41	40	35	36	34	39	50	36	31	33	25	29	29	33	37	34	37													
WM	31	35	31	31	28	30	32	33	33	33	31	34	33	34	38	32	33	36	30	29	23	22	26	24	21	22	22	21													
NWF	15	11	16	13	16	15	18	19	16	18	14	17	14	14	11	14	11	11	11	10	12	9	12	9	10	13	12	14													
WF	15	12	10	14	18	13	16	16	14	14	15	14	14	18	17	14	16	13	13	12	10	12	11	9	9	10	11	8													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	8% LT	70% LT	59% LT	NWM
9% GT		67% LT	56% LT	WM
233% GT	206% GT		35% GT	NWF
146% GT	126% GT	26% LT		WF

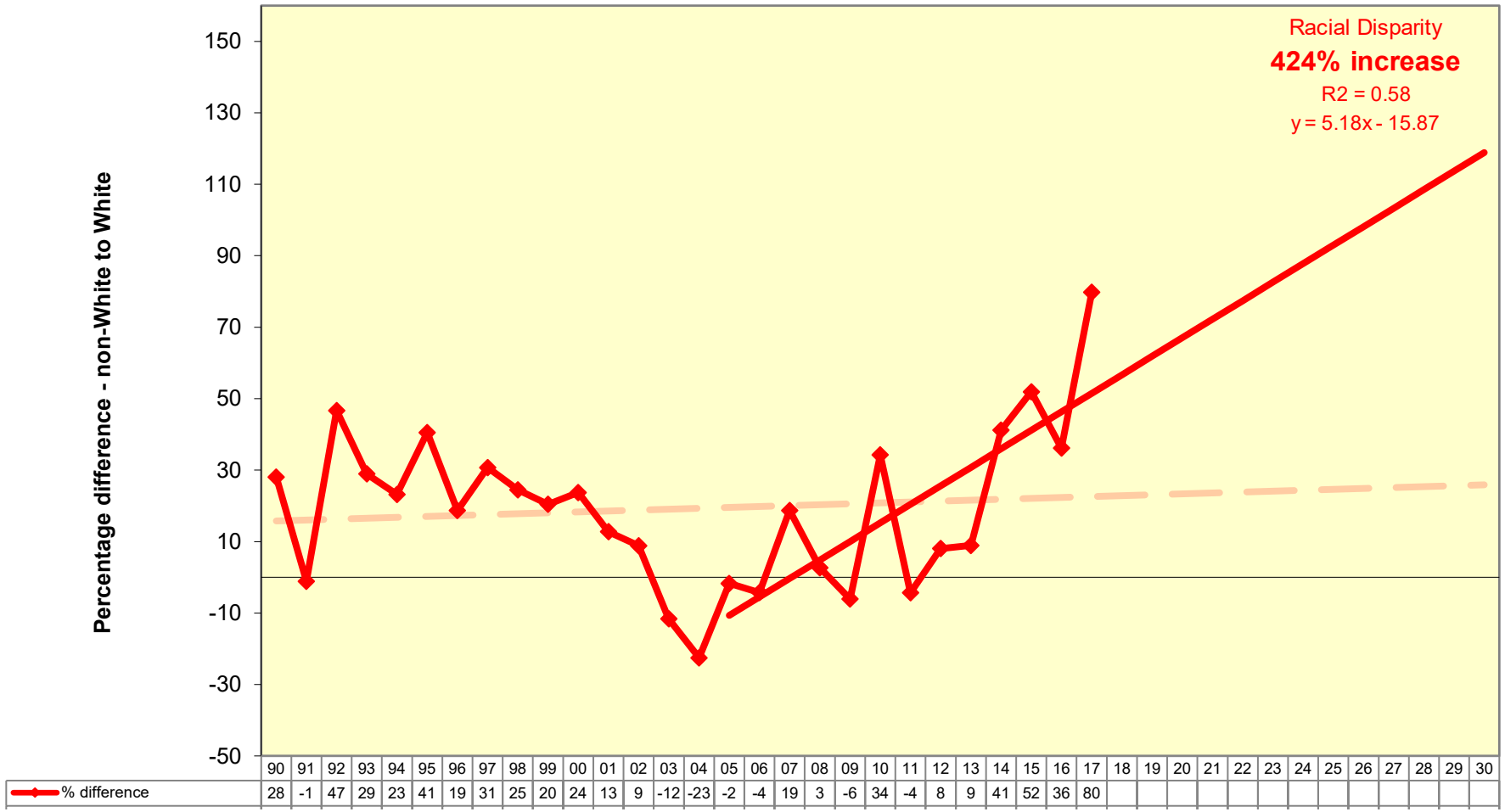
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	37% LT	64% LT	72% LT	NWM
60% GT		42% LT	56% LT	WM
178% GT	74% GT		23% LT	NWF
263% GT	127% GT	31% GT		WF

Figure 6.10 iv. Unintentional Motor Vehicle Injuries: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	29	23	30	30	29	30	29	31	29	28	28	27	26	23	23	23	24	29	22	19	22	16	20	18	21	24	22	25													
W	23	23	20	23	23	22	24	24	23	23	23	24	24	26	28	23	25	24	22	21	16	17	18	17	15	16	16	14													

Figure 6.10 v. Unintentional Motor Vehicle Injuries: Measuring disparity in age-adjusted mortality rates by race for ENC41, 1990-2017 with projections to 2030



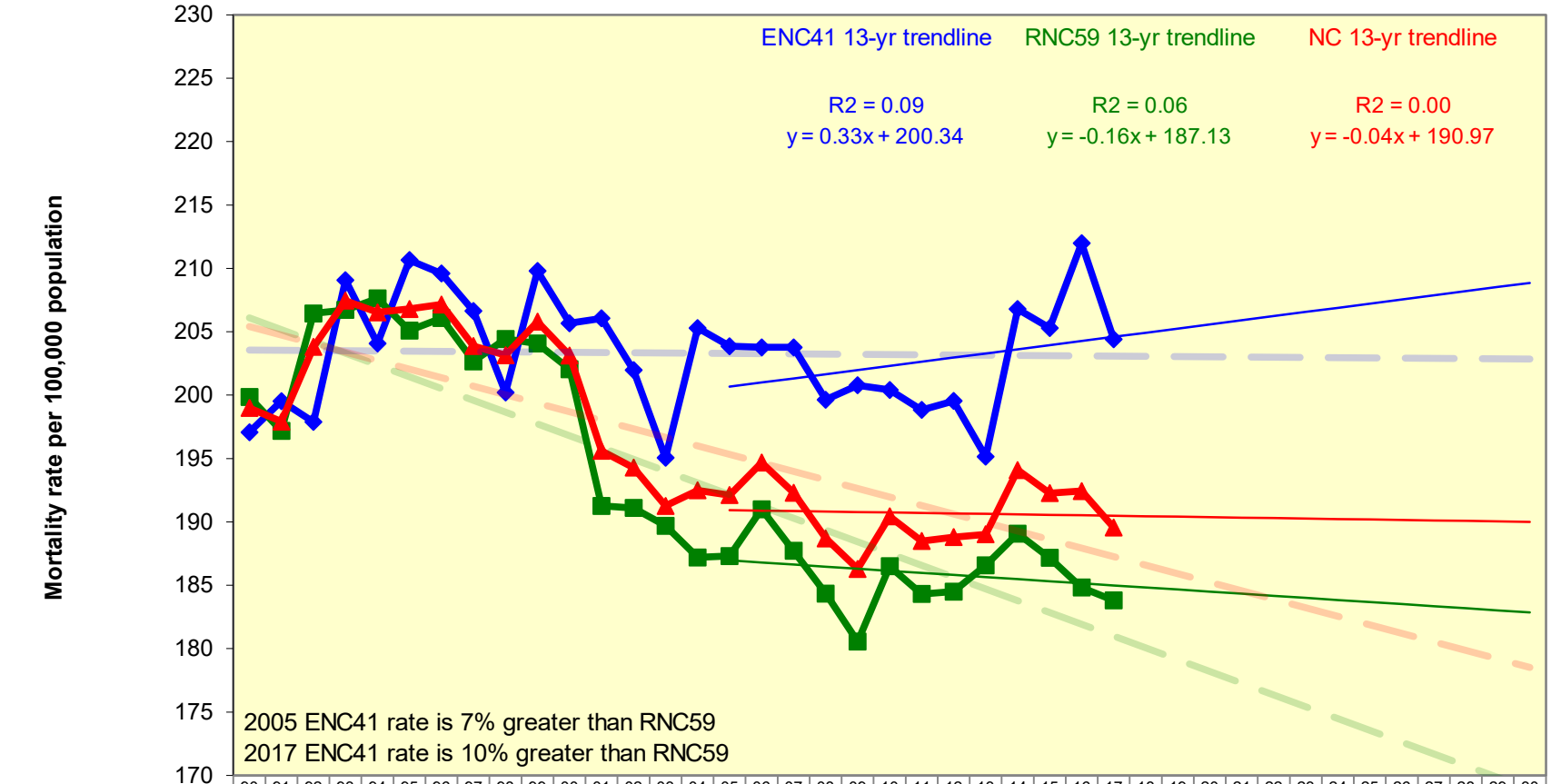
7. Trends and Disparities in Mortality in ENC41: Cancer - All Sites and HIV Disease; 1990-2017

Cancer - All Sites

- The cancer - all sites mortality rate trends for ENC, NC and RNC are unreliable.
- The age-adjusted cancer - all sites mortality rate trends for ENC, RNC, NC and the US are all decreasing at about the same pace. The ENC rate trend is 8% greater than RNC and 9% greater than the US.
- The rate for non-White males has decreased 28% over 13 years and the White male rate has decreased 21%. The non-White male and White male rates are the highest.
- Both White and non-White cancer – all sites mortality rates are decreasing over the 13-year period, although non-White rates are 9% greater than Whites.
- The moderately reliable 13-year trend for racial disparity shows a 62% 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 ENC41, RNC59, and NC, 1990-2017 with projections to 2030

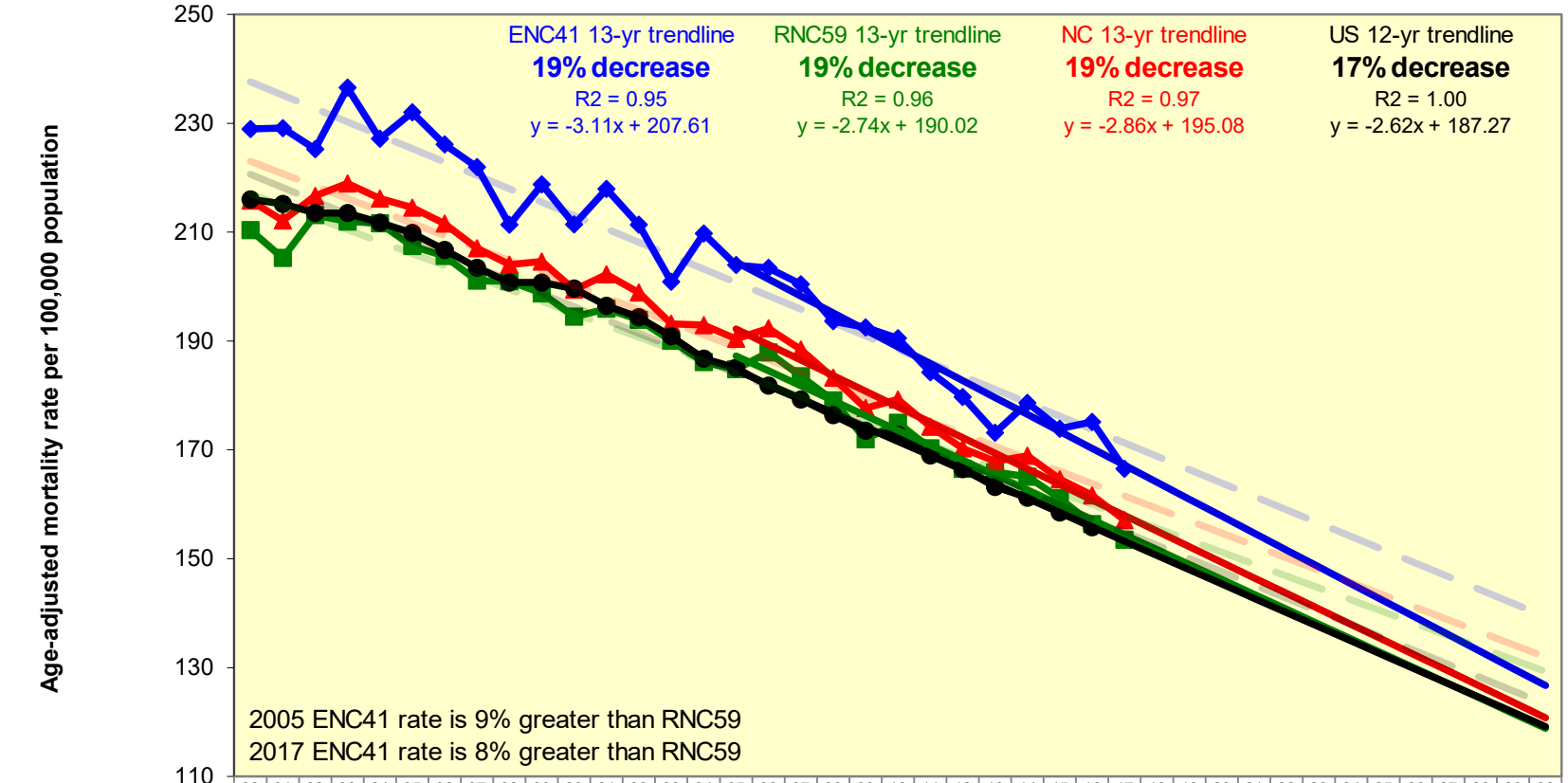


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	197	200	198	209	204	211	210	207	200	210	206	206	202	195	205	204	204	204	200	201	200	199	200	195	207	205	212	204													
RNC59	200	197	206	207	208	205	206	203	204	204	202	191	191	190	187	187	191	188	184	181	186	184	184	187	189	187	185	184													
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													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	7% LT	5% LT	ENC41
7% GT		2% GT	RNC59
5% GT	2% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	9% LT	7% LT	ENC41
10% GT		3% GT	RNC59
7% GT	3% LT		NC

Figure 7.1 ii. Cancer - All Sites:
Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

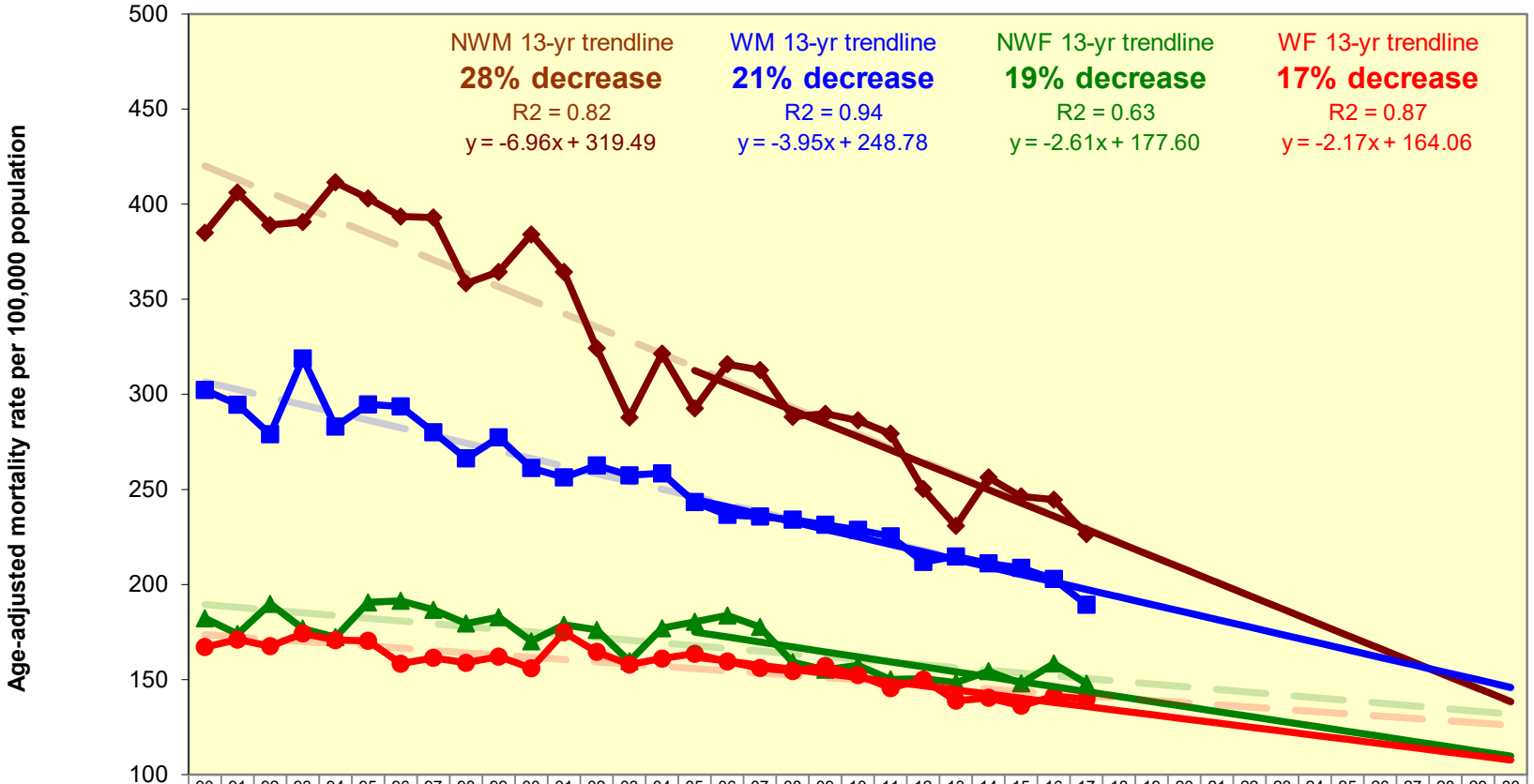


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	229	229	225	237	227	232	226	222	211	219	211	218	211	201	210	204	203	200	194	193	190	184	180	173	179	174	175	167													
RNC59	210	205	213	212	212	207	206	201	201	199	194	196	194	190	186	185	188	184	179	172	175	170	167	166	165	161	156	153													
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													
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				
ENC41	RNC59	NC	US	
	8% LT	6% LT	10% LT	ENC41
9% GT		3% GT	1% LT	RNC59
6% GT	3% LT		4% LT	NC
11% GT	1% GT	4% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	8% LT	6% LT	8% LT	ENC41
8% GT		2% GT	1% LT	RNC59
6% GT	2% LT		3% LT	NC
9% GT	1% GT	3% GT		US

Figure 7.1 iii. Cancer - All Sites: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

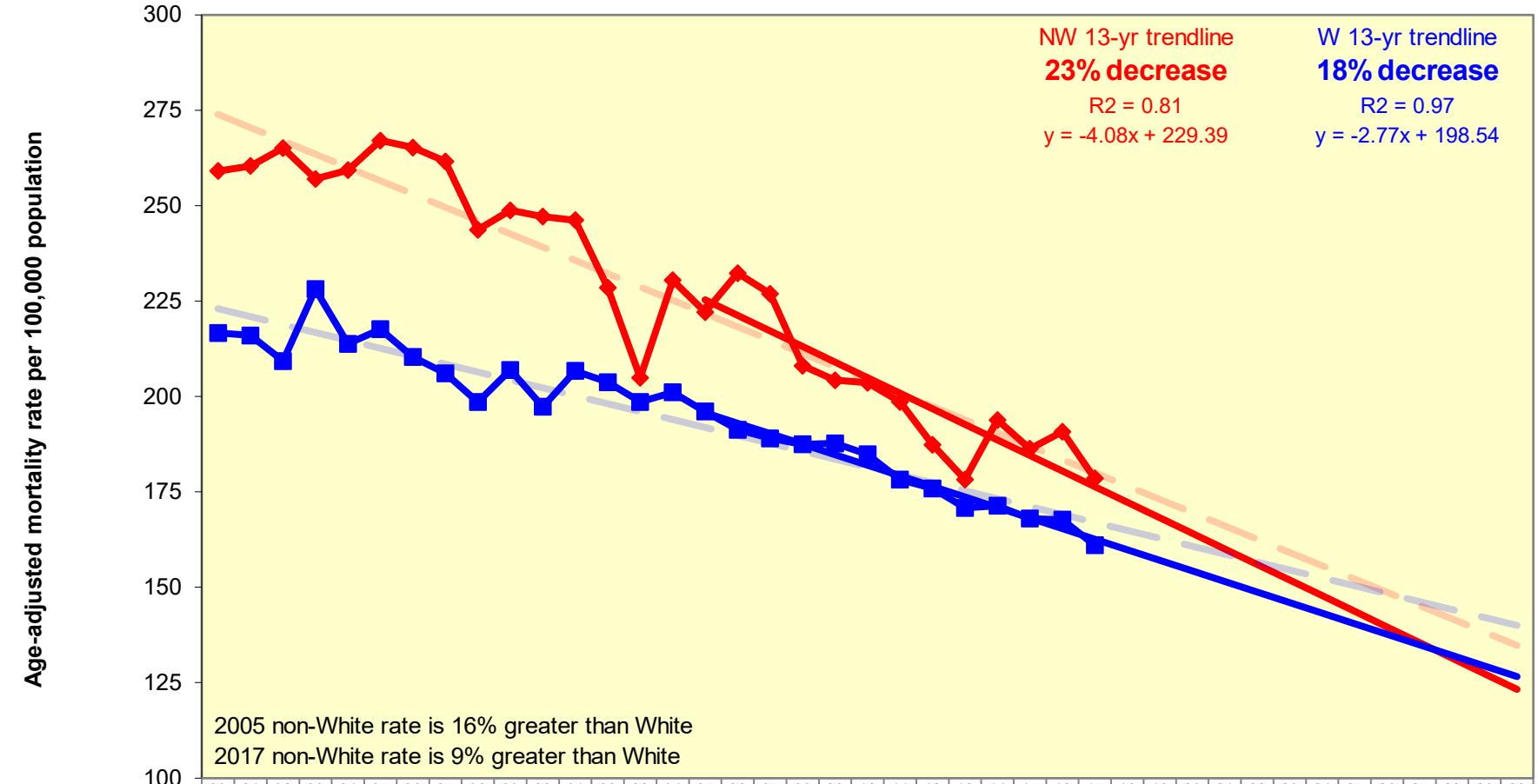


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	385	406	389	391	411	403	393	393	358	364	384	364	324	288	321	293	316	313	288	290	286	279	250	231	256	246	245	226													
WM	302	295	279	319	283	295	294	280	266	277	261	256	263	257	258	243	237	236	234	232	229	225	212	215	211	209	203	189													
NWF	182	174	190	177	172	191	191	187	179	183	170	179	176	160	177	180	184	178	159	155	157	150	151	148	154	148	158	148													
WF	167	171	168	174	171	170	158	161	159	162	156	175	165	158	161	164	160	156	155	157	152	146	150	139	140	136	141	140													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	22% LT	44% LT	49% LT	NWM
28% GT		29% LT	34% LT	WM
80% GT	40% GT		8% LT	NWF
95% GT	52% GT	8% GT		WF

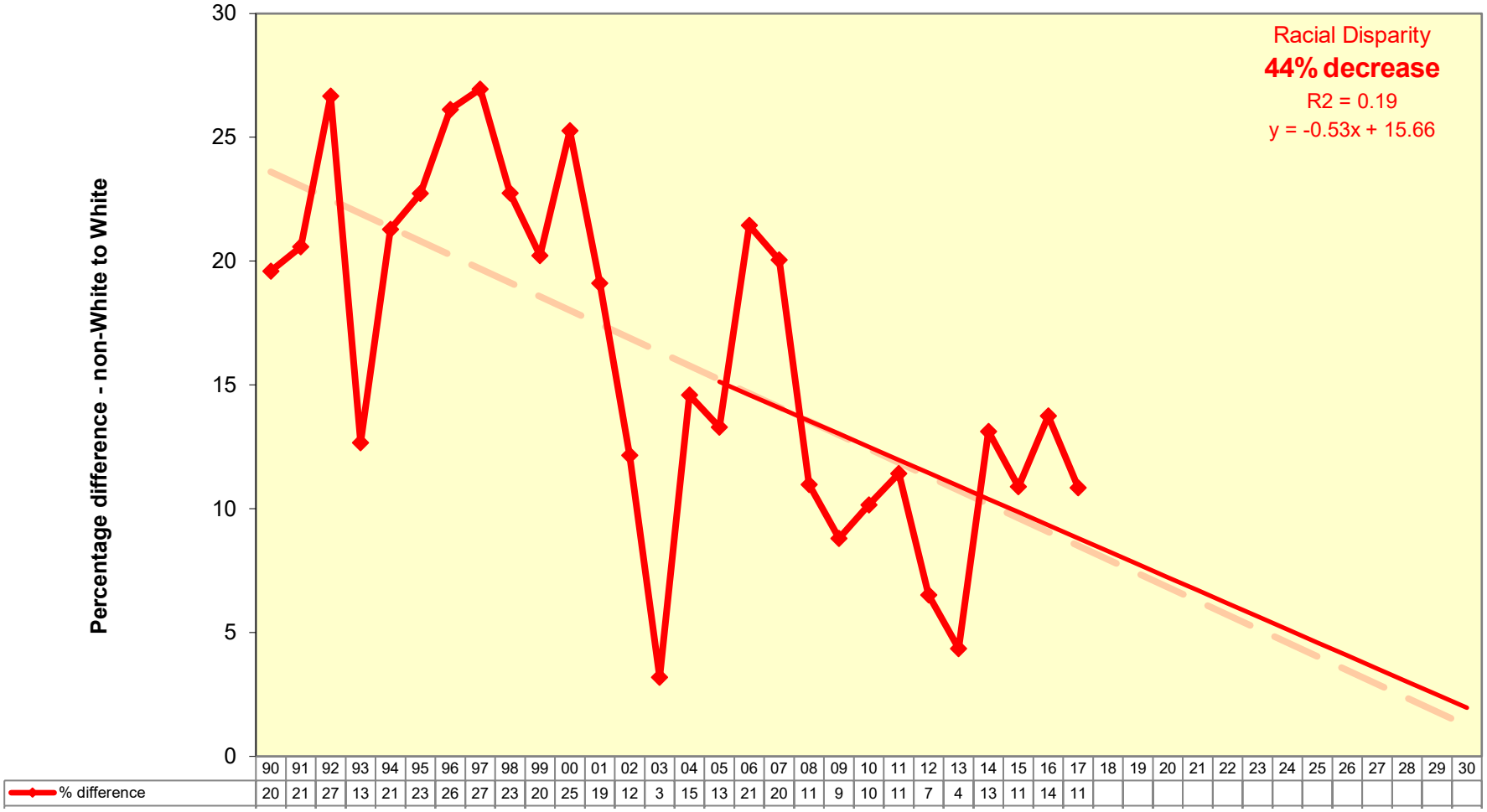
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	15% LT	38% LT	41% LT	NWM
17% GT		27% LT	31% LT	WM
61% GT	38% GT		6% LT	NWF
71% GT	46% GT	6% GT		WF

Figure 7.1 iv. Cancer - All Sites: Trends in age-adjusted mortality rates by race for ENC41, 1990-2017 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	259	260	265	257	259	267	265	262	244	249	247	246	228	205	230	222	232	227	208	204	204	199	187	178	194	186	191	178													
W	217	216	209	228	214	218	210	206	199	207	197	207	204	199	201	196	191	189	187	188	185	178	176	171	171	168	168	161													

Figure 7.1 v. Cancer - All Sites:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 with projections to 2030

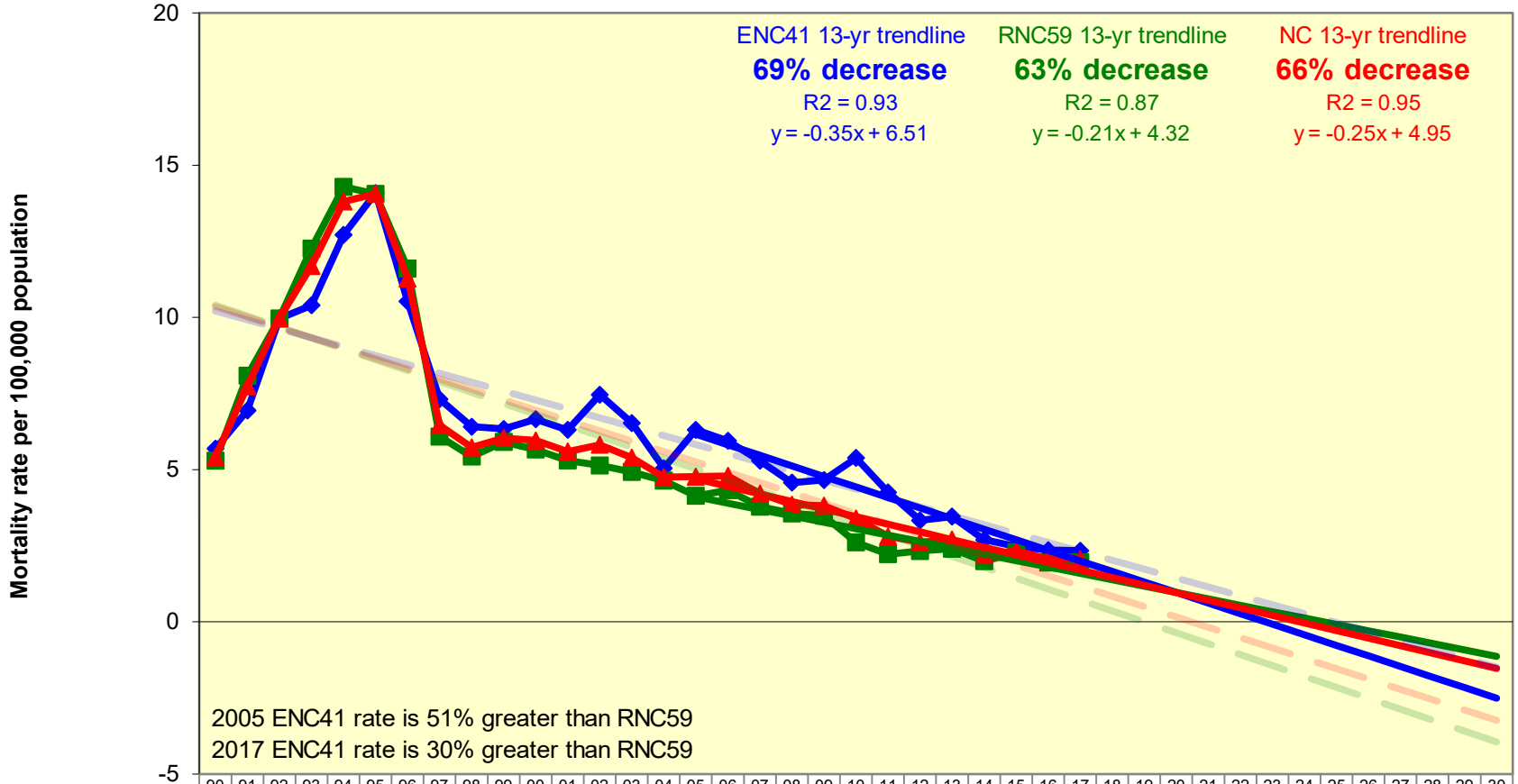


HIV Disease

- The HIV mortality rate for ENC has decreased 69% over the past 13 years but was still 30% higher than RNC in 2017.
- The 13-year age-adjusted rate trend for ENC has been decreasing over the past 13 years, but still was 38% greater than RNC.
- Non-White males continue to have the highest rate of age-adjusted mortality, but this rate has decreased 74% in a 13-year reliable trend. The rate for White males decreased 69% and non-White females decreased 77%. A convergence of the non-White and White rate is expected in the future.
- The 13-year non-White age-adjusted HIV mortality rate has decreased by 75%; the White rate has decreased by 59%. The 2 rates are expected to converge.
- Racial disparity has decreased 40% over the 13-year period 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 7.2 i. HIV Disease: Trends in mortality rates for ENC41, RNC59, and NC, 1990-2017 with projections to 2030

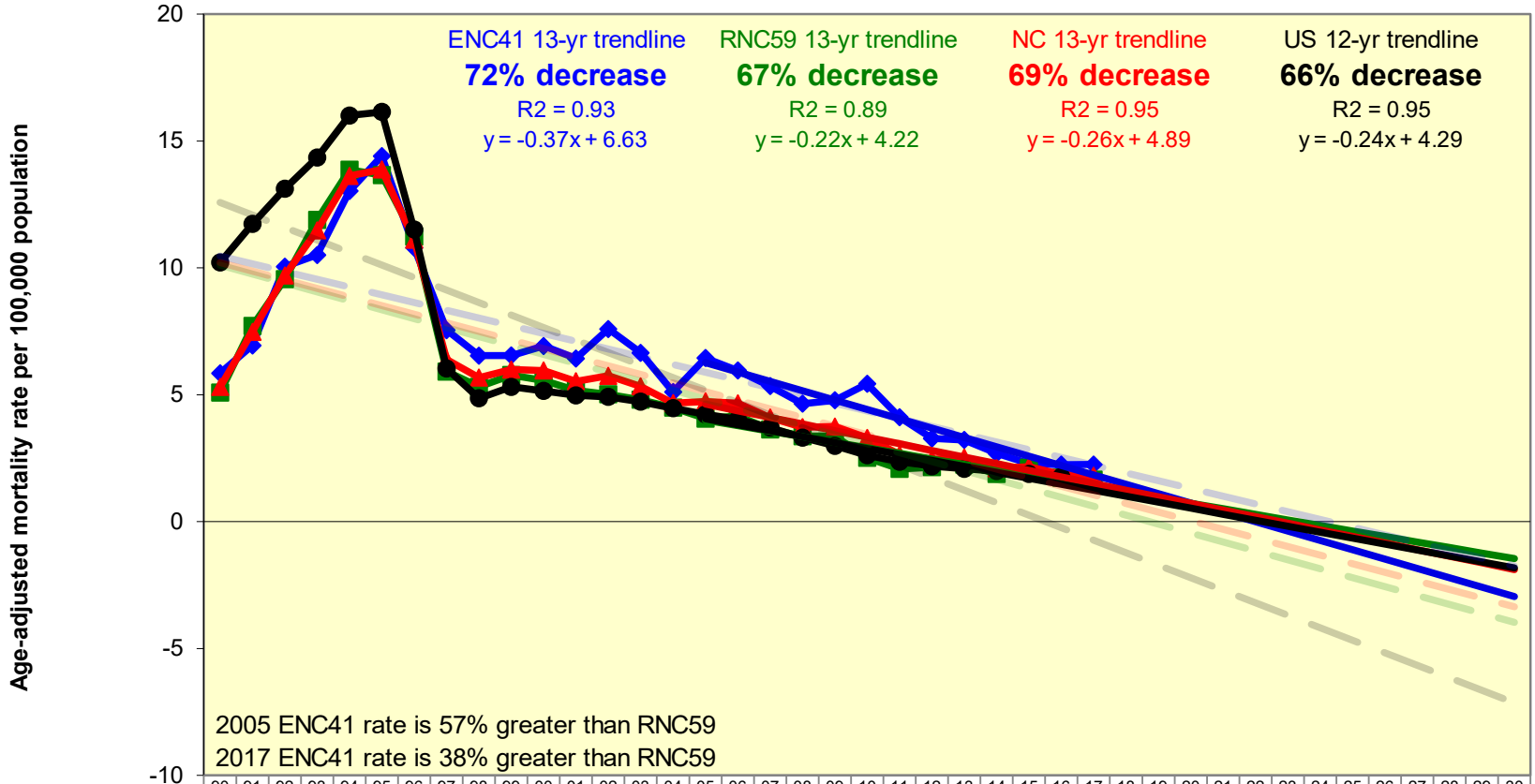


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	6	7	10	10	13	14	11	7	6	6	7	6	7	7	5	6	6	5	5	5	5	4	3	3	3	2	2	2													
RNC59	5	8	10	12	14	14	12	6	5	6	6	5	5	5	5	4	4	4	4	3	3	2	2	2	2	2	2	2													
NC	5	8	10	12	14	14	11	6	6	6	6	6	6	5	5	5	5	4	4	4	3	3	3	3	2	2	2	2													

Comparison of Fitted Rates in 2005			
ENC41	RNC59	NC	
	34% LT	24% LT	ENC41
51% GT		15% GT	RNC59
32% GT	13% LT		NC

Comparison of Fitted Rates in 2017			
ENC41	RNC59	NC	
	23% LT	17% LT	ENC41
30% GT		9% GT	RNC59
20% GT	8% LT		NC

Figure 7.2 ii. HIV Disease: Trends in age-adjusted mortality rates for ENC41, RNC59, NC, and US, 1990-2017 with projections to 2030

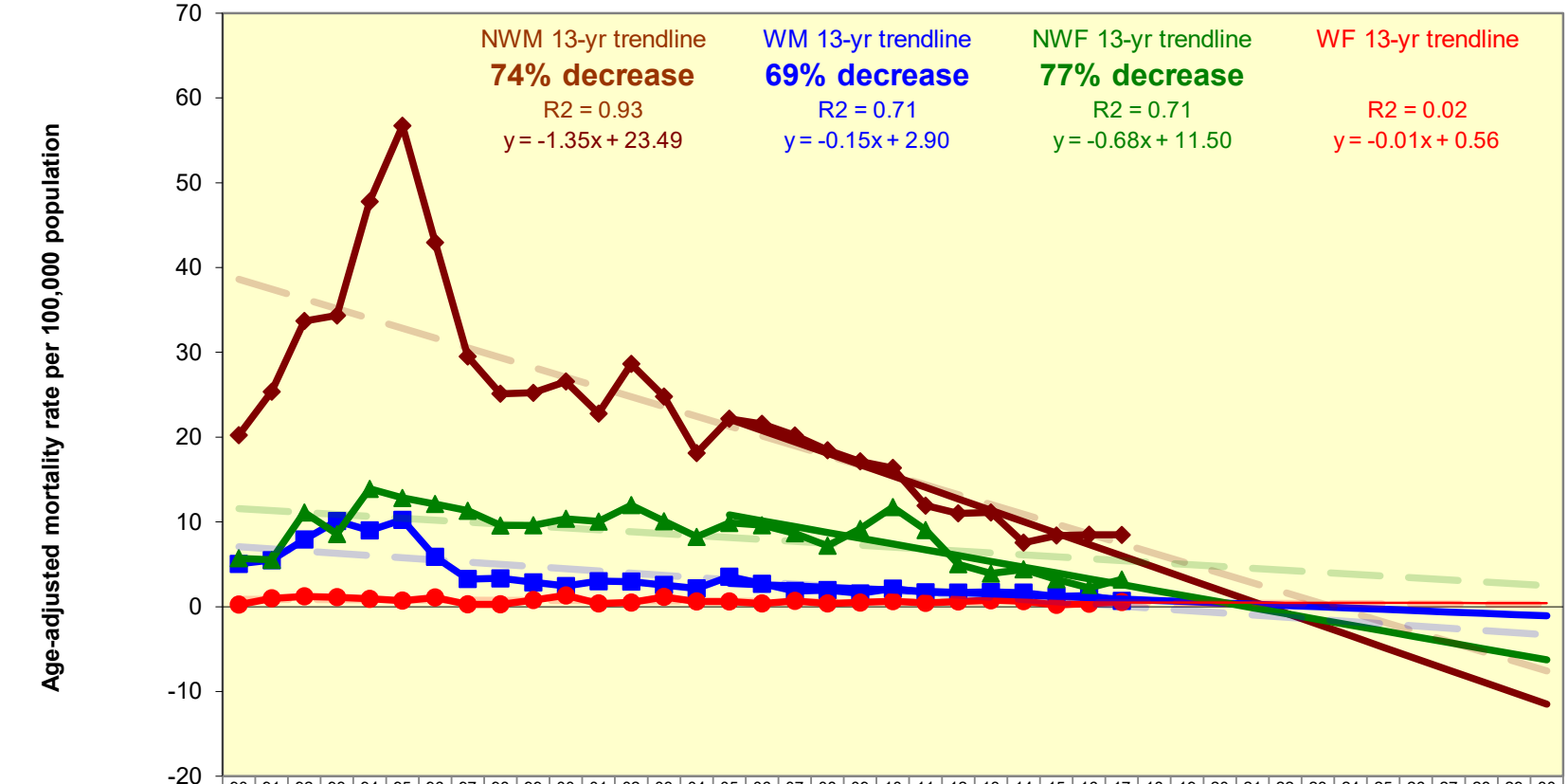


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ENC41	6	7	10	11	13	14	11	8	7	7	7	6	8	7	5	6	6	5	5	5	5	4	3	3	3	2	2	2													
RNC59	5	8	10	12	14	14	11	6	5	6	6	5	5	5	4	4	4	4	3	3	3	2	2	2	2	2	2	2													
NC	5	7	10	11	14	14	11	6	6	6	6	6	6	5	5	5	5	4	4	4	3	3	2	3	2	2	2	2													
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				
ENC41	RNC59	NC	US	
	36% LT	26% LT	35% LT	ENC41
57% GT		16% GT	2% GT	RNC59
36% GT	14% LT		12% LT	NC
55% GT	2% LT	14% GT		US

Comparison of Fitted Rates in 2017				
ENC41	RNC59	NC	US	
	28% LT	20% LT	34% LT	ENC41
38% GT		10% GT	8% LT	RNC59
25% GT	9% LT		17% LT	NC
50% GT	9% GT	20% GT		US

Figure 7.2 iii. HIV Disease: Trends in age-adjusted mortality rates by race and gender for ENC41, 1990-2017 with projections to 2030

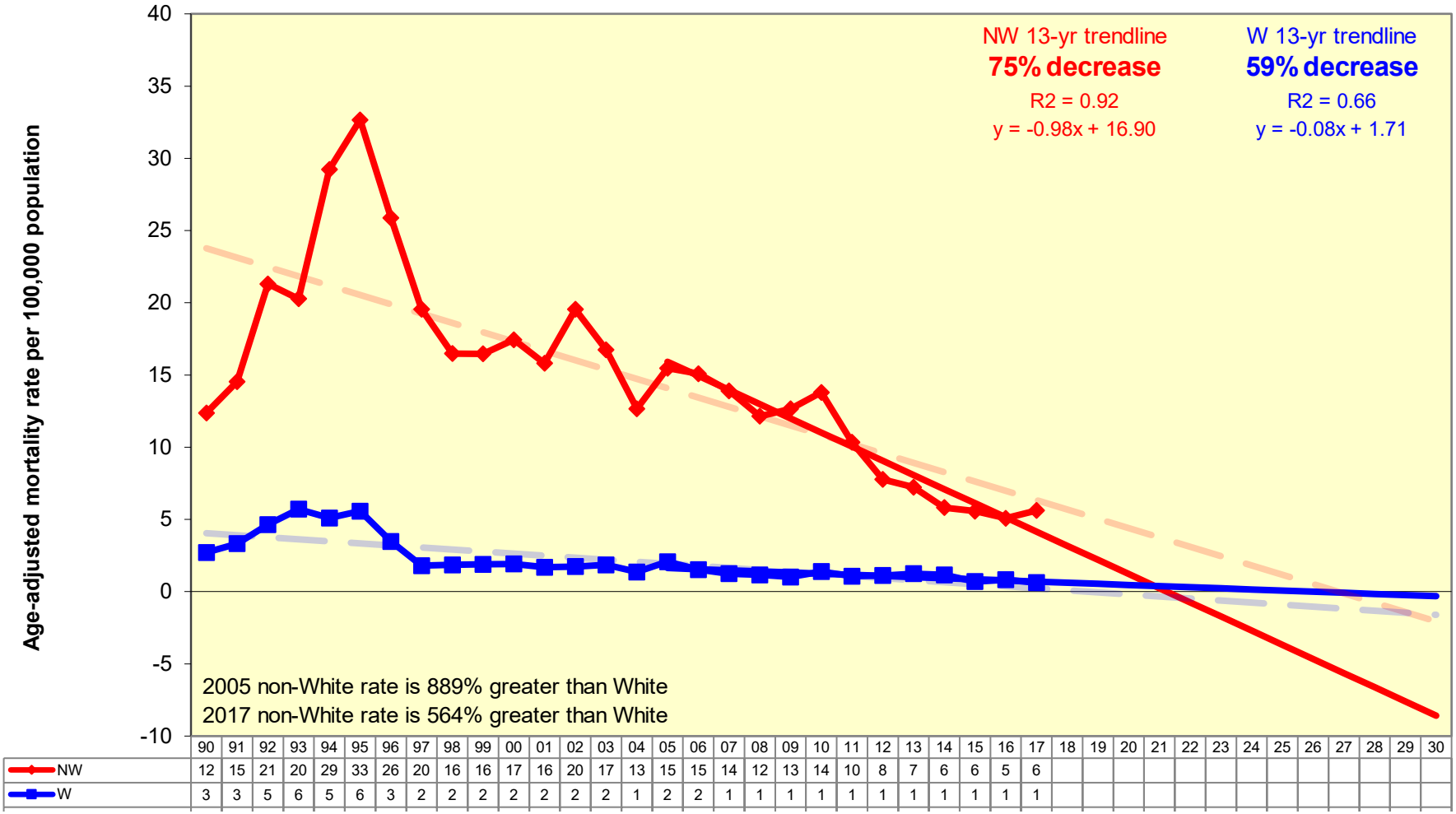


	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
NWM	20	25	34	34	48	57	43	29	25	25	27	23	29	25	18	22	22	20	18	17	16	12	11	11	8	8	8	8													
WM	5	5	8	10	9	10	6	3	3	3	2	3	3	3	2	4	3	2	2	2	2	2	2	2	2	1	1	1													
NWF	6	6	11	9	14	13	12	11	10	10	10	10	12	10	8	10	10	9	7	9	12	9	5	4	4	3	2	3													
WF	0	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	0	1	0	0	1	0	1	1	1	0	0	1													

Comparison of Fitted Rates in 2005				
NWM	WM	NWF	WF	
	88% LT	51% LT	98% LT	NWM
711% GT		297% GT	81% LT	WM
104% GT	75% LT		95% LT	NWF
4071% GT	414% GT	1942% GT		WF

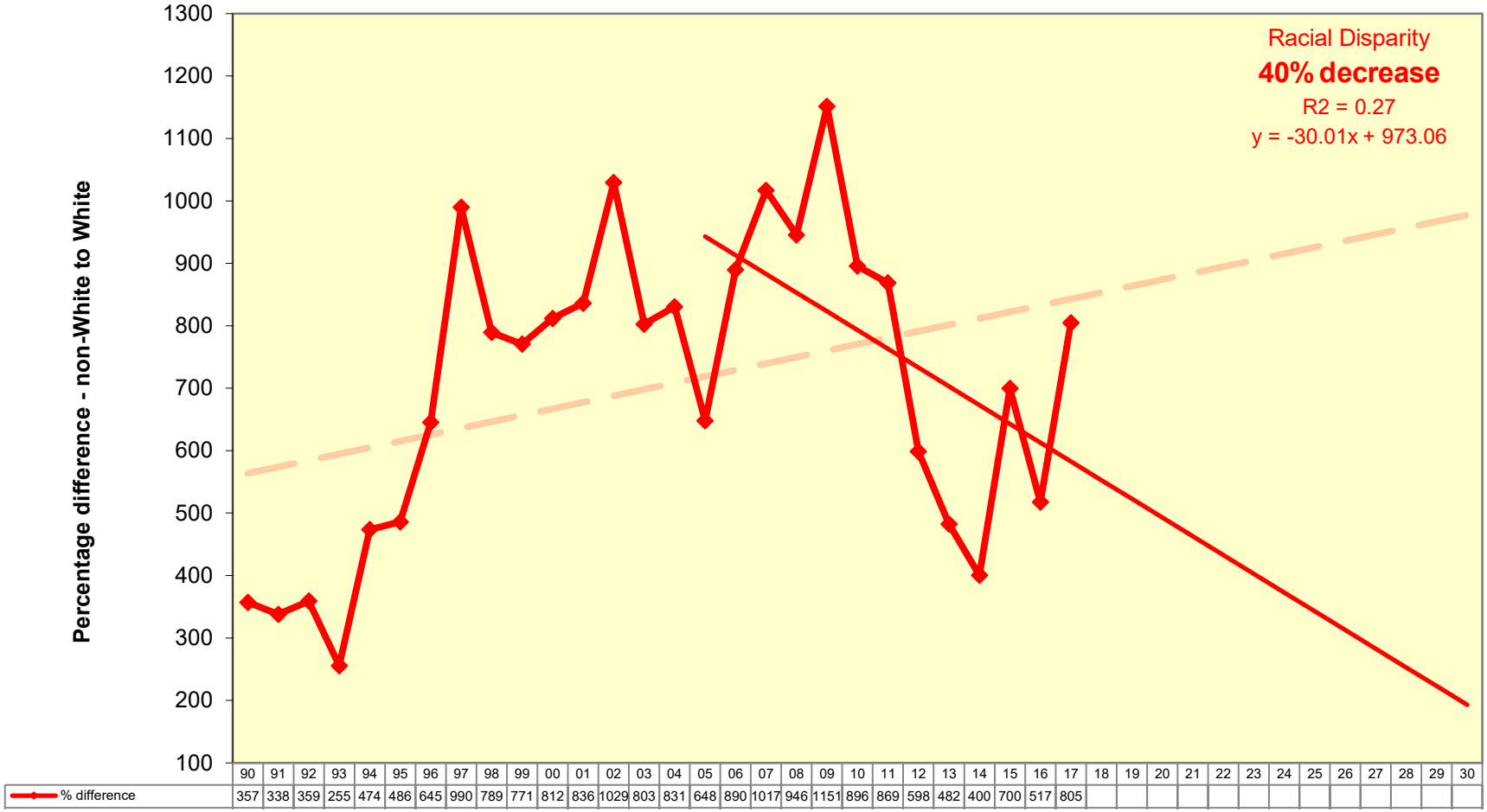
Comparison of Fitted Rates in 2017				
NWM	WM	NWF	WF	
	86% LT	55% LT	93% LT	NWM
590% GT		210% GT	53% LT	WM
123% GT	68% LT		85% LT	NWF
1364% GT	112% GT	557% GT		WF

Figure 7.2 iv. HIV Disease:
Trends in age-adjusted mortality rates by race for ENC41,
1990-2017 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	12	15	21	20	29	33	26	20	16	16	17	16	20	17	13	15	15	14	12	13	14	10	8	7	6	6	5	6													
W	3	3	5	6	5	6	3	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1													

Figure 7.2 v. HIV Disease:
Measuring disparity in age-adjusted mortality rates by race for ENC41,
1990-2017 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