Increased Mortality and Health Risk Behaviors of Midlife White North Carolinians: A Marked Contrast to Nonwhites

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BACKGROUND Death rates for white, middle-aged Americans are increasing after decades of steady decline. In this paper, mortality and health behavior trends are examined for midlife North Carolinians.

METHODS Mortality rates were calculated for midlife whites from 2000 to 2013 for the state as a whole and in counties grouped by level of economic distress. Trend lines were used to estimate future death rates, and comparisons were made to rates for nonwhites. Current and past health risk behaviors were also analyzed.

RESULTS The all-cause mortality rate for midlife whites in North Carolina was higher than the 2000 base in 11 of 13 years; white midlife mortality increased by 5.9%. In contrast, nonwhite mortality decreased by 30.6%. By 2020, midlife mortality for whites is predicted to increase by 9.1%; for nonwhites, there is a predicted decrease of 47.2%. Midlife white mortality increased most in economically distressed counties. Major contributors were suicide and liver disease. Risk factors that increased were drinking, obesity, and lack of health insurance.

LIMITATIONS Mortality and risk factor data could not be analyzed by ethnicity. Deaths due to drug and alcohol poisoning were not included.

CONCLUSIONS The statewide mortality rate for midlife whites in North Carolina is increasing and is in marked contrast to the decreasing rate for nonwhites. The racial disparity in this metric is likely to be eliminated by 2020, perhaps even reversed. Midlife white mortality increased most dramatically in the state’s poorest counties. Policymakers should consider links between economic issues and health behaviors involved in midlife mortality and why they may affect whites and nonwhites differently.
In 35 of North Carolina’s 100 counties, the premature mortality rate for whites increased over that time period. Whites in those counties were dying at a younger age than before, and the causes that stood out were chronic obstructive pulmonary disease (COPD), suicide, injuries, and motor vehicle crashes [9]. Following the Case and Deaton study, we looked more deeply into our North Carolina data to analyze mortality for middle-aged whites and nonwhites, with particular attention to counties that are economically stressed. We also looked at self-reported morbidity and health risk behavior data.

**Methods**

The data for this study were derived from North Carolina death certificates and the Behavioral Risk Factor Surveillance System (BRFSS) annual surveys conducted in North Carolina.

**Mortality Rate Data**

Midlife mortality rates were calculated for the years 2000 to 2013 from death certificate data provided by the North Carolina State Center for Health Statistics. The data files were downloaded from the Dataverse website of the Odum Institute at UNC-Chapel Hill [10]. Causes of death were examined according to diagnosis codes contained in those files. The ICD 10 Codes for diseases reported here are: diseases of the heart I00–I09, I11, I13, I20–I51; lung cancer (malignant neoplasm of trachea, bronchus, and lung) C33–C34; diabetes mellitus E1–E14; chronic liver disease and cirrhosis K70, K73–K74; and intentional self-harm (suicide) X60–X84, Y87.0.

Midlife was defined as a 45–54-year-old age group consistent with the Case and Deaton study. For mortality rate trend projections, population data for 2014–2020 were obtained from the North Carolina Office of State Budget and Management LINC website [11]. While the primary focus was to see if the phenomena of increasing mortality of midlife whites reported by Case and Deaton was evident in North Carolina, we also compared their mortality rates to those of nonwhites. The nonwhite category included black, American Indian, Chinese, Japanese, Filipino, other Asian, and other nonwhites. The grouping was necessary in order to retain sufficient numbers of individuals in the age groups to permit single year analysis. The data were not disaggregated by ethnicity. North Carolina Vital Statistics data classifies individuals by race and then separately by Hispanic origin. We did not separate the data by ethnicity because the number of events within each age group would be very small. White individuals in our data, therefore, may be Hispanic or not.

Mortality rates were calculated for midlife whites and nonwhites for each year of the 14-year period (2000–2013) for the state as a whole, and for counties grouped in 3 economic tiers that characterize their economic well-being. Economic tier designations are those made by the North Carolina Department of Commerce for 2016 using 4 factors: average unemployment rate, median household income, percentage growth in population, and adjusted property tax base per capita. There are 40 Tier 1, 40 Tier 2, and 20 Tier 3 counties. Tier 1 counties are the most economically distressed [12].

The yearly mortality rates were graphed in time series to discern trends across the 14 years with 2000 as the base year. We used linear regression to calculate fitted rates (rates derived from the line that best fits the data) for comparing across time and to project smoothed trend lines to estimate what the death rates are most likely to be in 2020.

**Health Status and Health Risk Behavior Data**

The percentages of midlife white and nonwhite men and women who reported their general health and health risk behaviors were obtained through the BRFSS, a large scale state-based random telephone survey on adult health supported by the Centers for Disease Control and Prevention [13]. The BRFSS collects data every year on self-reported health and health-related behaviors along with demographic data. In this study, we combined the most recently available 4 years of data, 2011–2014, to obtain sufficient sample sizes for subgroups for analysis. We compared this recent midlife cohort to one represented by 4 years of data from 2001-2004.

There were 2 major changes in sampling methods after 2011. The first was the inclusion of people who use cell phones only as well as users of landline telephones; the second improved weighting methods to represent population characteristics more accurately [14]. While changes in sampling and statistical methods for assigning weights after 2011 prohibit exact comparisons of statistics between the years before and after 2011 [15], the data are sufficiently precise to describe general trends.

Analyses were performed for men and women aged 45–54 years who responded to BRFSS interviews (N = 7292, years 2001–2004; N = 6753, years 2011–2014). Analyses were performed using SAS 9.3 (SAS Institute, Inc.) and SUDAAN 11.0.1 (RTI International) statistical software, which utilize the complex sampling design methods employed in BRFSS to adjust sampling biases such as age, gender, and race/ethnicity.

**Behavioral and health variables.** Behavioral variables reported here are: obesity (calculated BMI); heavy drinking (defined as adult men having more than 2 drinks per day and adult women having more than 1 drink per day); binge drinking (adult men having 5 or more drinks on 1 occasion and adult women having 4 or more drinks on 1 occasion); current smokers (adults who smoke every day or some days); no regular exercise (Yes or No: “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”); and activity limitation due to health (Yes to the question, “Are you limited in any way in activities because of physical, mental, or emotional
problems?”). The poor health variable included adults who reported either “fair” or “poor” to the question, “Would you say that in general your health is: excellent, very good, good, fair, or poor?”

Demographic variables. Demographic variables included: highest education attained (adults who graduated high school or obtained a GED, or less than high school); no health insurance coverage; and income level (adults living in a household with less than $25,000 annual income). White race was ascribed by how respondents answered the question, “Which one or more of the following would you say is your race: white, black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaskan Native, other race, no preferred race?” Race classification of white or nonwhite in the BRFSS data was therefore consistent with the mortality data from death certificates.

Results

All-Cause Mortality Trends Statewide

The death rate for the midlife white population in North Carolina increased from 2000–2013. The all-cause mortality rate for 11 of the 13 subsequent years was higher than the 2000 base (see Figure 1). The most recent rate in 2013 (419.6 deaths per 100,000) was 4.4% higher than the base year (see Table 1). Using a fitted rate for 2013, the percentage increase in all-cause mortality for midlife whites for that year when compared to baseline was 5.9%. In contrast, the all-cause mortality rate for midlife nonwhites in 2013 (524.0 deaths per 100,000) decreased by 30.6% from 2000 to 2013 (unfitted decrease 30.3%).

Figure 1 portrays the gradients in all-cause mortality for midlife white and nonwhite North Carolinians. The statewide rate for midlife nonwhites went down each year from 2000–2013 by an average of 18.1 deaths per 100,000. For whites, the rate went up an average of 1.8 deaths per 100,000 each year from 2000–2013. Projecting the rates by linear regression, the all-cause mortality rate for midlife whites is predicted to be 9.1% higher in 2020 than in 2000. For nonwhites, midlife mortality in 2020 is predicted to be 47.2% lower than it was in 2000, a reduction of almost half in 2 decades. Projections suggest the all-cause mortality rate for midlife whites will surpass nonwhites before 2020, reversing a long-standing trend.

Specific Causes of Mortality Statewide

Considering specific causes of death for midlife whites in the state as a whole (see Table 1), the fitted rates for heart disease, diabetes, and lung cancer in 2013 were lower than in 2000, but rates for suicide and liver disease were higher. The fitted rate for suicide increased by 52.0% from 2000 to 2013. There were 623 additional suicide deaths over this time period than if the 2000 rate had held constant. The increase in suicide deaths of midlife whites is projected to be 80.0% in 2020. Similarly for liver disease, the fitted mortality rate of midlife whites increased by 38.8% from 2000–2013 and is estimated to be 59.7% higher in 2020. There were 431 more deaths from liver disease during the period than would have been predicted by the rate in 2000.

While diabetes, lung cancer, and heart disease mortality rates decreased for both whites and nonwhites from 2000–2013, they did so by different percentages. Using the fitted rate for diabetes, there was a 9.4% decrease in mortality for midlife whites in 2013 and a 14.5% decrease predicted for 2020. The improvement in diabetes mortality for nonwhites during this same period was 27.5% in 2013 and is predicted to be 42.4% in 2020. For heart disease, there was a reduction of 12.4% for whites vs 31.5% for nonwhites. The reductions were similar for lung cancer mortality, 13.4% for whites vs 36.4% for nonwhites.
All-Cause Mortality Trends by Economic Tier

When the all-cause mortality rates for midlife North Carolinians are examined across the economic tiers of counties, there are clear differences associated with economic well-being (see Figure 2). While the all-cause mortality rate for nonwhites is substantially decreasing across all 3 tiers, the rate for whites is going up in Tiers 1 and 2 and is essentially static in the Tier 3 (most wealthy) counties.

Midlife mortality for whites increased most dramatically in the most distressed Tier 1 counties. The 2013 fitted mortality rate for midlife whites was 16.9% higher than the 2000 fitted rate; by 2020, it is predicted to be 26.0% higher. However, the opposite is seen in mortality rates for nonwhites in Tier 1 counties; the 2013 mortality rate for nonwhites in Tier 1 counties decreased by 17.3%, and by 2020 the decrease is predicted to be 26.7%.

In Tier 2 counties, the all-cause mortality rate increased by 13.0% for whites while it decreased by 26.9% for nonwhites compared to baseline. The predicted all-cause mortality rates in 2020 are an 18.4% increase for whites and a 41.5% decrease for nonwhites.

In Tier 3 counties, the decrease in the all-cause mortality rate for whites by 2013 was 0.7% and is predicted to be 1% by 2020. Midlife mortality of nonwhites in Tier 3 counties decreased by 37.3% in 2013 compared to baseline and is predicted to reach 57.3% by 2020.

Specific causes of mortality in Tier 1 counties. Table 2 and Figure 3 provide a deeper examination of trends for specific causes of death within Tier 1 counties. Mortality for midlife whites increased in Tier 1 counties for all of the selected causes of death. In contrast, for nonwhites all mortality rates except for suicide decreased. Considering the rate in 2000 as a benchmark for the Tier 1 counties, there were 830 more deaths from all causes for midlife whites in the succeeding 13 years than would have occurred if the 2000 rate held constant. For midlife nonwhites, there were 1,221 fewer deaths than there would have been had the 2000 rate held constant.

Figure 3 compares mortality trends for whites and nonwhites in Tier 1 counties for heart disease, lung cancer, suicide, and liver disease. The heart disease mortality rate of whites in Tier 1 counties increased by 4.4% from 2000–2013 and the increase is predicted to be 6.8% in 2020. For nonwhites, there was a 29.6% decrease from 2000–2013. Although the base rate for nonwhites in 2000 was almost twice the rate for whites, the nonwhite mortality rate for heart disease is predicted to be equal to or less than that of whites in 2020. A similar trend is apparent for lung cancer, for which the mortality rate in Tier 1 counties is increasing among whites and decreasing for nonwhites. The white rate in 2020 is predicted to be 17.8% greater than in 2000, equivalent to the nonwhite rate predicted for 2020.

Suicide mortality rates are increasing for both whites and nonwhites, but from very different base rates. The suicide mortality rate in 2013 for whites is a 33.8% increase over 2000, and by 2020 it is projected to be over 50% higher. The white/nonwhite differences in the liver disease mortality trends are remarkable, given that the base rates...
for the 2 groups are the same. For whites, the fitted rate in 2013 was a 51.2% increase, and the rate projected for 2020 is an increase of 78.8%. For nonwhites, the trend indicates a decrease of 14% by 2020.

Health Status and Health Risk Behaviors

Considering the underlying factors contributing to these causes of death (ie, health behaviors reported in the North Carolina BRFSS), there are some important clues to explaining the mortality rates revealed in this analysis across time, economic tiers of the counties, and race.

Risk factors of midlife whites across time. Relationships between poor health and health risk behaviors are suggested by comparing the recent BRFSS cohort of midlife whites (2011–2014) to the cohort from a decade earlier (2001–2004), shown in Table 3. Despite increasing mortality rates, the percentage of whites reporting to be in poor health did not change. There are, however, some statistically significant changes in risk factors and behaviors. A higher percentage of midlife whites in North Carolina are estimated to be obese in the most recent cohort vs the earlier, 31.1% vs 26.5%. A higher percentage of midlife whites currently report heavier drinking than a decade ago, 6.2% vs 3.5%, as well as binge drinking, 13.4% vs 8.0%. More activity limitation due to poor health is also reported by those in the current cohort of midlife whites than the past, 24.0% vs 20.5%.

Changes in economic factors are also observed. While the increase in midlife whites with low incomes (18.8% to 21.7%) seen in Table 3 is not statistically significant, the percentage of midlife whites who report having no health care coverage is statistically significant, increasing from 11.4% to 16.5%.

Risk factors of midlife whites across economic tiers. There are differences in the percentage of midlife whites with low incomes between Tiers 1, 2, and 3. This is expected, because income is a component of the definition of tiers (see Table 4). There is also a substantial difference between Tiers 1 and 3 in the percentage of North Carolinians without health insurance—21.2% in Tier 1 counties (poorest) compared to 14.0% in Tier 3 (wealthiest) counties.

There are also differences between Tier 1 and 3 in behavioral risk factors. A higher percentage of midlife whites in Tier 1 are current smokers, 35.1% in Tier 1 vs 18.8% in Tier 3. A higher percentage in Tier 1 report no regular exercise, 31.0% vs 18.9%, and a higher percentage report themselves to be in poor health, 25.1% vs 16.3%. Additionally, a higher percentage report activity limitation due to poor health, 29.7% vs 20.7%. There is no difference in heavy drinking between Tier 1 and 3. Binge drinking, however, is actually less reported in poor counties than in wealthy counties, 7.8% vs 15.7%.

Risk factors of midlife whites compared to nonwhites. For the current 2011–2014 cohorts of whites and nonwhites (see Table 3), there was no statistically significant difference in regard to heavy drinking, binge drinking, or smoking. A higher percentage of nonwhites than whites reported having no regular exercise, 34.1% vs 25.3%, and a higher percentage reported themselves to be in fair-to-poor health, 26.7% vs 18.9%. Significantly, a much higher percentage of nonwhites than whites reported having no health insurance coverage, 28.1% vs 16.5%. A higher percentage of whites became uninsured however, a 45% increase for whites vs 17% for nonwhites. More nonwhites than whites reported less than a high school education, 52.2% vs 38.4%, and more nonwhites reported their income to be less than $25,000, 47.0% vs 21.7%. There were no significant differences among nonwhites between the 2 time periods in any of the BRFSS variables.

Discussion

Consistent with Case and Deaton’s recent findings for the US population, we find that the mortality rate for midlife whites in North Carolina has increased over the 13 years examined here by almost 6%. This is a new trend for midlife whites in North Carolina, with midlife whites accounting for
| Cause of death | Base rate 2000 | Rate in 2013 | Percent change from 2000 to 2013 | Fitted rate for 2013 | Percent change from 2000 to 2013 using fitted rate | Predicted rate for 2020 | Percent change from 2000 to predicted rate in 2020 |
|---------------|---------------|--------------|---------------------------------|---------------------|------------------------------------------------|------------------------|-----------------------------------------------|
| **All causes**|               |              |                                 |                     |                                                |                        |                                               |
| White         | 485.7         | 586.9        | 20.8%                           | 568.5               | 16.9%                                         | 612.8                  | 26.0%                                         |
| Nonwhite      | 869.0         | 661.6        | -23.9%                          | 682.3               | -17.3%                                        | 605.3                  | -26.7%                                        |
| **Heart disease** |           |              |                                 |                     |                                                |                        |                                               |
| White         | 108.6         | 126.3        | 16.3%                           | 115.5               | 4.4%                                          | 118.2                  | 6.8%                                          |
| Nonwhite      | 214.8         | 140.3        | -34.7%                          | 148.1               | -29.6%                                        | 114.6                  | -45.5%                                        |
| **Lung cancer** |           |              |                                 |                     |                                                |                        |                                               |
| White         | 35.6          | 45.3         | 27.2%                           | 46.0                | 11.6%                                         | 48.6                   | 17.8%                                         |
| Nonwhite      | 54.1          | 58.7         | 8.5%                            | 50.3                | -1.7%                                         | 49.8                   | -2.6%                                         |
| **Diabetes** |               |              |                                 |                     |                                                |                        |                                               |
| White         | 17.4          | 24.3         | 39.5%                           | 18.4                | 3.9%                                          | 18.0                   | 6.0%                                          |
| Nonwhite      | 55.7          | 28.6         | -48.6%                          | 32.7                | -9.7%                                         | 30.8                   | -14.9%                                        |
| **Suicide**  |               |              |                                 |                     |                                                |                        |                                               |
| White         | 25.7          | 33.2         | 29.2%                           | 29.5                | 33.8%                                         | 33.6                   | 51.9%                                         |
| Nonwhite      | 13.1          | 7.2          | -45.4%                          | 6.4                 | 78.0%                                         | 8.0                    | 119.9%                                        |
| **Liver disease** |           |              |                                 |                     |                                                |                        |                                               |
| White         | 25.7          | 31.6         | 22.9%                           | 27.1                | 51.1%                                         | 32.7                   | 78.8%                                         |
| Nonwhite      | 24.6          | 22.9         | -6.8%                           | 22.7                | -9.1%                                         | 21.5                   | -14.0%                                        |

*Deaths per 100,000 population.

Note. Tier 1 Counties are the 40 classified as most economically distressed by the North Carolina Department of Commerce for 2016 using 4 factors: average unemployment rate, median household income, percentage growth in population, and adjusted property tax base per capita.

*Deaths per 100,000.
almost a million people, or 10% of the state’s population. It is a substantial change, not previously reported, and a sharp divergence from the 30% improvement seen for nonwhites over the same time. Consistent also with Case and Deaton, we find that suicide and liver disease are substantial contributors to the increasing mortality rates for midlife whites, rates which increased on the order of 50% and 40% respectively. A limitation of our analysis, however, is that unlike Case and Deaton, deaths due to drug and alcohol poisoning are not included. Opioid overdose and alcohol poisoning could be responsible for many deaths in the all-cause mortality rates and significantly different for whites and nonwhites.

Our study expands on the Case and Deaton findings by considering trends within economically-stratified geographies. The increased mortality rates for midlife whites is most dramatic in the poorest (Tier 1) counties, where all-cause mortality increased by 17%. The findings in the poor counties are also consistent with our previous reported finding that premature mortality for whites increased in one-third of North Carolina counties [9]; 16 of those counties are classified as Tier 1. The specific causes examined in this paper most responsible for increased midlife white deaths in poor counties are, in ascending order: diabetes (up 3.9%), heart disease (up 4.4%), lung cancer (up 11.6%), suicide (up 33.8%), and liver disease (up 51.0%). If present trends continue, by 2020 midlife white mortality rates for suicide and liver disease could increase by over 50%, and for lung cancer by over 15%.

The contrast of mortality trends for whites to nonwhites in our study also expands on the Case and Deaton study. They reported that the mortality ratio of black non-Hispanics to white non-Hispanics decreased from 2.1 to 1.4 over 15 years. The time period and racial categories we examined for North Carolina are not identical, but we observe a similar trend. The nonwhite/white midlife mortality ratio decreased from 1.9 to 1.3 over 13 years. If present trends continue in North Carolina, the nonwhite/white mortality ratio would be -0.1 in 2020, an elimination or reversal of the racial disparity for mortality in this age group.

For years, health care experts and policymakers have observed racial disparities and focused on efforts to eliminate them. At the national level, Healthy People 2000 [16] set a goal of reducing racial disparities in health and Healthy People 2010 [17] set a goal of eliminating them. Most recently, Healthy People 2020 [18] includes data to highlight continuing disparities and encourage further work. North Carolina embraced these goals in its Healthy Carolinians 2010 plan [19], and the objectives in Healthy North Carolina 2020 [20] continue the focus by highlighting racial and ethnic disparities in chronic disease, longevity, health status, health insurance, and obesity. In 2000, when Healthy Carolinians 2010 was adopted, elimination of racial disparities was a daunting challenge [19]; now it is possible to imagine for some diseases and population subgroups. But the closing gap in midlife mortality is a combination of increased mortality for whites and improved outcomes for nonwhites.

The nonwhite to white mortality disparity for North Carolinians in midlife is likely to be eliminated by 2020. Over the 13-year period, there were 1,973 more deaths for midlife whites than there would have been if their 2000 rate had held constant. Also considering the 2000 rate as a baseline for nonwhites, there were 5,545 deaths averted in the age group (ie, deaths delayed until a later age).

This study suggests some changes in behavioral risk factors that may explain the increasing midlife mortality for whites but not for nonwhites. There are limitations related to findings about health and risk behaviors from the BRFSS survey data, particularly subjectivity of response and that associations do not establish cause. However, despite these data limitations, we found results similar to Case and Deaton. There have been increases in heavy drinking and binge drinking among midlife whites, more activity limitation due...
to poor health, and increased rates of obesity. We did not find an increase among midlife whites reporting to be in poor health but did find a significant difference between whites and nonwhites; there was greater self-reported poor health for nonwhites. Nonwhites in midlife report a greater degree of negative risk factors and health behaviors than whites—more obesity, more with low income, less health insurance, and less exercise. Considering the differences in mortality trends between whites and nonwhites, the contrasts in their behaviors and risks are paradoxical and beg for more examination. It is particularly vexing to consider the improvements in nonwhite mortality rates in contrast to whites when nonwhites report a greater likelihood of being poor and a greater degree of negative risk factors and behaviors. We can only speculate from the clues found in our analysis of secondary data and suggest some potential explanations to investigate in more rigorous studies using both primary and secondary data.

Considering the underlying factors contributing to causes of death, the differential rates in the economic tiers are dramatic and strongly suggest economics as at least one explanation for the retrograde trends for whites but does not explain the improvement for nonwhites. Both whites and nonwhites in the poorest counties are likely to be struggling economically more than they were a decade and a half ago. The recession of 2008 resulted in job loss and reduced income in many of the poor, mostly rural North Carolina counties, which are often the hardest hit and last to recover. Our data show that midlife whites, as a group, have lost income in nonwhite mortality rates in contrast to whites when nonwhites report a greater likelihood of being poor and a greater degree of negative risk factors and behaviors. We can only speculate from the clues found in our analysis of secondary data and suggest some potential explanations to investigate in more rigorous studies using both primary and secondary data.

Our data show that midlife whites, as a group, have lost income in many of the poor, mostly rural North Carolina counties, which are often the hardest hit and last to recover. The recession of 2008 resulted in job loss and reduced income in many of the poor, mostly rural North Carolina counties, which are often the hardest hit and last to recover. Our data show that midlife whites, as a group, have lost income and health insurance across the decade, but so have nonwhites. Is there a differential effect? If so, why?

Midlife used to be the time of greatest earning potential, when people might start to get ahead financially, and savings could be set aside or invested in retirement plans. Our study doesn’t reveal all of the economic issues that might be involved or clearly link financial insecurity to mortality but suggests some relationships to health risk behaviors that may underly mortality. To what extent might the diseases responsible for the increasing mortality of midlife whites be diseases of despair for them? The BRFSS data show that there was an increase in heavy drinking and binge drinking among midlife whites but not significantly so for nonwhites. If we had data on opioid addiction and overdose mortality for this age group, what would it show? Many midlife whites today may not enjoy the financial security and retirement of their parents and, unfortunately, some may not have as many healthy years. Is it reasonable to speculate that how one takes care of one’s health depends on how one visualizes and values the future? That one can aspire to a secure retirement with more good health and hope to enjoy the golden years? Does good health depend on hope? Does hope vary across race, culture, time, and economic circumstance?

The BRFSS data point to links not only between poor health and low income but lack of health insurance as well. It clearly raises policy questions. Could consistent health insurance coverage have kept the midlife mortality trend for whites on a downward gradient? Could Medicaid expansion make a difference in the future? Will our nation or state provide affordable access to health care for all? How much of a negative impact will there be on Medicare solveny when those now in midlife reach enrollment age if their health continues to decline? Or will there be a savings in Medicare costs if they die before they are eligible?

Conclusion

This study begs important questions. How can the difference in trends between whites and nonwhites be under-

| TABLE 4. Behavioral Risk Factors Reported by Midlife (45–54) Whites in North Carolina by Economic Tier County Groupings 2011-2014** |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tier 1** poorest               | Tier 2**        | Tier 3** wealthiest                                    | Tier 1 compared to 2 | Tier 1 compared to 3 |
| N     | %    | N     | %    | N     | %    | P<0.05* | P<0.05* |
| Heavy drinking                  |                 |                 |                 |                 |                 |
| 20    | 3.7  | 81    | 5.8  | 168   | 7.3  |         |         |
| Binge drinking                  |                 |                 |                 |                 |                 |
| 39    | 7.8  | 173   | 11.8 | 304   | 15.7 |         |         |
| Current smoker                  |                 |                 |                 |                 |                 |
| 152   | 35.1 | 481   | 31.8 | 410   | 18.8 |         |         |
| No regular exercise             |                 |                 |                 |                 |                 |
| 143   | 31.0 | 474   | 30.7 | 405   | 18.9 |         |         |
| Activity limitation due to poor health |            |                 |                 |                 |                 |
| 153   | 29.7 | 463   | 26.9 | 488   | 20.7 |         |         |
| High school education or Less   |                 |                 |                 |                 |                 |
| 220   | 49.6 | 680   | 47.0 | 572   | 29.4 |         |         |
| Income < $25K                   |                 |                 |                 |                 |                 |
| 145   | 34.5 | 384   | 25.4 | 344   | 16.1 | *       |         |
| Having no health care coverage  |                 |                 |                 |                 |                 |
| 109   | 21.2 | 285   | 18.0 | 299   | 14.0 | *       |         |
| Obesity (BMI ≥ 30)              |                 |                 |                 |                 |                 |
| 165   | 38.2 | 518   | 35.1 | 543   | 26.7 | *       |         |
| Reporting health to be fair-to-poor |             |                 |                 |                 |                 |
| 139   | 25.1 | 341   | 19.6 | 338   | 16.3 | *       |         |

*Includes Hispanic-white.
**3,192 of 39,493 (8%) missing county code information were excluded from analyses. Among them, 196 (0.5%) were missing because they don’t know, are not sure, or refused to answer. County information is not available because 2,996 (7.6%) were missing the information to protect privacy of those who live in small counties (adult population < 10,000) or reside in a county which has fewer than 50 respondents.

Note. All percentages are weighted percentages to represent the demographic characteristics of the population.
stood? We provide some clues to understanding the trend of increasing mortality for whites, but how do we explain the improvement for nonwhites? How should future studies be designed? Should we continue to benchmark improvement for nonwhites against whites? Should not our goal be continuing improvement in life expectancy for all? NCMJ

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