A FURTHER STUDY OF LIFE EXPECTANCY BY SOCIOECONOMIC FACTORS
IN THE NATIONAL LONGITUDINAL MORTALITY STUDY

Charles C. Lin, PhD; Eugene Rogot, MA; Norman J. Johnson, PhD; Paul D. Sorlie, PhD; Elizabeth Arias, PhD

Objectives: The objective of this article is to provide estimates of life expectancy for White, Black, and Hispanic populations by socioeconomic factors. Effects of educational, income, employment, and marital status on life expectancy are presented and interpreted.

Design: The National Longitudinal Mortality Study, consisting of a number of Current Population Surveys (CPS) linked to mortality information obtained from the National Death Index, provides data to construct life tables for various socioeconomic and demographic groups. Probabilities of death are estimated using a person-year approach to accommodate the aging of the population over 11 years of follow up.

Results: Across various ethnicity-race-sex groups, longer life expectancy was observed for individuals with higher levels of education and income, and for those who were married and employed. The differences in life expectancy between levels of the socioeconomic characteristics tended to be larger for men than for women. Also, differences were found to be larger for the non-Hispanic Black population compared to the non-Hispanic White population. Hispanic White men exhibited patterns similar to those of non-Hispanic White and Black men.

Conclusions: For selected ethnicity-race-sex groups, the impact of socioeconomic variables on life expectancy is dramatic. The shorter life expectancy observed among the poor, the less educated, the unmarried, and those not in the labor force, highlights the impact of socioeconomic disadvantage on survival. Further, the substantial 14-year differential favoring the employed over those not in the labor force may be partially explained by unemployment due to poor health. Another reason may be that employed individuals have greater access to health care than those not in the labor force. (Ethn Dis. 2003;13:240-247)

Key Words: Life Expectancy, Socioeconomic Factor, Mortality, Longitudinal Study

INTRODUCTION

Estimates of life expectancy for various levels of education were reported by Kitagawa and Hauser1 for White men and White women in the United States in 1960. These estimates were based on abridged life tables these researchers constructed from their now classic cross-sectional study of mortality in the United States. A comparison of the findings from the National Longitudinal Mortality Study (NLMS) to those of the Kitagawa-Hauser study was reported by Rogot, Sorlie, and Johnson.2 In that paper, the Kitagawa-Hauser estimates of life expectancy by education were compared to the corresponding estimates generated from the NLMS. In addition, life expectancies for various levels of income and employment status for White men and White women were estimated from the NLMS. Estimates of life expectancy by income for the White and Black populations, published in the Health, United States, 19983 report, were provided by the NLMS.

In this report, our main objectives are to extend the results of Rogot, Sorlie, and Johnson4 with an additional 4 years of follow up, to estimate life expectancies for White, Black, and Hispanic populations according to education, family income, employment status, and marital status, and to assess differences in life expectancy for these race-ethnicity groups, and between various socioeconomic strata.

METHODS

The study sample consists of 569,384 persons who were aged 25 years and over at the start of follow up (Table 1), pulled from a total of 822,347 persons of all ages who were part of the NLMS, a prospective study of mortality in the United States.4 NLMS data consists of selected samples drawn from the Current Population Surveys (CPS) of March 1979, March 1981, March 1982, March 1983, March 1984, March 1985, and April, August, and December of 1980. These 9 samples were designated as cohorts for mortality follow up. Mortality status was ascertained by matching NLMS records to the National Death Index (NDI)5 for the 11-year period from January 1, 1979 through December 31, 1989.

The CPS is a household and telephone interview survey, conducted by the US Census Bureau, consisting of probability cluster samples of households chosen from the civilian non-institutionalized population of the United States.6 This survey has a response rate of approximately 96%. The primary purpose of the CPS is to provide estimates of monthly labor force participation. The CPS also provides data on various socioeconomic and demographic...
Table 1. Study population age 25+ by sex, race, and Hispanic status, NLMS, 1979–89 follow-up

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>D</td>
</tr>
<tr>
<td>White*</td>
<td>237,748</td>
<td>27,397</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15,325</td>
<td>927</td>
</tr>
<tr>
<td>Not Hispanic</td>
<td>213,870</td>
<td>25,846</td>
</tr>
<tr>
<td>Black*</td>
<td>21,271</td>
<td>2,960</td>
</tr>
<tr>
<td>Hispanic</td>
<td>272</td>
<td>16</td>
</tr>
<tr>
<td>Not Hispanic</td>
<td>20,475</td>
<td>2,933</td>
</tr>
<tr>
<td>All races†</td>
<td>266,546</td>
<td>30,908</td>
</tr>
<tr>
<td>Hispanic†</td>
<td>15,769</td>
<td>955</td>
</tr>
<tr>
<td>Not Hispanic†</td>
<td>241,496</td>
<td>29,315</td>
</tr>
</tbody>
</table>

Note: N=numbers of persons at start of follow-up; D=deaths in 1979–89 period.
† Includes other races and unknown races.

The practice of using the age of 95 as the highest age to estimate life expectancy values of ages less than 95 years was derived from the estimate of life expectancy of a comparable subgroup. For example, the closing life expectancy value for Hispanic White men in the labor force was obtained from the estimate of life expectancy for non-Hispanic White men in the labor force. Standard errors of \( e_x \) were computed following Chiang. Two-sided tests of significance were conducted at the 1% level to safeguard significant results for multiple comparisons.

Variables studied include employment status, educational level, income level, and marital status. Employment status is derived from the detailed employment history obtained by the CPS. For analyses in this paper, the categories of “employed,” “not employed,” and “not in the labor force” are used. The category of “not employed” is for unemployed persons who were seeking work. The category of “not in the labor force” includes persons engaged in their own housework, those who are going to school, those unable to work, and “other,” a category that includes retired persons or persons not working for any other reason. Education level is defined as the highest grade completed, and is presented in 3 categories: less than high school, high school, and greater than high school. Family income is defined as the combined income of all members of the family, adjusted to 1980 income levels using the Consumer Price Index, and given in 3 categories: income below $10,000, $10,000–$24,999, and $25,000 and over. There are insufficient data to provide finer categories of income. Marital status is presented as 3 categories: “married,” “previously married,” and “never married.” The “previously married” category includes separated, widowed, and divorced. Although marital status is not strictly a socioeconomic status variable, it is an important social factor, and is consistently shown to have an effect on mortality, whereby married individuals have lower mortality rates than do unmarried individuals. Marriage may have a direct effect on mortality by conferring psychological and/or social support that mitigates illness. An additional hypothesis is that persons who marry may be healthier to begin with than those who do not marry. In other words, marital status could be a function of health status.

There were too few individuals in the Hispanic Black category to be included in this study (see Table 1). Estimated life expectancies for subgroups with insufficient data (fewer than 100 deaths) were not computed.

RESULTS

The NLMS study group compared the average life expectancy for all ages with those for US White males, US Black males, US White females, and US Black females. Overall estimates of expectations are given in Table 2 for ages 25, 45, and 65.

As shown in Table 2, life expectancy estimates from the NLMS were consistently greater than those given in the US life tables, by about 1 to 2 years for Whites, and 1 to 4 years for Blacks. The principal reason for this difference between the data sources is that the CPS
Table 2. Comparison of estimated life expectancies in years at age 25, 45, and 65 for White men, White women, Black men, and Black women: NLMS, 1979–89 vs US, 1985*

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>NLMS, 1979–89</th>
<th>US, 1985*</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>White men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>50.2</td>
<td>48.6</td>
<td>1.6</td>
</tr>
<tr>
<td>45</td>
<td>31.5</td>
<td>30.3</td>
<td>1.2</td>
</tr>
<tr>
<td>65</td>
<td>15.5</td>
<td>14.8</td>
<td>.7</td>
</tr>
<tr>
<td>White women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>56.8</td>
<td>55.1</td>
<td>1.7</td>
</tr>
<tr>
<td>45</td>
<td>37.5</td>
<td>35.9</td>
<td>1.6</td>
</tr>
<tr>
<td>65</td>
<td>20.2</td>
<td>18.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Black men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>45.8</td>
<td>42.2</td>
<td>3.6</td>
</tr>
<tr>
<td>45</td>
<td>28.3</td>
<td>25.9</td>
<td>2.4</td>
</tr>
<tr>
<td>65</td>
<td>14.7</td>
<td>13.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Black women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>52.8</td>
<td>50.4</td>
<td>2.4</td>
</tr>
<tr>
<td>45</td>
<td>34.2</td>
<td>32.3</td>
<td>1.9</td>
</tr>
<tr>
<td>65</td>
<td>19.0</td>
<td>17.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

* Average of 1979–81 and 1989–91 values (see references 10 and 11).

The NLMS data found women to have a substantially greater life expectancy compared at various ages to men. These differences are similar to those found for the United States. For example, at age 25, the difference for White individuals was 6.6 years in the NLMS, compared with 6.5 years in the United States; the difference for Black individuals was 7.0 years in the NLMS, compared with 8.2 years in the United States.

Figure 1 presents life expectancy estimates obtained from NLMS data for White, Black, and Hispanic groups by sex at ages 25, 45, and 65 years. Figure 1 compares estimates for Hispanic groups to those for the White and Black groups presented in Table 2. In Figure 1, White Hispanic individuals were also included in the “White” category, so that the “White” and “Hispanic” categories are not mutually exclusive. Similarly, the “Black” and “Hispanic” categories are not mutually exclusive. For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy. For example, at age 25, Hispanic men lived an average of 2.9 years longer than White males, and White males lived an average of 4.4 years longer than Black males. Therefore, at age 25, Hispanic males lived an average of 7.3 years longer than Black males. Similarly, at
For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.

For each age-sex group, the Hispanic group had the longest life expectancy, followed by the White group, with the Black group having the shortest life expectancy.
The negative differences observed for Hispanic White women at the different age levels were not statistically significant; -1.0 year at age 25, -1.3 years at age 45, and -1.5 years at age 65. In addition, among individuals aged 25 with incomes less than $25,000, Hispanic White men lived an average of 4 to 5 years longer than non-Hispanic White men. At age 25, among those with incomes of $25,000 and over, non-Hispanic White men lived an average of only 2.7 years longer than non-Hispanic Black men.

Table 5 presents estimates of life expectancy by employment status. Individuals in the labor force had a substantially longer life expectancy than those not in the labor force. Especially large differences were observed for men. For example, 25-year-old, employed non-Hispanic White men could expect to live 53.0 more years, on average, compared with those not in the labor force.

Table 5. Estimated life expectancies in years for selected groups at ages 25, 45, and 65 by employment status: NLMS, age 25+, 1979–89 follow-up (estimated standard errors are shown in parentheses)

<table>
<thead>
<tr>
<th>Hispanic Status</th>
<th>Race</th>
<th>Sex</th>
<th>e_{25}</th>
<th>e_{45}</th>
<th>e_{65}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic</td>
<td>White</td>
<td>Male</td>
<td>53.0 (.16)</td>
<td>59.3 (.74)</td>
<td>41.6 (.37)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>White</td>
<td>Female</td>
<td>59.5 (.32)</td>
<td>59.8 (.140)</td>
<td>55.6 (.11)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>Black</td>
<td>Male</td>
<td>50.5 (.64)</td>
<td>42.9 (.131)</td>
<td>36.5 (.79)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>Black</td>
<td>Female</td>
<td>57.6 (.70)</td>
<td>*</td>
<td>48.7 (5.2)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>White</td>
<td>Male</td>
<td>57.3 (.83)</td>
<td>*</td>
<td>43.3 (2.10)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>White</td>
<td>Female</td>
<td>*</td>
<td>*</td>
<td>58.4 (.45)</td>
</tr>
</tbody>
</table>

* Insufficient data.
pared to an average of only 41.6 more years of life expected for those not in the labor force—a difference of more than 11 years. Differences of 3.9 years for non-Hispanic White women, 14.0 years for non-Hispanic Black men, 8.9 years for non-Hispanic Black women, and 14.0 years for Hispanic White men, were observed when comparing these 2 categories. These differences were statistically significant. There was insufficient data available to allow for comparisons of Hispanic White women in and out of the labor force. At age 25, among non-Hispanic women who were not in the labor force, White women lived an average of almost 7 years longer than Black women.

Table 6 shows estimates of life expectancy by marital status. Married persons were generally observed to live longer than non-married persons. At age 25, the difference in estimates of life expectancy between the married and previously married groups was 5.2 years for non-Hispanic White men, 2.7 years for non-Hispanic White women, 4.9 years for non-Hispanic Black men, 2.6 years for non-Hispanic Black women, and 6.8 years for Hispanic White men. These differences were statistically significant. Small differences were observed for Hispanic White women: .7/year at age 25, .3/year at age 45, and −.5/year at age 65. The differences between the previously married and never married groups were small.

**DISCUSSION**

Life expectancy, or average remaining years of life, is a summary measure utilizing age-specific death rates. This summary may obscure important age-specific differentials in mortality, but has the advantage of providing a meaningful statement of the cumulative health consequences of social and economic inequalities which occur over a lifetime. The results provided in this paper describe the large effect that these factors have, with, for example, life expectancy differing by as much as 9 years for those with high compared to low income, and by 14 years for those employed vs those not in the labor force.

In drawing conclusions from these data, it is important to keep in mind that each life table is constructed for persons who were at the given level of a characteristic at the start of follow up. However, one cannot assume individuals remain at the baseline level for the entire follow-up period. By assuming no change from baseline status, observed differences in estimates of life expectancy are underestimated. For example, a person initially classified as being in the labor force, who subsequently left the labor force, would have switched from a group with a low death rate to one with a high death rate. By remaining classified as “in the labor force,” this person raises the death rate for those “in the labor force” and lowers the death rate for those “not in the labor force,” resulting in an artificially smaller difference in estimates of life expectancy between the 2 groups. Actual movement, of course, can go in the other direction as well, from “not in the labor force” to “in the labor force,” also causing the observed effect to be an underestimate of the differences. Of the 4 factors studied, educational level is the least likely to change after age 25, while family income, employment status, and marital status are much more variable.

As seen in Tables 3–6, observed differences in life expectancy estimates according to educational level, income level, employment status, and marital status were substantial, with differences tending to be larger for men than for women; however, differences in life expectancy between educational levels were found to be nearly identical for men and women in the non-Hispanic Black and Hispanic White groups. Differences were also larger for the non-Hispanic Black population than for the non-Hispanic White population. While Hispanic White men exhibited patterns of life expectancy similar to those of non-Hispanic White and Black men, the differences between both educational and income levels for Hispanic White men were considerably smaller than those observed for non-Hispanic White and Black men. Almost no difference in life expectancy was observed between income levels for Hispanic White women.

The largest differences in life expectancy for the socioeconomic variables considered were observed between employment status categories. For example, as already noted, the difference at age 25 between those employed and those not in the labor force was 14.0 years for non-Hispanic Black men and Hispanic White men. Since those “not in the labor force” also include sick and disabled persons, estimates of life expectancy for employment status may reflect the effects of being healthy compared to being sick, which confounds the causal relationship between labor force participation and mortality outcomes. However, the differences at age 65 were small: 3.5 years for non-Hispanic White men, 4.4 years for non-Hispanic Black men, and 4.9 years for Hispanic White men. These differences might have been larger if individuals reaching retirement ages had been put in the “not in the labor force” group. For example, a person aged 60 at the start of follow-up who was employed at baseline might retire at age 65, but would be categorized in this study as “employed.”

Hispanic White individuals were observed to have longer life expectancies than non-Hispanic White individuals in all socioeconomic and sex groups, which confirms the low mortality rates for Hispanic White individuals found in other studies. For instance, Sorlie, Backlund, Johnson, et al demonstrated that Hispanic White individuals, as compared to the general US population, exhibited fewer risk factors for cancer and heart disease, the 2 leading causes of death in the United States. Various explanations have been presented in the literature to
Table 6. Estimated life expectancies in years for selected groups at ages 25, 45, and 65 by marital status: NLMS, age 25+, 1979–89 follow-up (estimated standard errors are shown in parentheses)

<table>
<thead>
<tr>
<th>Hispanic Status</th>
<th>Race</th>
<th>Sex</th>
<th>e25 Married</th>
<th>Previously Married</th>
<th>Never Married</th>
<th>e45 Married</th>
<th>Previously Married</th>
<th>Never Married</th>
<th>e65 Married</th>
<th>Previously Married</th>
<th>Never Married</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic</td>
<td>White</td>
<td>Male</td>
<td>51.0 (.09)</td>
<td>45.8 (.28)</td>
<td>46.2 (.32)</td>
<td>32.0 (.08)</td>
<td>28.0 (.22)</td>
<td>28.1 (.32)</td>
<td>15.7 (.07)</td>
<td>13.6 (.16)</td>
<td>14.1 (.26)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>White</td>
<td>Female</td>
<td>57.5 (.11)</td>
<td>54.8 (.23)</td>
<td>55.3 (.36)</td>
<td>38.1 (.11)</td>
<td>35.8 (.15)</td>
<td>36.2 (.34)</td>
<td>20.7 (.11)</td>
<td>19.6 (.09)</td>
<td>19.9 (.25)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>Black</td>
<td>Male</td>
<td>47.8 (.49)</td>
<td>42.9 (.53)</td>
<td>42.2 (.89)</td>
<td>29.7 (.30)</td>
<td>25.4 (.45)</td>
<td>26.1 (.91)</td>
<td>15.1 (.27)</td>
<td>13.5 (.37)</td>
<td>15.2 (.92)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>Black</td>
<td>Female</td>
<td>54.3 (.57)</td>
<td>51.7 (.42)</td>
<td>50.2 (.98)</td>
<td>36.0 (.48)</td>
<td>33.1 (.33)</td>
<td>32.3 (.98)</td>
<td>20.0 (.49)</td>
<td>18.5 (.26)</td>
<td>18.5 (.94)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>White</td>
<td>Male</td>
<td>54.2 (.43)</td>
<td>47.4 (2.77)</td>
<td>*</td>
<td>35.1 (.42)</td>
<td>31.7 (.97)</td>
<td>*</td>
<td>18.4 (.41)</td>
<td>16.9 (.82)</td>
<td>*</td>
</tr>
<tr>
<td>Hispanic</td>
<td>White</td>
<td>Female</td>
<td>59.3 (.68)</td>
<td>58.6 (.61)</td>
<td>*</td>
<td>39.8 (.68)</td>
<td>39.5 (.57)</td>
<td>*</td>
<td>21.7 (.71)</td>
<td>22.2 (.48)</td>
<td>*</td>
</tr>
</tbody>
</table>

* Insufficient data.

... observed differences in life expectancy estimates according to educational level, income level, employment status, and marital status were substantial, with differences tending to be larger for men than for women ...

explain this “Hispanic Mortality Paradox”: the healthy migrant effect, the salmon bias effect, and the data artifact effect. The first 2 paradoxes basically argue that the migration process has a direct effect on observed death rates among the Hispanic population in the United States. The healthy migrant effect posits that Hispanic immigrants self select due to good health and are in better health than the general US population, while the salmon bias effect argues that large numbers of Hispanic individuals return to their country of origin following illness, or to retire, thus artificially lowering the Hispanic death rate in the United States. Unfortunately, testing these hypotheses is beyond the purview of this study, and other studies provide little empirical support for these hypotheses. The data artifact hypothesis posits that mismatches between mortality data (used in the numerator) and census/survey data (used in the denominator) explain the paradox of Hispanics. This problem is not an issue in the NLMS, since only one source of ethnic identification is used to estimate death rates: the self-identified race-ethnicity of the individual collected during the CPS interview. Another frequent explanation of the good health of the Hispanic population is what some call a “cultural effect.” Hispanic individuals may behave differently in ways known to affect health, such as smoking less, following healthier diets, and having greater access to family and social support.16–19

We further studied whether a difference in ascertainment of death might account for differences in death rates between Hispanic and non-Hispanic populations in the NLMS. To this end, we created a sample of those individuals from the Hispanic White population (76%), and those individuals from the non-Hispanic White population (87%) who had a Social Security Number (SSN), and then estimated the proportion of deaths missed in each group using the estimate of 3% missed with SSN, and 13% missed without SSN, as reported by Calle and Terrell.14 The results were a 95% ascertainment of death for the Hispanic population vs 96% for the non-Hispanic population. Therefore, only a negligible part of the Hispanic—non-Hispanic difference could be explained by the smaller proportion of Hispanic population with a SSN.

While the NLMS data are very useful when estimating life expectancy by social and economic characteristics, some limitations exist. The strengths of the NLMS data come from the importance and the intense effort required to conduct the Current Population Survey. The data from the survey are collected by the US Census Bureau for use by the Bureau of Labor Statistics to compute the National Unemployment Index, a leading economic indicator. The interview is collected by highly trained staff who obtain permission from the respondents before conducting the survey, and response rates are greater than 95%. Households in the sample are interviewed monthly on 8 different occasions. There are, however, several limitations to using these CPS data. Respondents’ status is obtained only at the time of interview. Individual characteristics are thus frozen for analysis purposes, and changes in individuals will not be captured. More complex dimensions of socioeconomic characteristics are not captured, including accumulated wealth, complex measures of social capital, and other detailed social and behavioral factors.

CONCLUSION

Life expectancy, or average remaining years of life, was used to summarize
mortality experience. Death rates by the economic and social characteristics used in this report have been previously reported to be much higher for the poor, the less educated, the unmarried, and those not in the labor force. Translating these death rates into estimates of life expectancy shows the dramatic impact that individual socioeconomic status has on the average length of life. For those not in the labor force, the average length of life is 14 years less than those employed, emphasizing the health needs of those not working who are possibly not part of employee-based health insurance systems. Differences in life expectancy are as much as 6 to 7 years for lower vs higher education levels for Black men and women, and up to 9 years for lower vs higher income levels for Black men. As indicated by these examples, studying the effect of socioeconomic differentials in terms of life expectancy provides yet another measure for describing the cumulative health consequences of these inequalities.

ACKNOWLEDGMENTS
This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a more limited review than official Census Bureau publications. This report is released to inform interested parties of research and to encourage discussion.

REFERENCES