RACE/ETHNICITY AND U.S. ADULT MORTALITY

Progress, Prospects, and New Analyses[1]

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Abstract

Although there have been significant decreases in U.S. mortality rates, racial/ethnic disparities persist. The goals of this study are to: (1) elucidate a conceptual framework for the study of racial/ethnic differences in U.S. adult mortality, (2) estimate current racial/ethnic differences in adult mortality, (3) examine empirically the extent to which measures of socioeconomic status and other risk factors impact the mortality differences across groups, and (4) utilize findings to inform the policy community with regard to eliminating racial/ethnic disparities in mortality. Relative Black-White differences are modestly narrower when compared to a decade or so ago, but remain very wide. The majority of the Black-White adult mortality gap can be accounted for by measures of socioeconomic resources that reflect the historical and continuing significance of racial socioeconomic stratification. Further, when controlling for socioeconomic resources, Mexican Americans and Mexican immigrants exhibit significantly lower mortality risk than non-Hispanic Whites. Without aggressive efforts to create equality in socioeconomic and social resources, Black-White disparities in mortality will remain wide, and mortality among the Mexican-origin population will remain higher than what would be the case if that population achieved socioeconomic equality with Whites.

Keywords: Race, Ethnicity, Mortality, Health Disparities, African Americans, Mexican Americans, Socioeconomic Status

INTRODUCTION

The need for continued attention to racial/ethnic disparities in U.S. adult mortality is pressing. A recent report from the National Center for Health Statistics indicates that the life expectancy gap between African Americans and non-Hispanic White Americans was reduced to slightly less than five years in 2007, seemingly the narrowest in U.S. history (Miniño et al., 2009). Despite this, the government's *Healthy People 2010* (2010) objective of eliminating health disparities between subgroups of the population has clearly not been met.[2] Moreover, a great deal of uncertainty remains with regard to the current mortality patterns of Mexican Americans (Markides

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and Eschbach, 2011). In short, this is a very important time to continue to devote significant scholarly attention to racial/ethnic adult mortality disparities and to inform the academic and policy audiences regarding the ways in which a better understanding of mortality disparities and their determinants can help lead to the elimination of racial/ethnic differences in mortality.

The four aims of this paper are (1) to review recent literature and elucidate a conceptual framework for the study of U.S. racial/ethnic adult mortality differences; (2) to provide the most recent estimate of adult mortality differences across the largest U.S. racial/ethnic groups, both overall as well as by age group and gender; (3) to empirically examine the extent to which measures of socioeconomic status and other risk factors impact the mortality differences across groups; and (4) to utilize the empirical findings of the paper to inform the policy community regarding ways to eliminate racial/ethnic disparities in mortality.

RACIAL/ETHNIC DIFFERENCES IN U.S. ADULT MORTALITY: PREVIOUS LITERATURE

Improvements in mortality rates were substantial throughout the twentieth century, but Black-White mortality differences remain wide. Sloan et al. (2010) used data on middle-aged American males from 1900–1914 and 1992–2006 to show that the Black-White relative mortality difference was largely stagnant during this long period of time. Earlier, Levine et al. (2001) examined national mortality data from 1933 to 1999 and found there had been no sustained decrease in Black-White mortality differences since 1945. A later examination of U.S. mortality data between 1960 and 2000 (Satcher et al., 2005) found very little change in Black-White mortality differences (see also Elo and Drevenstedt, 2004). Estimates from two of the above studies (Levine et al., 2001; Satcher et al., 2005; also see Williams and Jackson, 2005) show that there are between 75,000 and 100,000 excess premature deaths for Blacks compared to Whites each year. Only recently has the Black-White adult mortality gap exhibited any signs of closure. Harper et al. (2007), for example, showed a narrowing of the Black-White life expectancy gap by one year among women and two years among men between 1993 and 2003. Similarly, Macinko and Elo (2009) reported narrowing Black-White gaps in both absolute and relative measures of premature (lower than age sixty-five) mortality since the early 1990s that were especially pronounced among men. In light of this recent evidence of a narrowing gap, a reassessment of Black-White mortality differentials is warranted.

Age patterns of Black-White adult mortality differences also vary. Stewart (2008) demonstrated that Black-White relative differentials peak during early adulthood and then decline throughout the remainder of the life course. This pattern corroborates earlier evidence; for example, Hummer et al. (1999) used data from 1989 to 1995 to show that non-Hispanic Black adults exhibited mortality risks 2.3 times as high as non-Hispanic Whites from ages eighteen to forty-four, 1.75 times as high from ages forty-five to sixty-four, and 1.23 times as high for ages sixty-five and above. Although there is debate regarding whether a Black-White mortality crossover from higher mortality to lower mortality among African Americans relative to Whites occurs at ages eighty-five and above (Nam 1995), there is no dispute that African Americans continue to exhibit substantially higher mortality than Whites from birth to at least age eighty-five (Jackson et al., 2011).

One study completely eliminated the Black-White adult mortality gap with controls for socioeconomic status and marital status (Rogers 1992), but most have

not. More common are studies that find that roughly one-half of the Black-White adult mortality difference is attributable to measured socioeconomic and marital status differences across populations, with notable variation in this percentage by age group, gender, and cause of death (Franks et al., 2006; Hummer et al., 2004). Nonetheless, understanding the contribution of socioeconomic and social resource advantages and disadvantages to mortality differentials is a substantial theoretical and measurement challenge given the complexities of the intergenerational, individual life course, and spatial dimensions of socioeconomic and social resources (Williams et al., 2010).

Substantial literature during the last twenty years provides evidence that Hispanics appear to have somewhat favorable adult mortality risks when compared to non-Hispanic Whites and much more favorable risks than non-Hispanic Blacks. At the same time, such patterns have been found to vary by Hispanic national origin, nativity, and, to some extent, by gender and age. Borrell and Crawford (2009) recently investigated Hispanic adult mortality patterns by national origin and nativity status. They found lower overall adult mortality risk for Hispanics compared to non-Hispanic Whites and Blacks, with particularly low mortality among older (aged sixty-five and above) foreign-born Hispanics. At the same time, they found higher mortality among Hispanics aged twenty-five to forty-four compared to non-Hispanic Whites and Blacks, in large part due to the heightened mortality risk in that age range among Puerto Rican-born and Mexican-born women and men.

An important body of research, though, has been critical of official adult mortality estimates among Hispanics and has offered alternative explanations (e.g., racial/ethnic misclassification and return migration selectivity) for their relatively low adult mortality (Palloni and Arias, 2004). Recent demographic work has attempted to account for the effect of out-migration on Hispanic mortality estimates in the United States and has dealt with the issue of disparate race/ethnicity reporting across different data sources and across time (Arias et al., 2010; Turra and Elo, 2008). These studies arrive at a consensus that officially reported Hispanic adult mortality rates are too low because of data quality issues. Nonetheless, even after adjustments for data deficiencies, overall Hispanic mortality estimates are found to be lower than non-Hispanic Whites and considerably lower than non-Hispanic Blacks, with particularly low mortality exhibited among the Hispanic population aged sixty-five and above.

Given that Hispanics have much lower overall socioeconomic status than non-Hispanic Whites, their relatively favorable adult mortality patterns have been termed an epidemiologic paradox (Markides and Coreil, 1986; Markides and Eschbach, 2011); that is, their mortality patterns do not seem to correspond with their socioeconomic status. Only recently, however, has limited research examined the impact of socioeconomic status on Hispanic mortality and on Hispanic-White mortality differentials. Most important, there is a weaker relationship between individual-level socioeconomic status and mortality among Mexican-origin adults in comparison to non-Hispanic Black and White adults (Turra and Goldman, 2007).

CONCEPTUAL FRAMEWORK FOR RACIAL/ETHNIC DIFFERENCES IN ADULT MORTALITY

Race/Ethnicity

Race and ethnicity are sociocultural constructs that reflect the common geographic origins, cultures, and social histories of groups that are defined by societies in a particular time-dependent context (Saenz and Morales, 2005; Waters 2002; Williams

et al., 2010). Given the sociocultural construction of race/ethnicity and the historical context in which groups are defined, racial/ethnic groups are fluid; they can and do change over time, and they vary across place. At this point in time, the U.S. government recognizes five major racial groups: Blacks/African Americans, Whites, Asian Americans, Native Americans and Alaskan Natives, Native Hawaiians and other Pacific Islanders; and one major ethnic group, Hispanics/Latinos (Office of Management and Budget 1997). In this paper, no distinction is made between racial and ethnic groups; instead, the concept of race/ethnicity is used to refer to currently defined sociocultural groups in American society. Discussion here is focused on non-Hispanic Blacks, non-Hispanic Whites, Mexican Americans, and Mexican immigrants because these groups are large enough to examine with the data set we use.

No analysis of mortality patterns and trends that contrasts African Americans with other racial/ethnic groups is sufficient without considering the impacts of institutional- and individual-level forms of discrimination on the African American population. Such discriminatory treatment first developed out of an ideology that justified the African slave trade and, while the forms of discrimination have shifted through the years and decades, the impact of such discrimination on the well-being of African Americans is still being felt. Indeed, decades of research have consistently documented the continued impacts of such systematic oppression and unequal treatment on the African American population, resulting in an array of disadvantages that play out in social institutions and in the everyday lives of Black individuals (Anderson and Massey, 2001; Oliver and Shapiro, 2006; Williams and Sternthal, 2010). These disadvantages include some factors that are measurable within large data sets that are used to analyze mortality patterns, such as years of educational attainment and annual family income, but they also include those that are difficult or impossible to measure using large data sets, such as the day-to-day hassles and slights that are encountered by African Americans, the segregation of African Americans and other minority group members in disadvantaged neighborhoods and schools, and the disadvantages that African Americans have faced in the intergenerational/life-course accumulation of wealth.

In contrast to African Americans, Whites in the United States have long enjoyed the privileges of living in a politically, culturally, and socioeconomically White-dominated society (Saenz and Morales, 2005). With such privilege come numerous rewards that accrue throughout life and across generations. These rewards include those that are relatively easy to document (e.g., greater political representation, better funded schools, and lower incarceration rates), those that are more institutionally hidden but not color blind (e.g., inheritance tax policies that favor the wealthy; the racial/ethnic composition of hiring/admissions committees in corporations and universities), and those that may be more subtle (e.g., a higher level of everyday comfort in White-dominated social institutions) (Bonilla-Silva 2003; Feagin 2001). These privileges do not, of course, mean that all Whites are similarly advantaged, nor are all African Americans similarly disadvantaged. For example, it took generations for members of national origin groups such as Italian Americans, Irish Americans, and Polish Americans to be considered White in American society and to accrue and enjoy some of the privileges of a dominant group. Such a *Whitening* option has, of course, largely been impossible for darker-skinned African Americans (Waters 2002).

The Mexican-origin population is, by far, the largest segment of the U.S. Latino population and currently numbers almost thirty-one million individuals (Pew Hispanic Center 2010). Although Latinos of Mexican origin were first numerically substantial in the United States after the ceding of northern Mexico to the United

States via the 1848 Treaty of Guadalupe Hidalgo, the population grew rapidly through both legal and undocumented immigration after the end of the Bracero Program in 1964, passage of the U.S. Immigration and Nationality Act in 1965, and later immigration policy changes (Massey 2008; Tienda and Mitchell, 2006). Current estimates suggest that 37% of the U.S. Mexican-origin population is comprised of immigrants and that this percentage is much higher for adults of Mexican origin (Pew Hispanic Center 2010).

Given the high level of Mexican immigration to the United States since 1965, understanding patterns of Mexican immigrant selectivity and generational assimilation have dominated the academic literature on the health and mortality patterns of the Mexican-origin population. At this point, several factors are thought to influence contemporary mortality patterns among Mexican immigrants and Mexican Americans. First, Mexican immigrants are selected on both positive educational characteristics, relative to Mexicans who do not migrate to the United States, and on good physical health and health behaviors relative to U.S.-born adults (Feliciano 2005; Palloni and Arias, 2004). Second, despite these patterns of positive selectivity, Mexican immigrants are among the most socioeconomically disadvantaged of U.S. racial/ethnic groups. Socioeconomic disadvantages are most pronounced among the large number of undocumented immigrants from Mexico, given their concentration in low-wage service-sector jobs (Tienda and Mitchell, 2006). Third, U.S.-born Mexican Americans exhibit assimilation through their higher levels of education and income than their immigrant counterparts, as well as through their relatively high levels of intermarriage with non-Hispanic Whites (Tienda and Mitchell, 2006). Some high-earning individuals of Mexican descent end up self-identifying as non-Hispanic White in the third and higher generations, which has largely been attributed to patterns of Latino-White intermarriage (Trejo 2003). Note, though, that this may not be possible for darker-skinned Latinos (Frank et al., 2010). Nonetheless, U.S.-born Mexican Americans continue to be a socioeconomically disadvantaged population, particularly in terms of education, in comparison to non-Hispanic Whites; such disadvantage could clearly have important impacts on their level of mortality. Moreover, rates of marriage are far lower and levels of smoking are far higher among Mexican Americans in comparison to their Mexican immigrant counterparts. This may also work to elevate their mortality risks.

Given all the ways in which race and ethnicity have structured and continue to structure American society, as has been only briefly outlined, it is very important to keep in mind that the most important indicator of mortality differences among African Americans, Whites, Mexican immigrants, and Mexican Americans is what is portrayed in basic mortality models or basic mortality rates, and not in statistical models that control for a portion of the inequalities that are the consequences of a racially- and ethnically-stratified society (Cooper 1984; Hummer 1996; Williams et al., 1994). In other words, differences in mortality among groups are not confounded by socioeconomic and other inequalities; the historical and continued significance of race and ethnicity are the reasons for such inequalities.

Demographic Composition

Most simply, the age and sex composition of racial/ethnic groups impacts their overall mortality. Populations with younger age structures and populations that have lower sex ratios (i.e., fewer males compared to females) will have lower mortality than populations with older age structures and those that have higher sex ratios. Thus, the age and sex of individuals must be held constant in any model that estimates racial/ethnic differences in adult mortality.

Racial/Ethnic Socioeconomic Stratification

African Americans have made impressive gains in access to high quality education, stable and high-paying jobs, income, housing, health care, and political representation since the Civil Rights Movement (Smelser et al., 2001). However, there is also little doubt that there continue to be very wide inequalities in valued resources between African Americans and Whites. Our mortality models will account for basic differences in educational attainment and family income across racial/ethnic groups. While important, these are only very crude measures of socioeconomic resources. Perhaps most telling is the current gap in wealth between the Black and White populations, which was recently estimated to have grown fourfold between 1984 and 2007 (Shapiro et al., 2010; see also Oliver and Shapiro, 2006). Given the intergenerational and life-course cumulative character of wealth, it is a very useful marker of inequality between populations and fundamentally structures the certainty and comfort level of the lives of African American and White adults. In short, vast differences in socioeconomic resources that can impact the length of life of individuals continue to characterize the Black and White populations in the United States.

Among Hispanics, the Mexican-origin population in the United States is highly disadvantaged along socioeconomic lines, with Mexican immigrants in particular exhibiting lower levels of schooling and lower incomes than other Hispanic groups as well as in comparison to Blacks and Whites (Saenz and Morales, 2005; Tienda and Mitchell, 2006). Similar to the case among African Americans, actual differences in socioeconomic resources between the Mexican-origin population and non-Hispanic Whites are far greater than what is indicated by education and family income measures. For example, a 2004 report found that Hispanic households have less than 10% of the overall wealth of White families and that this gap has widened in recent years (Kochhar 2004). It is also the case, however, that median family wealth among Hispanics was about 30% higher than that among Blacks (Kochhar 2004), which suggests a bit less socioeconomic vulnerability among Hispanics as compared to Blacks. Statistical models that account for measured socioeconomic variables should help to reduce net mortality among Mexican immigrants and Mexican Americans relative to non-Hispanic Whites, given the sizable socioeconomic disadvantages among the Mexican-origin groups.

Our mortality models further group marital status in with socioeconomic status variables. This is because marriage in the United States is highly stratified along socioeconomic lines (McLanahan 2009); marriage is most likely to occur among individuals who are highly educated and those who perceive substantial certainty and confidence regarding future employment and economic prospects (Burton and Tucker, 2009). While Mexican immigrants exhibit very high levels of marriage, given traditional patterns in Mexico, such a pattern is much less the case among U.S.-born Mexican Americans (Hummer and Hamilton, 2010). Thus, rather than conceptualizing marital status as a simple indicator of differing demographic behavior across racial/ethnic groups, one should view marital status differences across groups as an indicator of certainty and future confidence regarding employment and income prospects.

Social and Behavioral Risk Factors

Beyond racial/ethnic socioeconomic stratification, it is important to give further attention to other risk factors that may impact mortality differences across racial/ethnic populations. Cigarette smoking, for example, is the leading behavioral risk factor associated with adult mortality in the United States (Rogers et al., 2005).

Moreover, there are racial/ethnic patterns in smoking that, at present, show lower levels among many immigrant groups, including Mexicans, and that show higher levels among non-Hispanic White and Black adults (Acevedo-Garcia et al., 2005; Lopez-Gonzalez et al., 2005). At the same time, social-psychological resources may exhibit important protective influences on the risk of mortality. One example of this is that the higher level of religious involvement among African Americans relative to Whites may be a particularly important protective factor for mortality risk among African Americans, given the institutionalized centrality of religion in the African American community (Ellison et al., 2000).

Mortality

Mortality differentials across racial/ethnic populations reflect the intergenerational and life-course processes of social, economic, and health advantages and disadvantages that vary across these socially defined groups (Jackson et al., 2011). This analysis focuses on all-cause, rather than cause-specific, mortality because its emphasis is on the broad patterns of social stratification and differentiation that lead to differing levels of overall adult mortality across racial/ethnic populations rather than on the biological processes that are best understood through a cause-specific mortality approach.

DATA AND METHODS

Data utilized in this study come from the most recent version of the public use National Health Interview Survey-Linked Mortality Files (NHIS-LMF). This analysis merges the Sample Adult NHIS respondents from 1997 to 2004, the vast majority of whom provided a sufficient amount of identifying information to be eligible for linkage with mortality follow-up through December 31, 2006 (National Center for Health Statistics 2009, 2010). With some file restrictions (e.g., an age range of twenty-five and above, the exclusion of persons in small racial and ethnic groups, the exclusion of persons with insufficient identification information to ever match to a death certificate), 195,279 adults ended up in the analytic data set, with 16,047 deaths occurring to these individuals during the follow-up period. Given that eight years of baseline data was used in this portion of the paper, it is possible to make adult mortality comparisons among non-Hispanic Blacks, Mexican Americans, Mexican immigrants, and non-Hispanic Whites. Later in the paper, the analysis is restricted to a single year of NHIS data, 2001, with mortality follow-up through the end of 2006. Only in 2001 did the NHIS collect data on measures of social integration and activity (e.g., religious attendance, visits with family and friends, and so forth) that may be important for understanding mortality patterns in the United States. Given the limitation of one year of baseline data with these measures, this section of the paper necessarily includes only non-Hispanic Blacks and non-Hispanic Whites because of the small number of available deaths to analyze among Mexican Americans and Mexican immigrants. This portion of the paper analyzes 22,628 non-Hispanic Black and White adults, aged twenty-five and above, with 1,716 deaths occurring for these individuals during the follow-up period.

Self-reports of race, ethnicity, and nativity in the NHIS are used to specify four racial/ethnic groups: non-Hispanic Blacks, non-Hispanic Whites, U.S.-born Mexican Americans, and Mexican immigrants. These mortality models also control for the age of respondents at baseline, in single years, and sex; also specified are some

models separately by age group (ages twenty-five to sixty-four and sixty-five plus) and sex.

Socioeconomic variables include educational attainment (less than high school vs. high school or more) and family income (family income less than the poverty line, family income 1.00–1.99 times poverty, family income 2.00+ times poverty, and missing family income). Because family income data were missing for roughly 20% of individuals, a missing indicator in the models was included in order to preserve those cases in the analysis. Marital status at baseline is measured as married versus not married (divorced, separated, widowed, and never married). Smoking status was included as the most important behavioral factor related to mortality risk; it is measured here as never smoked, former smoker, and current smoker.

Survival status is the event of interest in these regression models. Individuals contribute exposure time from the quarter-year they are interviewed (e.g., the first quarter of 1999) to the quarter-year of death (e.g., the third quarter of 2005). Individuals who do not die during the follow-up period are right censored. Given the structure of the event history data, Cox proportional hazards modeling techniques were used to analyze mortality risk (Allison 1984).

RESULTS

Descriptive Data

Table 1 provides descriptive statistics for the data set as a whole, as well as by race/ethnicity. The bottom of the table indicates that while 7.1% of African Americans and 7.1% of non-Hispanic Whites died during the follow-up period, just 4.1% of Mexican Americans and 2.9% of Mexican immigrants died during the follow-up period, respectively.

Table 1 also illustrates the demographic, socioeconomic, and behavioral uniqueness of each racial/ethnic group. Mexican immigrants have, by far, the youngest average age. At the same time, Mexican immigrants also are the only group composed of a majority of males (53.7% men), while African Americans have the lowest percentage of males at 44.0%. Mexican immigrants exhibit particularly low levels of education and family income, while African Americans and Mexican Americans are also disadvantaged as to these characteristics compared to non-Hispanic Whites. Conversely, Mexican immigrants are the most likely to be married, while African Americans are the least likely to be married. Non-Hispanic White adults exhibit the most risky patterns of smoking, with 27.5% being former smokers and 23% being current smokers. Mexican immigrants exhibit the lowest levels of both current and former smoking.

Basic Racial/Ethnic Models of Adult Mortality

Table 2 illustrates racial/ethnic differences in mortality for U.S. adults of both sexes aged twenty-five and above. The first model here, while the most basic, may also be the most important given the logic of the conceptual framework discussed above. That is, when controlling for only demographic differences across these populations, African Americans exhibit 36% higher adult mortality risk during the follow-up period than non-Hispanic Whites (the reference category). There is no statistical difference between Mexican Americans and non-Hispanic Whites or between Mexican immigrants and non-Hispanic Whites. The similarity in adult mortality between the Mexican American, Mexican immigrant, and non-Hispanic White populations

Table 1. Weighted Descriptive Statistics of Adult Mortality Covariates and Outcomes, by Race/Ethnicity, U.S., 1997–2006

Variable	Non-Hispanic Black	Mexican American	Mexican Immigrant	Non-Hispanic White	Overall
Age (Mean in years)	46.2	44.3	40.7	49.9	49.0
Sex					
Female	56.0%	51.9%	46.4%	52.2%	52.4%
Male	44.0%	48.1%	53.7%	47.8%	47.6%
Education					
High School Degree or More	75.9%	70.2%	29.8%	86.7%	82.9%
Less Than High School	23.2%	29.0%	68.7%	12.8%	16.6%
Missing Education Info	0.9%	0.9%	1.5%	0.5%	0.6%
Family Income: Poverty Threshold					
2.00 or More	44.9%	49.4%	25.0%	62.7%	58.8%
1.00–1.99 (near poverty)	17.9%	18.6%	29.2%	11.4%	13.0%
0.99 or Less (in poverty)	15.4%	12.2%	22.8%	5.0%	7.1%
Missing Family Income Info	21.8%	19.9%	22.9%	21.0%	21.1%
Marital Status					
Married	42.6%	61.2%	74.0%	67.1%	64.3%
Unmarried	57.1%	38.6%	25.8%	32.7%	35.5%
Missing Marital Info	0.4%	0.2%	0.2%	0.1%	0.2%
Smoking Status					
Never Smoked	58.2%	61.7%	70.3%	48.9%	51.2%
Former Smoker	16.3%	18.2%	13.9%	27.5%	25.4%
Current Smoker	24.6%	19.8%	15.3%	23.0%	22.8%
Missing Smoking Info	0.9%	0.4%	0.6%	0.5%	0.6%
Survival Status Across Follow-up Period					
Survived	92.9%	95.9%	97.1%	92.9%	93.1%
Died	7.1%	4.1%	2.9%	7.1%	6.9%
Number of Deaths	1,634	213	215	11,379	13,441
Un-weighted N	29,158	8,638	11,009	146,474	195,279

Source: National Center for Health Statistics (2010).

Table 2. Hazard Ratios for Racial/Ethnic Differences in U.S. Adult Mortality, Ages 25 and Above, 1997–2006

Variable	Model 1	Model 2	Model 3
Racial/Ethnic Differences			
NH-White (ref.)	—	—	—
NH-Black	1.36***	1.11***	1.11***
Mexican American	0.91	0.75***	0.79***
Mexican Immigrant	0.95	0.71***	0.77***
Age (continuous in years)	1.09***	1.09***	1.09***
Sex			
Female (ref.)	—	—	—
Male	1.57***	1.78***	1.61***
Education			
High School or More (ref.)		—	—
Less Than High School		1.24***	1.21***
Family Income: Poverty Threshold			
2.00 or More (ref.)		—	—
1.00–1.99		1.38***	1.34***
0.99 or Less		1.64***	1.58***
Missing Income Info		1.15***	1.15***
Marital Status			
Married (ref.)		—	—
Unmarried		1.36***	1.31***
Smoking Status			
Never Smoked (ref.)			—
Former Smoker			1.36***
Current Smoker			2.21***
Fit Statistics			
−2 Log L	348,563.9	347,382.6	346,178.2
Degrees of Freedom	5	12	15
N	195,279	195,279	195,279
# of Deaths	16,047	16,047	16,047

*p < .05, **p < .01, ***p < .001
Source: National Center for Health Statistics (2010).

further reinforces the concept of the epidemiologic paradox (Markides and Eschbach, 2011). The overall Black-White relative difference appears to be modestly narrower when compared to previous studies that used similar methodology but with data from the late 1980s and early 1990s (Hummer et al., 1999; Rogers et al., 1996). This slightly smaller relative Black-White differential is also consistent with findings from the recent trend studies reviewed above (Harper et al., 2007; Macinko and Elo, 2009). Nonetheless, the 36% Black-White difference, net of age and sex differences across populations, strongly suggests that the historical and continued significance of race remains alive and well in structuring adult mortality patterns in the United States.

Model 2 of Table 2 includes measures of socioeconomic resources: educational attainment, family income, and marital status. Despite the weaknesses in these measures, Model 2 shows that controlling for them results in two substantial changes in the race/ethnic mortality differences. First, the Black-White difference narrows considerably in Model 2 in comparison to Model 1, illustrating that these socioeco-

nomic resources, even when weakly measured, account for a majority of the Black-White adult mortality gap. Second, Mexican Americans and Mexican immigrants now exhibit 25–30% lower mortality risk, respectively, than non-Hispanic Whites in Model 2. In other words, these models strongly suggest that African Americans would have adult mortality rates that are similar to non-Hispanic Whites and the Mexican-origin groups would have significantly lower mortality than non-Hispanic Whites if there were greater equity in socioeconomic resources across populations.

Model 3 includes the measure of cigarette smoking, which, like the socioeconomic status measures, does not capture the full extent of life-course variations in smoking across these racial/ethnic groups. While former smoking and current smoking are both strongly related to adult mortality risk in Model 3, the addition of smoking into the model does nothing to further influence Black-White differences in adult mortality beyond what was estimated in Model 2. Thus, while continued strategies to curb smoking will undoubtedly reduce overall adult mortality, impacts on Black-White differences will most likely be minimal unless the strategies are particularly effective or ineffective for a particular group. The inclusion of smoking in Model 3 does reduce the degree of mortality advantage among Mexican immigrants and Mexican Americans relative to non-Hispanic Whites. For example, the hazard ratio for Mexican immigrants relative to non-Hispanic Whites moves from 0.71 in Model 2 to 0.77 in Model 3. Thus, one reason that both of the Mexican-origin groups have relatively low adult mortality is because of their lower level of smoking compared to both non-Hispanic Whites and Blacks.

Age- and Sex-Specific Adult Mortality Models

Table 3 turns to models that examine racial/ethnic differences in adult mortality for four age/sex groups: women twenty-five to sixty-four years of age, women sixty-five and above, men twenty-five to sixty-four years of age, and men sixty-five and above. The basic mortality differences across racial/ethnic groups, controlled only for age, appear in Models 1, 4, 7, and 10, respectively. The results illustrate that relative Black-White mortality differences are wider for younger adults than they are for older adults, as expected (Stewart 2008). That is, among both women and men aged twenty-five to sixty-four years of age at baseline, Black adults exhibit 1.8 times the risk of death across the follow-up period compared to White adults, as shown in Model 1 for younger women and Model 7 for younger men. Thus, while levels of younger adult (i.e., premature) mortality have decreased in the United States in impressive fashion during the last century and even as recently as the 1989–2005 window (Macinko and Elo, 2009), very large Black-White disparities remain among both women and men. By contrast, there are no statistically significant differences in younger adult mortality risks between Mexican immigrants and Whites or between Mexican Americans and Whites.

Among adults aged sixty-five and above at baseline, relative Black-White differences in mortality are not nearly as wide as among younger adults but are also unmistakable. Model 4 shows that older African American women exhibit a 14% higher mortality risk than older White women during the follow-up period, while Model 10 shows a 22% higher mortality risk among older Black men as compared to older White men. These Black-White hazard ratios are similar to those estimated in previous work using similar methodology but with data from roughly a decade ago (Hummer et al., 2004). Note, as well, that overall mortality levels among older individuals are much higher than among younger individuals. Thus, even moderately sized relative mortality differences at these ages indicate that the lives of many

Table 3. Hazard Ratios for Racial/Ethnic Differences in U.S. Adult Mortality by Age and Sex Group

	Females Ages 25–64			Females Ages 65+		
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Race/Ethnicity						
NH-White (ref.)	—	—	—	—	—	—
NH-Black	1.84***	1.26***	1.37***	1.14***	1.00	1.01
Mexican American	0.85	0.57***	0.67**	0.87	0.74***	0.78***
Mexican Immigrant	1.14	0.62***	0.83	0.89	0.72**	0.76***
Age (continuous in years)	1.09***	1.09***	1.09***	1.11***	1.10***	1.11***
Education						
High School or More (ref.)		—	—		—	—
Less Than High School		1.46***	1.38***		1.25***	1.27***
Family Income: Poverty Threshold						
2.00 or More (ref.)		—	—		—	—
1.00–1.99		1.93***	1.82***		1.17***	1.16***
0.99 or Less		2.72***	2.51***		1.29***	1.29***
Missing Poverty Info		1.31***	1.31**		1.08*	1.09*
Marital Status						
Married (ref.)		—	—		—	—
Unmarried		1.32***	1.21***		1.22***	1.18***
Smoking Status						
Never Smoked (ref.)			—			—
Former Smoker			1.47***			1.44***
Current Smoker			2.23***			2.13***
Fit Statistics						
−2 Log L	39,505.9	39,053.1	38,835.6	125,697.0	125,481.0	125,077.2
Degrees of Freedom	4	11	14	4	11	14
N	83,173	83,173	83,173	27,234	27,234	27,234
# of Deaths	1,880	1,880	1,880	6,626	6,626	6,626

Table 3. Hazard Ratios for Racial/Ethnic Differences in U.S. Adult Mortality by Age and Sex Group (continued)

	Males Ages 25–64			Males Ages 65+		
Variable	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Race/Ethnicity						
NH-White (ref.)	—	—	—	—	—	—
NH-Black	1.81***	1.31***	1.31***	1.22***	1.02	1.01
Mexican American	1.11	0.88	0.92	0.94	0.80*	0.81*
Mexican Immigrant	1.01	0.68***	0.77*	0.87	0.70**	0.70**
Age (continuous in years)	1.09***	1.09***	1.09***	1.10***	1.09***	1.10***
Education						
High School or More (ref.)		—	—		—	—
Less Than High School		1.25***	1.14*		1.20***	1.15**
Family Income: Poverty Threshold						
2.00 or More (ref.)		—	—		—	—
1.00–1.99		2.10***	1.94***		1.23***	1.20***
0.99 or Less		2.38***	2.17***		1.33***	1.27***
Missing Poverty Info		1.18**	1.18**		1.04	1.06
Marital Status						
Married (ref.)		—	—		—	—
Unmarried		1.70***	1.58***		1.25***	1.22***
Smoking Status						
Never Smoked (ref.)			—			—
Former Smoker			1.27***			1.35***
Current Smoker			2.18***			2.29***
Fit Statistics						
−2 Log L	50,943.1	50,347.4	50,089.4	91,581.4	91,392.3	91,082.7
Degrees of Freedom	4	11	14	4	11	14
N	68,329	68,329	68,329	16,543	16,543	16,543
# of Deaths	2,473	2,473	2,473	5,068	5,068	5,068

*$p < .05$, **$p < .01$, ***$p < .001$
Source: National Center for Health Statistics (2010).

African Americans are ending earlier than the lives of many White Americans, even after reaching age sixty-five. Among this older age group, there are no statistically significant differences in mortality between either of the Mexican-origin groups and older non-Hispanic Whites. The estimates lean toward lower Mexican-origin mortality than White mortality, though, for both women and men (see Models 4 and 10, respectively).

For each age/sex group, the subsequent two models add covariates in the same fashion as was the case for the complete set of adults who were included in Table 2. The overall story in these age/sex-specific models can be effectively summarized in two points. First, all of the covariates operate in expected ways to influence mortality. To provide just one example, women aged twenty-five to sixty-four who live in poverty exhibit 2.5 to 2.7 times the risk of mortality during the follow-up period, depending on the other covariates in the model, compared to women who live in families with incomes 2.00+ times the poverty level. Second, the socioeconomic variables have a very powerful impact on racial/ethnic mortality differences among all of the age/sex groups. For example, Model 2, for younger women, shows that the inclusion of education, income, and marital status results in nearly a 70% decrease in the Black-White hazard ratio; from 1.84 in Model 1 to 1.26 in Model 2. The inclusion of this set of covariates in the older adult mortality models for both women and men completely eliminates the Black-White mortality differences (see Models 5 and 11, respectively). Moreover, the inclusion of this set of covariates for all age/sex groups results in lower net mortality risks among both Mexican immigrants and Mexican Americans compared to non-Hispanic Whites. This finding is consistent with other recent research that suggests that if Mexican immigrants and Mexican Americans had similar socioeconomic resources as Whites, mortality levels among the Mexican-origin groups would be significantly lower than those of Whites (Turra and Goldman, 2007).

Supplemental Analysis Focusing on Social Support and Integration

Table 4 uses data from the 2001 NHIS, linked to mortality follow-up through the end of 2006, to focus on the extent to which additional measures of social support and integration influence Black-White adult mortality differences. Models 1 and 2 of Table 4 echo the findings of Table 2 that used the full eight years of available NHIS baseline data. Model 3 adds the additional social support and integration measures. Net of demographic and socioeconomic variables, several of the additional covariates that display significant associations with mortality risk. For example, adults who are satisfied with life, who visit with friends, and who are socially involved and integrated in other ways exhibit lower mortality during the follow-up period compared to their counterparts. However, the inclusion of this set of measures has virtually no impact on racial/ethnic mortality differences, as best illustrated by the hazard ratio for Blacks of 1.08 in Model 2 and 1.10 in Model 3.

DISCUSSION AND CONCLUSION

This paper has reviewed recent literature and placed racial/ethnic adult mortality differentials in a conceptual framework that emphasizes the historical importance of race/ethnicity and the continued ways in which that importance is reflected in the health patterns of adults in the United States. For African Americans, historical and continued institutional- and individual-level discrimination, while perhaps changing

Table 4. Hazard Ratios for Black-White Differences in U.S. Adult Mortality, Ages 25 and Above, 2001–2006

Variable	Model 1	Model 2	Model 3	Model 4
Race/Ethnicity				
NH-White (ref.)	—	—	—	—
NH-Black	1.38***	1.08	1.10	1.10
Age (Mean Years)	1.09***	1.09***	1.09***	1.09***
Sex				
Female (ref.)	—	—	—	—
Male	1.74***	1.99***	1.89***	1.72***
Education				
High School or More (ref.)		—	—	—
Less Than High School		1.28***	1.15*	1.14*
Family Income: Poverty Threshold				
2.00 or More (ref.)		—	—	—
1.00–1.99		1.44***	1.35***	1.32***
0.99 or Less		1.79***	1.57***	1.53***
Missing Income Info		1.22**	1.17*	1.18**
Marital Status				
Married (ref.)		—	—	—
Unmarried		1.40***	1.33***	1.32***
Social Support				
Some Social Support (ref.)			—	—
No Social Support			0.99	0.97
Satisfied with Life				
Yes (ref.)			—	—
No			1.90***	1.71**
Visit with Friends				
Yes (ref.)			—	—
No			1.13*	1.13
Talk on Phone with Friends				
Yes (ref.)			—	—
No			1.04	1.04
Visit with Family				
Yes (ref.)			—	—
No			0.94	0.94
Talk on Phone with Family				
Yes (ref.)			—	—
No			1.06	1.07
Attend Worship Service				
Yes (ref.)			—	—
No			1.37***	1.30***
Attend Group Event				
Yes (ref.)			—	—
No			1.29***	1.26***
Dine out at Restaurant				
Yes (ref.)			—	—
No			1.31***	1.30***
Smoking Status				
Never Smoked (ref.)				—
Former Smoker				1.42***
Current Smoker				2.03***
Fit Statistics				
−2 Log L	31,058.8	30,906.3	30,706.3	30,594.9
Degrees of Freedom	3	10	28	31
N	22,628	22,628	22,628	22,628
# of Deaths	1,716	1,716	1,716	1,716

*p < .05, **p < .01, ***p < .001
Source: National Center for Health Statistics (2010).

in form, is the lens through which to understand current mortality differences with Whites. In the type of data set used in this paper, such discrimination is probably best measured through the education, income, and family structure inequalities between Blacks and Whites, although it is argued that such measures fall far short of capturing the full extent of the legacy and continued effects of discrimination faced by African Americans. For the Mexican-origin population, the influences of healthy immigrant selectivity, positive health behavior, assimilation patterns, and continued socioeconomic disadvantages are critical. While some of these forces operate to reduce mortality among the Mexican-origin population (e.g., immigrant selectivity, positive health behavior), others operate to heighten mortality risk vis-à-vis Whites (e.g., socioeconomic disadvantage). For Whites, a lens of social, political, and cultural privilege is fundamental to the understanding of their mortality patterns relative to African Americans, Mexican immigrants, and Mexican Americans. While it has been argued that all Whites are not equally privileged, on average, Whites in the United States are characterized by structural advantages that play out across their life course and influence their mortality levels relative to the other groups. Again, measurable indicators of such privilege in large nationally representative mortality data sets are inadequate, and very basic social and economic indicators were relied upon as proxies.

Using this conceptual context as a guide, this analysis of mortality in the United States found that overall Black-White adult mortality differences seem to be modestly narrower in comparison to a decade ago but remain wide. Relative Black-White differences are especially divergent among younger adults. The majority of the Black-White adult mortality gap can be accounted for by the measures of socioeconomic resources that are used to reflect the historical and continuing significance of U.S. racial socioeconomic stratification. None of these empirical findings, unfortunately, are a surprise. Nonetheless, they are important: they serve as a very strong reminder that adult mortality inequalities continue to be very large and are especially harmful to African Americans.

Second, socioeconomic resources, even when poorly measured, are of great consequence in structuring the disparate racial/ethnic adult mortality patterns in U.S. society. Moreover, when controlling for these socioeconomic resources, Mexican Americans and Mexican immigrants exhibit significantly lower mortality risk than non-Hispanic Whites. This finding is consistent with other recent work that suggests that if Mexican immigrants and Mexican Americans had similar socioeconomic resources as Whites, mortality levels among the Mexican-origin groups would be significantly lower than those of Whites. Thus, socioeconomic disadvantages among the Mexican-origin population, like those experienced by African Americans, serve to raise the risks of mortality for these populations to a level higher than what they could or should be.

These findings can influence U.S. health policy, but only if policymakers are open to focusing on the social and economic influences that, at the core, drive racial/ethnic disparities in mortality. Recent related papers (e.g., House et al., 2008; Kaplan et al., 2008; Williams and Jackson, 2005) have made similar pleas. That is, rather than focus a vast majority of health policy attention on the ways that medical and behavioral interventions can improve health outcomes, our attention needs to be focused on the basic socioeconomic resources that are fundamental to the creation and maintenance of health and mortality disparities in the United States. This most likely means tackling what seem to be non–health-related issues in American society, including racial/ethnic disparities in educational opportunities and outcomes, employment and income disparities, and the intergenerational and life-course processes by

which socioeconomic-based disparities, including wealth, have been widening during the last several decades.

These are not simple or politically popular policy priorities; they are potentially expensive and complicated changes to be made with regard to the racial/ethnic mortality disparities in question. Without aggressive efforts to create greater equality in socioeconomic resources across racial/ethnic groups, these findings strongly suggest that Black-White disparities in mortality will remain wide, and mortality among the Mexican-origin population will remain higher than what would be the case if the Mexican-origin population achieved greater socioeconomic equality with Whites. Thus, policy efforts that address racial/ethnic mortality differences must focus on making high-quality education and advanced education attainable for all subgroups of the population; the racial/ethnic distribution of income is also related to racial/ethnic differences in mortality. Further, as Pollack et al. (2008) note, the costs of social policies that sharply increase U.S. educational attainment, decrease poverty, and decrease wealth inequality are dwarfed by potential increases in medical care spending during the next decade and beyond.

Some may argue that since racial/ethnic mortality differences have shown signs of modest narrowing in the last decade or so, with time, the disparities will continue to decrease and eventually close without significant policy attention. Similarly, others may argue that the 2008 election of President Barack Obama signifies the beginning of a post-racial America and that there is little or no remaining concern regarding racial/ethnic disparities in American life, including those specific to health and mortality. Quite the contrary, this is not the time to be passive with regard to mortality disparities. Lives are being lost prematurely and not in a color-blind fashion. Progress toward the elimination of racial/ethnic mortality disparities has been slow, and there is need for policy attention to this issue now.

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NOTES

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2. See www.HealthyPeople.gov.

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