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Racial Differences in Mortality in Older Adults: Factors Beyond Socioeconomic Status

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Abstract

Background—Little is known about the simultaneous effect of socioeconomic status (SES), psychosocial, and health-related factors on race differences in mortality in older adults.

Purpose—This study examined the association between race and mortality and the role of SES, health insurance, psychosocial factors, behavioral factors, and health-related factors in explaining these differences.

Methods—Data consisted of 2,938 adults participating in the Health, Aging and Body Composition study. Mortality was assessed over 8 years.

Results—SES differences accounted for 60% of the racial differences in all-cause mortality; behavioral factors and self-rated health further reduced the disparity. The racial differences in coronary heart disease mortality were completely explained by SES. Health insurance and behavioral factors accounted for some, but not all, of the race differences in cancer mortality.

Conclusions—Race-related risk factors for mortality may differ by the underlying cause of mortality.

Keywords

Race; SES; Behavior; Psychosocial; Mortality; Older adults; Aging

Introduction

Despite declines in mortality rates over the last half of the twentieth century among Americans 65 years of age and older, Black/White differences in mortality persist [1–10]. For example, in 1950, African Americans had a higher mortality rate (5,310.3 per 100,000 resident population) than Whites (4,864.9 per 100,000 resident population) [11]. In 2006, this Black/White mortality gap (although narrowed) is still large—3,669.2 per 100,000 resident population for African Americans and 2,455.8 per 100,000 resident population for Whites. Efforts to elucidate racial disparities in mortality among community-dwelling older adults have been hampered by the limited numbers of Black study participants, confounding of race and socioeconomic status (SES), and insufficient assessment of key factors associated with race and/or mortality.

This study seeks to address a gap in the health disparities literature by examining a wide array of factors that may contribute to race differences in mortality in well-functioning, community-dwelling African American, and White adults aged 70–79 years at study inception. Little is known about the simultaneous effect of SES, health insurance, behavioral, psychosocial, and health-related factors on race differences in mortality in this segment of the population.

Background

The higher mortality rates in older African American adults compared to older White adults have been attributed to several factors such as SES [12–14], health behaviors [15–18], health insurance [19, 20], and health status [4, 5]. Previous research indicates that SES accounts for a substantial proportion, but not all, of the racial differences in mortality [2, 3, 6, 10]. The remaining difference is likely due to the inadequate assessment of key dimensions of SES

and the confounding of race and SES on mortality [14, 21–23]. Furthermore, this highlights the importance of understanding SES measures beyond income and education, and how these factors influence mortality [21, 22, 24]. This is particularly true for older adults because most are living on limited incomes due to retirement, but have accumulated other financial resources across their life course. Financial strain is an SES factor that has received little attention, but has been linked to mortality in older adults [25]. Thus, SES represents a key factor for elucidating racial differences in mortality.

There are other factors that may further explain race differences in mortality in older adults such as health insurance status. Indeed, all older adults have Medicare; however, there is a considerable amount of racial variation in those who have supplemental private health insurance coverage which affects health care [26, 27]. Having health insurance is a predictor of various health outcomes and mortality [19, 20]. Furthermore, it represents the ability to receive preventive services and facilitates access to care and management and treatment of chronic conditions when used. The differences in health insurance coverage between Black and White older adults may influence the association between race and mortality in older adults.

Other potentially important factors that could further explain racial differences in mortality are health behaviors and chronic conditions. Engaging in negative health behaviors such as smoking, excessive drinking, and physical inactivity is associated with mortality [18, 28–30]. The onset and prevalence of chronic conditions are also associated with mortality [28]. Moreover, Blacks are more likely to rate their health as fair or poor, experience earlier onset and greater severity of chronic conditions such as hypertension, cardiovascular disease, stroke, and cancer, and experience higher mortality rates relative to Whites [28, 31–35]. The greater prevalence of health-negating behaviors, and the greater severity and earlier onset of diseases among Blacks may contribute to the explanation of racial disparities in mortality in community-dwelling older adults.

Because many of these social and health risk factors coexist and are more common in African Americans [36], a better understanding of how these factors concomitantly affect race differences in mortality in older adults is needed. Sudano and colleagues [10] demonstrated that examining the simultaneous contributions of SES, health status, health behaviors, and health insurance on racial mortality disparities does not completely explain the disparities in a sample of middle-age adults. However, this relationship is unknown in older adults. Furthermore, studies have not explored whether the patterns of association are similar for all-cause mortality as well as cause-specific mortality.

This study will advance our understanding of race differences in mortality in late life by examining a community-based, well-functioning, biracial cohort of older adults. Studies examining race differences in mortality among community-dwelling older adults with a sufficient number of African Americans are rare. Moreover, little is known about the concurrent contributions of SES, psychosocial, behavioral, and health-related factors on Black/White disparities in mortality in older adults. The present study examines the contributions of SES, psychosocial, health insurance, behavioral, and health-related factors on the association between race and all-cause mortality and cause-specific mortality in a large sample of well-functioning community-dwelling Black and White older adults.

Methods

Study Sample

The Health, Aging, and Body Composition (Health ABC) study is a longitudinal cohort study consisting of 3,075 well-functioning, 70- to 79-year-old, Black and White men and

women. Participants were identified from a random sample of White Medicare beneficiaries and all age-eligible community-dwelling Black residents in designated zip code areas surrounding Memphis, Tennessee, and Pittsburgh, Pennsylvania. Participants were eligible if they reported no difficulty in either walking one quarter of a mile, going up 10 steps without resting, or performing any basic mobility activities of daily living. Participants were excluded if they reported a history of active treatment for cancer in the prior 3 years, planned to move out of the study area in the next 3 years, or were currently participating in a randomized trial of a lifestyle intervention. Baseline data, collected in 1997/1998, included an in-person interview and a clinic-based examination, with evaluation of body composition, clinical and sub-clinical diseases, and physical functioning. Of the 137 participants who were excluded from the present study, 60 had missing information for one or more variables and 77 did not have an underlying cause of death adjudicated, resulting in 2,938 participants in this analytic sample.

Measures

Mortality—All-cause and cause-specific mortality was assessed over 8 years. Surveillance was conducted by in-person examination or telephone interview every 6 months. Deaths were identified through attempts to contact participants, notification by proxy, spouse, next of kin or friend during interviews, local newspaper obituaries, and Social Security Death Index data. All deaths were confirmed by death certificates. Cause of death was adjudicated by a standing committee of clinicians who considered hospital records, next of kin interviews, and autopsy data (if available) to identify an underlying and immediate cause of death. Cause-specific analyses were conducted for the two leading causes of death among older adults: coronary heart disease (CHD) and cancer. CHD deaths were coded similarly to the Cardiovascular Health Study [37]. All cancer deaths were confirmed by biopsy.

Race—Race was determined by participant self-identification as either Black or White.

Demographic Variables—Demographic variables included age (years), sex, and study site (Memphis or Pittsburgh).

Socioeconomic Status—Measures of SES included education (<12, 12, >12 years), family income (<\$10,000, \$10,000–<\$25,000, 25,000–<\$50,000, \$50,000, and missing (12.2%)), number of financial assets, perceived financial inadequacy, and functional literacy level. Participants reported whether they had the following assets: money market account, saving bonds or treasury bills, home ownership or investment property or housing, a business or farm, stock or stock mutual funds, an individual retirement account or KEOGH account, and other investments. Following previous work using these data [38, 39], three categories of financial assets (none, 1–2, 3–7) were created. Participants who reported that their income poorly met their financial needs, they did not have enough money to buy food, or did not have enough money at the end of the month were considered to perceive their income as inadequate. Because the quality of education can vary by race and region [40], functional literacy was measured using the Rapid Estimate of Adult Literacy in Medicine (REALM) in which participants were asked to read aloud from a word list of medical terms. Scores ranged from 0 to 66 indicating the number of words read and pronounced correctly [41]. Because the REALM was administered at the year 3 in-clinic visit, only 82% completed this functional literacy assessment. For participants missing the literacy assessment, we imputed a score using results from a regression analyses that included education, sex, study site, and age [42].

Health Insurance—Health insurance status was assessed by asking whether a person had any health insurance plan in addition to Medicare that pays for any part of a hospital,

doctor's or surgeon's bill (e.g., private insurance, Health Maintenance Organization, Medigap).

Psychosocial Factors—Psychosocial factors included living arrangement (living alone or not), social contact, emotional support, personal mastery beliefs, and religious faith. Low social contact was defined as social contact with friends, neighbors, children or other relatives less than once a week. People who agreed or strongly agreed with “Do you feel you need more emotional support” were defined as lacking adequate emotional social support. People who did not strongly agree with the statement “I can do just about anything I really set my mind to” and did not strongly disagree with the statement “I often feel helpless in dealing with problems” were considered to have low personal mastery beliefs. Religious faith was considered not important if a person responded that religious faith was not important or only somewhat important [42].

Behavioral Factors—Behavioral factors included smoking, drinking, and physical activity level. Smoking was categorized as current smoker, former smoker, and never smoker. Average weekly alcohol consumption was classified as never, former, low (<1) moderate (women, 1–7; men, 1–14), and high (women >7, men >14). Three physical activity patterns were created: exercise (<1,000 kcal per week exercise), lifestyle active (<1,000 kcal per week exercise and <2,719 kcal per week total physical activity), and inactive (<1,000 kcal per week of exercise and <2,719 kcal per week total physical activity) [43–46].

Self-Rated Health—Self-rated health was classified into excellent/very good, good, fair, or poor.

Health-Related Factors—Health-related factors consist of a wide range of clinical diseases. Presence of heart disease, cerebrovascular disease, peripheral arterial disease, diabetes mellitus, lung disease, osteoarthritis, and cancer was determined using standardized algorithms considering self-report, use of specific medications, and clinical assessments. Heart disease was based on self-report of physician diagnosis of CHD and/or congestive heart disease. Cerebrovascular disease was defined as a history of stroke or transient ischemic attack. Peripheral arterial disease was based on self-report of physician diagnosis of intermittent claudication, lower extremity bypass or angioplasty. Diabetes mellitus was based on fasting glucose level greater than 126 mg/dl. Lung disease was defined as self-report of current asthma, current chronic bronchitis emphysema, and use of pulmonary drug or oral steroids. Osteoarthritis was based on combination of self-report of arthritis, degenerative or osteoarthritis in hip, hand, knee, other joints, or pain lasting at least 1 month in past 12 months. Cancer was based on self-report of physician diagnosis of cancer or malignancy and/or use of anticancer medications. Cognitive functioning was assessed with the Modified Mini Mental State Examination. A score less than 78 was considered poor cognitive functioning [47]. Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression scale. A score of 16 or more was used as a criterion for major depressive symptoms [48, 49]. Body mass index was categorized as: <25, 25–30, and >30 kg/m². Hospitalization was assessed by a question that asked whether a person had been a patient in a hospital for one or more nights in the past 12 months.

Statistical Analyses

Differences in baseline characteristics between Black and White older adults were determined using chi-square tests for categorical and *t* tests for continuous variables. Cox proportional hazard regression models were specified to examine the association between race and all-cause and cause-specific mortality. Persons who survived were censored at the last study visit and those lost to follow-up were censored at their last interview. The first

model was adjusted for age, sex, and site. The contribution of SES, health insurance, psychosocial factors, behavioral factors, self-rated health, and health-related factors was examined separately in the next six models. The final model included all factors in the previous models. Finally, the effect of health insurance, psychosocial factors, behavioral factors, self-rated health, and health-related factors beyond SES was determined in explaining racial differences in mortality. For each model, a percentage reduction in hazard ratios from model 1 was computed: $[(HR_{\text{model 1}} - HR_{\text{model x}}) / (HR_{\text{model 1}} - 1)] \times 100\%$ [38]. The proportional hazards assumption was investigated by testing the constancy of the log hazard ratio over time by means of log-minus-log survival plots. According to the test, the proportional hazard assumption was not violated. Analyses were performed using SPSS, version 15.0.

Results

Table 1 shows the select baseline characteristics of the study sample by sex and race. There were no differences between Black and White men with respect to their age or being from the Pittsburgh study site; whereas Black women were younger and a larger proportion were from the Pittsburgh study site. In general, Blacks had a worse SES profile than Whites as indicated by higher proportions of individuals with less than 12 years of education, with less than \$10,000 income, without any financial assets, who perceive their income as inadequate, and lower average functional literacy scores. Fewer Blacks have supplemental health insurance than Whites. With regard to psychosocial factors, a larger proportion of Blacks lives alone, have low social contacts, or lack emotional support relative to Whites. Fewer Blacks have low personal mastery and report that religious faith is not important than Whites. As it relates to behavioral factors, more Blacks were current smokers, former drinkers, and physically inactive than Whites. Blacks more often than Whites rated their health as fair or poor. The prevalence of diabetes mellitus, poor cognitive functioning, and obesity was higher among Blacks, whereas the prevalence of osteoarthritis and cancer was higher among Whites. Compared to White men, Black men had lower prevalence of heart disease. Black women had higher prevalence of heart disease, peripheral arterial disease, and hospitalizations within the last year compared to White women. Black women had a lower prevalence of lung disease than White women.

The number of deaths and mortality rates are presented in Table 2. Over 8 years, 291 (17%) White persons and 288 (24%) Black persons died. Rates of all-cause mortality and cause-specific mortality were significantly higher in Blacks than in Whites with the highest death rates among Black men. Although death rates were higher in men than in women, interactions between race and sex were not significant (all $p > 0.20$). Therefore, all other results are presented for men and women together.

The contribution of each group of factors in explaining racial differences in mortality is presented in Table 3. Adjusting for age, sex, and study site, Blacks had a higher risk of all-cause mortality (hazard ratio (HR) 1.62, 95% confidence interval (CI) 1.38–1.91), CHD mortality (HR 1.54, 95% CI 1.12–2.12), and cancer mortality (HR 1.71, 95% CI 1.28–2.29) compared to Whites (model 1). For all-cause mortality, adjusting for SES in model 2 accounted for 60% of Black/White difference. Behavioral factors and self-rated health each explained about 30% of the racial differences in all-cause mortality (models 5 and 6). In the fully adjusted model where we simultaneously account for role of SES, health insurance, psychosocial factors, behavioral factors, self-rated health, and health-related factors in explaining racial differences in mortality (model 8), Blacks had a similar risk of all-cause mortality (HR 1.18, 95% CI 0.95–1.47) compared to Whites. With respect to CHD mortality, compared to Whites, Blacks had a higher risk of CHD mortality (HR 1.54, 95% CI 1.12–2.12) independent of age, sex, and study site. SES explained 96% of the racial differences in

CHD mortality. Health-related factors, behavioral factors, and self-rated health each explained over 40% of the racial differences in CHD mortality (models 5–7). In the fully adjusted model (model 8), Blacks also had a similar risk of CHD mortality (HR 0.93, 95%CI 0.60–1.45) compared to Whites. For cancer mortality, controlling for age, sex, and study site, Blacks had a higher risk of cancer mortality (HR 1.71, 95%CI 1.28–2.29) relative to Whites (Table 3, Model 1). Only 30% of the excess risk of mortality of cancer in Blacks was explained by SES, health insurance accounted for 18% and behavioral factors for 17%. In the fully adjusted model (model 8), Blacks had a higher risk of cancer mortality (HR 1.50, 95%CI 1.01–2.21) than Whites. In additional analyses, it was determined that income, number of financial assets, and functional literacy reduced the hazard ratios of mortality the most, while education and perceived financial adequacy did not further decrease the hazard ratios (data not shown).

The contribution of health insurance, psychosocial factors, behavioral factors, self-rated health, and health-related factors beyond SES in explaining racial differences in mortality is presented Table 4. After adjustment for age, sex, study site, and SES, Blacks had a higher risk of all cause mortality (HR 1.25, 95%CI 1.02–1.53) compared to Whites. Additional adjustment for behavioral factors (HR 1.17, 95% CI 0.95–1.44) or self-rated health (HR 1.18, 95%CI 0.96–1.45) eliminated race differences in all-cause mortality. When examining race differences in CHD mortality, SES (HR 1.02, 95%CI 0.69–1.52) completely explained the association between race and CHD death. With regard to cancer mortality, Blacks had a higher risk of mortality (HR 1.50, 95%CI 1.05–2.14) than Whites when accounting for age, sex, study site, and SES. Differences in health insurance (HR 1.43, 95%CI 0.99–2.06) or behavioral factors (HR 1.42, 95%CI 0.98–2.04) eliminated the race differences in cancer mortality.

Discussion

Among initially well-functioning older adults, when simultaneously accounting for all factors, Blacks show a similar risk for all-cause and CHD mortality, but a higher risk of cancer mortality relative to Whites, independent of SES and psychosocial, behavioral, and health-related factors. SES explained most of the racial differences in all-cause mortality, while behavioral factors and self-rated health further reduced the disparity. SES completely explained racial differences in CHD mortality. Health insurance and behavioral factors, specifically smoking and low physical activity accounted for some, but not all of the race differences in cancer mortality. Findings suggest that race-related risk factors for mortality may differ by the underlying cause of mortality.

Consistent with previous work [2, 3, 6, 10, 50], this study found a substantial part of racial differences in all-cause mortality was explained by the relative disadvantage among Blacks with regard to income, financial assets, and functional literacy. The unequal distribution of SES by race accounted for nearly all of the Black excess risk of death from CHD but only partially explained the race difference in cancer mortality. Different types of cancer have different etiologies, complicating the relationship between SES and cancer. Future research should focus on understanding the pathway by which SES contributes to disparities in mortality.

Behavioral factors, self-rated health, and health insurance status were key factors in explaining racial differences in all-cause and cancer mortality. Consistent with previous work [10, 18, 30] and extending to well-functioning older adults, an unhealthy lifestyle, such as smoking and low physical activity, was more common among Blacks, which partly contributes to their higher death rates. Future research should focus on health promoting strategies to encourage positive health behaviors among older Black adults.

This study also provides evidence that race differences in self-rated health explain in part race differences in all-cause mortality. Previous studies have shown the importance of self-rated health over specific health indicators in predicting mortality [51, 52]. Likewise, in the current study, self-rated health contributed to the explanation of race-related differences in all-cause and cancer mortality, whereas prevalence of several diseases did not. A possible explanation is that self-rated health may reflect severity of chronic conditions and overall disease burden.

Few studies have examined the impact of health insurance on race differences in all-cause or cause specific mortality among older adults [10]. In the current study, fewer Blacks (men 61.1% vs. 91.2%; women 66.8% vs. 92.6%) had supplemental health insurance which likely contributed to the excess Black risk of cancer mortality. Because health insurance facilitates access to health care, it is associated with better health outcomes by improving the quality and quantity of access to health care. Although older adults have Medicare, they still have variable access to health care based on the purchase of supplemental health insurance through Medicare or private companies. This finding is consistent with previous work that showed that cancer survival is higher and all-cause mortality lower in people with private insurance or comprehensive health care [53, 54]. In the current study, even though Whites had a higher prevalence of cancer than Blacks, they had lower cancer-related mortality. This suggests that Blacks may have higher rates of undiagnosed and/or late-stage diagnosed cancer and consequently lower 5-year survival rates than Whites (American Cancer Society, 2010). These findings suggest that improved access to health care may help reduce disparities in cancer-related mortality.

Our findings should be interpreted in the following context. First, selective survival may have affected the association between race and mortality. Because the Health ABC cohort consists of initially well-functioning adults who have lived at least seven decades, the findings only apply to persons who avoided early mortality and substantial comorbidity. If the age group was older, we may have found lower mortality rates in Blacks relative to Whites which has been observed in some studies of very old persons [55–57]. In the present study, the Black/White differences in mortality are somewhat stronger in people younger than 75 years; however, in the group of 75 years and older, Blacks still had significantly higher mortality than Whites (data not shown). Second, the narrow age range and restriction to two geographical areas may also limit the external validity of the findings. Third, with the exception of educational attainment, there was limited information on earlier life experiences that may condition disparities in late life [58–60]. Because exposures in early life may affect initiation and progression of health conditions in late life, attempts should be made to capture early life exposures to identify critical periods across the life course where disparities emerge. Furthermore, investigators are strongly encouraged to begin to understand the complex way in which behavioral factors operate (e.g., emerge, remain constant, or be modified) to differentially place people into groups that may lead to observed race differences [61]. Fourth, we had no standardized assessment of severity of baseline health conditions and relied on self-rated health to account for disease burden. We cannot exclude the possibility that more comprehensive measurement of disease burden may have explained the residual association between mortality and race. Finally, this study included only Black and White older adults. It is unclear if findings would differ for other minority groups.

This study has several strengths. First, sufficient numbers of older well-functioning Black adults were available to provide reliable estimates of the association between race and mortality in this select group. Second, we were able to evaluate an expanded set of SES indicators including, in addition to education and income, number of financial assets, perceived income adequacy, and health literacy. Third, inclusion of psychosocial,

behavioral, and health-related factors provided an opportunity to simultaneously examine the role of different explanatory factors for the observed racial difference in mortality [10]. Future work should focus on more fully exploring what underlies the construct of “race.” Thus, it is necessary to conduct within race group investigations to understand how social and behavioral factors influence mortality [23, 62, 63]. This cannot be gleaned from a difference in the race parameter estimate [23, 62, 64]. Such analysis is needed for the development of health-promoting strategies and interventions [23, 62].

This study shows that racial differences in mortality still exist in the eighth decade, but are largely explained by the unequal distribution of SES by race. Beyond SES, unhealthy behavior and poor self-rated health among Blacks further explained the racial difference in all-cause mortality and lack of supplemental health insurance among Blacks and behavioral factors eliminated the racial differences in cancer mortality. These findings underscore the need to develop health policies and health promotion strategies focused on social and behavioral factors to reduce premature mortality particularly among Blacks.

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Table 1
Baseline characteristics of 2938 Health ABC study participants (1997/1998) by sex and race

Characteristics	Men		Women		p value	p value
	White n=899	Black n=524	White n=822	Black n=693		
Demographic variables						
Age, mean (SD)	74.4 (2.9)	74.0 (2.8)	74.1 (2.8)	73.9 (3.0)	0.34	0.01
Pittsburgh site,%	48.9	49.8	46.2	54.5	0.75	<0.01
Socioeconomic status						
Education,%						
<12 years	13.9	49.2	10.1	37.5	<0.01	<0.01
12 years	25.9	25.0	42.8	35.8		
>12 years	60.2	25.8	47.1	26.7		
Income,%						
<10,000	1.2	16.6	6.6	27.3	<0.01	<0.01
10,000–<25,000	24.9	44.3	31.0	42.6		
25,000–<50,000	37.6	23.7	33.3	14.1		
50,000	27.3	7.8	15.2	2.0		
Missing	9.0	7.6	13.9	14.0		
Financial assets,%						
None	6.4	21.4	11.7	31.0	<0.01	<0.01
1–2	27.9	59.2	29.4	54.1		
3–7	65.7	19.5	58.9	14.9		
Perceived financial inadequacy,%	6.1	16.0	7.3	21.9	<0.01	<0.01
Functional literacy score, mean(SD)	62.6 (5.9)	52.2 (15.3)	64.2 (4.2)	57.0 (12.8)	<0.01	<0.01
Health insurance,%						
Supplemental health insurance	91.2	61.1	92.6	66.8	<0.01	<0.01
Psychosocial factors,%						
Living alone	15.8	24.4	38.2	43.7	<0.01	0.03
Low social contacts	5.9	13.0	4.6	6.5	<0.01	0.11
Lack of emotional support	10.0	17.9	16.7	18.8	<0.01	0.29
Low personal mastery beliefs	49.8	48.3	57.4	47.1	0.57	<0.01

Characteristics	Men		Women		p value
	White n=899	Black n=524	White n=822	Black n=693	
Religious faith unimportant	21.7	9.4	10.5	1.9	<0.01
Behavioral factors,%					
Smoking					
Never	28.8	30.5	59.5	55.4	0.01
Former	66.2	49.4	32.7	32.3	
Current	5.0	20.0	7.8	12.3	
Alcohol intake					
Never	15.2	18.5	35.6	42.7	<0.01
Former	20.1	34.5	11.9	26.6	
Low	19.1	20.0	22.9	20.8	
Moderate	40.4	21.2	24.6	7.9	
High	5.1	5.7	5.0	2.0	
Physical activity,%					
Inactive	16.8	27.5	22.7	28.0	<0.01
Lifestyle active	42.6	51.5	57.7	59.5	
Exercise	40.6	21.0	19.6	12.6	
Self-rated health,%					
Very good/excellent	53.6	34.4	50.2	33.5	<0.01
Good	37.3	37.0	42.2	41.4	
Fair	8.7	27.1	7.2	24.1	
Poor	0.4	1.5	0.2	1.0	
Health-related factors,%					
Heart disease	24.9	18.5	9.5	14.7	<0.01
Cerebrovascular disease	6.1	7.8	6.9	8.1	0.40
Peripheral arterial disease	6.5	7.4	2.6	5.1	0.01
Diabetes mellitus	18.7	27.3	9.1	23.7	<0.01
Lung disease	23.1	25.4	16.4	10.7	<0.01
Osteoarthritis	12.0	5.2	23.1	14.0	<0.01
Cancer	26.6	13.9	22.5	9.2	<0.01
Poor cognitive functioning	2.4	20.6	1.3	11.0	<0.01

Mortality rates for all-cause, coronary heart disease, cancer, and other causes of death for Black and White older adults in the Health ABC Study

Table 2

	Cause-specific					
	All-cause		Coronary heart disease		Cancer	
	Death <i>n</i> (%)	Mortality rate per 10,000 person-years	Death <i>n</i> (%)	Mortality rate per 10,000 person-years	Death <i>n</i> (%)	Mortality rate per 10,000 person-years
White						
Total	291 (17)	250	80 (5)	69	90 (5)	77
Men	187 (21)	314	53 (6)	89	59 (7)	99
Women	104 (13)	183	27 (3)	47	31 (4)	54
Black						
Total	288 (24)	366	75 (6)	95	94 (8)	120
Men	167 (32)	515	45 (9)	139	57(11)	176
Women	121 (17)	262	30 (4)	65	37 (5)	80

Hazard ratios and 95% confidence interval (CI) of all-cause and cause-specific mortality for Black and White older adults in the Health ABC Study over 8 years

Table 3

Model	All-cause			Coronary heart disease			Cancer		
	White	Black		Black	Black	% Red ^a	HR	95% CI	% Red ^a
		HR	95% CI						
1—Age, sex, site	1.00	1.62	1.38–1.91	1.54	1.12–2.12	1.71	1.28–2.29		
2—Age, sex, site, SES	1.00	1.25	1.02–1.53	60	1.02	0.69–1.52	96	1.50	1.05–2.14
3—Age, sex, site, health insurance	1.00	1.53	1.28–1.83	15	1.41	1.00–2.00	24	1.58	1.15–2.16
4—Age, sex, site, psychosocial factors	1.00	1.59	1.34–1.88	5	1.47	1.06–2.04	13	1.70	1.25–2.29
5—Age, sex, site, behavioral factors	1.00	1.42	1.19–1.69	32	1.32	0.94–1.84	41	1.59	1.14–2.13
6—Age, sex, site, self-rated health	1.00	1.43	1.20–1.69	31	1.32	0.95–1.84	41	1.65	1.22–2.22
7—Age, sex, site, health-related factors	1.00	1.50	1.25–1.79	19	1.28	0.89–1.83	48	1.90	1.39–2.60
8—All variables of the previous models	1.00	1.18	0.95–1.47	71	0.93	0.60–1.45	>100	1.50	1.01–2.21

^aPercentage reduction in hazard ratio from model 1 computed by [(HR model 1 – HR model x)/(HR model 1 – 1)] × 100%

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Hazard ratios and 95% confidence interval (CI) of all-cause and cause-specific mortality for Black and White older adults in the Health ABC Study: the role of health insurance, psychosocial factors, behavioral factors, and health-related factors beyond socioeconomic status

Table 4

Model	All-cause			Coronary heart disease			Cancer		
	White		Black	Black		Black	Black		Black
	HR	95% CI		HR	95% CI		HR	95% CI	
1—Age, sex, site, SES	1.00	1.02–1.53		1.02	0.69–1.52		1.50	1.05–2.14	
2—Age, sex, site, SES, health insurance	1.00	1.01–1.53	4	1.01	0.67–1.51	50	1.43	0.99–2.06	14
3—Age, sex, site, SES, psychosocial factors	1.00	1.03–1.55	–	1.01	0.68–1.51	50	1.54	1.07–2.22	–
4—Age, sex, site, SES, behavioral factors	1.00	0.95–1.44	32	0.95	0.64–1.42	>100	1.42	0.98–2.04	16
5—Age, sex, site, SES, self-rated health	1.00	0.96–1.45	28	0.96	0.64–1.42	>100	1.48	1.03–2.12	4
6—Age, sex, site, SES, health-related factors	1.00	1.03–1.56	–	1.02	0.67–1.54	–	1.62	1.13–2.34	–

^aPercentage reduction in hazard ratio from model 1 computed by [(HR model 1 – HR model x)/(HR model 1 – 1)] × 100%