

shown in Table 1, suggesting a greater exposure to a hazardous and violent environment. These exogenous causes also need traditional public health interventions such as legislation, education, or education.

The large differences in mortality rates between poor and nonpoor youth for these and other causes warrant further studies to determine, on a cause-specific basis, the reasons for these mortality differentials. □

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# Does Equal Socioeconomic Status in Black and White Men Mean Equal Risk of Mortality?

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## Introduction

In the early 1970s Terris<sup>1</sup> expressed disdain for evaluation of health statistics by race, contending that the appropriate variable for comparison was socioeconomic status. Despite evidence by Antonosky, Kitagawa, Kaplan, Feldman, Marmot, and Haan<sup>2-7</sup> of an inverse relationship between socioeconomic status and mortality, studies have continued to focus on ethnicity. Such studies<sup>8-9</sup> identify a racial difference in risk factors for mortality but, in most instances, use the concept of socioeconomic status to explain the reported difference. Nevertheless, these studies have served social and humanitarian purposes by identifying underserved populations at particular risk of disease or death. In the Charleston Heart Study cohort, low socioeconomic status was found to be a significant predictor of the incidence of hypertension, while skin color was not.<sup>10</sup> Recently, Gillum<sup>11</sup> has shown that mortality from coronary heart disease or from all other causes among Blacks has been greater than among Whites. The purpose of this report is to provide additional evidence

from the Charleston Heart Study to support the hypothesis that socioeconomic status is a key predictor of mortality when ethnicity is controlled.

## Materials and Methods

The study population in Charleston, SC, was a random sampling of Black and White men who were 35 to 74 years of age

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## ABSTRACT

Although concerns have been expressed that mortality from coronary disease and all other causes is greater among Blacks than Whites, we hypothesized that, when socioeconomic status is adequately considered, mortality inequalities between Blacks and Whites are insignificant. The study population was a random sampling of Black and White men who were 35 years of age or older when recruited into the Charleston Heart Study in 1960. Education level and occupational status at baseline were used to compare mortality over the ensuing 28 years between Black and White men, who were classified as low or high socioeconomic status. In no instance were Black-White differences in all-cause or coronary disease mortality rates significantly different when socioeconomic status was controlled. We conclude that socioeconomic status is an important predictor of mortality and that, when socioeconomic status is considered, differences in Black-White mortality rates may be small. (*Am J Public Health*. 1992;82:1133-1136)

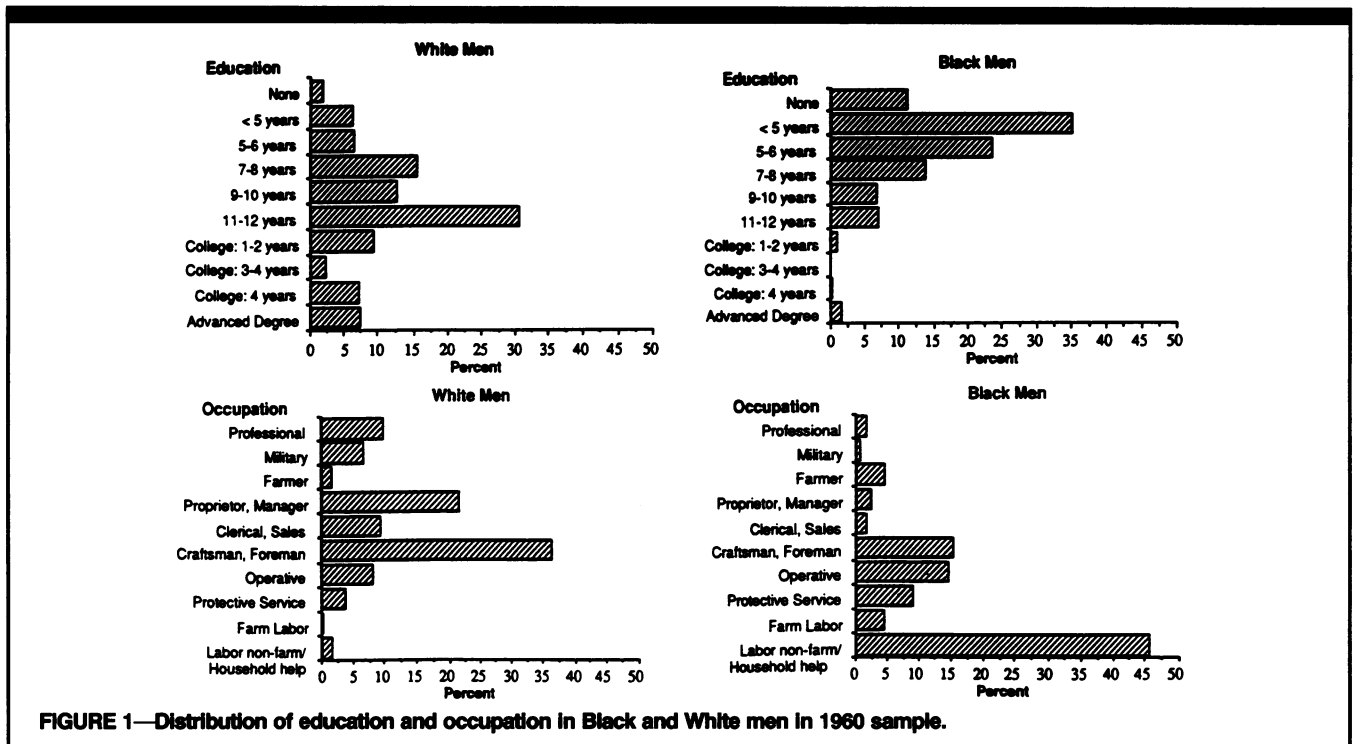


FIGURE 1—Distribution of education and occupation in Black and White men in 1960 sample.

**TABLE 1—Status of the Cohort in 1988**

1960 Cohort	Deceased								Unable to Locate		
	Coronary Heart Disease <sup>a</sup>				Other Causes						
	Alive		Deceased		Alive		Deceased				
n	n	%	n	%	n	%	n	%	n	%	
White men	653	131	20	240	37	267	41	15	2		
Black men	333	50	15	157	47	123	37	3	1		
High socioeconomic status Black men	102	8	8	26	25	68	67	0	0		

<sup>a</sup>Codes 410–414 of the *International Classification of Diseases*, 9th version, from nosologist coding of underlying cause of death.

in 1960. Details of the baseline examination and sampling plan have been previously published.<sup>12</sup> In 1963, the cohort was supplemented with 102 Black men of high socioeconomic status who had been recruited by peer nomination to provide an extended range of economic status in Blacks. Between 1960 and 1988, there were four recalls of the cohort. Table 1 provides the vital status of the cohort through 1988.

While there was a wide range of education and occupations among White men, more than 85% of randomly selected Black men had 8 years or less of education and 75% were in the lower occupation groups of laborer, protective service worker, craftsman, or operative (Figure 1). To assess the influence of both race and socioeconomic status, comparisons of

age-adjusted coronary heart disease and all-cause mortality rates<sup>13</sup> were made in four groups: Black, White, low socioeconomic status, and high socioeconomic status. Low socioeconomic status was defined as having 0 to 8 years of education and being in the lower occupation group. High socioeconomic status was defined as having some college education and an occupation of proprietor or professional.

The participants of low socioeconomic status included in the analyses were from the random sampling of 1960. For high socioeconomic status, the White men were from the random sampling of 1960, while most of the Black men were from the special cohort recruited in 1963. Baseline characteristics are described in Table 2.

## Results

Table 3 provides a comparison of mortality among Black and White male participants in the Charleston Heart Study when socioeconomic status criteria are strictly met, and also provides estimates of the effect of socioeconomic status while controlling for race. White men had higher rates than Black men, regardless of socioeconomic status or cause of death. In no instance was the White-Black difference in rates statistically significant, although the White-Black ratio for coronary heart disease mortality among men of low socioeconomic status was 1.8 (7.1/4.0). Among Whites for all causes of death, men of low socioeconomic status had rates 1.8 times those of men of high socioeconomic status. The rate ratio was 2.1 for coronary heart disease mortality. Among Blacks, the low-high socioeconomic status ratio was 2.1 for all-cause mortality and 1.6 for coronary heart disease mortality.

## Discussion

There is evidence in both White and Black men that socioeconomic status has a powerful influence on coronary mortality and death from all causes. In every comparison controlling for socioeconomic status, the rates for Black men were slightly, but not significantly, lower than for White men.

TABLE 2—Charleston Heart Study Baseline Characteristics of Men Aged 35–74 by Socioeconomic Status

	Low Socioeconomic Status <sup>a</sup>						High Socioeconomic Status <sup>b</sup>					
	White (n = 151)			Black (n = 258)			White (n = 115)			Black (n = 77)		
	Mean	SD	%	Mean	SD	%	Mean	SD	%	Mean	SD	%
Age	51.5	9.34		49.1	9.75		47.9	9.83		47.4	9.63	
Systolic blood pressure	143.6	23.58		153.6	30.09		139.6	20.25		139.9	18.85	
Diastolic blood pressure	85.3	10.88		91.5	14.18		83.8	9.40		85.6	12.76	
Cholesterol	229.9	41.98		222.8	51.76		242.1	41.24		251.4	45.15	
Body mass index	25.6	4.23		25.3	4.32		25.1	2.91		27.2	4.72	
Education, y	6.0	1.9		4.2	2.6		14.9	2.6		15.2	2.6	
Smoking			65.8			56.2			56.3			51.9
Diabetes			2.0			4.3			2.6			2.6
Electrocardiogram LVH			2.6			9.7			0.9			2.5
Medical care												
Private physician			87.8			65.1			98.3			98.7
Clinic			3.4			14.9			1.8			0.0
None			8.8			20.0			0.0			1.3
Occupation												
Laborer			4.6			60.6			...			...
Other			95.4			39.4			...			...
Professional			...			...			51.3			71.4
Proprietor			...			...			48.7			28.6

<sup>a</sup>Education = less than 8 years; occupation = craftsman, operative, protective, farm laborer, or other laborer.

<sup>b</sup>Education = some college or greater; occupation = professional or proprietor.

Black men of low socioeconomic status had lower baseline levels of education, higher blood pressure, more electrocardiogram left ventricular hypertrophy, and less access to medical care, but had lower cholesterol and were younger, than the White men. Age adjusting the risk factors of the low socioeconomic status group had the effect of increasing the risk factors of Black men, yet their mortality rates were lower. White and Black men of high socioeconomic status had comparable characteristics. Blood pressure was higher and cholesterol was lower in the low than in the high socioeconomic status ethnic peer group. In both socioeconomic status groups, Black men had lower mortality rates than White men. Black men of lower socioeconomic status had 13.7% lower all-cause rates and 43.1% lower rates for coronary heart disease mortality than Whites. Black men of high socioeconomic status had 24% lower all-cause and 32% lower coronary heart disease mortality than White men of high socioeconomic status.

Our findings may be mediated by the Black-White mortality crossover effect reported by Wing<sup>14</sup> that suggests that once Blacks attain age 65 they have preferred survival status. It has also been postulated that socioeconomic status may have opposite effects during the earlier and later periods of the coronary heart disease epi-

TABLE 3—Mortality Rates,<sup>a</sup> 1960–1988: White and Black Men

	All-Cause Mortality			Coronary Heart Disease Mortality		
	n	Age-Adjusted Rate	(95% CI)	n	Age-Adjusted Rate	(95% CI)
Low socioeconomic status						
White men (n = 151)	101	20.9	(13.5, 28.3)	33	7.1	(2.2, 11.9)
Black men (n = 258)	159	18.0	(14.3, 21.7)	36	4.0	(2.2, 5.9)
High socioeconomic status						
White men (n = 115)	59	11.5	(7.5, 15.4)	22	3.5	(2.0, 5.0)
Black men (n = 77)	30	8.7	(5.6, 11.8)	8	2.4	(0.7, 4.1)

<sup>a</sup>Age-adjusted rate per 1000 person years.

demic. This concept, suggestive of a socioeconomic status crossover, was demonstrated by Marmot<sup>15,16</sup> to show “that as the CHD [coronary heart disease] epidemic grew in industrialized countries, it affected first the more affluent classes and then percolated through the social classes.” A similar finding in the Evans County, Georgia, cohort was reported by Morgenstern.<sup>17</sup> For the Charleston Heart Study cohort, a socioeconomic status crossover effect was not detected. However, since Black men of low socioeconomic status had lower rates and fewer years of education and were more likely to be laborers than White men, a protective effect for

these men is suggested. Our findings of lower mortality in Black men of low socioeconomic status may suggest that they were acculturating at a rate somewhat slower than White men of low socioeconomic status, providing evidence for Marmot's thesis.

Finally, more positive interpretations of our results are difficult because of the relatively small sample size and the commensurate large confidence intervals around the estimates of mortality.

While our results are comforting in that Black men per se may not have higher mortality than White men, they may also provide further evidence of the validity of

Antonosky's exclamation<sup>2</sup> of the 1960s: "The inescapable conclusion is that class influences one's chance of staying alive." □

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## ABSTRACT

The aim was to investigate whether job strain affects mortality in a representative population of elderly men, and whether social network and social support outside the workplace can buffer the negative health effects of job strain. A higher relative mortality risk (RR) was found among men exposed to job strain (RR = 1.7). The combination of exposure to job strain and seven different measures of weak social network and social support was associated with a further increased RR ranging from 2.1 to 4.6. (*Am J Public Health*. 1992;82:1136-1139)

## Job Strain and Mortality in Elderly Men: Social Network, Support, and Influence as Buffers

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### Introduction

In 1979, Karasek proposed a two-dimensional model for measuring psychosocial work conditions, in which the combination of high psychological job demands and low personal schedule freedom (job strain) was found to be associated with depression, exhaustion, and job dissatisfaction.<sup>1</sup> After that, several studies found associations between job strain and cardiovascular disease.<sup>2-6</sup> Job support was later added as a third concept in a three-dimensional model (iso-strain).<sup>7-8</sup>

Social network and social support have been shown to affect morbidity and mortality,<sup>9-13</sup> and it has been suggested that they may have a buffering function on the negative health effects of different stressors.<sup>14</sup>

Previous studies on the health effects of job strain have all been performed on active, working populations. No studies

have investigated the chronicity of job strain and its effects on health in elderly people.

The aims of this study are therefore to investigate whether exposure to job strain during the active working period affects mortality in elderly men after retirement and to investigate if the social network and social support outside the place of work can buffer the negative health effects of job strain.

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