

# SOCIAL CLASS AND HEART DISEASE MORTALITY AMONG AFRICAN AMERICANS

The purpose of the present study was to examine variation in heart disease death rates by the social class of decedents. The term, "social class" refers to a complex set of phenomena such as control over economic resources, social status, and power relative to others in society.

The target population for this study was African-American adults aged 35–74 years old who resided in the United States during the years 1996–1997. As a proxy for social class, we examined 5 levels of educational attainment: 0–8 years of school completed (Social Class I), 9–11 years of school completed (Social Class II), high school graduate/12 years of school completed (Social Class III), some college completed (Social Class IV), and college degree completed (Social Class V).

Older age, male gender, and lower social class were all independently associated with higher heart disease death rates. For all ages, more disadvantaged social classes had a higher risk of heart disease mortality. The highest relative risks were found for Social Classes I and II among the younger age groups.

Many of the "prerequisites" for the "heart healthy lifestyle" are predicated on the benefits of a privileged social class position. For African Americans, there are the additional stressors of segregation, exclusion, and discrimination to overcome, as well as the cumulative physiological toll of lifetime resistance to various forms of racism. For many African Americans in disadvantaged social class positions, the obstacles to reducing the risk for heart disease are very difficult to overcome. (*Ethn Dis.* 2002;12[suppl3]:S3-76–S3-81)

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From the Department of Epidemiology and Biostatistics, College of Public Health, University of South Florida, Tampa, Florida.

Address correspondence and reprint requests to Elizabeth Barnett, PhD; Associate Professor; Department of Epidemiology and Biostatistics; College of Public Health; University of South Florida; 13201 Bruce B. Downs Blvd, MDC 56; Tampa FL 33612; 813-974-2235; 813-974-4719 (fax); ebarnett@hsc.usf.edu

Elizabeth Barnett, PhD;  
Carol R. Williams, MPH; Latetia Moore, MSPH;  
Fangfei Chen, MPH

Compared with Whites in the United States, African Americans experience a greater prevalence of most heart disease risk factors,<sup>1–4</sup> face greater barriers to medical care access,<sup>5–8</sup> are more likely to develop heart disease, and are more likely to die from heart disease.<sup>9–10</sup> Studies that focus on racial comparisons provide important data about continuing disparities. However, despite the utility of racial comparisons, heart disease researchers have placed insufficient emphasis on understanding diversity and heterogeneity within "the African-American community." The practice of designing studies and analyzing data in ways that classify all Blacks as members of an essentially homogeneous group (especially in comparison with Whites) is a logical extension of the prevalent biomedical paradigm in cardiovascular research. Within this dominant paradigm, racial disparities in cardiovascular disease are purported to derive from essential, heritable, biological differences between Blacks and other racial groups. Genetic explanations for the continued excesses in cardiovascular disease suffered by African Americans have persisted into the 21st century, despite an abundance of rigorous scientific evidence that racial groups do not vary in a significant biological way, whether related to development or evolution.<sup>11–14</sup>

In contrast, the theoretical paradigm on which our research is based recognizes race not as a genetic risk factor, but rather as a critically important social category.<sup>15</sup> The idea of "race" emerged 500 years ago as Europeans colonized the Americas and then began the iniquitous dispossession and enslavement of West Africans. The labor of these displaced African men and women and their descendants built the wealth of the

colonies and subsequently the nation.<sup>16–17</sup> Although outright slavery was made illegal in the United States in 1865, many other forms of racial segregation and discrimination were legal for another 100 years.<sup>18</sup>

A very small economically and socially privileged class of Blacks had emerged in the United States as early as the 18th century.<sup>19</sup> Following emancipation, several waves of migration away from the rural South to the industrial centers of the North created vibrant and self-contained urban neighborhoods. However, a substantial Black middle class did not emerge until after World War II. The war, and the economic boom that followed, created unprecedented opportunities for some Blacks, as racial exclusions in federal government hiring and trade union membership were considerably diminished.<sup>20</sup> Today, the legacy of this history is the existence of many geographically dispersed African-American communities characterized by tremendous cultural, social, and economic diversity.<sup>21–22</sup>

The purpose of the present study was to examine variation in heart disease death rates by the social class of decedents. Historically, heart disease has been positively associated with industrialization, societal wealth, and privileged social class.<sup>23</sup> During the 20th century, dramatic changes in the material conditions of the poor and working classes contributed to a change in the character of heart disease from a disease of the affluent to a disease increasingly of the disadvantaged and poor.<sup>24</sup> In the latter half of the 20th century, African Americans of lower social class were at a substantially increased risk of heart disease risk factors and mortality, compared with those of higher social class.<sup>10</sup>

## METHODS

The target population for this study was African-American adults aged 35–74 years old who resided in the United States during the years 1996–1997. Our final analyses excluded the populations of Georgia, Oklahoma, Rhode Island, and South Dakota because social class and education information was not available on death certificates in these states for both 1996 and 1997.

We chose to define social class based on educational attainment because this was the best measure of social class available for both women and men, and for both population (denominator) data and heart disease death (numerator) data. We examined 5 levels of educational attainment: 0–8 years of school completed (Social Class I), 9–11 years of school completed (Social Class II), high school graduate/12 years of school completed (Social Class III), some college completed (Social Class IV), and college degree completed (Social Class V).

To calculate heart disease death rates for the years 1996–1997 by social class, we needed population counts for African Americans stratified by social class (5 levels of educational attainment), gender (women and men), and 10-year age group (35–44, 45–54, 55–64, 65–74). We used data from the decennial Census for 1990,<sup>25</sup> but detailed Census 2000 data on educational attainment had not been released at the time these data were analyzed (early 2002). However, national estimates of educational attainment (stratified by race, gender, age) were available from the Current Population Survey (CPS) for the year 2000.<sup>26</sup> We used the CPS percent distributions of educational attainment in combination with the Census 2000<sup>27</sup> population counts for Blacks (stratified by gender and age) to create reliable population counts by social class, gender, and age for the year 2000. Finally, we linearly interpolated from the 1990 and 2000 endpoints to calculate popu-

lation denominators for the years 1996 and 1997.

Heart disease death data were obtained from national computerized files of death certificates created by the National Center for Health Statistics.<sup>28</sup> We included decedents whose underlying cause of death was listed as “diseases of the heart,” and who were residents of the United States.

Preliminary examination of the heart disease death data for Blacks revealed that 14% of death certificates were missing information about educational attainment. Rather than exclude those deaths from our analyses, we chose to assign social class based on a conservative algorithm. We compared the social class distributions for our death (numerator) and population (denominator) data. We found that the population distribution was weighted toward the more privileged social classes compared with the death distribution. Therefore, we assigned social class for the death certificates with missing data based on the underlying population distribution of social class. If misclassification resulted from this imputation process, it would have the effect of biasing our estimates of relative risk toward the null, since the true figures for educational attainment were likely lower than the assigned values. We subsequently compared heart disease death rates by social class for all deaths, including assigned data vs deaths with all those missing information, and found no notable differences in the relative risks.

We calculated age-specific heart disease death rates by social class and gender by dividing death counts by population counts for each sociodemographic group. Age-adjusted heart disease death rates for ages 35–74 were calculated using the direct method with the 2000 US population as the standard. Relative risks and 95% confidence intervals for heart disease mortality by social class, with Social Class V as the referent group, were calculated using Poisson regression.

We obtained descriptive information about the sociodemographics and living and working conditions of African Americans by social class from a special tabulation of the 1990 Census of Population and Housing.<sup>29</sup>

## RESULTS

More than 24 million person-years of mortality experience were analyzed in this study (Table 1). Overall, only 15% of men and 16% of women aged 35–74 years old were in the most privileged social class (Social Class V) in 1996–1997. The social class position of African-American men and women varied substantially by age and to a lesser extent by gender. For example, the percentage of Black men in the most disadvantaged social class (Social Class I) ranged from only 3% among those aged 35–44 years old to 34% among those aged 65–74 years old. For both men and women, Social Class III (high school graduates) was the largest group, including 33% of the total population.

During the period 1996–1997, heart disease deaths among Blacks aged 35–74 years old numbered greater than 46,000 for men, and greater than 34,000 for women (Table 1). Heart disease death rates varied substantially by age, gender, and social class (Table 2). Older age, male gender, and lower social class were all independently associated with higher heart disease death rates.

Social Class V (college graduates) was the referent (low risk) group for calculation of estimated relative risks of heart disease mortality by social class (Table 3). For both genders of all ages, more disadvantaged social classes were at a higher risk for heart disease mortality. The highest relative risks were found for Social Class I and II among the younger age groups. For both men and women aged 55–74, the highest relative risks were observed for Social Class III. African Americans who had some college education but no degree (Social Class

**Table 1. Social class distribution of person-years and heart disease deaths in African Americans, 1996–1997**

Person-Years	Social Class											
	I		II		III		IV		V		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Social class distribution												
Black men												
35–44	162619	3	578225	12	1802909	39	1412876	30	776278	16	432907	100
45–54	231605	7	563246	17	1062117	32	857442	26	581865	18	3296275	100
55–64	355609	18	488791	25	553070	28	346593	17	239056	12	1983119	100
65–74	444584	34	281078	22	313632	24	150331	12	105036	8	1294661	100
35–74	1194417	11	1911340	17	3731728	33	2767242	24	1702235	15	11306962	100
Black women												
35–44	122555	2	752835	14	1786351	34	1748264	32	979535	18	5389540	100
45–54	179868	5	664614	17	1332972	34	990510	26	699077	18	3867041	100
55–64	295056	12	616035	25	857072	34	433106	17	293641	12	2494910	100
65–74	465039	25	534975	29	485985	26	174683	9	199914	11	1860596	100
35–74	1062518	8	2568459	19	4462380	33	3346563	24	2172167	16	13612087	100
Heart disease deaths												
Black men												
35–44	197	5	834	20	2043	49	729	17	376	9	4179	100
45–54	845	9	1890	20	4082	44	1580	17	967	10	9364	100
55–64	2638	19	3091	22	5582	40	1509	11	1105	8	13925	100
65–74	6006	32	3653	20	6231	33	1607	9	1143	6	18640	100
35–74	9686	21	9468	20	17938	39	5425	12	3591	8	45108	100
Black women												
35–44	88	3	478	19	1161	46	566	22	257	10	2550	100
45–54	353	7	962	17	2388	45	1062	20	568	11	5333	100
55–64	1292	14	2130	22	4071	44	1095	12	727	8	9315	100
65–74	4210	25	3681	21	6310	38	1496	9	1118	7	16815	100
35–74	5943	17	7251	22	13930	41	4219	12	2670	8	34013	100

Social Class I = 0–8 years of education; Social Class II = 9–12 years of education; Social Class III = high school graduate; Social Class IV = some college education; and Social Class V = college and beyond.

**Table 2. Heart disease deaths per 100,000 population by social class and age in African Americans, 1996–1997**

	Social Class				
	I	II	III	IV	V
Black men					
35–44	121	144	113	52	48
45–54	364	336	384	184	166
55–64	741	632	1011	435	462
65–74	1351	1300	1987	1069	1088
35–74	449	424	573	279	279
Black women					
35–44	72	64	65	32	26
45–54	196	144	179	107	81
55–64	438	345	475	253	248
65–74	905	688	1298	856	559
35–74	272	211	317	191	145

Age-adjusted death rate. Social Class I = 0–8 years of education; Social Class II = 9–12 years of education; Social Class III = high school graduate; Social Class IV = some college education; and Social Class V = college and beyond.

IV) were at only a marginally increased risk of heart disease mortality, with the exception of being women aged 65–74 years old (RR 1.5, 95% CI 1.4–1.7).

## DISCUSSION

The results of our study demonstrate a strong, statistically significant association between social class and heart disease mortality among African Americans aged 35–74 years old. Social class gradients were highest among adults aged 35–44 years old, and slightly higher for women compared with men at all ages.

The term “social class” refers to a complex set of phenomena, such as control over economic resources, social status, and power relative to others in society.<sup>30</sup> Social class has been shown to be strongly associated with disparities in

**Table 3. Relative risks<sup>a</sup> of heart disease mortality for social class by gender and age in African Americans, 1996–1997**

	Social Class				
	I	II	III	IV	IV†
Black men					
35–44	2.5	3.0	2.3	1.1	1.0
95% CI	(2.1–3.0)	(2.6–3.4)	(2.1–2.6)	(.9–1.2)	(1.0–1.0)
45–54	2.2	2.0	2.3	1.1	1.0
95% CI	(2.0–2.4)	(1.9–2.2)	(2.2–2.5)	(1.0–1.2)	(1.0–1.0)
55–64	1.6	1.4	2.2	.9	1.0
95% CI	(1.5–1.7)	(1.3–1.5)	(2.1–2.3)	(.9–1.0)	(1.0–1.0)
65–74	1.2	1.2	1.8	1.0	1.0
95% CI	(1.2–1.3)	(1.1–1.3)	(1.7–1.9)	(.9–1.1)	(1.0–1.0)
35–74	1.6	1.5	2.1	1.0	1.0
95% CI	(1.5–1.6)	(1.5–1.6)	(2.1–2.2)	(1.0–1.1)	(1.0–1.0)
Black women					
35–44	2.7	2.4	2.5	1.2	1.0
95% CI	(2.2–3.5)	(2.1–2.8)	(2.2–2.8)	(1.1–1.4)	(1.0–1.0)
45–54	2.4	1.8	2.2	1.3	1.0
95% CI	(2.1–2.8)	(1.6–2.0)	(2.0–2.4)	(1.2–1.5)	(1.0–1.0)
55–64	1.8	1.4	1.9	1.0	1.0
95% CI	(1.6–1.9)	(1.3–1.5)	(1.8–2.1)	(.9–1.1)	(1.0–1.0)
65–74	1.6	1.2	2.3	1.5	1.0
95% CI	(1.5–1.7)	(1.2–1.3)	(2.2–2.5)	(1.4–1.7)	(1.0–1.0)
35–74	1.7	1.4	2.2	1.3	1.0
95% CI	(1.7–1.8)	(1.4–1.5)	(2.1–2.3)	(1.2–1.3)	(1.0–1.0)

<sup>a</sup> RR calculated using Poisson Regression.

† Referent category.

Social Class I = 0–8 years of education; Social Class II = 9–12 years of education; Social Class III = high school graduate; Social Class IV = some college education; and Social Class V = college and beyond.

a wide range of health outcomes, including quality of life, disabilities, incidence of disease, access to medical care, and premature death.<sup>31–32</sup> The material benefits of a privileged social class position include stability of income, accumulation of wealth, high quality of housing and residential neighborhood, and access to many other resources for healthy living. There are also frequently important benefits, both sociocultural (eg, greater prestige, better social networks, less social isolation)<sup>33–34</sup> and psychological (eg, greater feelings of self-efficacy, hopefulness, and control over the future)<sup>35–38</sup> to a privileged social class position, and these benefits contribute to health and longevity. In epidemiological studies, the social class position of individuals is usually classified indirectly based on current occupation, annual income, or educational attainment.<sup>31,39</sup>

We examined the association of our chosen measure of social class (educa-

tional attainment) with several other commonly used measures, including income, occupation, and poverty (Table 4). Employment in high prestige managerial and professional occupations had a strong positive association with social class. Employment in low status blue collar (operator and laborer) and service occupations was negatively associated with social class. The percentages of households with low and poverty-level incomes both demonstrated the expected associations with social class as measured by educational attainment. However, a measure of high household income revealed that even among the most educated African Americans, only 6% of men and 1% of women earned more than \$75,000 per year. The geographic dependence of social class patterns for Blacks is also illustrated by the data in Table 4. Fewer than 5% of heart disease decedents in Social Class V lived in the South or in non-metropolitan

counties, compared with 34% and 41%, respectively, of heart disease decedents in Social Class I.

The pathophysiological processes underlying heart disease (atherosclerosis, hypertension, and diabetes) are not engendered by conditions of extreme material deprivation, but rather by dietary excess (particularly of meat, fat, and salt) and lifelong physical inactivity.<sup>40–41</sup> Consequently, heart disease became a major cause of morbidity and mortality in the world during the early 20th century as a result of profound increases in societal wealth, urbanization, industrialization, and the mechanization of daily life.<sup>23</sup> The privileged social classes were initially more vulnerable to heart disease because of their material affluence and abundance of leisure. In many parts of the world today, heart disease is still primarily an affliction of the affluent.

However, in the United States (and in most other wealthy industrial nations), the population burden of heart disease shifted dramatically from the privileged classes to the disadvantaged classes.<sup>24,42</sup> This profound reversal resulted from the universal transformation of daily life engendered by the industrialization of agriculture,<sup>43</sup> the increase in sedentary work,<sup>44</sup> mass migration to urban areas,<sup>20</sup> suburbanization,<sup>45</sup> the ubiquity of the automobile, the industrialization of food production,<sup>43</sup> the widespread availability of meat and dairy products,<sup>43</sup> and the aggressive marketing of mass-produced tobacco products.<sup>46–49</sup> In other words, the material living conditions of the disadvantaged classes changed dramatically. The proportion of workers engaged in hard physical labor declined precipitously. World War II and the GI bill paved the way for an entire generation to adopt a middle-class lifestyle. Strong labor unions and a robust industrial economy ensured comfortable “family” wages and greater leisure, along with refrigerators, washing machines, family cars, and many other labor-saving devices. Meat, milk, fat-

**Table 4. Characteristics of African Americans 35 years and older by social class 1996–1997**

Variables	Social Class				
	I %	II %	III %	IV %	V %
Population characteristics					
Employed as managers and professionals*					
Men	3.2	4.0	6.5	16.7	60.1
Women	3.5	5.4	11.5	26.2	74.5
Employed as operators or laborers*					
Men	44.8	45.9	40.6	23.3	6.3
Women	24.3	25.5	19.7	7.0	1.3
Employed in service occupation*					
Men	16.5	16.3	15.5	15.2	6.7
Women	56.3	45.5	26.8	13.9	4.2
Household income <10,000†					
Men	49.0		25.2	17.9	9.6
Women	73.6		42.5	27.3	12.1
Household income >75,000‡					
Men	0.4		0.5	1.0	6.2
Women	0.1		0.2	0.3	1.3
Below poverty‡					
Married families	18.3		8.3		2.4
Other family householder	42.9		30.2		8.2
Decedent characteristics					
Residence in the south*	33.6	15.9	22.1	5.5	4.7
Residence in non-metroplitan area*	40.8	15.2	16.0	3.3	3.2

\* Social Class I = 0–8 years of education; Social Class II = 9–12 years of education; Social Class III = high school graduate; Social Class IV = some college education, and Social Class V = college and beyond.

† Social Class I = 0–12 years of education; Social Class III = high school graduate; Social Class IV = some college education; Social Class V = college and beyond.

‡ Social Class I = 0–12 years of education; Social Class III = high school graduate; Social Class V = college and beyond.

rich foods, and cigarettes could now be consumed on a daily basis by all but the very poorest and most deprived Americans.

More recently, initiatives from medical professionals, public health workers, and government agencies to encourage healthy lifestyles have had mixed results at best. Contemporary social relations create overwhelming psychological demands on many people, while the current geographic, social, economic, and cultural context of the United States encourages physical inactivity, poor nutrition, overeating, and social isolation. Consequently, the adoption of a heart healthy lifestyle requires considerable time, effort, expense, the support of family and friends, and access to specialized facilities, goods, and services. Many of the “prerequisites” for this lifestyle are predicated on the benefits of a

privileged social class position. For African Americans, there are the additional stressors of segregation, exclusion, and discrimination to overcome, as well as the cumulative physiological toll of lifetime resistance to various forms of racism. For many African Americans in disadvantaged social class positions, the obstacles to reducing the risk of heart disease are very difficult to overcome.

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**REFERENCES**

1. Folsom AR, Prineas RJ, Gillum RF. Trends in cardiovascular risk factors in an urban Black population, 1973–74 to 1985: The Minnesota Heart Survey. *Am Heart J.* 1987;114(5): 1199–1205.

2. Greenlund KJ, Kiefe CI, Gidding SS, et al. Differences in cardiovascular disease risk factors in Black and White young adults: comparisons among five communities of the CARDIA and the Bogalusa heart studies. *Ann Epidemiol.* 1998;8:22–30.
3. Shea S, Stein AD, Basch CE, et al. Independent associations of educational attainment and ethnicity with behavioral risk factors for cardiovascular disease. *Am J Epidemiol.* 1991; 134(6):567–582.
4. Diez-Roux AV, et al. Prevalence and social correlates of cardiovascular disease risk factors in Harlem. *Am J Public Health.* 1999;89(3): 302–307.
5. Young RF, Waller JB, Kahana E. Racial and socioeconomic aspects of myocardial infarction recovery: studying confounds. *Am J Prev Med.* 1991;7(6):438–444.
6. Bearden D, Allman R, McDonald R, et al. Age, race, and gender variation in the utilization of coronary artery bypass surgery and angioplasty in SHEP. *J Am Geriatric Society.* 1994;42:1143–1149.
7. Gornick ME, Eggers PW, Reilly TW, et al. Effects of race and income on mortality and use of services among medicare beneficiaries. *N Engl J Med.* 1996;335(11):791–799.
8. Giles WH, Anda RF, Casper ML, Escobedo LG, Tyroler HA. Race and sex differences in rates of invasive cardiac procedures in US hospitals. *Arch Intern Med.* 1995;155:318–324.
9. Barnett E, Halverson JA. Disparities in premature coronary heart disease mortality by region and urbanicity among Black and White adults ages 35–64, 1985–1995. *Public Health Rep.* 2000;115(52):64.
10. Barnett E, Armstrong D, Casper M. Evidence of increasing coronary heart disease mortality among Black men of lower social class. *Ann Epidemiol.* 1999.
11. Gould SJ. *The Mismeasure of Man.* New York, NY: WW Norton & Co; 1981.
12. Cooper R. A note on the biologic concept of race and its application in epidemiologic research. *Am Heart J.* 1984;108:715–723.
13. Krieger N. Refiguring “race”: epidemiology, racialized biology, and biological expressions of race relations. *Int J Health Services.* 2000; 30(1):211–216.
14. Williams DR, Lavizzo-Mourey R, Warren RC. The concept of race and health status in America. *Public Health Rep.* 1994;109(1):26–41.
15. Centers for Disease Control. Use of race and ethnicity in public health surveillance: summary of CDC/ATSDR workshop. *MMWR.* 1993;42(RR-10):1–17.
16. Marable M. *How Capitalism Underdeveloped Black America: Problems in Race, Political Economy, and Society.* Boston, Mass: South End Press; 1983.
17. Smallwood AD. *The Atlas of African-American History and Politics: From the Slave Trade to*

- Modern Times*. Boston, Mass: McGraw-Hill; 1998.
18. Delaney D. *Race, Place, and the Law 1836–1948*. Austin, Tex: University of Texas Press; 1998.
  19. Graham LO. *Our Kind of People: Inside America's Black Upper Class*. New York, NY: Harper Collins; 1999.
  20. Fusfeld DR, Bates T. *The Political Economy of the Urban Ghetto*. Carbondale, Ill: Southern Illinois University Press; 1984.
  21. Asante MK, Mattson MT. *The African-American Atlas: Black History and Culture—An Illustrated Reference*. New York, NY: MacMillan; 1998.
  22. Haymes SN. *Race, Culture, and the City: A Pedagogy for Black Urban Struggle*. Albany, NY: SUNY Press; 1995.
  23. Marmot MG, Adelstein AM, Robinson N, Rose GA. Changing social distribution of heart disease. *BMJ*. 1978; ii:1109–1112.
  24. Wing S. Social inequalities in the decline of coronary mortality. *Am J Public Health*. 1988; 78(11):1415–1416.
  25. Bureau of the Census. *1990 Census of Population and Housing*. Washington, DC: Bureau of the Census; 1993.
  26. Bureau of the Census. *Current Population Survey*. Washington, DC: Bureau of the Census; 2000.
  27. Bureau of the Census. *2000 Census of Population and Housing*. Washington, DC: Bureau of the Census; 2001.
  28. National Center for Health Statistics. *Multiple Cause of Death Computerized Death Certificate Files, 1996 and 1997*. Rockville, Md: NCHS.
  29. Bureau of the Census. *1990 Census of Population and Housing. CP-3-6. Characteristics of the Black Population*. Washington, DC: Bureau of the Census; 1994.
  30. Grabb EG. *Social Inequality: Classical and Contemporary Theorists*. Toronto: Holt, Rinehart, and Winston; 1984.
  31. Krieger N, Rowley D, Herman AA, Avery B, Phillips MT. Racism, sexism, and social class: implications for studies of health, disease, and well-being. *Am J Prev Med*. 1993;9(6):82–122.
  32. Marmot MG, Kogevinas M, Elston MA. Social/economic status and disease. *Ann Rev Public Health*. 1987;8:111–135.
  33. House JS, Landis KR, Umberson D. Social relationships and health. *Science*. 1988;241: 540–545.
  34. Berkman LF. Assessing the physical health effects of social networks and social support. *Ann Rev Public Health*. 1984;5:413–432.
  35. Kaplan GA, Roberts RE, Camacho TC, Coyne JC. Psychosocial predictors of depression: prospective evidence from the human population laboratory studies. *Am J Epidemiol*. 1987;125:206–220.
  36. Barefoot JC, Peterson BL, Dahlstrom WG, Siegler IC, Anderson NB, Williams RB. Hostility patterns and health implications: correlates of Cook-Medley hostility scale scores in a national survey. *Health Psychology*. 1991;10: 18–24.
  37. Dohrenwend BS, Dohrenwend BP. Class and race as status-related sources of stress. In: Levine S, Scotch NA, ed. *Social Stress*. Chicago, Ill: Aldine; 1970:111–140.
  38. Dohrenwend BP. Social status and stressful life events. *J Pers Soc Psychol*. 1973;28:225–235.
  39. Barnett E, Armstrong DL, Casper ML. Social class and premature mortality among men: a method for state-based surveillance. *Am J Public Health*. 1997;87(9):1521–1525.
  40. Marmot M, Elliot P, eds. *Coronary Heart Disease Epidemiology: From Aetiology to Public Health*. Oxford: Oxford University Press; 1992.
  41. Labarthe DR. *Epidemiology and Prevention of Cardiovascular Diseases: A Global Challenge*. Gaithersburgh, Md: Aspen Publishers; 1998.
  42. Barnett E, Strogatz DS, Armstrong D, Wing S. Urbanization and coronary heart disease mortality among African Americans in the US South. *J Epidemiol Community Health*. 1996; 50:252–257.
  43. Schlosser E. *Fast Food Nation: The Dark Side of the All-American Meal*. New York, NY: Houghton-Mifflin; 2001.
  44. Kuttner R. The changing occupational structure. In: Eitzen DS, Zinn MB. *The Reshaping of America: Social Consequences of the Changing Economy*. Englewood Cliffs, NJ: Prentice Hall; 1989:85–102.
  45. Duany A, Plater-Zyberk E, Speck J. *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream*. New York, NY: North Point Press; 2000.
  46. Stebbins KR. Tobacco, politics, and economics: implications for global health. *Soc Sci Med*. 1991;33(12):1317–1326.
  47. Chapman S. Tobacco memos reveal efforts to disrupt smoking cessation. *BMJ*. 1999;318.
  48. Sklair L. The transnational capitalist class and global capitalism: the case of the tobacco industry. *Political Power Soc Theory*. 1998;12:3–43.
  49. Green GP. The political economy of flue-cured tobacco production. *Rural Sociol*. 1987; 52(2):221–241.

**AUTHOR CONTRIBUTIONS**

*Design and concept of study:* Barnett  
*Acquisition of data:* Barnett, Williams, Moore, Chen  
*Data analysis and interpretation:* Barnett, Williams, Moore, Chen  
*Manuscript draft:* Barnett, Williams  
*Statistical expertise:* Barnett, Williams, Moore, Chen  
*Acquisition of funding:* Barnett  
*Administrative, technical, or material assistance:* Barnett, Williams, Moore, Chen  
*Supervision:* Barnett