

# US SOCIOECONOMIC AND RACIAL DIFFERENCES IN HEALTH: Patterns and Explanations

*David R. Williams and Chiquita Collins*

Institute for Social Research, University of Michigan, Ann Arbor, Michigan  
48106-1248

**KEY WORDS:** socioeconomic status, social class, race, health, racism

---

## ABSTRACT

This chapter reviews recent studies of socioeconomic status (SES) and racial differences in health. It traces patterns of the social distribution of disease over time and describes the evidence for both a widening SES differential in health status and an increasing racial gap in health between blacks and whites due, in part, to the worsening health status of the African American population. We also describe variations in health status within and between other racial populations. The interactions between SES and race are examined, and we explore the link between health inequalities and socioeconomic inequality both by examining the nature of the SES gradient and by identifying the determinants of the magnitude of SES disparities over time. We consider the ways in which major social structures and processes such as racism, acculturation, work, migration, and childhood SES produce inequalities in health. We also attend to the ways in which other intervening factors and resources are constrained by social structure. Measurement issues are addressed, and implications for health policy and future research are described.

## INTRODUCTION

Class is a very widely used concept in the social sciences in general, and sociology in particular. Although no consensus exists on exactly what it means

and how it should be measured, class, however defined, has proven to be remarkably robust in elucidating the complexities of social and historical processes and in predicting variations within and between social groups in living conditions and life chances, skill levels and material resources, relative power and privilege. Health status is one arena where the effects of class are readily evident.

Similarly, race is one of the major bases of division in American life, and throughout US history racial disparities in health have been pervasive. The vast majority of studies focus on the black-white contrast, but a rapidly growing literature describes variations in health status within and between America's increasingly diverse racial populations. The US government requires all federal statistical reporting agencies to recognize four racial groups (American Indian or Alaskan Native, Asian or Pacific Islander, black, and white) and one ethnic category (Hispanic). Given that racial taxonomies are socially constructed and arbitrary, we treat all of these categories as racial groups. Moreover, since group designations should reflect generally recognized definitions as well as individual dignity, and there are varying views within racial groups with regard to terminology, we treat the following paired categories as alternative labels: American Indian or Native American, Hispanic or Latino, and black or African American.

This chapter reviews the evidence for persisting inequalities in health by socioeconomic status (SES) and race. We focus on the magnitude of the differences, the trends over time, and the major explanatory factors invoked to account for these variations. Methodological issues are also discussed, and directions for future research are outlined. We begin with a consideration of SES differences in health.

## SOCIOECONOMIC STATUS AND HEALTH

SES is widely used as a proxy for social class in studies that examine variations in the distribution of disease, and it continues to be a remarkably robust determinant of variations in the rates of illness and death. The terms SES and social class are used interchangeably in the literature, but we treat SES as the preferred term except when explicit theories of social class are invoked. SES is typically assessed more in line with Weberian notions of stratification (income, education, occupation, and ownership of property) than with the Marxist emphasis on relationship to the system of production.

Recent reviews reveal that SES remains a persistent and pervasive predictor of variations in health outcomes (Bunker et al 1989, Haan & Kaplan 1986, Marmot et al 1987, Wilkinson 1986, Williams 1990, Adler et al 1993, Adler et al 1994, Feinstein 1993, Kreiger & Fee 1994, Kreiger et al 1993). A robust inverse association between SES and health status dates back to our earliest

records and exists in all countries where it has been examined. Some of the clearest recent evidence for the United States comes from studies of mortality rates. Descriptive data from the National Longitudinal Mortality Study (NLMS) reveal, for example, that higher levels of both income and education are associated with lower rates of mortality (Rogot et al 1992). For blacks and whites, males and females, the mortality ratios for persons with a total family income of less than \$5,000 (1980 dollars) per year were at least twice those of persons with incomes greater than \$50,000 per year. Other recent studies have also found a strong inverse relationship between SES and mortality (Mare 1990, Feldman et al 1989, Duleep 1989, Pappas et al 1993, Haan et al 1987).

Research interest in the association between SES and mental health status has been declining over time (Dohrenwend 1990), but recent findings continue to demonstrate a powerful role for SES. The Epidemiologic Catchment Area study (ECA), the largest study of psychiatric disorders ever conducted in the United States, found that low SES predicted elevated rates of a broad range of psychiatric conditions (Holzer et al 1986, Robins & Regier 1991). Moreover, this inverse association between SES and psychiatric disorders was evident for both blacks and whites (Williams et al 1992).

The direction of causality between SES and health has been debated in the literature. The positive association between SES and health could reflect selection or "drift" processes where poor health is the cause of low SES. The competing social causation hypothesis views the elevated rates of illness among low SES populations as a consequence of their low socioeconomic circumstances. The direction of influence cannot be assessed in the typical study, but a growing number of cohort studies suggest that although health-driven downward social mobility occurs, it makes only a minor contribution to SES differences in health (Power et al 1990, Fox et al 1985, Wilkinson 1986).

### *Widening Inequality*

The extent to which the association between SES and health has been widening in recent decades has emerged as a major issue in the SES literature. Three US studies have compared SES differences in mortality in recent studies with those reported by Kitagawa & Hauser (1973) from the 1960 Matched Records Study. Feldman et al (1989) found that mortality differentials by education increased substantially for white men between 1960 and 1984. Duleep (1989) noted that the observed mortality differentials by education and income in the late 1970s for men aged 25–65 years old were not smaller than those in 1960. A comparison of 1960 mortality differentials with those from the 1986 National Mortality Follow-back Survey found evidence for an increase in socioeconomic disparity (Pappas et al 1993).

Much of the widening disparity in health status reflects more rapid gains in the health status for high SES than for low SES groups, but for some health

indicators, evidence suggests a worsening health status at the low end of the socioeconomic spectrum. A recent study by Wagener & Shatzkin (1994), for example, documents that although the SES differential in breast cancer narrowed between 1969 and 1989, breast cancer mortality has been declining for women in high SES counties in the United States, but rising for women in low SES counties.

Differences between SES groups in accessibility, utilization, and quality of care, or differences in the benefits derived from medical care, are contributing factors to the widening inequality. Mandinger (1985) shows that in the wake of the large budget cuts in health and social service spending early in the Reagan administration, an increase occurred in the number of pregnant women not receiving prenatal care, in the incidence of anemia in pregnant women, and infant mortality rates among poverty populations in 20 states. Similarly, Lurie et al (1984) found evidence of significant deterioration in access to care, satisfaction with care, and health status in a population of medically indigent adults in California six months after their termination from Medicaid. For example, their mean diastolic blood pressure increased by 10 points (mm Hg).

However, an increase in economic inequality is apparently the major driving force behind widening health disparities. Since the mid-1970s in the United States, there have been an increase in income inequality, a growing concentration of wealth among the highest income groups, and a worsening of the economic conditions of a substantial portion of the population (Danziger & Gottschalk 1993). The economic expansion of the 1980s was accompanied by a deterioration in the standard of living for a majority of households. Compared to the 1970s, more American adults in the 1980s fell from middle- to low-income status, and low-income families found it increasingly difficult to climb into the middle class (Duncan et al 1993). This polarization of the income distribution may have resulted from changes in the economy that led to a decline in manufacturing jobs and simultaneous increases in both low-wage (service industry and low-skilled) and high-wage (high technology industries) employment.

Income inequality has also increased in Western European countries (Danziger & Gottschalk 1993), and a pattern of widening socioeconomic differentials in mortality is also evident in England, France, Finland, Norway, and the Netherlands (DHSS 1980, Kunst & Mackenbach 1994). A study of mortality trends over time in England, Wales, and the Netherlands documents most clearly for England and Wales, although the pattern for the Netherlands is consistent, that a widening of mortality differences between SES groups is partly due to differences in the decline of mortality from conditions amenable to medical intervention. However, the contribution of medical care is limited. The higher SES groups also experienced larger improvements in mortality than did their lower SES counterparts from those causes of death where medical care does not play a major role (Mackenbach et al 1989).

### *Nature of the Gradient*

The nature of the SES gradient in health status has generated considerable interest. Some studies indicate a stepwise progression of risk in the relationship between SES and health status, with each higher level of SES associated with better health status. The most impressive evidence of this pattern comes from the Whitehall Study of civil servants in England (Marmot et al 1984, Marmot et al 1991). This study population consists of adults mainly from one ethnic group, residing in one geographic area, stably employed in white-collar jobs, with limited exposure to industrial hazards. Workers in the lowest occupational grades had a rate of mortality three times higher than those in the highest occupational grades. However, each higher grade of employment had lower levels of mortality and better health status than the prior grade. Further, homeowners engaged in professional employment who own two cars have lower mortality than their counterparts who own only one car (Goldblatt 1990). Thus, elevated rates of disease and death are not restricted to the low occupational grades but are evident even for privileged groups, when compared to those of highest SES.

Some recent reviews have noted a similar pattern in at least some studies conducted in the United States, and they have concluded that this finely graded pattern is characteristic of the association between SES and health status (Adler et al 1993, Adler et al 1994). Accordingly, there has been great interest in understanding the determinants of this finely stratified mortality difference that appears to run from top to bottom of the social hierarchy. Several studies document that the gradient is nonetheless characterized by a threshold that predicts a weakening of the association between SES and health. That is, beyond some level of SES, usually around the median for income, additional increases in SES have little or a greatly diminished effect in reducing mortality and morbidity rates. For example, both the Kitagawa & Hauser (1973) and the Pappas et al (1993) studies of mortality document diminishing returns to increases in socioeconomic status after a certain level of income. House et al (1990) also report a similar pattern for morbidity indicators. The health gains due to income are small for households above \$20,000 per year. Recent analyses of the association between income and mortality in the Panel Study of Income Dynamics (PSID) also find large reductions in the mortality rate associated with increases in income at low levels of SES, but smaller declines in mortality linked to additional income at higher levels of SES (McDonough et al 1995). Wilkinson (1986) reports a similar pattern for income data in Great Britain.

Evidence suggests that even in a single study, patterns of association vary for different indicators of SES. For example, Rogot et al (1992) found in the NLMS a continuous linear gradient between income and mortality for African

Americans and whites, males and females, aged 25–64. In contrast, although an inverse association exists between education and mortality, a graded pattern of association was not evident for all of the four race-sex groups. Clearly needed now are more systematic efforts to identify the conditions under which particular indicators of SES manifest patterns of linear or nonlinear associations with health outcomes. We need to identify the thresholds after which weaker effects of SES are observed, and we also need to identify the social, psychological, material, and especially occupational resources and risks that characterize each level of SES.

### *Measuring Socioeconomic Position*

Numerous variables are used to measure SES: Income, education, and occupational status are the most common. Although SES tends to be related to health outcomes irrespective of the indicator used, each SES measure has its own set of advantages and limitations. Some researchers suggest that education is the most stable and robust indicator of SES (Kitagawa & Hauser 1973, Liberatos et al 1988) or the most practical and convenient in some contexts (Williams et al 1994).

However, the education measure suffers from several limitations (Krieger & Fee 1994). First, in at least some national data, inequalities in health associated with income are larger than those associated with education, such that using education as a measure of SES may minimize estimates of social inequalities in health. Second, the lack of volatility in education levels for most adults precludes assessing how health status is affected by changes in SES. Third, many studies that use education as an indicator of SES are individualistic in approach and do not incorporate information about the education level of other members of the household. Fourth, as discussed in greater detail later, the return for a given level of education varies importantly by race and gender.

Numerous problems appear with the measure of income. Analyses using income are more likely than those of some other SES indicators to be open to reverse causation arguments. That is, poor health can lead to declines in income such that the association between low income and health status can be a cause rather than a consequence of poor health. In addition, income information may be especially sensitive for some, resulting in higher nonresponse for income questions than for other SES indicators. Measuring income well can also be costly and time-consuming. Income is probably best measured in the Survey of Income and Program Participation, which uses 50 questions to assess annual income. Moreover, the poverty measure, a widely used indicator of income, is almost 40 years old and of questionable current applicability (Sheak 1988, Ruggles 1990).

Income is also a more unstable measure of SES than is either education or occupation. Family incomes throughout the life cycle are characterized by

considerable volatility, with many households experiencing sharp losses in income, and a substantial portion of the population is at risk of experiencing such losses. Duncan (1988) shows, for example, that between 1969 and 1979 in the United States, between 20% and 35% of women between the ages of 25 and 75 experienced poverty at least once. The rates of poverty were higher among women than among men. Persistent poverty, defined as living in poverty for more than half of the eleven-year period, increased with age from 5% among women aged 25–45 to 11% among those in the 66–75 year age group. Thus, volatility of income also was patterned by age. Measures of education miss this dynamic component of SES, and although highly educated persons are not completely shielded from the volatility of income, they tend to be protected from income drops to near-poverty levels.

Rather than using the volatility of income as a reason not to collect income information, the dynamic nature of income highlights the importance and potential contribution of indicators of long-term economic well-being. Three longitudinal studies have documented that measures of average income capturing long-term exposure to economic deprivation are more strongly related to childhood health outcomes than are single-year indicators of economic status (Miller & Korenman 1994, Takeuchi et al 1991, Duncan et al 1994). These findings highlight the importance of having longitudinal data with multiyear or long-term measures of income. This larger effect for long-term economic deprivation may reflect the fact that families may use assets or credit to cushion the impact of short-term economic losses.

Permanent income or wealth may thus be better measures of economic status than is annual household income. In addition, wealth may be more strongly linked to social class location than is earned income. In a study of 100,000 black, white, and Hispanic youth between 1973 and 1990, parental home ownership had a large effect on both school dropout and college entry independent of parental income, education, and occupational status (Hauser 1993). More health studies should include indicators of assets or wealth. In the National Longitudinal Survey of the Labor Market Experience of Mature Men (NLS), Mare (1990) found that family assets were strongly related to mortality independent of the effects of education and first occupation. Studies in Britain also find that home and car ownership are predictive of decreased mortality risk (Goldblatt 1990). The extent to which traditional measures of economic consumption such as the monthly cost of housing and food are predictors of health status is another important but neglected issue.

Occupational status is likely to be a better indicator of long-term income than is income at a single point in time. Nonetheless, there is some volatility to occupational status, and this may also have consequences for health. A national study of black and white male workers found that one third of the sample changed their occupational class over the 7–13 years of follow-up

(Waltzman & Smith 1994). Compared to whites who remained in professional and technical jobs between baseline and follow-up, African American and white males who remained in the lower occupational classes or made certain transitions, especially into lower occupational classes, had significantly higher rates of new cases of hypertension.

Considering multiple measures of occupational status can also shed light on underlying processes. Mare (1990) studied the association of father's occupation, first occupation, and current occupation to mortality in the NLS. Father's occupation was inversely related to mortality, but the effects of first occupation on mortality were stronger than those of father's occupation, and they appeared to be due to the ability of sons from higher SES origins to acquire more schooling. Current occupation and family assets were also linked to mortality. The association between multiple measures of occupation and mortality can be complex. Moore & Hayward (1990) found in the NLS data that the occupational category with the highest mortality risk for longest occupation was different from that for most recent occupation.

A practical barrier to the use of occupation for analyses of national mortality data in the United States is that the numerator and denominator do not use the same units of measurement. Denominator data comes from the census, which collects information about current occupation. The 21 states that record occupational information on death certificates collect information about usual, instead of current, occupation (Krieger & Fee 1994). The collection of uniform data about both current and usual occupation could alleviate this problem.

Krieger & Fee (1994) emphasize that social class should be measured at the level of the individual, the household, and the neighborhood. At the individual level, class-based (occupational) measures can capture exposure to occupational health risks, while household SES measures can provide information regarding standards of living and cultural patterns. Community level measures of SES can provide information about neighborhood-related conditions such as exposure to environmental hazards and levels of neighborhood violence. Two California studies have found that measures of deprivation based on area characteristics were associated with mortality independent of individual socioeconomic status indicators (Haan et al 1987, Krieger 1991). Moreover, Krieger (1991) found that a deprivation measure based on census block characteristics (smaller unit of analysis) explained more variance than did the one based on the characteristics of the census tract. These studies document that area characteristics provide additional information about social inequalities in health that are not captured by individual level data. Similarly, British studies have found a robust relationship between area-based measures of social deprivation and health status (Townsend et al 1988, Carstairs & Morris 1989). Future research needs to identify the specific characteristics of residential environments that are deleterious to health.



Greater attention also needs to be given to theoretically driven measures of social class. Krieger (1991) found that a relational measure of social class (that emphasizes social class location based on relationship to others and to property through employment) was more strongly related to women's reproductive history outcomes than was a measure of household poverty. The three class categories utilized were working class, not working class, and other class. An alternative measure for assessing objective class location distinguishes social class based on the possession of productive assets: property assets, skill assets, and organizational assets (Baxter 1994). There is growing awareness that SES, as well as social class, attempts to capture a dynamic multidimensional process, and greater attention needs to be given to modeling the joint effects of SES variables.

### *Other Emerging Issues*

The age patterning of the association between SES and mortality has been addressed in recent studies. Early studies noted that SES differentials in health status tend to be largest during middle age but are relatively small at older ages (Antonovsky 1967). Analyses of the NLMS data found that although the association between education and mortality exists for persons aged 65 or older, it was not as strong as at the younger ages (Rogot et al 1992). Similarly, House et al (1990), using two national probability samples, document that the association between SES and morbidity (chronic conditions, functional status, and activity limitation) is most marked between ages 45–64, but narrows with increasing age. Replications and extensions of these cross-sectional findings with short-term longitudinal data provide further support for this pattern with both income and education (House et al 1994). However, the evidence is not uniform. Recent analyses by Wu & Ross (1994) found the opposite pattern. Using two nationally representative telephone samples, they found that educational differences for three measures of health (physical functioning, self-reported health, and physical well-being) widens with increasing age. It is not clear if these findings reflect differences in the measurement of health status or the coverage of the population.

Women are overrepresented among the poor, but the nature of the association between SES and women's health status is not well understood. The measurement of occupation has been particularly problematic for women. Findings are inconsistent for the few studies that have assessed the association between occupation and women's health. Strong linear SES gradients have been found in some studies, while others report relatively weaker associations than those obtained for men (Arber 1987, 1991). In some studies occupation has been unrelated to mortality risk for women (Passannante & Nathanson 1985, Hibbard & Pope 1991, Moen et al 1989).

It is likely that these inconsistencies reflect, at least in part, the limitations

of the measurement of SES. Frequently, married women are assigned to the occupational class of their husband, while single women are given their own or their father's class position. The assignment of women to the occupational status of male relatives is increasingly problematic given the growing number of women who are employed outside of the home and the increasing number of female-headed households (Liberatos et al 1988). Most of the widely used classification systems are based on the occupational patterns of men. Gender-based differences in income and education within occupations and the gender segregation of employment suggest that the inclusion of women may require modifications in occupational classification schemes (Haug 1977, Powers & Holmberg 1982).

Evidence from the United Kingdom reveals that for married women, social class based on the husband's occupation predicts mortality better than does social class based upon the woman's own occupation (Moser et al 1990). For single women, own social class is a powerful predictor. A recent study of the relationship between objective class location and subjective class identification for men and women in the United States, Sweden, Norway, and Australia found that husbands' class location is a major determinant of subjective class identity for women (Baxter 1994). Thus, women's increasing independence from men appears not to undermine the conventional view of class analysis. These findings also suggest the importance of studying social class at the household level, as opposed to only the individual level, for women.

There is growing interest in understanding the contribution of biological factors to human behavior in general and processes of social stratification in particular. Ellis's review (1993) suggests that genetic and physiological factors account for a substantial portion of the variation in both adult education and earning levels. For example, sex hormone levels, especially testosterone, are associated with individuals' career choices, and some twin studies suggest that as much as 40–50% of the variation in vocational interest can be attributed to genetic factors. However, cause and effect remain problematic because a person's experiences also affect hormone levels. In addition, the determinants of individual risks of disease are often different from those of population risks of disease (Rose 1985). It is likely that genetic factors play a larger role in the causes of individual variations in disease than they do in socioeconomic group differences in health status. While guarding against biological determinism is important, social scientists need to give greater attention to the biological mechanisms and processes through which social factors affect health and to the interrelationships between genetic factors and social variables. Much remains to be understood about the ways in which genetic susceptibilities combine additively or interactively with exposures in the social and physical environment to affect health at different stages of the life cycle and for persons living under varying environmental conditions.

## RACIAL/ETHNIC DIFFERENCES IN HEALTH STATUS

The United States is relatively unusual among industrialized countries in that it reports the health status of its population based on race (Navarro 1990). Most other countries focus on social class differences. For most of this century, the contrast between whites and nonwhites (a category that consisted almost exclusively of blacks) was the basis of differentiation. Since the late 1970s there has been a growing emphasis on collecting more data on the racial and ethnic minority populations that constitute an increasing proportion of the American population. Recent reviews reveal that race and ethnicity remain potent predictors of variations in health status (Braithwaite & Taylor 1992, Furino 1992, Livingston 1994, Zane et al 1994).

The most recent report card on the health of the US population presents infant and adult mortality rates by race (National Center for Health Statistics 1994a). Infant mortality rates are reported for major subgroups of the Asian and Pacific Islander American (APIA) and the Hispanic population, but subgroup differences were not available for adult mortality. The infant mortality rate for blacks is twice that of whites, and American Indians also have elevated infant mortality rates compared to the white population. The APIA population and its four major subgroups have rates that are lower than those of whites, while the rate for Hispanics is equivalent to that of whites. However, variation occurs within the Hispanic category: Puerto Ricans have higher infant mortality rates than do the other Hispanic groups and the white population. The report also revealed that the age-adjusted death rate for the entire black population is dramatically higher than that of whites, but all of the other racial/ethnic populations have death rates lower than the white population, with the APIA population having the lowest death rates.

These overall data mask important patterns of variation for subgroups of these populations and for specific health conditions, a point readily evident in recent overviews of the health of the Hispanic population (Sorlie et al 1993, Vega & Amaro 1994). While Latinos have lower death rates for the two leading causes of death (heart disease and cancer) than do non-Hispanics, they also have higher mortality rates than do non-Hispanic whites for tuberculosis, septicemia, chronic liver disease and cirrhosis, diabetes, and homicide. Death rates of Hispanics also exceed those of whites in the 15–44 age group (Fingerhut & Makuc 1992). Moreover, Hispanics have elevated rates of infectious diseases such as measles, rubella, tetanus, tuberculosis, syphilis, and AIDS. The prevalence of obesity and glucose intolerance are also particularly high, especially among Mexican Americans. Similar to the findings for infant mortality, adult mortality rates for Puerto Ricans are higher than the other Hispanic groups. However, even among Puerto Ricans, the mortality rate is lower than for white non-Hispanics and considerably lower than for African Americans.

Specific subgroups of the APIA population have elevated rates of morbidity and mortality across a number of health indicators. The Native Hawaiian population has the highest cancer rates of any APIA population in the United States (Lin-Fu 1993) and the highest death rates due to heart disease of any racial group in the United States (Chen MS 1993). Rates of stomach cancer are high among Japanese Americans, and Chinese Americans have an incidence of liver cancer that is four times higher than that of the white population (Lin-Fu 1993). Very high rates of obesity are evident for Native Hawaiians and Samoans, and these populations, along with Asian Indians, Japanese Americans, and Korean Americans, have prevalence rates of diabetes that are more similar to those of the black population than of the white population (Crews 1994). Death rates for Native Americans are high for the under-45 age group, and suicide rates for American Indian youth are two to four times higher than those of any other racial group (Fingerhut & Makuc 1992). Native American youth also have higher levels of alcohol and other drug use than does any other racial group (Smith 1993).

### *Worsening Health Status*

As part of the increasing income inequality in the United States, the gains in economic status of blacks relative to that of whites have stagnated in recent years (Smith & Welch 1989). Moreover, for several economic indicators there has been an absolute decline in the economic status of African Americans. For example, unlike the pattern for white families, low-income black and Hispanic families have experienced absolute declines in family income since 1973, and weekly wage and salary income declined for all black and Hispanic males below the 90th percentile of income between 1979 and 1987 (Karoly 1993). Similarly, the percentage of black children living in poverty increased from 41% to 44% between 1979 and 1988 (Hernandez 1993). Similar to the findings noted earlier for SES, this decline in black economic well-being and increase in black-white inequality is associated with worsening black health across a number of health status indicators.

The gap in life expectancy between blacks and whites widened between 1980 and 1991 from 6.9 years to 8.3 years for males and from 5.6 years to 5.8 years for females (NCHS 1994b). Moreover, for every year between 1985 and 1989, the life expectancy for both African American men and women declined from the 1984 level, although an upturn has been reported in the most recent data (NCHS 1994a). A slower rate of decline among blacks than whites for heart disease is the chief contributor to the widening racial gap in life expectancy, while HIV infection, homicide, diabetes, and pneumonia are major causes of decreasing life expectancy for blacks (Kochanek et al 1994).

The age-adjusted death ratios for blacks and whites were greater in 1991 than in 1980, and the annual number of excess deaths for the African American,

compared to the white population, increased from 60,000 in 1980 to 66,000 in 1991 (NCHS 1994b). During this period, the overall age-adjusted death rate decreased more rapidly for white males and females than for their black counterparts. Under the age of 70, three causes of death—cardiovascular disease, cancer, and problems resulting in infant mortality—account for 50% of the excess deaths for black males and 63% of the excess deaths for black females. Homicide accounts for 19% of the excess deaths for black males and 6% for black females. An analysis of death rates between 1900 and the present reveals that black-white health inequality among men is currently at an all-time high for this century (Cooper 1993). In some depressed urban environments there has been no improvement in the health status of the black population over time. For example, Freeman (1993) shows that, in contrast to a steady decline in national mortality rates for both blacks and whites between 1960–1980, there was no change in mortality for African Americans in Harlem over this 20-year period. However, the potential contribution of selection processes via migration to this pattern was not assessed.

The gap in infant mortality rates for white and black babies widened for each sex between 1980 and 1991 (NCHS 1994b). Rates of both preterm delivery (Rowley et al 1993) and low birth weight (NCHS 1994b) have remained stable for white women but have been increasing among African Americans. A widening differential between African Americans and whites is also evident for rates of sexually transmitted diseases (Castro 1993). Between 1986 and 1989, cases of gonorrhea and syphilis decreased by 50% and 11%, respectively, for whites. In contrast, gonorrhea declined by only 13% for blacks while syphilis increased by 100%. The increase in syphilis is thought to be associated with increases in the use of crack cocaine and related increases in prostitution.

### *Major Historical Events*

This recent evidence of the deterioration in the health of the African American population emphasizes the importance of considering the larger historical context in understanding the health status of population groups. Mullings (1989) has suggested that the Civil Rights Movement, for example, has had important positive effects on black health. By reducing occupational and educational segregation, it improved the SES position of at least a segment of the black population and also influenced public policy to make health care accessible to larger numbers of people. Consistent with this hypothesis, one study found that between 1968 and 1978 blacks experienced a larger decline in mortality rates (both on a percentage and absolute basis) than whites (Cooper et al 1981).

More recently, the presidential campaign of Jesse Jackson may have had a positive short-term impact on the health of the African American population.

Using four-wave data from the National Study of Black Americans that span the period 1979–80 to 1992, Jackson et al (1995) found that during the third wave of data collection (1988), the reported levels of physical and mental well-being were at their highest. In addition, the proportions of respondents reporting that they had experienced racial discrimination and that they perceived whites as wanting to keep blacks down were at their lowest levels. Contemporaneously, Jesse Jackson, a black male, was making the most successful run for the presidency of the United States that had ever been made by an African American in the history of the United States. These researchers suggest that this political event may have had spillover effects for black adults' perceptions of America's racial climate and their health status.

The massive internal migration of blacks in the United States earlier this century has been an important influence on the African American population. Although the initial economic and longer-term political gains linked to migration may have had positive health consequences, the black migration may have also had profound adverse effects on health (Williams 1995a). First, the black migration disproportionately distributed the African American population to urban residential areas where living conditions are hostile to life and health. Unlike the white urban poor who are dispersed throughout the city, with many residing in relatively safe and comfortable neighborhoods, the black poor are concentrated in depressed central-city neighborhoods (Wilson 1987) where the stress of poor urban environments can lead to illness (Harburg et al 1973, Haan et al 1987). A recent study in Harlem, one of the poorest areas of New York City, documented that black males between the ages of 25–44 in Harlem are six times more likely to die than are their white counterparts in the United States (McCord & Freeman 1990). Moreover, the life expectancy of blacks in Harlem is lower than that of persons in Bangladesh, one of the poorest countries in the world.

Wilson (1987) suggests that the concentration of black poverty in the inner city is due to the out-migration of middle class blacks to other areas. In contrast, Massey & Gross (1993) found that three complementary mechanisms were responsible: the wholesale abandonment of black and racially mixed areas by middle class whites, the selective migration of poor people into black neighborhoods, and the net movement into poverty of blacks living in segregated areas. Living conditions in inner-city areas are also deteriorating over time. The economic status of central-city African Americans has declined relative to other urban blacks. In 1940, central-city blacks earned 10% more than did other black urban dwellers, but by 1980 they were receiving 10% less (Smith & Welch 1989). There is also growing concern about the health consequences of stress in residential environments such as the high level of community violence in many depressed urban environments (Gabarino et al 1992).

The internal migration of the African American population also affected

health by changing health behaviors in ways that lead to high risks of disease and death. With the great migration and urbanization of black Americans came a dramatic rise in their use of alcohol and tobacco, and a reversal in the racial distribution of alcohol and tobacco use (Williams 1991). During the first half of this century, the prevalence of cigarette smoking and alcohol abuse was higher for whites than for blacks. The great migration shifted a considerable portion of the black population from the relatively “dry” rural South, where social life revolved around churches and family associations, to the “wet” areas of the urban North, where taverns and associated alcohol use were an integral part of social life (Herd 1985). Moreover, by producing feelings of alienation, powerlessness, and helplessness, life in urban settings created the need for individuals to mask these feelings or obtain temporary relief from them by consuming tobacco and alcohol. African Americans have been special targets of the advertising of both the tobacco and the alcohol industries (Davis 1987, Singer 1986), targeting that dates back to the 1950s (Levin 1988).

A recent provocative theory designed to account for the high rates of hypertension among African Americans also gives a central role to historical factors (Wilson & Grim 1991). According to the “slavery hypothesis” the historic conditions of slavery, especially those linked to capture in Africa and the transatlantic slave voyage, resulted in the preferential survival of those Africans who had a genetic propensity to conserve sodium and water. Contemporary African Americans have inherited this trait, which is responsible for the elevated rates of high blood pressure. Despite its deceptive simplicity and intuitive appeal, like earlier biological explanations, it locates racial disparities in health inside of the individual and pays scant attention to current living conditions. Serious questions have been raised regarding the plausibility of a historic genetic “bottleneck” being a key determinant of current genetic characteristics (Jackson 1991), and about the validity of the historic data that have been invoked to support this theory (Curtin 1992). Moreover, there is abundant evidence that the current social circumstances of African Americans play a major role in accounting for their elevated rates of high blood pressure (Williams 1992).

### *Race and SES*

Socioeconomic differences between racial groups are largely responsible for the observed patterns of racial disparities in health status. Race is strongly correlated with SES and is sometimes used as an indicator of SES. For example, while 11% of the white population is poor, poverty rates for the African American and Hispanic population are 33% and 29%, respectively. Not surprisingly, differentials in health status associated with race are smaller than those associated with SES. For example, in 1986 persons with an annual household income of \$10,000 or less were 4.6 times more likely to be in poor

health than those with income over \$35,000, while blacks were 1.9 times more likely to be in poor health than whites (Navarro 1990). Thus, race differentials were less than half of the SES differentials.

Researchers frequently find that adjusting racial disparities in health for SES substantially reduces these differences. In some cases the race disparity disappears altogether when adjusted for SES (Baquet et al 1991, Rogers 1992). Two recent studies provide striking evidence of the contribution of SES to observed racial differences in violence and illegal drug use. Greenberg & Schneider (1994) showed that rates of violent deaths in New Jersey were associated not with race per se, but with residence in urban areas with a high concentration of undesirable environmental characteristics such as waste incinerators, landfills, and deserted factories. Violent deaths from homicide, poisoning/drug use, falls, fires, and suicide in these marginal areas were ten times higher for males and six times higher for females than for their counterparts in the rest of New Jersey. Moreover, deaths in these marginal areas were high for whites and Hispanics as well as blacks, females as well as males, and middle-aged and elderly populations as well as youthful populations. Lillie-Blanton et al (1993) also found that a twofold higher prevalence of crack cocaine use for blacks and Hispanics compared to whites was reduced to nonsignificance when adjusted for census indicators of social environmental risk factors. Thus, failure to adjust racial differences for SES can reinforce racial prejudices and perpetuate racist stereotypes, diverting both public opinion and research dollars from the underlying social factors that are responsible for the pattern of risk distribution.

More frequently, it is found that adjustment for SES substantially reduces but does not eliminate racial disparities in health (Cooper 1993, Otten et al 1990, Krieger & Fee 1994). That is, within each level of SES, blacks generally have worse health status than whites. One recent study found higher infant mortality rates among college-educated black women than among their similarly situated white peers (Schoendorf et al 1992). Moreover, some studies find that the black-white mortality ratio actually increases with rising SES. This is clearly the case for infant mortality where the black-white gap is narrowest among women who have not completed high school, and highest among women with a college education (Krieger et al 1993).

Kessler & Neighbors (1986) emphasize the importance of systematically testing for interactions between race and socioeconomic status. They reanalyzed data from eight epidemiologic surveys and demonstrated that, although controlling for SES reduced to nonsignificance the association between race and psychological distress, low-SES blacks had higher rates of distress than did low-SES whites. However, the findings have not been uniform. Analyses of data from the large ECA study found that low-SES white males had higher rates of psychiatric disorders than did their black peers (Williams et al 1992).



Among women, low-SES black females had higher levels of substance abuse disorders than did their white peers. These findings suggest the importance of distinguishing distress from disorder, as well as the need to understand the interactions among race, gender, and class.

One reason for the persistence of racial differences despite adjustment for SES is that the commonly used SES indicators do not fully capture the economic status differences between households of different races. For example, racial differences in wealth are much larger than those for income. There are large racial differences in the inheritance of wealth and inter-generational transfers of wealth. Table 1 shows that while white households have a median net worth of \$44,408, the net worth was \$4,604 for black households and \$5,345 for Hispanic households (Eller 1991). Compared to white households, black households had a significantly greater percentage of their net worth in durable goods such as housing and motor vehicles, and a significantly lower percentage of their net worth in financial assets. Moreover, at every income level, the net worth of black and Hispanic households is dramatically less than that of white households. Thus, in studies of racial comparisons, measures of assets are necessary for the identification of the economic status of the household.

In some cases where blacks are more exposed to particular risk factors, these risk factors appear to have weaker effects for the black population. In a national study in which black children constituted 75% of those in the category of lowest long-term income, persistent poverty was unrelated to either stunting or wasting for blacks, unlike the strong pattern evident for non-Hispanic whites and Hispanics (Miller & Korenman 1994). Similarly, although black infants have twice the low-birth-weight risk of whites, low birth weight is more strongly linked to infant mortality in the neonatal period for blacks than for whites (Hogue et al 1987).

**Table 1** Median net worth in 1991 by monthly household income quintiles for whites, blacks, and Hispanics

| Household income | White     | Black    | Hispanic |
|------------------|-----------|----------|----------|
| All              | \$44,408  | \$4,604  | \$5,345  |
| Lowest quintile  | \$10,257  | \$1      | \$645    |
| Second quintile  | \$25,602  | \$3,299  | \$3,182  |
| Third quintile   | \$33,503  | \$7,987  | \$7,150  |
| Fourth quintile  | \$52,767  | \$20,547 | \$19,413 |
| Highest quintile | \$129,394 | \$54,449 | \$67,435 |

(Source: Eller 1994)

*Racism*

Another reason for the failure of SES indicators to completely account for racial differences in health is the failure of most studies to consider the effects of racism on health. A growing body of theoretical and empirical work suggests that racism is a central determinant of the health status of oppressed racial and ethnic populations (King & Williams 1995, Williams et al 1994, Williams 1995b, Krieger et al 1993, Cooper 1993). Racism is viewed as incorporating ideologies of superiority, negative attitudes and beliefs toward racial and ethnic outgroups, and differential treatment of members of those groups by both individuals and societal institutions. Racism can affect health in at least three ways (Williams et al 1994, Cooper 1993).

First, it can transform social status such that SES indicators are not equivalent across race. There are large differences related to race in the quality of elementary and high school education, so that blacks bring fewer basic skills to the labor market than do whites (Maxwell 1994). In addition, as Table 2 indicates, whites receive higher income returns from education than blacks and Hispanics. These racial differences are larger among males than among females, and the black-white income gap for males does not become narrower with increasing years of education. In addition, although Hispanic males do

**Table 2** Median earnings in 1990 by education (years of school completed) for white, black, and Hispanic, male and female full-time workers

| Education level | MALES   |        |          |
|-----------------|---------|--------|----------|
|                 | White   | Black  | Hispanic |
| 8 Years or less | 16,906  | 16,961 | 13,913   |
| 9-11 Years      | 21,048  | 16,778 | 17,868   |
| 12 Years        | 26,526  | 20,271 | 20,932   |
| Some college    | 31,336  | 25,863 | 26,380   |
| College degree  | 28,263  | 30,532 | 33,074   |
| Graduate        | 47,787  | 36,851 | 42,315   |
| Education level | FEMALES |        |          |
|                 | White   | Black  | Hispanic |
| 8 Years or less | 11,826  | 11,364 | 11,231   |
| 9-11 Years      | 14,010  | 13,643 | 12,586   |
| 12 Years        | 17,552  | 16,531 | 16,298   |
| Some college    | 21,547  | 19,922 | 20,881   |
| College degree  | 26,822  | 26,881 | 22,555   |
| Graduate        | 31,991  | 31,119 | 30,133   |

(Source: US Bureau of the Census 1991)

better than their black peers at the higher levels of education, the same is not true for Hispanic females. These data indicate that simply equalizing levels of education would still leave a large racial gap in earned income.

Dressler (1993) also indicates that the pattern of income production varies for black and white households. Black households are more likely than white ones to rely on several wage earners to contribute to total household income. Middle class blacks are also more likely than their white peers to be recent and tenuous in that class status (Collins 1983). College-educated blacks, for example, are almost four times more likely than their white peers to experience unemployment (Wilhelm 1987). Researchers have also emphasized that the purchasing power of a given level of income varies by race (Cooper 1984, King & Williams 1995), with blacks paying higher prices than whites for a broad range of goods and services in society, including food and housing. African Americans also have higher rates of unemployment and underemployment than do whites. Moreover, employed blacks are more likely than their white peers to be exposed to occupational hazards and carcinogens, even after adjusting for job experience and education (Robinson 1984).

Second, racism can restrict access to the quantity and quality of health-related desirable services such as public education, health care, housing, and recreational facilities. Recent studies have found a positive association between residential segregation and mortality rates for both adults (Polednak 1993) and infants (LaVeist 1989, Polednak 1991). The relationship between segregation and infant mortality exists for blacks but not for whites. A recent review of racial differences in medical care found that even after adjusting for severity of illness, SES and/or insurance status, blacks are less likely to receive a wide range of medical services than are whites (Council on Ethical and Judicial Affairs 1990).

Third, the experience of racial discrimination and other forms of racism may induce psychological distress that may adversely affect physical and mental health status, as well as the likelihood of engaging in violence and addiction. Recent reviews reveal that a small but growing body of evidence indicates that the experience of racial discrimination is adversely related to a broad range of health outcomes (Kreiger et al 1993, Williams et al 1994). In addition, the internalization of racist ideology is also adversely associated with morbidity (Williams et al 1994).

In color conscious American society, skin color may be an important determinant of the degree of exposure to racial discrimination, access to valued resources, and the intensity of the effort necessary to obtain them (Dressler 1993). Dressler (1993) has employed darker skin color as an objective indicator of low social status within the black population and found that status inconsistency based on the relation of skin color to life-style (ownership of material goods and engaging in status enhancing behaviors) is associated with elevated

rates of hypertension. Independent of education level, persons with darker skin color and higher life-style had the highest levels of blood pressure. Klag et al (1991) also found an interaction between skin color and SES in a sample of blacks. Darker skin color was associated with elevated rates of hypertension for low but not high SES blacks. Consistent with the notion that darker skinned African Americans may experience higher levels of discrimination, analyses of data from the National Study of Black Americans found that skin color was a stronger predictor of occupational status and income of blacks than was parental SES (Keith & Herring 1991).

Age may be a proxy for the cumulative exposure to racism and adverse living conditions. There is an intriguing age patterning of at least some of the racial disparities in health. For both obesity and high blood pressure, racial differences are absent in childhood but emerge in early adulthood (Williams 1992, Kumanyika 1987). Similarly, neonatal mortality rates increase with age of the mother from the teens through the twenties for blacks and Puerto Ricans, while an opposite pattern is evident for whites and Mexican Americans (Geronimus 1992). These patterns may reflect a lagged effect of environmental exposure or a marked change in health status, as young adults are forced to confront restricted socioeconomic opportunities and truncated options (Williams 1992). Geronimus (1992) has proposed a "weathering hypothesis" to account for this pattern: for disadvantaged populations, age is a proxy for chronic exposure to adverse living conditions, with older age reflecting cumulative exposure to environmental assaults and the consequent increase in biological vulnerability.

### *Acculturation*

The health profile of the Hispanic population in general and Mexican Americans in particular has seriously questioned the dominant paradigm that focuses heavily on SES and medical care as key explanatory factors for racial differences in health. Although Mexican Americans are low in SES and have low rates of health insurance, utilization of medical care and preventive health care, they have rates of infant mortality, overall mortality, and many chronic illnesses that are lower than those of African Americans and comparable to those of Anglos (Furino 1992). Moreover, several recent studies have noted that unlike the pattern for other racial groups, SES is unrelated to health outcomes such as blood pressure and low birth weight for Mexican Americans or foreign-born Mexican Americans (e.g. Sorel et al 1992, Collins & Shay 1994). It is unclear whether this pattern reflects a healthy immigrant effect, protective effects of host cultures, or differences in the historical time period across societies in the secular distribution of disease. For example, SES has opposite effects in the earlier versus the later periods of the heart disease epidemic. A role for acculturation is suggested by the fact that foreign-born Hispanics have

a better health profile than do their counterparts born in the United States. Rates of infant mortality, low birth weight, cancer, high blood pressure, adolescent pregnancy, and psychiatric disorders increase with length of stay in the United States (Vega & Amaro 1994). Migration studies of the Chinese and Japanese show that rates of some cancers such as prostate and colon increase when these populations migrate to the United States, while the rates of other cancers such as liver and cervix decline (Jenkins & Kagawa-Singer 1994).

It has been hypothesized that the cultural factors resident in traditional Mexican culture enhance the health of Mexican immigrants (James 1993). However, exactly what these protective cultural symbols, attitudes, or experiences are has not been clearly identified. As groups migrate from one culture to another, immigrants often adopt the diet and behavior patterns of the new culture. At the same time the transition to a new culture can also generate stress that may have adverse consequences for health. Several behaviors that adversely affect health status increase with acculturation. These include decreased fiber consumption, decreased breast feeding, increased use of cigarettes and alcohol especially in young women, driving under the influence of alcohol, and the use of illicit drugs (Vega & Amaro 1994). Acculturation also brings declines in caloric intake and fat, and reduced rates of diabetes and obesity.

Earlier studies of acculturation and heart disease among the Japanese immigrants to the United States provide a useful model for identifying and studying the health consequences of different aspects of culture (Marmot & Syme 1976). Rogler et al (1991) have also outlined directions for improvement in the conceptualization and measurement of acculturation and for assessing its relationship to health.

### *Conceptualization of Race*

Researchers have recently emphasized that we need to give more attention to what race is and why it is related to health status. They emphasize that our fundamental assumptions about what race is will shape the research questions developed to understand racial disparities in health (Dressler 1993, Krieger et al 1993, King & Williams 1995, Williams et al 1994). Historically, explanations for differences in health between the races focused on biological differences between racial groups. The biological approach views racial taxonomies as meaningful classifications of genetic differences between human population groups. The available scientific evidence shows that such a view of race is seriously flawed. Our current racial categories do not capture biological distinctiveness. Racial groups are more alike than different in terms of biological characteristics and genetics, and no specific scientific criteria distinguish different racial groups. Williams et al (1994) note that unlike the social sciences, medicine and epidemiology have been slower in rejecting the now scientific-

cally discredited biological view of race. They argue that an emphasis on biological sources of racial variations in health are least threatening to the status quo. Biological explanations focus on factors that reside within the individual and develop solutions that target individuals. They can effectively divert attention from current societal arrangements and policies that shape the health status of population groups.

Diseases that have a clear genetic component account for only a tiny part of racial disparities in health. For example, sickle cell anemia in African Americans accounts for three tenths of one percent of the total number of excess deaths in the black population (Cooper 1984). Thus, racial differences in biology are not the primary cause of racial variations in health and disease. Although the genetic contribution to racial variations in health status is likely to be small, researchers should be attentive to interactions between biological variables and environmental ones.

Studies that have examined the ways in which race is used in health and medical research document that race and ethnicity are widely used in the health literature to stratify or adjust results and to describe the sample or population of the study (Jones et al 1991, Williams 1994). However, the terms used for race are seldom defined, and race is frequently employed in a routine and uncritical manner to represent ill-defined social and cultural factors. Researchers seldom specify how race is measured. A more deliberate, purposeful, and theoretically informed explication of race is needed (Williams 1994). Race is a proxy for specific historical experiences and a powerful marker of current social and economic conditions that determine exposure to pathogenic factors. Advances in our understanding of the role of race in health are contingent on efforts to directly assess the critical aspects of race that are implicated in health outcomes.

### *Problems with Racial Data*

There is growing awareness of serious reliability and validity problems with the measurement of race and ethnicity (Hahn 1992). One study of a large national population found that fully one third of the US population reported a different racial or ethnic status one year after their initial interview (Johnson 1974). There is also considerable discrepancy, especially for American Indians, Hispanics, and APIAs, between interviewer-observed race and respondent self-report. Massey (1980) found, in a large national sample, that 6% of persons who reported themselves as black, 29% of self-identified APIAs, 62% of self-identified American Indians, and 80% of persons who self-identified with an "other" category (70% of whom were Hispanic) were classified by the interviewer as white. Given that racial status on death certificates is typically based on observer identification, the undercount problem in the numerator for mortality rates may be especially acute for some minority populations. Vari-

ations in the classification of race by different administrative systems can affect reported rates of health conditions, and this has also emerged as a major concern (Hahn 1992).

The implications of census undercount for the quality of health data for racial and ethnic populations have also been receiving increasing attention (Williams et al 1994, Notes & Comments 1994). Census data are routinely used to construct sampling frames for population-based epidemiologic studies, to adjust obtained samples for nonresponse, and to calculate denominators for mortality and selected morbidity rates. Any rate that uses an undercounted denominator is overestimated in exact proportion to the undercount in the denominator. For all five-year age groups of black men ages 30–54, the estimated net undercount is almost 20%. Estimates of undercount based on demographic analysis are only available at the national level, and rates are probably even higher in selected geographic areas.

There is growing awareness that the Latino, APIA, and Native American populations are characterized by considerable heterogeneity in sociodemographic characteristics as well as the distribution of disease and risk factors for disease (Vega & Amaro 1994, Zane et al 1994). Failure to attend to the variations in health indicators within a racial category can prevent the identification of health needs for some specific groups. Increasing attention has also been given to the heterogeneity of the black population (Williams et al 1994). The major white ethnic groups are also characterized by distinctive histories and cultures, but little recent attention has been given to exploring ethnic variations in health for the non-Hispanic white population.

The classification of persons of mixed racial parentage is a significant issue facing data collection agencies, and American society more generally. The numbers of interracial couples and children from these unions have been increasing steadily over time. The health risks associated with multiracial status have not been systematically studied. Morton et al (1967) studied the birth weight of infants of mixed race in Hawaii and found that such infants had birth weights intermediate between those of their parents' racial groups. A recent study suggests that the relationship between multiracial status and health may be complex, e.g. infants born to black mothers and white fathers were more likely to be low in birth weight than those born to white mothers and black fathers (Collins & David 1993).

The noncoverage of selected racial/ethnic subgroups in population-based epidemiologic surveys is a matter of continuing concern. In addition to precluding our understanding of the distribution of disease in certain populations, the unavailability of data also has policy implications. For example, due to the lack of baseline data, there were fewer objectives in Healthy People 2000 for the APIA population than for any other racial group (Chen MS 1993). Healthy People 2000 is a national health planning initiative that has defined a set of

measurable health targets to improve the health status of the American population by the year 2000. Because it has increasingly become a basis for the allocation of funds to support public health programs, lack of objectives can importantly determine the distribution of economic resources.

## MECHANISMS UNDERLYING SES AND RACIAL DIFFERENCES IN HEALTH

Research on the determinants of health has suggested that a broad range of factors such as stress in family home and work environments, health practices, social ties, and attitudinal orientations are important determinants of health. Typically, inadequate attention is given to the ways in which the social distribution of risk factors and resources for health is constrained by societal norms and structures. A growing body of evidence suggests that risk factors for health outcomes are related to SES and race (Mirowsky & Ross 1989, Williams 1990, House et al 1990; 1994). The distribution of risk factors and resources are shaped by the conditions under which people live and work. Researchers should also be attentive to interactions between social status and risk factors because evidence suggests that comparable stressful events, for example, have stronger negative effects on lower SES persons than on those of higher status (Kessler 1979).

### *Medical Care*

Inadequate use of medical care, especially preventive medical care, by the poor and members of racial/ethnic minority populations is generally viewed as an important determinant of their health status. There are racial and socio-economic status differences in the quantity and quality of medical care (e.g. Blendon et al 1989). A study of deaths of blacks and whites in Alameda County, California (Woolhandler et al 1985) found that deaths due to causes amenable to medical intervention accounted for about one third of the excess total death rate of blacks relative to whites. Recent reviews of the evidence on the contribution of medicine to health status indicate that the role of medicine is frequently overstated and that the removal of economic barriers alone will not eliminate social disparities in health care utilization (Williams 1990, Adler et al 1993).

However, equitable access to medical care is important and crucial to preventing further deterioration of the health status of disadvantaged populations (Williams 1990). For many disease conditions such as cancer, tuberculosis, and hypertension, the higher incidence rates among African Americans do not account for the higher mortality rates (Schwartz et al 1990). The higher mortality rate may result from later initial diagnosis of disease, comorbidity, delays



in treatment, or other gaps in the quality of care. Thus, preventive medical care, appropriate early intervention in the course of an illness, and medical management of chronic disease can play important roles in enhancing the quantity and quality of life. Some evidence indicates that medical care has a greater impact on the health status of vulnerable racial and low SES groups than on their more advantaged counterparts (Williams 1990). For disadvantaged groups faced with multiple deficits, medical care may be a critical health-protective resource, while the incremental contribution of medicine is more limited for groups that already enjoy many social advantages.

### *Health Behavior*

Health behaviors are important determinants of health. A US Surgeon General's Report indicated that unhealthy behavior or life-style account for half of the annual number of deaths in the United States (US Department of Health, Education & Welfare 1979). In comparison, 20% are due to environmental factors, 20% to genetics, and 10% to inadequate medical care. Health practices such as better nutrition and eating habits, diminished tobacco, alcohol, and drug abuse, and more exercise can dramatically improve health. The federal report on black and minority health (US Department of Health and Human Services 1985) also identified health behaviors as the major determinants of the excess levels of mortality in minority populations in the United States.

Cigarette smoking is responsible for more than one in six deaths annually in the United States, for a total of 430,000 deaths (VW Chen 1993). A growing body of evidence suggests that smoking is increasingly concentrated among the lowest socioeconomic groups and minority populations. The prevalence of smoking is higher for black and Hispanic men than for whites. There is a paradox to black rates of smoking. Compared to whites, African American smokers start smoking later and smoke fewer cigarettes per day, but they are more adversely affected by smoking (Sterling & Weinkam 1989). In particular, there has been a sharper rise in lung cancer incidence among blacks than whites. Part of this difference may reflect differences in occupational exposures (Sterling & Weinkam 1989). A much greater proportion of blacks than whites work in occupations where they are exposed to occupational hazards such as toxic chemicals, dust, and fumes. Another factor accounting for this difference is the tendency for blacks to smoke cigarettes with higher tar content than those smoked by whites. More than 75% of black smokers use high tar cigarettes compared to 56% of whites and 69% of other races. Blacks are also three times more likely than other groups to smoke menthol cigarettes (VW Chen 1993). In general, blue collar and service workers are more likely to smoke nonfilter cigarettes than are

professional managerial workers, and blacks are disproportionately represented in the former category.

### *Working Conditions*

In one of the earliest sociological treatises on the association between social class and health, Engels ([1844] 1984) noted that the average longevity of the upper classes in Liverpool in 1840 was 35 years, compared to 22 years for business men and better-placed craftsmen, and only 15 years for operatives and day-laborers. He identified conditions of work including machine-paced employment, long hours, exposure to dust, fumes, other bad atmospheric conditions, and having to maintain uncomfortable body positions as major mechanisms responsible for excess mortality. Most recent US studies utilize income and education as indicators of SES and neglect the role of occupational conditions. Low SES persons are more likely to be employed in occupational settings where there is an elevated risk of exposure to toxic substances and bad working conditions, but the role of occupational conditions tends to be neglected. Moore & Hayward (1990) is an exception to this pattern. They used data from the NLS and found that the aspects of the occupational environment that accounted for the association between occupation and mortality varied with the occupational indicator utilized. For longest occupation, the substantive complexity of the job (routinization and autonomy) is the major factor, while social skills and physical and environmental demands are the major factors accounting for the effects of the most recent occupation. In a study of over 5613 persons aged 15–75 in Sweden, Lundberg (1991) found that the physical working conditions were the major source of SES differences in physical illness, although economic hardship during upbringing and health-related behaviors also played a role. Bad working conditions were defined as heavy work, and daily contact with poisons, dust, smoke, acid, explosives, vibration, and the like.

### *Environmental Exposure*

Concerns have also been raised about the extent to which low SES persons in general and racial minorities in particular are disproportionately exposed to environmental risks in residential environments. One early study found that treatment, storage, and disposal of hazardous waste sites were disproportionately located in areas where the surrounding residential population was black, and a study by the United Church of Christ (Commission for Racial Justice 1987) found that race was the strongest predictor of the location of hazardous waste sites in the United States. However, a recent industry-funded national study found that there is no significant relationship between the racial

or ethnic composition of census tracts, and the presence of commercial hazardous waste facilities (Anderton et al 1994).

### *The Economy and Health*

Brenner (1995) has recently reviewed the evidence linking changes in the economy to health status. Rates of suicide and admissions to psychiatric hospitals increase during economic recessions. Cirrhosis mortality increases substantially one to two years after a national economic recession. Instructively, it is the consumption of distilled spirits, rather than wine or beer, that is a significant factor in the increase in cirrhosis mortality. Blacks are estimated to purchase half of all the rum sold in the United States, 41% of the gin, 50% of scotch whiskeys, and 77% of Canadian whiskeys (Djata 1987).

In Britain, higher mortality rates are also found for the unemployed compared to the employed (Brenner 1995). The wives of unemployed men had higher mortality rates during the follow-up period in some studies. This literature also indicates that economic stress induces divorce and separation in families, and adversely impacts friendship networks.

### *Personality*

A number of personality variables have emerged as major risk factors for health status or as buffers or moderators of the impact of stressful experiences on health. These include self-esteem, perceptions of mastery or control, anger or hostility, feelings of helplessness and hopelessness, and repression or denial of emotions (Kessler et al 1995). The distribution of at least some health-enhancing personality characteristics varies by SES (Williams 1990, Mirowsky & Ross 1989), and future research must seek to identify the ways in which individual dispositions are shaped by the larger social context. Research on John Henryism illustrates the interaction between personality characteristics and socioeconomic status (James 1994). The John Henryism scale measures an active predisposition to master stress. Research with this measure suggests that John Henryism acts to increase blood pressure among lower SES blacks while simultaneously decreasing it among their higher SES black counterparts. It is interesting that the limited evidence available indicates that John Henryism is unrelated to blood pressure in whites.

### *Early Life Conditions*

Most studies of SES and racial differences in health focus on current socioeconomic status. However, an adult's health status is a function not only of current SES but of the SES conditions experienced over the life course (Williams 1990, Mare 1990). Elo & Preston (1992) have provided a comprehensive review of the evidence suggesting that early life socioeconomic and health conditions have long-term consequences for an adult's health status. Several

mechanisms appear to be at work. It appears that some diseases acquired in childhood, such as tuberculosis and typhoid, can be harbored for decades and manifest themselves later in life. Infection with the Hepatitis B virus can impair liver functioning and lead to cirrhosis of the liver and liver cancer. Living in a crowded household can increase one's risk of streptococcal infection and acute rheumatic fever, which in turn become major risk factors for rheumatic heart disease later in life. Infection plays a major role in growth retardation, and malnutrition as reflected in height may adversely affect the immune system. Diarrhea in childhood can also affect child growth.

In other instances a childhood disease may impair an individual's organ system, which can create a chronic debility that leads to worse health status and earlier mortality. Some childhood illnesses and conditions can lead to changes in adult health status. Nutritional intake in childhood and exposure to and host resistance to infections play a major role in determining adult height. Respiratory tract infections in childhood as well as height (a proxy for early environmental influences) are related to the development of chronic bronchitis, asthma, and emphysema in adulthood. Several studies have also noted an association between height and mortality. Shorter persons have higher mortality rates than do their taller counterparts. However, some of these connections between height and adult mortality can be linked indirectly through SES status achieved in adulthood. There is a positive relationship between height and SES.

There is growing evidence that conditions related to the intrauterine environment during the fetal period and/or patterns of behavior acquired in early childhood are major risk factors for cardiovascular disease in adulthood (Elo & Preston 1992). Several of these factors appear to have direct relevance for the health status of the African American population. For example, some studies have found that growth retardation during the fetal period or low birth weight is associated with high blood pressure in later life. Rates of low birth weight are twice as high for African Americans as for whites, and low birth weight is believed to be a crude indicator of growth retardation.

Using infant weight up to age one as a proxy for nutritional deprivation in early childhood, a study of over 5000 British boys documented a strong association between nutritional deprivation in childhood and heart disease in adulthood (Barker et al 1989). Death rates for heart disease were 2.6 times higher for those in the lowest weight category at age one than for those in the highest category. Interestingly, breast-fed children were also at lower risk of heart disease. Breast-feeding is positively associated with SES, and blacks are less likely to breast-feed than whites; rates of breast-feeding also decline for Hispanic and Asian immigrants with assimilation (Jeffrey 1993). Infant formula companies aggressively market their product to low income and minority women, who may be less aware of the benefits of breast-feeding, and the WIC

program (a federal program that provides nutritional support to poor women) accounts for 40% of the sale of infant formula in the United States (Jeffrey 1993).

### *Power*

The proliferation of studies of socioeconomic status and health needs to be placed within an appropriate framework to enhance our understanding of the underlying dynamics. Some studies tend to reify the categories of SES such as education or income by addressing what it is about these specific factors that are linked to health outcomes. Rather, SES measures are crude indicators of location in social structure. A return to the sociological construct of social class can serve to inform and structure our understanding of inequalities in health. Social classes are hierarchically arranged, socially meaningful groupings linked to the structure of society. Systematic inequality will flow from membership in one class rather than another. The Marxist view of class, in particular, emphasizes that antagonistic and contradictory relations would exist between classes as they mobilize and struggle over economic and political power. Class membership leads to differential political and economic power, and inequality in power is a neglected but important construct for enhancing our understanding of the consequences of class for health (Packham 1991).

Power is differentially distributed in society, and location in social structure determines the degree of power and influence that social groups have with regard to the decisions that have a differential impact on all members of society. Good health status is one product of the power of the class to which one belongs. The power of social classes in a given community can be inferred from an analysis of which groups occupy important institutional positions, who takes part in important decisions made over private and public issues, and ultimately who benefits or is harmed by these decisions and policies (Packham 1991). Packham (1991) illustrates this process in the case of the location of hazardous waste sites and hazardous production. Similarly, Brenner (1995) argues that because of blue collar workers' relative lack of power (knowledge of occupational health risks and political influence to change their work environments) they are less able to affect the development of occupational safety and health codes. Also, Rice & Winn (1990) emphasize that those with the most power and influence have greater impact on decision-making and the allocation of benefits for themselves. Groups with less influence are less competitive in policy and decision-making processes, and therefore they experience inequities in a broad range of societal outcomes linked to this deficit in power. Rice & Winn argue that governmental involvement and advocacy are necessary to reduce the natural tendency for the higher social classes to exert greater control and extract greater benefit from the allocation and distribution of valued benefits and services.

The concept of power along with the related concept of control can serve to integrate major findings in the literature on inequalities in health and point to promising directions for future research. LaVeist (1992) found a strong inverse relationship between black political power and post-neonatal mortality rates, and outlines some pathways through which political empowerment may enhance health. Syme (1991) also indicates that control may be the key determinant of the SES gradient in health. He argues the effects of social support, Type A behavior, and stressful life events can all be interpreted to reflect the presence or absence of different aspects of control (Syme 1991). Other evidence suggests that the ability to understand, predict, and control daily life experiences can determine both the level of stress to which persons are exposed and the impact of stress on them (Sutton & Kahn 1987). Control may facilitate the management of uncertainty, which can be a key determinant of the stressfulness of many social situations. Lack of control in occupational environments has also been shown to predict increased risks of disease (Karasek & Theorell 1990).

Differences in power may also undergird the greater awareness of health risks by higher SES persons and their greater responsiveness to health education campaigns. Coleman (1974) indicates that access to and control of valuable information in society is a key manifestation of power. High SES persons are among the first to be exposed to new information and have the necessary economic and other resources to capitalize on new information and to develop alternatives to behaviors that have been shown to be health damaging.

## ARE INEQUALITIES IN HEALTH INEVITABLE?

International comparisons of inequality in health and trends in social inequalities over time provide compelling data to address the issue of reducing health inequalities. National mortality rates are not strongly related to a country's overall economic status but are closely linked to the level of inequality within each country (Wilkinson 1992b). Countries with the least inequality have the best health profiles (Smith et al 1990, Wilkinson 1992a). Differences in income distribution alone account for two thirds of the variation in national mortality rates for the 23 countries belonging to the Organization for Economic Cooperation and Development. Trends in income inequality are also related to SES variations in health over time within a given country. An analysis of SES differences in mortality in England and Wales between 1921 and 1981 revealed that they widened or narrowed to correspond with increases or decreases in relative poverty (Wilkinson 1989).

A study of the relationship between education and mortality in nine industrialized countries also suggests that a country's level of egalitarian social and economic policy is linked to the nature of SES differentials in health within

that country. Inequalities in mortality were twice as large in the United States, France, and Italy as in the Netherlands, Sweden, Denmark, and Norway (Kunst & Mackenbach 1994). Finland, England and Wales occupied intermediate positions. Vagaro & Lundberg (1989) have shown that the lowest social classes in Sweden have lower mortality than the highest social classes in Great Britain. Thus, the benefits of income redistribution within a society may affect the health status of the majority of the population.

A clear illustration of the link between economic inequality and health is found in the comparison of the trends in life expectancy and income for Japan and Great Britain over the past two decades (Wilkinson 1992a). In 1970, Japan and Great Britain were similar in average life expectancy and income distribution. During the last two decades SES differentials in Japan became the narrowest in the world, while the income distribution widened in Great Britain. During this same period Japan's life expectancy rapidly increased to become the highest in the world while Britain's relative international ranking in life expectancy has declined. Changes in Japanese nutrition, health services, or prevention policies do not account for these differences (Marmot & Smith 1989).

Further evidence that the health status disadvantage of low SES groups is not driven by an absolute standard of economic well-being comes from comparisons of the African American population in the United States with their counterparts in the Caribbean. Although the average annual income in Barbados is under US \$3000, life expectancy among black men in Barbados was 71 years in 1988, while it was 65 years for black men in the United States. Infant mortality in Barbados was similar to that of US blacks—19 per 1000 live births (Cooper 1993).

The evidence is fairly clear that reductions in inequalities in health are closely linked to reductions in societal inequality. Factors such as medical care, even if equally provided to all, are unlikely to diminish SES differentials. Improved access to health enhancing resources may improve health for both high and low social status groups without reducing the health disparity between them. Reducing the SES gradient in health will require more fundamental changes. Freeman (1993) suggests that Third World communities in the United States (geographically and culturally defined areas of extreme excess mortality) should be identified and designated as chronic disaster areas. Special federal, state, and local resources should then be provided to such designated areas as is done in the case of natural disasters. Conditions such as substandard housing, low educational levels, poor social support and unemployment, as well as insufficient access to preventive health services should then be improved.

Income is probably the component of SES that is most amenable to change through redistributive policies such as tax credits or direct income supplement-

tation. Two studies have documented that changes in household income can enhance health. In a study of expanded income support, Kehrer & Wolin (1979) found that the birth weight of the infants of mothers in the experimental income group was higher than those of mothers in the control group, although neither group experienced any experimental manipulation of health services. Improved nutrition, probably a result of the income manipulation, appeared to have been the key intervening factor. Similarly, Wilkinson (1990) found in analysis of mortality over a ten-year period that changes in the proportion of workers with low earnings in specific occupational categories were significantly associated with changes in occupational mortality.

## CONCLUSION

One of sociology's most enduring contributions to the health field is the documentation that social class position is a key determinant of variations in the distribution of disease. Researchers in diverse disciplines recognize that SES is so strongly linked to health that they must statistically control for it in order to study their phenomena of interest. However, familiarity has bred complacency, and an opportunity exists for sociologists to provide leadership and direction to enhance understanding of the pathways by which social structure affects health.

The evidence reviewed indicates that large-scale societal factors are the primary determinants of health status. They determine not only the social categories to which people are assigned but their exposure to risk factors and resources. However, the ways in which location in social structure constrains and shapes daily life experiences in ways that adversely affect health is not well understood. Studies that seek to identify these pathogenic factors and mechanisms are urgently needed. Research on racism, acculturation, and power are fruitful places to begin. However, research and policy aimed at understanding the determinants of, and ensuring improvements in, health must recognize that intervening mechanisms and risk factors can be understood and effectively modified only in the context of the larger social environment in which they occur. For example, the high levels of low birth weight among African Americans are regarded as the prime risk factor for elevated rates of infant mortality. However, the mean birth weight for blacks in the United States is similar to that in Japan—but Japan has the lowest rate of infant mortality in the world (Wise & Pursley 1993). Not surprisingly, the available evidence indicates that interventions aimed at altering known risk factors without addressing fundamental social causes have had very limited success (Syme 1994). Thus, improvement in the health of vulnerable populations appears to be contingent on altering the fundamental macrosocial causes of inequalities in health.

Racial and socioeconomic inequality in health is arguably the single most



important public health issue in the United States. The evidence reviewed indicates that SES inequalities in health are widening, and the health status of at least some racial groups has worsened over time. The ranking of the United States relative to other industrialized countries in terms of health has been declining over time, while America continues to spend more on medical care per capita than any other country in the world. The evidence reviewed suggests that a serious and sustained investment in reducing societal inequalities can enhance the quantity and quality of life of all Americans and create the necessary liberty for the pursuit of health and happiness.

**Any Annual Review chapter, as well as any article cited in an Annual Review chapter, may be purchased from the Annual Reviews Preprints and Reprints service.  
1-800-347-8007; 415-259-5017; email: arpr@class.org**

### Literature Cited

- Adler NE, Boyce T, Chesney MA, Folkman S, Syme SL. 1993. Socioeconomic inequalities in health: no easy solution. *J. Am. Med. Assoc.* 269:3140-45
- Adler NE, Boyce T, Chesney MA, Cohen S, Folkman S, et al. 1994. Socioeconomic status and health: the challenge of the gradient. *Am. Psychol.* 49:15-24
- Anderton DL, Anderson AB, Oakes JM, Fraser MR. 1994. Environmental equity: the demographics of dumping. *Demography* 31:229-48
- Antonovsky A. 1967. Social class, life expectancy and overall mortality. *Milbank Q.* 45: 31-73
- Arber S. 1987. Social class, non-employment and chronic illness: continuing the inequalities in health debate. *Br. Med. J.* 294:1069-73
- Arber S. 1991. Class, paid employment and family roles: making sense of structural disadvantage, gender and health status. *Soc. Sci. Med.* 32:425-36
- Baquet CR, Horm JW, Gibbs T, Greenwald P. 1991. Socioeconomic factors and cancer incidence among blacks and whites. *J. Natl. Cancer Inst.* 83:551-57
- Barker DJP, Osmond C, Winter PD, Margetts B, Simmonds SJ. 1989. Weight in infancy and death from ischaemic heart disease. *Lancet* 9:578-80
- Baxter J. 1994. Is husband's class enough? Class location and class identity. *Am. Sociol. Rev.* 59:220-35
- Blendon R, Aiken L, Freeman H, Corey C. 1989. Access to medical care for black and white Americans. *J. Am. Med. Assoc.* 261: 278-81
- Braithwaite RL, Taylor SE. 1992. *Health Issues in the Black Community*. San Francisco: Jossey-Bass
- Brenner MH. 1995. Economy, society, and health: theoretical links and empirical relations. In *Society and Health: Foundation for a Nation*, ed. S Levine, DC Walsh, BC Amick, AR Tarlov. New York: Oxford Univ. Press. In press
- Bunker JP, Gomby DS, Kehrer BH, eds. 1989. *Pathways to Health: The Role of Social Factors*. Menlo Park, CA: Kaiser Family Found.
- Carstairs V, Morris R. 1989. Deprivation and mortality: an alternative to social class? *Commun. Med.* 11:210-19
- Castro KG. 1993. Distribution of acquired immunodeficiency syndrome and other sexually transmitted diseases in racial and ethnic populations, United States: influences of life-style and socioeconomic status. *Ann. Epidemiol.* 3:181-4
- Chen MS. 1993. A 1993 status report on the health status of Asian Pacific Islander Americans: comparisons with *Healthy People 2000* objectives. *Asian Am. Pacific Islander J. Health* 1:37-55
- Chen VW. 1993. Smoking and the health gap of minorities. *Ann. Epidemiol.* 3:159-64
- Coleman JS. 1974. *Power and the Structure of Society*. New York: Norton
- Collins JW Jr, David RJ. 1993. Race and birthweight in biracial infants. *Am. J. Pub. Health* 83:1125-29
- Collins JW Jr, Shay DK. 1994. Prevalence of low birth weight among Hispanic infants with United States-born and foreign-born mothers: the effect of urban poverty. *Am. J. Epidemiol.* 139:184-92
- Collins SM. 1983. The making of the black middle class. *Soc. Prob.* 10:369-82

- Commission for Racial Justice. 1987. *Toxic Wastes and Race in the United States: A National Report on the Racial and Socioeconomic Characteristics of Communities with Hazardous Waste Sites*. New York: United Church of Christ
- Cooper R. 1984. A note on the biological concept of race and its application in epidemiologic research. *Am. Heart J.* 108: 715-23
- Cooper RS. 1993. Health and the social status of blacks in the United States. *Ann. Epidemiol.* 3:137-44
- Cooper RS, Steinhauer M, Schatzkin A, Miller W. 1981. Improved mortality among U.S. blacks, 1968-78: the role of antiracist struggle. *Int. J. Health Serv.* 11:511-22
- Council on Ethical and Judicial Affairs, American Medical Association. 1990. Black-white disparities in health care. *J. Am. Med. Assoc.* 263:2344-46
- Crews DE. 1994. Obesity and diabetes. In *Confronting Critical Health Issues of Asian and Pacific Islander Americans*, ed. NWS Zane, DT Takeuchi, KNJ Young, pp. 174-208. Thousand Oaks, CA: Sage
- Curtin PD. 1992. The slavery hypothesis for hypertension among African Americans: the historical evidence. *Am. J. Pub. Health* 82: 1681-86
- Danziger S, Gottschalk P, eds. 1993. *Uneven Tides: Rising Inequality in America*. New York: Russell Sage
- Davis RM. 1987. Current trends in cigarette advertising and marketing. *New Engl. J. Med.* 316:725-32
- Department of Health and Social Security. 1980. *Inequalities in Health: Report of a Research Working Group* (The Black Report). London: Dep. Health Soc. Security
- Djata. 1987. The marketing of vices to black consumers. *Bus. Soc. Rev.* 62:47-49
- Doh enwend B. 1990. Socioeconomic status (SES) and psychiatric disorders. *Soc. Psychiatr. Epidemiol.* 25:41-47
- Dessler WW. 1993. Health in the African American community: accounting for health inequalities. *Med. Anthropol. Q.* 7:325-45
- Duleep HO. 1989. Measuring socioeconomic mortality differentials over time. *Demography* 26:345-51
- Duncan G. 1988. The volatility of family income over the life course. In *Life Span Development and Behavior*, Vol. 9, ed. P Bates, D Feathe man, R Lerner, pp. 317-58. Hillsdale, NJ: Lawrence Erlbaum Assoc.
- Duncan GJ, Brooks-Gunn J, Klebanov PK. 1994. Economic deprivation and early childhood development. *Child Dev.* 65:296-318
- Duncan GJ, Smeeding T, Rodgers W. 1993. W(h)ither the middle class?: a dynamic view. In *Poverty and Prosperity in the USA in the Late Twentieth Century*, ed. D Papadimitriou, E Wolff, pp. 240-271. London: MacMillan
- Eller TJ. 1994. *Household Wealth and Asset Ownership: 1991. US Bureau of the Census, Current Population Reports, P70-34*. Washington DC: US Govt. Printing Off. (USGPO)
- Ellis L, ed. 1993. *Social Stratification and Socioeconomic Inequality*, Vol. 1. Westport, CT: Praeger
- Elo IT, Preston SH. 1992. Effects of early-life conditions on adult mortality: a review. *Pop. Index* 58:186-212
- Engels F. 1984. [1844] *The Condition of the Working Class in England*. Chicago: Academy Chicago
- Feinstein JS. 1993. The relationship between socioeconomic status and health. *Milbank Q.* 71:279-322
- Feldman JJ, Makuc DM, Kleinman JC, Coronon-Huntley J. 1989. National trends in educational differentials in mortality. *Am. J. Epidemiol.* 129:919-33
- Fingerhut LA, Makuc DM. 1992. Mortality among minority populations in the United States. *Am. J. Pub. Health* 82:1168-70
- Fox A, Goldblatt PO, Jones DR. 1985. Social class mortality differentials: artefact, selection or life circumstances? *J. Epidemiol. Commun. Health* 39:1-8
- Freeman HP. 1993. Poverty, race, racism, and survival. *Ann. Epidemiol.* 3:145-49
- Furino A, ed. 1992. *Health Policy and the Hispanic*. Boulder: Westview
- Gabarino J, Dubrow N, Kostelney K, Pardo C. 1992. *Children in Danger: Coping with the Consequences of Community Violence*. San Francisco: Jossey-Bass
- Geronimus AT. 1992. The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethnicity & Disease* 2:207-21
- Goldblatt P. 1990. *Longitudinal Study: Mortality and Social Organisation*. London: HMSO
- Greenberg M, Schneider D. 1994. Violence in American cities: young black males is the answer, but what was the question? *Soc. Sci. Med.* 39:179-87
- Haan MN, Kaplan AG. 1986. The contribution of socioeconomic position to minority health. In *Report of the Secretary's Task Force on Black and Minority Health*, 2:69-103. Washington, DC: US Dep. Health Hum. Serv.
- Haan M, Kaplan G, Camacho T. 1987. Poverty and health: prospective evidence from the Alameda County Study. *Am. J. Epidemiol.* 125:989-98
- Hahn RA. 1992. The state of federal health statistics on racial and ethnic groups. *J. Am. Med. Assoc.* 267:255-58
- Harburg E, Erfurt J, Chape C, Havenstein L, Scholl W, Schork MA. 1973. Sociological

- stressor areas and black-white blood pressure: Detroit. *J. Chron. Dis.* 26:595-611
- Haug M. 1977. Measurement on social stratification. *Annu. Rev. Sociol.* 3:51-77
- Hauser RM. 1993. Trends in college entry among blacks, Hispanics, and whites. In *Studies of Supply and Demand in Higher Education*, ed. C Clotfelter, M Rothschild, pp. 61-119. Chicago: Univ. Chicago Press
- Herd D. 1985. Migration, cultural transformation and the rise of black liver cirrhosis mortality. *Br. J. Addict.* 80:397-410
- Hernandez DJ. 1993. *America's Children: Resources from Family, Government and the Economy*. New York: Russell Sage.
- Hibbard J, Pope C. 1991. Effect of domestic and occupational roles on morbidity and mortality. *Soc. Sci. Med.* 32:805-11
- Hogue CJR, Buehler JW, Strauss LT, Smith JC. 1987. Overview of the national infant mortality surveillance (NIMS) project: design, methods, results. *Pub. Health Rep.* 102:126-38
- Holzer C, Shea B, Swanson J, Leaf P, Myers J, et al. 1986. The increased risk for specific psychiatric disorders among persons of low socioeconomic status. *Am. J. Soc. Psychiatr.* 6:259-71
- House JS, Kessler RC, Herzog AR, Mero RP, Kinney AM, Breslow MJ. 1990. Age, socioeconomic status, and health. *Milbank Q.* 68:383-411
- House JS, Lepkowski JM, Kinney AM, Mero RP, Kessler RC, Herzog AR. 1994. The social stratification of aging and health. *J. Health Soc. Behav.* 35:213-34
- Jackson FLC. 1991. An evolutionary perspective on salt, hypertension, and human genetic variability. *Hypertension* 17 (1, Suppl. I): 129-32
- Jackson JS, Brown TN, Williams DR, Torres M, Sellers SL, Brown K. 1995. Perceptions and experiences of racism and the physical and mental health status of African Americans: a thirteen year national panel study. *Ethnicity and Disease*, 5(1). In press
- James SA. 1993. Racial and ethnic differences in infant mortality and low birth weight. *Ann. Epidemiol.* 3:130-36
- James SA. 1994. John Henryism and the health of African-Americans. *Culture Med. Psychiatry* 18:163-82
- Jeffrey C. 1993. Formula for failure. *Chicago Reporter* 22:1,6-11
- Jenkins CNH, Kagawa-Singer M. 1994. Cancer. In *Confronting Critical Health Issues of Asian and Pacific Islander Americans*, ed. NWS Zane, DT Takeuchi, KNJ Young, pp. 105-47. Thousand Oaks, CA: Sage
- Johnson CE. 1974. *Consistency of Reporting Ethnic Origin in the Current Population Survey. US Dep. Commerce Tech. Pap. No. 31* Washington, DC: Bur. Census
- Jones CP, LaVeist TA, Lillie-Blanton M. 1991. Race in the epidemiologic literature: an examination of the *American Journal of Epidemiology*, 1921-1990. *Am. J. Epidemiol.* 134:1079-84
- Karasek RA, Theorell T. 1990. *Healthy Work*. New York: Basic Books
- Kehrer BH, Wolin CM. 1979. Impact of income maintenance on low birth weight: evidence from the Gary experiment. *J. Hum. Resour.* 14:434-62
- Keith VM, Herring C. 1991. Skin tone and stratification in the black community. *Am. J. Sociol.* 97:760-78
- Kessler RC. 1979. Stress, social status, and psychological distress. *J. Health Soc. Behav.* 20:259-72
- Kessler RC, House JS, Anspach R, Williams DR. 1995. Social psychology and health. In *Sociological Perspectives on Social Psychology*, ed. K Cook, G Fine, JS House, pp. 548-70. Boston: Allyn & Bacon
- Kessler RC, Neighbors HW. 1986. A new perspective on the relationships among race, social class, and psychological distress. *J. Health Soc. Behav.* 27:107-15
- King G, Williams DR. 1995. Race and health: a multi-dimensional approach to African American health. In *Society and Health: Foundation for a Nation*, ed. S Levine, DC Walsh, BC Amick, AR Tarlov. New York: Oxford Univ. Press. In press
- Kitagawa EM, Hauser PM. 1973. *Differential Mortality in the United States: A Study in Socioeconomic Epidemiology*. Cambridge: Harvard Univ. Press
- Klag MH, Whelton PK, Coresh J, Grim CE, Kuller LH. 1991. The association of skin color with blood pressure in US blacks with low socioeconomic status. *J. Am. Med. Assoc.* 265:599-602
- Kochanek KD, Maurer JD, Rosenberg HM. 1994. Why did black life expectancy decline from 1984 through 1989 in the United States? *Am. J. Pub. Health* 84:938-44
- Krieger N. 1991. Women and social class: a methodological study comparing individual, household, and census measures as predictors of black/white differences in reproductive history. *J. Epidemiol. Commun. Health* 45:35-42
- Krieger N, Fee E. 1994. Social class: the missing link in U.S. health data. *J. Health Serv.* 24:25-44
- Krieger N, Rowley DL, Herman AA, Avery B, Phillips MT. 1993. Racism, sexism, and social class: implications for studies of health, disease, and well-being. *Am. J. Prev. Med.* 9(supp.):82-122
- Kumanyika SK. 1987. Obesity in black women. *Epidemiol. Rev.* 9:31-50
- Kunst AE, Mackenbach JP. 1994. The size of mortality differences associated with educa-

- tional level in nine industrialized countries. *Am. J. Pub. Health* 84:932-37
- LaVeist TA. 1989. Linking residential segregation and infant mortality in U.S. cities. *Social. Soc. Res.* 73:90-94
- LaVeist TA. 1992. The political empowerment and health status of African-Americans: mapping a new territory. *Am. J. Sociol.* 97: 1080-95
- Levin M. 1988. The tobacco industry's strange bedfellows. *Bus. Soc. Rev.* 65:11-17
- Liberatos P, Link BG, Kelsey JL. 1988. The measurement of social class in epidemiology. *Epidemiol. Rev.* 10:87-121
- Lillie-Blanton M, Anthony JC, Schuster CR. 1993. Probing the meaning of racial or ethnic group comparisons in crack cocaine smoking. *J. Am. Med. Assoc.* 269:993-97
- Lin-Fu JS. 1993. Asian and Pacific Islander Americans: an overview of demographic characteristics and health care issues. *Asian Pacific Islander J. Health* 1:20-36
- Livingston IL. 1994. *Handbook of Black American Health: The Mosaic of Conditions, Issues, and Prospects.* Westport, CT: Greenwood
- Lundberg O. 1991. Causal explanations for class inequality in health—an empirical analysis. *Soc. Sci. Med.* 32:385-93
- Lurie N, Ward NB, Shapiro MF, Brook RH. 1984. Termination from Medi-Cal—does it affect health? *New Engl. J. Medicine* 311: 480-84
- Mackenbach JP, Stronks K, Kunst A. 1989. The contribution of medical care to inequalities in health: differences between socio-economic groups in decline of mortality from conditions amenable to medical intervention. *Soc. Sci. Med.* 29:369-76
- Mandinger MO. 1985. Health service funding cuts and the declining health of the poor. *New Engl. J. Med.* 313:44-47
- Mare RD. 1990. Socio-economic careers and differential mortality among older men in the United States. In *Measurement and Analysis of Mortality—New Approaches*, ed. J Vallin, S D'Souza, A Palloni, pp. 362-87. Oxford: Clarendon
- Marnot MG, Kogevinas M, Elston MA. 1987. Social/economic status and disease. *Annu. Rev. Pub. Health* 8:111-35
- Marnot MG, Shipley MJ, Rose G. 1984. Inequalities in death—specific explanations of a general pattern? *Lancet* 1:1003-06
- Marnot MG, Smith DG. 1989. Why are the Japanese living longer? *Br. Med. J.* 1547-51
- Marnot MG, Smith GD, Stansfeld S, Patel C, North F, et al. 1991. Health inequalities among British civil servants: the Whitehall II Study. *Lancet* 337:1387-93
- Marnot MG, Syme SL. 1976. Acculturation and coronary heart disease in Japanese-Americans. *Am. J. Epidemiol.* 104:225-47
- Massey DS, Gross AB. 1993. Black migration, segregation, and the spatial concentration of poverty. *Irving B. Harris Graduate School of Public Policy Studies Working Paper Series: 93-3.* Univ. Chicago
- Massey JT. 1980. *A comparison of interviewer observed race and respondent reported race in the National Health Interview Survey.* Presented at Ann. Meet. Am. Statist. Assoc., Houston, Texas
- Maxwell NL. 1994. The effect on black-white wage differences in the quantity and quality of education. *Indust. Labor Relat. Rev.* 47: 249-64
- McCord C, Freeman HP. 1990. Excess mortality in Harlem. *New Engl. J. Med.* 322:173-77
- McDonough P, Duncan G, Williams DR, House JS. 1995. *Income Dynamics and Adult Mortality in the U.S., 1972-1989.* Unpublished ms. Survey Res. Ctr. Inst. for Soc. Res. Ann Arbor, MI
- Miller JE, Korenman S. 1994. Poverty and children's nutritional status in the United States. *Am. J. Epidemiol.* 140:233-43
- Mirowsky J, Ross CE. 1989. *Social Causes of Distress.* New York: Aldine de Gruyter
- Moen P, Dempster-McClain D, Williams R. 1989. Social integration and longevity: an event history analysis of women's roles and resilience. *Am. Sociol. Rev.* 54:635-47
- Moore DE, Hayward MD. 1990. Occupational careers and mortality of elderly men. *Demography* 27:31-53
- Morton NE, Chung CS, Mi M-P. 1967. *Genetics of Interracial Crosses in Hawaii.* Basel, Switzerland: S. Karger
- Moser KA, Pugh H, Goldblatt P. 1990. Mortality and the social classification of women. In *Longitudinal Study: Mortality and Social Organization*, Ser. LS, no. 6, ed. P Goldblatt, pp. 146-62. London: Her Majesty's Stationery Off.
- Mullings L. 1989. Inequality and African-American health status: policies and prospects. In *Twentieth Century Dilemmas—Twenty-First Century Prognoses*, ed. WA VanHome, TV Tonnesen, pp. 154-182. Madison: Univ. Wisc. Inst. on Race and Ethnicity
- National Center for Health Statistics. 1994a. *Health United States 1993.* Hyattsville, MD: USDHHS
- National Center for Health Statistics. 1994b. *Excess Deaths and Other Mortality Measures for the Black Population: 1979-81 and 1991.* Hyattsville, MD: Pub. Health Serv.
- Navarro V. 1990. Race or class versus race and class: mortality differentials in the United States. *Lancet* 336:1238-40
- Notes & Comments. 1994. Census undercount and the quality of health data for racial and ethnic populations. *Ethnicity & Disease* 4: 98-100

- Otten MC, Teutsch SM, Williamson DF, Marks JS. 1990. The effect of known risk factors on the excess mortality of black adults in the United States. *J. Am. Med. Assoc.* 263:845-50
- Packham J. 1991. *Power as a neglected variable in the assessment of the class/health relation.* Presented at Ann. Meet. Am. Soc. Assoc.
- Pappas G, Queen S, Hadden W, Fisher G. 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New Engl. J. Med.* 329:103-15
- Passannante MK, Nathanson C. 1985. Female labor force participation and female mortality in Wisconsin 1974-78. *Soc. Sci. Med.* 21:655-65
- Polednak AP. 1991. Black-white differences in infant mortality in 38 standard metropolitan statistical areas. *Am. J. Pub. Health* 81:1480-82
- Polednak AP. 1993. Poverty, residential segregation, and black/white mortality rates in urban areas. *J. Health Care Poor Underserv.* 4:363-73
- Power C, Manor O, Fox AJ, Fogelman K. 1990. Health in childhood and social inequalities in health in young adults. *J. Royal Statist. Soc.* 153 Part 1:17-28
- Powers M, Holmberg J. 1982. Occupational status scores: changes introduced by the inclusion of women. In *Measures of Socioeconomic Status: Current Issues*, ed. M Powers, pp. 55-81. Boulder, CO: Westview
- Rice MF, Winn M. 1990. Black health care in America: a political perspective. *J. Natl. Med. Assoc.* 82:429-37
- Robins LN, Regier DA, eds. 1991. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study.* New York: Free Press
- Robinson J. 1984. Racial inequality and the probability of occupation-related injury or illness. *Milbank Q.* 62:567-90
- Rogers RG. 1992. Living and dying in the U.S.A.: sociodemographic determinants of death among blacks and whites. *Demography* 29:287-303
- Rogler LH, Cortes DE, Malgady RG. 1991. Acculturation and mental health status among Hispanics. *Am. Psychol.* 46:585-97
- Rogot E. 1992. *A Mortality Study of 1.3 Million Persons by Demographic, Social and Economic Factors: 1979-1985 Follow-up: US National Longitudinal Mortality Study.* Bethesda: Natl. Inst. Health, Natl. Heart, Lung, and Blood Inst.
- Rose G. 1985. Sick individuals and sick populations. *Int. J. Epidemiol.* 14:32-8
- Rowley DL, Hogue CJR, Blackmore AC, Ferre CD, Hatfield-Timajchy K, et al. 1993. Pre-term delivery among African-American women: a research strategy. *Am. J. Prev. Med.* 9(supp.):1-6
- Ruggles P. 1990. *Drawing the Line: Alternative Poverty Measures and their Implications for Public Policy.* Washington DC: Urban Inst.
- Schoendorf KC, Hogue CJR, Kleinman JC, Rowley D. 1992. Mortality among infants of black as compared with white college-educated parents. *New Engl. J. Med.* 326:1522-26
- Schwartz E, Kofie VY, Rivo M, Tuckson RV. 1990. Black/white comparisons of deaths preventable by medical intervention: United States and the District of Columbia 1980-1986. *Int. J. Epidemiol.* 19:591-98
- Sheak R. 1988. Poverty estimates: political implications and other issues. *Sociol. Spectrum* 8:277-94
- Singer M. 1986. Toward a political economy of alcoholism. *Soc. Sci. Med.* 23:113-30
- Smith DG, Bartley M, Blane D. 1990. The black report on socioeconomic inequalities in health 10 years on. *Br. Med. J.* 301:373-77
- Smith EM. 1993. Race or racism? Addiction in the United States. *Ann. Epidemiol.* 3:165-70
- Smith JP, Welch FR. 1989. Black economic progress after Myrdal. *J. Econ. Lit.* XXVII: 519-64
- Sorel JE, Ragland DR, Syme SL, Davis WB. 1992. Educational status and blood pressure: the Second National Health and Nutrition Examination Survey, 1976-1980, and the Hispanic Health and Nutrition Examination Survey, 1982-1984. *Am. J. Epidemiol.* 135: 1339-48
- Sorlie PD, Backlund E, Johnson NJ, Rogot E. 1993. Mortality by Hispanic status in the United States. *J. Am. Medical Assoc.* 270: 2464-68
- Sterling TD, Weinkam JJ. 1989. Comparison of smoking-related risk factors among black and white males. *Am. J. Industr. Med.* 15: 319-33
- Sutton R, Kahn RL. 1987. Prediction, understanding and control as antidotes to organizational stress. In *Handbook of Organizational Behavior*, ed. JW Lorsch, pp. 272-85. Englewood Cliffs, NJ: Prentice Hall
- Syme SL. 1991. Control and health: a personal perspective. *Advances* 7:16-27
- Syme SL. 1994. The social environment and health. *Daedalus* 123:79-86.
- Takeuchi DT, Williams DR, Adair RK. 1991. Economic stress in the family and children's emotional and behavioral problems. *J. Marriage Fam.* 53:1031-41
- Townsend P, Phillimore P, Beattie A. 1988. *Health and Deprivation: Inequality and the North.* London, England: Croom Helm
- US Bureau of the Census, Current Population Reports, Series P-60, No. 174. 1991. *Money Income of Households, Families, and Per-*

- sons in the United States. Washington DC: USGPO
- US Department of Health, Education, and Welfare. 1979. *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*. Washington DC: USGPO
- US Department of Health and Human Services. 1985. *Report of the Secretary's Task Force on Black and Minority Health*. Washington, DC: USGPO
- Vagaro D, Lundberg O. 1989. Health inequalities in Britain and Sweden. *Lancet* II(8653): 35-36
- Vega WA, Amaro H. 1994. Latino outlook: good health, uncertain prognosis. *Annu. Rev. Pub. Health* 15:39-67
- Wagener DK, Schatzkin A. 1994. Temporal trends in the socioeconomic gradient for breast cancer mortality among U.S. women. *Am. J. Pub. Health* 84:1003-06
- Waizman NJ, Smith KR. 1994. The effects of occupational class transitions on hypertension: racial disparities among working class men. *Am. J. Pub. Health* 84:945-50
- Wilhelm SM. 1987. Economic demise of blacks in America: a prelude to genocide? *J. Black Stud.* 17:201-54
- Wilkinson RG, ed. 1986. *Class and Health: Research and Longitudinal Data*. London: Tavistock
- Wilkinson RG. 1989. Class mortality differentials, income distribution and trends in poverty 1921-81. *J. Soc. Policy* 18:307-35
- Wilkinson RG. 1990. Income distribution and mortality: a 'natural' experiment. *Soc. Health & Illness* 12:391-412
- Wilkinson RG. 1992a. Income distribution and life expectancy. *Br. Med. J.* 304:165-68
- Wilkinson RG. 1992b. National mortality rates: the impact of inequality? *Am. J. Pub. Health* 82:1082-84
- Williams DR. 1990. Socioeconomic differentials in health: a review and redirection. *Soc. Psychol. Q.* 53:81-99
- Williams DR. 1991. Social structure and the health behavior of blacks. In *Aging, Health Behaviors and Health Outcomes*, eds. KW Schaie, JS House, D Blazer, pp. 59-64. Hillsdale, NJ: Erlbaum
- Williams DR. 1992. Black-white differences in blood pressure: the role of social factors. *Ethnicity & Disease* 2:126-41
- Williams DR. 1994. The concept of race in *Health Services Research*, 1966-1990. *Health Serv. Res.* 29:261-74
- Williams DR. 1995a. Poverty, racism and migration: the health of the African American population. In *Immigration, Race, and Ethnicity in America: Historical and Contemporary Perspectives*, ed. S Pedraza, RG Rumbaut. Belmont, CA: Wadsworth. In press
- Williams DR, ed. 1995b. Special issue on racism and health. *Ethnicity & Disease*, 5: In press
- Williams DR, Lavizzo-Mourey R, Warren RC. 1994. The concept of race and health status in America. *Pub. Health Rep.* 109:26-41
- Williams DR, Takeuchi D, Adair R. 1992. Socioeconomic status and psychiatric disorder among blacks and whites. *Soc. Forces* 71: 179-94
- Wilson TW, Grim CE. 1991. Biohistory of slavery and blood pressure differences in blacks today. *Hypertension* 17(suppl. I):122-28
- Wilson WJ. 1987. *The Truly Disadvantaged*. Chicago: Univ. Chicago Press
- Wise PH, Pursley DM. 1992. Infant mortality as a social mirror. *New Engl. J. Med.* 326: 1558-60
- Woolhandler S, Himmelstein DU, Silber R, Bader M, Harnly M, Jones AA. 1985. Medical care and mortality: racial differences in preventable deaths. *Int. J. Health Serv.* 15:1-11
- Wu, C-I, Ross, CE. 1994. *Education, Age, and Health*. Presented at Annu. Meet. Am. Sociol. Assoc., Los Angeles
- Zane NWS, Takeuchi DT, Young KNS, eds. 1994. *Confronting Critical Health Issues of Asian and Pacific Islander Americans*. Thousand Oaks, CA: Sage

#### ACKNOWLEDGMENTS

Preparation of this paper was supported by grant AG-07904 from the National Institute of Aging. We wish to thank Greg Duncan, James S. House, and Sherman James for helpful comments on an earlier version of this paper.