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Volume II:  
Crosscutting Issues  
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# Report of the Secretary's Task Force on

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# Black & Minority Health

**Margaret M. Heckler**  
Secretary

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U.S. Department of Health and  
Human Services

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# The Contribution of Socioeconomic Position to Minority Health

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## The Contribution of Socioeconomic Position to Minority Health

### Introduction

Investigation of the differential health experience of minorities and whites cannot help but raise important questions concerning the reasons for these differences. In Part 1 of this report, we will argue that socioeconomic position (SEP) represents an important and plausible area of investigation in the search for reasons. It is important because SEP and minority status are clearly intertwined, and examination of both will potentially clarify our understanding of minority health. We say plausible because limitations in the available data advise caution in interpretation and application. However, there is considerable information which points to the critical role of SEP. We will examine this role in several stages. First we will review the strength and consistency of the association between SEP and a variety of disease outcomes. Rather than focusing on specific organ systems, we will use the epidemiologic triad of person, place, and time to organize the massive amount of evidence on SEP and health. Then we will consider the association between SEP and membership in minority groups. Our next step will be to consider available evidence concerning the consistency of the association between SEP and health, between and within specific minority groups. We will then move to evidence which indicates how much of the differences in health between minorities and whites can be attributed to SEP. In Part 2, we will examine evidence which suggests some of the ways in which low SEP may be associated with poorer health.

As a first step, we need to consider for a moment what is meant when we refer to SEP. This topic has been addressed recently by Morgenstern (66). Most investigators have viewed SEP as an amalgam of income, education, and occupation. Various indices have been constructed in an attempt to combine, on empirical or theoretical grounds, information from these three domains. Indices of social status have also been constructed, again on empirical or theoretical grounds, which rank people according to "prestige." Lastly, the construct "social class" has been used to order groups in a number of ways, ranging from broad occupational groupings to orderings based on influence, authority, and power in the economic structure.

It is clear from this brief discussion that we can mean many things by SEP. Measures which combine different domains of socioeconomic information can hinder our understanding of the ways in which SEP is associated with health. Although different socioeconomic measures may be related, they have differential utility depending upon the question being asked. For example, in situations where illness is likely to effect occupation and income, education may be the preferred socioeconomic measure. Income level, however, may be more important in obtaining services or meeting needs than education would be. On the other hand, because of secular and group-specific trends in educational attainment, level of education may behave differently as a risk factor for different cohorts. Measures of occupation which group individuals in broad classes such as professional-technical, managers-administrators-proprietors, or semiskilled operatives may obscure large income or educational differences within these classes. On the other hand, occupation may summarize the cumulative effects of education and income or measure other aspects of SEP not tapped by education and income.

In what follows, we will report on socioeconomic measures which are derived from income, education, or occupation. Where possible, we will utilize more than one measure in our discussion. In addition, in some cases, we will utilize measures which reflect characteristics of the areas in which individuals live. Census tract characteristics such as median family income, median years of education, or per cent in a particular occupational category are sometimes used as proxy measures of individual levels. Recognizing the potential "ecological fallacy" (65) involved in the use of such measures, we will use them with great caution and only where the pattern of findings is consistent with results using other measures. In Part 2 of this report, we will indicate, however, how such area characteristics may, in themselves, be important to our understanding of the health differentials between minorities and whites.

## Part 1

### All-Cause Mortality: The General Picture

Ever since the 12th century, when data were first recorded on this topic, those at the lowest socioeconomic levels in the community have been found to have higher death rates (1, 90). This pattern is reflected in a large number of reports which have examined the association between socioeconomic factors and all-cause mortality. An illustrative example comes from Kitagawa and Hauser's study of adult mortality in the United States in 1960 (51). They found a consistent inverse gradient of mortality rates associated with socioeconomic position. Those who had higher SEP had lower mortality rates. This was true whether the measure of socioeconomic position was based on family income, median income of census tract of residence, education, or occupation. In the many studies of which we are aware, this pattern of increased all-cause mortality associated with lower socioeconomic position is found in well over 80 per cent. Furthermore, in many cases, there is an orderly gradient of rates associated with increases or decreases in SEP. In what follows, we will briefly examine the consistency of this finding for different age groups, diseases, geographical locations, and time periods.

#### Consistency by Age

**All-Cause Mortality.** Socioeconomic gradients of all-cause mortality are found in most age ranges. There is some evidence that the association between socioeconomic factors and health is somewhat weaker at the older ages. Kitagawa and Hauser (51) found that the gradients associated with income and education were larger for persons 25-64 years of age than they were for those 65 years or older. In analyses (49) of the 18-year mortality experience of a large (n=6,928) cohort of individuals representative of Alameda County, California, in 1965 (6), we found that the increased risk associated with low compared to high family income decreases with age, becoming non-significant between 60 and 70 years. Others have reported similar findings (51). However, in interpreting the significance of this apparent dilution of effect, we must take into account the fact that income generally declines with retirement, resulting in a disproportionate lowering of the income of those who were not previously in the lower income categories. Thus some portion of those in the lower SEP groups have only recently entered these groups. The absence of lifelong measures of SEP may

result in dilution of the association between SEP and mortality in the later years. Similarly, average levels of education have increased in successive birth cohorts, and the educational requirements for most occupations have increased. It is, therefore, reasonable to believe that the health consequences of a low education may have similarly increased. As always, the interpretation of "age" effects are complicated by period and cohort effects.

**Diseases of the Young.** The overall consistency of the association between socioeconomic position and health status can be further seen by examining outcomes which are age-related. A substantial body of evidence exists linking higher rates of infant mortality to socioeconomic position (2, 7, 12, 16, 35, 36, 60, 73, 79, 84, 102). Many studies have shown that perinatal and infant mortality rates are elevated for those with lower income, lower educational attainment, poorer occupational status, or other types of social disadvantage (9, 10, 51, 105). There is also evidence which suggests that higher rates of birth defects are found in the poor (14, 28). The major sources of mortality from unintentional injury in children (housefires, drowning, and suffocation) also show a strong association with SEP (4). A similar pattern is found for a wide variety of health outcomes in the young (9, 10, 27, 57, 63, 83, 85, 89, 92, 104).

**Diseases of the Middle Years.** When we turn to diseases of middle-age, we see similar patterns. Vital statistics data confirm the inverse association between SEP and the various manifestations of atherosclerotic disease (29, 37, 46, 69, 76, 80). In the United States, both prevalence and incidence of cardiovascular disease are inversely related to SEP (15, 48, 50, 51, 53, 78, 95, 112), although for some groups, there have been changes in the direction of the association between SEP and cardiovascular disease (64). In the 1972 Health Interview Survey (101), those who had family incomes under \$5,000 had 33 per cent higher prevalence of heart conditions than those with family incomes of \$15,000 or more. The rates of hypertension without heart involvement were over 60 per cent higher in the poorer group. Similar findings have been reported in a number of studies. Findings from the Hypertension Detection and Follow-Up Program show a strong inverse gradient of prevalence of hypertension associated with years of education (41). Mortality from coronary heart disease shows a consistent SEP gradient when SEP is measured by occupational groupings as well (51). In addition, survival from coronary heart disease appears to be inversely associated with SEP (82). An SEP gradient is also found for unintentional injuries in this age group. For example, residents of low income compared to high income counties have about three times the mortality rate for motor vehicle occupants even though they are likely to be driving less (4). Similar patterns are found for other diseases of this age group (11, 31, 40, 91, 112).

**Diseases of the Later Years.** Many cancers which reach their peak prevalence in the later years show inverse gradients with SEP. Among these are cancers of the lung and pleura (56, 81, 109), oral cavity and pharynx (42, 111), esophagus (59, 110), and stomach (43, 93). There are, of course, sites which evidence the opposite gradient such as breast (3, 26) and testicular (68, 77). However, it is notable that the poorer survival associated with lower SEP is found both for sites where there is an inverse association with SEP, for example, prostate (21), and for sites where there is a direct association with SEP, for example, breast (22). Gradients of disease related to SEP are also found for stroke, osteoarthritis, and other diseases and for various measures of disability and impairment (19, 51, 99,

100). Mortality rates for those in this group from pedestrian injuries, falls, fires and burns, and exposure to cold also show a strong association with SEP (4).

Although not an exhaustive listing, the evidence presented above is quite compelling regarding the consistency of the association between socioeconomic position and health at different age groups. In general, those at lower levels of SEP have higher rates of most diseases, covering a wide range of ages and organ systems.

#### Consistency by Place

The association between socioeconomic position and health is consistently found throughout the world. Mortality differentials associated with socioeconomic position are found in countries as diverse as the the United States and India. These differentials are found in England and Wales (67, 76), Sweden (30), Finland (69, 80), France (24), Norway (45), Australia (29), New Zealand (74), Latin America (5), Ghana (13), Canada (62), and many others. Within the United States, associations between socioeconomic position and health outcomes have been found in such diverse places as Evans County, Georgia (95), and Alameda County, California (38); Iowa (31) and Hawaii (83); and Chicago (51) and Charleston (50).

#### Consistency over Time

Despite the large improvements in health seen during the last 60 years, the gradient of health associated with SEP has changed very little. Hollingsworth (45) has done the most extensive review of changes in the SEP health gradient over time. He examined changes in all cause mortality by occupational class in England and Wales for the period 1891-1971. The standardized mortality ratio for the lowest social class (V) compared to the highest social class (I) in the period 1890-1902 was 1.50. In the period 1970-1972, the same ratio was 1.58. Although there clearly are problems in the comparability of data sources and definition of social class over this 80-year period, the similarity between the two figures is striking. It is especially striking when we consider that these data cover a period in which there were major changes in the leading causes of death. Similarly, Kitagawa and Hauser (51) found very little convergence of the socioeconomic differentials in mortality for all causes, excluding infant mortality, in Chicago during the period 1930-1960. Others have reported similar findings (54, 88). Analyses of mortality between 1960-1970 in Birmingham, Buffalo, and Indianapolis suggest that there was a slight increase in the gradient of mortality associated with socioeconomic position during that period (112). Some reports have suggested that the association between socioeconomic position and specific diseases has changed over time (58, 64). For example, mortality from cancer of various sites has changed over time (56). Blaxter (8) summarized these changes in England and Wales between 1930-1963 by noting that for sites which have been more common in those of lower socioeconomic position, the gradient associated with SEP has increased, whereas the gradient associated with SEP had decreased for sites more common in those of higher SEP. For sites which are decreasing in mortality, SEP gradients are increasing, and for sites which are increasing, SEP gradients are reversing.

Changes in the SEP gradient for coronary heart disease have also been noted. For example, in analyses in Evans County, Georgia (64), and England



and Wales (58), there appears to have been a reversal in the SEP gradient for mortality from coronary heart disease (CHD). That is, CHD among low SEP men has increased, and CHD among high SEP men has decreased. However, in both cases, this trend has been seen only for men; low SEP women have consistently had higher rates than high SEP women. It is important to note that although SEP gradients for CHD in men may have reversed in rural Georgia (Evans County) during this period, there is no evidence in the total mortality experience of this cohort which suggests that at any time during the early part of the 20-year follow-up, low SEP individuals had better survival than high SEP individuals (95).

To summarize, lower SEP is consistently associated with poorer health. This association is found when considering different ages and diseases, different geographical locales, and has been relatively stable over a considerable period of time. In the next section, we will present evidence which argues for the important role of SEP as a risk factor in the examination of minority and white health differences.

### Socioeconomic Position and Minority Status

This section describes the socioeconomic position of minority groups in the United States. Data on income, education and occupation is presented for blacks, hispanics, Asians, and American Indians. Much of the available data permits only analysis of white compared to "non-white." The "non-white" group is approximately 85 per cent black and 15 per cent other "non-whites." When possible, more detailed groupings will be presented.

From a health standpoint, the lack of detailed information on other minority groups is a deficit since what data does exist suggests there are some important differences in SEP and in health status between the various minority groups.

#### Income

Table 1 shows the income distribution for hispanics, blacks, and all others including whites (23, 97). This data shows that hispanics and blacks are similar in income and that both have substantially lower incomes than whites. For children under 18, black children are four times more likely to live in poverty than whites. When the family is headed by a woman, black children are 56 per cent more likely to live in poverty than whites. However, the poverty status of blacks is not entirely due to the higher proportion of female-headed households. In fact, the black-white poverty difference decreases when comparing female-headed households only, suggesting that presence of dependents and lower incomes afforded women in general also serve to increase the poverty rates.

Comparison of 1970 median incomes earned by non-black minority groups shows that white males earned more than three times that earned by American Indians, 47 per cent more than Japanese males, and twice that earned by Chinese males and Filipino males. The median income differentials were less striking for females, but white females tended to earn 10 per cent more than other females except for American Indian women, who earned two times less than white women (23).

#### Occupation

The white labor force participation rate is 7 to 8 per cent higher

than the rate for blacks and other minority groups. This picture is further complicated by the fact that black women have a 4 per cent higher participation rate than white women, while black men have an 8 per cent lower rate than white men. Examination of employment status among persons over 16 years of age for other minority groups shows that American Indians are the most disadvantaged (36% of males not in the labor force), while Japanese, Chinese, and Filipino males are similar to whites, with approximately 21 per cent of males over 16 not in the labor force. Rates for women of non-black minority groups follow a similar pattern, except that their non-participation rates tend to be around 50 per cent. About 65 per cent of American Indian women are not in the labor force (23, 97).

Table 2 shows the occupational distribution by minority group and sex. These figures were calculated as the relative proportion of whites employed in a category to minorities employed in that category. For example, white females were 39 per cent more likely to be employed in white collar jobs than black females. Consistently, minority groups have proportionately fewer members in white collar jobs and greater numbers in blue collar and service jobs. Blacks, hispanics, and American Indians are most similar in this regard. Asians are more similar to whites, except for employment in service jobs where white females exceed Asian females, and white males are slightly fewer than Asian males.

Job tenure also varies by minority status. Thirty per cent of white males have job tenure of 20 years or greater. Females of both groups have the shortest tenure (10%), and black males have job tenure 10 per cent less than that of white males. Job tenure is associated with increased social stability, increased income, and increased post-retirement benefits and therefore affects socioeconomic position.

### Education

Blacks, hispanics, and American Indians have lower educational attainment, and lower college enrollment than whites. This is much less true for Asians, whose educational attainment is similar to whites. According to 1978 data, among persons over 18 years of age, 83.9 per cent of whites, 69.8 per cent of blacks, and 55.5 per cent of hispanics were high school graduates. Blacks aged 18-19 had lower college enrollment (25%) compared to whites of the same ages (35%). Hispanics were eight times less likely to have college or greater education than whites and 2.5 times more likely to have a less than eighth-grade education than whites.

In 1978, the black-white ratio for college enrollment among persons 14-34 years of age was .13 for men and .15 for women. Tables 3 and 4 show educational attainment levels for whites and minorities.

The data presented above abundantly demonstrate that blacks, hispanics, and American Indians are of lower socioeconomic position than whites as measured by income, education, and occupation. Asians appear to be at less of a disadvantage with respect to educational attainment but are also disadvantaged with respect to income and occupation. The recent changes in immigration patterns may have altered the socioeconomic position of Asians, and an examination of more recent data (i.e., 1980 Census) could be useful. It seems apparent that our understanding of minority health status must include examination of SEP. The evidence provided in previous sections on SEP as an independent risk factor and on the close association between minority status and low SEP point to the need for this approach.

## Minority Status, Socioeconomic Position, and Health

This section will review research on minority status and health which also examines socioeconomic position. We will specifically examine all-cause mortality, cardiovascular disease, cancer, infant mortality, and mortality from non-disease causes such as accidents, fires, and drownings. In general, research on minority and health has not simultaneously examined SEP. This is of particular concern because of the close association between minority and socioeconomic position discussed above. Without such an approach in studies of minority health, especially of the more disadvantaged groups such as blacks, hispanics, or American Indians, it is difficult to conclude whether any results obtained are due to some minority characteristic or due to the socioeconomic conditions prevailing in that group.

### All-Cause Mortality and General Morbidity

Black, hispanic, and American Indian minority groups in the United States generally incur higher mortality rates from all causes and exhibit higher rates of other indicators of morbidity. Table 5 shows some measures of morbidity for blacks, hispanics, and all others (including whites) of all ages for incomes less than \$5,000 and greater than \$15,000 for 1976 (106). The prevalence of morbid conditions, hospitalizations, and activity limitations are negatively associated with income for all groups. The rates for each of these measures of morbidity are very similar between the different groups at each income level. The number of days of restricted activity varies somewhat but a consistent income gradient is still present within each group.

Kitagawa and Hauser (51) have shown that SEP is consistently associated with mortality and that the association between SEP and all-cause mortality is as consistent within minority groups as it is for whites. A problem found in the Kitagawa and Hauser study and many others is that the great majority of minorities have lower incomes than whites, making adjustment for SEP difficult within minority groups and for purposes of comparison to whites.

An opportunity to examine the contribution of SEP to the differential survival experience of whites and blacks presented itself in studies of Alameda County, California, residents. In 1965, the Human Population Laboratory of the California Department of Health Services selected a representative sample of almost 7,000 adults to participate in a longitudinal study (6). The mortality experience of this cohort has been ascertained through 1982. Survival of blacks, as expected, was poorer than whites. A proportional hazards model showed that the age-sex adjusted hazard rate was 34 per cent higher for blacks ( $p=.004$ ). When a measure of income adjusted for family size was introduced, the difference between black and white survival was no longer significant, while the impact of income was significant ( $p=.0001$ ). Figures 1a and 1b present the differential survival experience of blacks and whites in this cohort without adjustment for income (1a) and with such adjustment (1b). Thus in these analyses, differences in SEP appear to account, to a great extent, for the differential survival experience of blacks and whites.

The association between SEP, minority status, and health is relatively consistent when specific disease outcomes are examined. The next sections will discuss these associations with respect to cancer, cardiovascular

disease, and infant mortality. These outcomes were chosen because they represent major causes of morbidity and mortality and because data are available that permit adjustment for both minority status and SEP.

### Cancer

Several studies have reported associations between increased cancer incidence and poorer survival with socioeconomic position (17, 55, 71, 72). The association has been observed for cancer incidence and survival for all sites but varies by specific site. Similarly, differences in cancer incidence and mortality vary by minority group. For example, blacks have higher incidence rates and poorer survival from rectal cancers than whites. White women have higher incidence of breast cancer and better survival than black women (71).

A study of cancer patient survival among minority groups in the United States reported that survival from all-site cancer was substantially worse for blacks, American Indians, and Chinese than for whites (113). Table 6a shows the ratio of white five-year survival rates to each minority group's survival rates for males. Table 6b shows these ratios for breast and corpus uteri for females.

Black males and Hawaiian males have been reported as having higher cancer incidence rates than whites and other minority groups for all sites. (107). White females and black females have similar incidence rates (300/100,000) for all cancer sites, while Hawaiian women have much higher rates (400/100,000) than all other groups. Site-specific incidence rates for blacks vary considerably, as do those for other minority groups. For example, black males have higher incidence rates than white males for lung cancer, pancreatic cancer, and prostatic cancer, and black females have higher incidence rates than white females for cervical cancer. Hispanics have notably lower incidence rates than most other groups for all sites and for most site-specific cancer incidence rates. Although site-specific cancer incidence among blacks is not dramatically higher for most sites than white rates, survival from cancer for blacks and some other groups is poorer than whites' for many sites.

Blacks' five-year cancer survival is poorer than whites' for colon, rectum, nasopharynx, larynx, lung, bronchus, skin melanoma, prostate, urinary bladder, kidney, pelvis, brain and other nervous system, thyroid, non-Hodgkin's lymphoma, breast, and corpus and cervix uteri. American Indians also have poorer survival rates than whites for a large number of cancer sites. In general, blacks and American Indians are at greater risk than whites, while other minority groups appear to do better than whites. Notably, Chinese do worse with all-site and stomach cancer than whites. It is useful to note that the more disadvantaged groups (i.e., American Indian, black) have poorer survival rates than whites for many sites (113). SEP may also affect survival from cancer by affecting access to medical care or availability of information on cancer. Unfortunately, data showing incidence and survival for each minority group by SEP are not available.

Cancer incidence from some sites may also be associated with SEP. For example, a study of coke plant workers found that blacks had a lung cancer SMR six times greater than whites employed in the same plant (61). Black workers in this study were employed in much greater numbers in jobs where the exposure to benzopyrene and other carcinogens was high. This study demonstrated, in part, that differences in employment opportunities may lead to differences in exposure and disease occurrence.

In fact, few studies of cancer survival and incidence among minority groups have also examined SEP. Limitations of available data are part of the reason for this lack: cancer is a rare disease, and a large number of cases is needed for such multivariate analyses; also, accurate information on socioeconomic variables is often not available. However, those studies which have examined SEP, minority status, and health have produced some important results.

Dayal (21, 22) has conducted two analyses examining black-white differences in survival from prostate and breast cancer and the contribution of SEP to those differences. In both studies, black-white survival differentials became non-significant with adjustment for SEP. A factor complicating the understanding of minority cancer differences is that some minorities present cancers at a later diagnostic stage than whites. The Dayal Study on breast cancer found that, even with adjustment for diagnostic stage, the black-white difference is significant. However, adjustment for SEP rendered the black-white survival difference non-significant.

Lung cancer incidence rates for blacks are higher, and survival rates are lower than whites. A study by DeVesa and Diamond (25) reported an SEP gradient for lung cancer incidence in males within both black and white groups. Black rates were higher than white rates, and rates for low SEP persons in both white and black groups were poorer than rates for high SEP persons. The group with the lowest rates was high SEP white males, and the group with the highest rates was low SEP white males. However, the overall black-white difference lost significance when adjusted for age, area of residence, income, and education. Comparison of white to black males at the same educational level suggested that there were no significant differences. A major shortcoming of this study was the lack of data on smoking, a major risk factor in lung cancer. However, the study authors felt that adjustment for smoking would not explain all of the differences and that SEP had an independent effect on lung cancer.

Little research has been done on cancers in minority groups other than blacks in the United States. Some of the survival rates experienced by these groups are shown in the tables above. These rates are not adjusted for SEP, so it is not possible to determine what effect SEP may have on cancer incidence and survival in these groups. A study of cancer survival among Asians and Pacific Islanders in Hawaii reported that Caucasians had the lowest median survival time overall and that Chinese, who were at the lowest status economically, survived the longest (107). Hawaiians and Filipinos who were at the lowest SEP level exhibited the shortest median survival time. After adjustment for sex, age at diagnosis, stage of disease, and SEP, many of the white-minority and minority-minority differences were non-significant. The strongest predictor of death in that study was stage at diagnosis, which has been associated with both SEP and minority group status in other studies.

Thus there exist substantial differences between whites and minority groups with respect to cancer incidence and survival. Both minority status and SEP are associated with incidence of some cancers and with stage at diagnosis for many cancers. It seems apparent that minority status and SEP are intertwined in the etiology of and survival from cancer.

#### Cardiovascular Disease

Blacks in the United States have among the highest rates of cardiovascular disease (CHD) in the world (33, 34). Reports of CHD mortality have

shown black male rates to be higher than white rates for the past twenty years. Rates among black and white women are similar. Ischemic heart disease and stroke account for 35 per cent of mortality among blacks and other non-whites as a group. However, CHD incidence and mortality rates for other minority groups do not follow the same pattern as for blacks. A study of CHD mortality in Los Angeles County, California, reported blacks as having the highest CHD mortality; whites as second; and hispanics, Japanese, Chinese, and Filipinos in descending order of mortality. Black rates were 10 per cent higher than whites for all major cardiovascular diseases and 24 per cent higher for cerebrovascular diseases (32).

Few cardiovascular disease studies have addressed the simultaneous issues of minority group membership and SEP. A study conducted in Evans County, Georgia, between 1960-1977 (34, 95) has attempted one such analysis. In this study (as in many studies), virtually all blacks were of low SEP. In fact, they were of lower SEP than most low status whites. This study reported that 20-year survival from all-cause mortality was almost identical for low SEP whites and blacks, and both were higher than high SEP whites. The risk of dying from ischemic heart disease associated with blood pressure, cholesterol, and smoking was similar for low status whites and for blacks, and both were substantially different from high status whites.

A study in Charleston, South Carolina (50), comparing CHD incidence among black males and females, white males and females, and high SEP black males for the period 1961-1975 demonstrated that SEP is strongly negatively associated with CHD. This study reported that high SEP black males had the lowest incidence of all categories of CHD compared to all blacks and all whites, except for arteriosclerotic heart disease, for which they had the highest rates. Table 7 shows these results. The lower rates observed in high SEP black males were found for all CHD, non-fatal CHD, fatal CHD, acute myocardial infarction (both fatal and non-fatal), angina, and sudden death. The number of cases of CHD (n=12) among high SEP black males was low, however, and the observations are most valuable for the trend they suggest.

#### CHD Risk Factors

The CHD risk factors most frequently measured include hypertension, blood lipids, smoking, diabetes, Type A behavior, overweight, ECG abnormalities, and, in some studies, heavy alcohol consumption. Blacks are reported (33, 34, 95) as being at greater risk for CHD from hypertension, diabetes mellitus, ECG abnormalities, and overweight (among black women). As a general pattern, these CHD risk factors operate for blacks and other minority groups as they do among whites.

Several studies on the distribution of CHD risk factors have suggested that there is an association between SEP and risk of CHD among blacks. Attempts to examine the association between CHD risk factors, minority status, and SEP have included both ecological level and individual level measures.

Research (94) by Tyroler and Cassel has reported that ecological measures of social disorganization are strongly associated with mortality from stroke among black males and females. Another study using ecological measures of urban stress (40) reported a positive association with systolic and diastolic blood pressure for blacks but not for whites.

Kraus, Borhani, and Franti (52), in their study of CHD risk factors,

reported a consistent negative SEP gradient for CHD risk factors and a consistent negative association between SEP and CHD risk within ethnic groups. Comparison of different minority groups at the same SEP levels suggests that (a) low SEP white males are at greater risk than minority males at the same SEP level, and (b) high SEP white males are at lower risk than minority males at a high SEP level, except hispanic males. For example, low SEP white males were at 30 per cent greater risk than low SEP black males, 52 per cent greater risk than low SEP Asian males, and 130 per cent greater risk than low SEP hispanic males. Conversely, high SEP white males were at 28 per cent lower risk than high SEP blacks males, 8 per cent lower than high SEP Asians, but 25 per cent higher risk than high SEP hispanics.

A study by Stern et al. (87) on Mexican Americans reported that they had higher CHD risk factors levels than whites with respect to plasma lipids, diet, and adiposity but lower risk from cigarettes, blood pressure, and alcohol. The study made the point that Mexican Americans were primarily of low SEP but did not report any SEP-stratified data. A study by Roberts and Lee (75) on Mexican Americans reported that adjustment for health practices reduced but did not completely explain the health difference between whites and Mexican Americans.

Data from the Hypertension Detection and Follow-up Program has been reported (47) showing that prevalence of hypertension among blacks and whites of both sexes decreases with increasing education. Furthermore, the difference between whites and blacks generally decreases with increasing education.

The evidence presented above suggests that SEP is a powerful risk factor that may help to explain the higher incidence and mortality rates and the poorer survival rates among certain minority groups. Furthermore, it suggests that the association between SEP and minority status and CHD cannot be fully explained by adjustment for risk factors such as smoking, alcohol consumption, or obesity. In short, SEP appears to exert an independent influence upon CHD and to partially explain the differences between blacks and whites. The association between SEP and CHD risk and occurrence among other minority groups is less clear, primarily because data on these groups is sparse and not generally presented with information on SEP.

### Infant Mortality

As discussed in an earlier section, the association between infant mortality, low birth weight, and SEP is well established. The question to be examined in this section is whether the differences observed between blacks and whites can be explained by SEP.

Data from 1976 on low birth weight reported by NCHS (104) show that (a) the percentage of infants weighing 2,500 grams or less at birth decreases with increasing education of mother or father, (b) that the percentage of low birth weight infants is greater at all education and income levels among blacks but declines with increasing SEP for both groups. Education of the mother appears to have little direct effect on low birth weight when prenatal care is totally absent. When prenatal care is present, education of the mother has a strong effect for both groups. The effect of prenatal care is not unrelated to SEP, however, since access to medical care and awareness of the need for prenatal care are probably both associated with SEP (89). The prevalence of low birth weight infants is greater among lower SEP individuals of both black and white groups and

is greater for blacks than for whites at all SEP levels.

Infant death is strongly associated with SEP for both whites and blacks (103, 105) whether measured by education of father or mother or by family income. Blacks at all income or education levels had higher rates than whites. However, the black-white difference decreases as SEP increases. For example, the black-white difference is 12 per cent when the father's education is eighth grade or less and 4 per cent when the father's education is at high school level (105). In this data, blacks were not present at the highest SEP levels, so it was not possible to determine whether the black-white differential for infant mortality would disappear at higher SEP levels. These data suggest that SEP as measured by parental education or family income can help explain the black-white differences in infant mortality. Data on higher SEP blacks and other minorities are lacking, however.

SEP and minority status appear to have direct effects on infant mortality and an indirect effect on neonatal mortality. A 1980 study by Brooks (12) using area measures of racial composition and income reported that racial composition did not affect post neonatal mortality, whereas income and low birth weight together explained 65 per cent of the variance. Low income alone explained 57 per cent of the variance. The addition of racial composition to a model including low birth weight, illegitimate status, and low income increased the explained variance by only 1.2 per cent, a non-significant change, suggesting that income and not minority status contributed most to infant mortality. Neonatal mortality in this study was best explained by a model including low birthweight, low income, and racial composition. Low birth weight and low income were highly correlated (.80) in this study, as were racial composition and low income (.683) (57).

Further evidence for the hypothesis that the higher rates of infant death and childhood experienced by blacks may be partly explained by SEP is provided in research by Mare (57). His research reported that for both blacks and whites, mother's education and family income were negatively associated with death for children of all ages under 19 years of age. Furthermore, this association increased in size with increases in the child's age. In general, mortality rates for white males were higher at most ages than rates for black males at both high and low income levels. Among females, the effects of income were less clear. For annual family income less than \$10,000, black females generally had lower rates than white females, and this was more true at older age levels. Comparison of white females to black females at family incomes over \$10,000 shows that black females suffered substantially higher mortality rates at all age levels. Examination of the association between mother's education and mortality produced somewhat different results. Mortality rates for white male children were lower than black male children at younger ages and higher at older ages for education less than twelve grades. For mother's education at twelve grades or more, the reverse was true, and black males mortality rates were lower than whites. The mortality rates for black females whose mothers had less than a twelfth-grade education were somewhat higher than white females. For those females with mothers educated at twelve grades or better, black females suffered substantially higher mortality than white females. This study demonstrated a clear association between SEP and childhood mortality for both blacks and whites and suggests that, for males at least, the higher childhood death rates suffered by blacks may be due to lower socioeconomic position.



These data suggest that neonatal and post-neonatal mortality are affected by SEP for both blacks and whites. Such socioeconomic factors as low income, low education, low status occupation, minority status, teenage pregnancy, and non-married parents are all closely associated risk factors in the etiology of low birth weight, neonatal mortality, and infant mortality. The data available on SEP was insufficient to conclude that all black-white differences could be explained by SEP. However, it is clear that SEP is a powerful risk factor in both infant and neonatal mortality for both blacks and whites and that increasing SEP substantially decreases the black-white differences with respect to low birth weight, infant mortality, and childhood mortality.

### Non-Disease Causes of Injury and Death:

#### Minority Status and Socioeconomic Position

There is substantial variation in injury death rates among ethnic groups. In general, Native Americans and blacks have the highest death rates from such causes, and Asian Americans have the lowest. For a number of non-disease causes of death, the differences between ethnic groups is lessened or eliminated with adjustment for some measure of SEP. This section reviews some available data which demonstrates these points for unintentional injuries, motor vehicle accidents, accidental death from firearms, and deaths from house fires.

More than 160,000 Americans died in 1980 from unintentional injuries, including such causes as accidental ingestion of poison, poisoning by faulty heaters (i.e., carbon monoxide), and motor vehicle accidents (nearly 50% of all unintentional injuries), etc. Asian Americans have the lowest rates, and Native Americans have the highest rates, with blacks and whites falling in between. All rates decline substantially with increasing income, although the differences between minority groups are not greatly reduced by such adjustment, except for Native Americans. The rate per 100,000 for Native Americans drops by nearly 300 per cent between per capita income less than \$3,000 and per capita income of \$5,000. The rate for blacks drops by more than 100 per cent with adjustment for income. The change in rates for Asians and whites is similar to those for blacks with income adjustment.

Death rates from unintentional firearm injury for whites and blacks are similar, with the rates for both groups declining precipitously with increasing income. Blacks have much higher death rates from housefires than whites. However, this difference declines substantially with adjustment for income. The difference between blacks and whites at per capita area incomes less than \$3,000 is three-fold. At incomes greater than \$6,000, the difference is less than 100 per cent higher. The black-white death rate difference for occupants of motor vehicles and for pedestrian deaths declines with income adjustment also, although blacks have lower rates than white from the former cause and higher rates than whites from the latter cause. In general, it may be said that differences in non-disease mortality rates between whites and minorities, especially blacks and Native Americans, are diminished with adjustment for income (4).

#### Part 2

In the preceding sections, we have argued that socioeconomic position

ought to be considered as a potential explanatory variable when considering minority and white health. We have reviewed the evidence that SEP is consistently related to a variety of health outcomes for different ages, places, and times. We have briefly presented evidence of the strong association between SEP and membership in minority groups and have reviewed much of the available evidence that differences in the distribution of SEP may account for the differential health experience of whites and minorities. Our intent was to make the argument plausible. The evidence which we have presented, in our opinion, supports such an argument. However, it is important to specify why low SEP is associated with poor health.

It has been argued that such associations reflect the downward drift of less healthy individuals into lower socioeconomic strata. However, there are a number of reasons to believe that this is not what accounts for the association between SEP and health. Although it is undoubtedly true that long-term illness has an impact on income, it is difficult to see how such an explanation might apply to groups of individuals. Given the overall pattern of lower SEP associated with minority status, it is hard to argue that this lower SEP is the result of poorer health. Indeed, in one analysis (18), income differences between minorities and whites were substantially reduced when there was statistical adjustment for age, education, occupational prestige, hours worked in the previous week, and average income of the state of residence. This adjustment accounted for 57 per cent of the income differences between whites and blacks. The comparable figures for Mexican Americans, Puerto Ricans, and American Indians were 49 per cent, 93 per cent, and 70 per cent, respectively. In short, the lower SEP of minorities is not due to poorer health, rather it reflects an overall pattern of disadvantage.

The argument is also not plausible given the variety of measures of SEP shown to be associated with poorer health. As we have pointed out earlier, although each of the measures of SEP has some interpretive problems, the overall pattern across measures is sufficiently consistent to be compelling.

Differential patterns of risk factors are often proposed as explanations for SEP gradients of disease. Our review has not turned up consistent patterns of risk factor differences which could account for the disparities between minority and white health. There are few studies which allow us to examine in detail the validity of these explanations. The few studies there are suggest that such explanations do not adequately account for SEP gradients. With respect to cardiovascular disease, there are three studies which have had the opportunity to directly address this issue. In one study of cardiovascular disease among 18,000 male British civil servants, it was possible to examine the contribution of serum cholesterol, smoking, hypertension, and other cardiovascular risk factors to the gradient of cardiovascular disease associated with SEP, measured by broad occupational groupings (76). In these analyses, there was a consistent gradient of cardiovascular mortality associated with SEP; those in administrative classifications had the lowest rates, followed by those in professional/executive positions, clerical positions, and the remainder. Figure 2 presents the results from this study when cardiovascular risk factors were introduced. Taking into account the standard risk factors for cardiovascular disease did not alter the gradient associated with SEP. Similar results were found by Salonen (80) in Finland, and Holme et al. in Oslo (46).

Turning to lung cancer, SEP gradients do not seem to be entirely due to higher rates of smoking among lower SEP groups. Although lower SEP groups such as blacks may have higher rates of current smoking, some evidence suggests that they smoke fewer cigarettes and tend to use weaker tobacco products (86, 111). Analyses of data from the Third National Cancer Study (25), the Washington County, Maryland, Study (15), and other studies (109) suggest that adjustment for level of smoking does not eliminate the SEP gradients for lung cancer incidence.

Differences in access to medical care are also often proposed as an explanation for SEP gradients in health. However, such factors do not adequately account for SEP gradients. The presence of the National Health Service in England and Wales and the equivalent services in the Scandinavian countries would seem to provide reasonable access to care. However, in England and Wales, Sweden, and Finland, there are substantial SEP gradients of health. The evidence in England and Wales is that these gradients did not change substantially following introduction of the National Health Service (45). Similarly, the last 20 years in the United States have seen large changes in the accessibility of medical care to the poor. Between 1964 and 1976, persons in the lowest fifth of the income distribution increased utilization of physician and hospital services by one third (54, 70). Similar changes in health insurance coverage have occurred, particularly for the aged. However, despite these changes, national data do not indicate any major changes in the SEP gradient of prevalence or mortality. This is not to say that such changes have not had important health consequences but only that they do not seem to have resulted in major changes in the association between SEP and health.

Further evidence that differences in levels of risk factors or medical care do not account for SEP gradients of health comes from analyses we have recently completed at the Human Population Laboratory in Alameda County, California (38). In these analyses, we examined the nine-year mortality experience of a representative sample of adults in Oakland, California, beginning in 1965. At that time, a portion of Oakland was federally designated as a poverty area, based on rates of unemployment and income reported in the 1960 Census. Table 8 shows some of the characteristics of the poverty area compared to the nonpoverty area (44). Approximately 41 per cent of Oakland's population lived in the designated poverty area. The poverty area exhibited disproportionate levels of unemployment for both men and women, poorer health measured in a variety of ways, and poorer quality of housing. Those in the poverty area had three times the rate of unemployment, twice the number with an eighth grade education or less, two and one-half times the rate of inadequate incomes, and almost two and one-half times higher rates of no health insurance compared to residents of the nonpoverty area.

We were interested in the extent to which this pervasive pattern of socioeconomic disadvantage would be associated with poorer health among the residents of the poverty area. Furthermore, because data were available for each participant, we were able to ascertain if poorer health among the poverty area residents might be due to differences in age, income, baseline health status, lack of medical care, minority group status, health practices such as smoking and alcohol consumption, or psychological factors such as depression.

When we examined the nine-year mortality experience of this cohort, residents of the poverty area were at significantly increased risk of death. Furthermore, when all of the above factors were taken into account statistically, poverty area residents had 46 per cent higher mortality from

all causes. In other analyses (49), we have shown that this survival disadvantage persists over 17 years of follow-up. In addition, when adjustment for residence in the poverty or nonpoverty area was carried out, there were no significant differences in mortality for whites and non-whites.

These results suggest that we need a broader based approach to our examination of SEP gradients in health and their value in explaining minority health experience. Poverty areas are characterized by a large number of vectors of disadvantage ranging from poorer environmental quality, higher unemployment, lower income and education, higher rates of crime, greater social isolation, poorer services, to higher levels of reported stress. It is of great significance that these are the areas in which a disproportionate number of minority group members live.

This clustering of high socio-environmental demands such as pollution, bad housing, and crime, coupled with low resources such as low income, social isolation, and inadequate services, may be what is responsible for SEP gradients of health. Several research efforts, using ecological measures of social area characteristics, have produced results relevant to this approach. Jenkins et al. (48) found census tract SEP indicators such as low occupational status, substandard housing, and low median education to be associated with mortality from hypertensive diseases. They also found significant associations for mortality due to all respiratory diseases, cerebrovascular disease (excluding hypertension), and ischemic heart disease. Dayal et al. (20) has reported that residence in low socioeconomic level neighborhoods is associated with mortality from both lung and non-lung cancers, suggesting that both air pollution and socioeconomic variables are associated with poorer health among low SEP groups. This association was not affected by adjustment for race. Harburg et al. (40), using an area measure of social stress, found a significant cross-sectional association between systolic blood pressure and residence in such areas for black males and females. Similarly, area measures of social disorganization were found by Tyroler and Cassel (94) to be positively associated with stroke mortality. Finally, a step toward integrating ecologic and individual level variables has been taken by Hakama et al. (39) in an analysis of cancer of the breast and cervix. The findings in his study suggest that social and physical environmental factors might be relatively more important in the etiology of breast cancer than cervical cancer.

### Conclusions

Studies which have examined minority/white differentials in health have often alluded to differences in culture, lifestyle, or genetics and have generally ignored the role of SEP. However, minority status and SEP are closely associated, and the evidence suggests that a portion of the difference in health between whites and minorities can be explained by differences in SEP. Furthermore, SEP gradients of health cannot, in many cases, be explained by differences in risk factor levels or differences in medical care. Finally, in analyses of all-cause mortality, survival differences in cancer of the breast and prostate, male lung cancer incidence, and mortality from coronary heart disease, minority/white differentials in health decrease significantly when SEP is taken into account. For many other outcomes, the evidence suggests a diminution of minority/white differentials with adjustment for SEP.

These results suggest that it is not minority status, itself, which leads to poorer health. Indeed, some minority groups evidence, for some outcomes, better health. Rather, it is the association of low SEP with minority group membership which has consequences for health.

It is clear from this review that more research and analysis is needed on the health status of minority groups. Much of the available data only focuses upon white versus black differences and excludes other minority groups or includes them in a non-white grouping. As we have demonstrated in the preceding sections, there are significant differences between the various minority groups with respect to both SEP and to health. However, our understanding of the role of SEP in minority health is compromised by the lack of data on patterns of incidence, survival, and medical care utilization. As has become apparent in the consideration of the declines in CHD mortality, such information may be critical to our understanding of mortality differences. These data may be particularly significant in unraveling the impact of SEP on minority and white health.

Similarly, the effort to understand minority health experience would be greatly improved by analyses that also examine the role of SEP. The evidence presented in this report strongly suggests that such analyses would be particularly helpful in clarifying the reasons for the substantial differences between whites and minorities observed for most major disease outcomes and all-cause mortality.

As we have discussed previously, the measurement of SEP is problematic. The most commonly used measures -- income, occupation, and education -- may not adequately assess the effects of SEP on health. For example, a white collar worker and a blue collar worker may have the same income and education but experience a different social and physical environment at work. Similarly, a highly educated person may have a relatively low income. Also, different measures may affect health in different ways. For example, income may affect health through the ability to purchase adequate medical care, while occupation may affect health through differential social and physical exposures on the job. Finally, one or two-time measures of SEP may fail to capture the lifetime exposures that individuals actually incur. As we discussed earlier, much research suggests that social and physical risk factors may co-occur in consistent patterns which are not random but are determined by larger socioeconomic forces. Our understanding of the role of SEP in minority health would be enhanced by examination of both ecological and individual-level risk factors. The studies by Jenkins et al., Dayal et al., Tyroler and Cassel, and Harburg et al. and Hakama et al. (20, 39, 40, 48, 94) indicate that SEP involves more than measures of income, education, and occupation can capture. As we have amply demonstrated, a large proportion of minority group members are also low SEP group members. Therefore, our understanding of minority health will be improved if analyses capturing the complex interrelationships between these different levels and types of risk factors can be attempted. An approach which combines environmental and individual level analyses can provide a method for a more coherent description of disease etiology than approaches which focus on only one level of analysis. This approach could be especially important in the investigation of minority health and SEP, factors which are multi-faceted and which exert their effects at both group and individual levels. Without such an approach, it is unlikely that we will be able to understand the reasons for the differential health experience of minorities and whites.

TABLE 1  
 Income by Minority Status for Currently Employed Persons  
 17 Years of Age and Older (per cent), 1976

Income	Hispanic	Black	All other (including white)
\$5,000	13.5	17.2	7.4
\$5,000 to \$9,999	30.5	30.6	17.6
\$10,000 to \$14,999	26.9	28.0	24.5
\$15,000+	29.1	28.0	50.5
Totals	3,662	7,418	69,463 (number)

Source: (23)

TABLE 2  
Occupational Distribution of Minority Groups  
Ratio of White to Minority

Category	Group							
	Black (112)		Asian (88)		American Indian (88)		Hispanics (23)	
Sex	F	M	F	M	F	M	F	M
White collar	1.39	1.59	1.03	.96	1.50	2.04	4.70	
Blue collar	.77	.85	.88	1.42	.68	.77	1.54	
Farm	1.56	1.08	1.20	1.03	.78	.66		
Service	.56	.49	1.03	.35	.57	.57	.13	
Employed	1.08	1.07	1.90	1.39	2.95	1.82		

Source: (23)

TABLE 3  
Educational Attainment by Sex and Race, 1978

	Females		Males	
	% White	% Black	% White	% Black
to 8th grade	4.3	4.0	4.3	6.5
4 years of college	21.4	12.6	27.6	10.7

Source: (97)



TABLE 4

Median Years of School by Minority Status, 1970

	American Indian	Japanese	Chinese	Filipino
Women	9.9	12.4	12.2	12.7
Men	9.7	12.6	12.5	11.6

Source: (97)

TABLE 5

Age-Adjusted Rates for Selected Conditions by Income and Minority Group

Condition	Hispanics		Blacks		All Others	
	\$5,000	\$15,000+	\$5,000	\$15,000+	\$5,000	\$15,000+
Limit of activity due to chronic condition	19.7	12.2	24.9	10.4	23.0	10.8
Hospitalization in short-term stay hospital	11.7	9.1	13.7	9.0	12.6	9.7
Days of restricted activity	16.3	4.2	12.8	8.5	10.1	5.5

Source: (106)

\*

TABLE 6A

Ratio of White/Minority Group 5-Year Survival Rates for Males

Minority Group	Cancer Site				
	All Sites	Lung	Stomach	Rectum	Prostate
Anglo	1.00	1.00	1.00	1.00	1.00
Hispanic	.97	1.00	.60	1.09	.92
Black	1.07	1.14	.82	1.40	1.10
American Indian	1.48	2.00	1.50	1.67	1.55
Chinese	1.15	.67	1.13	.81	.94
Japanese	.91	.80	.43	.78	.82
Filipino	1.11	.89	.82	1.03	.80
Hawaiian	1.29	.80	.75	.75	.98

TABLE 6B

	Breast	Corpus Uteri
Anglo	1.00	1.00
Hispanic	.99	.99
Black	1.16	1.65
American Indian	1.25	1.23
Chinese	.90	.96
Japanese	.79	.95
Filipino	.97	.95
Hawaiian	.96	1.15

Source: (113)

TABLE 7  
 Age-Adjusted Incidence of Cardiovascular Disease by Sex and  
 Minority Status, and SEP

	Males			Females	
	Blacks	Whites	Hi-SEP Black	Blacks	Whites
All CHD	131.7	188.4	61.2	161.0	113.8
CHD Deaths	79.8	93.8	38.3	62.2	46.3

Source: (95)

TABLE 8

Poverty Area Characteristics

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41% of Oakland's Population

---

66% of unemployed males 14 years or older  
61% of unemployed females 14 years or older  
85% of Oakland General Assistance recipients  
79% of AFDC recipients  
79% of aid to disabled  
63% of blind receiving aid  
65% of police work load  
68% of active TB cases  
69% of Oakland's deteriorating housing units  
75% of Oakland's non-owner occupied units  
89% of Oakland's housing units with shared or no bathroom

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Source: (44)

Figure 1

### Age and Sex-Adjusted Survival for Blacks and Whites in the Alameda County Study

In 1a, blacks have significantly poorer survival ( $p < 0.004$ ); when there is adjustment for SEP (1b), this difference is no longer significant ( $p > 0.05$ ).

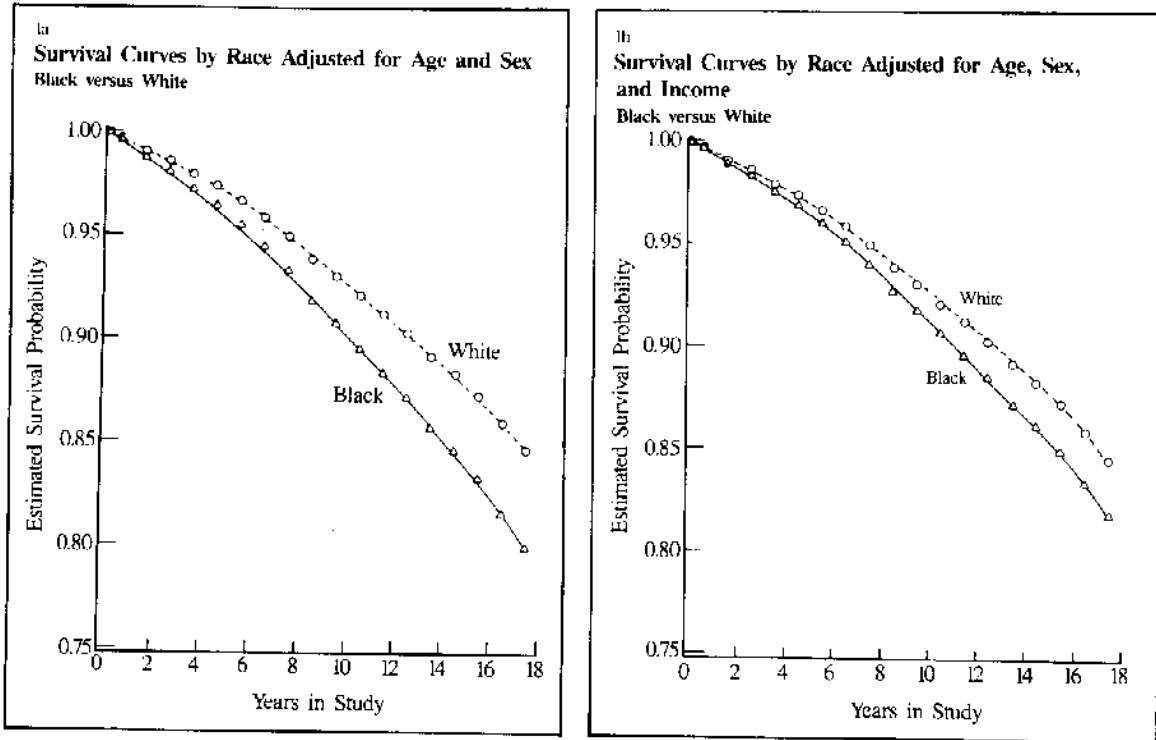
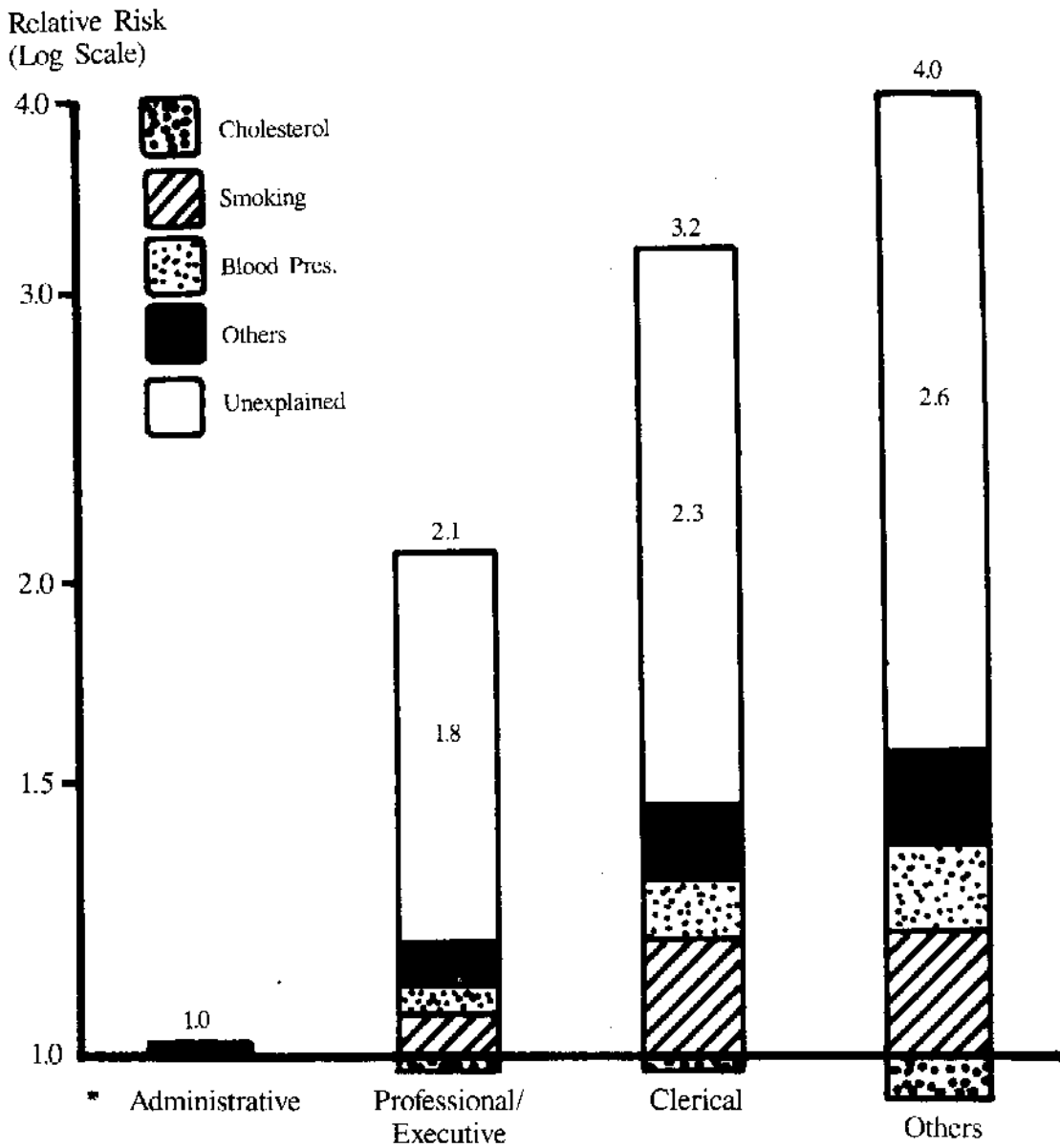


Figure 2

**Relative Risk of Death from  
CHD Compared to Administrative Classification**  
Adapted with permission from reference 76.



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