

# *Recent Publications on Socioeconomic Status and Health*

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Abramson, J. H., Gofin, R., Habib, J., Pridan, H., Gofin, J. 1982. Indicators of social class. A comparative appraisal of measures for use in epidemiological studies. *Social Science and Medicine* 16:1739-1746.

Various indicators of social class were compared in a community health survey in Jerusalem to determine their value in detecting associations with health characteristics. Correlation among the indicators and between them and selected health-relevant variables were measured. Results suggested that there were few differences between the occupation scales tested for use as general indicators of social class, as the correlations between them were very high, and the patterns of their correlations with health variables were very similar. Other indicators of social class (e.g., education, income, crowding) were not strongly correlated with occupation, and there were differences in their association with the health variables, indicating that conclusions about the relationship between health and social class are not insensitive to the measure used. Despite these discrepancies, the patterns of association with the health measures were broadly similar for occupation scales, education, and income.

Adelstein, A. M. 1980. Life-style in occupational cancer. *Journal of Toxicology and Environmental Health* 6:953-962.

Data on cancer mortality, for twenty-seven sites, from the Registrar General's Decennial Report based on the census of 1971 were examined in relationship to occupation. For all cancer deaths there was a gradient rising regularly from class I, the highest, to class V, the lowest. Contributions of the separate cancers to the gradient varied; some were high in social class I, such as leukemia and testis, but many of the important sites such as lung, stomach, and rectum show a negative gradient. The expected number of deaths for 25 ordered occupations were calculated after standardizing for 1) age differences, 2) social class, 3) area, and 4) town and county. The results suggested that social class accounted for 88 percent of the variation in cancer mortality.

Antonovsky, A. 1967. Social class, life expectancy, and overall mortality. *Milbank Memorial Fund Quarterly* 45:31-73.

Evidence concerning the association between social class and life expectancy and mortality is reviewed. Studies presented begin in the 13th century and, despite wide variations in methodology, virtually all find a consistent, graded relationship between various socioeconomic measures and mortality.

———, Bernstein, J. 1977. Social class and infant mortality. *Social Science and Medicine* 11:453-470.

The general pattern between social class and infant mortality is described. Historically, infant mortality has declined substantially. A review of the literature and data on neonatal and postneonatal mortality rates demonstrated that the decline in infant mortality was the result of a steep drop in the postneonatal component. The relationship between social class and infant mortality has been narrowing, largely because postneonatal mortality, which has an inverse relationship to SES, has declined. This has not been the case for neonatal mortality. Other studies have indicated that as one gets closer to birth,

the smaller the mortality difference between classes becomes. Thus, in these studies, the social class gap for neonatal death reflected late postneonatal deaths. One possible explanation for this was a common exposure (i.e., hospital). For stillbirths, the loss rate was higher and the social class gap wider than for neonatal mortality. Lower class per se does not cause high infant mortality, as social class subsumes a large set of more directly causative biological and behavioral variables (low birthweight, prematurity, cigarette smoke, and alcohol consumption).

Arnesen, E., Forsdahl, A. 1985. The Tromso heart study: coronary risk factors and their association with living conditions during childhood. *Journal of Epidemiology and Community Health* 39:210-214.

The relationship between risk factors for cardiovascular disease and information about economic conditions during childhood was examined as part of the Tromso Heart Study. Men and women (7,405 men and 7,247 women) age 20 to 49 answered questions concerning living conditions during childhood and concerning cerebrovascular disease risk factors. Significant age-adjusted differences in cholesterol, height, and current smoking were found for those with very difficult vs. very good childhood economic circumstances. When adjustment was made for age, cholesterol, body mass index, leisure time activity, coffee, alcohol consumption, and cigarette smoking, childhood living circumstances were significantly associated for women, but not for men. When the analysis was restricted to subjects born in Tromso, this relationship was seen for men.

Baker, S. P., O'Neill, B., Karpf, R. S. 1984. *The injury fact book*. Lexington, MA: Lexington Books.

Data from the National Center for Health Statistics, the National Highway Traffic Safety Administration, the Bureau of the Census, and other sources are used to present the descriptive epidemiology of mortality from injuries in the United

States for 1977-1979. Topics covered include intent of injury and injury etiology, often presented by age, race, sex, and census tract income. For most injury outcomes, there are substantial variations by socioeconomic status.

Bakketeig, L. S., Hoffman, H. J., Oakley, A. R. T. Oxford University Press 1984. Perinatal mortality. In Bracken, M. B., ed. *Perinatal epidemiology*, pp. 99-151. New York: Oxford University Press.

A review of the factors associated with perinatal mortality, based primarily on analyses of Norwegian births during 1967-1976. Particular attention is given to socioeconomic factors, with information presented on social class, income, occupation, education, and ethnicity. In general, social disadvantage is associated with higher rates of perinatal mortality.

Barker, D. J. P., Osmond, C. 1986. Infant mortality, childhood nutrition, and ischaemic heart disease in England and Wales. *Lancet* I:1077-1081.

Although the rise in ischemic heart disease in England and Wales was associated with increasing prosperity, mortality rates are highest in the least affluent areas. On division of the country into 212 local authority areas, a strong geographical relation was found between ischemic heart disease mortality rates in 1968-1978 and infant mortality in 1921-1925. Of the twenty-four other common causes of death, only bronchitis, stomach cancer, and rheumatic heart disease were similarly related to infant mortality. These diseases are associated with poor living conditions, and mortality from them is declining. Ischemic heart disease is strongly correlated with both neonatal and post neonatal mortality. It is suggested that poor nutrition in early life increases susceptibility to the effects of an affluent diet.

Baughman, B. B., Knutson, C. O., Ahmen, W., Jones, C. E., Polk, H. C. 1976. The surgical treatment of carcinoma of the colon and rectum. *Annals of Surgery* 183:550-555.

Reasons for increased mortality risk following operations for colorectal cancer were examined. Outcomes varied by type of hospital and social class. The authors speculated that because county facilities provided care to the underprivileged and because that care was of lesser quality, patients admitted were less likely to experience favorable results. The higher mortality may be explained by the small numbers of operations for cancer of the bowel, meager facilities, and the fact that patients cannot count on seeing the same physician consistently.

Berg, J. W., Ross, R., Latourette, H. B. 1977. Economic status and survival of cancer patients. *Cancer* 39:467-477.

The relation of economic status to survival was studied for 39 kinds of cancer representing all types for which 60 or more indigent patients were seen in University of Iowa Hospital for primary care during 1940-1969. For every type, the indigent patients had poorer survival than nonindigent patients. These differences were also found when nonindigent ward patients were compared to indigent patients. Age differences and differences in stage of disease accounted for less than half of the survival deficits in the indigents. The two important problems were high mortality from causes other than cancer and excess cancer mortality not accounted for by stage differences, particularly among patients who should have had 5-year survival rates between 40 percent and 72 percent. In these patients, cancer recurred more often and earlier among the indigent. Host differences associated with poverty are postulated to account for these differences.

Bice, T. W., Eichorn, R. L., Fox, P. D. 1972. Socioeconomic status and use of physician services: a reconsideration. *Medical Care* 10:261-271.

National trends in relationships between indicators of socioeconomic status and the use of outpatient physician services were described, and evidence for various explanations examined. The relationship between income and use has diminished considerably over the past four decades. Race and edu-

cation remain consistently related to use. There is little evidence that social psychological variables account for differences in use among socioeconomic groups. Research shows that use among low income persons is sensitive to the price of services.

Blair, A., Fraumeni, J. F., Mason, T. J. 1980. Geographic patterns of leukemia in the United States. *Journal of Chronic Disease* 33:251-260.

Age-adjusted mortality rates for leukemia during 1950-1969 by race and sex were examined in relation to demographic, industrial, and agricultural data for 3,056 United States counties. Despite relatively uniform mortality across the country, there were high rates among whites in the north and south-central states, and among nonwhites in the northeast and midwest, with corresponding lower rates in the southeast. Mortality increased in proportion to county socioeconomic indices (income and education). The rates for counties in the upper socioeconomic category were about 30 percent higher among males, and 15 percent higher among females, than those in the lowest category, with the excess primarily in the group over 55 years of age. The rising mortality over time was greatest for counties with lower socioeconomic levels. After controlling for demographic and regional influences, leukemia mortality showed a positive correlation with tobacco and primary metal industries among males, but no occupation gradients were seen among females. Agricultural factors were not correlated with leukemia mortality.

Blane, D. 1985. An assessment of the Black Report's "explanations of health inequalities." *Sociology of Health and Illness* 7:423-445.

The Black Report identifies four types of possible explanations for social class differences in health, and judges one of these ("materialist") to be the most important. This paper seeks to support this assessment with additional evidence

from the literatures of sociology and medicine. It suggests questions that could usefully be the subject of future research.

Blattner, W. A., Blair, A., Mason, T. 1981. Multiple myeloma in the United States, 1950-1975. *Cancer* 48:2547-2554.

Geographic patterns, recent temporal trends, and racial differences of multiple myeloma in United States counties for 1950-1969 are examined. A total of 68,400 whites and 10,533 nonwhites died during this period. Age-adjusted mortality rates for nonwhites were approximately two times as high as for whites. During the 25 years of this study, there was a two- to three-fold increase in multiple myeloma mortality. Multiple myeloma mortality was somewhat higher in socioeconomic areas with residents of higher median income, but the trend was not statistically significant for either race. There was a positive correlation of multiple myeloma mortality among whites and number of years of schooling ( $r = .25$ ,  $p < .001$ ). Income was not statistically significant. Urban areas had the highest rates, and rural areas had the lowest. Mortality rates were higher in areas with high petroleum and paper production and slightly higher for those with furniture manufacturing.

Blaxter, M. 1983. Health services as a defense against the consequences of poverty in industrialized societies. *Social Science and Medicine* 17:1139-1148.

The role of health services as a "defense" against the consequences of poverty is discussed. General questions addressed are: Is it true that industrialized nations have reached a stage of development where health care is irrelevant to health? Is the issue inequality in health, or, more narrowly, the particular problems of a minority, the "poor"? Are the causes of disadvantage in health to be seen as behavioral or structural, and if health systems concern themselves with social-structural issues, is this medical imperialism or the proper exercise of responsibility? The role of health services is considered in relation to primary prevention (or curative medicine) and tertiary

prevention (or rehabilitative medicine). It is concluded that (though the impact of any form of universally available health service must not be minimized) health systems in industrialized societies are not in general successful in mitigating or preventing social inequalities in health.

Blot, W. J., Fraumeni, J. F., Jr. 1976. Geographic patterns of lung cancer: industrial correlations. *American Journal of Epidemiology* 103:539-550.

A survey of lung cancer mortality by county in the United States in 1950-1969 revealed an excess mortality for males where industry was present. The industrial correlation was not attributed to SES or to urbanization alone. Multiple regression was used to relate lung cancer to demographic and occupational indices. Rates of lung cancer increased with urbanization in each geographical region and increased as the density increased within each percent urbanization category. SES, independent of geographic and urban influences, was also related to lung cancer. Although statistically insignificant, higher rates of lung cancer tended to occur at the lowest education levels. After adjusting for demographic factors, lung cancer for whites was significantly elevated ( $p < 0.05$ ) in counties with four manufacturing industries: paper, chemical, petroleum, and transportation.

Brennan, M. E., Lancashire, R. 1978. Association of childhood mortality with housing status and unemployment. *Journal of Epidemiology and Community Health* 32:28-33.

Childhood mortality rates for two age groups (0-4 and 4-14 years) in each county and metropolitan borough of England in 1971 were examined in relation to type of housing and unemployment. At ages 0-4 years, there was a significant and positive association between mortality and low socioeconomic position, high density housing, inadequate housing amenities, and unemployment rate ( $p < .001$ ). The significant association between housing remained even after controlling for SES and unemployment. Between ages 4-15, there was a

statistically significant association ( $p < .001$ ) between housing density and mortality when SES was held constant. There was no association between mortality and unemployment rates in those ages 4-15.

Brenner, M. H. 1979. Mortality and the national economy. *Lancet* 2:568-573.

The hypothesis that indicators of economic instability and insecurity are associated with higher mortality rates while smooth, long-term exponential trends in economic growth are inversely correlated with mortality was tested. A theoretical model using national economic changes based on United States data is applied to England and Wales for 1936-1976. Secular declines in the mortality rate were associated with long-term trends in economic growth and recessional losses, while rapid economic growth was associated with fluctuating mortality rates. The lag effect of unemployment varied by cause of death: suicides and homicides increased within a year, while coronary heart disease mortality increased two to three years after an increase in unemployment.

Brooks, C. H. 1975. Path analysis of socioeconomic correlates of county infant mortality rates. *International Journal of Health Services* 5:499-514.

The relationship between selected socioeconomic characteristics of counties and infant mortality rates was examined in 2,237 United States counties. Low family income, low education, sound housing, and the percentage of blacks were examined. The percentage of blacks and percentage of persons who had completed fewer than five years of schooling were important determinants of infant mortality. These two factors were responsible, in large part, for the associations between low family income, sound housing, and rates of infant loss. It was estimated that approximately two thirds of the zero-ordered correlation between a given county's measure of SES and infant mortality occurred through the postneonatal component.

Byckling, T., Akerblom, H. K., Viikari, J., Louhivouri, K., Uhari, M., Rasanen, L., Souminen, P., Pietikainen, M., et al. 1985. Atherosclerosis precursors in Finnish children and adolescents. *Acta Paediatrica Scandinavica Supplement* 318:155-167.

Children and adolescents in Finland whose 3rd, 6th, 9th, 12th, 15th, and 18th birthdays occurred in 1980 were examined to determine whether there was a relationship between parental socioeconomic status and coronary heart disease risk factors. SES was assessed using father's occupation or information regarding mother's occupation when there was no father present. An association was observed between parents' occupation and children's dietary polyunsaturated/saturated fat ratio. Farmers' children had, in all age groups, the lowest ratio. There were no other associations between parental social status indicators and children's coronary heart disease risk factor levels.

Cantor, K. P., Fraumeni, J. F., Jr. 1980. Distribution of non-Hodgkin's Lymphoma in the United States between 1950 and 1975. *Cancer Research* 40:2645-2652.

Average annual Non-Hodgkin's Lymphoma (NHL) mortality rates per 100,000 were calculated for each of the United States' 3,056 counties. Age-adjusted rates using the direct method were employed. Multiple regression analysis was used to examine the association of sex and race-specific mortality with several demographic, socioeconomic, and occupation measures. Variables such as median income, median years of school completed, population density, and ethnicity were obtained. Mortality from NHL increased from 1950 to 1975 in most race-sex-regional groups. Median family income and education showed a consistent association with NHL mortality. Among whites, rates in both sexes showed a positive gradient with median county income. Rates in southern counties were consistently lower, which may be related to SES. After adjustment for SES, southern counties made no statistically significant contribution to mortality. Nonwhites experienced lower mortality during 1950-1975 than whites.

Carstairs, V. 1981. Multiple deprivation and health state. *Community Medicine* 3:4-13.

Data from Glasgow and Edinburgh were examined to assess the association between health state and multiple deprivation. Health data were gathered through the census bureau and were standardized to remove the effects of differences in age and sex. A deprivation index was defined by overcrowding, lack of amenities, employment, number of rooms, and inside water closet. A strong association between deprivation and health indicators such as mortality, discharges, and bed days was found. The association was moderately strong for mental hospital admissions and low birthweight. The coefficients were high for parasitic and infectious diseases but only moderate for hospital discharges. The coefficients were low for cancer and circulatory disorders and high for accidents for both deaths and discharges.

Chirikos, T. N., Reiches, N. A., Moeschberger, M. L. 1984. Economic differentials in cancer survival: a multivariate analysis. *Journal of Chronic Diseases* 37:183-193.

Economic differentials in cancer survival were investigated in this study of 1,180 white males. A Cox regression model was employed to estimate the direct and interaction effects of economic status on survivorship, controlling for age at diagnosis, stage, severity of disease, and initial course of treatment. The results did not show a strong relationship between economic status and survival. Estimates of direct or main economic effects rarely reached borderline statistical significance; they were highly sensitive to model specification and the measurement of the economic variable. A weak interaction effect between economic status and stage was detected in several cases, but the parameter estimates were unstable. Measurement and specification error may have exaggerated the importance of economic factors in cancer survival in earlier investigations.

Chirikos, T. N., Horner, R. D. 1985. Economic status and survivorship in digestive system cancers. *Cancer* 56:210-217.



The association between occupation and survivorship was examined using data from the Tumor Registry of the Ohio University hospitals. A group of 1,180 men registered with a first primary malignancy from July 1977 to May 1981 were included. Patients' occupational level influenced survival. Whereas low income patients did not differ significantly from middle income patients, high income patients had substantially better chances of survival over middle. The relationship between income level and survival was especially different for colorectal cancer. All things being equal, high income patients enjoyed a more favorable survival experience.

Cohen, B. B. 1978. *Social class, morbidity, and use of medical services: studies in a prepaid health plan*. Unpublished dissertation, University of California, Berkeley.

This study investigated the relationships between SES, the use of medical services, and morbidity. A random sample of 2,804 enrollees of a prepaid health plan (Kaiser-Permanente) were followed for subsequent hospitalization between 1971-1976. The rate of outpatient physician visits was compared among SES groups taking into account their morbidity status. No statistically significant differences were found between SES groups for the diagnosis-specific rates of physician visits. Adjusting for morbidity, there was no statistically significant SES difference in the rate of physician visits not related to hospital discharge, rate of total physician visits, and the rate of non-physician contact with the medical care system. These findings persisted when alternative measures of SES were considered. There was a gradient in the frequency of morbidity between SES groups. Persons in low SES groups had a greater number of discharge diagnoses than persons of upper SES groups for many diagnostic categories including diseases of the heart, endocrine, digestive, skin, and muscular systems. The risk of hospitalization was higher in the low SES group even after adjustment for age, race, and sex. Persons of low SES have increased utilization and higher morbidity. Once morbidity was controlled, no excess in utility existed in low SES persons.

Comstock, G. W., Tonascia, J. A. 1977. Education and mortality in Washington County, Maryland. *Journal of Health and Social Behavior* 18:54-61.

The association between level of education and mortality over eight years was studied in 47,423 persons who were residents of Washington County, Maryland in 1963. There was an inverse relationship between years of education and risk of death, even after adjustment for important confounders. Residence in housing which lacked complete bathroom facilities for exclusive use of the household was also associated with increased risk. When mortality from specific causes was studied, deaths from diabetes mellitus, suicide, rheumatic heart disease, and arteriosclerotic heart disease were significantly and inversely related to education level.

Cooke, K. R., Skegg, D. C. G., Fraser, J. 1984. Socio-economic status, indoor and outdoor work, and malignant melanoma. *International Journal of Cancer* 34:57-62.

All occupations recorded with malignant melanoma of the skin between 1972-1976 and deaths occurring between 1973-1976 were obtained from the NZ Cancer Registry in order to study the role of SES and exposure to sunlight in malignant melanoma. SES was determined using the Elley-Irving scheme based on occupation. An increased risk with higher SES was evident among all workers and similar trends were evident among indoor and outdoor workers. Specifically, the malignant melanoma incidence rate was highest among professional, administrative, and managerial workers, and lowest among production and transport workers. After adjustment for SES, there was little difference in the risk of dying from malignant melanoma between indoor and outdoor workers.

Cunningham, L. S., Kelsey, J. L. 1984. Epidemiology of musculoskeletal impairments and associated disability. *American Journal of Public Health* 74:574-579.

Data from the US HANES I study were used to examine the relationship between education, income, and other variables, and the prevalence of musculoskeletal impairments. The prevalence of musculoskeletal impairments tended to be higher among persons of lower education and income.

D'Arcy, C., Siddique, C. M. 1985. Unemployment and health: an analysis of "Canada Health Survey" data. *International Journal of Health Services* 15:609-636.

Analyses of data on over 14,000 persons, who were part of a national probability sample in Canada, examined the relationship between unemployment and self-reported physical and mental health problems and physician-diagnosed problems. The unemployed reported higher levels of distress, greater disability, health problems, and utilization of medical care. The unemployed were diagnosed with higher rates of heart trouble, pain in heart or chest, high blood pressure, and other conditions. The effect of unemployment was more severe for females, the older unemployed, and blue-collar workers.

Davies, J. M. 1981. Mortality trends for stomach cancer in England and Wales. *British Journal of Cancer* 44:879-885.

Stomach cancer has been a major cause of death in England and Wales. Using national death data from 1916 to 1979, sex, age, and social class (manual vs. nonmanual) specific rates were calculated. Male and female rates have declined since 1931; the decline has been unequivocal for women and slight for men until 1941. Men in manual (lower) classes had consistently higher death rates than nonmanual in each age group. Since 1951, the difference between the rates for manual and nonmanual classes has generally been larger for men than for married women, but this was not the case in 1931. Between 1931-1951, rates for nonmanual men and both groups of married women fell sharply, but the rate for manuals fell only slightly.

Davies, J. M. 1981. Testicular cancer in England and Wales: some epidemiological aspects. *Lancet* 1:928-932.

Mortality data and trends for testicular cancer in England and Wales were examined in relation to social class. The 1951 Decennial Supplement was used to determine social class. General trends suggested that the overall increases in testicular cancer incidence and mortality since the beginning of the century were probably due to some feature of modern life that has gradually become more common throughout life, but has always affected men in higher socioeconomic classes more than manual workers. Occupation per se was deemed unlikely to have had a significant role.

Dayal, H. H., Chiu, C. 1982. Factors associated with racial differences in survival for prostatic carcinoma. *Journal of Chronic Diseases* 35:533-560.

The role of race, age, extent of disease at diagnosis, histological grade, and SES in survival for prostatic cancer patients was investigated. Data were abstracted from the Medical College of Virginia tumor registry for the period 1968-1977. SES score was determined for each census tract using six predictors: median school years, median income, percent high school graduates, median rent, median house value, and percent below poverty. White patients had a higher probability of survival compared to black patients. The relationships of SES to survival was not statistically significant, although the survival plots indicated better survival prognosis for higher SES patients. When adjusted for race, the significant association between SES and survival disappeared.

Dayal, H. H., Power, R. N., Chui, C. 1982. Race and socioeconomic status in survival from breast cancer. *Journal of Chronic Diseases* 35:675-683.

Survival data for 388 black and 515 white female breast cancer patients diagnosed at the Medical College of Virginia between 1968 and 1977 were examined with respect to racial and



socioeconomic strata. Each of the six SES variables had a significant association with survival. Age and stage did not explain the difference in survival between the two racial groups. Race and SES were highly associated; a higher percent of blacks than whites were at the lower end of the socioeconomic scale. Racial differences became less significant when controlling for SES.

Dayal, H. H., Chui, C. Y. Sharrar, R., Mangan, J., Rosenwaik, I., Shapiro, S., Henley, A., Goldberg-Alberts, R., Kinman, J., 1984. Ecologic correlates of cancer mortality patterns in an industrialized urban population. *Journal of the National Cancer Institute* 73:565-574.

The association between cancer mortality, air pollution, and SES for Philadelphia in 1968-1980 was studied. SES was determined for each census tract and included variables such as median income and education, percent below poverty, and median rent or house value. A significant clustering of all cancers was seen for males but not for females. Lung cancer accounted for 22 percent of all cancer deaths. Male lung cancer rates exhibited a clustering pattern. Neighborhoods with statistically significant mortality due to smoking-related cancers were also the lowest in terms of SES. Air pollution levels were only slightly higher in these areas. Neighborhoods that had either high SES or average air pollution levels did not exhibit higher lung cancer, suggesting that a synergistic effect was operating.

Dayal, H. H., Polissar, L., Dahlberg, S. 1985. Race, socioeconomic status, and other prognostic factors for survival from prostate cancer. *Journal of the National Cancer Institute* 74:1001-1006.

Survival data on prostate cancer patients from 11 Comprehensive Cancer Centers contributing data to the Centralized Cancer Patient Data System were analyzed to examine the contribution of various factors to the probability of survival from prostate carcinoma. Application of a number of exclusion cri-

teria resulted in 2,513 patients (1,032 blacks and 1,481 whites) for whom complete data on variables of interest were available. The stage of disease at diagnosis was a major determinant of survival. The proportion of blacks presenting the disease in advanced stage was substantially higher than that of whites—a difference that was maintained within each socioeconomic status (SES) category. White patients had a better prognosis than black patients for each disease stage. A dose-response relationship between SES and survival prognosis was observed, and this relationship persisted for each stage of the disease. Although both race and SES turned out to be significant in regression models in which one or the other was considered, the model including both race and SES showed only SES to be a significant factor. Hence, it can be hypothesized that the racial difference in the survival prognosis for prostate cancer is, to a large extent, due to the differences in the distribution of SES in the two races.

Dayal, H., Goldberg-Alberts, R., Kinman, J., Ramos, J., Sharar, R., Shapiro, S. 1986. Patterns of mortality from selected causes in an urban population. *Journal of Chronic Diseases* 39:877-888.

Mortality data for selected noncancer causes for the period 1974-1980 in Philadelphia were analyzed for spatial patterns. Four categories of conditions—ischemic heart disease (including acute myocardial infarction), chronic liver disease and cirrhosis, cerebrovascular disease, and external causes—demonstrated significant variation in death rates by area. Neighborhoods with high levels of mortality for these conditions appeared in significant clusters. With the exception of ischemic heart disease, neighborhoods with high levels of mortality were characterized by below average levels of SES. A group of predominantly black neighborhoods in the central part of the city had extremely high rates for five or more of the nine causes investigated in this paper. In an earlier analysis, all but one of these neighborhoods were found to have the highest level of overall cancer mortality. These findings support the hypothesis that there are social and behavioral factors

that are associated with a wide range of disease conditions, and many of these factors are associated with socioeconomic status.

Degoulet, P., Menard, J., Vu, H. A., Golmard, J. L., Devries, C., Chatellier, G., Plouin, P. F. 1983. Factors predictive of attendance at clinic and blood pressure control in hypertensive patients. *British Medical Journal* 287:88-93.

Patients with blood pressure greater than 160/95 mm Hg (N=1,396) were followed for three years to determine what factors were predictive of poor attendance and inadequate blood pressure control in a hypertension clinical trial. SES was classified by occupation: 1) manual workers, 2) middle executives, and 3) senior executives. Among the 801 patients with regular employment at entry, the dropout rate was higher in the 399 patients belonging to the lowest occupational category (21.9 percent at one year) than in the 136 patients belonging to the highest category (16.2 percent) or the middle category (16.6 percent). Other factors that significantly related to dropout rate were obesity, young age, male sex, cigarette smoking, and type of referral.

Department of Health and Human Services, Great Britain. 1980. *Inequalities in health: report of a research working group (Black Report)*. London: Department of Health and Human Services.

Evidence is reviewed concerning the nature, extent, and trends in the association between social class and mortality from various causes in the United Kingdom and other countries. Various alternative explanations are considered, and the policy implications of the consistent relationship between social class and health discussed.

Devesa, S. S., Diamond, E. L. 1980. Association of breast cancer and cervical cancer incidences with income and education

among whites and blacks. *Journal of the National Cancer Institute* 65:515-528.

Data from the Third National Cancer Survey were studied to evaluate the relationship between cancer of the uterus cervix and breast with income and education. In the 19,344 cases of breast cancer diagnosed among white females during the three year survey, there was a strong positive association between income level and breast cancer. The age-area-adjusted relative risk of the highest to the lowest group was 1.37. Cancer of the breast also showed an association with education in white females. Depending on which education group was used as the referent category, the age-specific relative risk of the highest to the lowest group varied from 1.3 to 1.6. Rates estimated by regression method showed a highly significant association with income and education before and after adjusting for other SES variables. Adjustment for socioeconomic variables reduced the black-white difference in breast cancer rate; education had a stronger effect than income. Among 1,570 cases diagnosed in black females, there was a significant association between education but not income. Of the 3,802 cases in white females and 954 in black females, the incidence of cancer of the cervix showed a negative association with education and income. The negative gradient persisted in all areas and decreased with age. After adjusting for socioeconomic variables, the excess risk among blacks was reduced by two thirds but remained statistically significant.

———. 1983. Socioeconomic and racial differences in lung cancer incidence. *American Journal of Epidemiology* 118:818-831.

Using data from the Third National Cancer Survey, the association between lung cancer incidence and two indicators of SES (income and education) among blacks and whites was examined. The Third National Cancer Survey provided incidence data for approximately 10 percent of the United States population for the years 1967-1971. For white males, cancer of the lung exhibited a strong and significant gradient with decreasing income. Among males, the rate of the lowest income

group was 50 percent greater than the highest income group. Among white females, the pattern was U-shaped. A negative trend was also apparent among men when SES was defined by education level. With adjustment for other SES variables, the significance of education and income remained for white males. For black males, there was the same trend as for white males when SES was defined by income and education. There was no significant trend among females. Lung cancer occurred 10 percent more frequently among black than white males.

Diehl, A. K., Rosenthal, M., Hazuda, H. P., Comeaux, P. J., Stern, M. P. 1985. Socioeconomic status and the prevalence of clinical gallbladder disease. *Journal of Chronic Diseases* 38:1019-1026.

Data from the San Antonio Heart Study, a population-based survey, allowed the relationship of SES to the prevalence of diagnosed gallbladder disease to be examined. Between October 1979 and November 1982, subjects age 25-64 were randomly selected from three urban neighborhoods (one low and almost exclusively Mexican American, one middle, and one high SES). Home interviews and examinations were conducted. Measures of SES included occupation, education, family income, and neighborhood. Logistic regression controlling for potential confounders (body mass index, age, and parity) indicated that neighborhood, occupation, and education were separate significant predictors of gallbladder disease in women. Education showed the strongest association, with odds ranging from 1.57 when comparing the second most educated to the least educated and 3.88 when comparing the most and least educated class. Income was not a significant predictor. These findings did not apply to men.

Dobson, A. J., Gibberd, R. W., Leeder, S. R., O'Connell, D. L. 1985. Occupational differences in ischemic heart disease mortality and risk factors in Australia. *American Journal of Epidemiology* 122:283-290.

Occupational differences in mortality data and trends from ischemic heart disease and ischemic heart disease risk factors in Australia were examined. Occupational status was divided into seven categories for men and five for women (Group 1 being the highest). Between 1969-1978, death rates for professionals (Group 1) were relatively low at the beginning of the period and declined by 36 percent. The trades/labor group experienced a less severe decline (25 percent). The highest rate throughout the period was for the service group (Group 5). With respect to risk factors, mean diastolic blood pressure increased with decreasing socioeconomic status for men and women. No statistical differences in mean cholesterol or HDL-cholesterol among occupations for men and women were found. Mean plasma triglycerides values increased with decreasing SES for men and women. Body mass index showed the same pattern. Smoking was less prevalent among professionals (Group 1) and highest in Group 4. Exercise scores followed the typical pattern of other risk factors. This study showed a very significant difference in risk factor levels among occupations, which were consistent with the mortality experience from ischemic heart disease among men.

Duncan, G. J. 1984. *Years of poverty/years of plenty*. Ann Arbor, MI: University of Michigan.

Data from the Panel Study of Income Dynamics, a longitudinal study of 5,000 American families with yearly follow-up, is presented. Chapters include discussions of family economic mobility, dynamics of poverty, dynamics of welfare use, dynamics of work hours, unemployment, and earnings-trends in relative earnings of black males, and differences in earnings of males and females.

Dutton, D. B. 1978. Explaining the low use of health services by the poor: costs, attitudes, or delivery system. *American Sociological Review* 43:348-368.

The poor, especially children, continue to receive fewer health services relative to need than the affluent. Explanations have

traditionally focused on cost constraints or on cultural differences. The paper provides empirical evidence that such explanations do not account fully for income trends in preventive and symptomatic use. A third explanation, based on inadequacies in delivery systems used by the poor, is required. Factors representing each explanation are added sequentially to a multivariate model to shed light on their role in the income-user relationships. Particularly instructive are changes in estimates when types of delivery systems are added, since system differences have been ignored in much previous research. The importance of factors promoting use among the poor, e.g., public assistance, is underestimated, while the role of individual characteristics, e.g., attitudes, is overestimated. Results suggest that neither financial access nor health education, without accompanying improvements in delivery systems, will eliminate income differentials in use.

———. 1985. Socioeconomic status and children's health. *Medical Care* 23:142-156.

The relationships between SES and three common children's health problems (ear disease, hearing loss, and visual problems) are examined. Data were from a household survey and independent clinical examination of 1,063 black children in Washington, D.C. All three problems had a U-shaped relationship with income, with significantly higher prevalences among both upper and lower income children than among the middle income group, even controlling statistically for other socioeconomic variables. Except for past illness, income was generally the strongest determinant of children's health, followed by housing, crowding, and neighborhood income level. Some risk factors varied between upper and lower income children. Doctors' contacts seemed to reduce illness among poor children but not among the more affluent, while the use of "private" rather than "public" settings did not appear to benefit either group.

Edwards, G., Kyle, E., Nicholls, P., Taylor, C. 1978. Alcoholism and correlates of mortality. *Journal of Studies of Alcohol* 39:1607-1617.

The contribution of alcoholism-associated mortality to social class gradients of health was studied in a cohort of alcoholics admitted to four English mental hospitals over five years. Alcoholism had a differential impact on mortality risk according to social group. Alcoholism was likely to increase the risk of death more in classes I and II than in classes IV and V. Persons in class III hold an intermediate position, closer to I and II.

Eisinger, R. A. 1972. Psychosocial predictors of smoking behavior change. *Social Science and Medicine* 6:137-144.

A prospective study was undertaken in an attempt to discover the possible predictors of smoking behavior change. Respondents subjected to a lengthy interview in 1966 were reinterviewed in 1968, at which time their smoking behavior was assessed. Respondents were classified as either "quit," "reduced," "no change," or "increased." Males were found to be more willing to have quit or to have reduced smoking than females. Respondents with children present in the household were more likely to quit or reduce. As the number of cigarettes increased per day, respondents were less likely to quit or reduce. The relationship between smoking pattern change and age and education was not significant.

Elinson, J. 1977. Have we narrowed the gap between the poor and the nonpoor? *Medical Care* 15:675-677.

This paper reviews trends in health status of the poor and nonpoor. Evidence is presented that there is a widening in the existing gap between the poor and the nonpoor. A narrowing of the gap in the utilization of health services has been accompanied by a widening of the gap in health status. The gap in health status between the poor and nonpoor in terms of various disability measures has also been widening.

Ell, K. O., Haywood, L. J. 1985. Sociocultural factors in myocardial infarction recovery: an exploratory study. *International Journal of Psychiatry and Medicine* 15:157-175.

The role of SES and ethnicity in recovery during one year following a first myocardial infarction was studied. The analyses were based on a panel of patients recruited from the coronary care units of two large teaching centers in Los Angeles (N=70). Medical information was obtained by medical records abstraction and face-to-face interviews. Significant differences in anxiety, functional status, self-reported health status, personal sense of control, belief about recovery, coping response, and social support systems were found. Coping variables were associated with the post-myocardial infarction outcomes that varied among different sociocultural groups. Low SES patients were less likely to seek information in coping with myocardial infarction recovery. A strong religious perspective and sense of personal efficacy was found among Hispanics.

Ericson, A., Eriksson, M., Westerhold, P., Zetterstrom, R. 1984. Pregnancy outcome and social indicators in Sweden. *Acta paediatrica Scandinavica* 73:69-74.

Differences between social classes in the perinatal mortality rate, birthweight, distribution of gestational age, and incidence of congenital malformations were studied in Sweden. All births reported to the Registry of Births during the years 1976-1977 were used (N=190,024). An SES index was defined, based on income, occupation, and housing standards. There was no difference in perinatal mortality between groups I and III. The incidence of low birthweight preterm and postterm births were statistically different in group III compared to group I. This relationship persisted after adjustment for age and parity of the mother. SES had the greatest impact on low birthweight.

Ericson, A., Eriksson, M., Zetterstrom, R. 1979. Analysis of perinatal mortality rate in the Stockholm area. *Acta Paediatrica Scandinavica Supplement* 275:35-40.

Information obtained from the birth certificate of the National Board of Health and Welfare for the years 1973-1976 was used to study the association between SES measures and perinatal mortality. SES was measured by occupation, income, and number of home owners in each area. During 1973-1976, the perinatal mortality decreased from 14.8/1,000 to 9.8/1,000. In spite of the low perinatal mortality, there was marked variation between different maternal hospitals. With one exception, the five hospitals with the lowest annual number of deliveries had a perinatal mortality above the mean. In the referral areas with hospitals with a perinatal mortality above the mean, there was a higher percentage of low income households, overcrowded dwellings, and fewer professional people.

Ernster, V. L., Selvin, S., Sacks, S. T., Austin, D. F., Brown, S. M., Winkelstein, W., Jr. 1978. Prostatic cancer: mortality and incidence rates by race and social class. *American Journal of Epidemiology* 107:311-320.

The role of SES differences in the higher black mortality rates for cancer of the prostate was examined. Socioeconomic class was based on census tract of residence. Age-specific incidence and mortality rates by SES revealed no gradient for prostate cancer in either whites or blacks.

Ernster, V. L., Winkelstein, W., Jr., Selvin, S., Brown, S. M., Sacks, S. T., Austin, D. F., Mandel, S. A., Bertolli, T. A. 1977. Race, socioeconomic status, and prostatic cancer. *Cancer Treatment Reports* 61:187-191.

Using population-based mortality and incidence data, cases of death from prostatic cancer were assigned to a social class based on census tract of residence, and rates by race and SES were compared. Census tracts were grouped into four economic levels based on education and income. Mortality rates by SES revealed no gradient for prostate cancer in either whites or blacks. The higher risks for blacks held up at almost every SES level.

Feder, J., Hadley, J., Mullner, R. 1984. Falling through the cracks: poverty, insurance coverage, and hospital care for the poor, 1980 and 1982. *Milbank Memorial Fund Quarterly* 62:544-566.

Evidence is reviewed concerning the magnitude, trends, and factors associated with unmet medical needs among the poor. The role of economic recession, declines in private insurance coverage, Medicaid cutbacks, and limits on the growth of government spending are discussed. Policies to sustain care for the poor are considered.

Fisher, S. 1978. Relationship of mortality to socioeconomic status and some other factors in Sydney in 1971. *Journal of Epidemiology and Community Health* 32:41-46.

In Sydney in 1971, low SES was found to be associated with high mortality. This relationship became more marked with increasing age. SES was not statistically significantly related to infant mortality. Mortality was higher among those born in Australia than among immigrants. SES was characterized by an area-type index applied to the results of the 1971 census and calculated for local government areas in the Sydney Statistical Division. Among men, lower SES was linked with higher mortality from all causes except diabetes and, among women, from all causes other than neoplastic diseases. In low SES areas, females were more disadvantaged with respect to cerebrovascular disease and males with respect to respiratory causes.

Forbes, J. F., Boddy, F. A., Pickering, R., Wylie, M. M. 1982. Perinatal mortality in Scotland: 1970-9. *Journal of Epidemiology and Community Health* 36:282-288.

The impact of demographic factors on the decline in Scottish perinatal mortality, trends in the distribution of birthweight and weight-specific mortality, regional differences in perinatal mortality, and recent changes in the registered causes of perinatal mortality were examined using data on all registered

births. Changes in the social class, maternal age, and parity distribution of legitimate births between 1970-1979 account for 7 percent of the improvement in perinatal mortality. Changes in the social class distribution of births accounted for 13 percent and 17 percent of the decline in perinatal mortality among women age 30-34 and 35-39, respectively. Despite the overall improvements in perinatal mortality, the approximately relative risk in social class IV and V, relative to I, changed only slightly from 1.5 to 1.3 in 1979 with most improvement occurring in 1977.

Forsdahl, A. 1977. Are poor living conditions in childhood and adolescence an important risk factor for arteriosclerotic heart disease? *British Journal of Preventive and Social Medicine* 31:91-95.

The hypothesis that poverty during adolescence is positively correlated with the risk of dying from heart disease in later years was studied. The analysis is based on official statistical data. Adjustments have been made for differences in sex and age by direct standardization (population of Norway in 1960 used as the standard). In countries where male infant mortality was high, middle age mortality was also high generations later ( $r = +.93$ ). This trend is similar for females, but the correlation was weaker ( $r = +.75$ ). When different causes of death were examined, there was a strong correlation between the coronary heart disease mortality for ages 40 and 69 and infant mortality and not during the early years of that cohort (males:  $r = +.79$ , females:  $r = +.61$ ).

Fortmann, S. P., Williams, P. T., Hulley, S. B., Maccoby, N., Farquhar, J. W. 1982. Does dietary health education reach only the privileged?: the Stanford three community study. *Circulation* 66(1):77-82.

One control and two treatment towns were studied before and after a three-year bilingual, mass-media health education program. An examination of the relationship of SES and cardiovascular risk factors (diet, cholesterol, weight) was obtained



by dietary questionnaires. SES was measured by income and education (Hollingshead). SES was related to dietary cholesterol, alcohol, weight, and plasma cholesterol ( $p=0.06$ ) when adjusted for age, sex, and language group. When adjusting for SES, language group was related to dietary cholesterol, saturated fats, alcohol, and relative weight, but not to plasma cholesterol. Prospectively, SES and language group were not associated with changes in risk factors after adjustment for age, SES, and other covariates.

Fox, A. J., Adelstein, A. 1978. Occupational mortality: work or way of life? *Journal of Epidemiology and Community Health* 32:73-78.

Assumptions in the traditional method of examining occupational contributions to mortality by comparing the mortality of employed men in a particular occupation with married women with husbands in that occupation are discussed. The validity of these assumptions is questioned, and a new technique based on social class standardization of mortality rates for a particular occupation is presented. Social class variations appear to explain, to a considerable extent, the increased mortality rates in certain occupations.

Fox, A. J., Goldblatt, P. O., Jones, D. R. 1985. Social class mortality differentials: artefact, selection, or life circumstance? *Journal of Epidemiology and Community Health* 39:1-8.

Data from 10 years of follow-up of mortality in the OPC Longitudinal Study were used to relate deaths of men in 1976-1981 to their social class as recorded by the 1971 census. Explanations of social class mortality differentials are critically reviewed in the light of these new data. The similarity between the class differentials observed for men aged 15-64 years in this study and those reported in the 1970-1972 Decennial Supplement on Occupational Mortality indicated that the published gradients were not grossly distorted by numerator/denominator biases. Distortions to gradients observed in the early years of the longitudinal study and ascribed to selective

health-related mobility out of employment from the principal social class to the permanently sick had largely worn off after five years of follow-up. Sharp gradients at ages over 75 years, similar to those at younger ages, suggest that, for men aged over 50 years, selective health-related mobility between social class does not contribute to differentials in mortality.

Frerichs, R. R., Chapman, J. M., Nourjah, P., Maes, E. F. 1984. *Cardiovascular disease in Los Angeles, 1979-1981*. Los Angeles: American Heart Association—Greater Los Angeles Affiliate, Inc.

Mortality data for major cardiovascular diseases in Los Angeles during 1979-1981 are presented by cause, race, sex, and income of census tract of residence. Persons in poor neighborhoods experienced higher rates of death from cardiovascular causes among both blacks and whites and males and females. Deaths among the poor were more likely to occur out of hospital than deaths among wealthier residents.

Gee, S. C., Lee, E. S., Forthofer, R. N. 1976. Ethnic differentials in neonatal and postneonatal mortality: a birth cohort analysis by a binary variable multiple regression method. *Social Biology* 23:317-325.

Ethnic differences in neonatal and postneonatal mortality among three ethnic groups (Spanish surnames, white, and nonwhite) were examined in birth and matched infant death certificates for 1958-1960 in Houston, Texas. There were 46,320 single live births during this time. Spanish surname and white infants exhibited a 13 percent below average risk of neonatal mortality factors adjusted for all. The risk for nonwhites was 30 percent above average. Of the four sociodemographic factors, birthweight and legitimacy status were responsible for most of the changing differentials when statistical adjustments were made. There were greater ethnic differences in postneonatal mortality than neonatal mortality, suggesting that environmental factors intervened after 27 days of an infant's life. Despite the Spanish surnames' much less favor-

able SES condition, their experience in this study resembled that of Anglos. This may be attributed to favorable weight distribution and full-term gestation period.

Gillum, R. F. 1982. Coronary heart disease in black populations: I. Mortality and morbidity. *American Heart Journal* 104:839-851.

Coronary heart disease is the leading cause of death among black Americans (57,999 deaths in 1977) despite the widely held belief that CHD is not common in blacks. CHD death rates were lower in black men than in white men in the United States in the 1940s, but rose rapidly until they exceeded those of whites in 1968. Since 1968, CHD death rates in blacks have fallen by about 30 percent, to levels similar to whites, but still higher than 1940 rates. Black women have higher CHD mortality than white women. The few population studies of myocardial infarction in the 1970s suggest similar or lower age-specific incidence in black than white men but higher case fatality and more out-of-hospital deaths.

\_\_\_\_\_, Paffenbarger, R. S., Jr. 1978. Chronic disease in former college students. *American Journal of Epidemiology* 108:289-298.

Former Harvard University students, age 15-29 at physical examination upon college entrance in 1930-1950, answered mailed questionnaires concerning their health. Information regarding the presence of medically diagnosed angina pectoris, high blood pressure, myocardial infarction, and other diseases was ascertained. There were 98 cases of coronary heart disease, 78 cases of myocardial infarction, and 48 cases of angina pectoris. For each of these cases, four controls were randomly selected. SES data were collected during entrance examination and mobility status gained by subsequent questionnaires. When fatal coronary heart disease and myocardial infarction categories were combined, a univariate analysis showed an inverse relationship between father's occupation and coronary heart disease risk. This association persisted

when stratifying on individual confounders and a multivariate confounder-summarizing score. Intergenerational mobility (as indicated by low occupation status of father) was associated with a 1.5 times greater risk of myocardial infarction and fatal coronary heart disease.

Gortmaker, S. L. 1979. The effects of prenatal care upon the health of the newborn. *American Journal of Public Health* 69:653-660.

The data from all birth and infant death records in New York in 1968 were analyzed. Educational status of the mother and father, age of mother, birth order of the child, and wedlock status were all significant predictors of adequacy of prenatal care received by mother and infant. Mothers with 0-8 years of education with similarly educated husbands and who were less than 20 years of age experienced a 7.5 times greater chance of receiving inadequate care compared to those who were older with more education. These analyses also found that white mothers who delivered on a general service, as well as black mothers, tended to experience a substantially increased risk of low birthweight when receiving inadequate as opposed to adequate care.

Greenlick, M. R., Shekelle, R., Syme, S. L. 1986. Social-demographic factors in coronary heart disease: the Multiple Risk Factor Intervention Trial (MRFIT) experience. Presented at the Annual Meeting of the Society for Epidemiologic Research, Pittsburgh, PA, June 19.

The associations between level of education, income, marital status, occupation, occupation-education incongruity, race, and incongruity with wife's education and fatal and total (fatal plus nonfatal) myocardial infarction were studied in the 12,000 men who participated in the MRFIT study. Education, occupation, incongruity with wife's education, and race were related to outcomes in age-adjusted analyses. However, most of these associations were due to risk factor profiles that differed between sociodemographic groups. There was no evi-

dence for an interaction between sociodemographic factors and treatment.

Grossman, M., Jacobowitz, S. 1981. Variations in infant mortality rates among counties of the United States: the roles of public policies and programs. *Demography* 18:695-713.

The role of birth control and family planning services in infant mortality is examined for United States counties between 1964-1977. After a period of relative stability, the neonatal mortality rate began to decline in 1964, possibly as a lagged response to the extremely rapid increase in the percentage of women who used the pill and the IUD in 1961 and 1964. The decline was further fueled by an increase in the percent of low income women who used subsidized family planning services between 1965-1971 and the dramatic rise in the legal abortion rate between 1969-1971. The acceleration in the rate of the decline in the mortality rate between 1971-1977 was due primarily to the increase in the abortion rate in that period.

Guggenheim, K., Kark, S. L., Abramson, J. H. 1964. Diet, social class, and neighborhood in Jerusalem, Israel. *Journal of the American Dietetic Association* 45:429-432.

The food consumption of 148 pregnant women living in three regions of Jerusalem was studied. The neighborhoods were selected because of contrasts in the prevalence of anemia and in social status. Considerable differences in food consumption were found between these three neighborhoods with the differences being reflected in differences in nutritive value of the diets. The diet eaten in the area of the highest social class was significantly superior with respect to animal protein, calcium, vitamin A, riboflavin, and ascorbic acid. There was evidence suggesting that the nutrient differences were primarily related to social class rather than to the differences in countries of origin between the neighborhoods. In all three neighborhoods, iron intake was well below that recommended for women in the second half of pregnancy.

Haan, M. N. 1985. *Organizations and ischemic heart disease: an epidemiologic study of employees in a Finnish metal fabrication company*. Unpublished doctoral dissertation. University of California.

This research examines the association between job strain and incident and fatal ischemic heart disease in a cohort of 902 Finnish metal workers followed between 1973-1983. The Job strain measure included subscales assessing job variety, job control, and physical-ergonomic demands on the job. After adjustment for age, sex, systolic blood pressure, total serum cholesterol, years of smoking, relative weight, alcohol consumption, and physical exercise, the analyses showed that persons exposed to high job strain had a 4.5-fold higher risk of ischemic heart disease than persons exposed to low job strain. The research concluded that job strain appeared to be a risk factor for ischemic heart disease which is not modified or accounted for by differences in more traditional cardiovascular risk factors.

\_\_\_\_\_, Kaplan, G. A. 1985. The contribution of socioeconomic position to minority health. In Heckler, M., ed. *Report of the Secretary's task force on black and minority health: crosscutting issues in minority health*. Washington, D. C.: Department of Health and Human Services.

Evidence is reviewed that tests the contribution of differences in socioeconomic position to the disparities in health status between minorities and whites in the U.S. 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 socioeconomic position is taken into consideration. For many other outcomes, the evidence suggests a diminution of these differentials with adjustment for socioeconomic level. The evidence is, in general, consistent with the hypothesis that the poorer health of some minorities, particularly blacks, represents the impact of their lower socioeconomic position.

\_\_\_\_\_, Camacho, T. 1987. Poverty and health: prospective evidence from the Alameda County Study. *American Journal of Epidemiology* 125:989-998.

To explore the reasons for the association between socioeconomic status and poor health, the nine-year mortality experience of a random sample of residents in Oakland, California, was examined. Residents of a federally designated poverty area experienced higher age-, race-, and sex-adjusted mortality over the follow-up period compared to residents of non-poverty areas (odds ratio = 1.71, 95 percent confidence interval: 1.20-2.44). This increased risk of death persisted when there was multivariate adjustment for baseline health status, race, income, employment status, access to medical care, health insurance coverage, smoking, alcohol consumption, physical activity, relative weight, sleep pattern, social isolation, marital status, depression, and personal uncertainty. These results support the hypothesis that properties of the sociophysical environment may be important contributors to the association between low socioeconomic status and excess mortality, and that this contribution is independent of individual behaviors.

Haberman, P. W., Baden, M. M. 1974. Alcoholism and violent death. *Quarterly Journal of Studies of Alcohol* 35:221-231.

The association between alcohol and alcohol ingestion prior to death and violent causes of death in New York City was studied. The demographic characteristics of and the postmortality findings for 1,000 decedents age 18 or older were examined. The sample had a disproportionately large number of males, blacks, younger persons, those in blue-collar occupations, and persons with less education. Among the alcoholics, there were more persons age 30-59, blacks, more separated and divorced, and blue-collar workers. Among nonalcoholics there were more persons younger than 30 and older than 59, and more married and with some college education.

Hadley, J., Osei, A. 1982. Does income affect mortality? An analysis of the effects of different types of income on age-sex-

race-specific mortality rates in the United States. *Medical Care* 20:901-914.

The effects of total family income on mortality rates were examined in eight adult and four infant age-sex-race-specific population cohorts. Income was a significant factor that could explain the geographic variations in adult mortality rates, displaying a generally negative relationship, although the relationship was not always statistically significant. Earned income had a negative impact on the middle age cohort but a positive impact on the elderly cohort. The reverse was true for unearned income.

Haenszel, W., Kurihara, M., Locke, F. B., Shimuzu, K., Segi, M. 1976. Stomach cancer in Japan. *Journal of the National Cancer Institute* 56:265-274.

A case control study of two Japanese prefectures was undertaken to provide information on the importance of environmental factors and stomach cancer. Seven hundred eighty-three patients with stomach cancer and 1,588 hospital controls participated in the study. Questionnaires covering dietary habits, residency history, occupation, tobacco use, customs, previous illness, and reproductive history were completed. There was an increased risk associated with being a farmer. This was not explained by place of residence since the increased risk for farmers persisted in data for rural and urban residences. Although education could be regarded as a good index of social status in Japan, the findings in the two prefectures diverged sharply. In one, non-farmers with middle school or better education had a lower risk of stomach cancer, while the opposite was true in the other prefecture.

Haglund, B. J. A. 1985. Geographical and socioeconomic distribution of high blood pressure and borderline high blood pressure in a Swedish rural county. *Scandinavian Journal of Social Medicine* 13:53-66.

The association between socioeconomic factors and hyperten-

sion was studied in a stratified random sample of 7,986 individuals ages 25 to 75 in Skaraborg County, Sweden. There were differences in systolic blood pressure and diastolic blood pressure between individuals with different levels of education, including an inverse relationship between education and high blood pressure. This association persisted after controlling for age, sex, weight, smoking, and treatment for blood pressure. These differences were more prominent in women. There was also a difference in blood pressure between socioeconomic groups based on occupation; these differences were greater among women than men. Stepwise regression indicated that, for men, occupation was the explanatory variable with the highest correlation to borderline high blood pressure, and marital status the strongest for systolic blood pressure. This pattern was repeated for women, with less formal education being the strongest predictive variable.

Hakama, M., Hakulinen, T., Pukkala, E., Saxen, E., Teppo, L. 1982. Risk indicators of breast and cervical cancer on ecologic and individual levels. *American Journal of Epidemiology* 116:990-1000.

The role of environmental and individual factors in the cancers of the breast and cervix uteri was studied using all new cases of breast and cervical cancer diagnosed between 1954 and 1974 in Finland. The risk of both types of cancer increased with increasing urbanization. Women living in towns had 1.5 times the risk as those living in rural areas. Eight variables were used to define the standard of living for a municipality: income, social class, education, number of television sets, crowdedness, availability of running water, central heat and electricity. Both cancers increased with an increase in living standards; relative risk ranged from 1.5 to 2.0 when the highest living standards were compared to the lowest. Individual analysis demonstrated that those in high occupation positions had a higher risk of breast cancer and lower risk of cervical cancer (relative risk for breast 1.7 and .3 for cervical cancer). When SES was defined by education, the magnitude

of the difference was the same. Among farmers, the risk of both types of cancer was low.

Halliday, M. L., Anderson, T. W. 1979. The sex differential in ischaemic heart disease: trends by social class 1931 to 1971. *Journal of Epidemiology and Community Health* 33:74-77.

Trends in the sex differential for ischemic heart disease were studied using data on death rates in social classes I and V, for persons age 45-64, between 1931-1971 in England and Wales. Death rates were calculated from death certificates, and population data was taken from the Decennial Supplement. In 1931, the recorded death rate from angina pectoris and other ischemic heart disease-specific terms was almost four times greater in men of social class I than V. The authors hypothesize that this may be due to the misclassification of certificates. To estimate this number, they classified nonspecific diagnoses as ischemic heart disease. When this was done, social class I and V had approximately the same total ischemic heart disease death rate in 1931. By 1961, class I had decreased while the mortality rate for V had increased. For married women in 1931, the death rate was higher in I than V, but the nonspecific ischemic heart disease term reversed this order, so that V had almost double the rate of I. Between 1931 and 1971, the rate went down for class I and stayed the same for class V.

Harburg, E., Erfurt, J. C., Chape, C., Hauenstein, L. S., Schull, W. J., Schork, M. A. 1973. Socioecological stressor areas and black-white blood pressure: Detroit. *Journal of Chronic Diseases* 26:595-611.

Socioenvironmental differences in blood pressure between black and white urban populations were studied. All census tracts in Detroit were ranked by SES (income, education, occupation, and home ownership) and by instability factors (adult and juvenile crime rate, marital instability, and percent of residents over five years of age). Blood pressure did not vary by sex, race, and residence. Black males of high stress tracts had higher adjusted blood pressure levels than blacks of

low stress areas; this was also true for whites. Black high stress males had a significantly higher percent of borderline and hypertensive blood pressure than other male groups. White low stress females had the lowest of all groups.

Hathcock, A. L., Greenberg, R. A., Dakan, W. A. 1982. An analysis of lung cancer on a microgeographical level. *Social Science and Medicine* 16:1235-1238.

Variations in lung cancer mortality by small geographic areas, internally homogeneous, but externally heterogeneous, were related to SES. Standard mortality ratios were calculated by age-sex-race groupings within each area using death certificates from the Commonwealth of Kentucky for 1968-1977 and SES data from the 1960 and 1970 censuses. Areas were described by income, education, and crowding indexes, and a summary index was generated. Area 1 was the lowest and Area 5 the highest on this index. After adjustment for covariates, lung cancer in Areas 1 and 3 showed consistently higher standard mortality ratios ( $p < .05$ ) in both five-year age periods and Area 1 was significantly higher for the entire study period. Areas 2 and 5 had consistently lower standard mortality ratios. Males had a significantly higher standard mortality ratio in Areas 1 and 3, but females showed an insignificantly higher standard mortality ratio.

Haynes, S. G., Cohen, B., Harvey, C., Murphy, R. 1983-84. *Cigarette smoking patterns among Mexican-Americans: HHANES, Southwest United States, 1982-84*. Presented at the 113th Annual Meeting of the American Public Health Association, November 19, 1985.

Cigarette smoking and trends in smoking were compared in Mexican American and non-Hispanic whites in the Southwest United States. Mexican American men were twice as likely as Mexican American women to smoke. There were no secular trends in smoking. White rates of cigarette smoking were higher among Mexican American than non-Hispanic whites. Among groups that smoked, usage was one half for Mexican

American compared to non-Hispanic whites. Mexican American women were less likely to smoke and smoked fewer cigarettes than non-Hispanic whites and blacks. Smoking status among Mexican American men varied by education level and smoking status varied by acculturation for women.

Hazuda, H. P., Stern, M. P., Haffner, S. M. 1985. *Acculturation, socioeconomic status, and coronary heart disease (CHD) prevention in Mexican Americans: San Antonio heart study*. Presentation at the 58th Scientific Sessions of the American Heart Association, November 13, 1985.

The relationships between acculturation, SES, and preventive knowledge and behavior were studied in participants in the San Antonio Heart Study. Acculturation and SES make independent contributions to preventive knowledge and behavior in Mexican Americans. At all levels, more highly acculturated Mexican Americans have a higher level of preventive knowledge and behavior than do the less acculturated. Mexican Americans at the highest acculturation level closely resemble non-Hispanic whites in their preventive knowledge and behavior. However, even in the highest acculturation and SES subgroups, Mexican Americans score low on preventive knowledge and behavior.

Hazuda, H. P., Haffner, S. M., Stern, M. P., Knapp, J. A., Eifler, C. W., Rosenthal, M. 1986. Employment status and women's protection against coronary heart disease. *American Journal of Epidemiology* 123:623-640.

Data were collected between October 1979 and November 1982 as part of the San Antonio Heart Study, a community-based investigation of diabetes and coronary heart disease risk factors in Mexican Americans and non-Hispanic whites. Women were classified as employed or full-time homemakers according to their response to an open-ended questionnaire. Major demographic characteristics were sampled, and SES was measured by the Duncan socioeconomic index. Differences in the profile of cardiovascular risk factors between cur-



rently employed women and homemakers were examined. There were no significant differences between employed women and homemakers in terms of cholesterol, low density lipoproteins, obesity, systolic and diastolic blood pressure, or cigarette smoking. There was a significant statistical difference in high density lipoproteins, favoring employed women over homemakers. The magnitude of the difference in mean high density lipoprotein levels was in a range associated with protection against coronary heart disease in women and men. The protective effect of employment was more pronounced for women in professional and managerial occupations and sales and clerical occupations than for those in blue-collar occupations.

Heller, R. F., Williams, H., Sittampalam, Y. 1984. Social class and ischemic heart disease: use of the male/female ratio to identify possible occupational hazards. *Journal of Epidemiology and Community Health* 38:198-202.

The male/female ratio for ischemic heart disease for social class, socioeconomic group, and occupation was explored to identify particular occupations that might be important in the etiology of ischemic heart disease. Data from the Occupational Mortality Decennial Supplement for England and Wales for 1931, 1951, 1961, and 1971 were used. From 1931 to 1971, the excess ischemic heart disease mortality ratio in groups VI and V was considerably higher at younger ages for males and females. During this time, there was never an excess of ischemic heart disease in classes I and II for all age groups. Men of social class I and II had a relative excess of ischemic heart disease compared to women of the same class, even though they had a low standard mortality ratio compared with other men. The magnitude of this difference was not seen for other diseases. Individual socioeconomic groups were examined: self-employed professionals appeared at the greatest risk compared with their spouses, whereas agricultural workers were at the lowest risk when compared to their spouses.

Herold, J., Waldron, I. 1985. Part-time employment and women's health. *Journal of Occupational Medicine* 27:405-412.

Data from a national probability sample of noninstitutionalized women age 30-44 in 1967 were used to examine the health differences between part-time and full-time workers and between part-time workers and housewives. The relationship between part-time employment and health varied depending on race and marital status. Part-time workers reported poorer health than full-time workers for married black women and for unmarried women, but for married white women health differences between part- and full-time workers were small and generally not significant. Longitudinal data provided evidence that part-time employment, or characteristics that were associated with part-time employment, may contribute to the poorer health of married black and part-time workers.

Holme, I., Helgeland, A., Hjermmann, I., Leren, P., Lund-Larsen, P. G. 1981. Physical activity at work and at leisure in relation to coronary risk factors and social class. *Acta Medica Scandinavica* 209:277-283.

The association between physical activity at work and during leisure time, other coronary risk factors, social class, and mortality over four years was studied in 15,000 men as part of the Oslo Study. Those with low education and income are at increased risk of death, even with adjustment for both types of physical activity, total serum cholesterol, systolic blood pressure, and smoking.

Holme, I., Hjermmann, I., Helgeland, A., Lund-Larsen, P. G., Leren, P. 1976. Coronary risk factors and socioeconomic status. *Lancet* II:1396-1398.

Coronary heart-disease (CHD) has been reviewed as a "manager's disease." However, deaths from CHD are now said to be more common in groups from the lower social classes than in those of higher socioeconomic status. The authors exam-

ined whether these differences in CHD mortality can be explained by differences in the conventional risk factors for CHD.

Holme, I., Helgeland, A., Hjermmann, I., Leren, P. 1980. Four-year mortality by some social indicators: the Oslo Study. *Journal of Epidemiology and Community Health* 34:48-52.

Risk factors for mortality from several causes were studied. Approximately 25,000 men were invited to participate in age group 40-49, and 16,202 men agreed to participate in the Oslo Study. Lower social classes exhibited higher cancer mortality rates. After adjusting for cigarette smoking, 75 percent of the gradient persisted. There was a gradient for coronary heart disease as well, and after adjusting for coronary heart disease risk factors, 60 percent of the gradient remained. Accidents and homicides also showed a strong gradient; after adjusting for risk factors, 70 percent of the gradient remained. Because social class and coronary heart disease risk factors are intercorrelated, the authors concluded that 20 to 40 percent of the social class mortality gradient can be explained by these risk factors. Additionally, if one considers possible measurement error, then 50 percent of the social class gradient can be explained by these risk factors and 50 percent by other factors.

Illsley, R. 1955. Social class selection and class differences in relation to stillbirths and infant deaths. *British Medical Journal* II:1520-1524.

Selective movement between classes and its effect on the rates of prematurity and obstetric death was examined in an analysis of all married primiparae who were residents and delivered in the city of Aberdeen between July 1950 and December 1954. Social class was based on husband's and father's occupation. Father's occupation was defined by his main occupation during the patient's school years. Women who raised their social status at marriage tended to be better educated, of superior intelligence, and had greater occupational skills. They also tended to be in good health. Conversely, women whose

social status fell at marriage tended to have the opposite characteristics.

Institute of Medicine. 1985. *The prevention of low birth weight*. Washington, D.C.: National Academy Press.

A comprehensive review of the demographic, behavioral, biologic, and social factors associated with low birthweight. Consistent relationships between socioeconomic status and low birthweight are demonstrated. The prospects for the prevention of low birthweight are discussed.

Jenkins, C. D. 1983. Social environment and cancer mortality in men. *New England Journal of Medicine* 308:395-398.

Characteristics of the social environment associated with cancer mortality were examined using data from death certificates from the Massachusetts Division of Health Statistics. Age-, sex-, and cause-specific mortality rates were calculated for the Commonwealth to determine the expected number of deaths due to all cancers for men and women. Male cancer mortality was higher than expected in areas where a high proportion of families and children lived in poverty. Cancer rates were higher in men where a high proportion of underemployed and unemployed men were present. The type of housing was also associated with excess cancer mortality.

\_\_\_\_\_, Tuthill, R. W., Tannenbaum, S. I., Kirby, C. R. 1977. Zones of excess mortality in Massachusetts. *New England Journal of Medicine* 296:1354-1356.

Social and demographic correlates of excess mortality by select causes were studied in 39 areas of Massachusetts in the 1970s. One area ranked the highest in excess mortality for 17 of 34 specific causes of death. Overall, 28 percent of the total excess mortality in 1972-1973 would not have occurred had the rates for the Commonwealth prevailed. High mortality areas were ones with severe economic deprivation, poor housing, overcrowding, loneliness, family breakdown, personal

disability, social instability, and minority status. Ranked correlation coefficient calculations between the 39 areas for total mortality and sociodemographic indicators showed 76 of 131 correlations that were statistically significant.

Johnston, J. M., Grufferman, S., Bourguet, C. C., Delzell, E., Delong, E. R., Cohen, H. J. 1985. Socioeconomic status and risk of multiple myeloma. *Journal of Epidemiology and Community Health* 39:175-178.

This study tested the hypothesis that individuals of higher SES are at increased risk of developing multiple myeloma. A hospital-based case-control study of 153 patients with multiple myeloma and 459 matched controls seen at Duke University Medical Center between June 1976 and May 1982 was carried out. Cases were matched on age, sex, race, hospital, date of admission, and in/out patient status. SES was defined by family income, education, occupation, home ownership, and number of rooms per number of occupants. No meaningful difference between cases and controls on years of education, number of rooms, or crowding index were found using bivariate and multivariate analysis. Home ownership was the only SES indicator that showed a positive association with multiple myeloma (relative risk of 1.6). There was a dose response relationship of increased multiple myeloma with increased occupational rank; the relationship was statistically significant only for outpatients.

Kaplan, G. A. 1985. Psychosocial aspects of chronic illness; direct and indirect associations with ischemic heart disease mortality. In Kaplan, R. M., Criqui, M., eds. *Behavioral epidemiology and disease prevention*. New York: Plenum Press.

The association between socioeconomic, behavior, social, and psychological factors and nine-year mortality risk for ischemic heart disease was studied in 2,352 persons, aged 50 years or more, who were participants in the 1965 Alameda County Study. Analyses of the patterns of mutual confounding between these factors indicated that those with low education

and income had 40 percent higher risk of death, and this increased risk was independent of all other covariables. In addition, socioeconomic status was responsible for some of the increased risk associated with low levels of perceived health and with high levels of depressive symptoms.

\_\_\_\_\_, Haan, M. N., Sept. 1986. *Socioeconomic position and health: prospective evidence from the Alameda County Study*. Presented at 114th Annual Meeting of the American Public Health Association, Las Vegas, Nevada.

The association between education and income and mortality from all causes, the role of other risk factors in explaining these associations, and the contribution of education and income to black/white mortality differentials is examined in the Alameda County Study 1965 Cohort. The analyses are based on 18 years of mortality experience. The association between income level and risk of death is influenced very little by adjustment for age, sex, smoking, physical activity, relative weight, sleep habits, alcohol consumption, social network participation, and depression. The association between level of education and mortality risk is lowered somewhat by adjustment for these factors, but it remains significant. Black/white differences in mortality risk are reduced substantially by adjustment for level of income, and there is no longer a significant association between race and mortality risk. Adjustment for education has a relatively small effect on the black/white difference.

Kaplan, G. A., Haan, M. N., Syme, S. L., Minkler, M., Winkler, M. 1987. Socioeconomic status and health. In Amler, R. W., Dull, H. B., eds. *Closing the gap: the burden of unnecessary illness*. New York: Oxford University Press.

As part of the Carter Center "Closing the Gap" Conference, evidence is reviewed concerning the relationship between socioeconomic status and a wide variety of health outcomes. The evidence supports the position that socioeconomic status

is a generic risk factor worthy of consideration in prevention efforts.

Karasek, R., Baker, D., Marxer, F., Ahlbom, A., Theorell, T. 1981. Job decision latitude, job demands, and cardiovascular disease: a prospective study of Swedish men. *American Journal of Public Health* 71:694-705.

The association between specific job characteristics and subsequent cardiovascular disease was tested using a large random sample of the male working Swedish population. The prospective development of coronary heart disease (CHD) symptoms and signs was analyzed. Additionally, a case-controlled study was used to analyze all cardiovascular-cerebrovascular (CHD-CVD) deaths during a six-year follow-up. A hectic and psychologically demanding job increases the risk of developing CHD symptoms and signs (standardized odds ratio 1.29) and premature CHD-CVD death (relative risk 4.0). Low decision latitude—expressed as low intellectual discretion and low personal schedule freedom—is also associated with increased risk of cardiovascular disease. Low intellectual discretion predicts the development of CHD symptoms and signs, while low personal schedule freedom, among the majority of workers with the minimum statutory education, increases the risk of CHD-CVD death (relative risk 6.6,  $p < .0002$ ). The associations exist after controlling for age, education, smoking, and overweight.

Keirn, W., Metter, G. 1985. Survival of cancer patients by economic status in a free care setting. *Cancer* 55:1552-1555.

All patients with a diagnosis of lung, breast, and colorectal cancer treated at the City of Hope Medical Center between 1976-1981 were included in a study of SES and survival. Patients were defined as indigent and nonindigent based on public assistance criteria. Comparisons were made between indigent and nonindigent subjects by tumor site for age, sex, and stage of diagnosis. For each tumor site the only variable that was statistically associated with survival after adjustment for

other variables was the stage at which the disease was diagnosed. There was no independent association of SES with survival.

Kitagawa, E. M., Hauser, P. M. 1973. *Differential mortality in the United States: a study in socioeconomic epidemiology*. Cambridge, MA: Harvard University Press.

The results of three major studies of the relationship between socioeconomic indicators and mortality are presented. The first study matched death certificates for 340,000 persons who died in the U.S. in May through August of 1960 with the 1960 Population Census. The second studied variations in mortality in the Chicago area from 1930 to 1960 as a function of socioeconomic characteristics of census tracts. The third study involved a detailed analysis of mortality gradients as a function of education for all deaths in the U.S. in 1959-1961. Considerable information is presented on the association between education, income, and occupation and mortality.

Knox, E. G., Marshall, T., Kane, S., Green, A. 1980. Social and health care determinants of area variation in perinatal mortality. *Community Medicine* 2:282-290.

Data on perinatal mortality for 90 English areas for 1974-1976 were related to a series of social indicators obtained from census and other sources, and a set of statistics describing the facilities, staffing, and throughputs of perinatal and other health care services. Birthweight standardization accounts for more than half the initial variation in perinatal mortality rates. Social descriptors also accounted for a lot of the variation of the weight-standardized expectations. The social descriptors also account for a large fraction of the mortality variance that remained following the standardization by birthweight. Variations in health care descriptors showed little evidence of an effect upon either component. In particular, the effect of the social variables on the stillbirth rates did not operate to any discernible extent through associated underinvestment in health care services.

Koskenvuo, M., Sarna, S., Kaprio, J. 1978. Mortality by marital status and social class in Finland during 1969-1971. *Scandinavian Journal of Social Medicine* 6:137-143.

The distribution of mortality rates by social class and marital status for men and women in three age groups (25-44, 45-64 and 65-84) in Finland is presented in these analyses. Natural and violent causes of death were analyzed separately. The death certificates of 137,780 Finnish citizens for the years 1969, 1970, and 1971 were analyzed and mortality rates standardized using as reference population the data from the 1970 census. Social class and marital status were significant risk factors for mortality, from both natural and violent causes.

———, Lonnqvist, J. 1979. Cause-specific mortality by marital status and social class in Finland during 1969-1971. *Social Science and Medicine* 13a:691-697.

The mortality experience of 25- to 64-year-olds in Finland was examined by marital status and social class. Social class was based on the occupational data found on the death certificates. Nonemployed and retired individuals were identified by their former occupations or the occupations of their supporters. The referent population was taken from the 1970 census. Mortality data were evaluated for 44,548 death certificates for the years 1969, 1970, and 1971. For mental disorders, respiratory illnesses, nervous disorders, infections, homicides, fires, and poisonings, men in social class 4 (unskilled workers) had the highest mortality rate. No clearcut pattern could be seen for women. This may be explained by the fact that non-gainfully employed women were classified by their husbands' occupations. If the mortality rates in other classes were the same as class 1, there would have been 21 percent lower rate from natural causes and 40 percent lower rate for violent causes in men. Cancer and coronary heart disease showed the least variation with a 1.8-fold risk for cancer and 1.7-fold risk for coronary heart disease.

Koskenvuo, M., Kaprio, J., Kesaniemi, A., Sarna, S. 1980. Differences in mortality from ischemic heart disease by marital status and social class. *Journal of Chronic Diseases* 33:95-106.

This paper presented mortality data from ischemic heart disease in a Finnish population by marital status and social class. The death certificates for all persons aged 25-84 dying from ischemic heart disease between 1969-71 were studied. Social class was based on occupation status. The referent population was based on 1970 census returns. In different marital status-social class combinations, the proportion of deaths from ischemic heart disease was highest when total disease mortality was lowest. The variation with marital status or social class, separately, was less than when both variables were analyzed simultaneously. The highest ischemic heart disease mortality was concentrated among widowed and divorced unskilled workers, the differences between marital status and social class being most marked (3.3-fold) for men age 25-54. Divorced and widowed persons had a higher risk of sudden death than married persons. Other than divorced persons, less educated persons in either blue-collar or white-collar occupations had higher risks of dying from ischemic heart disease than their more educated counterparts.

Koskenvuo, M., Kaprio, J., Romo, M., Langinvainio, H. 1981. Incidence and prognosis of ischaemic heart disease with respect to marital status and social class: a national record linkage study. *Journal of Epidemiology and Community Health* 35:192-196.

The relationship between social class and marital status and ischemic heart disease in men age 40-64 during 1972 in Finland were analyzed by linking death certificates and hospital records (7,499 cases and 3,136 deaths). Age-adjusted incidence, mortality, and survival rates for the first and third year were calculated by marital status and social class. The highest mortality rate was found among unskilled workers; the highest incidence was among widowers and those in lower professional classes, and the lowest survival rate was among divor-

ees, single persons, and unskilled workers. The ratio of mortality by marital status (1.77) was in part due to survival (ratio 1.44) and in part due to incidence (ratio 1.32). The ratio of mortality by social class (1.44) seemed to be due more to differences in incidence (ratio 1.36) than to differences in survival (ratio 1.18). The distribution of conventional risk factors of ischemic heart disease by marital status and social class seemed to explain only part of the mortality differences.

Kraus, J., Redford, R. J. 1975. Some ecological correlates of perinatal mortality in a metropolis. *Medical Journal of Australia* 2:16-18.

Geographical differences in perinatal mortality and select population characteristics were studied in the metropolitan areas of Sydney. The sample included 39 municipalities and shires. Perinatal mortality was higher in areas of high juvenile delinquency, low socioeducational status, high unemployment, and low home ownership. High birth rates were found in areas that tended to coincide with low socioeducational status, adult and juvenile crime, child neglect, crowding, and unemployment.

Kraus, J. F., Fife, D., Ramstein, K., Conroy, C., Cox, P. 1986. The relationship of family income to the incidence, external causes and outcomes of serious brain injury, San Diego County, California. *American Journal of Public Health* 76:1345-1347.

The relationship of SES to the incidence, external causes, and outcome of serious brain injury in a defined U.S. population was studied. Identification of subjects was made by examining records in acute-care hospitals, all coroner's records, all death certificates, nursing homes, and extended care facilities in San Diego and the major hospitals in adjoining cities. U.S. census data for 1980 were used to estimate the population size of San Diego, enumerate subgroups, and identify census tracts by median family income. Incidence rates of serious brain injury in 1981 was 44 per 100,000. Rates for persons in

low, middle, and high income tracts were 58, 40, and 37, respectively. Adjustment for age did not significantly change these rates. Overall, for all racial/ethnic groups except Hispanic, the rates declined with increased family income. Brain injuries from firearms and assaults were highest in the lowest income groups. There was no significant difference in the injury rate to motor vehicle occupants, but rates were higher for pedestrian and motorcycles in low compared to high. Type of emergency transport, time from injury to first contact, and probability of death were not related to income.

Kraus, J. F., Borhani, N. O., Franti, C. E. 1980. Socioeconomic status, ethnicity, and risk of coronary heart disease. *American Journal of Epidemiology* 111:407-414.

The authors undertook this study to determine whether the risk of coronary heart disease was related to SES for five major self-reported race/ethnic groups. SES was defined using occupation and education, a modified version of the Hollingshead Index. The prevalence of coronary heart disease event was 2.3 percent for men in the highest SES categories and 3.2 percent for men in the lowest categories. The proportion of men in the upper quartile of coronary heart disease risk increased with decreasing SES for all race/ethnic groups, except blacks for whom this proportion varied only slightly by SES. Blacks had the highest prevalence of hypertension, Hispanics the highest cholesterol levels, and the proportion of heavy smokers was highest among whites.

Kristiansen, C. M. 1985. Seat belt legislation and seat belt use: effects on differences related to sex, social class and smoking. *Accident Analysis and Prevention* 17:75-78.

The present study examined the association between general preventive health behavior and reported seat belt use, and the impact of legislation upon sex and social class differences in seat belt use. Respondents (n = 177) were categorized as High SES (nonmanual) or Low SES (manual) on the basis of information about occupation. Both SES groups reported signifi-



cant increases in frequency of seat belt use after legislation was enacted, suggesting that the legislation had been effective. Regression analysis showed that while SES, gender, and general preventive behavior were significant predictors of prelegislation seat belt use ( $p < .001$ ), only SES was a significant predictor of postlegislation seat belt use ( $p < .05$ ).

Kronenfeld, J. 1979. Access to dental care: a comparison of medicine/dentistry and the role of a regular source. *Medical Care* 17:1000-1011.

The purpose of this paper was to determine the relative importance of income and education as the explanatory variables in access to dental care as compared to medical care using a random sample of Rhode Island residents. SES was important in determining whether someone had a regular source of dental care. The gap between low and high income and education was 24 percent and 41 percent, respectively. As education and income increased, those who reported a regular source of dental care increased. Only 50 percent of the people in the poorest families had a regular source of dental care compared to 91.5 percent of the wealthiest. Of those with low education, 58.6 percent had a regular source compared to 82.9 percent in the highest education groups. The primary role of income was confirmed in a discriminant function analysis, which also found education, sex, race, and age to be significant predictors of dental care use. These five variables predicted 71 percent of those with a regular source and 61.5 percent without a regular source.

Kuller, L., Seltser, R. 1967. Cerebrovascular disease mortality in Maryland. *American Journal of Epidemiology* 86:442-450.

A multiple-cause tabulation of death certificates for 1960-1962 was conducted in Baltimore and several counties of Maryland to study cerebrovascular disease mortality. All death certificates of residents age 20 and over were reviewed. As expected, the proportion of cerebrovascular disease deaths increased with age. This percent was greater in blacks than in

whites and in females than males. Rates were higher for blacks than whites in both urban and rural areas. An attempt was made to analyze SES computed from census tract information. SES was defined by median rental value and adjustments were made for owner-occupied homes. Death rates were higher in low socioeconomic areas for all four race-sex groups, although differences were small compared to racial differences.

Lambert, C. A., Netherton, D. R., Finison, L. J., Hyde, J. N., Spaight, S. J. 1982. Risk factors and life style: a statewide health-interview survey. *New England Journal of Medicine* 306:1048-1051.

In 1980, the Division of Preventive Medicine of the Massachusetts Department of Public Health surveyed the health-related behaviors of 1,091 adults. Persons with higher educational attainment, and to a lesser extent those with higher incomes, reported less smoking and alcohol consumption, less overweight, and more exercise.

Lapidus, L., Bengtsson, C. 1986. Socioeconomic factors and physical activity in relationship to cardiovascular disease and death: a 12-year follow-up of participants in a population study of women in Gothenburg, Sweden. *British Heart Journal* 55:295-301.

A prospective cross-sectional study of 1,462 women aged 38, 46, 50, 54, and 60 was undertaken. Information about education, marital status, number of children, and SES was obtained by questionnaire. The women were divided into five SES groups according to Carlsson. Group I consisted of large-scale employers or officials of high or intermediate rank. Group II included groups two and three and was made up of small-scale employers and officials of low and intermediate rank. Group III (groups 4 and 5) was made up of skilled and semiskilled workers. After controlling for six risk factors and (SES, education level, smoking, blood pressure, obesity, cholesterol), physical activity was found to be independently

correlated with stroke in women. A significant negative correlation between physical activity at work and physical activity was shown ( $p < .05$ ). Myocardial infarction was associated with SES when classified by husband's occupation. Multivariate analysis showed that low education levels among women were significantly associated with angina pectoris, after adjustment for confounding variables.

Leaf, P. J., Livingston, M. M., Tischler, G. L., Weissman, M. M., Holzer, C. E., Myers, J. K. 1985. Contact with health professionals for the treatment of psychiatric and emotional problems. *Medical Care* 23:1322-1337.

This study focuses on the predisposing, enabling, and need factors affecting contact with health professionals for the treatment of psychiatric and emotional problems during a six-month period. Data are from 5,934 community interviews from a 13-town area of New Haven. Race emerges as a significant factor in utilization once level of symptomatology is taken into account. Whites are more likely to report some mental health-related contacts than nonwhites. Income is only associated with the use of services before controlling for other factors in the analysis not related to the number of contacts. Education emerges as a significant factor in utilization only after controlling for clinical and other factors. The authors believe that these results indicate that lack of awareness concerning the nature of psychiatric disorders as well as low receptivity to mental health professionals exert a greater barrier to obtaining treatment than does income.

Lebowitz, M. D. 1982. Multivariate analysis of smoking and other risk factors for obstructive lung diseases and related symptoms. *Journal of Chronic Disease* 35:751-758.

A longitudinal study in a community population sample of approximately 3,600 white, non-Mexican American adults, stratified on SES and age were selected. The relationship of risk factors and respiratory symptoms were studied. Information regarding education and income were obtained by

questionnaire. In a linear discriminant analysis, among males age 18 and older, income and education, alcohol consumption, and occupation exposure all contributed to the classification of diagnosis, symptoms, and lung function.

Leren, P., Helgeland, A., Hjermmann, I., Holme, I. 1983. The Oslo Study: CHD risk factors, socioeconomic influences, and intervention. *American Heart Journal* 106:1200-1206.

Social class was defined by gross income and years of education (1 being the highest and 5 the lowest). Coronary heart disease risk was approximately 2.5 times greater in class 5 than in class 1. Total mortality increased sharply with decreasing social status, even for those subjects who were initially healthy. Mortality from cancer, accidents, and homicides followed the same pattern. Men employed in industrial jobs were at higher risk for coronary heart disease, compared to those in occupations requiring more education. Those with lower education levels also smoked more cigarettes and had higher cholesterol levels.

Lerner, M. 1986. Cancer mortality differentials by income, Baltimore, 1949-51 to 1979-81. In *Cancer in the economically disadvantaged*. New York: American Cancer Society.

The association between income and cancer mortality and secular trends in this association were compared in Baltimore for the period 1949-1951 to 1979-1981. There was a relative narrowing of the mortality differentials for low and high income over this time period for most major sites except female breast cancer. Greatest differentials in the last time period were seen for cancer of the cervix uteri, stomach, ovary and Fallopian tube, respiratory system, and corpus uteri. The overall income gradient was seen, separately, for whites and nonwhites. Race exerted an effect independent of income only among the low income population.

\_\_\_\_\_, Stutz, R. N. 1978. Mortality by socioeconomic status 1959-62 and 1969-71. *Maryland State Medical Journal* 27(12):35-43.

This paper presents mortality data for Maryland for 1959-1961 and 1969-1971 from the Maryland Center for Health Statistics. Counties and State Economic areas are the units of analysis. The analysis examines whether socioeconomic differentials in total and cause-specific mortality changed during the decade of the 1960s. The authors concluded that some evidence exists to indicate that SES differentials in mortality are narrowing. Between 1959 and 1964, service programs narrowed existing socioeconomic differentials in mortality as well as in other aspects of health status.

Levin, D. L., Connelly, R. R., Devesa, S. S. 1981. Demographic characteristics of cancer of the pancreas: mortality, incidence and survival. *Cancer* 47:1456-1468.

Information on 9,668 patients with pancreatic cancer diagnosed during 1973-77 was obtained from a population-based cancer registry in five states and five metropolitan areas covered by SEER. Sex and age-specific incidence rates for pancreatic cancer were calculated. No significant association with either income or education was found among men of either race or among black females. Nonsignificant trends were suggested in the lower income groups of each race among men. Incidence rates among white females were significantly associated with both socioeconomic variables. Age and area adjusted rates were about 30 percent higher among blacks compared with whites of each sex. Blacks continued to have an excess risk for pancreatic cancer within comparable levels of income and education, although in some instances these differences were not statistically significant. Adjustment for income reduced the difference somewhat in men. Only small, not statistically significant, differences in pancreatic cancer incidence rates among urban and rural residents were found in the data analysis.

Lilienfeld, A. M. 1971. Variation in mortality from heart disease. Race, sex, and socioeconomic status. *Public Health Reports* 1956:545-552.

Using information on certified deaths in Baltimore during the period 1949-1951, mortality from various types of heart disease was analyzed by race, sex, and socioeconomic status. No significant differences in arteriosclerotic heart disease were noted in the rates for five socioeconomic groups. For both sexes and both races, the highest rates were noted in the lowest socioeconomic group, with a gradual decrease in rates as socioeconomic status increased. This risk distribution is similar to that observed in England and Wales. The lowest socioeconomic group had the highest rates of hypertensive disease, and there tended to be a decrease in rates with an increase in socioeconomic status, although the pattern was not regular. The female rates were higher than the male rates in the lower socioeconomic groups, whereas the reverse was true in the upper groups. This was observed for both races. The use of death certificate information for analysis of mortality and the use of census tracts for socioeconomic classification both impose certain limitations on the data derived. Nonetheless, the apparent existence of differences in the social distribution of coronary disease deaths in two geographic areas indicates a need for further study of the subject.

Lines, D. R. 1977. An Auckland high school health survey. *Australia and New Zealand Journal of Medicine* 7:143-147.

To assess the relevance of racial and socioeconomic factors on teenager health, clinical examinations were performed on students in a New Zealand school. Social class was determined on the basis of parental occupation as defined by the Elley-Irving Socio-Economic Index. Only one third of the children were considered completely healthy, and even when the cases of scabies, impetigo, and visual defects were ignored, only 50 percent were considered healthy. The four racial groups (Europeans, Maori, Pacific Islanders, and Asians) were predominantly from SES classes 4 and 5. Health patterns were not significantly different between racial groups with the exception of a high rate of skin infections among Maori and Pacific Islanders. Dental caries were more common in Maori. The author concluded that socioeconomic conditions, not differences

in susceptibility to disease, were responsible for the poor health conditions.

Lipworth, L., Abelin, T., Connelly, R. R. 1970. Socioeconomic factors in the prognosis of cancer patients. *Journal of Chronic Diseases* 23:105-116.

The role of socioeconomic factors in observed differences in the cancer survival of patients from Connecticut and Massachusetts was examined utilizing data from the state cancer registries. The differences observed were consistent with the greater concentration of low income patients in the Massachusetts registry. To examine the issue in more detail, survival data was examined for patients from low and high income census tracts in Boston. There was evidence of a trend toward better survival associated with higher income.

Lloyd, O. L., Smith, G., Lloyd, M. M., Holland, Y., Gailey, F. 1985. Raised mortality from lung cancer and high sex ratios of birth associated with industrial pollution. *British Journal of Industrial Medicine* 42:475-480.

Geographical and temporal associations were shown between high mortality from lung cancer and a high sex ratio of births both in the town of Bathgate (Scotland) and in the area of that town that was most exposed to polluted air from a local steel foundry. These findings constituted a replication of a similar association in an adjacent town.

Lyng, E., Jeune, B. 1983. Excess mortality among male unskilled and semi-skilled workers. *Scandinavian Journal of Social Medicine*, 11:37-40.

All-cause mortality and its relationship with age for skilled and unskilled workers in Denmark, Norway, England, and Wales was examined. Compared to all employed men, there was a 40-50 percent higher risk of total mortality between ages 30 to 40 for unemployed men. The rise decreased with age. Deaths due to accidents and violence were higher among

lower SES men at younger ages. The same effect was seen for natural causes of death as well. The age-related decline in excess mortality among lower SES workers was due partly to the fact that sick and disabled unskilled and semiskilled workers leave the market earlier than similarly disadvantaged persons from other social groups.

Mack, T. M., Paganini-Hill, A. 1981. Epidemiology of pancreas cancer in Los Angeles. *Cancer* 47:1474-1483.

Information describing the characteristics of diagnosed cases of carcinoma of the pancreas for 1972-1977 was obtained using the Cancer Surveillance Program data. Medical records were abstracted for demographic data. Social class was not determined individually but on the basis of a geographic index determined by census tract of residence. An index from 1 (high) to 5 was assigned based on average education level and family income level (Hollingshead Index). Overall, an inverse association between social class and pancreatic cancer was present in men and women. There was a high rate in the lowest social class category for both sexes. This association was strongest in men, at older ages, and for confirmed cases. The high risk among both whites and blacks of low social class suggested that some attribute of poverty contributes to mortality.

MacMahon, B., Johnson, S., Pugh, T. F. 1963. Relation of suicide rates to social conditions: evidence from U.S. Vital Statistics. *Public Health Reports* (Washington) 78:285-293.

This article reviews evidence from United States vital statistics on factors associated with suicide rates during 1948-1952. Differences by sex, age, race and employment status are examined as are secular trends during the depression of the 1930s. Suicide rates were higher during the 1930s, and higher rates are also reported among unemployed people compared to employed people for the years 1930-1960. In contrast, nonwhites have lower suicide rates than whites at almost all ages and for both sexes.

Marcus, A. C., Reeder, L. G., Jordan, L. A., Seeman, T. E. 1980. Monitoring health status, access to health care, and compliance behavior in a large urban community. *Medical Care* 18:253-265.

This article summarized the results from two health surveys conducted in Los Angeles County in 1974 and 1977. The original objective of this analysis was to identify aggregate changes in the health status of this population, in access as measured by the use/disability ratio, and in self-reported compliance with medical regimens. The investigators found evidence of improved access relative to disability, and a corresponding reduction in the traditional income differential. Analysis of self-reported compliance showed little change over time, with Anglos and the middle and upper socioeconomic groups reporting less compliance with their doctors' recommendations.

Mare, R. D. 1982. Socioeconomic effects on child mortality in the United States. *American Journal of Public Health* 72:539-547.

This paper reported the analysis of socioeconomic differentials in mortality among persons under age 20 in the United States. Data from the Current Population Survey (CPS) were used. CPS contained mothers' accounts of the survival of their children. Child mortality estimates specific to education attainment of mothers and income of the family were compared to those observed for adults in the 1960 Matched Records Study. For most age-race-sex groups, the percent of children dead differed substantially by mother's education. Among white boys of dropout mothers, 3.36 percent had died by age 10-14, in contrast to 1.94 percent of mothers with more education. Advantages to children of mothers with better education occurred at every age for white and black boys, but the difference was minimal for black girls. Mortality differences by family income were similar to those for maternal schooling. An inverse association between accidental death

and SES accounted for a large proportion of the SES differences in total mortality among children.

Markides, K. S., Barnes, D. 1977. A methodological note on the relationship between infant mortality and socioeconomic status with evidence from San Antonio, Texas. *Social Biology* 24(1):38-44.

Total, neonatal, and postneonatal infant mortality rates were calculated for four SES groups (High, Med-high, Med-low, and Low) in 115 census tracts for San Antonio, Texas, for the years 1970-74. Indices used to define SES were income, education, and occupation. Infant death rates for groups of census tracts delineated by each of these indices separately demonstrated that all three rates were most sensitive to income differentials. The data indicated a strong relationship between SES and total infant mortality and an even stronger one between SES and postneonatal mortality. The postneonatal rate went from 2.3 to 6.3 as SES decreased (combined scores). Because of the large number of Mexican Americans, the proportion of persons with Spanish surnames or language for the four SES groups was calculated. This proportion rose from 16.9 percent in high SES to 92.6 percent in low SES. However, when Non-Anglo and Anglo rates were compared, the differences were small.

Markowe, H. L. J., Marmot, M. G., Shipley, M. J., Bulpitt, C. J., Meade, T. W., Stirling, Y., Vickers, M. V., Semmence, A. 1985. Fibrinogen: a possible link between social class and coronary heart disease. *British Medicine* 291:1312-1314.

Mortality in England and Wales for civil servants in lowest grade of employment was found to be three times higher than for men in the highest grade. Seventy-five of 1,274 civil servants age 34-54 were stratified by grade of employment and whether they smoked. Questionnaires and physical exams were completed. There was a statistically significant difference in plasma fibrinogen concentrations between men in lower grades (n=29) and those in higher grades (n=45). The

means were 3.39 and 2.95, respectively ( $p < 0.01$ ). There was an independent association for fibrinogen concentration and cigarette smoke ( $p < 0.05$ ) and grade of employment ( $p < 0.05$ ). A summary measure of job stress was significantly related to fibrinogen concentration ( $p < 0.01$ ). Physical activity and behavior type was not related to fibrinogen concentration.

Marmot, M. G. 1986. Social inequalities in mortality: the social environment. In Wilkinson, R. G., ed. *Class and health—research and longitudinal data*, pp. 21–33. London: Tavistock Publications.

This paper addressed two questions: (1) Are the general social class differences in mortality more likely to have a general explanation or to be the results of the combined effect of a number of specific factors? (2) What role might psychosocial factors play in causing social differences in mortality?

Data from the British Civil Servants study (see reference below, Marmot 1978) is presented along with other data examining childhood and adult differences in physical stature, health, and behavioral risk factors. The author concludes that there is urgent need to take action on social class differences in established risk factors, such as smoking.

—, Adelstein, A. M., Robinson, N., Rose, G. A. 1978. Changing social-class distribution of heart disease. *British Medical Journal* 2:1109–1112.

The purpose of this study was to describe whether and why there had been a change in the social-class distribution of heart disease in England and Wales. The most recent data (1970–1972) on mortality for the different classes showed people in the higher social classes had lower mortality than the working classes. Death rates were taken from the Registrar General's Decennial Supplement which reported SES by occupational status. Mortality from heart disease in 1931 was higher for classes I and II than for IV and V in age groups 55–65 and 45–54. In each age group, mortality increased over time, and this

increase was most rapid in groups IV and V. By 1961, in each age group, male mortality was higher in IV and V than I and II; this was not the case for women. From 1931–1971, women in IV and V had the highest mortality. The authors thought that changes in diet, smoking, or intake of refined carbohydrates or cereal fiber contributed to the changing SES-CHD association.

Marmot, M. G., Rose, G., Shipley, M., Hamilton, P. J. S. 1978. Employment grade and coronary heart disease in British civil servants. *Journal of Epidemiology and Community Health* 32:244–249.

This paper reported the coronary heart disease mortality in 7½ years of follow-up for employed men in different grades. Analysis of the association between employment grade and coronary heart disease was confined to 17,530 men from England and Wales. Data were collected by questionnaires. Within each age group, there was an inverse association between grade of employment and risk of coronary heart disease. Overall, men in the lowest grade had 3.6 times the coronary heart disease mortality rate of the men in the highest grade. To understand this association, the age-adjusted risk factor distribution was studied. Systolic blood pressure showed a negative association with grade, while the association with plasma cholesterol was positive. The proportion of smokers was two times greater in the low grade. There was a positive association between grade and height, while those in the lower grades were heavier.

Marmot, M. G., Shipley, M. J., Rose, G. 1984. Inequalities in death-specific explanations of a general pattern? *Lancet* I:1003–1006.

The relationship between employment grade and 10-year mortality was studied in 17,500 civil servants as part of the Whitehall Study. There was a steep inverse relation between grade and risk of death from coronary heart disease, from a number of other causes, and from all causes combined. All



though smoking and other coronary risk factors are more common in the lower grades, these differences accounted for only a part of the increased risk associated with lower employment grade.

Marmot, M. G., McDowall, M. E. 1986. Mortality decline and widening social inequalities. *Lancet* II:274-276.

Mortality from coronary heart disease (CHD) is higher in manual than in nonmanual occupational classes. Trends in these inequalities were examined in the light of the decline in CHD mortality in Great Britain. Mortality from all causes, coronary heart disease, cerebrovascular disease, and lung cancer were compared. A standardized mortality ratio was used, referenced to the 1979 population. Despite the general fall in mortality, the relative disadvantage of manual compared with nonmanual classes has increased between 1970-1979 for each of these causes. Among men, in every region of Great Britain, CHD mortality has declined in nonmanual classes. Among women, lung cancer and CHD mortality has fallen in nonmanual classes but has increased in manual classes. Differences in smoking between social classes are likely to be important, but the effect of unemployment and increased income differentials should also be explored.

Mathews, J. D. 1976. Alcohol usage as a possible explanation for socio-economic and occupational differentials in mortality from hypertension and coronary heart disease in England and Wales. *Alcohol, Hypertension and Coronary Disease* 6:393-397.

Using 1951 occupational mortality data for men aged 20-64 from England and Wales, standard mortality ratios for hypertension, vascular lesions of the nervous system, coronary heart disease, and cirrhosis were analyzed. SES was defined by the Registrar General's Classification. Socioeconomic groups with high standard mortality ratios for cirrhosis tended to have high standard mortality ratios for hypertension, vascular lesions, and coronary heart disease. As a single predictor variable, the standard mortality ratio for cirrhosis

accounted for 65-69 percent of the variance in the standard mortality ratio for hypertension, stroke, and coronary heart disease. Lung cancer accounted for 17-22 percent of the variance. The occupations that had the greatest risk for cirrhosis represented individuals from all social classes.

McCarthy, P., Byrne, D., Harrison, S., Keithley, J. 1985. Respiratory conditions: effect of housing and other factors. *Journal of Epidemiology and Community Health* 39:15-19.

This survey examined the hypothesis that poor health is related to poor housing. Occupants of the local authority accommodations in a metropolitan district of England were interviewed. Information regarding several facets of health and illness were ascertained. The present summary involved 533 adults below retirement age. Analyses indicated that housing area, smoking, and an unhealthy environment were predictors of poor health. When age, housing type, cigarette smoke, and work experience were held constant, people who lived in areas where poor housing predominated reported more respiratory conditions than those who lived in "good" areas.

McCormick, M. C. 1985. The contribution of low birth weight to infant mortality and childhood morbidity. *New England Journal of Medicine* 312:82-90.

Evidence was reviewed on the contribution of low birth weight to infant mortality and childhood morbidity. In the neonatal period, the proportion of low birthweight infants, particularly very low weight, was a strong predictor of mortality rates. Differential prevalence of low birthweight infants may account for the higher rates of infant mortality observed in economically disadvantaged groups.

McMichael, A. J., Hartshorne, J. M. 1982. Mortality risks in Australian men by occupational groups, 1968-1978: variations associated with differences in drinking and smoking habits. *Medical Journal of Australia* 1:253-256.

Analysis of patterns of male mortality in Australia during 1968-78 showed elevated death rates from liver cirrhosis, alcoholism, and alcoholic psychosis in various occupations. The risks of mortality from lung cancer and cancers of the upper alimentary tract and larynx were raised in service and blue-collar groups. In contrast, the risk of mortality from cancer of the colon, thought to be influenced by dietary "affluence," were higher in professional and white collar groups. As reported in other populations, stomach cancer mortality risk was higher for service and blue-collar groups. The risks of mortality from coronary heart disease and cerebrovascular disease were also higher for these two groups.

McWhirter, W. R., Smith, H., McWhirter, K. M. 1983. Social class as a prognostic variable in acute lymphoblastic leukemia. *Medical Journal of Australia* 2:319-321.

This study presented some of the characteristics thought to affect the prognosis of childhood acute lymphoblastic leukemia. Seventy children under the age of 15 and residents of Queensland who were diagnosed with the disease between 1975-1979 were enrolled in the study. Follow-up ranged from 31 to 88 months. There were differences in survival between the two groups. Children from upper class families (Group 1) did significantly better than those from lower class families (Group 2) ( $p=0.039$ ). Group 1 children had a 5-year survival rate that was twice that of Group 2. Median duration of disease remission was 48 months for Group 1 and 17 months for Group 2 ( $p=0.048$ ). There was no detectable difference between treatment given the two groups. Although differences in white cell count, platelet count, and spleen size were not statistically significant, differences in each of these parameters indicate that the disease was more advanced in children of low SES.

Metropolitan Life Insurance Company. Socioeconomic mortality differentials by leading causes of death. 1977. *Metropolitan Life Insurance Company Statistical Bulletin* 58(Jan):5-8.

Mortality by specific causes of death was related to socioeco-

nomic variables such as occupation, education, and income. An examination of the ratios of death rates in each occupation class to the death rates for all classes combined indicated an inverse relationship between socioeconomic status. The ratios at the lowest level (Class V) were 1.5 to 2 times greater than they were at the highest level for all ages and all causes of death combined. The ratio of mortality in the lowest salaried group to mortality for the middle and highest groups ranges from 1.1 for heart disease to 1.8 for suicide. For both males and females, those with eight years of education or less had a higher mortality than those with more education for every cause except diabetes, coronary heart disease, and cirrhosis of the liver for men, and breast cancer, cirrhosis of the liver, and accidents for women.

Mettlin, C., Cummings, M. K., Walsh, D. 1985. Risk factors and behavioral correlates of willingness to participate in cancer prevention trials. *Nutrition and Cancer* 7:189-198.

This paper assessed the interest of individuals in participating in cancer prevention research that would involve making changes in diet or regularly taking medications, such as vitamin supplements. The eligible population consisted of a 33 percent random sample of persons seen at the Prevention-Detection Center at Roswell Park Memorial Institute between May 1979 and December 1982 (N=556). Respondents who expressed the greatest interest in participating in research involving changes in eating habits or taking vitamin supplements to prevent cancer were younger, more likely to have at least a high school education, and to have come from a family that had an average annual income above \$16,000.

Milio, N. 1985. Health policy and the emerging tobacco reality. *Social Science and Medicine* 21:603-613.

This paper outlined the changing reality of tobacco use and production, emphasizing the economic picture. Policy implications were suggested. Economic data revealed that the tobacco sector of affluent nations has been declining at an accel-

erated rate. At the same time, the tobacco economy has been growing in less industrialized nations. Economic strategy was suggested for dealing with these changes.

Millar, W. J., Wigle, D. T. 1986. Socioeconomic disparities in risk factors for cardiovascular disease. *Canadian Medical Association Journal* 134:127-132.

This paper examined the prevalence of risk factors (smoke, blood pressure, obesity, alcohol consumption, diabetes, cholesterol, physical activity) associated with coronary heart disease by SES in Canadian adults to determine preventive health promotion programs. Among men age 20-69, the largest differences in risk factor prevalence between education groups were found for smoking, obesity, physical inactivity, and excessive alcohol consumption. For women in the same age group, the largest differences were found for smoking, overweight, obesity, increased blood pressure, and physical inactivity. The prevalence of risk factors in the lowest education group tended to be higher than those in the highest education groups. Women with elementary education were least likely to use oral contraceptives. The decline in smoking prevalence among women was greatest for university educated.

Millard, A. V. 1985. Child mortality and economic variation among rural Mexican households. *Social Science and Medicine* 20:589-599.

Two rural Mexican communities were compared and child mortality rates were examined. Although the two communities differ with respect to ethnicity, ecology, history, family economic strategy, and agricultural systems, two economic measures emerged as important correlates of child mortality rates in both communities: a woman's marital status at the time of the interview and housing quality. The correlation of the rate of child mortality per woman with economic factors ranged from -.25 to -.54 and accounted for up to 30 percent of the variation in children's mortality. A high rate of child mortality could impoverish a household by diminishing the family

agricultural work force. Other studies have not found a similar relationship because they have not used culturally appropriate research designs and field techniques.

Miller, A. B. 1982. Risk factors from geographical epidemiology for gastrointestinal cancer. *Cancer* 50:2533-2540.

This article reviews the associations between various cancer sites and race, nationality, migration, and socioeconomic status (SES). The latter association is summarized here. SES is inversely associated with colon and rectal cancer in several studies in the United States. Finnish studies have reported similar associations between SES and a number of cancer sites, while Norwegian records suggest higher cancer incidence and mortality among urban compared to rural residents for most sites. United States urban-rural comparisons were similar for colon and rectal cancer. Migrants from urban to rural areas show a reversal in this latter association.

Miller, D. R. 1982. Editor's column: prognostic factors in childhood leukemia. *Journal of Pediatrics* 87:672-676.

This editorial contained no original contributions with respect to the factors affecting the prognosis of leukemia in children. It did make the following comments with regard to other studies on this subject: "The incidence of acute lymphoblastic leukemia in white and nonwhite children is similar, and the differences in mortality are likely to be related to SES and the availability of medical care rather than ethnic or racial factors. The remission rate and median duration of remission and survival are much lower in black children than in white children, and it has been suggested that black children be studied separately."

Miller, W. J., Jr., Cooper, R. 1982. Rising lung cancer death rates among black men: the importance of occupation and social class. *Journal of the National Medical Association* 74:253-258.

Thirty years ago the age-adjusted cancer mortality rate for black men was about 20 percent lower than for whites in the United States. This difference was thought to be due to underreporting and to poorer medical care. In the last three decades, death rates among black men have risen sharply. Most of the increase was due to an increase in lung cancer among blacks. From 1950-1977, nonwhite males experienced a 320 percent increase, compared to a 161 percent for whites. This may be explained by increased smoking patterns, occupational exposure, or migration patterns.

Monson, R. R. 1980. Cause of death in Boston. *Journal of Chronic Diseases* 33:21-28.

The purpose of this paper was to report an evaluation of the relationship between cause of death and ethnicity, occupation, and residence. Death certificates for Boston residents who died in 1970 were reviewed. There were deficits of deaths from motor vehicle accidents and suicide. Slight to moderate excesses of specific causes of death were seen for specific ethnic, occupational, and residence groups. An analysis of observed to expected deaths by occupation showed little variation within each sex for the major categories of deaths. Cancer of the buccal cavity and pharynx and esophagus was lowest among male workers in professional/managerial and clerical/sales groups. In contrast, pancreatic cancer was higher in service machining and bench-pressing groups and structural/miscellaneous groups. Suicide was markedly higher in the professional/managerial group.

Morgan, M., Chinn, S. 1983. ACORN group, social class, and child health. *Journal of Epidemiology and Community Health* 37:196-203.

This study compared the extent to which ACORN and social class groups identify differences in rates of morbidity and service use based on data collected in a longitudinal study based on children age 5-11 attending designated primary school in England and Scotland. Occupation of the father was recorded

on a sample of 5,500 children. ACORN differentiated at least as well as social class on selected measures of children's health. It was also found to be valuable in identifying small areas with particularly high rates of morbidity. Two questions remained: Can ACORN identify variation in health outcomes that are independent of regional variation? Does it produce consistent ranking of health outcomes among different age groups, sexes, and regions of the country?

Morgenstern, H. 1980. The changing association between social status and coronary heart disease in a rural population. *Social Science and Medicine* 14a:191-201.

This analysis of the Evans County Heart Study was designed to test the hypothesis that changing social status was related to health outcomes. Mortality comparisons were made for 1960-67 and 1967-74, correcting for length of follow-up. The data indicated that high social class males were more likely to develop coronary heart disease before 1960 and low social class males were more likely to develop the disease after the mid-1960s.

Morris, J. N. 1979. Social inequalities undiminished. *Lancet* 1:87-90.

Information regarding social inequality from Registrar General's "social class" and "socioeconomic group" were based on occupation. Social class (skills and status in the community) and "socioeconomic group" (SEG) encompassed lifestyles. Postneonatal mortality rates increased uniformly between class I and IV and rose by as much again in V. Neonatal mortality in England and Wales for 1975-1976 ranged from 7.4 to 14.4 with gradient effect. Post neonatal mortality had an inverse relationship to SEG (range: 2.8 to 8.6). Using the highest qualification attained by SEG showed a gradient effect. Those in low SEG consumed more refined carbohydrates and sugar and less brown bread and fruit. Men of lower SEG smoked more cigarettes, 29, 42, 47, 49, 55 percent respectively. The amount of active participation in leisure-time

sports was greater for professional (37 percent) than unskilled (8 percent), and a gradient effect was present. The all-cause standard mortality ratio for working men in 1970-1972 was 77, 81, 99, 106, 114, and 137. Coronary heart disease standard mortality ratio for the same period ranged from 88 to 111. Mortality rates for bronchitis, pneumonia, lung and stomach cancer, cerebrovascular disease, peptic ulcers, and motor vehicle accidents showed a I-V gradient, but the gradient was reversed for leukemias and malignancies of lymphoma.

—, Heady, J. A. 1955. Social and biological factors in infant mortality. V. Mortality in relation to father's occupation, 1911-1950. *Lancet* 1:554-560.

This paper is a historical study of the mortality of children of men in different occupations. Reports of the General Register Office relating to the censuses of 1911, 1921, and 1931 are used, together with data for 1939 collected for the project census of 1941. Infant mortality rates are shown to vary significantly with the occupation of the father. The postneonatal rate is more sensitive to the father's occupation than the neonatal rate. There is reported a continuous decline in infant mortality for all occupational classifications. However, the differences remain fairly constant, such that mortality among children of miners and textile workers remains highest compared to mortality among children of professional workers and teachers. There has been no narrowing of the social gap in infant mortality; if anything, it may have widened slightly.

Moser, K. A., Fox, A. J., Jones, D. R. 1984. Unemployment and mortality in the OPCS longitudinal study. *Lancet* 2:1324-1329.

This paper examined the relationship between SES and unemployment using mortality data for 1971-1981. Controlling for the distribution of unemployed men and looking at the mortality for women married to unemployed men, this relationship was studied. Social class was defined by the man's most recent job. Men "seeking work" in 1971 had a standard

mortality ratio of 136 over the next 10 years. Some of the excess can be explained by more unemployment in classes IV and V, but a 20 to 30 percent excess remained after controlling for SES. Cancer and suicide had significantly raised levels of mortality. Among women of unemployed husbands, the standard mortality ratio was 120, which remained unchanged after controlling for the tenured distribution. Some of the excess mortality may be explained by SES and some may be explained by possible ill health that leads to unemployment.

Murrells, T. J., Catford, J. C., Smith, T. M. F., Machin, D. 1985. The use of logit models to investigate social and biological factors in infant mortality. II. Stillbirths. *Statistics in Medicine* 4:189-200.

This paper examined the stillbirth data for 1945-1950 and 1975 by formally incorporating the year of data collection into a statistical model enabling changes in the age, parity, and social class effect and time to be investigated. The mother's social class was determined by her husband's occupation. In both time periods, there was a high stillbirth rate among the less privileged social classes (IV and V). Maternal age and parity explained more of this variation in 1949 than 1975, but SES explained more in 1975 (Chi Squared increased from 8 to 33). The odds ratio for class times time effect showed that the odds of stillbirth in social class I against V have increased by a factor of 1.32 between 1950 and 1975. The combined effect of age, parity, and social class was also important in explaining the variation. In sum, the social class gradient has widened for stillbirths.

Nagi, M. H., Stockwell, E. G. 1973. Socioeconomic differentials in mortality by cause of death. *Health Services Reports* 88:449-456.

This study described the relationship between SES and mortality for nine leading causes of death. The approach examined variations that had been differentiated according to an index of SES. Using official 1960 census statistics, the following

scores were used to define each census tract: the number of employed persons who were working at blue-collar occupations; the number of persons age 25 and over who had completed less than eight years of school, and the number of families with annual incomes less than \$3,000. In the areas with the highest SES, observed deaths were generally fewer than the expected, but for cancer and respiratory diseases, the differences were not large. In the lowest SES areas, the observed deaths from several causes (with the single exception of the genito-urinary diseases) were much higher than the expected. Areas 2 and 3 fell in between these two extremes with area 2 (being more affluent) showing fewer differences than 3. Thus, the general pattern revealed a pronounced inverse relationship between SES and mortality from nine causes of death. The strongest association was for infectious and parasitic diseases.

Nandakumar, A., Armstrong, B. K., de Klerk, N. H. 1986. Multiple myeloma in western Australia: a case-control study in relation to occupation, father's occupation, socioeconomic status and country of birth. *International Journal of Cancer* 37:223-226.

This study investigated multiple myelomas in relationship to father's occupation by means of a death certificate-based case-control study. Cases were identified through a cancer registry and controls were selected from death registrations. There was an increased mortality among those where fathers were woodworkers (crude odds ratio was 1.5, CI=0.87-2.87). The odds ratio did not change when adjustments for SES or place of birth were made. There was no increase in the odds ratio with increasing SES (from Group III to Group I). An elevated odds ratio in rural residents was independent of the association of multiple myeloma and farming and suggested that bias created by matching on death certificate may be operating.

National Center of Health Statistics. 1986. Current estimates from the National Health Interview Survey, United States, 1983. *Vital and Health Statistics*. Series 10, No. 154. D.H.H.S.

1983. Pub. N. (PHS) 86-1582. Public Health Service. Washington, D.C.: G.P.O.

———. 1985. Health characteristics according to family and personal income, United States. *Vital and Health Statistics*. Series 10, No. 147. D.H.H.S. Pub. N. (PHS) 85-1575. Public Health Service. Washington, D.C.: G.P.O.

———. 1986. Types of injuries and impairments due to injuries, United States. *Vital and Health Statistics*. Series 10, No. 159. D.H.H.S. Pub. No. (PHS) 87-1587. Public Health Service. Washington, D.C.: G.P.O.

———. 1986. Disability days, United States, 1983. *Vital and Health Statistics*. Series 10, No. 158. D.H.H.S. Pub. No. (PHS) 87-1586. Public Health Service. Washington, D.C.: G.P.O.

Nayha, S. 1977. Social group and mortality in Finland. *British Journal of Preventive Social Medicine* 31:231-237.

Social class was based on occupation of respondents at the time of census. Those no longer working were classified by their former occupation or by supporter's occupation. Mortality rates for the various social groups for the population of Finland were compared using 179,919 death certificates for 1969-72. Age adjustment by sex and cause of death revealed that mortality rates from all causes are generally lowest in the high social group (I) and increase up to the IV and fall again for the V. Farmers were generally on the better side of average. Difference between groups IV and I was greatest for men with respect to pulmonary tuberculosis, respiratory disease, drowning, and suicide. For women these differences were small. Cancer of the breast and intestine and suicide are lowest for women. Lifestable analysis showed that the difference in life expectancy at birth between IV and I is 7.2 and at age 55



the difference is 2.1. These findings are similar to those of other researchers.

Newton, R. W., Hunt, L. P. 1984. Psychosocial stress in pregnancy and its relation to low birthweight. *British Medical Journal* 288:1191-1194.

A prospective study designed to examine the relationship of low birthweight to psychosocial stress was undertaken in Great Britain. The number, nature, and subjective effect of any life event was recorded, the pregnancy outcome defined, and the contribution of cigarette smoking and social class was considered for 224 women. Social class was defined by the Registrar General's Classification. No significant difference was found in the social class distribution between the study group and a random selection of 300 women delivering at the hospital over the same period. There were significantly more smokers among single women in class IV and V than those in class I and II. Seventy percent of the women who gave birth to babies that were small for gestational age had experienced an objective major life event during pregnancy, but this was not statistically significant ( $p \leq .08$ ).

Notkola, V., Punsar, S., Karvonen, M. J., Haapakoski, J. 1985. Socio-economic conditions in childhood and mortality and morbidity caused by coronary heart disease in adulthood in rural Finland. *Social Science and Medicine* 21:517-523.

The aim of this study was to determine whether there was a relationship between living conditions in childhood and subsequent development of coronary heart disease morbidity and mortality in adulthood. Additionally, the influence of risk factors such as smoke and cholesterol on this process was assessed. From 1959-1974, 823 men in Eastern Finland and 888 men in Western Finland were followed and their risk factors studied. SES in childhood was measured by father's occupation and by farm size. The relative risk of coronary death, myocardial infarction, and ischemic heart disease increased with decreasing social class. A partial explanation for this

finding was an increase in body weight and smoking habits among individuals in lower classes. On the other hand, the effects of cholesterol were negligible. Findings that relative risk of coronary heart disease events were increased for those of small height suggested that nutritional deficiency in childhood or some unknown hereditary or other factor was connected to coronary heart disease.

Nowotny, M., Stretton, P. J. 1979. The health of the preschool child. *Medical Journal of Australia* 7:289-291.

To assess the effectiveness of a standardized medical examination of 4- and 5-year-olds in Victoria, a random sample of 512 children from inner urban and disadvantaged outer urban preschools was compared with a group of 500 children from preschools in more advantaged areas. SES was composed of a cluster of variables that included occupation, type of housing, number of persons per household, education, religion, and shared accommodations. Children from disadvantaged areas had a higher incidence of previously unrecognized disabilities. Thirty-four percent of the disadvantaged group as compared to 17.6 percent of the advantaged group were referred for intervention. The prevalence of visual problems was almost identical in the two groups.

Oken, B., Hartz, A., Giefer, E., Rimm, A. A. 1977. Relation between socioeconomic status and obesity changes in 9,046 women. *Preventive Medicine* 6:447-453.

This was a study of weight reduction in 9,046 members of TOPS. A structured questionnaire was used to identify SES and obesity history. SES was measured by the educational level of the woman, husband's income, and family's total income. Unmarried students, retired women, and those with missing data were omitted. The obesity index used was height/weight. Initial analysis showed that as income or education increased, there was a decrease in the amount of weight gained. The association between obesity and SES could not be explained by the effect of income or education alone, since

each was statistically significant ( $p < 0.0001$ ) after adjustment for the other. This relationship was examined using analysis of covariance (ANCOVA); covariates included age and maximum teenage obesity. Estimate from ANCOVA for excess weight at the lowest education and income groups relative to the highest was 17.5 lbs., but when age was the only covariate in the model, this difference increased by 75 percent. Less than 2 percent of the variation in adult weight change during childbearing years was explained by SES. The authors concluded that SES was related to obesity primarily because of its effect on weight changes during childbearing years.

Ostfeld, A. M. 1973. Heart disease and stroke in an elderly welfare population. *Bulletin of the New York Academy of Medicine* 49:458-466.

The primary aim of this prospective study was to identify factors associated with the risk of stroke among elderly patients in Illinois. A stratified probability sample of 4,800 persons was selected from a population between 65 and 74 receiving old-age assistance. The prevalence of cerebrovascular disease and coronary heart disease per 1,000 was substantially different between the sexes and between blacks and whites. Of those invited to participate in the study, two thirds agreed. Interviewers found that many of the participants starved themselves before getting onto the welfare rolls. Additionally, good care was not being given to those with diabetes and/or hypertension. These are important risk factors in the development of stroke, and they need to be addressed in this population. The substantially higher incidence rate of stroke among blacks than whites may in part be due to the fact that blood pressure in blacks was higher than in whites.

Pamuck, E. R. 1985. Social class inequality in mortality from 1921 to 1972 in England and Wales. *Population Studies* 39:17-31.

Secular trends between 1921-1972 in the social class gradient for mortality in England and Wales were examined, and a

number of methodological problems in the interpretation of these trends were addressed. The evidence suggests that the gradient declined during the 1920s. These trends do not seem to be the result of numerator/denominator errors, changes in classification of occupations, or other factors.

Papiernik, E., Maine, D., Rush, D., Richard, A. 1985. Prenatal care and the prevention of preterm delivery. *International Journal of Gynaecology and Obstetrics* 23:427-433.

An innovative program of prenatal care at the Hospital Antoine Beclere in Clamart, France, was studied. The study population consisted of 11,000 women. At the first prenatal visit, all patients completed a questionnaire regarding education, SES, ethnicity, health, living conditions, and OB/GYN history. The group of women were stratified into two groups: one had early care, and less than one half had late care. The early care group had significantly lower rates of both early and preterm delivery. There were also significantly fewer low birthweight babies in this group and the relative risk was 3.6 ( $p < .0001$ ). Youth primigravidity, low SES, and history of preterm delivery were all associated with current preterm delivery. Women who came early for prenatal care were more advantaged. The low frequency of preexisting risk factors in the early care group did not account for the low rates of current preterm delivery. The advantage of early care persisted within strata by preexisting risk factors.

Pearce, N. E., Davis, P. B., Smith, A. H., Foster, F. H. 1983. Mortality and social class in New Zealand I: overall male mortality. *New Zealand Medical Journal* 96:281-285.

This paper concentrated on New Zealand males age 15-64 and documented social class differences in overall mortality using two different systems of social class classification (the British Registrar General's Classification and the Elley-Irving Classification). A 10 percent sample of the 1976 Census data was taken. Direct age-standardized mortality rates per 100,000 person-years were calculated for each social class. All

data were classified into five-year age groups, and Segi's world population was used as the standard. Tests for trend were performed using the Mantel-Hanzsel extension. Which-ever classification scheme was used, New Zealand data showed a genuinely higher mortality rate for low socioeconomic class as compared with the higher classes ( $p < 0.001$ ). The New Zealand experience parallels that of England and Wales, although the gradient was significantly nonlinear ( $p < 0.001$ )

———. 1983. Mortality and social class in New Zealand II: male mortality by major disease groupings. *New Zealand Medical Journal* 96:711-716.

This paper investigated social class patterns of mortality among New Zealand males age 15-64 for each major disease. SES was defined using the British Registrar General's Classification and Elley-Irving Classification. Denominator data were produced from a 10 percent sample of the 1976 New Zealand census population and dwellings, and numerator data from the National Health Statistic Centre. Coronary heart disease, neoplasms, accidents, poisonings, and violence together accounted for 74 percent of the overall mortality. All categories had at least some tendency for the lower social class to experience higher mortality rates than the upper social classes and the test for trend was statistically significant for each of the disease groupings except congenital anomalies. In general, disease groups with the strongest social class gradient contained the highest percent of excess deaths (i.e., 55 percent for accidents, poisonings and violence). Neoplasms and coronary heart disease had weaker (but still significant) social class gradients than diseases of respiratory, genito-urinary, digestive, metabolic, or mental disorders.

———. 1984. Mortality and social class in New Zealand III: male mortality by ethnic group. *New Zealand Medical Journal* 97:31-35.

Social class differences in male mortality in New Zealand

were investigated separately for Maori, Pacific-Island, and other New Zealand males age 15-64. All three groups displayed strong social class mortality gradient but, for each class, the Maori mortality rates were approximately 50 percent higher than the rates for the other category, while the Pacific-Island rates generally occupied an intermediate position. The Maori mortality rates were particularly high for respiratory, infectious, genito-urinary, endocrine, nutritional and metabolic disorders, and circulatory and other coronary heart and cardiovascular diseases—even after adjustment for age and social class factors. Overall, there were substantial social class and ethnic differences in mortality. About 20 percent of the Maori mortality excess was attributable to social class factors.

———. 1985. Social class, ethnic group, and male mortality in New Zealand, 1974-1978. *Journal of Epidemiology and Community Health* 39:9-14.

This paper examined social class differences in male mortality in New Zealand. Denominator data were produced from a 10 percent sample of 1976 New Zealand census statistics and the numerator from the National Health Centre records of deaths for 1974-1978. Direct age-standardized mortality rates per 100,000 person-years at risk were calculated for each social class and ethnic group. Smoking data were also included. SES was defined by the Registrar General's Classification. A test for trend confirmed that mortality was higher in lower social classes ( $p < .001$ ). The New Zealand gradient was nonlinear; high mortality for V but higher rate for I than II. Maori and non-Maori experienced a statistically significant social class gradient ( $p < .001$ ). Overall, there were 74 percent more Maori deaths than non-Maori (53 percent more than there would have been if the Maori had experienced the same mortality rate as non-Maori in each class and age group). Crude calculations suggest that smoking patterns explained much of the increased risk for classes III-IV but not the very high mortality for class V.

Phillips, R. A., Garfinkel, L., Kuzma, J. W., Beeson, W. L., Lotz, T., Brin, B. 1980. Mortality among California Seventh-Day Adventists for select cancer sites. *Journal of the National Cancer Institute* 65:1097-1107.

This study reported the differences of cancer risk among California Seventh-Day Adventists (SDA) compared with a demographically similar segment of the general population. The study consisted of 17 years of follow-up on 22,940 white SDA and 13 years of follow-up on 112,725 white non-SDA (NSDA). Both groups responded to the same four-page self-admission questionnaire in 1960. Mantel-Haenszel chi-squared produced age-adjusted, sex-specific mortality ratios for SDA vs. NSDA vs. U.S. population. Deaths were ascertained by periodic follow-up. SDA are more comparable to NSDA than to the general population in terms of education achievement and marital status. The SDA: NSDA mortality ratio remained significantly below 1.0 for smoke-related cancer and male and female colorectal cancer ( $p < .01$ ) and male leukemia ( $p < .05$ ) were below 1.0. When SDA were compared to a more socioeconomically similar population (NSDA), the risk difference of fatal cancer was reduced (except for those mentioned).

Pincus, T., Callahan, L. F. 1985. Formal education as a marker for increased mortality and morbidity in rheumatoid arthritis. *Journal of Chronic Diseases* 38:973-984.

Eighty-nine patients who had been referred to the Department of Orthopedic Surgery at Vanderbilt University between 1964-1973 were evaluated during 1973. In 1982, a retrospective analysis of 75 of the 89 was undertaken to study adult-onset rheumatoid arthritis. Higher mortality was associated with lower formal education. The mean formal education level of patients who died was 9.0 vs. 11.5 for those surviving nine years ( $p < .002$ ). Baseline measures were different in the survivors and nonsurvivors. Potential confounding variables were stratified in the analysis, but the association persisted. Mortality experience for the three education groups

was as follows: 79 percent of grade school, 43 percent of high school, and 20 percent of college educated subjects either died or decreased in functional capacity more than 50 percent over the nine-year period.

Pirkle, J. L., Schwartz, J., Landis, J. R., Harlan, W. R. 1985. The relationship between blood lead levels and blood pressure and its cardiovascular risk implications. *American Journal of Epidemiology* 121:246-258.

The relationship between blood pressure and blood lead levels in the second National Health and Nutrition Examination Survey (1976-1980) was examined for white males age 40-59 years. After adjustment for age, body mass index, nutritional factors, and blood biochemistries in a multiple linear regression model, the relationship of systolic and diastolic blood pressures to blood lead levels was statistically significant ( $p < 0.01$ ). There was no evidence of a threshold blood level for this relationship. Although these data alone do not prove a causal relationship between low blood lead levels and blood pressure, the findings are consistent with current epidemiologic and animal studies, indicating that a causal relationship is probable. To examine the potential risks, the multiple logistic risk factor coefficients from the Pooling Project and Framingham studies were used to predict the impact of the 37 percent decrease in mean blood lead levels that occurred in adult white males between 1976-1980. As a result of this blood lead level decrease, the calculations predicted a 4.7 percent decrease in the incidence of fatal and nonfatal myocardial infarction over 10 years, a 6.7 percent decrease in the incidence of death from all causes over 11.5 years. In addition, as a result of this blood lead decrease, the predicted number of white males in this age group with hypertension (diastolic blood pressure > 90 mmHg) decreased by 17.5 percent.

Powles, J. 1978. The effects of health services on adult male mortality in relation to the effects of social and economic factors. *Ethics in Science and Medicine* 5:1-13.

This article described the general problem of declining cost-effectiveness in health services by referring to disease control measures in the health care industry. The author also assessed the effect of these control measures on male mortality rates. Powles reminded the reader that higher mortality rates were found among the less privileged. High income, well-educated groups had lower mortality experiences. When age-standardized mortality ratios were calculated, an SES gradient was observed. The standard mortality ratio for those with high family income (\$10,000) was 84, and for those with low incomes (\$2,000) in 1960, the standard mortality ratio was 100. The authors concluded that without a substantial social re-ordering to secure greater social stability and better employment conditions, improvements in adult male mortality could not be achieved.

Rantakallio, P. 1979. Social background of mothers who smoke during pregnancy and influence of these factors on offspring. *Social Science and Medicine* 13a:423-429.

This was an analysis of 1,819 Finnish mothers who smoked after their second month of pregnancy. Data were collected at the sixth or seventh month of pregnancy from 157 antenatal clinics during 1966. Controls were chosen from among nonsmokers and matched on the number of children born, marital status, age +/- 2 years, parity, and place of residence. Perinatal mortality was higher among mothers with less schooling, ranging from 19.2 among poor women with less education, to 55.6 per 1,000 among women with highest education births. Additionally, postneonatal mortality was greater for social class IV than for social classes I to III when mother's education was the marker for SES. These differences were not explained by differences in smoking patterns between the cases and the controls.

Roberts, R. W., Mack, J., Woodhead, D. 1976. Health survey—disadvantaged schools. *Australian Paediatric Journal* 12:31-36.

In July 1974, a study was mounted to compare a variety of

health measures in disadvantaged and nondisadvantaged government schools. Census information was collected, and an index based on school characteristics was designed to describe the quality of education. Variables included in this index were migrant population, mobility, family structure, occupation, employment, and ethnic origin. Questionnaires and physical exams were completed for 167 children from disadvantaged schools and 154 from nondisadvantaged schools. No differences in physical measure (height), haemoglobin level, nutritional status, or social condition were found. In the disadvantaged schools many more children threw tantrums, or were bullies, attention seekers, noncompatible, disruptive, distressed, and had poorer concentration spans.

Rodin, J. 1986. Aging and health: effects of the sense of control. *Science* 233:1271-1276.

The relation between health and a sense of control may grow stronger in old age. This could occur through three types of processes: Experiences particularly relevant to control may increase markedly in old age; the association between control and some aspect of health may be altered by age; and age may influence the association between control and health-related behaviors or the seeking of medical care. Studies show that there are detrimental effects on the health of older people when their control of their activities is restricted. In contrast, interventions that enhance options for control by nursing home patients promote health. With increasing age, however, variability in preferred amounts of control also increases, and sometimes greater control over activities, circumstances, or health has negative consequences including stress, worry, and self-blame. Mechanisms mediating the control-health relation include feelings of stress, symptom labeling, changes in the neuroendocrine and immune systems, and behavior relevant to health maintenance.

Rogot, E., Murray, J. 1980. Cancer mortality among nonsmokers in an insured group of U.S. veterans. *Journal of the National Cancer Institute* 65:1163-1168.

This study examined the cancer mortality in a group of veterans at low risk of developing cancer (nonsmokers). Policy holders were mostly white, and from upper and middle socioeconomic classes. Information was available for those who served in the U.S. armed forces between 1917-1940. Death certificates were abstracted and 97.6 percent of them were complete. The standard mortality ratio for nonsmokers was calculated with age-specific probabilities of death in the period of all respondents used as the standard. About 66 percent of the population was 55- to 65-years-old at the start of the study. More nonsmoking veterans lived in urban areas than those in the general population (80 percent vs. 63 percent). The veterans occupied more professional and managerial positions than those of the general population. Standard mortality ratios for selected occupations follow: 42 for dentists, 48 for carpenters, 56 for lawyers, 79 for auto mechanics, 80 for mail carriers, and 82 for doctors.

Roos, N. P., Roos, L. L., Jr. 1982. Surgical rate variations: do they reflect the health or socioeconomic characteristics of the population? *Medical Care* 20:945-958.

This paper attempted to assess the unexplained variations in surgical rates across geographic areas. The focus was the relationship between elderly surgical rates and population characteristics of 56 hospitals in a rural area of Canada. In 1971, extensive interviews of a five-percent probability sample were conducted. Three measures of SES were studied: education, income, and poverty. Although 76 percent of the respondents replied that their incomes were satisfactory, only 16 percent were found to be above the poverty line. Neither income variable was significantly associated with surgical measures. Education and ethnicity were strongly and consistently associated with overall surgical rates but not with rates of elective or cataract surgery.

Rose, G., Marmot, M. G. 1981. Social class and coronary heart disease. *British Heart Journal* 45:13-19.

The Whitehall Study examined 7,530 civil servants age 40-64 for signs, symptoms, and risk factors for coronary heart disease, then categorized them by employment status: administrator, executive, clerical, and others. "Others" were the lowest grade and were comprised mostly of unskilled laborers. Age adjustment was done by the direct method using the total population as the standard. In the lowest grade, the rate of EKG abnormality was 177 percent of that for the top grade. The lower the grade, the more likely that angina accompanied an abnormal EKG. Age adjusted 7½ year mortality rates were 3.6 times higher in the lower group than the higher one. Age-adjusted all-cause mortality was also calculated, and the results demonstrated the same trend as for coronary heart disease mortality. Men in the lowest class smoked more than those in the higher classes. Physically active leisure time was less common in lower grades. Additionally, systolic blood pressure was an average of 4.2 mm Hg less among those in higher classes. Blood sugar levels tended to be higher in the lower classes. Because of these class differences, multiple variable analysis was done. After controlling for these factors, the relative risks were 1.0, 1.8, 2.3, and 2.6 for high and low grades respectively.

Rundall, T. G., Wheeler, J. R. C. 1979. The effect of income on use of preventive care: an evaluation of alternative explanations. *Journal of Health and Social Behavior* 20:397-406.

Three alternative explanations for the effect of income on use of physician services for preventive care were evaluated. Path analysis was used to estimate the direct effect of income on use (the financial constraint explanation), the indirect effect of income through health beliefs (the culture of poverty explanation), and the indirect effect through the availability of a usual source of care (the system barrier explanation). Data for the analyses came from household interviews with 781 adult residents of Washtenaw County, Michigan. The data reveal a negligible direct effect of income on preventive use, a positive indirect effect through perceived susceptibility to illness (one



operationalization of the culture of poverty explanation), and a positive indirect effect through usual source of care.

Rush, D., Cassano, P. 1983. Relationship of cigarette smoking and social class to birth weight and perinatal mortality among all births in Britain, 5-11 April 1970. *Journal of Epidemiology and Community Health* 37:249-255.

Perinatal mortality, cigarette smoking, and social class were examined in all singleton births for whom there was valid data on birthweight, perinatal mortality, social class, and smoking (N=16,688). Of all the women delivering singletons, 41.3 percent reported smoking at term. Rates differed tremendously by class. In social class I, 15.4 percent of women were light smokers, whereas 46.0 percent of women in social class V smoked at term. More upper than lower class women stopped smoking before and during pregnancy. There was a difference of 215 g between mean birthweight of infants of nonsmokers and those who smoked more than 15 cigarettes per day. This varied little across social class. After controlling for maternal age, height, and gravidity, being single was associated with 136 g depression in birthweight ( $p<.001$ ), and there was a 23 g decrement in birthweight associated with one lower class category ( $p<.001$ ). Thirty-seven percent of the association of birthweight with social class can be attributed to the difference in smoking habits across class.

Salonen, J. T. 1982. Socioeconomic status and risk of cancer, cerebral stroke, and death due to coronary heart disease and any disease: a longitudinal study in eastern Finland. *Journal of Epidemiology and Community Health* 36:294-297.

The relationship between socioeconomic indicators and disease risk was examined in a mainly rural area in Finland. A random sample of men 30-59 with no prior history of coronary heart disease, cancer, or risk factor history for the two diseases were recruited into the study. SES was defined by years of education, gross family income, place of residence, number of episodes, and marital status. The analyses showed

an association between death due to ischemic heart disease and unmarried status, less education, and low income, and, similarly, death due to any disease. Cerebrovascular disease was associated with urban/rural markers and cancer with low education. The relationship between SES and coronary heart disease could not be explained by the three primary coronary heart disease risk factors (smoking, blood pressure, and cholesterol). Education had an independent impact on cancer risk even after controlling for age and smoking in a multivariate model.

Savage, D., Lindenbaum, J., Van Ryzin, J., Struening, E., Garrett, T.J. 1984. Race, poverty, and survival in multiple myeloma. *Cancer* 54:3085-3094.

The relationship between race, clinical findings, poverty and survival was examined in patients with multiple myeloma. Fifty-two black patients with diagnosis of multiple myeloma during 1965-1980 at a community hospital in Harlem and age-sex matched black and white patients at a university-affiliated hospital were studied. Patients at the community hospital had poorer survival than those from university-affiliated. Survival was shorter among patients from blocks that were overcrowded, had more families below poverty, and had higher unemployment. Patients from blocks with low educational backgrounds had a shorter median survival (14 months) vs. those with more education (27 months). Those with low family income had a mean survival of 18 months vs. 28 months for high. In a stepwise multiple regression analysis of community-hospital based patients, the most important variable related to survival was overcrowding. The same trend was true for university-affiliated, but the results were not statistically significant.

Schwartz, J. 1985. *The relationship between blood lead levels and blood pressure*. Unpublished report for EPA. Washington, D.C.:Environmental Protection Agency.

This research paper examines the association between blood

lead and blood pressure. Data is derived from the NHANES II and reports an association between blood lead and blood pressure such that for a 10ug/deciliter rise in blood lead, there is a 15 percent rise in blood pressure. Other research is also cited describing interference with calcium metabolism as the potential biological pathway by which blood lead may influence blood pressure.

Shapiro, S., McCormick, M. C., Starfield, B. H., Krischer, J. P., Bross, D. 1980. Relevance of correlates of infant deaths for significant morbidity at 1 year of age. *American Journal of Obstetrics & Gynecology* 136:363-373.

Morbidity data for infants surviving to one year were obtained through a household survey of a random sample of infants born during a six month period in 1976. There were 4,989 infant visits, 3,179 were <2500 gm and 1,777 were >2500 gm. There were more low birthweight infants and a higher neonatal mortality among nonwhites. Factors heavily influenced by environmental conditions (young maternal age, low maternal education, and race) were associated with high postneonatal mortality and also with increased rates of significant postneonatal illness.

Simpson, S. P. 1984. Causal analysis of infant deaths in Hawaii. *American Journal of Epidemiology* 116:1024-1029.

The association between measures of SES and infant deaths was studied in 34,220 live births registered in Hawaii in 1978-1979. Infant death records were linked to birth records. Using information on the birth certificate, a group of high risk infants could be identified. Apgar score was the single most important predictor of infant mortality. Birth certificates in Hawaii used measures of maternal and paternal education as a measure of SES. By path analysis, these were poor indicators of infant mortality. The census tract of residence appeared to be a better predictor. Low risk tracts had higher SES, and high risk tracts had lower SES.

Starfield, B. 1982. Family income, ill health and medical care of U.S. children. *Journal of Public Health Policy* 3:244-259.

Evidence was summarized concerning the link between poverty and ill health in childhood, the relationship between poverty and receipt of medical care, evidence that increased access to medical care reduced the disparity in health status among poor and nonpoor, and the effects of reduced funds for care of the poor. Poor children compared to nonpoor were more frequently and more seriously ill. Although they received care more often than was previously the case, the kind of care they received was different. Data also indicated that near poor were also at a severe disadvantage with regard to their health and with respect to access to and use of services, even more so than the poor.

\_\_\_\_\_, Budetti, P. P. 1985. Child health status and risk factors. *Health Services Research* 19:817-886.

Evidence was reviewed concerning the determinants of children's health. A powerful correlate of ill health in childhood is family income. Illness is more common among the poor, and when it occurs it is more severe. Poor children are two times as likely to be low birthweight and to contract meningitis, three times as likely to lack immunization, two to three times as likely to have rheumatic fever, iron deficiency anemia, and hearing problems, fifty times as likely to have uncorrected vision, nine times as likely to have elevated levels of lead in blood, and 75 percent more likely to die of injuries and leukemia. Poor children have greater deficits in IQ. Average length of stay in hospital is twice as long. Factors such as parents' education level may modify the relationship between income and ill health. Some measures of ill health are more susceptible to the effects of income than to the effects of education. The poorer the family, the more likely that the child has no regular source of medical care, partly because of poor insurance coverage. Low income children are also more likely to wait longer between visits, and the sort of care they receive is often of a different type.

Steinhorn, S. C., Myers, M. H., Hankey, B. F., Pelham, V. F. 1986. Factors associated with survival differences between black women and white women with cancer of the uterine corpus. *American Journal of Epidemiology* 124:85-93.

To investigate the poorer survival among blacks, the authors analyzed a series of patients with cancer of the uterine corpus, diagnosed between 1973-1977. Racial differences were examined in detail with respect to stage of disease, age at diagnosis, histological type, geographic area, and SES. SES was defined by mean family income and mean highest education received. Major racial differences in patient survival were noted among women with adeno cancer, and, although adjustment for prognostic factors reduced the gap, statistically significant differences in survival remained. Median family income and mean education were also found to be significant predictors with relative risk of 1.33 and 1.18, respectively. Inability to close the gap between black and white survival rates after adjusting for these factors suggest that other factors may be involved. Multivariate analysis determined that income and stage of disease were the strongest explanatory variables affecting survival by race.

Stern, J. 1983. Social mobility and the interpretation of social class mortality differentials. *Journal of Social Policy* 12:27-49.

Problems in the assessment of social class mortality differentials were discussed. In particular, emphasis was given to biases associated with differential social class mortality that may yield overestimates of mortality differentials by social class.

Stern, E., Mischynski, M., Greenland, S., Damus, K., Coulson, A. 1977. "Pap" testing and hysterectomy prevalence: a survey of communities with high and low cervical cancer rates. *American Journal of Epidemiology* 106:296-305.

The authors surveyed areas within Los Angeles County with known high and low rates of cervical cancer in order to relate

the level of pap screening and prevalence of hysterectomy to differential cancer rates. Highest rates were found in low income, inner-city areas where there were large concentrations of black and Spanish-surname women and small numbers of whites; the rates were high for everyone in these areas. The risk was low in middle and upper income areas even for blacks and Spanish-surname women. The age-adjusted mortality rate was 2.6 to 5.3 in high income areas and 8.4 to 14.3 in the low income areas. Income and health-related information was obtained by surveying 2,063 households. After controlling for age and ethnicity, the authors found that the prevalence of pap testing was lower in low income areas than middle income areas.

Stewart, P. J., Dunkley, G. C. 1985. Smoking and health care patterns among pregnant women. *Canadian Medical Association Journal* 133:989-994.

A population-based study was undertaken to determine the current rate of smoking before and during pregnancy. Between May and October 1983, all women who had delivered a baby at one of the major hospitals with an obstetrics facility in Ottawa were surveyed. Women who agreed to participate completed a self-administered questionnaire. A poverty index was defined on the basis of the number of people supported on a yearly income. Overall, 59.1 percent changed their habit, with 31 percent stopping and 28.1 percent reducing. Logistic regression analysis identified factors associated with cessation. Among smokers, fewer numbers of cigarettes before pregnancy, higher level of education, less use of alcohol, multiparity, and less marijuana use were associated with cessation. Among multiparous women, the first two factors were significant, and among primiparous women, the first three factors were significant. For common-law and single women, lower education and occupation were associated with increased prevalence of smoking. Women below poverty were more likely to smoke after the third month of pregnancy.

Sunderland, R. 1984. Dying young in traffic. *Archives of Disease in Childhood* 59:754-757.

Sheffield, a stable urban community, was studied to determine whether information on the pattern of fatal childhood traffic accidents might aid in the planning of preventive programs. An index of relative prosperity was defined by the number of persons per room per dwelling and the availability of toilet facilities. A disproportionate number of accidents and deaths occurred among children living in crowded dwellings and dwellings situated near a main road. When geographic regions were grouped crudely by prosperity, the most prosperous had lower death rates, while the least prosperous had higher rates.

Syme, S. L. 1985. Socioeconomic factors: content discussion. In Ostfeld, A. M., Eaker, E. D., eds. *Measuring psychosocial variables in epidemiologic studies of cardiovascular disease: proceedings of a workshop*. NIH Publication No. 85-2270. Washington, D.C.: Department of Health and Human Services, Public Health Service.

The role of SES in cardiovascular disease was discussed, including the fact that SES is often ignored by researchers. The author says that poverty contributes to SES and health effects, but that it cannot explain the social class gradient. The changes over time in the SES-CHD association that have been observed by other researchers were discussed.

———, Berkman, L. F. 1976. Social class, susceptibility and sickness. *American Journal of Epidemiology* 104:1-8.

Evidence on the relationship between social class and sickness was reviewed. Previous research found that persons in lower class groups had higher mortality and morbidity from almost every disease or illness and that these differences had not diminished over time. The differences could not be explained by differences in medical care. There has been a reduction in mortality, but a gap between the highest and the lowest social class

groups remains significant. Social and cultural mobility, as well as other coping behaviors such as smoking, obesity, and Type A behaviors are also associated with the disease process in man. Future research should include the precise identification and description of subgroups in lower SES classes. Disentanglement of socioenvironmental variables should take place. The clarification of causes and effects and the "downward drift" should be put forth. Lastly, a more comprehensive description of those psychosocial variables that compromise the defenses must be made.

Szklo, M., Gordis, L., Tonascia, J., Kaplan, E. 1978. The changing survivorship of white and black children with leukemia. *Cancer* 42:59-66.

Time trends of survival of white and black children with acute leukemia in a defined metropolitan area were examined. The study population included all cases of acute leukemia diagnosed in children less than 20 years of age. SES was based on median rental value of the census tracts in which the patient was living at the time of diagnosis. Sex, SES, time interval from onset of symptoms to diagnosis, clinical severity at time of diagnosis, and type of therapy were not statistically different between white and black children. For the entire 1960-1975 period, the survival of white children was significantly better than that of black children ( $p < .05$ ). Among the 23 white children in the low SES category the two-year survival rate was lower (28 percent) than that of the 22 (51 percent) children in the highest SES category ( $p < .005$ ).

Taylor, E. M., Emery, J. L. 1983. Family and community factors associated with infant deaths that might be preventable. *British Medical Journal* 287:871-874.

All postperinatal deaths in Sheffield over two years were examined to assess the importance of different pathological, family, community, and health care factors. During the study period, 65 babies between the ages of eight days and two years died. Controls (102) were matched for age. Each child was as-

essed for 13 potentially adverse social and family factors. Deaths were classified into causal groups. Families of children who died during potentially treatable illnesses had significantly greater numbers of adverse social conditions than children who died from conditions of poor prognosis. Adverse conditions included low intelligence, family crisis, low competence, and domestic and financial problems. Adverse social conditions were independent of social class.

Todson, D. R. 1980. Spatial perspective of infant health care: the distribution of infant health care delivery in Hillsborough County, Florida. *Social Science and Medicine* 14D:379-385.

Infant and postneonatal mortality were examined as a function of SES in a Florida county. The 15 census tracts that recorded 100 or more births for each year between 1971-1973 were ranked according to SES. Infant death rates decreased as socioeconomic level increased. The lowest tract had rates 29 percent above average, while the highest recorded an infant mortality rate 36.8 percent below average. SES had a greater impact on postneonatal mortality than overall mortality.

Tuomilehto, J., Puska, P., Virtamo, J., Neittaanmaki, L., Koskela, K. 1978. Coronary risk factors and socioeconomic status in Eastern Finland. *Preventive Medicine* 7:539-549.

The relationship between coronary heart disease risk factors and socioeconomic factors was examined in 10,951 men and women age 25-59 in Eastern Finland. Men with lower education levels smoked more often than those with higher education levels, with the exception of the lower age group. Women of lower education levels smoked significantly more in age group 25-29, while this association was inverse after age 45. Men with lower income were more often smokers with the exception of the lower age group. Among women the percent of smokers was higher in those with high incomes. Higher cholesterol values were observed more often among those living in rural areas, having low education levels, lower family income, and more physical activity. Among

women higher blood pressure was more prevalent in rural areas, with a lower education level, lower family income, and higher level of physical activity at work. The prevalence of a high risk score among men was usually more common among those living in rural areas, with lower education levels, lower family income and higher level of physical activity at work.

Van den Berg, B. J., Oechsli, F. W. 1984. Prematurity. In Bracken, M. B., ed. *Perinatal epidemiology*, pp. 69-85. New York: Oxford University Press.

Using international data and data from the Child Health and Disability Study (CHDS), factors are reviewed that contribute to prematurity. Socioeconomic factors, including education and income, are consistently associated with prematurity. In the CHDS, the mother's educational level was significantly associated with risk of prematurity after adjustment for father's occupation, mother's smoking, length of gestation of previous and current pregnancy, weight gain, first trimester bleeding, and sex of infant.

Wadsworth, M. E. J., Cripps, H. A., Midwinter, R. E., Colley, J. R. T. 1985. Blood pressure in a national birth cohort at the age of 36 related to social and familial factors, smoking and body mass. *British Medical Journal* 291:1534-1538.

The association between blood pressure and SES was followed in a national birth cohort study of men and women age 39. Social class was determined by father's education. Men who had grown up in families in the lowest socioeconomic group had significantly higher mean systolic blood pressure (123.43 mm Hg) than those of non-manual and well educated parents (119.33 mm Hg). Mean diastolic blood pressure was also significantly higher for men of the lower classes compared to the highest (78.87 vs. 76.26). Mean systolic blood pressure of men decreased significantly as their own education qualifications increased. Women who came from families in the lowest socioeconomic group had significantly higher mean systolic blood pressure than families of the highest

group (118.00 and 114.60 mm Hg). They also had significantly higher diastolic blood pressure (75.63 vs. 73.64 mm Hg). There were no significant differences in blood pressure associated with women's employment or educational achievement.

Wadsworth, M. E. J. 1986. Serious illness in childhood and its association with later-life achievement. In Wilkinson, R. G., ed. *Class and health—research and longitudinal data*. London: Tavistock Publications.

The relationship between serious illness in childhood, social achievement and mobility, and health as an adult was studied in a sample of children born in one week of March 1946 in England, Wales, and Scotland, who have been followed up periodically through 1982. Analyses indicate that, to some extent, early serious illness is associated with both decreased social mobility in later life, and poorer health.

Waldron, I., Eyer, J. 1975. Socioeconomic causes of the recent rise in death rates for 15-24-year-olds. *Social Science and Medicine* 9:383-396.

The total death rate for 15- to 24-year-olds in the U.S. rose by 20 percent during the 1960s. The rise was due in part to a doubling of suicide and homicide and increases of 33 percent in fatal motor vehicle and other accidents. A major cause of the rise in suicide was an increase in potentially overwhelming life problems, including increased divorce among parents, increased alcohol consumption and attendant family problems, increased illegitimate pregnancy, and a relative decline in income for young people compared to their parents. To study the stress on young people in greater depth, the investigators obtained diaries from college students. The most commonly reported source of tension was related to academic work. Much of the tension associated with academic work was due to the students' fear of failure in the increasing competition for the most desirable jobs.

Watkins, L. O., Neaton, J. D., Kuller, L. H. 1986. Racial differences in high-density lipoprotein cholesterol and coronary heart disease incidence in the usual-care group of the multiple risk factor intervention trial. *American Journal of Cardiology* 57:538-545.

Using MRFIT data, the relationship between high-density lipoprotein-C levels and the risk of first major coronary heart disease event was examined in black and white men randomly assigned to the usual-care group. At baseline, mean SES scores of black men were significantly lower than those of white men. Blacks had fewer years of education and lower income than whites and were less likely to be employed in professional, technical, or managerial jobs. Reported daily intake of saturated fatty acids was lower in blacks. The black-white differences in high-density lipoprotein-C levels was largest among those of the lowest SES, education, and income and were smallest at the highest levels. The black-white difference in the extent of change in risk factors was statistically significant for high-density lipoprotein-C and cigarette cessation. The black-white crude risk ratio for a coronary heart disease event was .49 (PV = .005).

Wegner, E. L., Kolonel, L. N., Nomura, A. M. Y., Lee, J. 1982. Racial and socioeconomic status differences in survival of colorectal cancer patients in Hawaii. *Cancer* 49:2208-2216.

The role of SES in racial differences in survival from colorectal cancer was examined in Hawaii. There were 1,446 cases of colon cancer and 881 cases of rectal cancer diagnosed between 1960-1974 eligible for inclusion in the study. SES was based on characteristics of the census tract in which the patient resided. Adjusting for age, sex, stage, and SES resulted in a convergence of survival curves for patients from the five major racial groups. For both colon and rectal cancer the only significant relationship that remained was a higher cancer rate among Japanese Hawaiians. Stage of disease was the single most important factor, and it was independently associated with survival. SES did not have a statistically significant in-



dependent association with survival. SES did account for some of the racial difference beyond that which could be explained by age, sex, and stage, but its importance was modest.

West, R. R. 1977. Geographical variation in mortality from ischaemic heart disease in England and Wales. *British Journal of Preventive and Social Medicine* 31:245-250.

An analysis of the proportional mortality attributed to ischaemic heart disease, adjusted for age, demonstrated a significant association with socioeconomic indexes for men in England and Wales. This association was not present for women.

Whitman, S., Coonley-Hoganson, R., Desai, B. T. 1984. Comparative head trauma experiences in two socioeconomically different Chicago-area communities: a population study. *American Journal of Epidemiology* 119:570-580.

Incidence and mortality rates from head trauma were studied in an inner-city area of Chicago and a suburb. Rates varied by location and by race, with suburban whites having the lowest rates, suburban blacks intermediate rates, and inner-city residents the highest rates. Examination of demographic information suggested that the black/white differential in the suburb reflected a disparity in socioeconomic levels.

Wilcox, N. S., Prochaska, J. O., Velicer, W. F., DiClemente, C. C. 1985. Subject characteristics as predictors of self-change in smoking. *Addictive Behaviors* 10:407-412.

The current investigation examined the usefulness of subject characteristics such as demographics, smoking history, health history, and life experiences as predictors of self-change in smoking status. There were 961 subjects who volunteered to participate in the study. Individuals with higher income and educational levels were more likely, following a relapse, to try again to abstain from cigarette smoking. In contrast, persons with lower incomes and fewer years of education often moved into a nonaction stage after having relapsed in their abstinence

efforts. Thus, despite their failed attempts, people in higher socioeconomic groups were more persistent in their self-change efforts.

Wilkinson, R. G. 1986. Socio-economic differences in mortality: interpreting the data on their size and trends. In Wilkinson, R. G., ed. *Class and health—research and longitudinal data*. London: Tavistock Publications.

Methodologic and interpretive issues in understanding the size and trends in social class differences in health in the United Kingdom were discussed, including numerator/denominator problems, heterogeneity and changing classification of occupations, and selective social mobility. None of these were found to compromise seriously the observed mortality differentials or trends in the differentials.

Williams, R. R., Horm, J. W. 1977. Association of cancer sites with tobacco and alcohol consumption and socioeconomic status of patients: interview study from the Third National Cancer Survey. *Journal of the National Cancer Institute* 58:525-547.

From personal interviews obtained for 7,518 incident cases of invasive cancer from the population-based Third National Cancer Survey, the quantitative lifetime use of cigarettes, cigars, pipes, unsmoked tobacco, wine, beer, hard liquor, and combined alcohol were recorded, as well as education and family income level. College education and high income both showed positive associations with cancers of the breast, thyroid gland, uterine corpus, and melanomas in males. These same indicators of high SES showed inverse associations with invasive neoplasms of the uterine cervix, lung, lip-tongue, and colon in females. College attendance (but not income) showed an inverse association with stomach cancer and positive association with pancreatic cancer in males.

Yeracaris, C. A., Kim, J. H. 1978. Socioeconomic differentials in selected causes of death. *American Journal of Public Health* 68:342-351.

The association between SES and mortality was analyzed for three select causes of death in three metropolitan areas: Birmingham, Buffalo, and Indianapolis. In all three cities, white mortality rates from heart disease, the leading cause of death, were inversely associated with socioeconomic group but to varying degrees. The male rate was higher than the female rate in all socioeconomic groups. Following the national trend, mortality from heart disease declined between 1960-1970. Reduction varied by socioeconomic group, generally favoring females over males.