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Black/White Differences in Cancer: A Framework for Intervention Linking Social Structure and Survival*

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ABSTRACT

Black/White differences in cancer survival persist. Factors shown to be differentially related to survival, and to differ by race, include the extent of disease present at diagnosis, disease classification or tumor histology, and host vulnerability. It is suggested that efforts to reduce this survival differential generally have been unsuccessful due to a failure to accurately identify the sources of this differential. Differences in the extent of disease present at diagnosis, for example, may not be a function of failure to seek physicians or dollars spent on health care, but may be due to differences in the nature of health care provided. Similarly, differences in socioeconomic status, lifestyle characteristics, and occupational exposures between blacks and whites may be correlated with histologic differences and the level of host vulnerability. Differences in relative survival rates are viewed as resulting largely from structural sources. Some mechanisms for modifying these structural producers of survival inequality are suggested.

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Introduction

Ample precedent exists for linking social stratification with survival. Perhaps the most dramatic illustration of the relationship between one's place in society and one's survival is the sinking of the H.M.S. *Titanic*. As most introductory level sociology textbooks illustrate, over 60 percent of those passengers with first class passage survived, while only 36 percent of those with second class tickets and 24 percent of those with third class tickets survived drowning. One's life chances, and it would seem one's death chances, are linked to one's position in a stratified social fabric. Differences between blacks and whites in the rate of mortality from homicides, house fires, drowning, and pedestrian accidents have consistently been noted (MMWR, 1989). Mortality rates with respect to disease entities, however, have been linked less frequently with social stratification. Yet evidence suggests that social structural mechanisms impact here as well.

Despite evidence of reductions in the incidence rates for some cancers, and the fact that incidence rates for some cancers are lower for blacks than for whites, black/white differences in cancer *survival*, with blacks exhibiting significant disadvantage, persist. Current evidence suggests that, in general, if you are a black American and you are diagnosed with cancer, you are more likely to die from that cancer, and to die more quickly from that cancer, than if you are a white American diagnosed with the same cancer (Freeman and Wasfie, 1989; NCI, 1989; Hankey and Myers, 1987; MMWR, 1987; Young, et al., 1984). Traditional explanations and solutions offered for this differential now appear overly simplistic or inaccurate (USDHHS, 1986). Efforts to reduce cancer incidence and mortality have focused on heightening cancer awareness and knowledge, lifestyle changes, and early detection. These interventions are based upon explanations emphasizing behavioral or lifestyle modifications and assumptions about health practices and lifestyle in relation to cancer etiology. Contrary to the assumptions supporting a behavioral approach, neither delay in treatment seeking, nor the extent of disease present at diagnosis, although contributing to the survival differential, appear to be adequate explanatory factors alone. The inability of current interventions to impact this survival differential can be attributed, in part, to a failure to take into account that structural factors associated with social class and ethnic group differences may impact an individual's survival chances regardless of individual actions (Navarro, 1989; Sterling and Weinkam, 1989; Herd, 1987). A more effective approach would include efforts to address the structural as well as behavioral causes of this survival differential.

A number of problems become apparent, however, when literature in this area is reviewed in an attempt to explain black/white differences in cancer survival. Studies of the etiology of cancer have been of limited utility, in part because the

social, behavioral, and environmental factors of potential impact may have occurred decades before the disease is diagnosed. Prospective studies are difficult and expensive to conduct. In addition, cancer is not one disease but more than 100 diseases, not infrequently occurring in combination. Compounding these difficulties, many of the sampling and measurement techniques employed are crude and often unreliable. Direct measures of socioeconomic status, for example, rarely are collected by tumor registries (a major source of our information) and are frequently estimated based on ability to pay or sources of payment for medical services, or estimated from census data. Despite these difficulties, the weight of evidence now accumulated does allow for some synthesis regarding factors contributing to differential survival rates between blacks and whites and means to reduce this differential.

Concepts of Survival and Race

Before examining the existing evidence, some concepts need to be defined. The endpoints of this analysis are relative survival rates and correlations with the concepts of race and ethnicity. The relative survival rate is, in a sense, a synthetic concept. It is the ratio of the observed survival rate to the expected survival rate for persons in the general population similar to the patient group in age, sex, race, socioeconomic status, and year of observation. While the measurement of relative survival rates varies in the literature depending on the statistical method used and whether or not the primary cause of death is cancer, a relative survival rate generally can be interpreted as an estimate of the probability of escaping death due to cancer related causes for a prescribed period of time. Since a five year interval of time without recurrence beginning with the date of diagnosis generally is accepted as a minimum indication of a cure, studies reporting five and ten year survival rates were viewed as the most useful.

The meaning of race in the literature of epidemiology is the subject of some debate. Some researchers would argue that the first step in an epidemiologic investigation is the description of host characteristics including age, sex, and race (Mausner and Bahn, 1974). There exists much confusion regarding this concept, however, for as Damon (1971) points out, race implies a biologically distinct group which shares a large percentage of genes in common and usually certain distinguishing physical features. An ethnic group is one that is culturally distinct. Cooper argues that whereas race continues to be a widely used concept in public health and medicine, when racial differentials are addressed, concern is not primarily with "true genetic markers," and "the relationship between genotype, and phenotype is almost universally ignored" (1984:718). Similarly, Navarro (1989) observes that the United States is unique among western industrialized nations as perhaps the only one recording its health data on the basis of race,

gender, age and other biological categories and largely excluding any measures of social class. While there is considerable overlap between these designations, each may separately, or in combination with the other, exert an influence on disease patterns (Navarro, 1989; Wilkinson and King, 1987).

Differences in Cancer Survival

As indicated at the outset, there is persistent evidence that blacks in the United States have a poorer cancer prognosis than whites. Although there is no single repository of cancer data, a consistent pattern can be seen across studies of tumor registries. In one of the first comprehensive evaluations of this pattern, Axtell, et al. (1975) compared five year relative survival rates for blacks and whites diagnosed between 1955 and 1964. In twenty-four out of the thirty-one sites compared for all stages of disease combined, whites evidenced higher rates than blacks, and equalled the survival rate in three other sites. The difference was particularly great in the case of bladder cancer and corpus uteri carcinoma. In a subsequent study of patients diagnosed between 1964 and 1973 (Myers and Hankey, 1980), evidence of a survival deficit was again found among the black patients studied, even when controlling for age and stage of disease. In this study whites exhibited a higher five-year relative survival rate than blacks in twenty-three of the twenty-eight sites examined and equalled the relative survival rate for blacks in one additional site. Further, none of the differences found in relative survival rates which favored blacks were large or statistically significant.

Prior to 1973, data were derived from only a small number of tumor registries which made generalizations and analyses of trends difficult. The most uniform and representative data currently available are collected by the Surveillance, Epidemiology and End-Results (SEER) program of the National Cancer Institute. The SEER program collects data with a uniform instrument from eleven tumor registries representing approximately 12 percent of the U.S. population. Recent analysis of trends in black/white cancer survival based on data collected between 1974 and 1985 indicates that this differential has not been significantly reduced despite prevention and control efforts (NCI, 1989). For all sites and stages combined, the five-year relative survival rate for whites diagnosed between 1980 and 1985 was 13 percent higher than for blacks diagnosed during the same period. Whites evidenced higher relative survival rates in seventeen of the twenty-four sites compared, and equalled the survival rate for blacks for one additional site.

In comparisons of five-year relative survival rates for those diagnosed between 1974 and 1976 with those diagnosed between 1980 and 1985, whites exhibited statistically significant increases in survival rates in sixteen of the

Table 1
Trends in 5-Year Relative Survival Rates (1974–1985)
for Selected Cancer Sites by Race/Ethnicity.

SITE	YEAR OF DIAGNOSIS					
	WHITES			BLACKS		
	1974–76 (%)	1977–79 (%)	1980–85 (%)	1974–76 (%)	1977–79 (%)	1980–85 (%)
All sites	49.9	50.3	51.1*	38.6	38.4	38.1
Oral cavity and pharynx	54.5	53.4	53.8	35.8	35.9	30.6
Esophagus	5.1	5.5	8.1*	3.9	2.8	5.8
Stomach	14.1	15.9	15.5*	16.3	14.9	18.5
Colon	50.0	52.4	55.2*	45.1	47.3	47.9
Rectum	48.4	50.3	52.9*	41.3	38.2	38.8
Liver	4.3	2.7	4.3	1.2	3.6	2.3
Pancreas	2.8	2.1	2.7	2.3	3.7	4.8
Larynx	66.1	67.5	68.2	58.3	55.6	52.9
Lung & Bronchus	12.2	13.4	13.1*	11.2	10.8	11.6
Melanoma of the skin	79.2	80.8	81.0*	66.5‡	37.3‡	66.4
Breast (females)	74.6	74.7	76.3*	62.6	62.2	63.5
Cervix Uteri	69.0	68.4	66.9	63.0	61.4	59.3
Corpus Uteri	89.0	86.5	83.4*	62.2	57.1	52.0*
Ovary	36.1	37.2	38.4*	40.8	39.1	38.3
Prostate gland	67.4	71.3	73.4*	57.6	61.9	62.8*
Testis	78.4	87.5	91.4*	77.2†	—	90.9
Urinary bladder	73.3	75.1	77.7*	47.0	54.2	56.1*
Kidney and renal pelvis	51.3	50.0	52.4	49.5	52.5	55.4
Brain and nervous system	21.8	23.6	23.5*	27.6	27.7	29.5
Thyroid gland	91.9	92.0	93.3	88.1	91.7	95.6
Hodgkin's Disease	71.5	72.8	75.7*	68.2	73.1	72.6
non-Hodgkin's lymphoma	47.3	47.8	50.9*	47.5	48.9	44.1
Multiple myeloma	23.8	23.9	25.8*	28.0	32.4	28.9
Leukemia	34.0	35.8	34.2	30.4	29.7	27.4

Source: *Cancer Statistics Review 1973–1986 including a report on the status of Cancer Control*. National Cancer Institute. USDHHS. Bethesda, MD. [Surveillance, Epidemiology, and End Results (SEER) Program] May 1989. Reprinted with permission of the National Cancer Institute.

*The difference in rates between 1974–76 and 1980–85 is statistically significant ($p < .05$)

†The standard error of the survival rate is between 5 and 10 percentage points

‡The standard error of the survival rate is greater than 10 percentage points

twenty-four sites examined (see Table 1). Only three sites showed statistically significant changes in relative survival rates for blacks and only two of those sites evidenced increases in survival rates. Closer inspection of the data revealed that the most significant change in five-year relative survival was experienced by black women diagnosed with corpus uteri carcinoma.

The five-year relative survival rate for white women diagnosed with corpus uteri carcinoma is now thirty-one percent higher than for black women diagnosed with corpus uteri carcinoma. Similarly, the relative survival rate for whites is 23 percent higher for cancers of the oral cavity and pharynx and 21 percent higher for urinary bladder cancer than the relative survival rate for blacks with these diagnoses. Further, of the thirteen sites where black/white differences in relative survival rates were statistically significant for those diagnosed between 1980 and 1985, all stages combined, the relative survival rate for whites was more than 10 percent higher than the rate for blacks in over half the sites. Again, differences found to favor blacks were generally small or not statistically significant.

Factors Related to Differences in Survival

In any attempt to derive meaning from research data, it is important that the methodology and sampling be examined as well. The large racial/ethnic gap in survival observed in the SEER data may, in part, be a function of the fact that a significant proportion of the data on blacks derived from low income and indigent patient populations. However, rather than introducing a confounding bias, this artifact may more clearly demonstrate the influence of socioeconomic status (SES) on survival outcome and potentially, the influence of a relationship between race/ethnicity and SES on sources of tertiary care. While few direct measures of SES have been available in cancer data, it has been well documented that significantly more blacks than whites are among lower socioeconomic groups (Farley, 1984; U.S. Bureau of Census, 1979). Current economic indicators also would suggest that the relative economic status of blacks is declining (Cotton, 1989). Further, early investigations of registries with relatively homogeneous, lower socioeconomic patient populations failed to find significant survival differences along racial or ethnic lines (Correa, et al., 1980; Page, et al., 1978). A number of independent studies also supported the view that observed differences in black/white survival were actually a function of SES (Savage, et al., 1984; Berg, et al., 1977). However, researchers have also reported findings which appear contradictory with respect to race/ethnicity and SES and suggest that observed racial differences in survival are a somewhat more complex phenomenon (Freeman and Wasfie, 1989; Mayer and McWhorter, 1989; Hayward, et al., 1988; Valanis, et al., 1987; Funch, 1986).

Although the evidence varies from one study to another, stage at diagnosis, tumor histology, and host vulnerability have been shown to be differentially related to survival and to differ by race. There is evidence that blacks tend to have more advanced disease at diagnosis, more aggressive tumors, and greater host vulnerability and fertile "site soil" for tumor implantation than whites. There are some interesting anomalies as well. For example, evidence also suggests that in some instances, racial differences in survival persist even when controlling for such factors as stage at diagnosis (Hankey and Myers, 1987). At issue are those factors contributing to the survival differential between blacks and whites and the extent to which those factors are a function of SES.

Early Detection and the Extent of Disease Present at Diagnosis

Certainly the existence of a relationship between the extent of disease present at diagnosis (stage) and survival outcomes has been well established throughout the cancer literature. That the extent of disease present at diagnosis also is correlated with race/ethnicity raises some significant questions, chiefly questions regarding those mechanisms which contribute to the extent of disease present at diagnosis. A tacit assumption is often made that knowledge and attitudes toward cancer somehow determine one's readiness to act "appropriately" in the presence of cancer signs and symptoms or when opportunities for screening and detection are present. This is a largely untested assumption and there is even a certain amount of evidence that it is patently false. What is known is that blacks and whites differ in this regard.

Blacks generally have been found to exhibit less knowledge about cancer and to hold different beliefs and attitudes regarding cancer than whites (Price, et al., 1988; NCI Technical Report, 1986; Michielutte and Diseker, 1982; ACS, 1981). In addition, blacks tend to be less likely to participate in screening programs (Adams and Kerner, 1982; Gould-Martin, et al., 1982; Grover, et al., 1982), and report receiving or practicing early cancer detection techniques such as breast self-exams (BSE), Pap tests, rectal exams, and physical examinations less frequently than whites (ACS, 1981; National Center for Health Statistics, 1977).

Where symptom response and delay are concerned with respect to influencing stage at diagnosis, evidence does suggest that blacks tend to delay seeking treatment longer than whites (Ansell, et al., 1982; Funch, 1986; Gould-Martin, et al., 1982; Valanis, et al., 1987). A number of explanations have been offered for this differential including knowledge of cancer, attitudes, perception of symptoms as illness, availability of paid time off and insurance (Berkanovic and Telesky, 1985; MacRae, et al., 1984; Warnecke, 1981).

The treatment facility used, the design of screening programs, the general organization of health care services, health insurance and, to some extent, age, also appear to be factors in cancer detection (Hayward, et al., 1988; Baquet and Ringen, 1987; Funch, 1986). In contrast to the results of other screening programs, for example, Ansell, et al. (1987) report a significant level of success in both the adoption of Breast Self-Examination (BSE) techniques and participation in mammography screening in a health care facility serving a predominantly black, indigent population. While screening efforts targeting an existing patient population base would seem to yield an advantage over mass population screening efforts, this factor alone does not appear to account for the program's success, since successful recruitment of black populations generally has not been evidenced in either type of screening program (Willis, et al., 1989). Rather, the success of the Cook County Hospital Breast Cancer Detection Program (BCDP) appears to rest with the design and structure of the program. One illustration of the impact of program design on the effectiveness of the screening program is the method used to schedule return appointments. Appointments to return to the BCDP were made with the patient while the patient was still in the clinic, for the same day as the individual's return appointment for the General Medicine/Primary Care Clinic in the same facility. This practice increased the possibility that patients would return to the screening program.

A growing body of evidence further suggests that the organization and delivery of health care may not be conducive to the early detection of cancer among blacks. For a number of reasons, blacks tend to get their medical care in emergency rooms and clinic settings (National Center for Health Statistics, 1979). In these acute care and treatment-oriented settings, prevention and detection techniques, such as breast examinations, Pap tests, colonic surveillance, testicular exams, and mammograms, generally are not performed in conjunction with examinations (Blendon, et al., 1989; Hayward, et al., 1988; Howard, 1987, 1982; Funch, 1986). Conversely, a number of studies have supported the conclusion that adoption of effective breast self-examination techniques, for example, is contingent upon (1) having been taught to do BSE and been asked to demonstrate proficiency in the technique, (2) having a regular physician, particularly a gynecologist, and (3) a belief that your physician feels the examinations are important (Rimer, et al., 1989; Zapka, et al., 1989; Roberts, et al., 1986; Sheley and Lessan, 1986; Celanto, et al., 1982). Continuity of care in health care services used by many blacks and the poor also appears to be lacking and to negatively influence disease detection. Not only does the increased fragmentation of services decrease the likelihood that a patient-physician relationship would develop which could encourage adoption of prevention and detection

techniques, but health care service components as basic as adequately following up women whose Pap tests are returned from the lab as abnormal also may be lacking (Baquet and Ringen, 1987).

Clearly not all cancers are amenable to highly effective early detection techniques. Factors such as differences in the site where disease is found, variations in symptom manifestation, and the patient's previous history (Valanis, et al., 1987; MacArthur and Smith, 1984; Adam, et al., 1980) also appear to influence the early detection of disease independent of the individual's actions. To illustrate, Johnson, et al. (1988), in a study of colorectal cancer, found that in whites the lesions tended to manifest themselves in the lower part of the colon and rectum, while in blacks the disease was more likely to be found in the upper parts of the colon. The significance of this finding for the topic at hand is that physicians have not, traditionally, performed total colonic surveillance in the course of routine examinations. In order for this cancer to be detected, as it appears to manifest itself in blacks, physicians will need to develop greater awareness of these differences and modify their examination practices.

Host Vulnerability and Tumor Histology

For a number of reasons as well, delay in treatment seeking, either through a failure to utilize early detection techniques or a failure to respond quickly to symptoms, cannot be globally linked to the extent of disease at diagnosis, nor to black/white differences in survival. There is evidence to suggest that for some cancers, delay alone may not result in survival differences. Vernon, et al. (1985) found that while blacks and Hispanics differed in the rate of survival, they did not differ in the number of months treatment-seeking was delayed. Hankey and Myers (1987) found that black/white survival differences persisted even when controlling for the extent of disease present at diagnosis and the potential effects of lag-time bias. Further, as noted previously, black/white differences in the way the disease manifests itself also may account for some of the differences noted in survival. This suggests that other factors, some of which may be impacted by socioeconomic or racial/ethnic differences, account for some of the survival differences observed.

Host vulnerability also appears to be a factor in cancer survival and to vary by race/ethnicity and socioeconomic status (Berg, et al., 1977). Host vulnerability refers to the ability of the organism to either fight off the causative agent or, potentially, to resist development of the tumor itself. The level of host vulnerability may be a function of genetics, lifestyle characteristics of the individual, or other previous or concurrent disease. From a sociological perspective a number of social and behavioral factors can be cited including smoking, patterns of alcohol consumption, estrogen use, nutrition, co-morbid conditions and the

extent of care received for these conditions, area of residence, and occupation (Feldman and Gerber, 1990; Pope, 1989; Patterson and Block, 1988; Austin and Roe, 1979).

Nutrition is perhaps the most straightforward illustration of the relationship between race/ethnicity, SES, host vulnerability and survival. Lower socioeconomic status is associated with compromised nutrition. Race/ethnicity also is associated with SES, cultural nutritional habits, and nutritional deficiencies. Some of these nutritional habits and deficiencies have been shown to result in a compromised host. Nutritional deficiencies over a long period of time may lead to a more amenable host or environment for cancer development. A compromised host also has been implicated in the speed at which cancer is able to grow and spread. Nutritional compromise, then, rather than delay in responding to symptoms, could be responsible for the extent of disease present at diagnosis in some cases. Certainly the effects of long-term nutritional deficits coupled with the disease process have been shown to negatively impact a person's ability to tolerate and benefit from cancer treatment (Savage, et al., 1984).

Histology, or disease classification, is somewhat more complex in its relationship to survival. The issue, with respect to survival differences, is the differential development of cancers which tend to be more aggressive, and less amenable to survival. While some cancers of the corpus uteri, for example, are detectable from a Pap test, these cancers are less likely to be detected in an early stage than cervix uteri under normal cervix screening regimens. This is particularly true of uterine sarcomas which tend to be most prevalent among black females (Turner, 1990; Christopherson and Nealon, 1981). Corpus uteri is also among those cancers exhibiting the greatest differential in black/white survival rates. Further, the greatest decrease in survival rates between 1974 and 1985 has been experienced by black women with corpus uteri carcinoma (NCI, 1989).

The development of cancer of the esophagus has been associated with alcohol consumption patterns, in particular, drinking heavy or dark liquors such as whiskeys. There is evidence to suggest that blacks are more likely to consume dark or heavy liquors while whites are more likely to consume beer and wines (Rothman, et al., 1989; Caetano and Herd, 1988). Here again, socioeconomic structural influences may be found as well. Sterling and Weinkam (1989), in a study of lung cancer risk factors, compared black/white differences in smoking patterns related to lung cancer (e.g., smoking prevalence, amount smoked, and age started) and occupational exposure. They found less smoking associated risks among the blacks in the study than whites and attributed the higher incidence of lung cancer among blacks to occupational differences. While research findings vary with respect to black/white differences in smoking, the additive effects of smoking and occupational exposure certainly have

been implicated in the increased incidence of some forms of cancer (Brownson, et al., 1987).

Occupational Exposure

Some of the disparity noted in SES findings may be explained by the use of ability to pay or existence of health insurance as a measure of SES, coupled with the influence of occupational exposure. Perhaps one of the most significant components of lifestyle for the majority of Americans is their occupation. Further, the types of carcinogens and risk factors one is exposed to during this large segment of one's life are likely to influence both the type or site of cancer reported and the histology of that cancer (Claude et al., 1988). Among the few studies which have examined occupational exposure among blacks, Silverman, et al. (1989) examined occupational risks of bladder cancer among nonwhite males in the United States and found elevated risks among those ever employed as auto workers, dry cleaners, ironers, and pressers. In comparing their findings to the risk of occupational exposure for bladder cancer in whites they concluded that "... the risk of occupational bladder cancer among white and nonwhite men is similar. When inconsistencies between whites and nonwhites did occur, they appeared either due to chance or possibly racial differences in exposure among men within the same industry and occupation" (1989:480).

Because blacks are a small cohort in any occupational group, elevations in exposure in this group are likely to escape enumeration or not be statistically meaningful in an industry-wide study (Brownson, et al., 1987). However, careful occupation-related studies which take into account differences in jobs within industry have been undertaken in a few industries. Michaels (1982), in a detailed examination of minority workers and occupational cancer, notes that in the steel industry, coke ovens are the greatest source of carcinogenic exposure. He reports that the elevated cancer rates for blacks in the steel industry at the time the study was conducted were due to employment patterns in the industry. The majority of black workers (almost 90 percent) were found to be employed on the coke ovens compared with 31 percent of the white workers. Further, black workers were five times as likely to remain in that job as white workers. Similar examples were noted in tire-making, the rubber industry, refining and chemical production, and the ship-building industry with respect to lung cancer, bladder cancer, and prostate cancer. In the chemical industry, for example, Michaels reported that while very few of the workers employed at a New Jersey plant were black, all of the workers employed in the building dedicated to the production of hexamethylenetetramine at that plant were black. A study commissioned by the National Cancer Institute (Clark, et al., 1977) found that workers in the "hexa"

building suffered seven times the expected lung cancer rate, a rate also exceeding levels for all other areas in the plant.

Although greater incidence among blacks of cancer sites which are more aggressive and less amenable to survival, e.g., lung and pancreas, should not necessarily be expected to translate into differential survival rates for those afflicted, studies suggest that the nature and duration of the carcinogenic exposure influences the histology as well. In a study of the relationship between occupation and lung cancer histologic types, Zahm, et al. (1989) found that carpenters, cabinet and furniture makers, and plumbers were more likely to develop adenocarcinomas of the lung, while electricians and welders tended to develop "other" or mixed cell types and squamous cell carcinomas of the lung as well. Differences have been related to the particular carcinogenic exposure in the job and to the duration of exposure.

It would appear likely, then, that a combination of factors related to both race/ethnicity and SES such as lifestyle, nutrition, organization of health care delivery, differences in symptom manifestation, definition, and detection, coupled with variations in exposure to carcinogens and resulting histologies, contribute to the observed differences in cancer survival between blacks and whites. Further, this would appear most likely to be evidenced by significant black/white differences in the rate of survival for those cancers with the lowest survival rates in the general population, and those cancers where occupation related exposure is most likely to result in differences in histologic classifications for the same site.

Type of Cancer Treatment Received

Finally, there is some evidence to suggest that the treatment received for cancer may be different for blacks and whites. Hankey and Myers (1987) observed that while no gross differences in treatment were noted in their study, there was a tendency for blacks to receive more radiation and chemotherapy, and less surgery, than whites. In a more detailed examination of this question, Mayer and McWhorter (1989) found that blacks, those of advanced age, those with unknown or advanced stage at diagnosis, and those with certain histologic types were more likely to go untreated for bladder cancer. However, their analysis indicated that black/white differences in treatment could not be explained fully by age, stage, sex, or histology. Whether these observed differences in treatment are related to black/white differences in the level of host vulnerability upon presentation (e.g., concomitant illness, nutritional compromise), or perhaps to differences in the level of expertise of physicians and the quality of health care organizations used, remains an issue. Certainly access to health care and the quality of health care for minorities, the poor, and the elderly continue to be a concern (Blendon, et al., 1989; Schlesinger, 1987; Whiteis and Salmon, 1987).

Discussion/Recommendations

Frequently the focus of discussions of applied sociology centers on the role of sociologists employed as researchers in non-traditional settings, the potential conflicts which may arise between the two roles, and the variation in educational preparation required (Freeman and Rossi, 1984). We suggest that the unique contribution of sociology derives not solely from participation as a researcher employed in a non-traditional setting, but from the grounded application of the sociological perspective. It can be argued that applied sociology in any setting should involve the use of a sociological perspective to understand and design solutions to problems, regardless of the sociologist's role in that setting (Straus, 1985). William Foote Whyte's (1948) analysis of the social structure and functioning of a restaurant clearly demonstrates this principal. It would appear that often applied medical sociology has tended to accept the medical model in research and intervention strategies rather than adhering to a sociological perspective. In the area of cancer, a significant amount of research has been directed toward the prevention of cancer. However, much of the work has been limited to screening programs, lifestyle and behavioral modification. While not disputing the value of these preventive measures, this paper suggests that current work fails to address the larger social pattern which contributes to cancer incidence and mortality and which is not addressed by a behaviorist approach to prevention.

From the preceding discussion it should be evident that the black/white differential in cancer survival is inextricably linked with the generally disadvantaged position of blacks in society. It is clear that blacks continue to occupy a subordinate position in the American system of social stratification. In 1986 the median family income for blacks was \$17,604, while the figure for whites was \$29,458. Evidence indicates that blacks have, over the course of history, been over-represented in low-paying jobs. Even the recent "turnaround" in the U.S. economy has damaged the position of black Americans. Since 1980 nearly 3,000 blue collar industrial jobs have disappeared and this has impacted most upon blacks. Simultaneously, cuts in the Federal budget have necessitated abandonment or reduction in domestic programs, further lessening chances for blacks to find employment in other fields. Unemployment continues to be approximately twice as high for blacks as whites (Jacob, 1986; Wilson, 1984). Educational and income disadvantage are equally easy to document. It also would appear that blacks continue to be relegated to occupational and environmental hazards with little attention paid to subsequent health status (Robinson, 1987).

The importance of these points is apparent. In a society in which occupational exposures and medical care are stratified, the disadvantaged will not fare well.

The exigencies of daily life make prevention and even help-seeking a relatively low priority. These, coupled with a cultural heritage of simply making do and surviving, are fertile ground for the development and maintenance of low response to disease signs and symptoms and high cancer mortality risk. Changes in the entire system of stratification are both ambitious and slow remedies. However, a number of more immediate remedies for modifying the structural mechanisms which appear to contribute to this cancer survival differential can be proposed in at least three areas.

Interventions in the Health Care Delivery System

One of the most obvious remedies immediately amenable to implementation is the inclusion of cancer detection procedures in facilities most often used by the poor and many blacks. Howard (1982) has investigated and found feasible the institution of an "in-reach," secondary prevention program in acute care settings. Further, as Baquet and Ringen note, "... there is no justification for sexually transmitted disease clinics not performing a Pap smear when performing a routine pelvic exam (1987:341)." A related area where modification appears feasible includes changing traditional examination practices to account for variations between blacks and whites in disease manifestation. A more difficult area to modify, but one no less amenable to immediate intervention, is the organization of health care delivery itself. Garrett, et al. (1987), for example, report that reducing the fragmentation of health services and increasing the possibility of the development of patient-physician relationships can be accomplished without incurring undue cost or staffing increases in a clinic serving low income patients. Improvements in the design of screening programs and the manner in which services, including patient follow-up of Pap test results, are equally feasible with research, planning, and motivation.

Legislative Interventions

Among the more motivating factors are legal and licensure requirements. It is conceivable that cancer could be made a reportable disease. Such an action might encourage routine cancer screening and lead to better patient follow-up, since a significant number of patients appearing in a cancer registry with advanced disease, less-than-optimum workup, or inadequate treatment appearing in a case abstract, could be viewed as indicative of the practice of poor medicine. Some precedent for this already exists at the state and federal level with respect to cancers associated with occupational exposure. Further, legislative actions in many states requiring employer insurance coverage of mammograms also

speaks to the issue of responsibility and equity in the allocation of non-acute care (Thompson, et al. 1989).

Federal legislative and budgetary decisions appear to have the potential to affect this survival differential in other areas as well. While some of the mechanisms by which nutritional deficiencies impact cancer survival are still under study, it appears clear that the provision of regular, nutritional meals to low income and indigent children could directly impact the continuation of this survival differential. Improving the nutritional and dietary content for disadvantaged Americans in general is likely to have some other positive effects as well. Further, it may be as feasible and economically beneficial to pay farmers to produce surplus for distribution to the disadvantaged as it is to pay farmers not to produce surplus.

Interventions in Occupational Practices

Perhaps the most difficult area in which to effect change is in the area of occupational exposure and employment patterns. While there has been some progress in this area, improvements are still needed in occupational exposure monitoring standards and protection of all workers. Similarly, while employment protection exists legally with respect to hiring practices, federal legislation covering post-hire activities is only now being proposed (1990 Civil Rights Amendment). The protections which will be afforded to temporary, contract, and migratory labor forces remain an issue. Further, legal protections do not consistently translate into compliance, and failure to comply with ethical and legislative employment guidelines is not confined to private industry. While some employment practices call for immediate legislative intervention and enforcement, it is suggested that improvements in the design of legislation, so that changes may be feasibly and effectively implemented by industry, and efforts to develop common goals would have a greater long-term impact (Jordan, 1990). Too often legislative proposals and changes in organizational practices are reactive in nature rather than studied, goal-oriented, and proactive.

Conclusion

It is regrettable that the risks of contracting cancer are differentially distributed within the population. More lamentable, however, is the fact that once the disease has appeared, the chances of surviving it also are differentially distributed. The disadvantaged position of blacks relative to whites in cancer survival will not be rectified with a simple "cancer awareness program," or a "Joint Health Venture" as proposed by Dr. Vincent DeVita, former Director of the National Cancer Institute in his 1985 editorial in *Public Health Reports*. What

will be required is a greater understanding of the mechanisms associated with the existing system of social stratification which contribute to this differential. It is not suggested that sociologists themselves have the means, expertise, or responsibility for designing the ideal intervention or redressing the disparities in survival. What is suggested is that sociologists are in a unique position to provide a framework for the design of more effective interventions.

At the individual level, the expertise of professionals such as health educators, anthropologists, or social workers may be required to adequately understand the unique value, attitude, and need structure of blacks as this relates to risk factors and cancer survival. It is clear, however, that intervention approaches must take these factors into account. At the organizational level, a simplistic approach to reducing black/white survival differences for most cancers would be to place the appropriate number of employees of the appropriate race in each job hazard category or level the nature and amount of health care provided. Given the nature of employment and the nature of the health care system at present, this is not a realistic or desirable approach. The alternative is to promote equity by increasing health care services and reducing hazard exposure for all groups. In any event, it does not appear that the cancer survival differential will be adequately addressed until the issues of equal access to safety and quality health care are addressed.

Current evidence demonstrates that behaviorist interventions alone are inadequate measures to reduce the cancer survival differential. At worst, attributing the differential to "cancer awareness" and "life style factors" is one more form of victim blaming and provides little in the way of direction for programmatic or social policy changes.

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