

RISING LUNG CANCER DEATH RATES AMONG BLACK MEN: THE IMPORTANCE OF OCCUPATION AND SOCIAL CLASS

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From 1950 to 1977 the age-adjusted cancer death rates for nonwhite men in the United States rose an astonishing 63.2 percent, while rates for white men increased 22.2 percent and fell slightly for women of both races. The bulk of this increase can be accounted for by cancer of the lung. As a serious health problem that is increasing in severity, cancer in black men deserves close attention and definitive action. This discussion focuses on basic epidemiological relationships in the origins of this epidemic, particularly in regard to the relative importance of occupation, cigarette smoking, and social class.

Despite continued improvement in the overall mortality rates among blacks in the last decade and a dramatic decline in cardiovascular deaths,^{1,2} the growing cancer epidemic poses a serious threat to the health of black Americans.³⁻⁹ From 1950 to 1977 the age adjusted cancer death rates for nonwhite men in the United States rose an astonishing 63.2 percent while rates for white men increased 22.2 percent but fell slightly for women of both races (Table 1). As described in this report, the bulk of this increase can be accounted for by cancer of the lung. Although the growth of this epi-

demie is currently restricted to men, the recent upsurge in lung cancer among women suggests that both sexes may be involved in the future.

THE RISING PROBLEM IN BLACK MEN

Thirty years ago the age adjusted cancer mortality rates for black men were about 20 percent lower than for whites in the United States.^{5,6} This difference was widely ascribed to underreporting of cancer in blacks, secondary to poorer medical care. It was suggested that the cancer rates in black and whites at that time were essentially the same with the exceptions of cancer of the cervix, which is higher in blacks, and cancer of the skin, which is higher in whites.⁵ Although uncertainty about comparisons during that period cannot be removed, there is little question about the present excess and upward trend of cancer among black men.⁷⁻⁹

In confirmation of the mortality data, a preliminary study of cancer incidence by the Biometry Branch of the National Cancer Institute in 1969 also indicated significant changes of rates in the United States since the last study was conducted in 1947.⁶ The overall incidence of cancer in men increased, a trend particularly marked among blacks, and rates were substantially higher for blacks than whites. Age adjusted incidence rates for all cancer among black men increased from 280 per 100,000 persons in 1947 to 304 in 1969, while the rate among black women decreased from 294 to 256 deaths per 100,000 persons.⁵ This increase among men was due largely to increases in cancer of the prostate and lung and a slight increase in

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**TABLE 1. US CANCER DEATH RATES, BY RACE AND SEX, 1950 TO 1977
(AGE ADJUSTED PER 100,000)**

Year	White Men	Nonwhite Men	White Women	Nonwhite Women
1950	130.9	125.8	119.4	131.0
1977	160.0	205.4	108.3	122.4
Change in Rate	+29.1	+79.6	-11.1	- 8.6
Percent Change	22.2	+63.2	- 9.2	- 6.5

From DHEW: Health: United States 1979. DHEW Publ. No. (PHS) 80-1232. Washington, DC, 1980

**TABLE 2. LUNG CANCER DEATH RATES, BY RACE AND SEX, 1950 to 1977
(AGE ADJUSTED PER 100,000)**

Year	White Men	Nonwhite Men	White Women	Nonwhite Women
1950	21.6	17.0	4.6	4.1
1977	56.4	71.4	15.6	15.7
Change in Rate	34.8	54.4	11.0	11.4
Percent Change	+161.1	+320.0	+239.1	+283.0

From DHEW: Health: United States 1979. DHEW Publ. No. (PHS) 80-1232. Washington, DC, 1980

cancer of the colon. Significantly higher incidence rates of cancer of prostate and esophagus were recorded for black than for white men.

Regarding mortality, over the last three decades death rates among black men from all cancers combined have risen sharply (Table 1). The largest increases have occurred for lung cancer in both races, but the increase in blacks has been almost twice that in whites. Lung cancer rates by sex-race group from 1950 to 1977 are shown in Table 2. Nonwhite males experienced a 320.0 percent increase over this period, compared to 161.1 for whites; females of both races increased roughly to the same degree.

REASONS PROJECTED FOR THE ALARMING INCREASE

In examining the reasons for the alarming rise of the black male cancer mortality rates, one must

first consider the validity of the national statistics.⁶ The question of major errors in the vital statistics has been carefully evaluated for potential under-reporting of cancer in death certificates or errors in the census enumeration.⁶ Consideration has also been given to age and genetic differences, as well as cure rates and environmental factors. All of these considerations except the last appear to be inconsequential and either individually or collectively cannot account for the alarming increase in cancer mortality rates.

Environmental factors remain the key question. Secular trends in cancer rates support this view. There is good reason to believe that much of the rise in lung cancer, for example, is causally related to the increase in cigarette smoking in the United States over the last half-century. The temporal and geographic patterns accompanying the rapid decrease in stomach cancer demonstrate the potential for environmental factors to be associated with a disappearance of common tumors as well.¹⁰

The interaction of many different environmental carcinogens probably influences overall rates. The wide exposure occurring with the growth of modern industry may be important,¹¹⁻¹⁷ particularly for the lung. Workers in those industries have been most intensely exposed and, therefore, would be most affected.

MIGRATION AND ENVIRONMENTAL FACTORS

Data obtained from migrant populations have generally supported the hypothesis that the environment contributes the major carcinogenic potential in the causation of lung cancer.⁸ The US black population has been involved in a large-scale migration from the South to the Northeast and Northwest in recent decades. A primarily rural population continued to migrate from the South to the industrial Northeast and Midwest, and then to the West from 1940 to 1970. This pattern of black migration rapidly accelerated after World War II when 1.6 million blacks, nearly one-sixth of the total southern population, migrated north and west in search of jobs and new opportunities.⁸

The rise in lung cancer mortality among black males is compatible with the pattern of migration for employment and the subsequent latent period for environmental effects. The interaction between environmental and host factors was demonstrated in the analysis of coke oven workers in the steel industry.¹⁵ An important association between place of birth and risk of lung cancer among the nonwhite men occurred with 33 of 35 deaths among men from the South; this could be accounted for by the lower job status of recent migrants.⁸

A review of cancer mortality of men employed in the coal tar industries shows that all of these occupations evidence excess cancer of one or more sites.¹⁵ An excess of lung cancer was observed not only for coke oven workers but also workers engaged in coal carbonization. In addition, those who worked closer to the oven experienced an increased susceptibility to lung cancer.

Occupation has been linked to lung cancer in several areas of the country. In a case control study undertaken to identify reasons for the exceptionally high rate of lung cancer among male residents of coastal Georgia, a significantly increased risk was found to be associated with em-

ployment in area shipyards during World War II.¹⁶ Adjusted for smoking, age, race, other occupations, and county of residence, the summary relative risk estimate was 1.6 (95 percent confidence limits = 1.1 to 2.3), and a synergistic relation was found between shipyard employment and cigarette smoking.¹⁶ These findings suggest that asbestos and possibly other shipyard exposures during wartime employment account for part of the excess mortality from lung cancer in certain coastal areas of the United States.

General occupational categories can also identify increased risks. Based on the total count of cancer sites within each occupation as a crude indicator of relatively hazardous occupations, bricklayers, shoemakers, craftsmen, and operatives in the textile industry would be prime suspects for being exposed to a hazardous work environment.¹¹ Besides having an excessive relative risk of leukemia, bricklayers have excessive risks of cancer of the digestive system (both esophagus and stomach cancers), the respiratory system (both nose and lung cancers), and the urinary system (both kidney and bladder cancers).¹¹ For the most part, those occupations exhibiting high, significant, age adjusted risks of cancer at a specific site continue to show the same, or even a more pronounced effect after adjustment for smoking habits. In 1960 the age adjusted cancer death rates for black men passed that for whites, and this disparity has subsequently continued to increase. Furthermore, the new black male migrants for a large part found work initially as laborers and subsequently as craftsmen and operators, work which was likely to expose them to chemical dusts and fumes. Racist employment practices have forced minorities to take the worst jobs: the most dangerous and the lowest paid (Table 3). Consequently, black males comprise a disproportionate number of the unskilled and blue-collar work force and a small minority of the professional and managerial work force in this country.

Smoking is more prevalent among blue-collar occupations, such as operators, laborers, and service workers, than among professional, technical, and managerial personnel.^{14,18,19} In addition, a higher percentage of never-smokers is found among professional, technical, and managerial personnel than among blue-collar workers. The proportion of white males who had smoked at one time showed a striking occupational difference. A higher propor-

**TABLE 3. OCCUPATION OF MALE WORKERS,
WHITE AND NONWHITE, 1966**

	White (%)	Nonwhite (%)	Median Income of Occupation (dollars)
Professional, technical, managerial	27	9	7,603
Clerical and sales	14	9	5,532
Craftsmen and foremen	20	12	6,270
Operatives	20	27	5,046
Service workers	6	16	3,436
Nonfarm laborers	6	20	2,410
Farmers and farm workers	7	8	1,699

From the Social and Economic Status of the Black Population in the United States 1973. Washington, DC, US Dept. of Commerce, 1974

**TABLE 4. AGE-ADJUSTED PERCENTAGE OF CIGARETTE SMOKERS AMONG 31,803 WHITE MEN
BY MAJOR OCCUPATIONAL CATEGORY, 1970, UNITED STATES**

	Never Smoked	Current Smokers	Former Smokers	Former Smokers (Percent of "Ever Smokers")
Professional, technical and kindred	37.1	30.6	32.2	51.3
Farmers and farm managers	43.4	31.9	24.7	43.6
Managers, officials, and proprietors	29.1	43.5	27.4	38.6
Clerical and kindred	30.9	41.9	27.2	39.4
Sales workers	28.2	42.7	29.1	40.5
Craftsmen, foremen, and kindred	24.7	49.0	26.3	34.9
Operatives and kindred	25.9	50.7	23.4	31.6
Service workers	28.6	47.9	23.5	31.6
Farm laborers and foremen	41.7	45.4	12.9	22.1
Laborers, excluding farm and mine	28.6	50.0	21.4	30.0
Not in labor force	32.5	43.7	23.8	35.3
Total	30.5	43.0	26.6	38.2

From Sterling TD, Weinkam JJ. Arch Environ Health 1978; 33:313-317

tion of individuals who smoke in professional, technical, and managerial occupations stop smoking than among individuals employed in blue-collar and service jobs (Table 4). Similar occupational patterns hold among blacks.¹⁴

Occupational differences are superimposed on racial and sex differences which, after all, are not unrelated to occupational opportunities and patterns. General features of smoking in 1970 by sex and race are summarized in Table 5.¹⁴ (Data represent National Health Examination Survey, 1970.)

Black men currently have a higher prevalence of smokers than white men, and they quit smoking at about half the rate of white men. Black men smoke fewer cigarettes per capita than white men.¹⁴ Table 6 contrasts the average amount smoked and the percent of smokers smoking a pack or more among whites and blacks, men and women. Black smokers consistently smoke less than whites.

The relation between occupation, sex, race, and socioeconomic grouping and cigarette smoking

TABLE 5. PERCENTAGE OF NEVER, CURRENT, AND FORMER SMOKERS, CLASSIFIED BY RACE AND SEX, 1970, UNITED STATES

	Never Smokers	Current Smokers	Former Smokers	Former Smokers as a Percent of "Ever Smokers"
White Males	23.7	42.7	26.5	38.4
White Females	56.4	31.2	11.7	27.3
Black Males	25.8	50.7	14.7	22.6
Black Females	59.7	31.6	7.0	18.1

From Sterling TD, Weinkam JJ. Arch Environ Health 1978; 33:313-317

TABLE 6. AVERAGE AMOUNT SMOKED AND PERCENTAGE OF INDIVIDUALS SMOKING A PACK PER DAY AND MORE CLASSIFICATION BY RACE AND SEX, 1970, UNITED STATES

	Average Amount Smoked (per day)	Percent Smoking a Pack or More
White Males	21.7	65.6
White Females	15.0	38.1
Black Males	18.0	54.6
Black Females	12.6	29.9

From Sterling TD, Weinkam JJ. Arch Environ Health 1978; 33:313-317

may have far reaching public health implications. Furthermore, we now see that the difference in smoking prevalence is related also to the socioeconomic level of an occupation. By occupation, the pattern of giving up smoking is just the opposite of active smoking; the proportion of individuals who quit smoking is low among blue-collar groups and high among professions and management.

CONCLUSION

In some surveys the fact that blacks have been found to smoke fewer cigarettes than whites raises important questions concerning the role of smoking as the primary cause of the black-white differential in lung cancer.¹⁴ Some of the findings discussed support the hypothesis that the lung cancer differential between black and white men may be largely a result of migration and occupa-

tional exposure to chemical dusts and fumes in industrial employment. Migration has also been associated with changing rates in white population groups.²⁰⁻²¹ Many of the jobs with the greatest exposure to health hazards are now filled by black men, and it is no surprise that the pressure and anxiety of the black male's life can provoke the need to smoke.²² It would appear that air and water pollution and modern food technology are not at the root of the black male lung cancer problem. The parts of the causation puzzle now assembled in respect to the cancer excess among black men point primarily to the association between occupation, socioeconomic grouping, and harmful aspects of migration and racism, in conjunction with cigarette smoking. Of added interest is the rapid rise in lung cancer among women,²³ accompanied by increased industrial employment.

It would appear more reasonable to ascribe the larger prevalence of lung cancer among black than white men to the larger percentage of black men in occupations where they are exposed to various environmental factors^{10,11,13-17,24} (ie, chemical dusts, fumes, and other toxic airborne particles) and the process of racism that perpetuates this, than to any differences in smoking habits between them. Any public health effort to curb and reverse the upward trend in cancer among blacks must address the conditions of industrial work, as well as the smoking habit.

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