

Black-White Differences in Health Status: Methods or Substance?

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THIS SUPPLEMENT TO THE *MILBANK QUARTERLY* is devoted to concerns about the effects of national health policies on the health status of the black population in the United States. Much of it necessarily addresses differences between blacks and the rest of American residents, particularly the majority white population. Our purpose is to consider how these apparent differences are influenced by issues of measurement. Do inconsistencies in the measurement process exaggerate or mask differences in health status between blacks and whites? Answers are essential to understanding how planning and resource allocation decisions based on assessed health status might be affected by methods.

The following sections will: (1) discuss problems in measuring health status and consider how various measures of health status might suggest differences between blacks and whites reflecting measurement errors and erroneous interpretation; and (2) provide empirical comparisons of health status measures for blacks and whites based largely on national data sources to explore further whether observed differences represent "methods" or "substance."

Problems in Measuring Health Status

The issues of measurement we will consider include: (1) sources of measurement error; (2) data collection methods; (3) interpretation of the measures; and (4) types of measures used to represent health status. Each issue will be defined, and related problems in comparing black and white health status will be identified.

Sources of Measurement Error

Errors in measuring health status can be separated into variable or random error and bias or systematic error (Kish 1965, 509, 519–20; Andersen et al. 1979). A common type of *variable error* arises from sampling because a sample can represent only a subset of a population. Differences between the sample estimates and the population are variable errors. These variable errors decrease as sample size increases.

Biases, on the other hand, are independent of sample size and exist in measures of the total population as well as in a sample. Important types of bias include: noncoverage or failure to include some types of individuals in reporting systems at all; nonresponse or lack of complete information on some persons; and errors of observation resulting from faulty data collection or processing. We shall consider how variable errors and biases may differentially influence health status estimates of blacks and whites.

Variable Sampling Error. The National Health Interview Survey is an annual probability sample of approximately 35,000 households with health information obtained on all household members (Moss and Parsons 1986, 132). Even this sophisticated, large survey, however, is subject to random errors which differentially have an impact on estimates for blacks and whites.

Because it is a national sample survey, the Health Interview Survey includes relatively small numbers of blacks because they are a minority of the total population. The results for blacks (especially for subgroups of blacks divided, for example, by age and sex) are subject to substantial variable errors.

The Health Interview Survey has taken steps to reduce this problem by oversampling black persons beginning with the 1985 survey (Moss and Parsons 1986, 132). Sampling rates were increased for areas known to have the highest concentrations of black persons.

Noncoverage Bias. Other studies of the health of black populations are subject to even more substantial problems of not only variable error but also bias. Jackson (1981) documents noncoverage bias where local nonprobability samples are used to draw conclusions about more general black populations. For example, reports of black women in St. Louis who had migrated from the rural south are used in one study to generalize the health practices of all pregnant black women.

Another problem of noncoverage is the use of telephone surveys to represent the total population. When poor blacks are less likely to have phones, noncoverage bias can substantially influence comparisons of health status between blacks and whites. (In the ongoing Urban Family Life Survey being conducted for William J. Wilson in low-income segments of Chicago with largely black populations, the National Opinion Research Center (NORC) estimates that 20 percent of the households do not have telephones for personal communication [Sara Segal Loevy, NORC, Chicago].)

A final important type of noncoverage bias is the "denominator problem." Certain types of blacks (e.g., young male inner-city blacks) may be systematically excluded from population counts. In subsequent ratio comparisons such as mortality rates, the black rate might be overstated because the denominator (population count) is incomplete.

Nonresponse Bias. Nonresponse bias can also affect black-white comparisons. The problem arises if response rates differ by race, or if nonrespondents of one race are less like respondents than is true for the other race. The evidence on participation in surveys by race is mixed. Participation tends to be higher among rural southern blacks and lower among inner-city urban blacks. Overall, Andersen et al. (1979, 135) found response rates similar in a national health survey conducted in 1970. The Health Examination Survey found blacks less likely than whites to participate in the oral glucose tolerance test to determine the presence of diabetes (Hadden and Harris 1987). Vernon, Roberts, and Lee (1984) using data from the longitudinal Alameda County Health Survey from 1965 and 1975 found blacks and Mexican-Americans less likely to be participants than whites in the follow-up survey. Some characteristics associated with black nonparticipation included younger age, unemployment, residential mobility, and depression.

Observational Bias. Observational biases that occur in the process of reporting of illness can also influence black-white differences. An example of a possible observational bias is the interviewer effect which

may arise between a white interviewer and black respondents (Shosteck 1977; Sudman and Bradburn 1980, 93–139). Another is differential reporting given the same underlying conditions. Berkanovic and Telesky (1985, 575) conclude that transitory physical sensations, however painful, are less likely to be defined as illness (by blacks) than they are by either Mexicans or whites.

Data Collection Methods

Data collection methods for measuring health status are commonly divided into: (1) direct observations of patients made by health professionals (e.g., autopsy reports and clinical examinations); (2) records originally collected for some other purpose such as treating patients (e.g., hospital records and physicians' medical charts) or compiled for administrative and legal purposes (e.g., school attendance, workers' compensation, and Social Security); and (3) self-reports provided directly by individuals (e.g., population-based health interview surveys and patient satisfaction surveys). Our concern about types of data collection is that certain collection methods may produce different results for blacks and whites not related to underlying health status.

Direct Observations. Direct observations of health status are likely to provide the most objective indicators of health for a population. Even here, however, problems in measurement can occur. Medical practices and diagnostic labeling, for example, may vary by physician and hospital as well as by geographic area. Furthermore, hospitals and physicians may unwittingly and systematically misclassify and misdiagnose patients.

Records. Records, which in many cases are completed by individuals without a medical background, provide a less objective measurement of health status. Workers' compensation records, for example, may vary by state and other political units and in the number and type of data items they contain; certain data items may routinely not be answered; and data that are reported may be inaccurate.

Self-reports. Self-reports of health status are likely to provide the least objective measurement of health status. Certain individuals and groups may refuse to participate in health surveys; or when they do participate, may not accurately report events because of lack of recall, misinterpretation of questions, or provide erroneous but socially acceptable answers.

All methods of collection have the potential to affect comparisons of health status between blacks and whites. Direct observations and records may vary because of differences in site of service by blacks or whites or may vary by race because of differences in where blacks and whites live and work. Self-reports show systematic differences between blacks and whites in reporting of conditions as well as services received and health insurance coverage (Andersen et al. 1979).

Interpretation Errors

Interpretation of measurements may lead to erroneous conclusions about differences in health status between blacks and whites. Interpretation errors can result because the meaning of a particular measure is misunderstood or the results are inappropriately generalized to another time or a more general population group.

An important way in which errors in interpretation can influence conclusions about black-white differences is failure to consider intraethnic diversity. In the past, many survey results were reported only for "nonwhites" and "whites." Jackson (1981) notes that studies need to account for potentially large differences between northern and southern blacks, urban and rural blacks, native and foreign-born blacks. Variation among blacks in other factors such as age, sex, and income should also be systematically considered in order to understand how black-white differences in health status are influenced by a myriad of other factors that determine health status.

Types of Health Status Measures

Health status is a complex concept and difficult to measure. Though various approaches to measuring health status have been suggested in the literature, we will use the five types suggested by Patrick and Elinson (1979): death, disease, disability, discomfort, and dissatisfaction. These types range from objective provider-determined measures of causes of mortality (death) to more subjective patient-oriented evaluations of how well an individual's perceived health care needs are being taken care of (dissatisfaction). Table 1 records major sources of data for each of the types of measures as well as primary methods of data collection for those sources. A central question addressed in this article is how different the health status of blacks compared with whites appears to

TABLE 1
Major Sources of Information by Type of Health Status Measure and Method of Collection

Health status measure	Primary collection method		
	Direct observation	Record	Self-report
DEATH			
Death certificates		×	
Certificates of fetal death		×	
Autopsy reports	×		
Life insurance claim records		×	
DISEASE			
Reports of notifiable disease	×		
Hospital medical charts		×	
Private physician medical charts		×	
Prepaid group practice program records		×	
Health insurance claim records		×	
Disease registers	×		
Health interview surveys			×
Health examination surveys	×		
DISABILITY			
Employer records		×	
School attendance records		×	
Health insurance claim records		×	
Hospital medical charts		×	
Workers' Compensation records		×	
Social Security records		×	
Individual and household health surveys			×
DISCOMFORT			
Patient surveys			×
Individual and household health surveys			×
Hospital medical charts		×	
DISSATISFACTION			
Patient satisfaction surveys			×
Individual and household health surveys			×

be depending on the type of health status measure used. Consideration of sources of error, collection methods, and issues of interpretation helps to clarify this question.

Death. In obtaining and interpreting information on the number and causes of deaths for blacks and whites, a number of problems arise. The amount and quality of data on deaths depend upon such factors as: the extent to which the deceased were medically studied before death, and the degree of familiarity certifying physicians had with them. Since sources and kinds of health services differ for blacks and whites (e.g., blacks are more likely to have no regular source of care or use outpatient departments and emergency rooms and be admitted to public and large teaching hospitals [Andersen et al. 1987]) bias of largely unknown magnitude and direction may be included in comparative mortality statistics.

The diagnostic (and in some cases demographic) terms used on death certificates are revised approximately every ten years. Thus, longitudinal analyses of differences between black and white mortality may be difficult to compare over time. These changes reflect medical advances, the changing profile of health problems, and social recognition. Only in recent years, for example, have deaths been coded by race, as opposed to the color system of "white" and "nonwhite" (Cooper and Simmons 1985).

Another difficulty with death certificates is the validity of information they contain. Coding of death certificates is subject to misclassification in categories such as sudden coronary death. In many cases, demographic and occupational information is obtained by the funeral director from the available next of kin. The accuracy and completeness of this information is generally low. For example, the occupation of individuals who were employed for many years may be listed as retired, and women who have worked outside the home for many years may be described as "housewives." Such misclassifications may be correlated with race. They may be especially important in mortality studies examining race and occupation since black Americans are exposed to more occupational hazards than are whites (Kleinman, Fingerhut, and Feldman 1980, 28).

Although autopsy reports generally provide the most accurate data about the cause of death of individuals, they cannot be used to generalize about the health status of a population for they are done on a nonrandom sample of all deaths. Furthermore, because of increasing

costs and perceived clinical value, the proportion of autopsies (currently about 15 percent of all deaths [Mausner and Kramer 1985, 73]) has been declining over the last decades. Also, the quality of information from autopsies may vary. Some are performed by medical examiners while others are conducted by a coroner who may not be a pathologist or even a physician. There are no current national estimates of the proportion of blacks or whites who are autopsied.

Last, comparisons of deaths for blacks versus whites reflect survivor effects as well as selection by competing cause which can lead to interpretive errors. Cooper and Simmons (1985, 344) indicate that:

The survivor effect is best seen in the black-white crossover in old age. Thus, while few blacks live to the age of 80, those who do survive are healthier and suffer lower age-specific death rates than do whites. Since a large proportion of the white population survives into old age, they will be more likely to die of the more common diseases of old age. The phenomenon of competing cause tends to eliminate potential candidates for a specific disease through premature death from another related disease.

Disease. A common method of determining the disease status of a population is through the utilization of hospital medical charts. These charts, however, also have their deficiencies.

Data based on hospital discharges or admissions may provide a biased picture of the illnesses of a population due to noncoverage of all illnesses. For example, acute minor illnesses may be treated in a physician's office or not treated at all. In addition, serious chronic diseases that are followed on an outpatient basis may also not appear in data based on hospital inpatient records.

Nonresponse error is also a problem. Because many hospitals still do not have automated medical record systems, hospital statistics on even a primary diagnosis may be difficult to collect. Cases that should be included may be missing because records are lost or misplaced.

Bias in hospital records resulting from both noncoverage and non-response can interfere with use of these data to compare health status of blacks and whites. For example, if blacks are less likely to seek service or be admitted to the hospital for less serious conditions, hospital data would underestimate the prevalence of these conditions vis à vis whites (Kravits and Schneider 1975). Furthermore, if the kind of hospitals blacks are more likely to use (e.g., public and inner-

city teaching hospitals) keep records either more or less complete than other hospitals, comparative black-white statistics could be misleading.

Disability. Disability can be defined and measured in a variety of ways. For insurance purposes, disability is defined as the inability to engage in gainful employment. Health researchers, on the other hand, generally define disability as any temporary or long-term reduction of a person's activity as a result of an acute or chronic condition. Three measures of disability are commonly used: restricted-activity days, work-loss days, and bed-disability days.

Some of the most commonly used sources of information on the disability status of the nation's population are national household surveys such as the National Health Interview Survey (Wilder 1986). Other sources of disability data—including those from employer records, school attendance records, health insurance records, etc.—are likely to be even more subject to bias and variable error.

Using disability days to represent health status can lead to significant interpretive error. Employees who are not ill, especially single parents with a large number of children, may take sick days to stay home with a sick child. Children may not attend school for a variety of reasons. And people may falsely claim disability to collect insurance money.

Lastly, disability, in many cases, may be unrelated to disease, and may instead be a measure of morale or conformity as, for example, when workers purposely take sick days because of alienating and stressful working conditions (Patrick and Elinson 1979). Correlations between race and nonhealth-related disability days could lead to biased comparisons of black-white health status differences.

Discomfort. Estimates of a population's level of discomfort (feelings of aches, pains, tiredness, sadness, etc.) are generally obtained through the use of individual and household surveys. Discomfort estimates are subject to considerable measurement and interpretation error.

The degree of reported discomfort of a population may vary because of a host of factors. Individuals may vary in their ability to assess various levels of discomfort and their importance. Some individuals—for example, the "worried well"—may indicate higher levels of discomfort than others. In contrast, individuals who may be experiencing great discomfort, and indeed at a high risk of death, may not report it at all. These differences as well as the perception of health status in

general seems likely to vary due to learning and cultural differences in the perception of health (Linn, Hunter, and Linn 1980).

An example of apparent differences in perceived discomfort can be found in a recent study of prehospital delay of myocardial infarction among black patients conducted at Cook County Hospital in Chicago. Cooper et al. (1986) found that the delay time from onset of symptoms to arrival at the hospital for blacks was markedly prolonged compared with studies of predominantly white populations.

Another problem with measuring discomfort and other self-reported health status indicators is that few of them have been objectively evaluated and verified. Watkins (1983), for example, states that the administration of questionnaires to black Americans concerning chest pain is likely to yield overestimates of the frequency of coronary heart disease.

Dissatisfaction. Information on dissatisfaction can be used in two widely different ways. First, it can be used to measure the feelings of acceptance or rejection of health services offered by professionals. Second, it can be used to measure the degree of satisfaction with one's state of health, regardless of the medical care process.

The most common sources of information on dissatisfaction are population surveys of individuals and households and surveys of hospitalized patients. The results of these surveys generally indicate that most people are satisfied with the care they receive, while a smaller number are dissatisfied (Fleming 1979, 1981). The reasons for this dissatisfaction vary and may produce interpretive errors in any estimate of a population's health status. Individuals may be dissatisfied because they have increasing expectations which are not met; they may be treated in various ways they are not accustomed to; or they may feel, in the case of patients, that their service will be unfavorably influenced by their complaints. As reasons for expressions of dissatisfaction vary between blacks and whites, substantial potential for interpretive errors in assessing differences in dissatisfaction occur.

Empirical Comparisons of Types of Health Status Measures

In this section we will compare the health status of blacks and whites using different types of measures: death, disease, disability, discomfort,

and dissatisfaction. Recent national data sources are employed for the most part. Our purpose is to show how these comparisons vary by type of measure and to explore, in some instances, how methods may influence the apparent differences between blacks and whites. Some ideas presented in the previous section concerning sources of errors, collection methods, and interpretation errors will be employed to help separate issues of "methods" from those of "substance."

Table 2 provides a summary view of black-white comparisons of health status according to a range of measures representing death, disease, disability, discomfort, and dissatisfaction. The conclusions vary greatly depending on which measures are emphasized.

For the most objective measure (death) and the most subjective measure (dissatisfaction), blacks appear to have much poorer health status. The age-adjusted death rates are 50 percent higher for blacks than for whites for both sexes. Similarly, the proportion of blacks reporting only fair or poor health is almost twice the proportion for whites, and blacks are also more likely to report little satisfaction with their health and physical condition.

In contrast, the self-reporting of acute conditions is actually higher for whites than for blacks for all age groups (especially for children). Number of disability days and symptoms of illness reported by blacks and whites varies according to age: the ratios are lower for children (whites report relatively more) and higher for adults (blacks report relatively more).

Finally, more blacks than whites report chronic conditions resulting in activity limitation but the differences (ratios) are not as great as for measures of death and dissatisfaction. We now turn to more detailed consideration of what some of these differences by types of measures may mean. We will refer back to table 2 throughout this section.

Death

The age-adjusted death rates shown in table 3 clearly reinforce the view that the health status of blacks is worse than that of whites. For both males and females the black death rate exceeds the white rate by 50 percent. The black rate is greater for all of the most common causes of death (heart disease, cancer, stroke, accidents, and homicides). Only for pulmonary disease and suicide among those listed

TABLE 2
Selected Health Status Measures According to Race: United States

Health status measure	Black	White	Ratio
DEATH (age-adjusted deaths per 100,000, 1984) ¹			
Male	1,012	690	1.5
Female	585	391	1.5
DISEASE (percentage of persons with limitations in activity due to chronic conditions, 1985) ²			
Under 18	6%	5%	1.2
18-44	9	8	1.1
45-64	31	23	1.4
65-69	50	38	1.3
70 and over	48	39	1.2
Number of acute conditions per 100 persons per year, 1985 ³			
Under 18	183	283	0.6
18-44	130	174	0.8
45 and over	98	109	0.9
DISABILITY (number of days activity restriction per person per year, 1985) ⁴			
Under 5	9	9	1.0
5-17	7	9	0.8
18 and over	22	16	1.4
DISCOMFORT (number of symptoms reported per person per year, 1982) ⁵			
Under 18	0.4	0.6	0.7
18-44	1.1	1.3	0.8
45-64	1.9	1.7	1.1
65 and over	2.1	2.0	1.0
DISSATISFACTION (age-adjusted percentage of persons who report health as fair or poor, 1985) ⁶			
All ages	17	9	1.9
Percentage of persons with some, little, or no satisfaction with health and physical condition, 1985) ⁷			
All ages	12%	8%	1.5

¹ National Center for Health Statistics 1986a, table 20.

² National Center for Health Statistics 1985, table 67.

³ National Center for Health Statistics 1985, table 3.

⁴ National Center for Health Statistics 1985, table 69.

⁵ Center for Health Administration Studies, University of Chicago, unpublished data. The study producing the data and the symptom measures are described in Andersen et al. 1987, chap. 6 and appendix A.

⁶ National Center for Health Statistics 1986a, table 39.

⁷ National Opinion Research Center 1985.

TABLE 3
Age-adjusted Death Rates for Selected Causes, According to Sex and Race,
United States, 1984, per 100,000 Resident Population

Cause	Males			Females		
	Black	White	Ratio	Black	White	Ratio
All causes	1,012	690	1.5	585	391	1.5
Heart disease	300	250	1.2	187	124	1.5
Cerebrovascular disease	63	34	1.8	52	29	1.8
Malignant neoplasms	235	159	1.5	131	110	1.2
Pulmonary disease	23	28	0.8	8	12	0.7
Pneumonia and influenza	25	16	1.6	11	9	1.2
Cirrhosis of liver	22	13	1.7	10	6	1.7
Diabetes	18	9	2.0	20	8	2.5
Accidents	65	51	1.3	20	18	1.1
Suicide	11	20	0.6	2	6	0.3
Homicide	51	8	6.4	11	3	3.7

Source: National Center for Health Statistics 1986a, table 21.

do we find the white rate higher. While measurement errors of one sort or another might cause minor variations in the mortality ratios shown, a general conclusion from table 3 that blacks experience poorer health seems undeniable.

Disease

Table 2 records that blacks of all age groups in the National Health Survey are more likely to report chronic conditions that result in activity limitation than are whites. Chronic conditions include diseases or impairments that are likely to be irreversible, ranging from the major killers such as heart disease, cancer, and stroke to others less likely to kill but which can result in considerable debilitation such as arthritis and asthma. Chronic conditions also include all those that have lasted two weeks or longer. The differences in reporting of chronic conditions that limit activity by race, however, are less than the differences in mortality rates as indicated by the ratios in table 2 (1.5 for mortality versus 1.1 to 1.4 for chronic conditions).

TABLE 4
Survival by Selected Sites of Cancer, by Race in Various Cities and States:
1973–1980*

Site	Relative 5-year survival		Ratio
	Black	White	
Esophagus	3%	5%	0.6
Stomach	14	14	1.0
Colon/rectum	42	50	0.8
Larynx	57	67	0.9
Lung/bronchus	10	12	0.8
Breast	62	74	0.8
Cervix	62	68	0.9
Prostate	58	68	0.9
Bladder	48	73	0.7

* Rates are from the Surveillance, Epidemiology, and End Results Program (SEER) and include patients diagnosed through 1980 and follow-up on all patients through 1981. They are based on data from population-based registers in Connecticut, New Mexico, Utah, Iowa, Hawaii, Atlanta, Detroit, Seattle-Puget Sound, and San Francisco-Oakland.

Source: U.S. Department of Health and Human Services 1986, 38.

Acute conditions as defined by the National Health Survey include diseases or injuries lasting less than two weeks that are not included on the chronic disease list. Most commonly reported as acute conditions are respiratory problems such as “colds” and minor injuries. Table 2 records that these less serious acute conditions are actually reported more often by whites than by blacks—especially for children under 18 where the black rate is only 60 percent of the white rate.

The picture that begins to emerge is that the health status of blacks compared with whites appears worse using measures of mortality than self-reports of disease. And if we were to restrict ourselves to self-reports of acute conditions only, we might even conclude that the health status of blacks is better than for whites.

Evidence on the incidence and seriousness of disease from sources besides self-reports, however, calls the above conclusion into question. Table 4, for example, provides information on the survival rates for black and white patients diagnosed as having cancer from selected areas throughout the United States. For all sites of cancer shown except the stomach, the five-year survival rate for blacks is less than

for whites. About 50 percent of all white patients registered survived five years compared to less than 40 percent of the black patients. Survival rates are influenced by the stage at which the cancer was diagnosed and the nature of follow-up treatment. The major lesson from table 4, however, is that even use of diagnosed disease prevalence for a serious condition like cancer may lead to an underestimate of the negative impact on the health status of blacks compared with whites. Once they have cancer, blacks are likely to die sooner.

In table 5 we compare national disease rates for selected conditions according to three methods of data collection: death certificates, hospital discharge records, and self-reports. Our purpose is to see if self-reports of these serious diseases suggest relatively better health status for blacks (lower ratios) than death rates would suggest (higher ratios). Hospital discharge rates differ in that they are based on treated conditions. Blacks are also, unfortunately, combined with other nonwhites in the source for hospital discharge rates. Our expectation was that black-white ratios might also be higher for hospital discharges than for self-reports. Notice that none of the rates in table 5 are age adjusted since our main purpose is to compare the ratios for different methods rather than to compare the actual black-white rates within a method.

The results in table 5 are mixed. Comparing death rate ratios to reported prevalence ratios shows death record ratios higher, as predicted, for heart disease and much higher for nephritis. The ratios, however, are the same for diabetes and the self-report ratio is actually higher than the death rate ratio for stroke.

The hospital discharge, self-report comparisons in table 5 show the black-white ratios to be higher for discharges in the case of diabetes but the same for heart disease and the self-report ratio is again higher for stroke. Thus, from a disease-specific perspective, we might conclude that blacks are in relatively better health using self-reports than if we used death or hospital discharge records for some diseases—but for other diseases this is not the case.

Table 6 records another way of examining the extent to which self-reports of disease might overestimate the health status of blacks relative to whites. It shows results from a health examination given to a national sample of the population regarding diabetes and hypertension. The diagnosed columns show the proportion of people examined who reported at the time of the examination that a physician had previously diagnosed their disease. For example, 4.5 percent of black males aged

TABLE 5
Crude Rates of Death, Hospitalization, and Self-reporting for Selected Conditions, by Race, United States, 1984

	Deaths/100,000			Hospital discharge/10,000			Reported prevalence/1,000		
	Black	White	Ratio	Nonwhite	White	Ratio	Black	White	Ratio
Heart disease	262	340	0.8	100	149	0.7	60	89	0.7
Cerebrovascular disease	64	67	1.0	31	36	0.9	15	12	1.2
Malignant neoplasms	177	198	0.9	66	84	0.8	—	—	—*
Diabetes	20	14	1.3	34	20	1.7	21	16	1.3
Nephritis and infections of the kidney	14	9	1.6	—	—	—*	15	17	0.9
Pneumonia	20	26	0.8	32	33	1.0	—	—	—**

* Not included in source.

** Not reported because of limited number of black cases.

Sources: Death rates calculated from National Center for Health Statistics 1986b. Hospital discharge rates from Graves 1986. Reported prevalence rates calculated from Moss and Parsons 1986, tables 59, 64.

TABLE 6
 Percentage of Persons with Diagnosed and Undiagnosed Diabetes and Hypertension, by Race, Sex, and Age, United States,
 1976-1980

	Diagnosed			Undiagnosed		
	Black	White	Ratio	Black	White	Ratio
DIABETES						
Male						
20-74	4.5	2.8	1.6	4.0	2.5	1.6
20-44	1.8	0.5	3.6	1.0	0.5	2.0
45-54	3.6	4.5	0.8	7.5	3.2	2.3
55-64	9.2	5.3	1.7	5.2	3.8	1.4
65-74	17.2	9.1	1.9	12.2	9.0	1.4
Female						
20-74	5.9	3.6	1.6	4.6	3.4	1.4
20-44	2.6	1.4	1.9	0.9	0.8	1.1
45-54	7.5	3.9	1.9	7.0	4.6	1.5
55-64	16.3	6.6	2.5	9.1	7.9	1.2
65-74	10.8	8.8	1.2	12.3	7.3	1.7

HYPERTENSION									
Male	18-74	16.1	12.5	1.3	9.9	9.8	1.0		
	18-24	1.4	1.7	0.8	3.3	5.2	0.6		
	25-34	8.2	5.7	1.4	6.2	7.2	0.9		
	35-44	20.2	6.7	3.0	14.5	10.5	1.4		
	45-54	22.6	20.2	1.1	11.0	12.2	0.9		
	55-64	36.7	24.6	1.5	17.2	13.4	1.3		
	65-74	28.4	28.6	1.0	16.8	15.0	1.1		
Female	18-74	26.2	14.2	1.8	4.5	5.6	0.8		
	18-24	2.5	0.8	3.1	1.7	1.3	1.3		
	25-34	5.9	2.7	2.2	2.9	1.9	1.5		
	35-44	21.6	7.2	3.0	3.0	5.1	0.6		
	45-54	52.0	19.8	2.6	9.7	8.0	1.2		
	55-64	55.5	29.3	1.9	6.2	9.5	0.6		
	65-74	68.8	41.8	1.6	7.7	11.6	0.7		

Sources: Diabetes: Hadden and Harris 1987, tables 1 and 2. Hypertension: Drizd, Dannenburg, and Engel 1986, tables 13, 15.

20 to 74 reported that they had been previously diagnosed for diabetes; 2.8 percent of the white males said the same. The undiagnosed columns show the percentages of the population found to have diabetes and hypertension at the time of the health examination survey who had *not* been previously diagnosed by a physician. For example, 4.0 percent of the black males and 2.5 percent of the white males were found to have diabetes at the time of the examination but did not know they had the disease.

The ratios in table 6 show that blacks are more likely to have previously diagnosed diabetes and hypertension. This is true for both males and females for most age groups. What is more important for our purposes is that blacks are also more likely to have undiagnosed diabetes than are whites. Blacks, however, are not more likely to have undiagnosed hypertension. The ratios show that black males have 60 percent more undiagnosed diabetes than white males and black females have 40 percent more than their white counterparts. Black and white males, however, have about the same rate of underreporting of hypertension overall, and undiagnosed hypertension is actually slightly more prevalent for white females than for black females, especially at older ages. The results from table 6, then, support our concern that self-reporting of disease in the case of diabetes may lead to conclusions that the health status of blacks compares more favorably to whites than a clinical examination would confirm. The results for hypertension, however, do not show such systematic biases.

Table 7 records another comparison of self-reporting—this time with physician and hospital records. It is based on data from a national survey of the population in which respondents were asked what physicians and hospitals they visited, what conditions they were treated for, and what surgical procedures were performed in the hospital. Physician and hospital records were then searched in an effort to match the conditions and procedures reported by the respondents. As table 7 records, less than one-half of the conditions reported by all respondents could be matched in the records while one-half to three-quarters of the surgical procedures were matched. The proportion of matches for whites exceeded that for nonwhites (over 90 percent of whom were black) for both conditions and surgical procedures. These results suggest that black self-reporting of specific conditions and procedures may be less accurate than white reporting when hospital and physician records are used as validity criteria.

TABLE 7
 Percentage of Self-reports of Conditions and Procedures Matched by
 Record, Race: U.S., 1970

Type of condition or procedure	Nonwhite	White	Ratio
Physician visit conditions matched by records	33%	36%	0.9%
Hospitalized conditions matched by records	35	43	0.8
Surgical procedures matched by records	54	73	0.7

Source: Daughety 1979, tables 5.1, 5.3, 5.5.

In general, the comparisons of self-reporting of disease with other data sources in this article suggest that self-reports can be misleading as measures of health status differences between blacks and whites. A similar concern is voiced by Haynes, Wolde-Tsadek, and Juarez (1985, 110), based on a study of conditions of physicians as seen in their private practices, according to the National Ambulatory Care Survey;

If Blacks and Hispanics feel a lesser sense of medical need, then the magnitudes of the identified circulatory, digestive, and musculoskeletal problems are underestimated and there might be other problems to which they are at greater risk but whose significance is suppressed. This is of special interest since the morbidity findings are certainly not as striking as the mortality statistics would suggest.

Disability

Table 2 records the average number of days per year of people reported being unable to engage in their usual activities because of illness or injury. For preschool children, usual activity might be play; for school age children, going to school; and for adults, working, keeping house, etc. Thus, this measure is designed to capture disability that results from transitory, acute conditions rather than long-term reduction in function resulting from chronic conditions.

The number of disability days per person per year is the same for

TABLE 8
 Number of Restricted Activity Days Associated with Acute Conditions per
 100 Persons per Year, by Race, Age, and Type of Condition: U.S., 1985

Type of condition	Black	White	Ratio
All acute conditions			
Under 18	583	705	0.8
18-44	724	650	1.1
45 and over	862	737	1.2
Infectious and parasitic diseases			
Under 18	151	143	1.1
18-44	30	47	0.6
45 and over	20	30	0.7
Respiratory conditions			
Under 18	238	348	0.7
18-44	220	246	0.9
45 and over	317	299	1.1
Digestive system conditions			
Under 18	18	15	1.2
18-44	30	19	1.6
45 and over	70	41	1.7
Injuries			
Under 18	60	84	0.7
18-44	221	195	1.1
45 and over	193	203	0.9
All other conditions			
Under 18	114	115	1.0
18-44	144	223	0.6
45 and over	162	264	0.6

Source: National Center for Health Statistics 1985, table 18.

black and white children under 5 years of age as reported in table 2. For children 5 to 17 the mean number of disability days reported is actually greater for whites than for blacks. It is only for adults that we find reported disability days higher for blacks.

Table 8 allows us to see if the general pattern of relatively more disability days for white children and black adults holds for most acute conditions resulting in disability days. The general pattern holds for all acute conditions as well as for respiratory and digestive conditions and injuries. Only for infectious and parasitic diseases and the residual category are the relationships reversed, with the ratios higher for

children (showing relatively more disability days for black children). The data in table 8 then confirm the results from table 2 showing lower ratios for children than for adults for most acute conditions. The discrepancy for infectious disease requires further study but may reflect more serious and debilitating problems in this category for black children.

A different measure of disability is activity limitation resulting from chronic conditions, as reported in table 9. The purpose of this table is to see if blacks report relatively more serious long-term disability than the short-term type resulting from acute conditions. The data in table 9 seem to confirm this expectation. Blacks are less likely to report no activity limitation than are whites. Blacks are also less likely to report activity limitation but not in major activity for children and young adults. In contrast, blacks are much more likely than whites to report being unable to carry on major activities due to chronic conditions in all age groups.

The methodological import of these results is that disability measures based on reporting of restricted activity days in response to acute conditions or activity limitations with no specification of degree of limitation may overstate the health status of blacks compared with whites—especially for children. Measures that are limited to possibly more serious acute conditions or major activity limitation show blacks to be relatively more disadvantaged in health status compared with whites. These latter measures, in particular, suggest black children are not in better health than white children but may be in worse health.

Discomfort

Discomfort is a subjective dimension of health status, based on people's self-reports of pain, worry, or other indicators that all is not well regarding their health. The measure of discomfort used in table 2 is based on a checklist of fifteen symptoms that respondents indicate were or were not experienced in the last year. The symptoms concern various body systems and both acute and chronic problems. Some are commonly experienced (sore throat or runny nose) while others are infrequent and often associated with serious problems (loss of over ten pounds in weight). The score reported in table 2 is the mean number of these symptoms reported by samples of central city residents

TABLE 9
 Percentage of Persons with Degree of Limitation Resulting from Chronic
 Conditions, by Race and Age: U.S. 1985

Degree of limitation	Black	White	Ratio
No activity limitation			
Under 18	94%	95%	1.0%
18-44	91	92	1.0
45-64	69	77	0.9
65-69	50	62	0.8
70 and over	52	61	0.8
Limited but not in major activity			
Under 18	1	2	0.5
18-44	2	3	0.7
45-64	6	6	1.0
65-69	11	8	1.4
70 and over	19	20	1.0
Limited in amount or kind of major activity			
Under 18	4	3	1.3
18-44	3	4	0.8
45-64	10	9	1.1
65-69	11	15	0.7
70 and over	17	13	1.3
Unable to carry on major activity			
Under 18	1	*	1.5
18-44	4	2	2.0
45-64	15	8	1.9
65-69	28	16	1.8
70 and over	12	6	2.0

* < 0.5 percent.

Source: National Center for Health Statistics 1985, table 67.

residing in five metropolitan areas representing all sections of the nation,

Table 2 records that black children and younger adults report fewer symptoms than whites. The number reported among older adults is similar according to race. These results for symptom reporting—our measure of discomfort—parallel the findings in table 2 for reporting of acute conditions and disability days. The ratios suggest blacks are

in relatively good health compared with whites—especially children. Further, these findings are at variance with those based on chronic disease reporting and, particularly, death rates showing blacks are in worse health.

As in the case of condition and disability day reporting, however, there is some supplementary evidence to suggest underreporting by blacks for symptoms. A national survey conducted in 1971 used the same list of fifteen symptoms described above plus an additional five. Kravits and Schneider (1975, 186) note in their analysis of this data that blacks reported fewer symptoms than did whites. But they go on to qualify these findings, observing that this evidence

appears to contradict some of the previous findings. . . . Up until now, we have seen that blacks appear to be considerably sicker than whites when they use either medical or dental care. . . . Several interpretations . . . are possible: (1) that the black population does have fewer symptoms and that these symptoms are less severe, and (2) that there is considerable underreporting going on, particularly of more serious symptoms. This second hypothesis is strengthened slightly by the finding that, once in the system, blacks . . . with symptoms have more visits than their apparently (judging by symptoms reported) sicker white counterparts.

Dissatisfaction

The last health status dimension—dissatisfaction, like discomfort—is a very subjective one. Unlike discomfort which was measured by reporting of specific symptoms of illness, dissatisfaction is measured in table 2 by more general assessments of how people feel about their health. The results show blacks to be much more dissatisfied. They are almost twice as likely as whites to report their health as fair or poor. And they are 50 percent more likely to have only some, little, or no satisfaction with health and physical condition.

Thus, even though dissatisfaction is measured by subjective self-reports, the black-white comparisons look more like the mortality comparisons than like other comparisons based on self-reports. According to the mortality and dissatisfaction ratios, blacks are in considerable worse health than whites, while the self-reports for conditions and disability days provide a much more mixed picture of health status according to race.

One possible explanation for the apparent discrepancy between the results for dissatisfaction and those for disease, disability, and discomfort has to do with differences in measurement. The latter generally require respondents to give specifics. To show a poorer health level people must name diseases, recall particular conditions and symptoms of illness, or count days when their activity was reduced by injury or illness. If blacks indeed, for whatever reason, have a higher threshold for reporting these specifics than whites—as some of the literature and evidence cited in this article suggest—their health status would appear relatively good compared to whites. In contrast, dissatisfaction is measured by more global and less specific assessments of health and well-being. Here, the realities of death, disease, and a hostile environment may be more readily expressed by blacks, resulting in relatively poorer health status compared to whites according to dissatisfaction measures.

Summary

Apparent differences in the health status of blacks and whites vary according to methods of measurement, errors in the measurement process and interpretation of the measures, and types of measures used. This article uses the literature and secondary analysis of available data to explore the impact of methods on health status comparisons by race.

Methods to measure health status include records, direct observations, and self-reports. Blacks generally show the greatest health deficits based on observation and least on some types of self-reports.

Major types of errors in health status estimates are random errors and biases. Random errors tend to be greater for blacks because samples used to estimate their characteristics have often been smaller than white samples. Biases include noncoverage or failure to include some types of individuals in the reporting systems at all, nonresponse or lack of complete information on some persons, and use of inaccurate information due to faulty data collection or processing. Such biases tend to be greater for black persons than for whites. Their impact often is to give the illusion that blacks may be in better health than is actually the case.

The types of measures that show blacks in the poorest health status

are those considered to be most objective: mortality rates and some clinical examinations and health provider records. Subjective measures of dissatisfaction with health level also show blacks to be much less healthy than whites. In contrast, self-reports of illness conditions, symptoms, and restricted-activity days show blacks, particularly children, to be relatively well off compared to whites. These self-reports may be misleading due to differential perceptions of illness and reporting biases between blacks and whites.

There is no doubt that measured differences in the health status of blacks and whites often reflect substance. There are also significant methodological problems, however, in comparing health status by race, which tend to underestimate the problems experienced by the black population.

This article and others in this volume stress the need to know much more about the sources and impact of these methodological problems. In the meantime, these problems need to be recognized and adjusted for, where possible, when health status measures are compared. It is particularly important to consider them when policy questions of equity and resource allocation are to be decided using indicators of health status.

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