



# Race and Health: Basic Questions, Emerging Directions

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**PURPOSE:** This paper examines the scientific consensus on the conceptualization of race, identifies why health researchers should analyze racial differences in morbidity and mortality and provides guidelines for future health research that includes race.

**METHODS:** Examines scientific dictionaries and reviews the social science, public health and medical literature on the role of race in health.

**RESULTS:** First, this paper reviews the evidence suggesting that race is more of a social category than a biological one. Variation in genotypic characteristics exists, but race does not capture it. Second, since racial categories have historically represented and continue to reflect the creation of social, economic, and political disadvantage that is consequential for well-being, it is important to continue to study racial differences in health. Finally, the paper outlines directions for a more deliberate and thoughtful examination of the role of race in health.

**CONCLUSIONS:** Race is typically used in a mechanical and uncritical manner as a proxy for unmeasured biological, socioeconomic, and/or sociocultural factors. Future research should explore how clearly delineated environmental demands combine with genetic susceptibilities as well as with specified behavioral and physiological responses to increase the risk of illness for groups differentially exposed to psychosocial adversity.

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**KEY WORDS:** Race, Health Status, Socioeconomic Factors, Risk Factors, Review, Methodology, Racism, Racial Differences.

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## INTRODUCTION

The Federal government's Office of Management and Budget (OMB) has guidelines for measuring race and ethnicity. These guidelines recognize four racial groups (white, black, Asian or Pacific Islander, and American Indian or Alaskan Native) and one ethnic category (Hispanic) in the United States (1). However, because these categories are socially constructed and almost 70% of all Hispanics would prefer to have Hispanic included as a racial category (2), this paper treats all five groups as "races." These racial categories importantly predict variations in health status. National mortality data reveal, for example, that blacks or African Americans have death rates that are more than one and a half times higher than those of whites. All of the other racial groups have officially reported overall death rates lower than those of whites, but problems with the quality of mortality data for these groups suggest that national death rates understate the true mortality rates of racial groups

other than blacks and whites (3). Moreover, other data reveal that Hispanics (4, 5), Asian Americans (6), and American Indians (7) have elevated rates of illness and death for several health conditions.

These racial disparities in health are not new, but our understanding of the specific factors responsible for them is limited from both a scientific and a policy perspective. Of particular concern is the growing evidence of widening black-white disparities in health in recent decades, driven in part by the deteriorating health status of the black population for selected indicators of health status (8). Understanding and addressing the role of race in health requires a clear understanding of what race is and a delineation of the specific risk factors and resources linked to race that may be responsible for variations in health status.

This paper has three aims. It will (i) examine the scientific consensus on the conceptualization and meaning of race; (ii) outline why health researchers should continue to study race; and (iii) provide guidelines for future health research that can promote an enhanced understanding of the role of race in health.

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## WHAT IS RACE?

To identify and understand how health researchers view race, following LaVeist (9), I examined definitions of the

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Selected Abbreviations and Acronyms

OMB = Office of Management and Budget (of the U.S. federal government)  
SES = socioeconomic status

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term "race" as published in scientific dictionaries. The definitions presented here are not representative in a statistical sense, but they capture the range, diversity, and tenor of the concept of race in different scientific disciplines.

Table 1 presents definitions of race in the social sciences. The top panel of the table provides definitions from anthropology, psychology, and sociology that were published during the 1960s (10-12). These definitions are consistent in that they reflect a biological understanding of race. They all indicate that the term race captures "physical" or "biological" variation within human populations. The third definition also emphasizes the interaction between biology and the social context. It is important to note that none of these definitions question the validity of the race concept. This omission is in striking contrast to the definitions of race given in the lower panel of Table 1. The first two definitions begin with a declaration that race is an unscientific term (13, 14). In a similar vein, the third definition indicates that the earlier biological view of race is without scientific merit and that current racial taxonomies are arbitrary (15). This theme is echoed in the fourth definition, which adds a rationale for its position: there are no biological criteria that can be universally applied to assign persons to specific racial groups (16). It therefore concludes that race is primarily a sociopolitical construct with strong cultural and ethnic components. However, the fifth definition, as recent as 1985, emphasizes the traditional biological view of race and illustrates that the rejection of the biological view of race is not uniform in the social sciences (17).

### Scientific Consensus on Race

This evolution in the definitions of race over time in the social sciences reflects a growing consensus that racial classification schemes do not reflect genetic homogeneity (18-21). The rejection of the biological view of race is based on several considerations. First, the race concept never rested on a firm scientific foundation (22, 23). The origin of racial categories did not reflect a scientific understanding of subdivisions within human population groups. The concept of race predated modern scientific theories of genetics and carefully executed genetic studies. Race emerged as a sociopolitical construct useful not only to classify human variation but also to justify the exploitation of groups defined as inferior (24). Several studies have documented that the conceptualization of race has been largely shaped by cultural and political considerations and has served important ideo-

TABLE 1. Definitions of race in the social sciences

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Early definitions

1. A major division of mankind with distinctive, hereditarily transmissible physical characteristics (10).
2. Those divisions of the human family which are, biologically considered, varieties (11).
3. An anthropological classification dividing mankind into several divisions and subdivisions . . . based essentially on physical characteristics . . . the awareness and relevance of racial distinctions found in any part of the world is related to the social and cultural history of the society (12).

Recent definitions

1. An unscientific term . . . (13).
  2. A scientifically discredited term . . . (14).
  3. The common use of [race] . . . to refer to a group of persons who share common physical characteristics and form a discrete and separable population unit has no scientific validity, since evolutionary theory and physical anthropology have long since demonstrated that there are no fixed or discrete racial groups in human populations . . . modern population genetics focuses on clines or patterns of distribution of specific genes, rather than artificially created racial categories (15).
  4. A race was defined as any relatively large division of persons that could be distinguished from others on the basis of inherited physical characteristics. . . . It is nearly impossible to classify or distinguish individual persons by such physical characteristics, when no specific set of them truly constitutes criterial features. . . . The working definition of race is one that is dependent upon a social-cultural-political identification, and not one that can be unambiguously determined by genetic classification (16).
  5. A genetically distinct inbreeding division within a species (17).
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logical functions in society (20, 25-27). That is, the generation of scientific theories and hypotheses, the conduct of scientific research, and thus the creation, dissemination, and acceptance of scientific knowledge is often influenced by cultural, social, and economic factors (27, 28). Second, and relatedly, the phenotypic characteristics used to define race are not strongly related to genotypic variation. Skin and hair color, facial features, and other superficial external characteristics do not correlate well with biochemical or other genetic characteristics (18, 21, 29, 30). Thus, there is more genetic variation within races than between them, making it impossible to classify the human population into discrete biological categories with rigid boundaries. Moreover, the genes that determine the physical attributes used to define race (e.g., skin color) are not systematically linked to those that may determine variations in health status (31).

A recent statement of the American Association of Physical Anthropology on the biological aspects of race has updated the 1964 UNESCO statement on race (32). It indicates that, "Pure races in the sense of genetically homogeneous populations do not exist in the human species today, nor is there any evidence that they have ever existed in the past" (32). There is considerable biological variation in human populations, but these traits are distributed across a broad range of population boundaries. Biological differences

**TABLE 2.** Recent definitions of race in the biomedical sciences

1. Persons who are relatively homogenous with respect to biological inheritance (33).
2. A class of individuals having common genetically transmitted physical characteristics (34).
3. A population within a species that is genetically distinct in some way, often geographically separate (35).
4. A local geographic or global human population distinguished as a more or less distinct group by genetically transmitted physical characteristics (36).
5. A phenotypically and/or geographically distinctive subspecific group, composed of individuals inhabiting a defined geographic area and/or ecological region, and possessing characteristic phenotypic and gene frequencies that distinguish it from other such groups. The number of racial groups that one wishes to recognize within a species is usually arbitrary but suitable for the purposes under investigation (37).
6. A vague, unscientific term for a group of genetically related people who share certain physical characteristics (38).

between population groups are small and reflect both inherited factors as well as the influence of the natural and social environment, with most differences produced by the interaction of both. Moreover, many biological factors or genetically-based conditions are malleable. The statement explains that the genetic composition of human population groups is not static but evolves over time due to natural selection, adaptations to the environment, mutations, genetic exchanges between different populations, and randomly changing frequencies of genetic characteristics from one generation to another.

### Race in the Bio-Medical Sciences

In striking contrast to the growing scientific consensus on the concept of race and the acceptance of this evidence as indicated in the lower panel of Table 1, Table 2 shows that definitions of race in the biomedical sciences and public health continue to view race as reflecting underlying genetic homogeneity. All but one of these recent definitions emphasize the primacy of biological distinctiveness as the criteria for the classification of human populations into races (33-37).

The first definition affirms the now-discredited scientific view that race captures biological distinctiveness in human population groups. It is instructive that the previous edition of this dictionary published in 1988 stopped at this point (39). In contrast, the current definition goes on to say (not included in the table) "In a time of political correctness, classifying by race is done cautiously, although some organizations, e.g., the American Public Health Association, ask members to record their racial group on membership forms. Epidemiologic studies have, of course, helped to identify racial correlates of certain conditions and to dissect race from socioeconomic and environmental conditions as deter-

minants of disease" (33). The definition then cites two of the critiques of the use of race in medicine and public health (40, 41). Curiously, this standard dictionary in epidemiology attributes questions about the validity of race to "political correctness" and not to scientific evidence.

The last two definitions in the table are also noteworthy. The definition from a dictionary of genetics indicates that there are clear criteria for defining race: "characteristic phenotypic and gene frequencies that distinguish it from other such groups" (37). At the same time, it goes on to say that the identification of racial groups is nonetheless "usually arbitrary but suitable for the purposes under investigation." The final definition clearly rejects the older traditional view of race and was the only example uncovered among dictionaries in the medical or health field to take such a position (38).

Other evidence indicates that much of medical education, clinical practice, and biomedical research continues to cling to a biological understanding of race (41-45). There are negative consequences to this pattern of usage (46). First, the uncritical use of race in medicine legitimates an unscientific construct. Second, physicians can use assumptions about a patient's race to prematurely eliminate possible diseases or to inappropriately narrow the focus to one disease in the diagnosis of patients (43). The diagnostic and therapeutic utility of racial labels is limited. For example, although an African American born and raised in the South, a Jamaican, Haitian, Nigerian, and an African American born and raised in the Northeast are all black they are likely to differ in beliefs, behavior, and even biology. Third, some evidence suggests that black patients are more likely than whites to be identified by a racial label and the medical case presentations of black patients are more likely to be unflattering than those of their white counterparts (42).

Finally, particular conceptualizations of race, often unwittingly, have larger societal implications. Viewing race as a biological category is considerably less threatening to the status quo than viewing race as a social category (47). If it is assumed that racial differences in disease are determined by biological factors, then the potential role of social factors in disease is obscured and societal institutions, policies, and processes that may be pathogenic are relieved from any responsibility and can remain unchanged (31).

### WHY WE SHOULD CONTINUE TO STUDY RACE

Given the problems with the conceptualization and measurement of the race construct and the potential for harmful social consequences linked to its use, some health researchers have suggested that the assessment of race should be discontinued in medical research (48). It has been argued that the continued use of race perpetuates the erroneous

but widespread view of race as a biological concept. According to this perspective, eliminating race from our analyses could begin the process of educating the lay and professional public about what race really is. Several researchers have suggested that the term ethnicity should replace race in health research (42-44, 49). An ethnic group is a group within the larger society that shares a common ancestry, history, or culture. Typically, ethnic groups share some combination of common geographic origins, family patterns, language, values, cultural norms, religious traditions, literature, music, dietary preferences, and employment patterns. Although ethnic groups can share a range of phenotypic characteristics due to their shared ancestry, the term is typically used to highlight cultural and social characteristics instead of biological ones.

Evaluating the hypothesis of abandoning the race construct is especially relevant given the current national debate in the United States over how race should be conceptualized and measured (50). There is disagreement over the optimal terminology to be used for particular racial groups (e.g., black vs. African American, Hispanic vs. Latino, American Indian vs. Native American), whether Native Hawaiians should be grouped with American Indians instead of with the Asian and Pacific Islander category, whether a new category should be added for persons from the Middle East, whether Hispanic should be a racial or an ethnic category, and whether a new multiracial category should be utilized for persons of mixed racial ancestry. The complete elimination of any attempt to classify persons by race has also been proposed in this context. It is argued that the very existence of these categories perpetuates and accents racial differences and encourages the fragmentation of society.

Although this paper rejects the use of race as a biological concept and agrees that the current racial categories capture ethnic status, it nonetheless argues that it is important to study racial differences in health for several reasons. First, the current racial categories capture an important part of the inequality and injustice in American society (51). There are important power and status differences between groups. This reality can be illustrated by looking at differences in socioeconomic status (SES) across racial groups. For example, rates of poverty are about three times higher for the black, Latino, American Indian and several subgroups of the Asian population than for the white population (3). Changing terminology will not alter these social realities. The contention that we should all just be called Americans and drop all other terms denies the power and status differences that exists between racial groups.

Second, and relatedly, racial categories have historically reflected racism. The term racism refers to an ideology of superiority that justifies social avoidance and domination of groups defined as either genetically or culturally inferior (51). There has been a history of racial oppression in the

United States, and racial categories capture some of the stratification and inequality in the system of power relations established in terms of the dominance of whites over groups defined as nonwhite. Historically, racism created a set of norms that required the differential treatment (discrimination) of these groups. From the very beginning, racial categories in the United States reflected a hierarchy of racial preference that was driven by a racist ideology. Three of the four officially recognized racial categories were listed in the very first census in 1790, and they were not regarded as equal. In compliance with Article One of the U.S. constitution, this census enumerated whites, blacks as three-fifths of a person, and only those Indians who paid taxes. The Thirteenth Amendment abandoned the Three-Fifths Rule, but Indians continued to be divided into the categories of "civilized Indians" and "Indians not taxed" until 1924, when all American Indians were granted U.S. citizenship by Congress (52).

Nonwhite immigrants were also denied U.S. citizenship (52), and new racial categories developed as the need arose to keep track of these new immigrants. As Chinese immigrants entered the United States in the mid-19th century, the 1870 Census added Chinese as a new racial group. However, the 1882 Chinese Exclusion Act barred further immigration of this group. Reflecting the presence of new groups of immigrants, Japanese was added as a new category in the 1890 Census; Filipino, Hindu, and Korean in the 1920 Census; and Mexican in the 1930 Census (52). Thus, changes in racial classification have historically captured the emergence or redefinition of marginal population groups.

Third, the categorization of human populations into races was consequential for every aspect of their lives. Race has been a fundamental organizing principle of society (53). Cultural, institutional, political, and economic interests created rigid boundaries through discrimination and segregation to prescribe certain forms of behavior for members of racial groups, enforce group membership, and maintain group boundaries. At the societal level, there has been a "racial dimension present to some degree in every identity, institution, and social practice in the United States" (53). That is, attitudes and beliefs about racial groups have been translated into policies and societal arrangements that limited the opportunities and life chances of stigmatized groups. Recent research has shown, for example, that considerations of race were central in the development of federal welfare policies (54) and policies regarding access to medical care (55). Minority populations' disproportionate representation at the lower levels of SES reflects the successful implementation of policies and programs designed to withhold societal benefits from marginalized groups regarded as undeserving. Persons who argue that racial labels should be completely abandoned must consider the history of the competition for scarce resources that has taken place along racial lines.

Fourth, the current racial categories reflect, in part, the

legislatively mandated attempt to monitor the social and economic progress of population groups that had historically experienced differential treatment because of their race (50). The 1990 Census, based on a question about ancestry, identified some 250 ethnic groups in the United States (56). The current OMB categories do not capture all of this variation, but only the *minority* racial and ethnic groups. The term *minority* in this context reflects stratification and access to power and resources and not the numerical size of a population. All immigrant groups to the United States did not encounter the same socioeconomic structures and opportunities (57, 58). Although most European immigrant groups experienced residential and occupational segregation when they first arrived in this country, unlike many blacks and Hispanics, they eventually experienced social mobility from low-status positions to higher-status ones. The current minority groups in the United States reflect the intersection of race and economic disadvantage (58). Only those groups who historically experienced prejudice and discrimination and have been unsuccessful in assimilating are minority groups. Since certain groups continue to occupy minority status in society, it is important to continue to monitor the well-being of these groups. Many civil-rights attorneys are concerned, rightly or wrongly, that the creation of a new racial category for persons whose parents come from two of the official racial groups could blur the boundaries of legally protected disadvantaged groups and undermine the enforcement of civil-rights statutes (59).

Fifth, some social-psychological research suggests that the social processes of in-group favoritism and out-group discrimination may be an inevitable part of social interaction. There appears to be a deep human tendency for individuals to value their own group over others and to demonstrate favoritism towards their group. Under experimental conditions, regardless of purpose, shared interests, knowledge, or contact with outgroup members, as soon as individuals can identify themselves as a group, distinct from another group, they seek to maximize the rewards given to their group members compared to members of another group, even when this pattern of discrimination will lead to lower rewards for their own group (60). Since this proclivity toward in-group comparison, favoritism, and competition is likely to persist, health researchers should continue to monitor its consequences. Although there may be no simple solutions to the problems of prejudice and discrimination, these data highlight the importance of implementing and sustaining strong countervailing influences, at the individual and societal level, to combat these tendencies.

Sixth, in a racialized society, race is central to the formation of identity (53). This is especially true for minority group members for whom racial identification frequently becomes incorporated into their view of self (51). Exposure to common experiences, including discrimination and segregation in residential and occupational contexts, can strengthen

the formation of group solidarity, common class interests, lifestyles, and friendships (58). The subjective sense of shared identification and belonging that members of a marginalized group often develop can enhance personal identity and provide community recognition and access to systems of support.

In sum, although not useful as a biological category, race has been and is likely to continue to be an important social category. It is what sociologists call a *master status*—a central determinant of social identity and obligations, as well as, of access to societal rewards and resources. From our earliest health records, race has been an empirically robust predictor of variations in morbidity and mortality. Collecting the appropriate data on race can facilitate ongoing monitoring of the magnitude of differentials, enhanced understanding of their causes, and the development of effective interventions to address them.

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#### DIRECTIONS FOR STUDYING RACE AND HEALTH

Health researchers have been giving increasing attention to the quality of racial data, and concerns have been raised about the uncritical use of race in research (9, 61-62). There are reliability and validity problems in the measurement of racial identification (3, 63, 64). First, the distribution of a study population into different racial groups varies by mode of assessment, with respondent reports of racial self-identification differing (substantially for some groups) from observer assessment. Second, racial self-identification depends, at least in part, on the wording of particular questions. Third, for a growing number of persons in our society, racial and especially ethnic identification is not singular and static, but multiple and dynamic. Fourth, the differential census undercount of minority populations, by understating the denominators used to calculate health events, can erroneously inflate the picture of the rates of health conditions for these groups.

What principles should the health researcher use in establishing racial categories and what racial categories should be utilized? First, race must be comprehensively assessed. Researchers must move beyond the simple black/white dichotomy that was the dominant approach for most of this century and assess the considerable racial diversity that characterizes the population. There is considerable ethnic heterogeneity within each of the five OMB categories, and an understanding of health status variations requires that these categories be disaggregated, whenever possible. These subgroups vary across a broad range of sociodemographic characteristics, as well as in access to and utilization of medical care (3). For example, although most Hispanics have a common language, religion, and various traditions, the tim-



ing of immigration and incorporation experiences in the United States have varied for the more than 25 national origin groups that make up the Hispanic group, such that each group is distinctive (58).

Second, the design and statistical analyses of epidemiologic studies should be attentive to the distinctiveness of each racial group. This uniqueness can often embody patterns of beliefs and behaviors that can adversely or positively affect health status. Researchers should not assume uniform processes either within or between groups. For example, blacks may be uniquely different from all other groups. Although many groups have suffered and continue to experience prejudice and discrimination in the United States, blacks have always been at the bottom of the hierarchy, and the social stigma associated with this group is probably the greatest. African Americans continue to be the most discriminated-against group in terms of residential segregation (65) and to have the greatest difficulties with socioeconomic mobility (57). Part of the answer may lie in skin color. In virtually all cultures, the color black is associated with negative attributes (66). Analyses of national samples of African Americans (67) and Mexican Americans (68) reveal that skin color is an important determinant of socioeconomic mobility and exposure to discrimination for both of these groups. Darker-skinned persons have a more difficult time than their lighter-skinned peers. Similarly, Sephardic Jews, a group of darker-skinned Jews, experience discrimination in the United States and internationally (69-71). Some research also indicates that, at least under some conditions, light-complexioned blacks have lower blood pressure levels than their darker-skinned counterparts (72, 73).

Third, given the centrality of racial identity to the self-concept of many persons, researchers should use terms that are broadly recognized by a wide variety of people and that reflect the preferences of respondents. In practice this is not easy. The term that others may recognize may differ from the preferred term of individual recognition. A recent national study of over 60,000 adults found that members of racial groups are divided over preferred terminology (2). Fifty-eight percent of Hispanics prefer "Hispanic" (12% prefer "Latino"), 62% of whites prefer "white" (17% prefer "caucasian"), 44% of blacks prefer "black" (28% prefer "African American"), and 50% of American Indians prefer the term "American Indian" (37% prefer "Native American"). In an effort to respect individual dignity, researchers should use the most preferred terms for each group interchangeably (e.g., black or African American, Hispanic or Latino). Researchers should also be sensitive to variations in preferred terms for race by age, SES, and region of the country.

### A Model for Studying Racial Differences in Health

Explicating what race means and documenting its role in health status is not an easy task but is indispensable to

understanding the complex ways in which environmental and biological factors relate to each other and combine to affect variations in health. Figure 1 provides a framework for studying the relationship between race and health. This framework is an adaptation of earlier models (74-76) and outlines the issues that must be addressed to understand the role of race in health. It indicates that race is a complex multidimensional construct reflecting the confluence of biological factors and geographical origins, culture, economic, political and legal factors, as well as racism. All of these forces are interrelated, and they may combine both additively and interactively to affect health status and the utilization of medical care. Race, an analytic variable of interest to many epidemiologists, is one of several social-status categories created by these large-scale societal forces and institutions. Social-status categories reflect, in part, differential exposure to risk factors and resources that ultimately affect health through biological pathways.

**Basic causes.** Importantly, the model argues that societal forces and biology are the basic causes of variations in health. Lieberman (77) argued that it is important to distinguish between basic causes and surface causes. Basic or fundamental causes are the factors responsible for generating a particular outcome; changes in these forces create change in the outcome. In contrast, surface causes are related to the outcome, but changes in these factors do not produce corresponding change in the outcome. As long as the basic causal forces are in operation, the alteration of surface causes will give rise to new intervening mechanisms to maintain the same outcome. Krieger (78) indicates that epidemiologists who recognize that a "web of causation" underlies chronic disease need to move beyond the current "framework of biomedical individualism" to identify the spider(s) responsible for spinning the web. Sociologists have argued that inequalities in social institutions are the basic causes of social inequalities in health (79-81). Societal inequality will give rise to new intervening mechanisms to maintain racial and SES inequalities in health status, even if intervening risk factors are modified. The persistence of social inequalities in health during this century, despite changes in the major causes of death and their underlying risk factors, is consistent with this perspective.

Figure 1 contends that culture, biology, racism, economic structures, and political and legal factors are the fundamental causes of racial differences in health. Keeping the larger societal factors and processes in mind can help guard against a tendency to view relationships in an ahistorical manner. An understanding of the social distribution of disease requires attention to the ways in which social disadvantage was produced historically and might currently be reproduced in different racial populations. Different combinations of factors in the model may be more salient, depending upon the context, historical period, health outcome, and the research question under consideration.

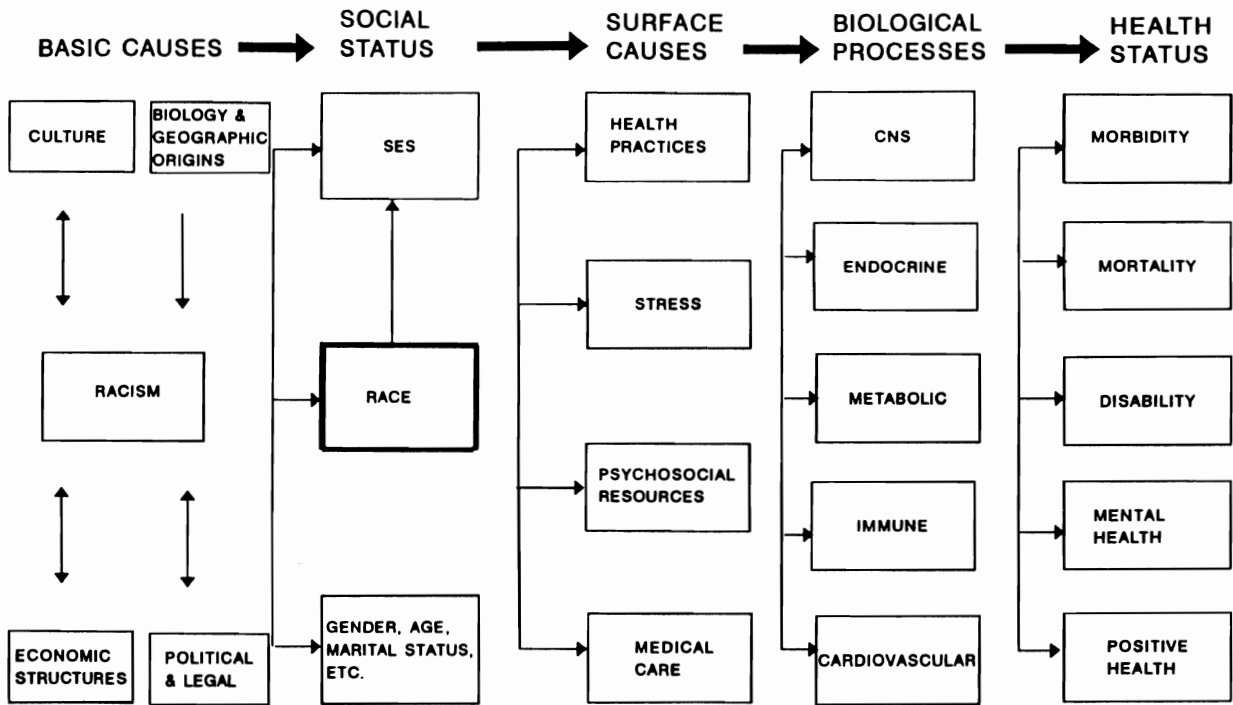


FIGURE 1. A framework for the study of the role of race in health.

Biological factors and the geographic origins of racial populations are included as part of the basic causes that produce disease. Because biology is not the central aspect of race, it is unlikely to play a major role in racial differences in health, but it should not be completely excluded. There are rare cases in which the current racial categories can be a clue to the role of genetics in disease causation and unique medical needs for screening or treatment. Malignant melanoma is an example of a cancer that disproportionately affects light-complexioned individuals. Similarly, persons who come from regions of the world, such as the Mediterranean and Africa, where malaria was common, may be more susceptible to sickle-cell anemia and may have higher needs for sickle-cell screening. This example illustrates that some genetic characteristics are strongly influenced by the environment. Similarly, the high prevalence of diabetes in some Native American and Hispanic populations may require efforts specially targeted to these groups. However, when feasible, researchers should attempt to identify markers better than race to identify the potential contribution of genetic factors.

Culture is a frequently invoked but seldom empirically examined concept in studies of racial differences in health. There are important cultural subgroupings within racial categories (including the white population). After identifying these subgroups, research must conceptualize and measure the specific cultural beliefs and behavior that may be linked to health status (82). This may involve more attention

to the role of religious beliefs and behavior, folk systems, alternative providers, acculturation, the socioeconomic and psychological impact of migration, and the recency of migration. Research on migration should include attention to the health consequences of one of the largest internal migrations of this century—the movement of blacks from the rural South to the urban North (83). Understanding culture will require greater inclusion of individuals who are knowledgeable about particular subcultures: not only the involvement of researchers from the particular groups being studied, but also more interaction between research teams and the representatives of communities to be studied.

The model explicitly includes racism as an important part of the structure of society that shapes the definition of race and can importantly affect health. Historically, meaning was attributed to readily observable external biological features, such as skin color, and the resulting ranking of identified groups determined access to societal resources. Racism was supported by societal institutions, but the influence goes in both directions. Once created, racism became an important societal force that shaped and reshaped other social structures. There are both institutional and individual dimensions of racism, but it is the institutional that is implicated as a basic cause of differences in health status. In recent years researchers have given increased attention to the delineation of the mechanisms and processes by which racism affects health (8, 74-76, 84-88). Although the effects of racism at the level of societal institutions are difficult to

assess in the typical epidemiologic study, the institutional forms are more consequential than the individual manifestations (76).

Residential racial segregation has been a primary institutional mechanism by which racism has operated in American society (65, 89). The systematic implementation of institutional policies premised on the inferiority of blacks and the need to avoid social contact with them led to the overrepresentation of African Americans in deprived socioeconomic residential environments. Residence in these highly segregated areas adversely affects health (90, 91). Residential segregation determines housing conditions, educational and unemployment opportunities, and thus truncated economic mobility for African Americans. Institutional racism may also contribute to the disproportionate exposure of minority racial populations to environmental risk in occupational and residential contexts (92), differential access to the quantity and quality of health care services (93), and to the large racial differences in the receipt of medical procedures in the Medicare program (94) and other contexts (95). Understanding discrimination in medical care settings will require more research on the characteristics of providers and the health care system (96).

The political and legal context is the arena in which social groups compete for power and desirable resources in society. In the United States, systematic inequality in power and influence regarding important societal decisions has flowed from membership in one race versus another. The government and legal codes have historically enforced race-based inequities in a broad range of societal outcomes. For example, legal codes have created systemic barriers to equal access to medical care (55). Currently, political influence in decision-making determines access of minority populations to medical care through the creation of underfunded and overburdened public clinics and hospitals, the location of public hospitals, and the closing of particular health care facilities. The location of populations within particular sociopolitical contexts may also affect the delivery of medical care. For example, the Mexican-American population's low level of access to routine medical care reflects, in part, the location of that population in the southwestern region of the country, where the funding for human services tends to be less generous. At the same time, interventions in the legal and political system have been important for improving the social situation of disadvantaged racial groups. Civil rights legislation and other positive political events can enhance the health of the African American population (8). LaVeist (97) has also documented a strong inverse relationship between black political power and mortality rates and has outlined several pathways through which political empowerment may enhance health. Nonetheless, researchers should be attentive to potential gaps between health-enhancing policy changes and their effective implementation. The Hill-Burton Act, for example, included a

number of provisions to ensure a more equitable distribution of medical services, but ineffective enforcement of its provisions limited its potential contribution (98).

**Social statuses.** The model shows that two classes of factors are linked to race. On the left of race there are the basic causes and to the right are the surface causes. Race as an analytic variable is a social status category reflecting the power relations within a society. Many researchers view race itself as the cause of ill health. Reifying the concept of race can leave relevant aspects of the social environment unexplored. The model suggests that researchers need to give more attention to the forces that produce race and the intervening processes that link race to health.

Race is only one of multiple social status categories that have been created by macrosocial factors and racism. Studies of race and health should attempt to understand multiple vulnerability and the extent to which racial status combines additively and interactively with other social-status categories (gender, age, and marital, family, and occupational roles) to facilitate or restrict exposure to the risk factors for disease. In addition to examining simple interactions among the social-status categories in analytic models, epidemiologists should also utilize indices consisting of counts of vulnerable statuses that allow for an examination of nonlinear effects on health status.

Most researchers studying racial differences in health recognize that SES is strongly related to race and routinely adjust racial differences in health for SES. Controlling for SES substantially reduces and sometimes eliminates racial disparities in health (99). However, race is more than SES, and merely controlling for SES is inadequate to understanding racial disparities in health (40, 74, 87). Moreover, racial differences often persist after adjustment for SES; in fact, for some indicators of health status, racial differences increase with increasing SES (87). This pattern could be due to the nonequivalence of SES measures across race, limited conceptualization of the relationship between race and SES, inadequate characterization of SES, and the contribution of noneconomic forms of racial discrimination (100). There are racial differences in the quality of education, income returns for a given level of education, wealth or assets associated with a given level of income, the purchasing power of income, the stability of employment, and the health risks associated with occupational status (8).

An arrow leading from race to SES in the model seeks to emphasize that SES is not just a confounder of the relationship between race and health, but part of the causal pathway by which race affects health (40). Causally, race precedes SES, and SES differences between blacks and whites reflect, in part, the impact of economic discrimination produced by large-scale societal structures. Researchers must also recognize the imprecision of the currently used measures of SES and the need for continuing to identify all of the relevant aspects of socioeconomic position that may



be linked to health status. Comprehensive, theoretically informed measures of socioeconomic status have been recently proposed (101). Some evidence also suggests that other experiences linked to race, such as subjective reports of discrimination, play an incremental role in explaining racial differences in health (100).

**Surface causes.** The model indicates that large-scale social structures and processes create, initiate, and support particular conditions under which the various races and other social groups live and work. Accordingly, when researchers identify social status (e.g., racial) differences in the distribution of a disease they should initiate a detailed examination of the contribution of environmental and genetic factors to observed differences. A broad range of factors intervene between race (and social-status categories) and health. These intervening mechanisms include health behavior; stress in family, occupational, and residential environments; social ties; psychological factors, including personality characteristics; culture; religious beliefs and behavior; and medical care. Many of these factors not only correlate with race, but are likely to relate additively and interactively with each other.

Several general points should be noted about surface causes. First, although typically measured at the individual level in epidemiologic studies, the model suggests that these risk factors are not autonomous individual factors but variables that have been shaped by larger societal forces. For example, levels of tobacco and alcohol use for the black and Hispanic population reflect, at least in part, the cooperative efforts of a broad range of governmental and commercial interests to initiate and maintain substance use within these populations (74, 102). Second, although identifying the structural sources of variations in surface causes may not change the measurement of these risk factors, they can affect understanding of the observed relationships. Greater attention to the macrosocial constraints on health behavior can guard against both "blaming the victims" for their particular health problems and using data in ways that reinforce racist stereotypes.

Third, understanding the relationship of surface causes to basic causes can affect the initiation of effective intervention strategies. In particular, the modification of surface causes alone is likely to be only minimally effective in eliminating inequities in health status if the basic social forces remain operative. Equally important, recognizing the intermediary role of surface causes in the disease process could lead researchers to pay greater attention to the social context of vulnerable populations and to fully characterize the risk factors and resources that are important determinants of health. For example, traditional measures of stress utilized by researchers have been criticized for being biased to the stressors experienced by middle-class individuals. In addition to the standard measures of stress, the comprehensive assessment of stress for minority group members residing

in depressed inner-city neighborhoods could include exposure to community violence (103), sexual and physical assault (104), and acute and chronic experiences of racial discrimination (100). A growing body of research indicates that exposure to racial bias adversely affects physiological and psychological functioning in laboratory studies (105-108) and is inversely related to indicators of physical and mental health in epidemiologic studies (100, 109-115).

One class of surface causes included in the model is psychosocial resources. Inclusion of this factor emphasizes the need for renewed attention to identifying the strengths and health protective resources that may buffer individuals from pathogenic risk factors. Much prior research on minority populations has focused only on pathology and deficits (74). Studies should also assess a broad range of social and psychological resources such as social support, self-esteem, perceptions of mastery and control, and coping patterns. Greater attention should also be given to the health-enhancing cultural resources that minority group members may uniquely have or have greater access to. These include religious involvement, family support, John Henryism (116), racial identity, and processes of attribution (117).

At the same time, researchers should be wary of romanticizing the resources, such as the social networks of minority populations, as if they were a panacea for a broad range of health problems (83). Although these networks facilitate survival, they provide both stress and support and the negative aspects of social ties may be more strongly linked to health than the supportive ones. The operation of these surface causes are also historically conditioned, and it is likely that cutbacks in government-provided social services in recent years may have increased the burdens and demands on the supportive services provided by extended family systems.

A detailed examination of the relative contribution of environmental and genetic factors to racial differences in health also has important implications for our analytic models. Singer and Ryff (85) suggest that a life history approach is critical to studies that would enhance our understanding of racial and ethnic inequalities in health. This approach allows for the assessment of the risk of disease in multiple domains of life, such as work, family, and neighborhood, and across the life course. Attention is given to the cumulation of negative and positive experiences over time and to the ways in which patterns of response to experiences, as well as pre-existing resources and vulnerabilities, affect the impact of these factors on health. This strategy facilitates the integration of a broad range of intervening risk factors and protective resources that are more typically studied in isolation.

**Biological processes.** Environmental and genetic factors ultimately affect health through explicit physiological pathways. There is growing attention to the need for more integrative models of the disease process that will include not

only characterization of environmental and psychological risks and resources, but also the behavioral, physiological, and biochemical responses (118). Most chronic illnesses have a multifactorial genetic basis. Even in the presence of genetic susceptibility, environment typically plays a critical role in how an inherited susceptibility is expressed (85). Given that only a minority of carriers of a specific allele develop disease, research needs to identify the conditions under which environmental triggers modify genetic risk. Recently, McEwen and Steller (119) have proposed the concept of allostatic load to understand the ways in which physiological processes and multiple sources of adversity cumulate to affect a broad range of organ systems and disease processes. It is suggested that repeated and cumulated experiences of adversity can create states of chronic elevation of physiological processes that lead to adverse changes in health status. They have also identified markers of physiological system impairment that could be used in broad-based epidemiologic studies to capture allostatic load.

## CONCLUSION

Race is an imprecise marker for exposure and vulnerability to factors that could lead to ill health. Identifying what these differences might be requires a clear understanding of what racial categories capture. The Tuskegee Syphilis Study (TSS) provides a vivid historical illustration of how researchers' understanding of race can determine which research questions are asked and how research studies are executed (120). This long-term follow-up study of untreated syphilis in black males used deception to recruit subjects and ensure compliance, withheld treatment from participants, and implemented strategies to prevent the study's subjects from otherwise receiving treatment. Although he advocated the treatment of syphilis in its latent stages in a 1933 textbook and in a 1932 scientific paper, Dr. Joseph Earl Moore served as an expert consultant to the Tuskegee study. The inconsistency between this researcher's written work and his participation in the reprehensible study is understandable only in the light of the prevailing conceptualization of race at the time. Conventional scientific wisdom held that because of large biological differences between the races, a given disease could manifest itself so differently in blacks, as compared with whites, that findings from studies of whites (such as the earlier Oslo Study of Untreated Syphilis) could not be generalized to blacks. In addition, normative beliefs about the cultural deprivation of blacks indicated that black males would not be interested in medical treatment if they were asymptomatic (120). Thus, the TSS is a potent reminder to contemporary health researchers that the uncritical acceptance of conventional wisdom can intro-

duce false assumptions, values, and biases into the scientific enterprise.

This review indicates that understanding the role of race in health is neither simple nor straightforward, but it is also not an impossible undertaking. Race remains an important predictor of access to societal rewards and a determinant of variations in health. Conceptual clarity about race is a prerequisite to the identification and assessment of the risk factors and resources linked to group membership. Since the term race does not primarily capture biological distinctiveness, an enhanced understanding of the role of race in health is contingent on integrated, interdisciplinary approaches that seek to elucidate how historically conditioned, biological, psychological, and social conditions and processes relate to each other and combine in particular physical environments to affect health and adaptive functioning.

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