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Topic 3. Racial and Ethnic Inequalities in Health

The Health of U.S. Racial and Ethnic Populations

David R. Williams

Departments of Sociology and Epidemiology and Survey Research Center,
Institute for Social Research, University of Michigan, Ann Arbor.

This article provides an overview of racial and ethnic disparities in health in the United States. It describes limitations linked to the quality and method of presentation of the available data. It also considers the complex ways in which immigrant status, race, and SES combine to affect health and outlines important directions for research that would enhance our understanding of the ways in which social factors can lead to changes in health status.

THE United States has a long history of collecting and reporting health statistics by race. This article provides an overview of racial disparities in health and examines multiple conceptual and methodological issues linked to the quality of racial statistics and how they are reported that can affect our knowledge of the underlying pattern of health differentials by race. It considers the ways in which migration and socioeconomic status (SES), singly and in combination, can affect patterns of the distribution of disease. It outlines research that is needed to enhance our understanding of how conditions linked to the lives of socially disadvantaged groups can positively and negatively affect health and emphasizes the importance of understanding how these unfold over the life course.

This article views "race" as capturing ethnicity: common geographic origins, ancestry, family patterns, language, cultural norms, and traditions. Historically, racial categories have also reflected oppression, exploitation, and inequality. Accordingly, race has been an important marker of differential access to societal resources and rewards, and health status is no exception. Given the arbitrary nature of racial categorization and the preference of the majority of Hispanics to have this category treated as a racial category (Tucker et al., 1996), in the interest of economy of presentation, the term "race" is used to refer to all of the official Office of Management and Budget (OMB) racial and ethnic categories. Moreover, in recognition of individual dignity, I use the most preferred terms for each group (such as Black and African American or Hispanic and Latino) interchangeably.

Racial Differences in Health

Mortality statistics are among the most readily available indicators of health status for multiple racial groups. However, the magnitude of racial disparities in mortality is related to how they are reported. Table 1 illustrates this by comparing age-adjusted mortality rates with age-specific ones. It presents mortality rates for Whites and the minority/White ratios for the major racial groups in the United States. Ratios greater than 1.0 indicate a higher rate and those less than 1.0 indicate a lower mortality rate than the White population. The first row of Table 1 presents overall age-adjusted data. Blacks have an overall death rate that is 30% higher than that of Whites. All other racial groups have death rates that are lower than that of Whites, with the Asian and Pacific Islander (API) population manifesting the lowest overall death rate. However, limiting racial comparisons only to the age-adjusted rate for the entire population can mask subgroups that have an elevated risk.

Limits of Age Adjustment

Age adjustment is a routine and widely used statistical procedure to make rates of health events comparable across various population groups that may differ in their age structures. An age-adjusted rate is a weighted average of age-specific rates, with the weights being determined by the age structure of the age standard. There is considerable variation in the age structure of the various racial populations in the United States. Table 4 indicates, for example, that the median age for Whites (37.7 years) is more than 10 years that of American Indians (28.0), Native Hawaiians and other Pacific Islanders (27.5), and Hispanics (25.8). It is also considerably greater than that of Blacks (30.2) and Asians (32.7). The other rows of Table 1 make comparisons across racial groups without using an artificially created age-adjusted mortality rate. The National Center for Health Statistics (NCHS, 2003) indicates that age-adjusted rates are relative indexes for comparison but not actual measures of risk. However, they are often misinterpreted by researchers and policy makers.

Strikingly different patterns emerge when age-specific mortality rates are compared across racial groups. In contrast to an overall age-adjusted rate that is 30% higher than that of Whites, age-specific rates reveal that African Americans have mortality rates that are markedly higher than those of Whites across the age span with age-specific ratios being higher than the overall ratio from birth through age 75 years. The death rates for Blacks are at least twice as high as those of Whites between ages 1–4 and ages 25–54 years. They decline in the later years, eventually falling to be 20% higher than those of Whites between ages 75 and 84 years and lower than that of Whites over age 85 years. Similarly, in contrast to an overall age-adjusted rate that is slightly lower than that of the White population, American Indians have death rates that are higher

Table 1. Overall Age-Adjusted Mortality Rates for 1998–2000* and Age-Specific Death Rates for 2000† for Whites and Minority/White Rates

Age (y)	Non-Hispanic White Rate	Black/ White Ratio	AmInd/ White Ratio	API/ White Ratio	Hispanic/ White Ratio
All ages	85.5	1.3	0.9	0.6	0.8
1–4	2.79	2.0	2.0	0.7	1.0
5–14	1.72	1.5	1.0	0.5	1.0
15–24	7.21	1.9	1.7	0.6	1.3
25–34	9.26	2.2	1.8	0.6	1.1
35–44	17.97	2.1	1.7	0.5	0.9
45–54	39.31	2.1	1.3	0.5	0.8
55–64	96.00	1.8	1.2	0.6	0.8
65–74	240.94	1.4	1.0	0.6	0.7
75–84	572.87	1.2	0.7	0.6	0.6
85+	1582.64	0.9	0.4	0.6	0.6

Note: Rates per 10,000 population.
*National Center for Health Statistics (2003).
†National Center for Health Statistics (2004).
AmInd = American Indian; API = Asian and Pacific Islander.

than those of the White population for ages 1–4 and ages 15–64 years. The rates are equivalent between ages 5–14 and 65–74 years and fall below those of the White population at ages greater than 75 years.

The overall age-adjusted mortality data for Hispanics indicated that this population had lower rates than that of Whites but a more complex pattern emerges with age-specific data. Hispanics have mortality rates that are comparable with those of Whites up through age 14 years and that are slightly higher than those of Whites in young adulthood (ages 15–34 years). Beyond age 35 years, rates for Hispanics are lower than those of Whites and decline with increasing age. It is only for the API population that the pattern with the overall age-adjusted data and the age-specific data is consistent with that of markedly lower death rates for this group than Whites throughout the life course. However, the combination of Asians and Pacific Islanders into a single subgroup skews the elevated rates of mortality for Pacific Islanders compared with that of the U.S. population (Frisbie, Cho, & Hummer, 2001; Zane, Takeuchi, & Young, 1994). The OMB's recent revision of the racial categories that requires a new separate category for Native Hawaiians and other Pacific Islanders will allow for better tracking of the health of this group in the future.

The magnitude of racial disparities over time also varies with the age adjustment standard utilized. For over 50 years, the NCHS has employed an age standard for creating age-adjusted rates for the U.S. population, called the 1940 Standard Million, which was based on the age distribution of the U.S. population in 1940. In 1998, the age standard was changed to the 2000 Standard Million—the projected age distribution of the U.S. population in the year 2000. The new age standard attempts to more accurately reflect the aging population of the United States and gives more weight to the older population where racial disparities in mortality are smaller. Importantly, this technical change in the age standard attenuates racial and some SES inequalities in health (Krieger & Williams, 2001). Moreover, it has occurred at the same time of Healthy People 2010—the first national commitment on the part of the federal government to eliminate these disparities.

Table 2. Mortality Rates From All Causes, 1950–1998

	Adjusted for 1940 Standard Million*				Adjusted for 2000 Standard Million†			
Year	White	Black	Diff. (B − W)	Ratio (B/W)	White	Black	Diff. (B − W)	Ratio (B/W)
1950	8.0	12.4	4.4	1.5	14.1	17.2	3.1	1.2
1960	7.3	10.8	3.5	1.5	13.1	15.8	2.7	1.2
1970	6.8	10.4	3.6	1.5	11.9	15.2	3.3	1.3
1980	5.6	8.4	2.8	1.5	10.1	13.1	3.0	1.3
1990	4.9	7.9	3.0	1.6	9.1	12.5	3.4	1.4
1998	4.5	6.9	2.4	1.5	8.5	11.4	2.9	1.3

Note: Deaths per 10,000 population.
*National Center for Health Statistics (2000).
†National Center for Health Statistics (2001).
B = Black; W = White.

Table 2 shows trends in all-cause mortality rates for Blacks and Whites from 1950 to 1998, adjusted for the 1940 Standard Million, and the same rates adjusted for the year 2000 Standard Million. It also presents both the absolute and the relative racial differences in rates. Patterns of disparity also vary by whether an absolute or a relative measure of inequality is used (Carter-Pokras & Baquet, 2002). Both rate differences and ratio measures are used to provide a complete picture of disparities over time. For both racial groups, mortality rates adjusted for the year 2000 Standard Million are larger than those adjusted for the 1940 Standard Million. However, regardless of the age adjustment standard or the measure of disparity used, racial disparities in mortality existed in 1950 and persist through 1998. At the same time, different patterns are evident for the two age adjustment standards. With use of the 1940 Standard Million, the Black/White differences have declined from 4.4 deaths per 1,000 population in 1950 to 2.4 in 1998, while the Black/White ratio at 1.5 in 1998 is identical to what it was in 1950. In contrast, when the 2000 Standard Million is used as the adjustment standard, there is only a slight decline (from 3.1 to 2.9) in the difference in rates from 1950 to 1998, and an increase in the Black/White ratio from 1.2 in 1950 to 1.3 in 1998.

Infant mortality rates provide another striking example of the persistence of racial disparities in health in over time and of how the magnitude of the disparity varies depending on the indicator utilized. Table 3 presents infant mortality rates for Blacks and Whites from 1950 to 2000. Infant mortality rates have declined over time for both racial groups, but a large disparity persists in the year 2000. The measure of the absolute difference between the rates indicates that they have declined by more than 50%, from 17.1 in 1950 to 8.4 in the year 2000. In contrast, the measure of the relative difference between the two rates (the Black/White ratio) has markedly increased from 1.6 in 1950 to 2.5 in the year 2000.

Numerator Problems

Errors linked to data quality can also affect the validity of the mortality statistics. There are problems with the accuracy of the numerator that vary across the major racial populations. The numerator for mortality statistics comes from death certificates. Race is typically recorded on the death certificate by the funeral home director. A comparison of racial status as reported in the Current Population Survey while respondents were alive to

that indicated on their death certificate revealed that the racial designation on the death certificate was highly consistent with self-reported race for Blacks and Whites (Sorlie, Rogot, & Johnson, 1992). However, 26% of American Indians and 18% of APIs were misclassified on the death certificate, with most of these persons being misclassified as White. Similarly, some 10% of Hispanics were misclassified as non-Hispanic on the death certificate.

A recent analysis of a cohort of elderly Mexican Americans indicated that the mortality rates for this group are seriously underestimated when compared with the National Death Index (NDI) (Patel, Eschbach, Ray, & Markides, 2004). This study compared the mortality of elderly Mexican Americans in a community-based cohort from five southwestern states using the NDI with that obtained from proxy data that collected the date, location, and cause of death from family members of the deceased and other informants. The NDI is more likely to miss Hispanics than non-Hispanic Whites for multiple reasons (Patel et al., 2004). Compared with Whites, the use and accuracy of Social Security numbers may be lower for Hispanics, the matching of names may be more unreliable because Hispanic naming customs are different from those used by non-Hispanics, and Hispanics may also be more likely to die outside of the United States and such deaths are not reflected in the NDI.

This study found that proxy-reported death rates were higher than those obtained from matches with the NDI (Patel et al., 2004). Specifically, 20% of deaths reported by proxy reports were missed by the NDI. NDI underreporting of Hispanic deaths was especially likely among older Mexican Americans, women, and the foreign-born. For example, proxy-reported rates were 9% higher for men and 28% higher for women compared with the NDI. Importantly, the study found that adjusting nationally reported mortality rates for Mexican Americans by the underascertainment documented in this study completely eliminated the pattern of lower mortality rates for Mexican Americans compared with Whites for women and narrowed the gap for men (Patel et al., 2004). Strikingly, once mortality patterns for elderly Mexican-American women were adjusted for underreporting, Mexican-American women over age 65 had higher age-adjusted mortality rates than White women. Similarly, in contrast to national vital statistics data that show lower heart disease mortality rates for Hispanics, community-based cohort studies find equivalent (Pandey, Labarthe, Goff, Chan, & Nichaman, 2001) or higher (Swenson, Trepka, Rewers, Scarbo, Hiatt, & Hamman, 2002) rates for Mexican Americans compared with Whites.

Denominator Problems

The quality and accuracy of the denominator data used to calculate the rates of various health events could also importantly affect the accuracy of the reported rates. Census counts for population subgroups are routinely used to calculate mortality and other health rates. The use of a denominator that has an undercount inflates the obtained rate in exact proportion to the magnitude of the undercount in the denominator. Throughout the history of the U.S. Census, the census has failed to count all residents and this undercount varies by age, sex, and race. For over 50 years, the U.S. Census Bureau has evaluated the extent of undercount for Blacks and Whites by using demographic analysis. This approach estimates the population based on administrative data and demographic trends (Robinson, Bashir, Prithwis, & Woodrow, 1993). The unavailability of consistent birth, death, and immigration data by detailed race has made demographic analysis difficult for the other major racial populations in the United States.

Table 3. Infant Mortality Rates, 1950–2000

	Infant Mortality			
Year	White (W)	Black (B)	Difference (B − W)	Ratio (B/W)
1950	26.8	43.9	17.1	1.6
1960	22.9	44.3	21.4	1.9
1970	17.8	32.6	14.8	1.8
1980	10.9	22.2	11.3	2.0
1990	7.6	18.0	10.4	2.4
2000	5.7	14.1	8.4	2.5

Note: Deaths per 1,000 live births. [From National Center for Health Statistics (2003).]

Demographic analyses reveal that census undercount is higher for Blacks than for Whites and has been declining over time. Within the African American population, census undercount is markedly higher for Black males than for Black females and varies considerably by age such that the census undercount in 1990 was between 11% and 13% for all of the 10-year age groups for Black males between the ages of 25 and 64 (NCHS, 1994). The net undercount in the 2000 Census was 10% for Black males aged 30–49 years (Robinson, 2001). Thus, all of the officially reported mortality rates (and rates for multiple other health events that use census data as denominators) for middle-aged Black males are likely to be at least 10% higher than they are in reality. In recent decades, the census has also done postenumeration surveys as a second means of estimating the net undercount. Data from these analyses suggests that the net census undercount is even higher for American Indians and Hispanics than for Blacks, with Asians having rates intermediate between Whites and African Americans (Anderson & Feinberg, 1999). However, there has been little systematic analysis of how the misclassification of race in the numerator combines with undercounts in the denominator to affect the officially reported rates of health events for multiple racial groups.

Understanding Racial Disparities in Health

In spite of various methodological limitations, the overall pattern of persisting racial differences in health remains. How do we make sense of these differences? Historically in the United States, research has focused on racial differences in underlying biological characteristics as crucial for creating racial differences in rates of disease and death (Krieger, 1987). The health field currently gives greater attention to differences in the social circumstances of racial groups in the United States (Cooper & David, 1986; Krieger, Rowley, Herman, Avery, & Phillips, 1993; Williams, 1997).

Race and Sociodemographic Variation

Table 4 illustrates how race is a crude proxy for location in varying social contexts by presenting a broad range of demographic and socioeconomic characteristics for the major

Table 4. Demographic and Socioeconomic Characteristics by Race and Ethnicity: United States, 2000

Indicator	White	Black	Am. Indian/ Alaska Native	Asian	Native Hawaiian and Pacific Islander	Other	Hispanic Race
Hispanic, %	8.0	2.0	16.4	1.2	11.4	97.0	—
Foreign born, %	3.5	6.1	5.4	68.9	19.9	43.4	40.2
Median age, %	37.7	30.2	28.0	32.7	27.5	24.6	25.8
Female-headed, %	9.2	30.8	20.9	9.1	16.1	19.3	17.8
White collar, %	36.6	25.2	24.3	44.6	23.3	14.2	18.1
High school+, %	85.5	72.3	70.9	80.4	78.3	46.8	52.4
College grad+, %	27.0	14.3	11.5	44.1	13.8	7.3	10.4
Poor, %	8.1	24.9	25.7	12.6	17.7	24.4	22.6
Own home, %	71.3	46.3	55.5	53.4	45.0	40.5	48.0

Note: *Source*: U.S. Census (2000).

racial categories in the United States. These data indicate that America's racial groups are characterized by considerable demographic and socioeconomic diversity. The first row shows that there is marked variation across race in the percentage who identify as Hispanic (U.S. Census, 2000). Reporting Hispanic ancestry varies from 1.2% among Asians and 2% among Blacks to 8% of Whites, 16% of American Indians, and 11% of Native Hawaiians and other Pacific Islanders. At the same time, an overwhelming 97% of people who mentioned that they belonged to a racial category other than the standard OMB ones offered in the census indicated that they were Hispanic. That is, many Hispanics report their national identity when requested to indicate their race. Table 4 also indicates that a relatively high proportion of Asians (69%) and Hispanics (40%) are immigrants (Malone, Baluja, Costanzo, & Davis, 2003). As noted, the median ages for American Indians, Native Hawaiians and other Pacific Islanders, and Hispanics are considerably lower than those for Whites, Asians, and Blacks (U.S. Census, 2000). Whites and Asians also have the lowest levels of female-headed households, Blacks have the highest, and the rates are intermediate for Hispanics and American Indians (U.S. Census, 2000).

Table 4 also shows that there is variation across race on multiple markers of SES: occupational status, educational attainment, poverty rates, and home ownership rates. The probability of being employed in upper-white collar jobs (professionals, executives, and managers) is much higher for Whites and Asians than for the other racial populations (Fronczek & Johnson, 2003). There are relatively high rates of high school completion for people aged 25 years or older of all races, but this ranges from only 52% for Hispanics to 86% for Whites (Bauman & Graf, 2003). Much lower proportions of Americans from all racial groups have completed a college degree, with 44% of Asians and 27% of Whites, but only about 10% of Hispanics and American Indians, and 14% of Blacks and Native Hawaiians having a college degree or more education. Similarly, Blacks, American Indians, and Hispanics have poverty rates that are considerably higher than those of Whites and Asians (Bishaw & Iceland, 2003). Racial differences in wealth are much larger than those for income. Table 4 provides data for rates of home ownership, one of the most common economic assets in American households (U.S. Census, 2000). Seventy-one percent of White households own homes, compared with slightly more than half of all American Indians and Asians, and less than half of Blacks, Native Hawaiians, and Hispanics. These demographic and SES variations point to two major influences on the health patterns of the United States: immigration and socioeconomic disadvantage.

Immigration and Health

Because processes linked to migration make an important contribution to health, the large number of immigrants within both the Asian and Hispanic population importantly affects the health status of these groups. National data reveal that immigrants of all of the major racial groups in the United States have lower rates of adult and infant mortality than their native-born counterparts (Hummer, Rogers, Nam, & LeClere, 1999; Singh & Miller, 2004; Singh & Yu, 1996). However, with length of stay in the United States and acculturation to American society, the health advantage of immigrants tends to decline over time. For example, research on Latinos reveals that adult mortality, infant mortality, psychiatric disorders, psychological distress, substance use, low birth weight, poor health practices, and other indicators of morbidity all increase with increasing acculturation (Finch, Hummer, Reindl, & Vega, 2002; Vega & Amaro, 1994). Similarly, an analysis of the prevalence of chronic disease in the National Health Interview Survey from 1992 to 1995 showed a consistent trend across multiple populations in which recent immigrants reported better health than long-term immigrants and the U.S. born (Singh & Miller, 2004). This pattern existed for non-Hispanic Whites and Blacks, Chinese, Japanese, Filipinos, Asian Indians, Koreans, Vietnamese, other APIs, Mexicans, Cubans, and Central and South Americans.

At the same time, a more complex pattern emerges for the relationship between immigrant status and health for some subgroups of the Asian and Hispanic population. For example, although White, Black, and Hispanic immigrants had markedly lower overall death rates than their native-born counterparts, the death rates for API immigrants were only slightly lower than those of their native-born peers (Singh & Miller, 2004). Moreover, Chinese, Japanese, and Filipino immigrants had all-cause mortality rates that were higher than those of their native-born peers. For the Chinese and Japanese, death rates for multiple causes of death (respiratory diseases, liver cirrhosis, unintentional injuries, suicide, homicide, and liver cancer) were higher for immigrants than their native-born counterparts. The health profile of Puerto Ricans is also distinctive. The infant mortality rate for mainland Puerto Ricans was identical to that of island-born Puerto Ricans, and recent Puerto Rican immigrants report higher levels of chronic disease than the U.S. (mainland)-born and long-term immigrants (Singh & Miller, 2004).

The relationship between immigrant status and health also varies by the health status indicator under consideration, such that our knowledge of the health of immigrants may be importantly shaped by the availability of data for certain health outcomes. A study of pregnancy-related mortality between 1991 and 1997 revealed that Hispanic and Asian immigrant women had higher pregnancy-related mortality rates than their U.S.-born counterparts (Centers for Disease Control and Prevention, 2001). Moreover, the pregnancy related mortality risk of both U.S.-born and foreign-born Black women was four times as high as that of White women. Other data reveal that

women of all Hispanic immigrant groups have a higher risk of low birth weight and prematurity than do Whites (Frisbie, Forbes, & Hummer, 1998). These data point to complex associations between immigration, acculturation, ethnicity, and health.

Immigrant SES, Social Mobility, and Health Trajectories

The health literature has also given inadequate attention to the SES characteristics of immigrant populations. The differences between these groups in SES levels upon arrival in the United States and their trajectories for socioeconomic mobility in the United States are likely to lead to diverging patterns of health over time. Table 5 presents the rate of college graduation, employment in white collar (managerial and professional) and blue-collar occupations, and poverty rates for the major immigrant and native-born racial groups (Rumbaut, 1996a,b). Within each subcategory, groups are ranked by the percentage graduating from college. Several Asian immigrant groups have higher occupational status and markedly higher levels of education than native-born Asians and other native-born Americans of all racial backgrounds. However, Cambodian, Laotian, and, to a lesser extent, Vietnamese immigrants diverge from this pattern with strikingly lower levels of education and managerial employment than U.S.-born persons. Many of these latter immigrants entered the United States with refugee status. With regard to poverty rates, with the exception of Japanese, Filipino, and Indian immigrants, all of the Asian immigrants have higher rates of poverty than native-born Asians. Instructively, the Cambodian and Laotian immigrants have higher rates of poverty than native-born Blacks and Hispanics.

The socioeconomic profile of Latin American immigrants differs markedly from that of Asians. The rates of college graduation and managerial employment are low for migrants from Mexico, the Dominican Republic, and El Salvador, considerably higher for immigrants from Venezuela, Brazil, and Argentina, and intermediate for those from Cuba and Nicaragua. Rates of poverty are high for some Hispanic immigrants (e.g. Mexicans, Dominicans, and Nicaraguans) but low for others (e.g. Brazilians and Argentineans). The final grouping in Table 5 provides the profile of Black immigrants. Not all immigrants from Africa are Black, and persons of African descent are currently outnumbered by persons of Indian (Asian) ancestry for two of the countries listed here (Guyana and Trinidad and Tobago). Nonetheless, Africa and the Caribbean countries included are the major sources of Black immigrants to the United States. Black immigrants from Africa have rates of college graduation that are more than twice that of the U.S.-born population and four times the college graduation rate of native-born Blacks. Most Black immigrants in the United States come from the Caribbean. The data from the five largest sending countries suggests that Black immigrants from the English-speaking Caribbean (with the exception of Barbados) have slightly higher levels of college completion than the native-born Black population but lower than that of the native-born U.S. population in general. In contrast, immigrants from French-speaking Haiti have levels of SES very similar to those of African Americans. Their poverty rates are also higher than those of other Black immigrants.

Table 5. Socioeconomic Status of Immigrants and Native-Born Persons, 1990

Group	Education College Grads %	Occupation White %	Occupation Blue %	Income Poor %
Native born				
Asian (U.S. born)	35.9	34	8	9.8
White (non-Hisp.)	22.0	29	13	9.2
Black (non-Hisp.)	11.4	18	21	29.5
Puerto Rican	9.5	17	21	31.7
Mexican (U.S. born)	8.6	16	19	24.5
Immigrants				
Asian				
India	64.9	48	8	8.1
Taiwan	62.2	47	4	9.8
Philippines	43.0	28	11	5.9
Japan	35.0	39	7	12.8
Korea	34.4	25	13	15.6
China	30.9	29	16	15.7
Vietnam	15.9	17	21	25.5
Cambodia	5.5	9	23	38.4
Laos	5.1	7	41	40.3
Hispanic/Latin American				
Venezuela	37.2	34	11	21.1
Brazil	34.2	20	12	10.8
Argentina	27.7	33	11	11.0
Cuba	15.6	23	18	14.9
Nicaragua	14.6	11	24	24.4
Dominican Republic	7.5	11	31	30.0
El Salvador	4.6	6	27	24.9
Mexico	3.5	6	32	29.7
Blacks				
Africa (Sub-Saharan)	47.1	37	12	15.7
Guyana	15.8	19	12	11.9
Trinidad and Tobago	15.6	20	10	14.9
Jamaica	14.9	22	11	12.1
Haiti	11.8	14	21	21.7
Barbados	8.6	11	8	9.4

Notes: College grad = college graduate or more for persons aged 25 years or older; White = white collar = professionals, executives, and managers; Blue = blue collar = operators, fabricators, laborers. [From Rumbaut (1996a,b).]

What are the implications of these patterns for health and trajectories of immigrant health status? The socioeconomic data indicate that both native-born Asians and most Asian immigrants have higher levels of education and occupational status than U.S. Whites. Thus, although the health advantage of Asian immigrants declines somewhat over time (Cho & Hummer, 2000; Frisbie et al., 2001), the maintenance of a relatively high SES profile suggests that Asians are likely to continue to lead the United States on multiple health indictors. In contrast, the low SES profile of Hispanic immigrants, combined with the low SES levels of native-born Latinos and the ongoing challenges that Hispanics face with educational and occupational mobility (Camarillo & Bonilla, 2001), suggest that the health status of Latinos is likely to decline more rapidly than that of Asians and to be worse than the U.S. average in the future.

The SES trajectory of Black immigrants is likely to importantly affect their future patterns of health. Some evidence suggests that the SES trajectory of second-generation Caribbean immigrants is importantly related to the SES of their parents, with those from low SES backgrounds faring considerably

Table 6. Percentage of Men and Women Reporting Fair or Poor Health by Race and Income, 1995

Household Income	Men			Women		
	White	Black	Hispanic	White	Black	Hispanic
Poor	30.5	37.4	26.9	30.2	38.2	30.4
Near poor	21.3	22.6	19.2	17.9	26.1	24.3
Middle income	9.3	13.1	11.9	9.2	14.6	13.5
High income	4.2	5.0	4.8	5.8	9.2	7.0

Notes: Poor = below federal poverty level; near poor = less than twice the poverty level; middle income = more than twice poverty level but less than $50,000; high income = $50,000 or more. [From Pamuk et al. (1998).]

worse than their middle-class counterparts (Waters, 1999). Inadequate research attention has been given to the health of Black immigrants in general and immigrants from Africa in particular. These groups provide a unique opportunity to identify how SES, acculturation, and exposure to racism relate to each other and combine to affect health and health trajectories.

The data in Table 5 also highlight the heterogeneity within immigrant populations. Although some 60% of Hispanics in the United States are of Mexican ancestry, there is considerable variation within the Hispanic category, and health researchers should attempt to assess this whenever feasible. There is similar variation within the Black and Asian categories. For example, combining all Asians into one category or focusing only on the subgroups that have a long history of settlement in the United States will mask those Asian subgroups that have higher levels of risks. Research reveals that the Laotians, Hmong, Cambodians, Vietnamese, and Pacific Islanders have levels of health status markedly worse than the overall Asian category and generally inferior to that of Whites (Cho & Hummer, 2000; Frisbie et al., 2001). Similarly, the health profile of black immigrants varies by the specific group and health outcome under consideration (Fruchter et al., 1990). Inadequate research attention has also been given to health status variations within the White population.

Race, SES, and Health

Table 4 noted that there were large racial differences in SES. SES is one of the strongest known determinants of variations in health (Williams & Collins, 1995). Across a broad range of societies, persons of higher social status enjoy better health than their lower SES counterparts. Data on self-assessed health by income level for Blacks, Whites, and Hispanics illustrate the complex role that SES plays in racial differences in health in the United States. Self-assessed health is a global indicator of health status that is a strong predictor of mortality and changes in physical functioning (Idler & Benyamini, 1997; Idler & Kasl, 1995). Racial differences exist on this overall indicator of health. In 1995, 9.1% of non-Hispanic Whites indicated that they were in fair or poor health compared with 15.1% of Hispanics and 17.3% of non-Hispanic Blacks (NCHS, 2003).

Several points are noteworthy regarding the data in Table 6. First, the differences by SES are large within each group for both men and women. Second, the SES differences are much larger than the racial ones. Within each racial and gender group, the differences between the poor and high income categories are more than three times larger than the overall Black/White difference in health and more than four times larger than the overall Hispanic/White difference in health. Third, there is the persistence of racial differences in health at comparable levels of income. At every level of income, African American men and women report poorer health than their White counterparts. This independent effect of race is especially marked among poor Black men and among Black women. A similar pattern exists for Hispanic men at the two highest income categories and for Hispanic women for the three nonpoor categories. It is instructive that among the poor, Hispanic women do not differ from White women in self-rated ill-health and Hispanic men report lower levels of self-rated ill health than White males. The interplay of migration with SES may underlie this pattern. A large number of Hispanic immigrants are low in SES, but are in relatively good health. However, as noted earlier, with increasing acculturation and length of stay in the United States, the health of many Hispanics worsens even as SES increases (Vega & Amaro, 1994).

Table 7 presents infant mortality rate by mother's education among women aged 20 years and older in the United States and further illustrates the complexity of the association between race, SES, and health. Infant mortality rates are inversely related to mother's education for each racial group. At the same time, the size of the association varies by group, with the relationship being stronger for non-Hispanic Whites and American Indians than for Blacks, Hispanics, and APIs. Compared with college graduates, women who have not completed high school have infant mortality rates that are 1.5 times higher for Blacks, 1.4 times higher for Hispanics, and 1.4 times higher for APIs compared with 2.4 times higher for Whites and 2.2 times higher for the highest available education group (women with some college education) for American Indians.

The racial differences in infant mortality at comparable levels of education are also striking. Infant mortality rates for the API population are equivalent to or lower than those of Whites at every level of education. Hispanics have lower rates than Whites at the two lower education levels but higher rates than Whites at the two highest levels. In contrast, both American Indians and African Americans have infant mortality rates that are higher than those of Whites at every level of education. The differences are especially striking for African American women. The Black/White difference in mortality rates does not decline with increasing years of education, and the Black/White ratio becomes larger as education levels increase. Most strikingly, the most advantaged group of African American women (college graduates) have higher rates of infant mortality than the most disadvantaged group of White, Hispanic, and API women (those who have not completed high school).

These data highlight that race and SES are two related but not interchangeable systems of inequality. The striking pattern of excess risk for African American women at all levels of SES, but especially among the college educated, is not unique to infant mortality data. In national data, the highest SES group of African-American women also has equivalent or higher rates of low birth weight, hypertension, and overweight than the lowest SES group of White women (Pamuk, Makuk, Heck, & Reuben, 1998). Other evidence suggests that middle-class African-American males also have elevated health risks for a number of stress-related outcomes such as suicide, hypertension, and reported levels of stress (Williams, 2003). Understanding these unique effects linked to race and the conditions under which

they occur requires increased research attention to the nonequivalence of all SES indicators across racial groups (Kaufman, Cooper, & McGee, 1997; Williams & Collins, 1995), the multiple ways in which racism can affect the health of socially disadvantaged populations (Williams, 2004), and the ways in which risk factors and resources for health combine over the life course to affect the social distribution of disease.

Research on the stressful consequences for health of perceptions of racial discrimination may provide one of the missing links to understanding the elevated health risks that are sometimes linked to middle-class status among members of minority groups. Levels of reported racial discrimination are positively related to SES among African Americans (Forman, Williams, & Jackson, 1997). Some evidence suggests that perceptions of discrimination make an incremental contribution to explaining the residual effect of race after SES is controlled (Williams, Neighbors, & Jackson, 2003). However, future research must seek to comprehensively characterize other risk factors that may either uniquely or disproportionately affect middle-class members of minority populations. Some of the unique stressors of middle-class minorities may arise from their occupational contexts. For example, exposure to tokenism at work and persistent glass ceilings can lead to frustration that could adversely affect health (Jackson & Stewart, 2003). Other health risks may arise from residential conditions. Compared with Whites with similar incomes, Blacks and Puerto Ricans live in neighborhoods that are poorer in quality (Alba & Logan, 1993). An analysis of 1990 Census data revealed that Blacks who reside in the suburbs lived in housing conditions that were equivalent or inferior to those of Blacks living within central cities (Harris, 1999). Not surprisingly, one recent study found that whereas suburban residence was associated with lower mortality for Whites, it predicted elevated mortality rates for Blacks, especially for Black men (House et al., 2000).

Another understudied risk factor for middle-class members of historically disadvantaged populations is the "costs of caring" (Kessler, McLeod, & Wethington, 1985) involved in the provision of material and other support to lower SES family members. Many of these middle-class persons have large family networks that exist in high stress, low SES contexts. The extent to which some middle-class minority members also experience health costs linked to caring for relatives has not been systematically explored. Still another understudied pathogenic factor may be the disidentification, distancing, and alienation from one's community of origin that may be true of some portion of middle-class minority group members (Cole & Omari, 2003).

Identifying Health Risks Over the Life Course

There is growing recognition that psychological, social, and economic adversity in childhood can have long-term consequences for health. Several recent studies highlight the importance of attending to these issues. For example, in the CARDIA Study, low childhood SES, as measured by parental education, was associated with poorer baseline pulmonary function among young adults, as well as declines in pulmonary function over time (Jackson, Kubzansky, Cohen, Weiss, & Wright, 2004). This graded association remained significant after adjustment for current SES, asthma history, smoking history, and other risk factors. Importantly, this pattern was evident for Blacks and Whites, males and females, in this large cohort. Hispanics and Blacks are more likely than Whites to reside in areas with poor air quality, and one recent study of 226 African American and Dominican women in New York documented that prenatal exposure to air pollution adversely affected the neurodevelopment of children beyond the neonatal period (Rauh et al., 2004). Infants born to mothers who had been exposed to indoor and ambient air pollutants were twice as likely to be classified as significantly delayed cognitively at 24 months compared with nonexposed children. Moreover, the study found an interaction between exposure to air pollution and material hardship, with children having both exposures manifesting the greatest cognitive deficits. This study also illustrates the importance of attending to complex interactions that may exist between factors in the physical environment with those in the social and psychological context. A study of childhood SES and adult psychological functioning from Kuopio, Finland, also highlights the importance of understanding how childhood and adult risk factors relate to each other and combine to affect health (Harper et al., 2002). The study found that childhood SES measured by parental education and occupation at age 10 years predicted higher levels of cynical hostility, hopelessness, and depressive symptoms in a cohort of men some 30–50 years later. However, childhood SES and adult SES were independently related to cynical hostility and hopelessness, but only adult SES was independently related to depressive symptoms.

Taking the life course seriously also requires greater attention to identifying critical time points and transitions that may be important in the development of health risk. For example, the period of transition from late adolescence to early adulthood appears to be pregnant with health risks for African Americans. During this time, elevated rates of blood pressure emerge or become pronounced, cigarette use, problem drinking, and illicit drug use show a larger increase for African Americans than for Whites, and if heavy use is initiated for Blacks, it continues for a longer period of time (Williams, 2003). Similarly, elevated rates of mood disorders are evident for African Americans compared with Whites only for the 18- to 29-year age group (Robins & Regier, 1991). These patterns may reflect the reality that the transition to adulthood is associated with heightened awareness of restricted opportunities that lead to elevated levels of stress and maladaptive patterns of coping (Williams, 2003). A recent study found that an increasingly disadvantaged post-high school educational pathway that led to the underrepresentation of Blacks and Hispanics in 4-year colleges largely accounted for their elevated rate of depressed mood compared with Whites and Asians (Gore & Aseltine, 2003).

Alternatively, the transition to adulthood may be associated with the declining influence of religious institutions and their potential health-enhancing effects. Black adolescents are much less likely than White adolescents to use a broad range of substances, including alcohol, tobacco, and marijuana (Wallace, Bachman, O'Malley, Johnston, Schulenberg, & Cooper, 2002). Among high school seniors in the United States, religious involvement is a powerful predictor of adolescent risk behavior. National data reveal that religious high school seniors are less likely than their nonreligious peers to carry a weapon to school, get into fights or hurt someone, drive after drinking, ride with a driver who had been drinking, smoke cigarettes, engage in

binge drinking, or use marijuana (Wallace & Forman, 1998). In addition, religious seniors were more likely than nonreligious seniors to wear seatbelts; eat breakfast, green vegetables and fruit; get regular exercise; and sleep at least 7 hours per night. A recent analysis of these same data indicated that religious involvement among African-American adolescents is a key determinant of their lower levels of substance use (Wallace, Brown, Bachman, & Laveist, 2003). These findings for the role of religion in health risk behavior highlight the importance of understanding resilience factors and processes and identifying how they combine with other individual and social factors to affect health risks.

The high level of childhood poverty in the United States emphasizes the importance of attending to life course factors in understanding adult health. In 1996, 11% of White non-Hispanic children under the age of 18 years lived in poor households (Pamuk et al., 1998). However, the poverty rate was twice as high for API children and four times as high for Black and Hispanic children. A large number of children are also at high risk of becoming poor. Households that are near poor (incomes above poverty but less than twice the poverty level) are at high risk of falling into poverty at some time while these children are being raised (Duncan, 1988). When the poor and near poor are combined into an economically vulnerable category, it becomes evident that 43% of all children in the United States are at risk of being exposed to economic adversities in childhood that may have long-term health consequences (Pamuk et al., 1998). This includes 31% of White, 36% of API, 68% of Black, and 72% of Hispanic children.

A recent review documented the broad range of risk factors that are associated with being raised in a family living in poverty (Evans, 2004). Compared with high SES children, poor children are more exposed to family turmoil, violence, separation, instability, and chaotic households. In addition, they experience less support and have parents that are less responsive and more authoritarian. They also are read to less frequently, watch more TV, and have less access to books and computers. Poor children are also less likely to have parents involved in their school activities and to be exposed to negative risk factors in their housing and residential environments. Poor children are more likely to consume air and water that is polluted and live in homes that are crowded, noisy, and of low quality (Evans, 2004). In addition, they live in neighborhoods that are more dangerous, have access to poorer city services, and have greater physical deterioration. Poor children are also more likely to attend schools and daycare institutions that are of inferior quality. Social adversities and stressors tend to co-occur and cumulate over the life course, with individuals and groups disadvantaged with exposure to a given pathogenic factor also being exposed to multiple risk factors. An important priority for future research on the health of racial populations is to better understand how adult health is affected by events earlier in life as well as by the accumulation of health risks over the life course.

Identifying the Biological Pathways

There is also a pressing need to identify the biological pathways by which psychosocial adversities affect health. Chronic exposure to stressors can also lead to dysregulation across multiple physiological systems of the body. The concept of allostatic load captures the cumulative burden of this physiological wear and tear on the human organism that can increase the risk of disease (McEwen & Seeman, 1999). A recent study of elderly adults suggests that a measure of allostatic load can shed light on understanding social inequalities in health (Seeman et al., 2004). In this study of high functioning elders, a summary measure of allostatic load that consisted of 16 biological indicators of cardiovascular risk (6), hormones (4), inflammation (4), and renal function and lung function was inversely related to SES. This composite measure of biological dysregulation explained one third of educational differences in morbidity. Importantly, allostatic load explained more variance when operationalized as a composite measure of biological risk than as multiple individual risk factors.

Conclusion

Clarity remains an elusive goal with regard to the patterns of racial disparities in health for each of America's racial groups. Future research on racial differences in health should be attentive to the ethnic heterogeneity of each racial category, the distinctiveness of each racial group, and the data limitations attendant to the assessment and presentation of racial data. There is also an urgent need to identify the determinants of racial disparities in health so that the effectiveness of efforts to eliminate elevated health risks for socially disadvantaged populations can be enhanced. More research is needed that is attentive to individual and group histories and to the particular social and geographic locations of America's racial populations. Efforts that catalogue and quantify the patterned ways in which risk and protective factors emerge in specific contexts and cumulate over the life course can deepen our understanding of how the larger social environment can shape the distribution of disease.

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Address correspondence to David R. Williams, PhD, MPH, Departments of Sociology and Epidemiology and Survey Research Center, Institute for Social Research, University of Michigan, Post Office Box 1248, 426 Thompson St., Ann Arbor, MI 48106-1248. E-mail: wildavid@umich.edu

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