

Death in the Golden State

Why Do Some Californians Live Longer?

By Helen Lee and Shannon McConville

Summary

A black man in California can expect to live 68.6 years on average, which is far below the life expectancy of the average California white male, who can expect to live 75.5 years. Despite the impressive gains in American longevity over the past century, significant disparities in life expectancies such as this one persist across racial and ethnic groups in California. These racial and ethnic disparities reflect underlying differences in specific causes of death, which is the focus of this issue of *California Counts*. Understanding the causes of death that contribute to racial and ethnic differences in life expectancies can shed light on the underlying factors that drive inequalities in health and can inform state health officials trying to identify more effective avenues of prevention.

In our analysis, we find that black men and women have higher levels of mortality (from all causes combined) than whites. In contrast, Hispanics and Asians appear to have a slight life expectancy advantage over whites. We further find that death rates for blacks for almost all chronic diseases and injuries exceed those of whites and sometimes markedly so. Hispanics and Asians have lower death rates for most chronic conditions and injuries than whites, with a few exceptions.

In addition, we illustrate how differences in socioeconomic status, measured in terms of educational attainment, contribute to observed mortality disparities. Across all racial/ethnic groups, more educated Californians have better mortality outcomes than less educated Californians, although black-white disparities persist among individuals with similar levels of educational attainment.

In this issue, we also break down the overall life expectancy gaps among racial/ethnic minority groups and whites to identify the causes of death that most definitively account for

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racial/ethnic disparities. Heart disease drives much of the mortality disadvantage for adult black men, followed by homicide. Eliminating these two causes of death would reduce the black-white disparity in life expectancy among men by more than 40 percent. Higher mortality rates from heart disease, cancers (especially lung cancer), and chronic lower respiratory diseases are the causes that mainly drive the lower life expectancy seen among white men relative to Hispanic men. However, the Hispanic mortality advantage over whites would be almost 30 percent higher were it not for Hispanic men's higher death rates attributed to diabetes and liver disease. For women, heart disease drives most of the black mortality disadvantage and the Asian and Hispanic advantage over white women, although diabetes-related deaths reduce the life expectancy advantage found among Hispanic women. Eliminating diabetes would particularly improve life expectancies for both Hispanic and black women, whereas eliminating liver disease/cirrhosis would lengthen Hispanic men's life span. Finally, improving the identification, transmission, and management of human immunodeficiency virus (HIV) infection and deaths would most distinctly benefit black men and women.

Introduction

The average Californian born at the turn of the 21st century can expect to live longer than at any other time in the state's history. In fact, one of the great accomplishments of the 20th century was the marked improvement in health and longevity for the nation, with an increase in life expectancy of almost 30 years between 1900 and 2000 (U.S. Department of Health and Human Services, 2000). The advent of effective treatments for chronic morbidities and infectious diseases, greater understanding of risk factors and preventive measures, and improvements in living conditions have all played important roles in declining mortality and increasing life spans.

Despite this progress, considerable disparities in life expectancies persist across racial and ethnic groups in California, as they do for the rest of the nation. Reduction of these racial/ethnic health disparities represents a longstanding health policy goal for the state of California (California Department of Health Services, 2003). As outlined in the U.S. Department of Health and Human Services' *Healthy People 2010* report (2000), which sets and monitors health objectives for the nation, improving the quality and length of life lived and eliminating health disparities among particular segments of the population—including

racial/ethnic and socioeconomic gaps—remain the two overarching public health concerns of the new century. Whereas gains in life expectancy since *Healthy People's* inception in the late 1970s have steadily increased for both sexes and for both white and black populations, the black-white gap in mortality, in which blacks consistently have lower life expectancies than whites, has fluctuated over time. In fact, there has been no sustained decrease in the overall disparity between blacks and whites since the end of World War II (Levine et al., 2001).

In this issue of *California Counts*, we investigate the sources of mortality differences in California by examining patterns in causes of death. Racial and ethnic differences in mortality from all causes (from which life expectancy measures are derived) ultimately reflect differences among groups in cause-specific mortalities from various chronic conditions, diseases, and injuries. Understanding the causes of death that contribute to racial and ethnic differences in overall mortality can shed light on underlying factors that drive inequalities in health; it can also help state health officials to identify relevant avenues of prevention. Moreover, many of the risk factors for the diseases and injuries that kill Californians are amenable to change. Reducing the prevalence of negative health risks such as obesity or smoking may improve

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not only life expectancies but also the quality of life lived. To this end, we highlight the role of health behaviors, prevention and screenings, and other factors that influence morbidities and that may explain some of the racial and ethnic inequalities that we document in this study.

The mortality measures that we present are based on pooled death certificate data from the California Department of Health Services (DHS) (2000–2002) and 2000 decennial census estimates.¹ We first calculate life expectancies at birth and at age 25 for the

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state's major racial/ethnic groups: non-Hispanic whites, Hispanics, non-Hispanic blacks, and non-Hispanic Asians.² We then extend our range to examine the leading underlying causes of death by sex and the race/ethnicity of adults ages 25 and older.³ Ideally, we would have liked to present estimates for other racial/ethnic groups in California and by nativity status as well (see Johnson and Hayes, 2004), but this was made difficult by the small numbers of deaths for many of the specific causes of interest, combined with skewed distributions by nativity status for certain national origin groups.⁴ We compare age-adjusted death rates across the major racial/ethnic and education groups for the leading causes of death. We then disaggregate differences in life expectancies among racial/ethnic groups by specific causes of death to identify those most accountable for the disparities. We also simulate possible gains in life expectancy in the hypothetical absence of certain diseases and injuries to help health officials identify where the burden of disease lies for all groups and for certain groups in particular. For more information on data and calculations, refer to the text box, "Cause-of-Death Data and Measurements."

We should note some limitations to our analyses regarding the quality of death certificate data and inconsistencies between the reporting of demographic char-

acteristics on death certificates and census population numbers. Demographic characteristics on death certificates are reported by the next of kin or a close loved one (or by the funeral director in the absence of such a person) and may not be accurate. Studies examining the quality of racial/ethnic information on death certificates reveal high accuracy for whites and blacks but underreporting of Hispanic and Asian race/ethnicity (Rosenberg et al., 1999). Age may also be misreported, both on the death certificate records and in the census, with blacks and Hispanics (especially the elderly) more likely to have misreported ages (Elo and Preston, 1997). Finally, education may be inflated on death certificates (and the census), particularly among older decedents (Sorlie and Johnson, 1996). To the extent these biases exist, our mortality measures will be underestimated for Hispanics, Asians, older adults, and the less educated and overestimated for more educated groups. However, observed discrepancies in reporting are relatively small and would not change the general conclusions of mortality differences among groups.

Disparities in Life Expectancies

Figure 1 shows the average life expectancy at birth—a widely used and broad indicator of popu-

Cause-of-Death Data and Measurements

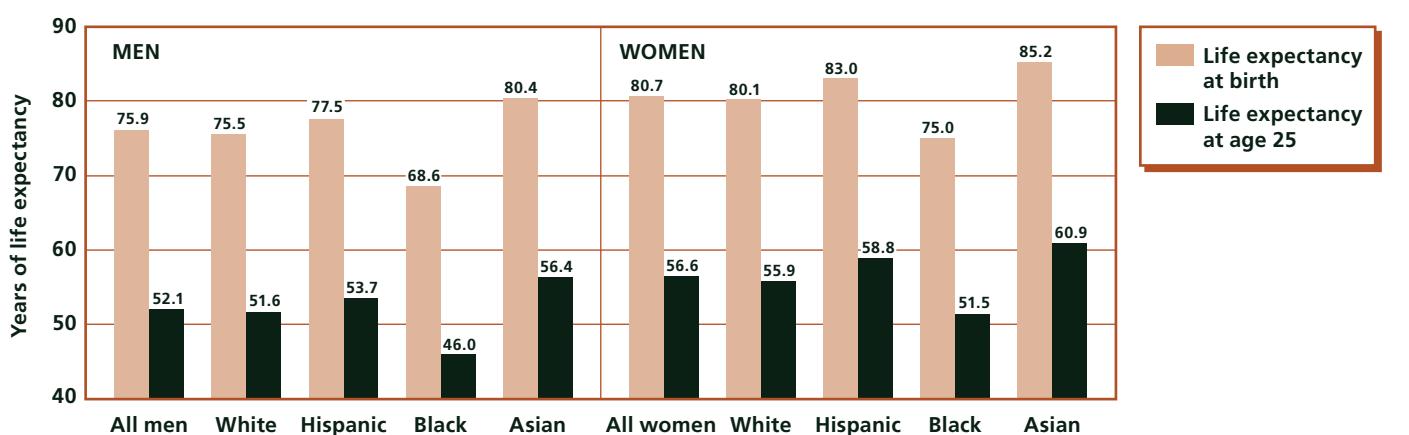
The primary data source for our analysis is vital statistics public use death records provided by the California Department of Health Services (DHS) for the years 2000–2002. We aggregate and average three years of death certificate information to have sufficient numbers for analyses. Excluded from our analyses are deaths of non-California residents and those of unknown age or race/ethnicity. Overall, of the 694,317 deaths of California residents over the three-year study period, 99.96 percent of decedents were of known age and 99.86 percent were of known race/ethnicity.

Cause-of-death coding is based on the International Classification of Diseases, currently in its tenth revision (ICD-10), a system developed and maintained by the World Health Organization to provide a consistent and comparable method for reporting mortality information. Physicians and medical examiners report the underlying cause of death, defined as the disease or injury that initiated the train of morbid events leading directly to death (National Center for Health Statistics, 2003).

We rank leading causes of death according to the total number of deaths attributable to a particular cause, by sex and race/ethnicity. We include causes that are in the top 10 for any racial/ethnic group for men and women separately. We also calculate age-specific death rates (ASDR) for the leading causes of death by dividing the number of deaths attributed to a specific cause among people in a particular age interval by the total number of people in the same age interval. The number of deaths by cause comes from the vital statistics data. Census 2000 data (Summary 2 and 4 files) are used to construct the denominators for the death rates. It should be noted that our denominator population counts do not take into account any changes (e.g., population changes resulting from migration in and out of the state) that occurred between 2000 and 2002. Although these changes are relatively small, they will most likely lead to an underestimate of mortality for subgroups that are declining in size and an overstatement of mortality for subgroups that are increasing.

Age-adjusted death rates (AADR) account for differences in the underlying age distribution of groups, allowing for more accurate comparisons across groups. We compute these for adults ages 25 and older by weighting the ASDR for each racial/ethnic group by a standard population and summing the weighted values to produce a single death rate for each group. We use the age-adjusted overall (all-cause) and cause-specific death rates to compare mortality inequalities across racial/ethnic and education groups among adults. It should be noted that for all rates, we calculated standard errors and confidence intervals. These estimates are available through PPIC's online data depot at <http://www.ppic.org/main/dataSet.asp?i=703>.

For the purposes of some of our analyses, we also construct standard abridged life tables (Chiang, 1984), which use the ASDR from birth to the oldest ages as their building block to calculate life expectancies by sex and race/ethnicity. From those life tables, we disaggregate differentials in life expectancies among racial and ethnic groups by select causes of death for decedents ages 25 and older (Preston, Heuveline, and Guillot, 2001). The breakdown of life expectancy differentials between groups is based on a multiple decrement life table process, which allows for competing risks to be incorporated into the analysis. The inclusion of competing risks takes into consideration the fact that if people do not die from one cause of death (such as heart disease), they are susceptible to the risk of dying from another cause (such as cancer). We also construct what are known as associated single decrement life tables, in which we examine what life expectancies would look like in the absence of a particular decrement or cause of death (Preston, Heuveline, and Guillot, 2001).

Figure 1. Life Expectancy at Birth and at Age 25 for Californians, by Sex and Race/Ethnicity

Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Note: The life expectancies for all men and women include any racial/ethnic group, including other ethnic minorities (e.g., Pacific Islanders, Native Americans) and multirace individuals.

lation health—for each major racial/ethnic group in the state, by sex. Life expectancy at age 25 is also included, representing the average additional years of life one can expect after reaching age 25. For all racial and ethnic groups, women have a mortality advantage over men. The average female born in California in 2000–2002 can expect to live about 80.7 years and the average male can expect about 76 years of life. Although biological differences across sexes may play a role, the female life expectancy advantage has also been attributed to traditional gender role patterns. These have historically translated into greater exposure among men to negative health behaviors and other contextual risks, such as smoking, excessive drinking, inju-

ries, and violence (Waldron, 1995). For both men and women, Asians and Hispanics appear to live longer than the average Californian, and whites are on par with the statewide average. Blacks lag behind all groups, with the black male life expectancy at birth notably 6.9 years lower than that of white males. Black women also experience a mortality disadvantage, dying five years earlier on average than white women.

As Figure 1 shows, if people survive to the age of 25, similar racial/ethnic patterns in life expectancies continue, but the gap between blacks and whites narrows (5.6 years difference for men and 4.4 years difference for women) and is not as large as it is at birth. Different mortality experiences,

notably much higher homicide rates among black men and women under age 25, are an important component of the black/white difference in life expectancy at birth and so help to account for this narrowing of the gap at age 25.

Life expectancy calculations, as noted above, are based on deaths from all causes. To identify the diseases and injuries that are most prominent for understanding adult mortality, we turn to an examination of the leading causes of death in California.

Leading Causes of Death

Table 1 shows the ranked leading causes of death for men

and women in each racial and ethnic group. Many of the leading causes reflect the dominance of mortality from chronic conditions at older ages. Across all racial/ethnic and sex groups, diseases of the heart and malignant neoplasms (cancers) are the two leading killers among California adults, accounting for half of all adult deaths. This is consistent with national patterns (Anderson, 2001).⁵ Following heart disease and cancer, cerebrovascular disease (i.e., stroke) is the third leading cause of death for all subgroups, except for Hispanic men for whom it ranks fourth. Stroke is related to a number of health-related behaviors (smoking, excessive alcohol use, high cholesterol, and sedentary lifestyles) and other comorbid conditions, such as obesity, diabetes, and heart disease, but not to one particular health behavior or risk factor (Mensah et al., 2005). These three leading causes tend to strike older populations, with deaths occurring, on average, among people over age 65 regardless of sex or race/ethnicity. Other leading causes of death, including accidents, homicides, suicides, and HIV, reflect mortality experiences at younger ages.⁶

Looking more specifically at the leading causes of death by race and sex groups highlights some troubling disparities. Homicide notably ranks as the sixth leading killer among black men and seventh among Hispanic men. For

Asian and white men, homicide ranks as the 14th and 20th killer, respectively. Among Hispanic men, death from chronic liver disease and cirrhosis ranks as the fifth leading cause of death, but for white men it ranks ninth and is not even among the top 10 causes of death for Asian men. Death from HIV infection—which typically leads to death at younger ages than other chronic conditions—ranks in the top 10 for both black and Hispanic males but is the 13th and 21st cause of death among white and Asian men, respectively. Although not shown here (because it did not rank in the top 10 for any racial/ethnic group among women), it should be noted that HIV is the 11th leading cause of death among black women. For white women, HIV is the 29th leading cause. Deaths related to diabetes, a condition characterized by the body's inability to produce or utilize insulin and regulate blood sugar levels, rank in the top 10 causes of death for all racial/ethnic and sex groups. However, there do appear to be differences by race/ethnicity particularly among women; almost 6 percent of deaths among Hispanic women and 5 percent of deaths among black women are due to diabetes, compared to about 2 percent among white women.

Rankings of leading causes of death are a widely used public health tool for understanding the raw societal burden of mortality

Across all racial/ethnic and sex groups, diseases of the heart and malignant neoplasms (cancers) are the two leading killers among California adults, accounting for half of all adult deaths.

(Anderson, 2001), but such rankings do not readily lend themselves to comparing differences across groups accurately. Next, we compare how age-adjusted and cause-specific mortality rates differ across racial and ethnic groups, for men and women.

Cause-Specific Mortality Rates

Differences by Race/Ethnicity

Table 2 displays absolute age-adjusted mortality differences (for adults ages 25 and older) by race/ethnicity and sex, and the ratio of mortality rates of ethnic minorities to whites. Death rates for blacks for almost all causes exceed those of whites, and sometimes markedly so, the exceptions

Table 1. Leading Causes of Death Among California Adults Ages 25 and Older, by Sex and Race/Ethnicity

Cause of Death	White			Hispanic			Black			Asian		
	Rank	No. of Deaths	% of Total	Rank	No. of Deaths	% of Total	Rank	No. of Deaths	% of Total	Rank	No. of Deaths	% of Total
MEN												
All causes		236,593			43,637			25,952			22,473	
Diseases of heart	1	75,127	31.8	1	10,998	25.2	1	7,863	30.3	1	6,467	28.8
Malignant neoplasms	2	58,771	24.8	2	8,958	20.5	2	6,119	23.6	2	6,190	27.5
Cerebrovascular diseases	3	14,810	6.3	4	2,763	6.3	3	1,640	6.3	3	2,139	9.5
Chronic lower respiratory diseases	4	14,519	6.1	9	1,112	2.5	5	1,047	4.0	4	1,134	5.0
Accidents	5	9,199	3.9	3	3,643	8.3	4	1,148	4.4	6	772	3.4
Influenza and pneumonia	6	8,070	3.4	8	1,196	2.7	9	656	2.5	5	952	4.2
Diabetes mellitus	7	5,333	2.3	6	2,180	5.0	7	987	3.8	7	749	3.3
Suicide	8	4,985	2.1	11	900	2.1	13	277	1.1	8	385	1.7
Chronic liver disease and cirrhosis	9	4,113	1.7	5	2,561	5.9	10	391	1.5	12	211	0.9
Alzheimer's disease	10	3,977	1.7	15	286	0.7	14	195	0.8	15	126	0.6
Aortic aneurysm and dissection	12	2,008	0.8	16	209	0.5	15	155	0.6	10	237	1.1
HIV	13	1,853	0.8	10	941	2.2	8	818	3.2	21	66	0.3
Nephritis, nephritic syndrome, nephrosis	14	1,753	0.7	12	509	1.2	12	344	1.3	9	282	1.3
Homicide	20	786	0.3	7	1,209	2.8	6	1,022	3.9	14	139	0.6
All other causes		31,289	13.2		6,172	14.1		3,290	12.7		2,624	11.7
WOMEN												
All causes		255,948			36,184			24,903			19,900	
Diseases of heart	1	79,921	31.2	1	9,815	27.1	1	8,083	32.5	2	5,406	27.2
Malignant neoplasms	2	58,041	22.7	2	8,814	24.4	2	5,700	22.9	1	5,578	28.0
Cerebrovascular diseases	3	23,875	9.3	3	3,125	8.6	3	2,329	9.4	3	2,506	12.6
Chronic lower respiratory diseases	4	17,726	6.9	7	1,030	2.8	5	858	3.4	6	579	2.9
Influenza and pneumonia	5	10,501	4.1	5	1,306	3.6	6	741	3.0	4	839	4.2
Alzheimer's disease	6	8,825	3.4	10	558	1.5	9	449	1.8	10	221	1.1
Diabetes mellitus	7	5,382	2.1	4	2,482	6.9	4	1,251	5.0	5	755	3.8
Accidents	8	5,190	2.0	6	1,161	3.2	7	593	2.4	7	520	2.6
Hypertension	9	2,767	1.1	11	444	1.2	8	505	2.0	9	313	1.6
Atherosclerosis	10	2,518	1.0	13	225	0.6	14	132	0.5	17	88	0.4
Chronic liver disease and cirrhosis	11	2,355	0.9	8	868	2.4	12	263	1.1	12	136	0.7
Nephritis, nephritic syndrome, nephrosis	12	1,650	0.6	9	566	1.6	10	355	1.4	8	316	1.6
All other causes		37,197	14.5		5,790	16.0		3,644	14.6		2,643	13.3

Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Table 2. Age-Adjusted Mortality Rates for Selected Causes of Death Among California Adults Ages 25 and Older, by Sex and Race/Ethnicity

Cause of Death	Age-Adjusted Mortality Rate (per 100,000)				Ratio of Ethnic Minority to White Rates		
	White	Hispanic	Black	Asian	Hispanic-White	Black-White	Asian-White
MEN							
All causes	1,501.4	1,242.9	2,089.0	1,040.7	0.83	1.39	0.69
Diseases of heart	484.3	380.4	681.9	315.8	0.79	1.41	0.65
Lung cancer	103.0	54.0	145.3	73.7	0.52	1.41	0.72
Prostate cancer	43.6	37.1	99.6	19.4	0.85	2.28	0.44
All other cancers	215.6	174.5	258.3	169.7	0.81	1.20	0.79
Cerebrovascular diseases	97.6	95.1	147.4	106.2	0.97	1.51	1.09
Chronic lower respiratory diseases	92.1	44.5	93.9	58.7	0.48	1.02	0.64
Accidents	56.3	52.1	65.4	28.7	0.93	1.16	0.51
Diabetes mellitus	33.0	66.1	80.0	33.3	2.00	2.42	1.01
Chronic liver disease and cirrhosis	24.0	49.4	24.0	7.8	2.06	1.00	0.33
Suicide	30.2	11.8	14.6	12.3	0.39	0.48	0.41
Hypertension	11.0	12.3	34.3	10.4	1.11	3.10	0.94
HIV	10.9	11.4	41.3	1.9	1.05	3.78	0.18
Homicide	4.8	11.6	47.2	4.1	2.42	9.82	0.84
All other causes	295.0	242.6	355.9	198.8	0.82	1.21	0.67
WOMEN							
All causes	1,077.0	847.9	1,428.9	712.8	0.79	1.33	0.66
Diseases of heart	316.1	256.6	474.4	209.5	0.81	1.50	0.66
Lung cancer	71.7	24.5	73.1	34.4	0.34	1.02	0.48
Breast cancer	44.1	25.6	56.9	24.0	0.58	1.29	0.54
All other cancers	152.4	133.8	193.3	118.5	0.88	1.27	0.78
Cerebrovascular diseases	93.8	79.9	137.4	93.2	0.85	1.47	0.99
Chronic lower respiratory diseases	75.7	26.7	49.7	22.0	0.35	0.66	0.29
Accidents	26.0	18.5	29.4	16.7	0.71	1.13	0.64
Diabetes mellitus	23.8	57.9	72.6	27.0	2.44	3.06	1.13
Chronic liver disease and cirrhosis	12.3	16.5	13.7	4.2	1.34	1.12	0.35
Suicide	8.2	1.9	4.0	4.7	0.23	0.49	0.58
Hypertension	10.9	11.7	29.5	12.2	1.08	2.72	1.12
HIV	1.0	1.7	12.6	0.3	1.75	12.73	0.31
Homicide	2.1	2.8	7.5	1.7	1.30	3.54	0.78
All other causes	239.0	189.7	274.7	144.5	0.79	1.15	0.60

Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Note: See the text box for more detail on calculations.

Heart disease, which has the highest age-adjusted death rates per 100,000 across all races, is about 40 percent higher for black men and 50 percent higher for black women than for white men and women.

being suicide, for both sexes, and chronic lower respiratory disease, for women.⁷ Heart disease, which has the highest age-adjusted death rates per 100,000 across all races, is about 40 percent higher for black men and 50 percent higher for black women than for white men and women. In addition, although not shown in Table 2, the black-white mortality disparity from heart disease is even larger at younger ages, so much so that death rates for black men and women under age 65 are between two and three times those of their white counterparts.

For some conditions and injuries, blacks appear to be at a substantial disadvantage. For instance, the age-adjusted death rate from

homicides among black males (47.2 homicide deaths per 100,000), although lower than death rates from chronic diseases such as heart disease (681.9 deaths per 100,000), is nearly 10 times the homicide death rate of white men (4.8 homicide deaths per 100,000). Although small in absolute magnitude, the black-white gap in homicide death rates for women is also notable. Age-adjusted death rates for HIV, hypertension, diabetes, and prostate cancer are also considerably higher among blacks than whites.

Hispanics and Asians, conversely, have lower death rates than whites for most causes. There are some exceptions to this general pattern, however. Hispanic men and women have age-adjusted diabetes death rates that are at least twice that of their white counterparts. The difference between Hispanic and white women, in particular, is large (57.9 versus 23.8 deaths per 100,000). Hispanics and blacks have higher obesity prevalence rates, which are related to higher risk for diabetes. Hispanic male death rates related to chronic liver disease and cirrhosis are double those of white men, and homicide death rates are also notably higher among Hispanic men. As discussed below, a sizable portion of liver disease deaths is related to long-term, excessive alcohol consumption, which is more prevalent among Hispanic males (Caetano, 2003). For most causes of death, Asians appear to

fare better with lower age-adjusted cause-specific mortality rates than any other group, although Asian men have slightly higher death rates from stroke and stomach cancer (not shown in the table).

Differences by Race/Ethnicity and Education

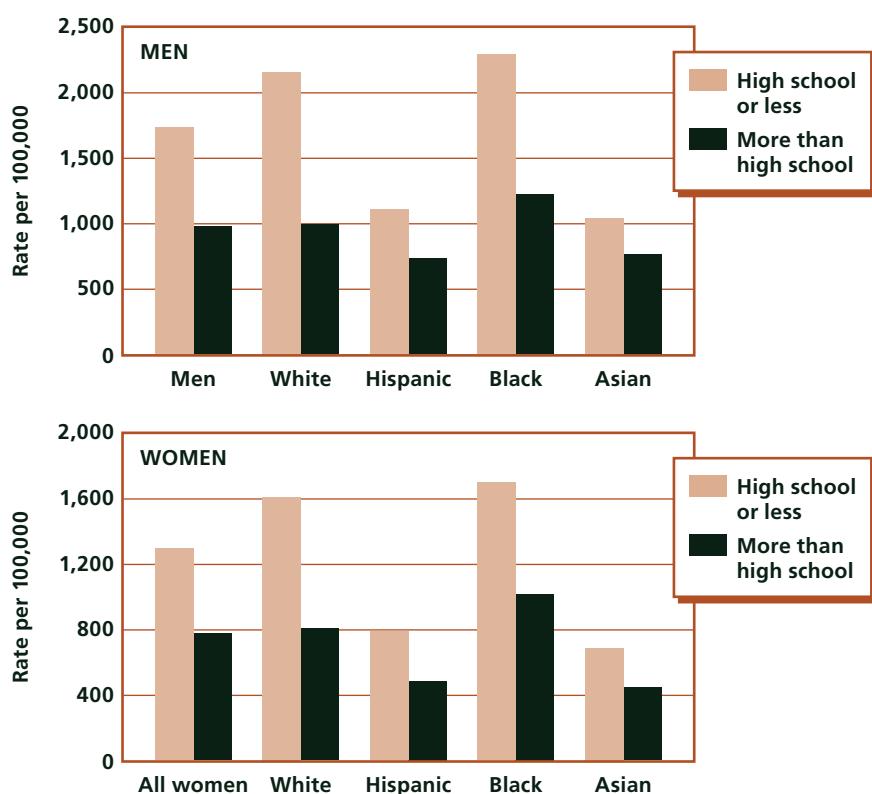
The socioeconomic status (SES) of an individual, particularly the educational attainment component, is one of the most salient predictors of mortality: Those with higher SES live longer than those with lower SES (Adler and Newman, 2002). There is much debate regarding the causal relationship between SES and health—does poor health lead to lower SES or does low SES lead to poor health?—with most research suggesting that the direction goes both ways (Williams and Collins, 1995). High SES is associated with greater access and use of health care, better living conditions, lower exposure to acute and chronic stress (or more resources to adequately mitigate those stressors), and lifestyle factors that promote better health (Adler and Newman, 2002; Ross and Wu, 1995), all of which may be related to longer life spans. Because SES differs by race/ethnicity and may contribute to the observed racial/ethnic mortality disparities, we examine relative differences in cause-specific mortality by educational attainment both within racial/ethnic groups and across

racial/ethnic groups. Because of limitations in the reporting of education on death certificates, we group decedents into only two broad education categories: those with a high school education or less and those with education beyond high school.⁸ Using these rather broad categories may mask differences in returns to higher education between racial/ethnic groups, but they provide insights on the contributions of SES to racial/ethnic disparities in health.

For all racial and ethnic groups and for both sexes, adults with schooling beyond high school have lower overall and cause-specific age-adjusted death rates than those with less education. Figure 2 displays the overall age-adjusted mortality rates for men and women and highlights the difference between the less educated and the more educated for the major racial/ethnic groups. Clearly, the more educated have lower mortality rates than the less educated across all racial/ethnic and sex groups. For whites and blacks, the differences are large, such that the all-cause mortality rate for those with less education is about twice that for those with more education. There is less of an education difference for Hispanics and Asians than for whites and blacks, although the same general pattern holds. For Asians and for Hispanics, the all-cause mortality rates of the less educated are between 30 and 60 percent more

For all racial and ethnic groups and for both sexes, adults with schooling beyond high school have lower overall and cause-specific age-adjusted death rates than those with less education.

Figure 2. Age-Adjusted, All-Cause Mortality Rates Among California Adults Ages 25 and Older, by Education, Race/Ethnicity, and Sex



Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Notes: Figure displays the overall age-adjusted mortality rates (per 100,000) between less and more educated groups (i.e., those with a high school education or less compared to those with more than a high school education) within the four main racial/ethnic groups, shown separately for men and women.

than the mortality rates among the more educated. Across all groups, less educated black men and women have the highest age-adjusted overall mortality rates. Figure 2 also shows that more educated blacks still have higher all-cause mortality rates than less educated Hispanics and Asians, and this is true for both sexes.

The educational differences for certain morbidities and injuries are similar across all racial and ethnic groups. Table 3 displays the ratios of the age-adjusted death rates for specific causes,

comparing those with more education and those with less education within racial/ethnic groups and by sex.⁹ For both black and white men, the death rate from heart disease for the less educated is about twice that of the more educated. This difference is less pronounced for Hispanic and Asian men. For women, the relative risk of dying from heart disease and stroke of the less and more educated is similar across racial/ethnic groups. Notably, for all men but particularly for white men, those with a high school

education or less are at greater risk of dying from lung cancer and chronic lower respiratory diseases (mainly emphysema-related) than their more educated counterparts. This pattern is also true for white women. As we discuss in a later section, both diseases are related to cigarette smoking and tobacco use, which was and continues to be more prevalent among the less educated (Honjo et al., 2006).

The educational difference is also notably large when we look at homicide and HIV, for both whites and blacks. Less educated

Table 3. Ratio of Age-Adjusted Death Rates of Less Educated California Adults to Those More Educated, for Select Causes of Death, by Sex and Race/Ethnicity

Cause of Death	Men				Women			
	White	Hispanic	Black	Asian	White	Hispanic	Black	Asian
All causes	2.2	1.5	1.9	1.3	2.0	1.6	1.7	1.5
Diseases of heart	2.1	1.4	1.8	1.3	2.1	1.8	1.8	1.7
Lung cancer	2.5	1.5	2.0	1.4	2.1	1.4	1.5	1.3
Prostate/breast cancer	1.5	1.4	1.5	1.1	1.4	1.0	1.0	0.8
All other cancers	1.7	1.2	1.6	1.2	1.7	1.4	1.4	1.2
Cerebrovascular diseases	1.9	1.7	1.7	1.4	1.8	1.8	1.7	1.8
Chronic lower respiratory diseases	3.0	1.9	2.3	2.2	2.4	1.7	1.8	2.0
Accidents	3.1	2.3	2.2	1.6	2.8	2.2	1.9	1.7
Diabetes mellitus	2.2	1.8	1.8	1.2	2.5	1.5	2.1	1.2
Chronic liver disease and cirrhosis	3.3	2.0	2.4	2.6	2.9	2.0	2.9	1.1
Suicide	2.7	1.3	1.6	1.8	2.1	0.8	1.3	1.3
Hypertension	2.3	1.8	1.9	1.8	2.2	1.9	1.9	1.8
HIV ^a	2.4	1.0	2.0	2.1	7.5	2.4	5.8	1.6
Homicide	5.4	2.8	4.7	2.8	3.6	1.8	3.0	2.2

Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Notes: The table displays the ratio of age-adjusted death rates for select causes of death comparing the less educated (high school education or less) to the more educated (more than a high school education) for whites, blacks, Hispanics, and Asians and for men and women.

^a Denotes that the standard errors for the cause-specific death rates are large for some race-education groups, and the precision of these ratios should be viewed with some caution. View the more detailed tables available at <http://www.ppic.org/main/dataSet.asp?i=703>.

whites and blacks have much higher death rates from homicide than their more educated counterparts.

In only one group is this educational pattern reversed. For Asian women, deaths from breast cancer are actually lower among the less educated than the more educated. This may partly be related to differences in disease patterns between immigrants and U.S.-born Asians, as well as to differences among Asian ethnic subgroups, which our analyses cannot untangle.

When we look at racial/ethnic differences within education groups in Table 4 to examine whether the disparities across racial/ethnic groups are mitigated by differences in educational attainment, we find that even within similarly educated groups, blacks still experience excess mortality for certain causes of death, whereas Asians and Hispanics experience mortality advantages. For example, the homicide death rate for black men is about eight times that of white men, and this holds for both less educated and more educated men. Also, diabetes death rates for blacks are sizably higher than for whites, and this difference is particularly pronounced for more educated women. In addition, across education levels and sexes, blacks experience significantly higher death rates than whites from HIV and hypertension. For leading killers such as heart disease and stroke, the risk of dying for black men and women is only slightly higher than

that for whites with similar education levels. Although Hispanics and Asians have a relative mortality advantage over whites across education levels, Hispanics continue to be at a disadvantage compared to whites for certain causes, such as liver disease/cirrhosis (for men), diabetes, homicide, and HIV. These relative differences are greater among the more educated.

... even within similarly educated groups, blacks still experience excess mortality for certain causes of death, whereas Asians and Hispanics experience mortality advantages.

Causes of Death That Explain Life Expectancy Inequalities

As evident throughout this study, blacks in California experience excess mortality compared to all other groups, whereas Asians and Hispanics boast longer life expectancies than whites. What diseases and injuries account for these life expectancy differences? Figure 3 displays how various causes of death drive differences in life expectancies between nonwhites and whites, for both men and women. Turning to the results for men, we find that heart disease accounts for 30 percent of the total 5.5-year shorter life expectancy for blacks relative to whites. After heart disease, the second largest contributor to black-white male mortality difference is blacks' higher mortality rates from homicides. Homicide,

a violent act that is often related to social and residential environments, is responsible for more than 12 percent of the difference in life expectancy between black and white adult males and accounts for an even greater disparity if all ages are included. The cumulative excesses in mortality among black men for many other causes, including prostate cancer, lung cancer, and stroke, account for much of the remaining life expectancy gap. Heart disease, cancers (including lung), and chronic lower respiratory diseases

Table 4. Age-Adjusted Death Rates of Similarly Educated Ethnic Minority California Adults to White California Adults, for Select Causes of Death, by Sex

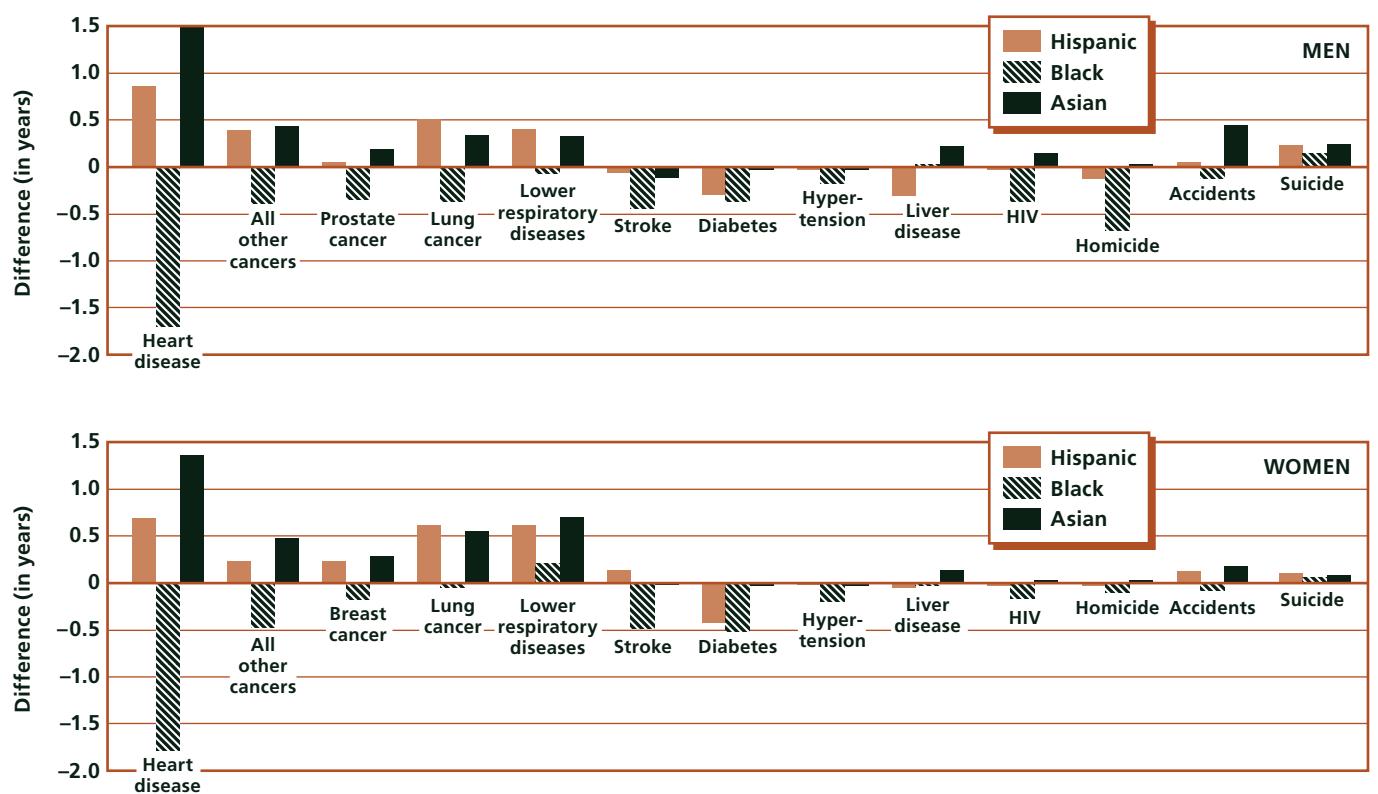
Cause of Death	Hispanic		Black		Asian	
	Less Educated	More Educated	Less Educated	More Educated	Less Educated	More Educated
MEN						
All causes	0.5	0.7	1.1	1.2	0.5	0.8
Diseases of heart	0.5	0.7	1.0	1.2	0.4	0.7
Lung cancer	0.3	0.5	1.1	1.3	0.5	0.9
Prostate cancer	0.6	0.6	1.8	1.8	0.3	0.4
All other cancers	0.6	0.8	1.0	1.1	0.6	0.9
Cerebrovascular diseases	0.7	0.7	1.2	1.3	0.8	1.1
Chronic lower respiratory diseases	0.2	0.4	0.7	0.9	0.4	0.6
Accidents	0.5	0.7	0.8	1.2	0.3	0.7
Diabetes mellitus	1.3	1.6	1.8	2.2	0.7	1.2
Chronic liver disease and cirrhosis	1.2	1.9	0.7	0.9	0.3	0.3
Suicide	0.2	0.5	0.3	0.6	0.3	0.5
Hypertension	0.6	0.8	2.4	2.9	0.7	0.9
HIV	0.6	1.5	2.9	3.6	0.2	0.2
Homicide	1.2	2.4	7.4	8.5	0.7	1.3
WOMEN						
All causes	0.5	0.6	1.1	1.3	0.4	0.6
Diseases of heart	0.5	0.6	1.0	1.3	0.5	0.7
Lung cancer	0.2	0.4	0.8	1.2	0.3	0.5
Breast cancer	0.4	0.6	1.0	1.5	0.4	0.7
All other cancers	0.6	0.8	1.0	1.3	0.6	0.8
Cerebrovascular diseases	0.5	0.5	1.2	1.3	0.7	0.7
Chronic lower respiratory diseases	0.2	0.3	0.5	0.7	0.2	0.2
Accidents	0.4	0.7	0.9	1.1	0.3	0.7
Diabetes mellitus	1.5	1.9	2.3	3.4	0.7	1.2
Chronic liver disease and cirrhosis	0.8	1.2	1.0	1.0	0.2	0.5
Suicide ^a	0.1	0.4	0.3	0.6	0.4	0.6
Hypertension	0.6	0.7	2.1	2.4	0.7	0.8
HIV ^a	0.8	2.4	9.4	12.2	0.2	0.8
Homicide	0.7	1.3	2.9	3.5	0.6	0.9

Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Notes: The table displays the ratio of age-adjusted death rates for select causes of death comparing ethnic minorities to whites (e.g., blacks to whites, Hispanics to whites, Asians to whites), shown for the less educated individuals (high school education or less) and for the more educated (more than a high school education).

^a Denotes that the standard errors for the cause-specific death rates are large for some race-education groups, and the precision of these ratios should be viewed with some caution. For specific standard errors, please view the more detailed tables available at <http://www.ppic.org/main/dataSet.asp?i=703>.

Figure 3. Differences in Life Expectancy for Ethnic Minorities Relative to Whites by Selected Causes of Death Among California Adults Ages 25 and Older, by Sex



Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.
Note: See the text box for more detail on calculations.

are the main drivers behind the slightly higher life expectancy (a two-year difference) of Hispanic men relative to white men. Conversely, diabetes and liver disease deaths reduce Hispanic men's life expectancy advantage over whites by nearly 30 percent. A sizable portion of the 4.7-year life expectancy advantage for Asian men over white men is related to Asians' favorable heart disease mortality outcomes.

Similar patterns emerge when we examine life expectancy differences by cause for women. Heart disease drives most of the black mortality disadvantage and the Asian and Hispanic advantage over white women. Similar to black men, black women's lower life expectancy results from many different chronic conditions including breast and other cancers, hypertension, and HIV, which all contribute to their

4.3-year lower life expectancy compared to white women. Diabetes and stroke combined account for nearly 25 percent of the total of the black-white female gap. For Asian women, their five-year higher life expectancy over that of white women is primarily attributable to their more favorable chronic disease mortalities from conditions including heart disease, cancers, and lower respiratory diseases. The same is true for

Eliminating diabetes would improve life expectancies for Hispanics and blacks, most notably for Hispanic women, who would gain more than 0.8 years in life expectancy.

Hispanic women, who experience a three-year increased life expectancy compared to white women, although diabetes deaths mean the three-year life expectancy advantage is almost 15 percent lower than it would otherwise be.

Modifiable Conditions That Would Improve Life Expectancies

What would happen if certain preventable diseases or causes of death were eliminated from the mortality experience of demographic groups? We answer this question by examining the potential years of life gained for

the major racial/ethnic and sex groups in the hypothetical absence of a particular disease or injury. We focus on conditions that are the most clearly driven by behavior and thus preventable, such as smoking (lung cancer and chronic lower respiratory diseases), obesity (diabetes), and alcohol consumption (cirrhosis). In addition, we discuss homicide because, although not directly determined by health behaviors, it is the fourth leading cause of preventable deaths in the nation (National Center for Health Statistics, 2001). We also look at HIV because, through advancements in treatment, it has become a largely manageable disease.

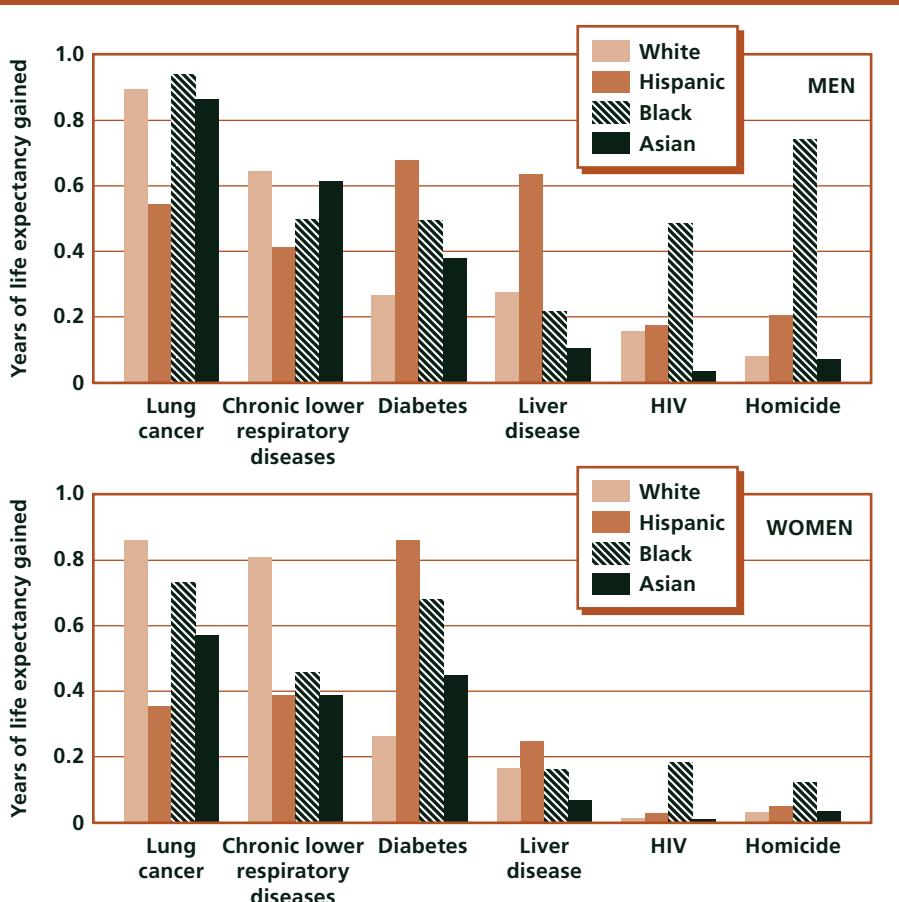
The story that emerges from this exercise, shown in Figure 4, is similar to what we have found throughout our analyses, but the cause-elimination process more particularly accounts for the timing or age at death from various causes. Thus, we see that eliminating homicide as a cause of death would have a large beneficial effect for adult black men, increasing their life expectancy by 0.7 years. This gain in life expectancy doubles to 1.4 years when we consider all ages, because homicide is more concentrated than chronic morbidities among teenagers and young adults. Eradicating smoking-related diseases, including lung cancer and chronic lower respiratory disease, would sizably increase life spans for all racial/ethnic groups but most par-

ticularly for whites, blacks, and Asian men. Eliminating diabetes would improve life expectancies for Hispanics and blacks, most notably for Hispanic women, who would gain more than 0.8 years in life expectancy, whereas eliminating liver disease/cirrhosis would lengthen Hispanic men's life span by more than 0.6 years. Improving the identification and management of HIV infection and reducing its transmission would most distinctly benefit black men and women. Although not shown in Figure 4, we note that eliminating heart disease (a condition that is driven by many factors in combination, including health behaviors, disease management, treatment decisions, and access to and quality of health care) would most greatly lengthen life spans for all demographic subgroups—by about 4.5 years for whites and Asian men to as much as 5.8 years for Hispanic and black women.

Modifying Mortality and Risk Factors

Many of the causes of death that we have highlighted in this study are related to a variety of risk factors, including health behaviors; access to, use of, and quality of health care; preventive screenings; knowledge of risk factors; and social environment. Modifying these risk factors could lead to increased longevity for all

Figure 4. Years of Life Expectancy Gained If Selected Causes of Death Are Eliminated Among California Adults Ages 25 and Older, by Race/Ethnicity and Sex



Sources: Authors' calculations from California DHS death certificate data (2000–2002) and the 2000 decennial census.

Note: See the text box for more detail on calculations.

Californians, and for some groups in particular. In this section, we describe some key determinants of selected causes of death and also discuss how differences in health behaviors, prevention, and treatment may explain some of the observed differences among groups.

It should also be emphasized that social and environmental factors influence health through their relationship to health behaviors and access to resources. For instance, much recent research has focused on how community contexts, such as the availability

Many of the causes of death that we have highlighted in this study are related to a variety of risk factors, including health behaviors; access to, use of, and quality of health care; preventive screenings; knowledge of risk factors; and social environment.

and accessibility of health services, of infrastructure (parks and supermarkets), of prevailing community norms, and of social networks differ across subgroups, and on how these may influence behaviors and help to explain racial/ethnic and SES differences in health outcomes (Pickett and Pearl, 2001). Furthermore, it has been argued that the stressors related to living in poor or residentially segregated communities "deteriorates" the health status of minorities, particularly blacks, faster than it does whites (Geronimus, 1992). Although a causal link between neighborhoods and individual health is difficult to establish, this research suggests that health officials may be well served

Perhaps more than any other health behavior, smoking is the most clearly linked to particular diseases, specifically lung cancer and chronic lower respiratory disease.

by addressing the broader community determinants of health and behavioral change, in addition to individual determinants.

Smoking and Disease Risk

Perhaps more than any other health behavior, smoking is the most clearly linked to particular diseases, specifically lung cancer and chronic lower respiratory disease. Lung cancer accounts for three of four smoking-related cancer deaths (Centers for Disease Control and Prevention (CDC), 2005). According to the CDC, 87 percent of male lung cancer deaths and 70 percent of female lung cancer deaths nationwide can be attributed to smoking. Incidences of lung cancer have declined in California for both men and

women over time, but mortality from lung cancer has only noticeably declined for men (California DHS, 2006). Smoking is also the primary contributor to deaths attributable to chronic lower respiratory diseases, which includes emphysema and chronic obstructive pulmonary disease.

As seen in Table 5, which presents health behavior patterns among California adults, current smoking rates are very low among Hispanic and Asian women but high among nonwhite men and black and white women. Our analysis also indicates that less educated groups have considerably higher mortality rates from smoking-related causes; other research has shown that low SES groups have less access to smoking cessation resources (e.g., nicotine replacement therapy) and are more likely to live in communities where smoking is considered normative (Honjo et al., 2006). This suggests that smoking cessation programs may be best targeted to socioeconomically disadvantaged populations and communities.

Although differences in smoking behavior may explain part of the lung cancer mortality disparities that we document, evidence suggests that other factors also play a role. Blacks are less likely than whites to survive lung cancer, and this has been attributed both to the disease being at a more advanced stage when it is diagnosed in blacks and to differences in treatment (Bach et al., 1999;

Lathan, Neville, and Earle, 2006). This suggests that to decrease lung cancer mortality rates, health care providers and officials should, in addition to continuing to promote smoking cessation programs, focus on promoting awareness of the importance of early screening and of improving our understanding of differences in surgical treatment decisions.

Diet, Exercise, and Disease Risk

Obesity has emerged as a serious health problem in California. In fact, research suggests that obesity is an example of how, for certain health risks, Californians (as well as those in the rest of the nation) are moving away from *Healthy People 2010* goals, because obesity prevalence has steadily increased over the past few decades (Lee, 2006). Racial/ethnic differences in obesity risk may also be contributing to racial/ethnic disparities in obesity-related mortality. Obesity is ultimately driven by two behaviors: high caloric intake and sedentary lifestyles. At the same time, poor communities and communities of color often have reduced access to fresh food outlets, grocery stores, open spaces, and safe parks and greater access to fast food restaurants (Moore and Diez Roux, 2006). This in turn may suggest that in addition to focusing on promoting better nutrition and exercise, health officials should also be aware of

Table 5. Health Risk Behaviors and Preventive Cancer Screening Rates Among California Adults, by Sex and Race/Ethnicity

	Men				Women			
	White	Hispanic	Black	Asian	White	Hispanic	Black	Asian
Health behaviors, %								
Smoking								
Current	18.7	21.1	25.2	21.4	16.2	8.8	21.2	5.5
Former	37.2	27.7	27.2	28.9	30.1	13.0	20.7	6.9
Never	44.1	51.2	47.5	49.7	53.7	78.3	58.1	87.6
Obesity								
Normal	33.4	24.6	27.1	58.0	56.9	34.0	31.5	75.3
Overweight	46.8	47.5	44.9	34.8	26.3	30.3	32.2	19.2
Obese	19.8	27.9	28.1	7.2	16.8	35.7	36.3	5.6
Alcohol consumption								
Binge drink, past month	21.2	28.1	15.3	13.1	7.3	5.1	5.6	2.3
Preventive screenings, %								
Prostate cancer								
Prostate specific antigen (PSA) test, ever	66.4	45.2	61.5	51.8				
Breast cancer								
Mammogram, ever					79.0	61.1	73.0	65.5
Sample size	13,409	4,196	845	1,814	19,277	6,092	1,466	2,394

Source: Authors' calculation from the 2001 California Health Interview Survey.

Notes: Estimates are shown for adults (ages 25 and older for health risk behaviors, ages 40 and older for prostate screening, and ages 30 and older for breast cancer screening) and are weighted. Binge drinking is defined as consuming five or more servings of alcoholic beverages at one time for men and four or more servings for women. Obesity is defined as having a body mass index (BMI) of 30 or higher, where BMI = weight in kilograms/height in meters, squared. Overweight category includes individuals with a self-reported BMI between 25 and 29.9.

environmental conditions that may promote or hinder behavioral changes related to obesity.

In California, as shown in Table 5, Hispanics and blacks, particularly women, have the highest obesity rates. Although obesity is associated with many different diseases that contribute to mortality, including heart disease, stroke, hypertension, and diabetes, it is most directly associated with diabetes. Therefore, it is not surprising that Hispanic and black women have higher

diabetes prevalence rates in the state (Chawla et al., 2003). As we have seen, Hispanics and blacks also have higher death rates from diabetes than other groups. Part of this mortality difference is related to differences in the long-term management of diabetes. Because most diabetics require regular blood sugar checks, insulin therapy, and careful planning of diet and activity levels, it is a difficult disease to manage well consistently. Differences in quality of health care explain a small portion of the

racial disparity in diabetic complications, but the racial difference often remains, even in similar health care settings (Adams et al., 2005). Other research suggests that blacks and Hispanics are less likely than other patients to closely monitor or change their dietary practices (Thackeray, Merrill, and Neiger, 2004), suggesting that promoting better self-management should also be an important focus of strategies that aim to reduce disparities in diabetes-related health outcomes.

Although some groups may be more susceptible than others and not all liver disease is caused by heavy alcohol consumption, nearly 70 percent of deaths from chronic liver disease in California result from alcohol.

Alcohol Consumption and Disease Risk

Alcohol consumption, in moderation, is by no means a detrimental health behavior. *Excessive* alcohol consumption (characterized by frequent and heavy binge drinking), however, does take a toll on the body's liver over time and is related to the development of cirrhosis (Caetano, 2003). In addition to alcohol's negative effects on the liver, excessive alcohol consumption also is implicated in about 30 percent of fatal motor vehicle accidents (Subramanian, 2003).

Hispanic men, as seen in Table 5, report the highest binge

drinking rates in California, 28 percent, and they have the highest age-adjusted cirrhosis death rates. Women report very low binge drinking rates and are much less likely than men to die of cirrhosis. Research at the national level has further shown that rates of binge drinking episodes have increased since 1993 across all major racial/ethnic groups (Naimi et al., 2003). Other research has noted the unequal distribution of liquor stores in urban neighborhoods, showing that liquor stores are disproportionately located in predominately black areas even after controlling for the SES of the neighborhood (LaVeist and Wallace, 2000). Although some groups may be more susceptible than others and not all liver disease is caused by heavy alcohol consumption, nearly 70 percent of deaths from chronic liver disease in California result from alcohol.

Cancers and Screenings

After lung cancer, prostate cancer and breast cancer are the second leading cancer killers among men and women, respectively. According to the National Cancer Institute, women of "average risk" who are 40 and older should get a mammogram every one to two years. Breast cancer has been linked to lifestyle behaviors including diet and use of birth control pills, but the overall evidence is very mixed. However, it is widely recognized that regular

screenings and early detection vastly improve survival probabilities, as is the case with most cancers. Table 5 displays preventive cancer screening rates for men (prostate cancer) and women (breast cancer) by race/ethnicity. White women in California report the highest rate of having at least one mammogram, and black women have similar screening rates, although slightly lower than the rates for whites. Hispanic and Asian women have much lower screening rates. Our comparisons of age-adjusted mortality rates reveal that black women are more likely than white women to die from breast cancer; this finding has been documented in national studies and has largely been attributed to late-stage diagnosis, although differences in aggressiveness of treatment may also play a role (Carey et al., 2006).

The causes of prostate cancer are largely unknown, and although the preventive screening guidelines are less clear than they are for breast cancer screenings for women, there is good evidence that PSA testing can detect early-stage prostate cancer. Like the breast cancer screening rates, white and black men appear to have the highest rates of prostate cancer screening, whereas Asians and Hispanics have the lowest rates (Table 5). It is unclear whether these differences reflect differences in knowledge or awareness of risk, health care access, or language

barriers. What is clear is that the burden of prostate cancer falls disproportionately on men who are older and black. Furthermore, it appears that black men are significantly more likely than whites to be diagnosed with advanced stage prostate cancer (Oakley-Girvan et al., 2003), and advanced stage cancer is consequently related to higher mortality.

Conclusion and Policy Implications

Despite celebrated improvements in overall mortality, such improvements have not been distributed equally across racial and ethnic groups (Levine et al., 2001). In particular, blacks are at a notable disadvantage compared to other racial and ethnic groups in the state. For almost all chronic conditions and injuries save suicide, black men and women have higher age-adjusted death rates than whites. Many of these black-white disparities persist even among similarly educated individuals. Hispanics and Asians have a mortality advantage over whites for almost all diseases and injuries and across education levels, with some important exceptions. These exceptions, including high Hispanic mortality from cirrhosis among men and diabetes for both men and women, are most likely related to differences in health behaviors

and disease management. Asians by and large have lower death rates for most of the leading causes of death. However, because we could not reliably estimate and examine cause-specific mortality patterns by country of origin and nativity status, our analyses could mask considerable heterogeneity in mortality among Asians.

Nonetheless, this study suggests some possible strategies that health officials and public health professionals might employ to increase life spans while reducing racial/ethnic disparities. One strategy would be to focus efforts on targeting the leading killers—to increase both policy and public education efforts related to the behavioral and structural correlates of those health conditions. Efforts that target risk factors for conditions such as heart disease and stroke would benefit all racial and ethnic groups because of the dominance of these diseases in driving overall mortality. Our analyses reveal that heart disease and stroke are responsible for about one-third of all deaths, regardless of sex or race/ethnicity. In addition, they also are responsible for a large portion of the overall black-white mortality disparity, such that for black women, these two diseases combined account for more than 50 percent of the gap in life expectancy between black and white women.

Several of the health behaviors we have discussed, includ-

Efforts that target risk factors for conditions such as heart disease and stroke would benefit all racial and ethnic groups because of the dominance of these diseases in driving overall mortality.

ing smoking, diet, and lack of exercise, are important predictors of both heart disease and stroke. For instance, studies have suggested that 80 percent of heart disease could be avoided through lifestyle changes such as those in diet, physical activity, and smoking habits (Willet, 2006). Treatments for high cholesterol and high blood pressure, most often through medication, are also effective strategies for reducing the risks of heart disease. In general, efforts to raise awareness of the benefits of engaging in exercise and the adoption of healthier diets would, if successful, likely result in improvements in mortality and morbidity

... success might be achieved by targeting the diseases and injuries that have the greatest influence on *disparities* in mortality. . . . This points to prevention efforts focused on heart disease and suggests that homicide and HIV should be important targets as well for black and Hispanic men.

for all groups. At the same time, evidence suggests that even after controlling for health behaviors, insurance status, health care setting, SES, and other important determinants, blacks are significantly less likely than whites to receive the same level of medical treatment and procedures (e.g., angioplasty, catheterization, surgery) or recommendations and referrals to specialists (Lillie-Blanton et al., 2002). This suggests that in addition to promoting behavioral changes, broader institutional efforts to promote equal treatment for the same health condition may be important considerations for narrowing racial gaps in mortality.

It is also important to consider whether success might be achieved by targeting the diseases and injuries that have the greatest influence on *disparities* in mortality. Again, this points to prevention efforts focused on heart disease, but it also suggests that homicide and HIV should be important targets as well for black and Hispanic men. Although the annual number of newly diagnosed HIV infections has decreased over the past two decades, minority races and ethnicities are still disproportionately affected by HIV. In addition, homicide most particularly erodes life expectancies for black men and contributes to lowering Hispanic male life expectancies.

Because homicide mortality risks predominantly afflict communities with high levels of racial segregation, poverty, and economic inequality (Massey, 1995), paying attention to the scope and emphasis of broader social policies that focus on improving the conditions among those in poverty and in segregated settings may be important. For black women, the focus may be best placed on addressing heart disease and stroke as well as diabetes prevention and management. Chronic liver disease/ cirrhosis and diabetes are clearly key target diseases for Hispanics, which also implies addressing and preventing excessive alcohol consumption and obesity risk factors. Promoting awareness of the importance of preventive screenings and addressing structural differences in access to such services among at-risk groups may improve the odds of earlier detection of chronic diseases among racial and ethnic minority groups.

Finally, it is also important to note that health care providers are often important gatekeepers in terms of information dissemination, disease risk assessment, and treatment recommendations. This suggests that medical professionals are important players in improving mortality outcomes and in reducing disparities among more disadvantaged groups. ♦

Notes

¹ Although later years of public use death certificate data for California were available to us, we chose to focus on the years centered on 2000 to use the 2000 decennial census information for our base population estimates. Although the 2000 decennial census may have small undercounts of certain demographic subgroups (U.S. Census Bureau, 2001), it is considered by most researchers to be the most accurate and reliable accounting of the population. Comparisons of 2000–2002 estimates with more recently available death certificate data years (2003–2004) do not reveal any notable differences in overall and cause-specific mortality patterns.

² Throughout this issue, we refer to non-Hispanic whites as whites, non-Hispanic blacks as blacks, and non-Hispanic Asians as Asians. Consistent with the Office of Management and Budget standards, any decedent who is identified as being of Hispanic origin (of any racial background) on the death certificate is categorized as Hispanic.

³ We focus on adult deaths because we are most interested in understanding the behavioral and preventable components of certain diseases among adults. Moreover, nearly all deaths (96.7%) occur over the age of 25. We also separate all analyses by sex because the mortality experience for men differs from that for women (Waldron, 1995).

⁴ For example, in the data we used, most deaths among Asians occur among the foreign-born who are represented by many different national origin groups. However, for U.S.-born Asians, deaths are dominated by individuals of Japanese descent. These uneven distributions of deaths by nativity status and country of origin make meaningful comparisons difficult. Note that the one racial/ethnic subgroup for whom we could calculate stable cause-specific mortality estimates by nativity status was the Mexican/Mexican-American group. These estimates are available through PPIC's online data depot.

⁵ Many of the leading cause-of-death categories, such as heart disease and cancer, can be further broken down into more specific diseases or causes. Among deaths attributed to diseases of the heart, about one-quarter (24%) result from acute myocardial infarctions or heart attacks and more than half (55%) are attributable to other chronic ischemic heart disease (these estimates are based on the authors' calculations).

⁶ Deaths attributed to "accidents" are a broad category that includes motor vehicle accidents (35%), accidental drug overdoses (25%), and falls (17%). Among homicide deaths, two-thirds are by firearms.

⁷ Higher rates of suicide among whites may partly be related to the potential misclassification and subsequent underestimation of suicide as a cause of death for other racial/ethnic minority groups (Rockett, Samora and Coben, 2006).

⁸ Education level is the key SES indicator available on the death certificate. We measure education level using the number of years of schooling completed. Those with 12 years or less of schooling are categorized as "high school education or less"; those with more than 12 years of schooling are categorized as "more than high school education." Although we would ideally like to have known the educational degree obtained by each decedent, this information was not available to us. Thus our measures should be seen as broad proxies of "less educated" and "more educated" individuals.

⁹ Although not shown, the age-adjusted cause-specific mortality rate estimates for the education/race-sex groups can be found at PPIC's online data depot.

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