I. Social Determinants of Health & Health Inequities

We all know that people don’t live in isolated bubbles. We live in families, neighborhoods, communities, and nations – in physical and social environments. The Institute of Medicine uses a “social-ecological” framework\(^1,2\) to show the connections among the many social conditions and environments that impact individual and community health over the life course.

At the center of the model is the individual, with his/her own genetic traits that may predispose to certain illnesses. Individual behaviors also shape health. These behaviors and their health effects may also be influenced by genetics. For instance, smoking is a complex behavioral activity with significant genetic heritability;\(^3\) many studies have also shown an interaction between smoking and specific genes in determining the risk of developing cardiovascular disease and cancers. This is an example of the complex and dynamic interactions between and among the different levels (represented by the dotted lines in the model) to produce population health.

Families, housing, education, social and community networks, the work environment, and environmental conditions all have important influences on individuals, their behavior, and their health – both directly and indirectly. Children whose parents smoke are exposed to...
second-hand smoke; they are also more likely to become smokers. In addition to public education on the health risks of smoking and record-high enrollment in smoking cessation courses, environmental policy changes such as limiting advertising for cigarettes, reducing youth access to tobacco, and banning smoking in public places have led to very significant reductions in smoking. This is an example of how social and physical environments influence and shape our behavior, and can either promote healthy behaviors or encourage and reinforce unhealthy ones.

In fact, we now know that it is these broad social, economic, cultural, and environmental conditions - represented in the outer circle of the model – that most impact the health of populations. We call these conditions the “upstream determinants” of health. Examples of upstream determinants include: economic inequality; educational attainment; urbanization; transportation access; cultural values; discrimination and intolerance on the basis of race, gender and sexual orientation; air pollution; immigration; crime and safety; and employment.  

Many of the upstream determinants of health in our society cluster together and the “social-ecological framework” helps to understand how these cumulative impacts could lead to poor health outcomes. For example, low-income people tend to live in low-income neighborhoods, with more crime, fewer grocery stores, more liquor stores, and fewer parks.

Health inequities are those differences in health for particular groups of people that are unnecessary, avoidable, unfair, and unjust. These are the poor health outcomes that cannot be changed simply by telling people not to smoke, or by opening up more clinics. Our ability to eliminate health inequities requires that we address the upstream determinants of health. If we truly wish to improve the health of our community, the Public Health Division must work closely together with Berkeley’s residents, schools, community-based organizations, policymakers, and many other agencies to achieve greater social justice and a healthier environment for all.
Highlights

- Berkeley has a diverse and highly educated population

- Berkeley has inequities in income, education, access to health care, and other health determinants. These inequities are not unique to Berkeley and occur across the region, state, and nation, and most often impact African Americans.

- Berkeley's population is aging and income inequality is growing, which impacts Berkeley's different race/ethnic groups in different ways.
Population

The total population of Berkeley has been stable over the last 2 decades and is currently estimated at about 105,000.

Figure 1.2 – Population of City of Berkeley, 1970-2006

Cal. Dept. of Finance, 2001-2006 (estimated population)

Social Determinants of Health: Environment

The environment is everything around us – the air we breathe, the food and water we consume, and the space we live in. It's also the chemicals, radiation, microbes, and physical forces with which we come into contact. The environment plays an important role in human development and health. Researchers have linked exposures to environmental hazards with specific diseases including cancer, lung disease, and child development.6, 7 Others have linked exposure to certain social and physical environments with health-related outcomes such as high poverty areas with mortality, residential segregation with infant mortality, and neighborhood violence with stress and hypertension.8-11

Environmental influences also come in the form of billboards advertising alcohol targeting youth and social norms such as, “smoking is cool.” Therefore, it is especially important to safeguard the health of populations and communities that are particularly vulnerable (such as the poor, children, elderly, disabled, and sick) from all types of hazards,12 and to work actively to create “opportunity structures:” neighborhood or community attributes that allow residents to live a healthier lifestyle.13-15
**Age**

The age distribution is highly influenced by the university; adolescents and young adults comprise 25% of the population. Females outnumber males in older age groups.

![Figure 1.3](image)

**Figure 1.3 – Population by Age and Gender, Berkeley, 2000**

Source: U.S. Census, 2000

Although the size of Berkeley’s population was constant from 1990 to 2000, there was a net loss of residents aged 44 years and younger and a net gain of residents aged 45 years and older, especially baby boomers.

![Figure 1.4](image)

**Figure 1.4 – Population Gains/Losses in 2000 from 1990 Baseline by Age, Berkeley, 2000**

Source: U.S. Census, 2000
Social Determinants of Health: Race and Racism

Nationwide, there continue to be significant differences in life expectancy, disease, and functional status between White and populations of color despite improvements overall.\textsuperscript{16,17} Racial/ethnic groups experience higher rates of disease and health risk because of complex interactions among socioeconomic, psychosocial, behavioral, and health care-related factors.\textsuperscript{18-20} Racial/ethnic groups also have less access to the health care system, and often experience lower quality of medical care than Whites.\textsuperscript{21} One reason for these poor health outcomes is that race and ethnicity are major determinants of every indicator of socioeconomic position. African Americans are disadvantaged in terms of education, but even given the same education, have lower incomes than Whites. But even after considering income, African American men and women have lower life expectancies than White men and women at every income level.\textsuperscript{22-24}

Poor health outcomes are further exacerbated by the effects of racism, discrimination, and social exclusion.\textsuperscript{25} Racism affects health inequities through restricted access to better education and income, segregation by race in environments with more pollution, crime, and poor-quality housing, and chronic stress that undermines mental and physical health in many ways.\textsuperscript{26-28}
The age distribution varies by race/ethnicity. African Americans and Latinos have more young children. The university likely influences the large number of 15-24 year olds and Asians of that age in particular. Among African Americans, there are fewer working age people and more elderly than in other groups.

**Figure 1.6** – Population by Age and Race/Ethnicity, Berkeley, 2000

The number of African Americans and Whites decreased from 1990 to 2000, and the number of Latino and Asian residents increased.

**Figure 1.7** – Population Gains/Losses in 2000 from 1990 Baseline by Race/Ethnicity, Berkeley, 2000
Language/Difficulty with English

Over 30% of Berkeley households speak primarily a non-English language. In 4% of households, no one over 14 speaks fluent English.

*See Technical Notes for Census Definition.

Figure 1.8 – Language Spoken at Home and Difficulty with English, Berkeley, 2000

Total Households
N = 45,007

Difficulty with English, N = 1,951

Source: U.S. Census, 2000
Income and Poverty

In 1999, the median income of Whites was twice that of African Americans. A large number of Asian households include university students who are not in the labor market.

Compared to every dollar of income earned by White residents, African Americans earn 50¢ and Latinos earn 68¢.

There were fewer low and middle income African American and White households in 2000 than 1990. The number of the poorest and richest households increased.
People living in the Berkeley Hills have the highest median income, and, except for student-oriented census tracts next to the University of California, census tracts in South and West Berkeley have the lowest median incomes.

Map 1.1 – Median Family Income by Census Tract, Berkeley, 1999

“*The reduction of socioeconomic and racial/ethnic disparities in health depends most on social changes and public policies that reduce disparities in socioeconomic and racial/ethnic status or, more exactly, ensure that all citizens live under conditions that protect against disease and promote health.*”

- House and Williams 2003
Both in California and Berkeley, the 15% of the population with the highest incomes account for 50% of all income. The 50% of the population with the lowest incomes account for only 12% of income generated by Berkeley residents.

**Figure 1.11 – Income Inequality, Berkeley and California, 1999**

The highest 15% of income earners account for 50% of all income

Source: 2000 US Census

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**Social Determinants of Health: Poverty**

All over the world, poverty and income inequality lead to worse health outcomes and higher death rates. Not only do the very poorest people have the worst health, but there is a gradient of poor health and mortality that cuts across all income levels – so the upper middle class has better health than the lower middle class, which has better health than the working poor. People living in poverty have limited access to protective resources such as healthy food, physical activity resources, adequate housing, education, transportation and health care. The poor also have fewer housing options, live in some of the most under-resourced neighborhoods, and frequently rent units in sub-standard buildings under conditions that worsen their health. These conditions, alongside the psychological impacts of powerlessness and lack of control over life situations, make the poor vulnerable to chronic stress and risk-taking behaviors, injuries, preventable diseases and early death.
Twenty percent of Berkeley residents live in poverty. Proportionately more African American and Latino children live below the poverty level than White children. Also, proportionately more African American seniors live below the poverty level than other groups.

Nearly 30% of African Americans living in poverty are children 0-17.

The proportion of families with incomes below the poverty level is highest in the southern and western census tracts of Berkeley. In Central Berkeley (census tract 4229), the high level of poverty is due to the high concentration of temporarily low-income university and college students.

Map 1.2 – Percent of Families Living Below the Poverty Level by Census Tract, Berkeley, 1999
Children in Poverty

Over 2,200 children live in poverty. The poverty rate in African American children is 6 times higher than in White children.

30% of African American children are poor.

In some south and west Berkeley neighborhoods, as many as 32% of children live in poverty.

Map 1.3 – Percent of Children Living Below the Poverty Level by Census Tract, Berkeley, 1999

Source: U.S. Census, 2000
Employment

Berkeley had about 60,200 people in the labor force in 2005, of whom 3,100 were unemployed.

Program Highlight: First Source and YouthWorks

The Employment Programs Division's First Source program promotes development of employment opportunities and helping local employers find qualified workers. YouthWorks helps young people ages 14 – 25 to transition to the adult working world. The Summer Youth Employment Program matches youth with appropriate jobs, conducts job-readiness workshops and collaborates with groups that provide youth services.
Jobs in education, health care, and professional, scientific, and arts and entertainment industries account for 61% of employment. Few jobs are available in traditional, “blue-collar” industries such as manufacturing and construction.

**Figure 1.15 – Industry of Employed Population, Aged 16 Years and Over, Berkeley, 2000**

![Bar graph showing the industry distribution of employed population in Berkeley, 2000](image)

Source: U.S. Census, 2000

**Program Highlight: Community Health Worker Training Program**

Community Health Workers (see picture above) – sometimes known as lay health workers or *promotores* - are members of the community and learn how to assist members of their own community in many ways such as: assistance with getting health insurance, help with learning how to eat healthier foods, teaching children how to better control their asthma, organizing for anti-smoking ordinances, and advocating for health policies that promote health for their communities.

This program provides health-related educational and professional opportunities for at-risk youth in Berkeley.
Education

Approximately 85% of Berkeley residents over age 25 attended college and 64% have a bachelors, graduate or professional degree.

Social Determinants of Health: Education

There is a strong, positive relationship between education and health that is well-documented. The more education a person gets, the better his/her health. It also appears that more education may actually reduce the risk of death. Possible explanations are that education may make people better decision-makers, that educated people can understand and have access to information about health, and that a higher educational status improves financial resources and overall income that may help to pay for protective resources such as health insurance and health care. Finally, educated parents can influence their child’s academic success. Educated and professional parents increase their children’s vocabulary and encourage their children more than parents who have lower education and are on welfare.
Whites are 4 times more likely to be college graduates than African Americans.

A separate analysis of race and educational attainment found that African Americans in Berkeley are more likely to have a college degree than African Americans in California. ⁴⁴
In the 2005-6 school year, 9,076 students were enrolled in kindergarten through 12th grade in the Berkeley Unified School District (BUSD). African Americans make up a larger fraction of the BUSD student population than the child population as a whole (31% vs. 23%); there are fewer White students than there are Whites in the total population (29% vs. 45%). This reflects enrollment of students from other cities in BUSD and enrollment of White students in private schools.

**Figure 1.18 – Students Enrolled in K-12 Grades by Race/Ethnicity, Berkeley Unified School District, 2005-6**

![Pie chart showing the distribution of students by race/ethnicity.](image)

Source: Berkeley Unified School District

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**Program Highlight: School-Linked Health Services Program**

School Linked Health Services (SLHS) was created to support interagency collaboration between the Berkeley Unified School District (BUSD) and Health & Human Services, as the school district works with community partners to address barriers to learning. SLHS is working to enhance the capacity of the Public Health Division and the school district to provide health services to elementary aged youth and to facilitate collaboration among programs. Currently this includes partnering to create a school based, multi-agency referral system; an initial assessment of unmet health needs and resources in BUSD; seeking opportunities for parent education and engagement; health consultations; policy recommendations and strengthening coordination of Public Health Division programs working in schools.
In the 2005-6 school year, over 40% of Berkeley students participated in special programs for English learners and for the economically disadvantaged.

See Technical Notes for definitions of these Special Programs.

Approximately 43% to 58% of 2nd to 11th grade Berkeley students are not proficient in reading on the California Standardized Test.
The following figures show the level of English-language arts (ELA) proficiency of all students in Berkeley according to their test scores on the 2004, 2005 and 2006 California Standards Test (CST). The first figure shows that African American and low income children in Berkeley do not score as well as White children and those with higher incomes. Compared to average test scores for Alameda County and California, Berkeley students with higher incomes have higher scores and low income Berkeley children have lower scores.

**Figure 1.21** – Percent Proficient or Above in English Language Arts by Race/Ethnicity, Berkeley Unified School District, Alameda County, and California, 2004-2006

**Figure 1.22** – Percent Proficient or Above in English Language Arts by Poverty Level, Berkeley Unified School District, 2005-6

Source: California Dept. of Education, CST English Language Arts, 2nd-11th grades combined
The rate of students not graduating from Berkeley High School ("4-year drop-out rate") was 13.9% in 2005-6. 1 in 4 Latino and 1 in 5 African American students did not graduate from high school.

**Figure 1.23 – Percent Non-Graduating Students by Race/Ethnicity, Berkeley Unified School District, Alameda County, and California, 2005-6**

![Bar chart showing percent non-graduating students by race/ethnicity.]

Source: Berkeley Unified School District

Nearly one-third of Berkeley High School graduates are African American, but only 11% of students eligible for admission at the University of California/California State University system are African American.

**Figure 1.24 – High School Graduates and UC/CSU Eligibles by Race/Ethnicity, 2004-2006**

![Pie charts showing high school graduates and UC/CSU eligibles by race/ethnicity.]

Source: Berkeley Unified School District
Housing

The U.S. Census counted 44,955 households in Berkeley. Many people live alone; married couples and other families make up 42% of households.

About half of the population rents and the other half lives in housing they own (most in single unit structures).

Figure 1.25 – Household Type and Presence of Children, Berkeley, 2000

Social Determinants of Health: Housing & Homelessness

Poor quality housing and homelessness are associated with a range of health conditions such as respiratory infections, asthma, lead poisoning, tuberculosis, and injuries. Overcrowded housing conditions are associated with absence of hot water for washing, ineffective waste disposal, infestation by insects and rats, and inadequate food storage. Homelessness is a major public health concern. In Alameda County, as many as 16,000 people are homeless during the course of a year and more than 6,000 are homeless on any given night. In 2003, a survey of Berkeley homeless estimated between 500-800 adults and up to 50 children were homeless on the day of the interview. Many people experiencing homelessness have disabilities, and thousands more with serious and persistent mental illness and/or HIV/AIDS are living in insecure and unstable situations. Many homeless adults also have serious alcohol and drug problems, mental illness, and high rates of diabetes and hypertension.
There are over 8,300 households in which one or both parents live with children under the age of 18 years. African Americans have the highest percentage of single-parent households and Asians have the lowest.

**Figure 1.26** – Percent of Single Parent Households with Children Under 18 Years of Age by Race/Ethnicity of Parent, Berkeley, 2000

![Bar chart showing percent of single parent households by race/ethnicity.](chart.png)

Transportation

Most Berkeley residents drive to work. Nearly 20% use mass transit (bus, BART, railroad). Over 40% spend 30 or more minutes commuting daily to work, and 30% of those over 16, work outside of Alameda County.

**Figure 1.27** – Means of Transportation to Work for Workers 16 Years and Older, Berkeley, 2000

![Pie chart showing means of transportation.](chart.png)
**Health Insurance**

Twelve percent of adults between 18 and 64 years (about 8,700 people) were uninsured in 2001.

**Figure 1.28** – Type of Current Health Coverage Source (18 to 64 Years Old), Berkeley, Alameda Co., California, 2001

![Bar chart showing type of current health coverage source](image)

Source: California Health Interview Survey, 2001

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**Social Determinants of Health: Health Care Access**

Insurance coverage is one of the key determinants of timely, reliable access to health care services because it helps to remove barriers to health care providers and assists with the high cost of health care. Many people have limited or no access to health insurance.\(^\text{17}\) As a result, they are significantly less likely to receive regular care from a medical provider who can help manage a chronic illness and facilitate access to preventive care. Those without insurance are also less likely to have medications they need to treat their condition, or a medical provider that is linguistically and culturally competent.\(^\text{17}\) Despite its importance, access to health insurance will not, by itself, reduce inequities in health.
Latinos were less likely than other groups to have insurance coverage.

The percent uninsured for African Americans is not reported because there were too few responses to be statistically reliable.

**Figure 1.29 – Uninsured Adults (18 to 64 Years Old) by Race/Ethnicity, Berkeley, 2001**

![Uninsured Adults by Race/Ethnicity](chart.png)

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percent Uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>17%</td>
</tr>
<tr>
<td>Latino</td>
<td>31%</td>
</tr>
<tr>
<td>White</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: California Health Interview Survey, 2001

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**Program Highlight: El Centro**

El Centro works to improve access to medical care for the Spanish-speaking population through outreach and assistance with completion of Medi-Cal / Healthy Families and Kaiser Child Health Plan applications.

*El Centro es un recurso en la comunidad para mejorar el acceso a cuidado médico para los que hablan español. Se ofrece ayuda con las aplicaciones para seguro médico (Medi-Cal / Healthy Families y Kaiser Child Health Plan).*
Inequities in Risk Factors

Risk factors for poor health outcomes are more prevalent among African American and Latino adults than other race/ethnic groups.

Figure 1.30 – Adults with 3 or More Risk Factors for Poor Health Outcomes by Race/Ethnicity, Berkeley, 2001 (Poverty, no health insurance, high school or less education, smoking, binge drinking, no exercise, low intake of fruits and vegetables, obesity)

![Figure 1.30]

Source: California Health Interview Survey, 2001

Picture of Community Meeting on Violence Prevention in South Berkeley with Elected officials, City Staff and community members.

Social Determinants of Health:

Neighborhood Influences on Behavioral Risk Factors

Use of alcohol, tobacco, and drugs, obesity, lack of exercise, and poor diet are more prevalent in residents of poor neighborhoods. Some risk behaviors (like smoking) may be adaptive responses that help people better cope with the stress of adverse living conditions, racism, and poverty. Unsafe streets and parks in poor neighborhoods can prevent outdoor exercise. Limited access to healthy foods at affordable prices by local food retailers contributes to inadequate diets, as does the ready availability of cheap and convenient candy, soda and fast food. An abundance of alcohol retail outlets makes alcohol more available, even to underage drinkers, and marketing tactics by tobacco and alcohol companies and the food and beverage industry increase the appeal of these harmful products and often target minority youth and communities of color.
Inequities in Health Outcomes

If African Americans in Berkeley had the same health status as Whites, a large proportion of the poorer health outcomes, illness, and hospitalizations in African Americans would not occur.

Figure 1.31 – Inequities in Selected Health Outcomes: If Berkeley African Americans had the same health status as Berkeley Whites, how many poor health outcomes would NOT occur each year in Berkeley African Americans?

Mortality Inequities

African Americans have much higher death rates than Whites, a pattern similar across Alameda County, California and the U.S.

Figure 1.32 – White and African American Mortality Rates, United States, California, Alameda County, Berkeley, 2000
Berkeley Whites and Latina women have much lower death rates than their counterparts in the rest of Alameda County.

**Figure 1.33 – Deaths by Gender and Race/Ethnicity, Berkeley and Other (non-Berkeley) Alameda County, 1999-2001**

Throughout the industrialized world, mortality has been closely associated with income and race. Berkeley has a mortality gap between Whites and African Americans that is even greater than that found in Alameda County or the U.S. One reason the difference is so great in Berkeley is that the White population in Berkeley has a much lower death rate than Whites in other parts of the County. This is likely related to the relatively high income and education levels of Berkeley’s White population.
Though mortality rates are decreasing overall, disparities between White and African American rates are holding constant over time.

![Figure 1.34](image1.png)

**Figure 1.34** – Mortality Rates in Whites and African Americans by Year of Death, Berkeley, 1993-2004

Poor neighborhoods (census tracts with a higher percent poverty level) have almost twice the mortality rate as neighborhoods where fewer people live in poverty.

![Figure 1.35](image2.png)

**Figure 1.35** – Mortality Rate by Poverty Level, Berkeley, 1999-2001

Note: The trend is statistically significant
Social Determinants of Health & Health Inequities

**Program Highlight: South and West Berkeley Community Action Team**

In 1999, The City of Berkeley Health Status Report released staggering statistics on ethnic and racial health disparities in the South and West Berkeley communities. In response, Community Action Teams (CAT) were established in both South and West Berkeley. The South and West Berkeley CAT is made up of local residents and built on an asset-based model of prevention using capacity-building methods. Its mission is to take action on neighborhood health issues that represent inequities. One of its charges is to recruit members who are least likely to participate in community organizing efforts and teach them a proactive way to effect positive change in the communities where they reside (see picture below of members at a CAT-organized Luau).

At every poverty level, African Americans have higher death rates than all other race/ethnic groups.

**Figure 1.36** — Mortality Rate by Race/Ethnicity and Poverty Level, Berkeley, 1999-2001

The mortality rate in the Berkeley flatlands is much higher than the mortality rate in the hills.

See Technical Notes for how we defined and measured hills versus flats.

**Figure 1.37 – Mortality Rate by Hills vs. Flats, Berkeley, 1999-2001**


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**Program Highlight:**

**Community Health Action & Assessment Section (CHAAS)**

CHAAS conducts data analysis using formal research methods and community assessments to report on the health of Berkeley residents. It also conducts evaluation of Public Health Division programs. CHAAS partners with residents, community-based organizations and City agencies to address health inequities in low-income residents in South and West Berkeley. Current initiatives include: 1) Youth Engagement and Policy Action, and 2) Public Health Preparedness.
If poverty and racial and ethnic inequities could be eliminated, the annual number of deaths would be reduced by at least one-third.

**Figure 1.38** – Inequities in Mortality: Annual Number of Avoidable Deaths and Years of Potential Life Lost If White/African American Inequities and Poverty Were Eliminated, Berkeley, 2000

If poverty and racial and ethnic inequities could be eliminated, the annual number of deaths would be reduced by at least one-third.

**Program Highlight: South & West Berkeley Health Forum**

The Forum is a community-based collaborative that formed after the release of the 1999 Health Status Report that first identified health inequities in Berkeley. Its purpose is to bring people and organizations together to talk about health inequities and improve communication and collaboration among institutions, organizations and the community. In the past few years, the Forum has been a community resource and information clearinghouse, educating participants on the root causes of health inequities. It has been central to the success of the Berkeley Hypertension Program and other city-wide efforts to address health inequities. Membership includes the Mayor’s Office, LifeLong Medical Care, Alta Bates, S&W Berkeley Community Action Team, UC Berkeley School of Public Health, Kaiser Permanente, and the Health & Human Services Department.

Source: Berkeley Public Health Division death certificates, U.S. Census, 2000