Understanding The Root Causes of Poor Health In Alameda County

The Challenge of Achieving Equity

Anthony Iton, M.D., J.D., MPH
Alameda County Health Officer

Livermore Community Meeting
June 5, 2007
Figure 1: Age Distribution, Alameda County and Tri-Valley

Age of Tri-Valley Residents

Source: CAPE Survey 2000
<table>
<thead>
<tr>
<th></th>
<th>Alameda County</th>
<th>Tri-Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>40.9%</td>
<td>72.8%</td>
</tr>
<tr>
<td>Asian</td>
<td>20.3%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Latino</td>
<td>19.0%</td>
<td>11.7%</td>
</tr>
<tr>
<td>African American</td>
<td>14.6%</td>
<td>3.0%</td>
</tr>
<tr>
<td>American Indian</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>0.6%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Some Other Race</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>3.9%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>
Figure 4: Household Income

- **Alameda County**
- **Tri-Valley**

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Percentage of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $25,000</td>
<td>10%</td>
</tr>
<tr>
<td>$25,000-$50,000</td>
<td>20%</td>
</tr>
<tr>
<td>$50,000-$75,000</td>
<td>15%</td>
</tr>
<tr>
<td>$75,000-$100,000</td>
<td>10%</td>
</tr>
<tr>
<td>Over $100,000</td>
<td>35%</td>
</tr>
</tbody>
</table>
Compared With Alameda County

Tri-Valley:
- Slightly younger
- Less diverse
- Wealthier
- Higher Life Expectancy
### Healthy People 2010 Objectives Met in Tri-Valley

<table>
<thead>
<tr>
<th>Objective</th>
<th>Tri-Valley</th>
<th>Alameda County</th>
<th>HP2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer mortality (per 100,000)</td>
<td>21.9</td>
<td>25.7</td>
<td>22.3</td>
</tr>
<tr>
<td>Prostate cancer mortality (per 100,000)</td>
<td>24.2</td>
<td>29.6</td>
<td>28.8</td>
</tr>
<tr>
<td>Homicide (per 100,000)</td>
<td>1.8</td>
<td>7.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Asthma hospitalization, all ages (per 100,000)</td>
<td>85.8</td>
<td>88.9</td>
<td>*160.0</td>
</tr>
<tr>
<td>Childhood asthma hospitalization (per 100,000)</td>
<td>146.3</td>
<td>160.0</td>
<td>*225.0</td>
</tr>
<tr>
<td>Early prenatal care</td>
<td>94%</td>
<td>89%</td>
<td>90%</td>
</tr>
<tr>
<td>Infant mortality (per 1,000 live births)</td>
<td>3.3</td>
<td>4.9</td>
<td>4.5</td>
</tr>
</tbody>
</table>

* Refers to HP2000 because no comparable HP2010 objective was made.
<table>
<thead>
<tr>
<th>Health Indicator</th>
<th>Tri-Valley</th>
<th>Alameda County</th>
<th>HP2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary heart disease mortality (per 100,000)</td>
<td>174.0</td>
<td>173.2</td>
<td>166.0</td>
</tr>
<tr>
<td>Stroke mortality (per 100,000)</td>
<td>64.4</td>
<td>65.9</td>
<td>48.5</td>
</tr>
<tr>
<td>Lung cancer mortality (per 100,000)</td>
<td>49.5</td>
<td>49.2</td>
<td>44.9</td>
</tr>
<tr>
<td>Colorectal cancer mortality (per 100,000)</td>
<td>19.5</td>
<td>18.4</td>
<td>13.9</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>6.2%</td>
<td>6.8%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Tuberculosis cases (per 1,000)</td>
<td>4.3</td>
<td>13.7</td>
<td>1.0</td>
</tr>
<tr>
<td>AIDS cases (per 1,000)</td>
<td>3.5</td>
<td>13.9</td>
<td>1.0</td>
</tr>
<tr>
<td>Unintentional injury mortality (per 100,000)</td>
<td>18.9</td>
<td>23.6</td>
<td>17.5</td>
</tr>
</tbody>
</table>

Note: Birth and death data are 2000-2002; hospitalization and communicable disease data are 2001-2003.
Mortality from All Causes

Rate per 100,000

Alameda County
Livermore
Tri-Valley

Male
Female
Map 3: Depression Hospitalization, 2001-2003

County rate = 172.6/100,000 persons.
Rates are age-adjusted annual averages from 2001 to 2003.
Shown here as calculated by zip code.
BARHII Framework
Mortality

Life expectancy
Leading Causes of Death, Alameda County, 2001-2003 (N=28,790)

- Heart Disease: 26.9%
- Cancer: 23.7%
- Stroke: 8.3%
- Chronic Lower Resp Dis: 4.5%
- Unintentional Injuries: 3.6%
- Influenza & Pneumonia: 3.2%
- Diabetes Mellitus: 3.0%
- Alzheimer's Disease: 2.1%
- Chronic Liver Dis/Cirrhosis: 1.4%
- Homicide: 1.3%

Number of Deaths

67%
Figure 22: Leading Causes of Death, Livermore

- Diseases of Heart: 28.2%
- Cancer: 25.9%
- Stroke: 7.6%
- Chronic Lower Resp Dis: 5.6%
- Unintentional Injuries: 4.3%
- Influenza & Pneumonia: 2.6%
- Alzheimers Disease: 2.4%
- Pneumonitis due to Solids & Liquids: 2.1%
- Suicide: 1.8%
- Diabetes Mellitus: 1.8%
Cardiovascular Disease
Coronary Thrombosis With Infarction
Figure 32: Historical CHD Mortality

Source: CAPE; Alameda County vital statistics files, CA DOF, Census 1990 and 2000.
Figure 33: CHD Mortality by Area

Diabetes
Figure 24: Historical Diabetes Mortality

Source: CAPE; Alameda County vital statistics files, CA DOF, Census 1990 and 2000.
Figure 25: Diabetes Mortality by Area

Cancer
Figure 48: Historical Lung Cancer Mortality

Source: CAPE; Alameda County vital statistics files, CA DOF, Census 1990 and 2000.
Figure 49: Lung Cancer Mortality by Area

Figure 52: Historical Colorectal Cancer Mortality

Source: CAPE; Alameda County vital statistics files, CA DOF, Census 1990 and 2000.
Figure 53: Colorectal Cancer Mortality by Area

Mortality
Access to health care
Disease and Injury
10 – 15%
Chronic disease
Infectious disease
Injury (intentional and unintentional)
Disease and Injury
Mortality
Genetics
10 – 15%
Causes of Differences in Health Outcomes

- Genetics: 10-15%
- Access to health care: 10-15%

15% + 15% = only 30%

What causes the other 70%???
Disease and Injury Mortality

Individual health knowledge

Risk Behaviors Disease and Injury Mortality

Smoking Nutrition Physical activity

Violence

70% ??
Is This All About Personal Responsibility???

The Medical Model Assumes that “Risk Behaviors” are the Missing 70%
The Obesity Epidemic
The Basic Problem

- More foods available everywhere
- More meals out with bigger meals
- More large volume sugar-sweetened beverages
- Aggressive food advertising

- More TV, video, computers
- More car travel
- Fewer PE classes
- Fewer safe walking/bike routes
- Lower perception of safety

Decreased Energy Expenditure

Increased Energy Intake
Figure 1
Annual soft drink production in the United States (12-oz. cans/person)

- **Diet soda**
- **Regular soda**

<table>
<thead>
<tr>
<th>Year</th>
<th>Diet soda</th>
<th>Regular soda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>1957</td>
<td></td>
<td>120</td>
</tr>
<tr>
<td>1967</td>
<td></td>
<td>180</td>
</tr>
<tr>
<td>1977</td>
<td></td>
<td>250</td>
</tr>
<tr>
<td>1987</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>1997</td>
<td>400</td>
<td>450</td>
</tr>
<tr>
<td>1998</td>
<td>500</td>
<td>550</td>
</tr>
<tr>
<td>2000</td>
<td>550</td>
<td>600</td>
</tr>
<tr>
<td>2004</td>
<td>580</td>
<td>630</td>
</tr>
</tbody>
</table>

**Sources:** USDA Economic Research Service (1947–87); Beverage Digest (1997–2004).

Figure 2
Growth in soda container size (oz.)

- 6½ oz.
- 12 oz.
- 20 oz.
- 24 oz.

- 1950s
- 1960s
- 1990s
- 2000s
### Table 6
**Low soft-drink prices promote consumption**

<table>
<thead>
<tr>
<th>Beverage</th>
<th>Cost</th>
<th>Cost per quart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cola, supermarket brand</td>
<td>$0.59/2 liters</td>
<td>$0.28</td>
</tr>
<tr>
<td>Coca-Cola</td>
<td>$0.69/2 liters</td>
<td>$0.33</td>
</tr>
<tr>
<td></td>
<td>$2.50/6½ liters</td>
<td>$0.79</td>
</tr>
<tr>
<td></td>
<td>$2.67/12 12-oz. cans</td>
<td>$0.59</td>
</tr>
<tr>
<td>Pepsi-Cola</td>
<td>$2.50/12 12-oz. cans</td>
<td>$0.56</td>
</tr>
<tr>
<td></td>
<td>$0.79/2 liters</td>
<td>$0.37</td>
</tr>
<tr>
<td>Sierra Mist</td>
<td>$0.89/2 liters</td>
<td>$0.42</td>
</tr>
<tr>
<td>Cranberry Juice Cocktail</td>
<td>$1.99/64 oz.</td>
<td>$1.00</td>
</tr>
<tr>
<td>Capri Sun Juice</td>
<td>$2/10 6¾ oz. pouches</td>
<td>$0.95</td>
</tr>
<tr>
<td>Bottled water (supermarket brand)</td>
<td>$0.89/gallon</td>
<td>$0.22</td>
</tr>
<tr>
<td>Bottled spring water (supermarket brand)</td>
<td>$0.89/gallon</td>
<td>$0.22</td>
</tr>
<tr>
<td>Seltzer water, club soda, supermarket brand</td>
<td>$0.89/2 liters</td>
<td>$0.42</td>
</tr>
<tr>
<td>Dannon water</td>
<td>$5.99/24 16.9-oz. bottles</td>
<td>$0.47</td>
</tr>
<tr>
<td>Milk</td>
<td>$2.99/gallon</td>
<td>$0.75</td>
</tr>
<tr>
<td></td>
<td>$0.95/quart</td>
<td>$0.95</td>
</tr>
<tr>
<td>Orange juice, frozen, supermarket brand</td>
<td>$1.49/12-oz. can</td>
<td>$0.99</td>
</tr>
<tr>
<td>Tropicana Orange Juice</td>
<td>$1.88/64 oz.</td>
<td>$0.94</td>
</tr>
<tr>
<td>Florida’s Natural Orange Juice</td>
<td>$2.50/64 oz.</td>
<td>$1.25</td>
</tr>
</tbody>
</table>

*Source:* Prices at Washington, D.C., area stores, late 2004–early 2005; many prices are specials.
Milk vs. Soda Consumption

Girls (6-11 years old)

Industry Perspective

- “A growing body of scientific evidence by governmental and academic researchers, looking specifically at soft drink consumption, shows there is no connection between soft drink consumption and health problems, including obesity, tooth decay and bone health.”

- National Soft Drink Association website
Industry Perspective

• “Limiting calories in schools is a sensible approach that acknowledges our industry’s long-standing belief that school wellness efforts must focus on teaching kids to consume a balanced diet and exercise more. Schools provide an opportunity to create a healthy environment that equips our children with these skills. Our industry will continue to do its part to contribute that environment.”

  -Susan Neely, CEO American Beverage Association
The Alliance and Industry leaders set healthy school beverage guidelines for U.S. schools

The Alliance for a Healthier Generation – a joint initiative of the William J. Clinton Foundation and the American Heart Association – has worked with representatives of Cadbury Schweppes, Coca-Cola, PepsiCo, and the American Beverage Association to establish new guidelines to limit portion sizes and reduce the number of calories available to children during the school day. Under these guidelines, only lower calorie and nutritious beverages will be sold to schools.
Obesity Trends* Among U.S. Adults
BRFSS, 1986

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1988

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1989
(*BMI \geq 30, or \sim 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1991

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1992

(*BMI \( \geq 30 \), or \(~30\) lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1994

(*BMI \geq 30, or \sim 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1995

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

No Data       <10%        10%–14%      15%–19%
Obesity Trends* Among U.S. Adults
BRFSS, 1996
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1997

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1998

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2001

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2002

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2003

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Figure 1. Prevalence of overweight among children and adolescents ages 6-19 years

An American Epidemic

Diabetes

The silent killer: Scientific research shows a 'persistent explosion' of cases—especially among those in their prime.

By Jerry Adler and Claudia Kalb
CDC: Diabetes to afflict 1 in 3 born in 2000

Scientist says kids must eat healthier, exercise more

BY JANET McCONNAUGHEY
Associated Press

New Orleans — One in three U.S. children born in 2000 will become diabetic unless many more people start eating less and exercising more, a scientist with the Centers for Disease Control and Prevention warned Saturday.

The odds are worse for African-American and Latino children. Nearly half of them are likely to develop the disease, said Dr. K.M. Venkat Narayan, a diabetes epidemiologist at the CDC.

“I think the fact that the diabetes epidemic has been raging has been well-known to us for several years. But looking at the risk in these terms was very shocking to us,” Narayan said.

The 33 percent lifetime risk is about triple the American Diabetes Association’s current estimate.

by 2050, to 29 million, an earlier CDC study by Narayan and others found.

“These estimates I am giving you now are probably quite conservative,” Narayan said in an interview before the diabetes association’s annual scientific meeting here.

Narayan said it would be difficult to say whether undiagnosed cases would rise at the same rate.

If they did, that could push the 2050 figure to 40 million or more.

Doctors had known for some time that Type 2 diabetes — what used to be called adult-onset diabetes because it typically showed up in middle-aged people — is on the rise, and that patients are getting younger.

Nobody else had crunched the numbers to look at current odds of getting the disease, Narayan said.

Overall, he said, 59 percent of the girls who now are healthy 2½ to 3-year-olds and 33 percent of the boys are likely to develop diabetes, he said.

For Latino children, the odds are closer to one in two: 53 percent of the girls and 45 percent of the boys. The numbers are about 49 percent and 40 percent for African-American girls.
A Potential Decline in Life Expectancy in the United States in the 21st Century

S. Jay Olshansky, Ph.D., Douglas J. Passaro, M.D., Ronald C. Hershow, M.D., Jennifer Layden, M.P.H., Bruce A. Carnes, Ph.D., Jacob Brody, M.D., Leonard Hayflick, Ph.D., Robert N. Butler, M.D., David B. Allison, Ph.D., and David S. Ludwig, M.D., Ph.D.

ABSTRACT

Forecasts of life expectancy are an important component of public policy that influence age-based entitlement programs such as Social Security and Medicare. Although the Social Security Administration recently raised its estimates of how long Americans are going to live in the 21st century, current trends in obesity in the United States suggest that these estimates may not be accurate. From our analysis of the effect of obesity on longevity, we conclude that the steady rise in life expectancy during the past two centuries may soon come to an end.
Obesity and Poverty in Alameda County School Districts 2000-2003

% Overweight and % Poverty

Piedmont Pleasonton Fremont Alameda Dublin Castro Valley San Lorenzo Livermore Newark San Leandro Emeryville Hayward Oakland
Disease and Injury Mortality

Individual health knowledge

70% ??

Medical Model

Smoking
Nutrition
Physical activity
Violence

Risk Behaviors
Disease and Injury
Mortality
Annual Medical Expense by Age and Gender
Medical Model Interventions

“SERVICES”

- Tend to focus is on individuals
- Tend to be remedial in nature
- Do not address underlying conditions
- Expensive and difficult to sustain
- Majority of Health, Social Services & Criminal Justice budget spent on these kind of interventions
What About The Environment?
Disease and Injury
Risk Behaviors
Disease and Injury
Mortality
Mortality Rate and % Poverty
Alameda County Census Tracts
2000-2003

![Graph showing the relationship between mortality rate and poverty rate for Alameda County Census Tracts from 2000 to 2003. The graph displays a positive correlation between the two variables, with data points scattered across a range of mortality rates and poverty rates. A trend line indicates the general upward trend.]
High school grads: 90%
Unemployment: 4%
Poverty: 7%
Home ownership: 64%
Non-White: 49%

High school grads: 81%
Unemployment: 6%
Poverty: 10%
Home ownership: 52%
Non-White: 59%
High school grads: 65%
Unemployment: 12%
Poverty: 25%
Home ownership: 38%
Non-White: 89%
Life Expectancy by Tract

Life Expectancy at Birth
- Green: > 80.0
- Yellow: 74.3 - 80.0
- Red: < 74.3

Neighborhood Context

- Parks & recreational space
- Walkability, bikeability
- Access to amenities
- Concentration of alcohol outlets, fast food
- Housing stock
- Point sources of pollution
- Jobs
Overall: Compared to 1969
Americans drive:
- 88% farther to shop
- 137% farther for errands

Mega-Mileage Moms

• Family “chauffeur”

• Average minutes per day spent in car:
  - Women overall: 64 minutes
  - Single mothers: 75 minutes

Surface Transportation Policy Project: 2000
We have changed how much we walk or bike

★ Percent of children who walk or bike to school:
★ 1974: 66%
★ 2000: 13%
(CDC, 2000)
Disease and Injury Risk Behaviors Disease and Injury Mortality
Institutional Power Neighborhood Conditions

Institutional Power → Neighborhood Conditions → Risk Behaviors → Disease and Injury → Mortality
Livermore Unified District 2006
4th Grade Reading Level

<table>
<thead>
<tr>
<th></th>
<th>Prof/Adv</th>
<th>Basic</th>
<th>Below Basic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>35%</td>
<td>38%</td>
<td>27%</td>
</tr>
<tr>
<td>Latino</td>
<td>33%</td>
<td>39%</td>
<td>28%</td>
</tr>
<tr>
<td>White</td>
<td>14%</td>
<td>14%</td>
<td>76%</td>
</tr>
<tr>
<td>Asian</td>
<td>10%</td>
<td>10%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Livermore Unified District 2006
8th Grade Reading Level

Mortality Rate and % HS Education
Alameda County Census Tracts
2000-2003

The graph shows the relationship between mortality rate and the percentage of individuals with high school education in Alameda County Census Tracts from 2000 to 2003. The points plotted indicate that there is a negative correlation between the two variables, suggesting that higher percentages of individuals with high school education are associated with lower mortality rates.
Results of the statistical comparison of weather and deaths over 12 years show that blacks and those with a high school education or less are most likely to die on extremely hot days. – Harvard School of Public Health study of almost 8 million deaths in 50 cities from 1989 to 2000.
Chicago also suffers from an everyday "emergency in slow motion" that its leaders refuse to acknowledge. The heat wave was a particle accelerator for the city: It sped up and made visible the hazardous social conditions that are always present but difficult to perceive. Yes, the weather was extreme. But the deep sources of the tragedy were the everyday disasters that the city tolerates, takes for granted, or has officially forgotten. – Eric Klineberg, author of Heat Wave
A Proposed Model

Understanding Health In Context
Health Inequities - Bay Area Regional Health Inequities Initiative

**Socio-Ecological Model**
- **UPSTREAM SOCIAL FACTORS**
  - Social Inequalities: Class, Race/ethnicity, Gender, Immigration Status
  - Institutional Power: Corporations & other businesses, Gov’t agencies, Schools
  - Neighborhood Conditions: Environment, Social, Physical, Residential Segregation

**Medical Model**
- **INDIVIDUAL HEALTH KNOWLEDGE**
  - Genetics
  - Risk Behaviors: Smoking, Nutrition, Physical activity, Violence

- **DISEASE & INJURY**
  - Infectious disease
  - Chronic disease
  - Injury (intentional & unintentional)

- **DOWNSTREAM HEALTH STATUS**
  - Mortality: Infant mortality, Life expectancy

**Health Care Access**