Socioeconomic Factors: Affect on Health Care Outcomes

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You think of social or economic factors that affect health care outcomes, factors come to mind?
Social Determinants of Health Care

World Health Organization defines this as:

“The social determinants of health are the conditions in which people are born, grow, live, work, and age. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social determinants of health are mostly responsible for health inequities--the unfair and avoidable differences in health status seen within and between countries.”
Socioeconomic Status

A composite measure that typically incorporates economic, social, and work status. Economic status is measured by income. Social status is measured by education, and work status is measured by occupation. Each status is considered an indicator. These three indicators are related but do not overlap.

Health Disparity

Difference in health that is closely linked with social or economic disadvantage. Health disparities negatively affect groups of people who have systematically experienced greater social or economic obstacles to health. These obstacles stem from characteristics historically linked to discrimination or exclusion such as race or ethnicity, religion, socioeconomic status, gender, mental health, sexual orientation, or geographic location. Other characteristics include cognitive, sensory, or physical disabilities.

Defined by US DHHS
Figure 1

Impact of Different Factors on Risk of Premature Death

- Genetics: 30%
- Individual Behavior: 40%
- Health and Well Being: 20%
- Social and Environmental Factors: 20%
- Health Care: 10%

# Social Determinants of Health

<table>
<thead>
<tr>
<th>Economic Stability</th>
<th>Neighborhood and Physical Environment</th>
<th>Education</th>
<th>Food</th>
<th>Community and Social Context</th>
<th>Health Care System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>Housing</td>
<td>Literacy</td>
<td>Hunger</td>
<td>Social integration</td>
<td>Health coverage</td>
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<tr>
<td>Income</td>
<td>Transportation</td>
<td>Language</td>
<td>Access to healthy options</td>
<td>Support systems</td>
<td>Provider availability</td>
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<td>Expenses</td>
<td>Safety</td>
<td>Early childhood education</td>
<td>Social engagement</td>
<td>Community engagement</td>
<td>Provider linguistic and cultural competency</td>
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<tr>
<td>Debt</td>
<td>Parks</td>
<td>Vocational training</td>
<td>Discrimination</td>
<td>Quality of care</td>
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<tr>
<td>Medical bills</td>
<td>Playgrounds</td>
<td>Higher education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>Walkability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Health Outcomes
- Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations
Prenatal Period

- Median family income correlates with birth weight—lower income is a big risk factor for having a low birth weight baby
  - Rate of teen pregnancies is higher
  - Less prenatal care/prenatal care may start later
  - Dietary differences: analysis of diet shows that low income women are less likely to intake the Recommended Daily Allowance (RDA)

- Higher risk of exposure to EtOH, tobacco, and other drugs
Parents

- Not only the income level but the education level of parents has an impact on the health of children.
  - Access to health care has been addressed by Medicaid/ SCHIP but has not improved health equality
  - These disparities are present even in countries with universal health coverage
- Children in lower income households more likely to develop chronic problems
- Taking all children with chronic problems, poor children more likely to have adverse health outcomes
### Percentage Of Children Ages 0–17 In Excellent Or Very Good Health, By Age, Mother’s Education And Health, And Income Level, 1986–1995

<table>
<thead>
<tr>
<th>Income quintile</th>
<th>Full sample</th>
<th>Child’s age</th>
<th></th>
<th>Mother’s education</th>
<th></th>
<th>Mother’s health</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>0–9</td>
<td>10–17</td>
<td>More than high school</td>
<td>High school or less</td>
<td>Good to excellent</td>
</tr>
<tr>
<td>1</td>
<td>66%</td>
<td>68%</td>
<td>63%</td>
<td>76%</td>
<td>64%</td>
<td>71%</td>
</tr>
<tr>
<td>2</td>
<td>77%</td>
<td>79%</td>
<td>75%</td>
<td>83%</td>
<td>75%</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>84%</td>
<td>85%</td>
<td>82%</td>
<td>87%</td>
<td>82%</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>87%</td>
<td>88%</td>
<td>86%</td>
<td>89%</td>
<td>85%</td>
<td>88</td>
</tr>
<tr>
<td>5</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>91%</td>
<td>88%</td>
<td>91</td>
</tr>
</tbody>
</table>

**SOURCE:** Authors’ analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).

**NOTES:** Based on a sample of 231,131 children ages 0–17 from the 1986–1995 NHIS, who have a mother present in the household. Health status is reported by a parent (for children ages 0–16) or by a parent or the child (for children age 17). Income quintile 1 is the poorest; 5, the richest.
## EXHIBIT 2

**Health Indicators Among Children, By Income, 1986–1995**

<table>
<thead>
<tr>
<th>Income quintile</th>
<th>Days missed from school (ages 5–17)(^a)</th>
<th>Annual hospital episodes (ages 1–17)(^b)</th>
<th>Percent with asthma</th>
<th>Percent with heart condition</th>
<th>Percent with hearing problem</th>
<th>Percent with mental retardation</th>
<th>Percent 5.5 lbs. or less at birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.234</td>
<td>.048</td>
<td>7.2%</td>
<td>2.3%</td>
<td>2.1%</td>
<td>2.2%</td>
<td>9.6%</td>
</tr>
<tr>
<td>2</td>
<td>.197</td>
<td>.039</td>
<td>5.9</td>
<td>2.3</td>
<td>1.9</td>
<td>1.4</td>
<td>7.8</td>
</tr>
<tr>
<td>3</td>
<td>.176</td>
<td>.034</td>
<td>5.6</td>
<td>1.9</td>
<td>1.8</td>
<td>0.9</td>
<td>6.5</td>
</tr>
<tr>
<td>4</td>
<td>.170</td>
<td>.032</td>
<td>6.0</td>
<td>2.0</td>
<td>1.6</td>
<td>0.9</td>
<td>5.4</td>
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<tr>
<td>5</td>
<td>.164</td>
<td>.025</td>
<td>6.4</td>
<td>1.7</td>
<td>1.3</td>
<td>0.7</td>
<td>4.8</td>
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<tr>
<td>N</td>
<td>192,044</td>
<td>255,210</td>
<td>43,892</td>
<td>44,921</td>
<td>45,098</td>
<td>45,098</td>
<td>12,219</td>
</tr>
</tbody>
</table>

**SOURCE:** Authors’ analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).

**NOTES:** Columns 1–6 are based on samples of children ages 0–17 from the 1986–1995 NHIS, which asks each family about only a subset of chronic conditions (accounting for the smaller numbers of observations for columns 3 through 6). The information on birthweight is from the 1988 Child Health Supplement of the NHIS, which collected information on one child age 0–17 in each household with children. Income quintile 1 is the poorest; 5, the richest.

\(^a\) Average number of days missed from school over a two-week period.

\(^b\) Average number of annual hospital episodes.
Built Environment

- Access to grocery stores/ Access to fresh food
- Proximity to recreational spaces/ parks
- Walkability
- Access to reliable transport
- Adequate housing
- Material Deprivation: inability of individuals/ households to afford consumption goods or services which are considered typical in that society at that given time, irrespective of people’s preferences to those items/ services
  - Comparisons across societies
Built Environment and Health

- Clearly affect development of obesity and other cardiovascular diseases
  - Strongest association seen within African American population
- **Food deserts**: definitions vary but usually represented by lower socioeconomic status areas where affordable grocery store is > 1 mile away in an urban area OR >10 miles away in a rural area
- **Food Security**: consistent access to healthy and affordable food
- Extreme cases: poor health care outcomes in the homeless community
- Center for Disease Control is sponsoring Health Impact Assessments
Walkability

- In a study performed in Australian Capital Territory
- 2011-2013
- Walk Score Index correlated with hospital cost and rate of hospital admission
- Higher Walk Score correlated with less cost and less admissions, even after adjusting for age, sex, and SES
- 20-unit increase in walkability was associated with 12.5% fewer admissions (all-cause)

Exhibit 3.1

Number of Health Status and Outcome Measures for which Groups fared Better, the Same, or Worse Compared to Whites

- **Data Limitations**
- **Worse**
- **No Difference**
- **Better**

<table>
<thead>
<tr>
<th>Race</th>
<th>Better</th>
<th>No Difference</th>
<th>Same</th>
<th>Worse</th>
<th>Data Limitations</th>
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<tbody>
<tr>
<td>Asian</td>
<td>25</td>
<td>7</td>
<td>4</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>29</td>
<td>4</td>
<td>1</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Black</td>
<td>29</td>
<td>1</td>
<td>4</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>AIAN</td>
<td>29</td>
<td>6</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>NHPOI</td>
<td>29</td>
<td>6</td>
<td>2</td>
<td>18</td>
<td>3</td>
</tr>
</tbody>
</table>
Exhibit 3.4

Smoking and Obesity Rates among Nonelderly Adults by Race/Ethnicity, 2014

- Share of Adults Who Smoke
  - White: 21%
  - Asian: 9%
  - Hispanic: 15*
  - Black: 21*
  - AIAN: 32*
  - NHOPR: 19%

- Share of Adults Who are Obese
  - White: 28%
  - Asian: 9*
  - Hispanic: 32*
  - Black: 39*
  - AIAN: 34*
  - NHOPR: 30%
Exhibit 3.9

Age-Adjusted HIV or AIDS Diagnosis and Death Rate per 100,000 Among Teens and Adults by Race/Ethnicity

- White
- Asian
- Hispanic
- Black
- AIAN
- NHOPPI

<table>
<thead>
<tr>
<th></th>
<th>HIV Diagnosis Rate</th>
<th>AIDS Diagnosis Rate</th>
<th>Death Rate for Individuals with HIV Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>7</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asian</td>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Black</td>
<td>13</td>
<td>31</td>
<td>4</td>
</tr>
<tr>
<td>AIAN</td>
<td></td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>NHOPPI</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Infant Mortality Rate (per 1,000) by Race/Ethnicity, 2013

- White: 5.1
- Asian/Pacific Islander: 3.9*
- Hispanic: 5.0
- Black: 11.1*
- AIAN: 7.7*
Exhibit 3.14

Age-Adjusted Death Rates per 100,000 for Selected Diseases by Race/Ethnicity, 2014

- Diabetes Death Rate:
  - White: 19
  - Asian/Pacific Islander: 15
  - Hispanic: 25
  - Black: 38
  - AIAN: 41

- Heart Disease Death Rate:
  - White: 170
  - Asian/Pacific Islander: 86
  - Hispanic: 116
  - Black: 211
  - AIAN: 153

- Cancer Death Rate:
  - White: 171
  - Asian/Pacific Islander: 103
  - Hispanic: 115
  - Black: 194
  - AIAN: 141

* denotes statistical significance.
Exhibit 2.2

Percent of Nonelderly Adults who did not Receive or Delayed Care in the Past 12 Months by Race/Ethnicity, 2014

- Did not see a Doctor for Needed Care Because of Cost
  - White: 14%
  - Asian: 11%
  - Hispanic: 24%
  - Black: 21%
  - AIAN: 19%
  - NHAPI: 15%

- Delayed Needed Care for Reasons Other than Cost
  - White: 19%
  - Asian: 21%
  - Hispanic: 28%
  - Black: 27%
  - AIAN: 36%
  - NHAPI: 26%
Racial Disparities in CV Medicine

Racial Disparities in MI

- When presenting with MI’s, black patients with worse presentation (Killip Class)
- Black patients less likely to be revascularized and more likely to receive lytic therapy
- Post-MI survival higher amongst white patients compared to black patients
  - Controlling for demographics, co-morbidities, and even socioeconomic status

Racial Disparities in Cancer Care

- Incidence of breast cancer, cervical cancer, prostate cancer, lung cancer, and colon cancer higher amongst black patients compared to white patients
  - Cervical cancer incidence highest amongst Hispanic, but cancer related mortality still higher in blacks
- Black patients likely to be diagnosed with more advanced disease
- Asian/ Pacific Islanders have higher incidence gastric cancer
- American Indian/ Native Americans with higher incidence of kidney cancer
Life at the Top in America Isn't Just Better, It's Longer

By JANNY SCOTT  MAY 16, 2005
Relationship Between Income and Health

- Higher income buys better quality healthcare
- More resources for goods/services that results in better health care outcomes
- Parents adopt better health care practices also tend to be “more productive” resulting in better outcomes for their children
Differences in SES life expectancy post-MI: white patients
Differences in SES life expectancy post-MI: black patients
"Nobody Dies Because They Don’t Have Access To Healthcare"
- Idaho Rep. Raul Labrador
Access To Health Care

- Thought that a lot of racial and socioeconomic disparities present in health care are secondary to decreased access to health care.
- Medicaid, SCHIP, and to a smaller extent, Medicare all formed to improve access to health care.
- Affordable Care Act (ACA) has served to significantly improve access to health care:
  - Subsidies to purchase health insurance
  - Exchanges
  - Expansion of Medicaid--not ALL states
  - Increased funding for community health centers
  - Development of Prevention and Public Health Fund
Percentage Point Change in Uninsured Rate among the Nonelderly Population by Selected Characteristics, 2013-2015

### Poverty Level

- **<100% FPL:** -10.1
- **100 to 199% FPL:** -11.1
- **>200% FPL:** -3.0

### Race/Ethnicity

- **White:** -4.7
- **Black:** -7.7
- **Hispanic:** -9.5
- **Asian:** -7.1

### State Medicaid Expansion Status

- **Expanded Medicaid:** -6.7
- **Did Not Expand Medicaid:** -4.4

**Note:** Indiana, New Hampshire, and Pennsylvania are included as non-expansion states during 2013 and 2014 and as expansion states in 2015.

Racial and ethnic disparities in health insurance coverage have narrowed.

Uninsured Rate Among Nonelderly Individuals by Race/Ethnicity, 2013-2015

Note: Includes nonelderly individuals 0-64 years of age.
Health Insurance Coverage of Nonelderly Population by Race/Ethnicity, 2014

- Uninsured
- Medicaid/Other Public
- Employer/Other Private

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Uninsured</th>
<th>Medicaid/Other Public</th>
<th>Employer/Other Private</th>
<th>Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>9%</td>
<td>20%</td>
<td>71%</td>
<td>159.6M</td>
</tr>
<tr>
<td>Asian</td>
<td>10%</td>
<td>19%</td>
<td>71%</td>
<td>15.3M</td>
</tr>
<tr>
<td>Hispanic</td>
<td>21%*</td>
<td>35%*</td>
<td>44%*</td>
<td>52.0M</td>
</tr>
<tr>
<td>Black</td>
<td>13%*</td>
<td>37%*</td>
<td>50%*</td>
<td>34.6M</td>
</tr>
<tr>
<td>AIAN</td>
<td>21%*</td>
<td>38%*</td>
<td>41%*</td>
<td>2.2M</td>
</tr>
<tr>
<td>NHUPI</td>
<td>10%</td>
<td>33%*</td>
<td>57%*</td>
<td>0.9M</td>
</tr>
</tbody>
</table>
Exhibit 4.9

Eligibility for ACA Coverage Among the Nonelderly Uninsured by Race/Ethnicity as of 2015

- Ineligible For Financial Assistance Due to Offer of ESI, Income, or Citizenship Status
- In the Coverage Gap
- Eligible for Tax Credits
- Medicaid Eligible

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Ineligible</th>
<th>Coverage Gap</th>
<th>Eligible for Tax Credits</th>
<th>Medicaid Eligible</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>38%</td>
<td>9%</td>
<td>26%</td>
<td>27%</td>
<td>14.5M</td>
</tr>
<tr>
<td>Asian</td>
<td>54%*</td>
<td>N/A*</td>
<td>18%*</td>
<td>26%</td>
<td>1.5M</td>
</tr>
<tr>
<td>Hispanic</td>
<td>53%*</td>
<td>6%*</td>
<td>25%*</td>
<td>55%</td>
<td>10.9M</td>
</tr>
<tr>
<td>Black</td>
<td>27%*</td>
<td>19%*</td>
<td>32%*</td>
<td>51%</td>
<td>4.4M</td>
</tr>
<tr>
<td>AIAN</td>
<td>22%*</td>
<td>8%</td>
<td>19%*</td>
<td>70%</td>
<td>0.5M</td>
</tr>
<tr>
<td>NHOPPI</td>
<td>N/A</td>
<td></td>
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<td></td>
<td>0.1M</td>
</tr>
</tbody>
</table>
Access to Care: Pediatric Effect

- Looking at the National Inpatient Sample for 15 years and the KIDS database for 3 years
- All inpatient data characterized: 23.5 million pediatric inpatient stays
  - 5.4% uninsured
  - 94.6% insured
- In-hospital mortality measured
  - 0.74% of uninsured patients
  - 0.46% of insured patients

Access to Care: ICU Patients

- Pennsylvania study looking at all ICU admissions in 2005 and 2006 provided by Pennsylvania Health Care Cost Containment Council
- Divided into three insurance status: Private (Reference Group), Uninsured, Medicaid

<table>
<thead>
<tr>
<th>Variable</th>
<th>Private Insurance, OR (n = 95,995)</th>
<th>Medicaid (n = 36,911)</th>
<th>Uninsured (n = 5,814)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>P Value</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>30-d Mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unadjusted</td>
<td>1.0</td>
<td>1.42 (1.35–1.50)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Adjusted for patient characteristics</td>
<td>1.0</td>
<td>1.06 (0.98–1.15)</td>
<td>0.164</td>
</tr>
<tr>
<td>Adjusted plus hospital fixed effects</td>
<td>1.0</td>
<td>1.05 (0.97–1.14)</td>
<td>0.204</td>
</tr>
</tbody>
</table>

Access to Care: Mortality in NHANES

- Utilizing NHANES III database and linking it to National Death Index, mortality among insured and uninsured compared.
- After adjustment for demographics, exercise, smoking, co-morbidities, people without insurance were more likely to die with a hazard ratio of 1.4 (unadjusted was 1.8).

Access to Care: After Medicaid Expansion

- Prior to ACA, some states had started to expand Medicaid--three of those states (ME, NY, AZ) compared to neighboring states that had not expanded Medicaid
- Compared county level mortality data
- Net change of 19.6/100,000 fewer deaths in states that had expanded Medicaid
- Reductions greatest in
  - Non-whites
  - Older adults
  - Poorer counties

Hispanic Paradox

Hispanics less likely to have insurance coverage

Annualized, age-adjusted prevalence of selected diseases and risk factors among adults aged 18-64 years

- U.S. population
- White, non-Hispanic
- Hispanic/Latino

Cancer

Heart disease

Diabetes

Obesity

Hypertension

Total high cholesterol

Note: Persons of Hispanic/Latino ethnicity can be of any race or combination of races.
Hispanic Paradox: SES

Exhibit 1.5
Family Work Status and Income of Nonelderly Population by Race/Ethnicity, 2014

- Full-Time Worker in the Family
  - White: 84%
  - Asian: 86%
  - Hispanic: 81%
  - Black: 71%
  - AIAN: 71%
  - NHOP: 82%

- Family Income Below Poverty
  - White: 11%
  - Asian: 11%
  - Hispanic: 24%
  - Black: 27%
  - AIAN: 29%
  - NHOP: 23%
Hispanic Paradox: Lower Mortality

For most disease processes, while they often have higher incidence than their white counterparts, they have comparatively low mortality rates, especially compared to other minorities

Unclear cause

Still with fairly high morbidity
Cultural Competency: Provider to Patient Communication

- Language barriers, cultural understanding, mistrust of health care system
- In survey data, Black and Hispanic patients place more of an emphasis on physician respect, courtesy, and concern than the amount of time spent with them
- Racially concordant patient-physician relationships have higher ratings of patient positive affect compared to racially discordant visits.
- Patients feel more connected and involved in decision making process with racially concordant physician.


Taking Access Out of the Equation

- Let’s consider a situation in which patients may have fully equal access to health care: In Hospital Cardiac Arrests.
- Numerous studies have been performed comparing outcomes between black and white patients.
  - Black patients have a lower rate of ROSC and a lower rate of survival to discharge.
In-Hospital Cardiac Arrest: Time to Defibrillation

- NRCPR/ GWTG-R
- Confirmed that earlier defibrillation yields improved survival to discharge and to have less neurological/functional damage

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adjusted Odds Ratio (95% CI)</th>
<th>P Value†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race or ethnic group‡:</td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Black</td>
<td>1.23 (1.05–1.43)</td>
<td>0.009</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.09 (0.83–1.43)</td>
<td>0.56</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>0.99 (0.83–1.43)</td>
<td>0.98</td>
</tr>
<tr>
<td>Native American</td>
<td>1.25 (0.61–2.57)</td>
<td>0.54</td>
</tr>
<tr>
<td>Unknown</td>
<td>1.02 (0.78–1.34)</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Table 2. Factors Associated with Delayed Time to Defibrillation in Multivariable Analysis.§

What are the reasons that defibrillation is taking longer in black patients?
In-Hospital Cardiac Arrests: PEA/ Asystole

- GWTG-R
- Worse outcomes for Black patients

<table>
<thead>
<tr>
<th>Table 4: Association between race and adjusted arrest outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival to Discharge</td>
</tr>
<tr>
<td>Unadjusted outcome</td>
</tr>
<tr>
<td>Adjusted for temporal trends and hospital</td>
</tr>
<tr>
<td>Adjusted for above plus age, sex, rhythm type, event location, and event characteristics</td>
</tr>
<tr>
<td>Adjusted for above plus co-morbidities</td>
</tr>
<tr>
<td>Adjusted for above plus interventions in place</td>
</tr>
<tr>
<td>PEA, fully adjusted for above variables</td>
</tr>
<tr>
<td>Asystole, fully adjusted for above variables</td>
</tr>
</tbody>
</table>

Reason for PEA/ Asystole Disparity

- Degree of pathologies/ co-morbidities
- End of life care
  - Culture
  - Discussion with physicians

Etiology of VF/VT In-Hospital Cardiac Arrest Disparity

- GWTG-R
- Black patients more likely to have VF, also more likely to have cardiac etiology of arrest, “sicker” on admission, more likely to be admitted to non-tele unit, more likely to be admitted to academic hospital
- Sequential adjustment decreases difference between black and white patients’ likelihood of survival to discharge

<table>
<thead>
<tr>
<th>Survival to discharge</th>
<th>RR (95% CI)</th>
<th>P Value</th>
<th>Survival Difference Explained, %a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td>0.73 (0.67-0.79)</td>
<td>&lt;.001</td>
<td>NA</td>
</tr>
<tr>
<td>Adjusted for age and sex</td>
<td>0.70 (0.64-0.76)</td>
<td>&lt;.001</td>
<td>0</td>
</tr>
<tr>
<td>Plus clinical characteristics</td>
<td>0.81 (0.75-0.88)</td>
<td>&lt;.001</td>
<td>30</td>
</tr>
<tr>
<td>Plus hospital characteristics</td>
<td>0.82 (0.76-0.89)</td>
<td>&lt;.001</td>
<td>33</td>
</tr>
<tr>
<td>Adjusted for age, sex, clinical characteristics, and hospital</td>
<td>0.89 (0.82-0.96)</td>
<td>.002</td>
<td>59</td>
</tr>
<tr>
<td>Plus processes of care and time to defibrillation</td>
<td>0.90 (0.83-0.96)</td>
<td>.004</td>
<td>63</td>
</tr>
</tbody>
</table>

Is the Hospital to Blame?

Table 4. Survival to Discharge After In-Hospital Cardiac Arrest

<table>
<thead>
<tr>
<th>Hospital Quintile</th>
<th>No.</th>
<th>Mean % (Range)</th>
<th>Patient Survival to Discharge, % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospitals</td>
<td>Patients</td>
<td>Black Patients</td>
</tr>
<tr>
<td>Lowest</td>
<td>50</td>
<td>2957</td>
<td>93</td>
</tr>
<tr>
<td>Second</td>
<td>54</td>
<td>1838</td>
<td>167</td>
</tr>
<tr>
<td>Third</td>
<td>60</td>
<td>1891</td>
<td>314</td>
</tr>
<tr>
<td>Fourth</td>
<td>56</td>
<td>1815</td>
<td>524</td>
</tr>
<tr>
<td>Highest</td>
<td>54</td>
<td>1510</td>
<td>785</td>
</tr>
<tr>
<td>Total</td>
<td>274</td>
<td>10011</td>
<td>1883</td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval.

Although racial differences in survival were seen within each hospital quintile, black patients were primarily concentrated in hospitals with the lowest rates of survival to discharge for cardiac arrests (P<.001 for trend comparing mean hospital survival rate for all cardiac arrests across quintiles).

Indicates average hospital percentage of cardiac arrest patients who were black.
Returning to CV Preventive Measures

- Earlier, we discussed Medicare Advantage Plans throughout the US and showed that blacks had worse BP, HbA1c, and LDL levels—EXCEPT IN THE WEST.
- Blacks were more likely to be enrolled in health plans that had overall worse control of these measures.
- Kaiser health plans
  - Comparison of Kaiser vs non-Kaiser health plans in the same regions showed that Kaiser members had less disparity in risk factor control.

Plans. Fifth and most notably, disparities in risk-factor control for blacks have been eliminated in the West among Kaiser health plans. Approximately 43% of enrollees in Medicare Advantage plans in this region were enrolled in Kaiser health plans in 2011.
Kaiser: BP Control

- Development of internal HTN control reports which contained information about ALL patients with HTN
- Development of organizational guidelines and algorithms
- Follow up visits with MA’s for BP-feedback loop
- Combo pill therapy

Patient-Physician Communication: Email

- Use of email communication tied with improved screening of BP, Lipid panel, HbA1c
- Resulted in improved BP control
- Dose-Response relationship

Zhou Y, Kanter M, Wang J, Garrido T. Improved Quality At Kaiser Permanente Through E-mail Between Physicians and Patients. Health Aff, July 2010, 29 (7); 1370-1375.
Surgery Outcomes: Quality of Sites

- Medicare Provider Analysis and Review files analyzed for disparities in those undergoing CABG, aortic aneurysm repair, lung resection
- Also looked at proportion of surgeries by race at each hospital, reported measures of each hospital, and degree of racial segregation (Dissimilarity Index)
- Blacks more likely to go to poor quality hospital
  - Live closer to better quality hospitals but will go farther to poor quality hospitals
  - If lived in area of high degree of segregation, more likely to go to poor quality hospital

<table>
<thead>
<tr>
<th>Surgical procedure</th>
<th>Number or percent admitted</th>
<th>Adjusted odds ratio for having surgery at each type of hospital, black versus white</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Coronary artery bypass grafting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>150,744</td>
<td>9,161</td>
</tr>
<tr>
<td>Hospital quality (mortality rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (4.6%)</td>
<td>19.1%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Average (3.5%)</td>
<td>60.1%</td>
<td>60.1%</td>
</tr>
<tr>
<td>High (2.7%)</td>
<td>20.9%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Abdominal aortic aneurysm repair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>52,239</td>
<td>2,394</td>
</tr>
<tr>
<td>Hospital quality (mortality rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (4.1%)</td>
<td>18.7%</td>
<td>27.2%</td>
</tr>
<tr>
<td>Average (3.3%)</td>
<td>60.7%</td>
<td>56.5%</td>
</tr>
<tr>
<td>High (3.0%)</td>
<td>20.6%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Lung cancer resection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>2,000</td>
<td>2,033</td>
</tr>
<tr>
<td>Hospital quality (mortality rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (6.0%)</td>
<td>19.7%</td>
<td>24.6%</td>
</tr>
<tr>
<td>Average (4.9%)</td>
<td>59.8%</td>
<td>59.4%</td>
</tr>
<tr>
<td>High (3.4%)</td>
<td>20.5%</td>
<td>16.0%</td>
</tr>
<tr>
<td>Level of segregation</td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Coronary artery bypass grafting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>21.3</td>
<td>19.5</td>
</tr>
<tr>
<td>Medium</td>
<td>22.6</td>
<td>27.8</td>
</tr>
<tr>
<td>High</td>
<td>15.7</td>
<td>21.7</td>
</tr>
<tr>
<td>Abdominal aortic aneurysm repair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>25.5</td>
<td>26.7</td>
</tr>
<tr>
<td>Medium</td>
<td>15.6</td>
<td>19.8</td>
</tr>
<tr>
<td>High</td>
<td>18.3</td>
<td>31.0</td>
</tr>
<tr>
<td>Lung cancer resection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>25.4</td>
<td>29.2</td>
</tr>
<tr>
<td>Medium</td>
<td>20.8</td>
<td>25.6</td>
</tr>
<tr>
<td>High</td>
<td>17.1</td>
<td>23.0</td>
</tr>
</tbody>
</table>
Socio-Ecological Model
What Can Kaiser Do?

- Define a population that may be experiencing health disparities AND those that are high utilizers
- Be aware of community resources that are available to meet those social needs that may be contributing to disparities
- Ensure that high utilizer patients with unmet social needs are being directed to the right resources
Social Needs: a Pilot Program

- 1% of Kaiser Permanente Southern California Patients utilize approximately a fourth (23%) of health spending
- Development of a call center to approach these high utilizers and address their social needs
<table>
<thead>
<tr>
<th>Question</th>
<th>% Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Within the past 12 months, “the food I bought just didn’t last, and I didn’t have the money to get more.”</td>
<td>32%</td>
</tr>
<tr>
<td>2. Within the past 12 months, “I couldn’t afford to eat balanced or healthy meals.”</td>
<td>35%</td>
</tr>
<tr>
<td>3. Do you worry about having a safe place to live or being homeless?</td>
<td>13%</td>
</tr>
<tr>
<td>4. In the past month, have you had concerns about the condition or quality of your housing?</td>
<td>13%</td>
</tr>
<tr>
<td>5. Do you have difficulty arranging for transportation to or from your medical appointments?</td>
<td>26%</td>
</tr>
<tr>
<td>6. Do you need help finding ways to pay your utility bills?</td>
<td>23%</td>
</tr>
</tbody>
</table>

*Data reflect response rates as of 03/04/2016.*
● Patients can be set up with community-based resources that will help them with their social needs
● 78% of patients at high risk of being a high utilizer have at least one unmet social need
At a Patient Level

Quick survey can be utilized to understand social setting in which patient is living/being treated

Would need to ID community resources
“Community Vital Signs”

- IOM recommends incorporation of social determinants of health care into EMR systems
- While a lot of determinants are those that need to be fully understood at the individual level, there are others that can be understood from patients’ communities
- One suggestion has been to utilize geocoded community level data and incorporate that into patients’ charts

<table>
<thead>
<tr>
<th>Community VS</th>
<th>Indicators</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built environment</td>
<td>Fast food restaurants per 100,000 population; liquor stores per 100,000 population; population density</td>
<td>American Community Survey, US Census Bureau, county business patterns, US Census Bureau, ZIP code business patterns</td>
</tr>
<tr>
<td>Environmental exposures</td>
<td>Median housing structure age; number of person-days with maximum 8-h average ozone concentration over the National Ambient Air Quality Standard (monitored and modeled data); number of person-days with PM2.5 over the National Ambient Air Quality Standard (monitored and modeled data); percent of occupied housing units without complete plumbing facilities; percent of population potentially exposed to water exceeding a violation limit during the past year</td>
<td>American Community Survey, Center for Disease Control and Prevention (CDC), Environmental Public Health Tracking Network, Environmental Protection Agency, Safe Drinking Water Information System</td>
</tr>
<tr>
<td>Neighborhood economic conditions</td>
<td>Dependency ratio (old-age); estimated percent of foreclosure starts over the past 18 months through June 2008; estimated percent of vacant addresses in June 2008 (90-day vacancy rate); Gini coefficient—inequality; overall percentile ranking for the CDC Social Vulnerability Index</td>
<td>Agency for Toxic Substances and Disease Registry, American Community Survey, Department of Housing and Urban Development, Neighborhood Stabilization Program</td>
</tr>
<tr>
<td>Neighborhood race/ethnic composition</td>
<td>Count and percent by race; residential segregation (dissimilarity and exposure)</td>
<td>American Community Survey</td>
</tr>
<tr>
<td>Neighborhood resources</td>
<td>Low access tract at 1 mile and at 1/2 mile for urban areas or 10 miles for rural areas; metro/non-metro classification codes; Modified Retail Food Environment Index (no. of healthy food stores divided by all food stores); percent of people in a county living more than 1 mile from a supermarket or large grocery store if in an urban area, or more than 10 miles if in a rural area; percentage of population living within 1/2 mile of a park; recreation facilities per 100,000 population; Urban Classification Code—rural, urban cluster (&gt;10,000 population, &lt;50,000 population), urban area (&gt;50,000 population)</td>
<td>Center for Disease Control and Prevention, Environmental Public Health Tracking Network, US Census Bureau, county business patterns, US Census Bureau, ZIP code business patterns, USDA Food Access Research Atlas, USDA, Economic Research Service</td>
</tr>
<tr>
<td>Neighborhood socioeconomic composition</td>
<td>Number with Bachelor’s Degree or higher; median household income; number and percent of persons in managerial, professional, or executive occupations; percent below 100% of Federal Poverty Level (FPL); percent below 200% of FPL; unemployment rate</td>
<td>American Community Survey</td>
</tr>
<tr>
<td>Social Deprivation Index</td>
<td>A composite measure of social deprivation validated to be more strongly associated with poor access to healthcare and poor health outcomes than a measure of poverty alone.</td>
<td>Robert Graham Center</td>
</tr>
</tbody>
</table>
Conclusion

Ask not what disease the person has, but rather what person the disease has. -Sir William Osler

- Very cursory look into social determinant of health
- Multi-factorial process
- Identify community based resources that may be helpful for patients
- Identify common unmet social needs which may be affecting your patients disease processes/treatment
- Be attentive to patient-physician discordance


https://letsgethealthy.ca.gov/sdoh/