Determinants of Health

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What do you need to make a book?

- What are the key materials?
- What are the most important processes?
- How big a difference is there between books?
- What makes a good or bad book?
  - Physical characteristics
  - Originality of ideas
  - Quality of writing
What makes health?

- Like a book—define the production function
  - Inputs
  - Processes
  - Outputs

- Unlike a book, need to define what we mean by health
What is health?

- What does it mean to you?
- What are its major characteristics and dimensions?
- How do you know when you see it?
“...a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity”

World Health Organization, 1948
“...an individual’s capacity in relation to aspirations and potential for living fully in the social environment.”

Alvin Tarlov, 1996
Population Health

- What is it?
- Is it best defined by the sum of the health of individuals in the population? Why or why not?
- What are the different populations of interest?
What determines health?

- Public surveys
  - Medical care

- Public consumption
  - Alternative medicine
  - Vitamins/ supplements
  - Cosmetic procedures
  - Exercise equipment
  - Diets
  - Viagra
  - HRT
Health Concepts

- Quality of Life
- Social & Role Functioning
- Physical & Mental Health
- Biologic Functioning
How have health problems changed?

- Longevity in 1900 vs 2000?
- Communicable diseases
  - Major killers since before recorded history through early 20th century
  - Decimated native American populations during early contact with Europeans
  - What are key factors that reduced their toll?
How have health problems changed?

- Chronic diseases—
  - What are they?
  - How quickly do they develop?
## Health Behaviors and Health Outcomes Multiple Pathways

<table>
<thead>
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<th>Smoking</th>
<th>Lack of Physical Activity</th>
<th>Poor Nutrition</th>
<th>Intermediate Factors</th>
<th>Alcohol Use</th>
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Community and Family Pathways to Health

Community, Society & Culture

Family Environment

Family Functions

Family’s Characteristics

Individual’s Community

Individual’s Innate Characteristics

Individual’s Health

Individual’s Development

Family Life-Cycle

Family Functioning

Family’s Characteristics
<table>
<thead>
<tr>
<th>Family's Characteristics</th>
<th>Health</th>
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<th>Household</th>
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<td>Language</td>
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</table>
Family Effects on Physical Aggression by Children

Trembly et al., 1996
Hostility and Mortality by City

CHD Mortality Rate

Hostility Score (Adjusted for Race, Education, Age, Income, Gender)

Philadelphia
Cleveland
New York

Detroit
Chicago
Des Moines

Minneapolis
Seattle

Honolulu

Williams et al., 1980
Psychological Problems
Within Families With at Least One Child with a Psychological Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Mother (-)</th>
<th>Mother (+)</th>
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<tbody>
<tr>
<td>Father (-)</td>
<td>36%</td>
<td>68%</td>
</tr>
<tr>
<td>Father (+)</td>
<td>47%</td>
<td>72%</td>
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</table>

(-) Individual without diagnosis
(+) Individual with diagnosis
Health of children: a special case

What are differences between the relative importance of influences on child and adult health?

- Role of parents
- Role of other caregivers
- Health/development interactions
- Long term impact of lifestyles/attitudes
Individual health versus population health

Does sum of health of individuals comprise health of the population?
Determinants of Individual Health

- Social Environment
- Physical Environment
- Genetic Endowment

Individual Response
- Behavior
- Biology

- Health & Function
- Disease

Well-Being

Health Care

Prosperity

Burden of Disease and Injury: Measures

- **Mortality rates**
  - the traditional measure of burden
  - counts how many people die of a particular problem
  - does not address disability or premature death

- **Years of life lost (YLL)**
  - measures how many years of expected life have been lost due to a particular problem
  - takes into account premature death

- **Disability-adjusted life years (DALYs)**
  - the newest measure
  - takes into account both disability and premature death
  - Los Angeles County is the first local jurisdiction to generate DALY’s estimates

- **Frequency of health problems**
Leading Causes of Death in Los Angeles County, 1997

- Coronary Heart Disease: 14,378
- Stroke: 4,168
- Trachea/Bronchus/Lung Cancer: 3,772
- Pneumonia: 3,364
- Emphysema: 2,671
- Diabetes: 1,747
- Colon Cancer: 1,483
- Homicide Violence: 1,247
- Breast Cancer: 1,242
- Hypertension: 1,241

Number of Deaths in 1999
Los Angeles County Department of Health Services
Overall Burden of Disease Among Men in Los Angeles County Based on DALYs, 1997

- Coronary Heart Disease: 42,560 DALYs
- Homicide & Violence: 40,555 DALYs
- Alcohol Dependence: 34,676 DALYs
- Drug Overdose: 25,847 DALYs
- Depression: 22,112 DALYs
- Osteoarthritis: 19,984 DALYs
- Motor Vehicle Crashes: 19,774 DALYs
- Diabetes Mellitus: 18,858 DALYs
- HIV/AIDS: 17,596 DALYs
- Lung Cancer: 16,646 DALYs

DALYs
Overall Burden of Disease Among Women in Los Angeles County Based on DALYs, 1997

- Coronary Heart Disease: 30,326 DALYs
- Alcohol Dependence: 26,196 DALYs
- Diabetes Mellitus: 23,598 DALYs
- Depression: 21,337 DALYs
- Osteoarthritis: 19,828 DALYs
- Stroke: 17,388 DALYs
- Alzheimer's & Dementia: 16,987 DALYs
- Breast Cancer: 15,379 DALYs
- Emphysema: 14,843 DALYs
- Lung Cancer: 13,139 DALYs
Among Adults (Age 18 years and older), Average Number of Activity Limitation Days by Chronic Health Condition, Los Angeles County, 1999

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Depression</td>
<td>7.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Asthma</td>
<td>6.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>6.0</td>
<td>2.1</td>
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<tr>
<td>Arthritis</td>
<td>5.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Diabetes</td>
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</tr>
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Average Number of Days of Activity Limitation
Social Ties and 9 year Mortality in Alameda County, CA

Income & Health

Relative risk of coronary heart disease death by civil service rank- male civil service workers

Environmental Exposure

Selected Attributable numbers/10,000 exposed subjects for total to fecal coliforms

HCG- highly credible GI illness with vomiting, diarrhea, and fever or stomach pain and fever

Health Disparities

- Major differences in frequency and severity of major diseases by race and ethnicity
  - All stages of life
  - Both men and women
  - Have not diminished with advances in health care
  - Combination of reasons
  - Elimination a national priority
Prevalence of Asthma Among Children (Age 0 to 17 years) by Race/Ethnicity and Age, Los Angeles County, 1999 - 2000

*Estimate may be unstable due to small sample size*
## Among Adults (Age 18 years and older), Average Number of Activity Limitation Days by Chronic Health Condition, Los Angeles County, 1999

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*Average Number of Days of Activity Limitation*
Key Health Indicators (LAC)

- Uninsured adults under 65 → 31%
- Overweight and obese adults → 52%
- Cigarette smoking among adults → 18%
- Binge drinking among adults who drink → 16%
- Sedentary adults → 41%
- Kindergarteners IZ up to date at second birthday → 64%
- Low birth weight births → 6%
- Low birth weight black births → 12%
- AIDS incidence rate (males) → 34 per 100,000
Community Health

Population health but includes the characteristics of community that influence determinants over time

- E.g. safety of parks; housing stock
- E.g. civic engagement
- E.g. environmental problems
- E.g. cohesion to work collectively to improve community
- E.g. markets selling affordable fresh fruit and vegetables
Community Health Report Cards

- Attempt to:
  - Provide snapshot of community health/quality of life
  - Improve awareness of problems/assets
  - Improve community health planning

- Broad collaborations
  - Often many sectors within community

- Health determinants often included
Determinants of Health

- Social Environment
  - Regulation
  - Public Health Services (Population-Based)
    - Health Services
      - Disease
        - Poor
        - OKAY
        - Optimum
      - Health
        - Disability
        - Health
      - Investment
        - Consumption
        - Workforce

- Physical Environment
  - Regulation
  - Individual Response: Biological Behavioral

- Genetic Environment

The Economy
Thinking ahead

- Need to consider contribution of different community institutions to health (potential vs actual)
- Importance of sense of place
- Need to address underlying health determinants
- Health care for all important-- but other health determinants at least as important
- How to develop sense of belonging/responsibility?
- Lifecycle perspective – understanding delayed effects
Health Department Roles

- Educate the public about multiple determinants and broad definitions
- Influence public policies to support health improvement
- Deliver targeted services to those in need
- Track changes in health and health risks
- Reduce disease burden and disparities