Population Health

- Focuses on improving health of communities – saves lives millions at a time, not just one at a time
- Prevents disease and disability
- Promotes healthy environments and behaviors
- Assures high quality, cost-effective health care
Linkages and Overlaps

Public Health/Health Care Systems

Population Health

Personal Health
An Ecological Model of Health

Population health modeled on evidence that there are multiple determinants of health

- Medical care
- Behavior
- Biology (genetics)
- Physical environment
- Social environment
- Education
- Socioeconomic Status
- Employment
- Housing
Magnitude of the Problem

- 10 million work-related injuries/year
- 430,000 new work-related diseases/year

Each day:
- 9,000 sustain disabling injuries
- 16 die from injury
- 137 die from work-related disease
## Annual Toll of Occupational Injury and Illness

### Injuries
- **Fatal**: 6,529
- **Non-fatal***: 13.25 million
- **Total costs**: $145 billion

### Diseases
- **Fatal**: 60,300
- **Non-fatal**: 862,200
- **Total costs**: $26 billion

* 46% disabling (6.09 million)

** Based on cancer, cardiovascular disease, chronic respiratory disease, neurologic and renal disorders
Annual Economic Burden of Disease and Injury

Global Burden of Occupational Injury and Illness

- Among 2.7 billion workers
  - Each year:
    - 2 million deaths from disease and injury
    - 270 million workers sustain non-fatal injuries
    - 12 million injuries among youth workers (12,000 fatal)
    - 4% gross domestic product (GDP) lost per year
### Annual Global Mortality

**In Millions**

<table>
<thead>
<tr>
<th></th>
<th>Low Income</th>
<th>High Income</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Causes</strong></td>
<td>48.4</td>
<td>7.9</td>
<td>56.3</td>
</tr>
<tr>
<td><strong>Communicable Diseases</strong></td>
<td>17.6</td>
<td>.56</td>
<td>18.2</td>
</tr>
<tr>
<td><strong>Non-communicable Diseases</strong></td>
<td>26.0</td>
<td>6.9</td>
<td>32.9</td>
</tr>
<tr>
<td><strong>Injuries</strong></td>
<td>4.7</td>
<td>.47</td>
<td>5.2</td>
</tr>
</tbody>
</table>
Occupational Risk Hazards

Attributable Fraction (%) of Global Disease and Injury Due to Occupational Risk Factors

- Low Back Pain (37): Female 32, Male 41
- Hearing Loss (16): Female 11, Male 22
- COPD (13): Female 6, Male 18
- Asthma (11): Female 7, Male 14
- Unintentional Injuries (10): Female 2, Male 15
- Trachea, bronchus or lung cancer (9): Female 5, Male 10
- Leukemia (2): Female 2, Male 2
Projected Changes in Civilian Labor Force 1998 to 2018

- **Minorities**
  - 1998: 26%
  - 2018: 36.1%

- **Over Age 55**
  - 1998: 12.3%
  - 2018: 24%

- **Women**
  - 1998: 46.2%
  - 2018: 46.8%
## Women Participating in the Global Workforce

<table>
<thead>
<tr>
<th>Developed Countries</th>
<th>% of women who work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden and Denmark</td>
<td>75%</td>
</tr>
<tr>
<td>United States</td>
<td>70%</td>
</tr>
<tr>
<td>France and Germany</td>
<td>57%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>53%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>38%</td>
</tr>
<tr>
<td>Italy</td>
<td>37%</td>
</tr>
<tr>
<td>Spain</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: ILO
## Women Participating in the Global Workforce

<table>
<thead>
<tr>
<th>Developing Countries</th>
<th>% of women who work*</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>80%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>78%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>77%</td>
</tr>
<tr>
<td>Thailand</td>
<td>67%</td>
</tr>
<tr>
<td>Brazil and Chile</td>
<td>33%</td>
</tr>
<tr>
<td>Mexico /Argentina</td>
<td>32%</td>
</tr>
<tr>
<td>Egypt, Saudi Arabia, Oman, and Jordan</td>
<td>10%</td>
</tr>
<tr>
<td>Algeria</td>
<td>8%</td>
</tr>
</tbody>
</table>

* Includes the informal workforce

Source, ILO
Aging Workforce

Workers Over Age 60

Source  Health Affairs, May/June 2000
Projected Changes in Employment by Industry

Source: BLS, Franklin 2007
Growth of the Contingent Workforce

Source: Bureau of Labor Statistics
Annual Hours Worked

Source: OECD 2008
Changing Nature of Work: Increased Stress

Three-fourths of employees believe the worker has more on-the-job stress than a generation ago.
Work Organization/Stress - Severity of the Problem

- No good surveillance systems and few studies in the U.S.
- Estimated 13% of U.S. worker compensation claims are for stress-related disorders
- 27% of U.S. workers reported jobs are greatest single source of stress
- 60% sampled women workers cited job stress as biggest problem at work
Health care workers = 8% of U.S. workforce

1996-2006: among fastest growing industries (health services and health practitioners’ offices)

Health care services are growing at twice the rate of the overall economy
Health Care Worker Hazards

- **Biological hazards**
  - bacteria, viruses, fungi, parasites

- **Chemical hazards**
  - medications, solutions, gases

- **Physical hazards**
  - radiation, electricity, extreme temperatures, noise, lifting

- **Psychosocial hazards**
  - factors causing stress, emotional strain, interpersonal problems
Infections in Health Care Workers
(35 million worldwide)

Attritable fraction of Hep C, Hep B and HIV infections in healthcare workers due to injuries with contaminated sharps, ages 20-65

Overall: of all Hep B&C, ~40% due to sharps
Of all HIV, about 1 – 12% due to sharps
## Occupations of Victims of Nonfatal Workplace Violence 1992-96

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Annual Average</th>
<th># per 1,000 Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2,009,400</td>
<td>14.8</td>
</tr>
<tr>
<td>Medical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians</td>
<td>10,000</td>
<td>15.7</td>
</tr>
<tr>
<td>Nurses</td>
<td>69,500</td>
<td>24.8</td>
</tr>
<tr>
<td>Technicians</td>
<td>24,500</td>
<td>21.4</td>
</tr>
<tr>
<td>Other</td>
<td>56,800</td>
<td>10.7</td>
</tr>
<tr>
<td>Mental Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>50,300</td>
<td>79.5</td>
</tr>
<tr>
<td>Custodial</td>
<td>8,700</td>
<td>63.3</td>
</tr>
<tr>
<td>Other</td>
<td>43,500</td>
<td>64.0</td>
</tr>
</tbody>
</table>

Source: Bureau of Justice Statistics, 1998

- Health Care Patient, 51%
- Other Person, 29%
- Worker/Former Coworker, 8%
- Other Source, 12%
Work Organization Stressors in Health Care Settings

- Death and dying
- Floating
- Work overload
- Work environment
- Family stress
- Role conflict
- Shiftwork
Effects of Medical Error

- IOM estimates that medical errors cause 44,000-98,000 deaths annually
- Medical error = 8th leading cause of U.S. deaths
- Medical error causes more deaths than auto accidents, breast cancer and AIDS
- Chicago Tribune: “To compensate for understaffing, hospitals often rely on machines with warning alarms to help monitor patients’ vital signs. At least 216 patient deaths and 429 injuries have occurred in hospitals where registered nurses failed to hear alarms built into lifesaving equipment, such as respirators and blood-oxygen monitors.”
More registered nurses are associated with shorter length of stay and fewer complications

<table>
<thead>
<tr>
<th>Outcome</th>
<th>%Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay</td>
<td>3.5</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>9.0</td>
</tr>
<tr>
<td>Upper Gastrointestinal Bleeding</td>
<td>5.1</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>6.4</td>
</tr>
<tr>
<td>Shock/Cardiac Arrest</td>
<td>9.4</td>
</tr>
<tr>
<td>Failure to Rescue</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Source: Needleman et al., Nurse-Staffing Levels and Quality of Care in Hospitals, NEJM, 2002
Nurse Staffing and Inpatient Hospital Mortality

- Retrospective observational study in large center with 200,000 Admits, 177,000 Nursing Shifts
- Overall: Success at staffing levels and overall mortality
- Risk of death: ↑2% for each below target shift and ↑4% for each high (patient) turnover shift

Hospital Nurse Staffing and Patient Mortality, Nurse Buyout and Job Dissatisfaction

Design: Linked data from discharge of 168 adult hospitals in PA, 10,000 nurses (random survey), 230,000 patients

Results:

Nurses –
94% women
43% high emotional exhaustion
42% dissatisfaction with current job

After adjustment for patient and hospital characteristics, each additional patient per nurse →
23% ↑ burnout
15% ↑ job dissatisfaction
7% ↑ patient mortality

Source: Aiken et al. JAMA 2002; 288:1987-93
Fewer People, Same Work

Work organization factors

- Downsizing
- Deskilling and collapsing of job titles
- More patients at higher acuity levels
- Decline of non-profit facilities

Fewer people + same work → added stress and fatigue → compromised patient care
Improving Worker Health and Safety Leads To:

- Improved health status
- Decreased health care/related costs
- Increased productivity
- Increased quality
Size of workforce: 150 million
Unionized: 12%
Unemployed: 9.5%
Effectively Unemployed: 17%
Insurance for Work-Related Conditions

- Workers’ compensation no fault, state by state
- Illnesses > injuries often contested
- Worker may be uninsured or underinsured for set of conditions despite being deemed fully insured
U.S. Health System: You Don’t Get What You Pay For

- Highly fragmented at all levels
- Most expensive (16.3% of gross domestic product)
- One of least accessible (50 million uninsured, more underinsured)
- U.S. pays for half of all personal health care (e.g., Medicare/Medicaid, DOD, VA, federal worker insurance)
Employer-Sponsored Health Insurance

Source: US Census Bureau/Kaiser Family Foundation
### Uninsured

#### An Unequal Distribution Among Races

<table>
<thead>
<tr>
<th>Race</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Asians</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Latino</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>African American</td>
<td>19%</td>
<td>21%</td>
</tr>
</tbody>
</table>
2000 - 2008

- Worker productivity (2000-2007) \(\uparrow 20\%\)

- Real income working, middle-class households (\(\downarrow \$2,000\)) \(\downarrow 3\%\)
### Rising Income Inequality

<table>
<thead>
<tr>
<th></th>
<th>1976</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Income to top 1%</td>
<td>8.9%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Average Hourly Wage (inflation adjusted)</td>
<td>↓ 7%</td>
<td></td>
</tr>
</tbody>
</table>
Share of Aggregate Income by Quintiles and Top 5%
How Rich are the Superrich?

AVERAGE INCOME PER FAMILY
Distributed by income group

Top 0.01%
$27,342,212

Top 0.01-0.1%
$3,238,386

Top 1%
$1,137,684

Top 1-10%
$164,647

Bottom 90%
$31,244

2008 data. Includes capital gains. Source: Emmanuel Saez, University of California-Berkeley
Gap between the average income of the top 0.01% and the average income of the bottom 90%

- 1928: 892 times
- 1955: 179 times
- 1980: 176 times
- 2006: 976 times
The Richest 1 Percent’s Share of National Income (Including Capital Gains), 1960 - 2004
The Top 1 Percent’s Share of National Income (Excluding Capital Gains), Mid-’70s vs. Circa 2000
A Tough 30 Years for Some

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO Pay vs. Average Worker</td>
<td>42x</td>
<td>530x</td>
</tr>
<tr>
<td>Top 1% Share of Income</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Top 1% share of Wealth</td>
<td>21%</td>
<td>35%</td>
</tr>
</tbody>
</table>
A MILLIONAIRE’S TAX RATE, NOW AND THEN

Effective tax rate for head of household earning equivalent of $1 million of non-investment income in 2010 dollars. Source: The Tax Foundation
Change in Average Real After-Tax Income (1979-2006)

<table>
<thead>
<tr>
<th>Percent Change</th>
<th>Average 2006 Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>+11%</td>
<td>$16,500</td>
</tr>
<tr>
<td>+18%</td>
<td>$35,400</td>
</tr>
<tr>
<td>+21%</td>
<td>$52,100</td>
</tr>
<tr>
<td>+32%</td>
<td>$73,800</td>
</tr>
<tr>
<td>+87%</td>
<td>$184,400</td>
</tr>
<tr>
<td>+256%</td>
<td>$1,200,300</td>
</tr>
</tbody>
</table>

Source: Congressional Budget Office
The More Wealth Concentrates

The slower the economy grows
The more corrupt politics become
The less leisure time
The less generous the social safety net
The more children in poverty
The more environmental degradation
The less healthy the workplace
The lower the voter turnout
Growth of Average Hourly Compensation and Productivity, 1947 - 2009

Union Share of Wage and Salary Workers in the U.S. and Canada

Percentage

United States

Canada

Why Declining Unionization Matters

- Wages and benefits more equal when unions operate, especially for less educated
  - Blunt erosion of wages due to health insurance
  - Protect attacks on pensions
- Labor is only major force focused on broad economic concerns of those with modest means
- Major force for worker health and safety
- One of few forces challenging unfettered clout of financial sector and top executives
- VOTE MORE
### Average Annual Worker and Employer Contributions to Premiums and Total Premiums for Family Coverage, 1999-2010

* Estimate is statistically different from estimate for the previous year shown (p<.05).

**Source:** Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2010.

<table>
<thead>
<tr>
<th>Year</th>
<th>Worker Contribution</th>
<th>Employer Contribution</th>
<th>Total Premiums</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>$1,543</td>
<td>$4,247</td>
<td>$5,791</td>
</tr>
<tr>
<td>2000</td>
<td>$1,619</td>
<td>$4,819*</td>
<td>$6,438*</td>
</tr>
<tr>
<td>2001</td>
<td>$1,787*</td>
<td>$5,269*</td>
<td>$7,061*</td>
</tr>
<tr>
<td>2002</td>
<td>$2,137*</td>
<td>$5,866*</td>
<td>$8,003*</td>
</tr>
<tr>
<td>2003</td>
<td>$2,412*</td>
<td>$6,657*</td>
<td>$9,068*</td>
</tr>
<tr>
<td>2004</td>
<td>$2,661*</td>
<td>$7,289*</td>
<td>$9,950*</td>
</tr>
<tr>
<td>2005</td>
<td>$2,713</td>
<td>$8,147*</td>
<td>$10,880*</td>
</tr>
<tr>
<td>2006</td>
<td>$2,973*</td>
<td>$8,508*</td>
<td>$11,480*</td>
</tr>
<tr>
<td>2007</td>
<td>$3,281*</td>
<td>$8,924</td>
<td>$12,106*</td>
</tr>
<tr>
<td>2008</td>
<td>$3,354</td>
<td>$9,325*</td>
<td>$12,680*</td>
</tr>
<tr>
<td>2009</td>
<td>$3,515</td>
<td>$9,860*</td>
<td>$13,375*</td>
</tr>
<tr>
<td>2010</td>
<td>$3,997*</td>
<td>$9,773</td>
<td>$13,770*</td>
</tr>
</tbody>
</table>
Promoting Health Coverage

- Medicaid Coverage (up to 133% FPL)
- Employer-Sponsored Coverage
- Exchanges (subsidies 133-400% FPL)
- Individual Mandate
- Health Insurance Market Reforms

Universal Coverage
Estimated Health Insurance Coverage in 2019

Total Nonelderly Population = 282 Million

Without Health Reform
- Uninsured: 19%
- Medicaid/CHIP: 12%
- Rate Non-group/Other: 11%
- Employer-Sponsored Insurance: 57%

With Health Reform
- Uninsured: 8%
- Medicaid/CHIP: 18%
- Exchanges/Private Non-group/Other: 18%
- Employer-Sponsored Insurance: 56%

SOURCE: Congressional Budget Office, March 20, 2010
Health Reform and Delivery System Changes

- Promoting primary care and prevention
- Improving provider supply
- Developing new models for coordinating and delivering care
- Making use of information technology
- Reforming provider payments to promote quality