Total Worker Health Surveillance in the US Workforce

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• Total Worker Health™ is a strategy integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance health and well-being

– Approach brings with it increased emphasis on stress management, organizational change and health behavior change
  • Workplace stress associated with:
    – smoking
    – heavy drinking
    – poor food choices
    – low levels of exercise
    – decreased sleep time

http://www.cdc.gov/niosh/twh/
http://www.nap.edu/catalog.php?record_id=18947
JOEM 2012; 55 (12 Suppl) S25-S29
Behavior Drives Health

Risk factors as a percentage of disability-adjusted life-years:

- Dietary risks
- Tobacco smoking
- High body mass index
- High blood pressure
- High fasting plasma glucose
- Physical inactivity and low physical activity
- Alcohol use
- High total cholesterol
- Drug use
- Ambient particulate matter pollution
- Occupational risks
- Childhood sexual abuse
- Intimate partner violence
- Lead exposure
- Low bone mineral density
- Residential radon
- Ambient ozone pollution

• Total Worker Health™ evaluation must happen at the worksite level and at the national level

• National surveillance provides “big-picture” views
  – Monitor trends in health behaviors/outcomes
    • Benchmarking (e.g., Healthy People 2020)
  – Document reductions in health disparities
  – Identify emerging public health issues
  – Prioritize limited funding
Prevalence of smoking estimated for workers 18 years and older by NORA Sectors, National Interview Survey, 1997-2007

- All NORA Sectors: 23.8%
- Agriculture, Forestry, Fishing: 23.1%
- Mining: 33.1%
- Construction: 34.9%
- Manufacturing: 27.2%
- Wholesale and Retail Trade: 28.7%
- Transportation, Warehousing, Utilities: 25.6%
- Healthcare and Social Assistance: 18.8%
- Services: 19.6%
Objective

- Overview of population-based surveillance systems which can inform Total Worker Health™ initiatives
  - None of the these systems specifically designed for this task
  - Use of multiple data sources can overcome limitations for comprehensive monitoring
<table>
<thead>
<tr>
<th>National Health Interview Survey 1957-present</th>
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</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
</tr>
<tr>
<td>Annual cross-sectional</td>
</tr>
<tr>
<td><strong># of Workers</strong></td>
</tr>
<tr>
<td>~30,000/ year</td>
</tr>
<tr>
<td>18 years and older</td>
</tr>
<tr>
<td><strong>Health Behavior Data</strong></td>
</tr>
<tr>
<td>Diet, smoking, alcohol,</td>
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<tr>
<td><strong>Occupational Classification/ Exposures</strong></td>
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<tr>
<td>Industry / Occupation Workplace injury</td>
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<tr>
<td><strong>Health Outcomes</strong></td>
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<tr>
<td>Physical, mental, injury, QOL</td>
</tr>
<tr>
<td><strong>Linkage Opportunities (linkage unit)</strong></td>
</tr>
<tr>
<td>NDI (individual)</td>
</tr>
<tr>
<td>O*NET (job title)</td>
</tr>
<tr>
<td>Medicare (individual)</td>
</tr>
<tr>
<td>Social Security (individual)</td>
</tr>
<tr>
<td>Census (household address)</td>
</tr>
</tbody>
</table>

**STRENGTHS**
- Nationally representative survey sample
- Annual random cross-sectional selection allows for trend analyses and pooled analyses
- Large dataset which allows for detailed occupational and other subpopulation analyses
- Many opportunities for data linkage to individuals and households
- Includes periodic occupational health supplemental questions

**WEAKNESSES**
- No individual occupational exposure data
- Major survey redesign in 1997 limits data aggregation over entire survey period
- All data are self report

**DATA AVAILABILITY**
- Indirect access available after application through the NCHS Research Data Center: [http://www.cdc.gov/rdc/](http://www.cdc.gov/rdc/)
# Medical Expenditure Panel Survey 1996-present

<table>
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<th>Design</th>
<th># of Workers</th>
<th>Health Behavior Data</th>
<th>Occupational Classification/Exposures</th>
<th>Health Outcomes</th>
<th>Linkage Opportunities (linkage unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel</td>
<td>~6,000/year</td>
<td>smoking, vaccinations</td>
<td>Industry / Occupation Workplace injury</td>
<td>Physical, mental, injury, disability, ER visits, QOL</td>
<td>NHIS (individual) NDI (individual) O*NET (job title) Medicare (individual) Social Security (individual) Census (household address)</td>
</tr>
<tr>
<td></td>
<td>18 years and older</td>
<td></td>
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</tbody>
</table>

## STRENGTHS
- Nationally representative survey sample drawn from NHIS sampling frame
- Detailed healthcare utilization and expenditure data
- Many opportunities for data linkage to individuals and households
- Includes standard quality of life measures (SF-12, EQ5D)

## WEAKNESSES
- No individual occupational exposure data

## DATA AVAILABILITY
- Indirect access available after application through the NCHS Research Data Center: [http://www.cdc.gov/rdc/](http://www.cdc.gov/rdc/)
### National Health and Nutrition Examination Survey 1999-present

<table>
<thead>
<tr>
<th>Design</th>
<th># of Workers</th>
<th>Health Behavior Data</th>
<th>Occupational Classification/ Exposures</th>
<th>Health Outcomes</th>
<th>Linkage Opportunities (linkage unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous cross-sectional</td>
<td>~3,100/year</td>
<td>smoking, alcohol, diet, sleep, vaccinations, preventive care practices</td>
<td>Industry / Occupation, workplace secondhand smoke exposure, # hours worked</td>
<td>Self report and examination data, laboratory, injury, mental health</td>
<td>NHIS (individual) NDI (individual) O*NET (job title) Medicare (individual) Social Security (individual) Census (household address)</td>
</tr>
</tbody>
</table>

#### STRENGTHS
- Nationally representative survey
- Detailed health examination and chemical exposure data
- Many opportunities for data linkage to individuals and households

#### WEAKNESSES
- Relatively small sample size

#### DATA AVAILABILITY
- Most data publically available: [http://www.cdc.gov/nchs/nhanes/nhanes_questionnaires.htm](http://www.cdc.gov/nchs/nhanes/nhanes_questionnaires.htm)
- Indirect access available after application through the NCHS Research Data Center: [http://www.cdc.gov/rdc/](http://www.cdc.gov/rdc/)
## The National Longitudinal Study of Adolescent Health (Add Health)

<table>
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<tr>
<th>Design</th>
<th># of Participants</th>
<th>Health Behavior Data</th>
<th>Occupational Classification/Exposures</th>
<th>Health Outcomes</th>
<th>Linkage Opportunities (linkage unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitudinal, Four waves (Fifth wave just funded)</td>
<td>~6,500 in wave 1 (enrolled in grades 7-12)</td>
<td>smoking, alcohol, use of other substances, sexual behaviors, physical activity, sleep patterns, diet</td>
<td>Occupation and industry job titles, job characteristics, income</td>
<td>chronic conditions, injury, mental health status, blood pressure, some biomarker data</td>
<td>Census (household address) Environmental conditions (household address)</td>
</tr>
</tbody>
</table>

### STRENGTHS
- Longitudinal design
- Genetic data available

### WEAKNESSES
- Relatively small sample size

### DATA AVAILABILITY
- Other data access requires a specific application with data security requirements: [http://www.cpc.unc.edu/projects/addhealth/data/restricteduse](http://www.cpc.unc.edu/projects/addhealth/data/restricteduse)
Other data sources

- Health and Retirement Survey
- National Longitudinal Surveys of Youth
- General Social Survey

https://ssl.isr.umich.edu/hrs/reg_pub2.php
https://www.nlsinfo.org/investigator/pages/login.jsp
http://www3.norc.org/GSS+Website/Download/
http://gss-ndi.blogspot.com/
Other data sources

- Behavioral Risk Factor Surveillance System
- Gallup daily tracking
- National Longitudinal Mortality Study (NLMS)

http://www.cdc.gov/brfss/annual_data/annual_data.htm
http://www.gallup.com/poll/110380/How‐does‐Gallup‐Daily‐tracking‐work.aspx
Conclusions

- Existing health surveillance network can be utilized to inform Total Worker Health initiatives throughout the worker life course
- Linkage with these surveys extends their value
- Additional work is needed to further enhance surveillance resources
  - TWH supplements
  - Linkage with claims data and worker compensation data

http://www.cdc.gov/brfss/annual_data/annual_data.htm
Acknowledgements

• We wish to thank Symposium Chair Dr. Sara E. Luckhaupt, Medical Officer, National Institute for Occupational Safety and Health

• Supported by the National Institute for Occupational Safety and Health (NIOSH R01 OH003915 and R03 OH010124) and the National Institute of Child Health and Human Development (NICHD F32 HD059318)

AND