Using the Behavioral Risk Factor Surveillance System (BRFSS) for Occupational Health


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Leading WA Industries
Services and Durable goods manufacturing
Source: 2013 Washington Manufacturers Directory® and Industrial Database

Agriculture:
Fruits, Hops, Seafood,
Dairy products, Cattle,
Wheat, Potatoes,
Nursery stock.

Industry:
Lumber and wood products,
Paper products,
Aerospace,
Software development,
Food processing,
Hydroelectric power,
Tourism.

Largest employers (by # employees):
Microsoft, Boeing, Amazon.com
Workers’ injury & illness burdens

- Estimated 7.6-11.4 million job injuries or illnesses annually
- Costs ~$250 billion annually
- Costs for cancer: ~$219 billion
- Costs for diabetes: ~$174 billion

Data source: Paul Leigh, Milbank Quarterly, 2011
Dave Bonauto, MMWR, 2010
Why the Behavioral Risk Factor Surveillance System (BRFSS)?

• Collects data on large number of workers on
  • Specific health outcomes
  • Health behaviors
  • Industry/occupation (I/O)

• Allows for quantifying prevalence by I/O
  • Prevalence of health factors/behaviors and chronic disease
  • Work-related injuries and reporting

• No other state-level data source for this information
Industry & Occupation Methods

• Collect data on industry and occupation
  • Currently employed & Self-employed

• “What kind of business or industry do you work in?” and

• “What is your job title?” If no job title is given, the respondent is then asked “What kind of work do you do?”

• Industry and occupation coding
  • NIOSH Standardized Occupation and Industry Coding software
  • NIOSH trained coders
  • 265 industry and 509 occupation (2000 Census)
  • Industry or occupation minor/major groups

• Descriptive and multivariable analyses

Washington State Department of Labor & Industries

SHARP
Safety & Health Assessment & Research for Prevention
Describing civilian workers’ health and work injury burden

- Underreporting of work-related injury
- Access to health care
- Mental health
- Obesity
- Inadequate sleep
- Hypertension
- Influenza like illness
- Health care coverage
- Work-related Asthma
Workers’ Compensation (WC) module

- Injury or illness
  - In the past 12 months, have you been injured while performing your job, OR has a doctor or other medical professional told you that you have a work-related illness?
- Who paid for treatment?
- Why not paid by WC?
(n=2612)

- Reporting work-related injury or illness: 12.8%
- Filing WC: 51.5%

Factors reporting a work-related injury/illness
- Income $25-50k vs. >$50k (Adj OR 1.5 (95% CI: 1.1-2.2))
- Binge drinking (Adj OR 1.9 (95% CI: 1.2-2.8))
- Asthma (Adj OR 2.0 (95% CI: 1.3-3.1))
- Diabetes (NS)
- Mental unhealthy days ≥14 in past 30 days (Adj OR 2.4 (95% CI: 1.4-4.0))
- Industry

24.7% of Agriculture, Forestry, Fishing workers reported a work related injury/illness.

Only 45% of those workers reporting a WR injury/illness filed a claim.
Factors related to filing a claim

- Body Mass Index  (Adj OR 2.2 (95% CI: 1.2-4.0))
- Marital Status   (Adj OR 2.8 (95% CI: 1.5-5.0))
Prevalence of Depression and Frequent Mental Distress

WA BRFSS 2006 & 2008

- State added questions (Anxiety & Depression):
  - Patient Health Questionnaire 8 (PHQ-8)
  - Health Related Quality of Life

- Mental health outcomes:
  - Current Depression [PHQ-8]
  - Frequent Mental Distress (FMD) [reported “mental health not good” for ≥14 days during the past 30 days]
Prevalence of Depression and FMD
WA BRFSS 2006 & 2008 (N=20,560, 20 occupational groups)

Prevalence of depression: 5.2%; FMD: 7.5%

Prevalence of Influenza like Illness
WA BRFSS Sept 2009-Aug 2010

- CDC sponsored question:
  - During the past month, were you ill with a fever?
  - Did you also have a cough and/or sore throat?

- 8,758 adults, currently employed, non-military
- 29 occupational groups
## Prevalence of Influenza like Illness (ILI)
**WA BRFSS Sept 2009-Aug 2010**

- Prevalence 6.8% (95% CI = 6.1, 7.6)

<table>
<thead>
<tr>
<th></th>
<th>% (95% CI)</th>
<th>PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians, NEC</td>
<td>3.0 (0.2-5.3)</td>
<td>0.4 (0.2-0.9)</td>
</tr>
<tr>
<td>Truck Drivers</td>
<td>1.6 (0.0-3.4)</td>
<td>0.2 (0.1-0.7)</td>
</tr>
<tr>
<td>Janitors and Cleaners</td>
<td>17.1 (6.5-27.7)</td>
<td>2.5 (1.3-4.7)</td>
</tr>
<tr>
<td>Secretaries</td>
<td>16.6 (3.7-29.5)</td>
<td>2.4 (1.1-5.4)</td>
</tr>
</tbody>
</table>

Asthma & Work-related Asthma
BRFSS Asthma Call-Back Survey (ACBS)
2006-2009

• Of the 41,935 respondents who were currently employed during 2006-2009, the prevalence of current asthma overall was 8.1%—Prevalence varies by occupation
• Compared to the reference group (Executive, Administration, and Managerial occupations), 3 occupational groups had significantly higher prevalence ratios of current asthma:
  – ‘Teachers, all levels, and Counselors’
  – ‘Administrative Support, including Clerical’
  – ‘Other Health Services’
Asthma & Work-related Asthma
BRFSS Asthma Call-Back Survey (ACBS)
ACBS data 2006-2009

Prevalence Ratio (PR) - Current Asthma

*Bold font identifies significance at p<0.05
All data weighted to account for BRFSS survey sampling

<table>
<thead>
<tr>
<th>ACBS Question</th>
<th>N (weighted frequency*)</th>
<th>% (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma symptoms caused or worsened by any current or past job (n=1,421)</td>
<td>930</td>
<td>55.1</td>
</tr>
<tr>
<td></td>
<td>(459,310)</td>
<td>(50.4-59.9)</td>
</tr>
<tr>
<td>Ever discussed asthma being work-related with a health-care professional (n = 1,673)</td>
<td>271</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>(119,141)</td>
<td>(8.6-12.8)</td>
</tr>
<tr>
<td>Ever changed or quit job because chemicals, smoke, fumes, or dust caused or worsened asthma (n = 444)</td>
<td>145</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td>(68,494)</td>
<td>(20.4-37.0)</td>
</tr>
<tr>
<td>Missed ≥1 day of work and/or couldn’t do usual activities due to asthma, in past 12 months (n = 1,285)</td>
<td>365</td>
<td>22.6</td>
</tr>
<tr>
<td></td>
<td>(180,227)</td>
<td>(18.7-26.4)</td>
</tr>
</tbody>
</table>

* Data weighted to account for BRFSS survey sampling.
Asthma & Work-related Asthma
BRFSS Asthma Call-Back Survey (ACBS)
2006-2009

Prevalence Ratio (PR) - Work Environment Caused/Worsened Asthma

* Bold font identifies significance at p < 0.05
All data weighted to account for BRFSS survey sampling
Occupations identified: WA Asthma Surveillance Program vs. BRFSS ACBS

- Farming/Forestry/Fishing: 2.4*
- Construction & Extraction: 2.0*
- Mechanics & Repairers, Precision Production: 1.9*
- Other Health Services: 1.9*
- Machine Operators, Equip Cleaners, Laborers: 1.8*
- Cleaning/Building, Personal Services: 1.7*
- Technical & Related Support: 1.6*
- Admin Support & Clerical: 1.6*
- Health Diagnosis/Treatment Professionals: 1.6*
- Transportation, Material Moving, Truck Drivers: 1.4
- Other Professionals: 1.3
- Math / Natural / Social Scientists: 1.3
- Sales: 1.2
- Food Prep / Services: 1.1
- Teachers & Counselors: 1
- Engineers/Architects/Surveyors: 1
- Management Related: 1
- Lawyers & Judges, Protective Services: 0.9
- Executive/Admin/Managerial (REFERENCE): 1

*Bold font identifies significance at p <0.05

All data weighted to account for BRFSS design

= Also identified in the top 10 by WA WRA Surveillance Program

Prevalence Ratio (PR) - Work Environment Caused/Worsened Asthma
Obesity Prevalence by Occupation in WA

Objectives
- To estimate obesity prevalence and other worker health behaviors by occupation in WA
- Identify occupations in need of workplace obesity prevention programs

Study population
- N=37,626
- Exclusion criteria: workers in military, in Extraction occupation, older than 65 years, BMI<18.5
- 28 occupational groups
## Obesity Prevalence by Occupation in WA


<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Obesity prevalence</th>
<th>% Adequate fruit and vegetable intake</th>
<th>% Vigorous Leisure Time Physical Activity (LTPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All occupations</td>
<td>25%</td>
<td>23%</td>
<td>34%</td>
</tr>
<tr>
<td><strong>Truck drivers</strong></td>
<td>39%</td>
<td>16%</td>
<td>31%</td>
</tr>
<tr>
<td>Transportation and material moving</td>
<td>38%</td>
<td>20%</td>
<td>31%</td>
</tr>
<tr>
<td>Protective services</td>
<td>34%</td>
<td>20%</td>
<td>51%</td>
</tr>
<tr>
<td>Cleaning and building services</td>
<td>30%</td>
<td>19%</td>
<td>28%</td>
</tr>
<tr>
<td><strong>Health diagnosing occupations</strong></td>
<td>12%</td>
<td>38%</td>
<td>45%</td>
</tr>
</tbody>
</table>
Obesity Prevalence by Occupation in WA

- Prevalence ratios (PRs) for obesity were significantly higher in workers that were:
  - older workers, male workers, those with less education, those in the lowest income group (<$35,000)
- Adequate fruit and vegetable intake, vigorous leisure time physical activity and occupational physical activity were found to be protective

- Better allocation of public health resources and research effort
- Help prioritize workplace wellness programs
## Summary

<table>
<thead>
<tr>
<th>Occupational Health Issue</th>
<th>Identified Industry/Occupation*</th>
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</table>
| Asthma & work-related asthma (WRA)                | **Current Asthma:** Teachers & Counselors; Administrative Support & Clerical; Other Health Services.  
|                                                   | **Potential WRA:** Agriculture, Forestry, & Fishing; Construction & Extraction; Mechanics, Repairers, Precision Production & Plant & System Operators; Other Health Services. |
| Obesity                                           | Truck Drivers; Transportation and Material Movers; Protective Services; Cleaning & Building Services. |
| Influenza-like Illness                            | Janitors & Cleaners; Secretaries.                                                               |
| Depression & Frequent Mental Distress             | Health Service Assistants; Truck Drivers; Machine Operators, Assemblers, and Inspectors.        |
| Health Care Coverage Discrepancy                  | Low-income workers employed in Agriculture, Forestry & Fishing, Construction, and Retail.        |

* Occupational groupings & outcomes vary by study; to access the methods sections for a full description, please see links to the free full-text publications at [http://www.lni.wa.gov/Safety/Research/Projects/BRFSSWorkerHealth/Materials.asp](http://www.lni.wa.gov/Safety/Research/Projects/BRFSSWorkerHealth/Materials.asp)
Using BRFSS for Occupational Health - WA Experience

- Successful in adding I/O to BRFSS interview, coding I/O

- Including I/O questions added significant value to BRFSS for WA
  - Regularly use the data to: identify needs, better describe the health and work-related injury burden of WA workers
  - First time comparing BRFSS I/O results with our state surveillance program for the same condition – confirms that BRFSS is representative of what is going on with WRA in WA (Top 10s – 8/10 in common)

- Next steps: transferring knowledge obtained from research studies to workplace practices and policies
  - To workplace practices & policies
  - To health care providers
  - To the workers
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Questions or comments?

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