

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



Industry:

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

Agriculture:

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

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

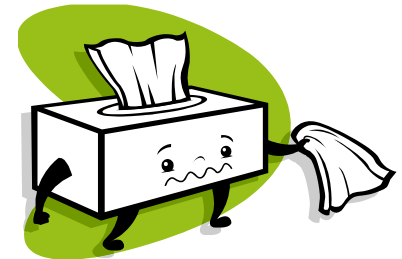
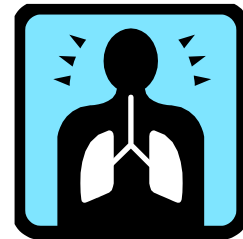


Industry & Occupation Methods

- 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

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





Work Injury Burden and Underreporting

WA BRFSS 2002

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?

Work Injury Burden and Underreporting (2002)

(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

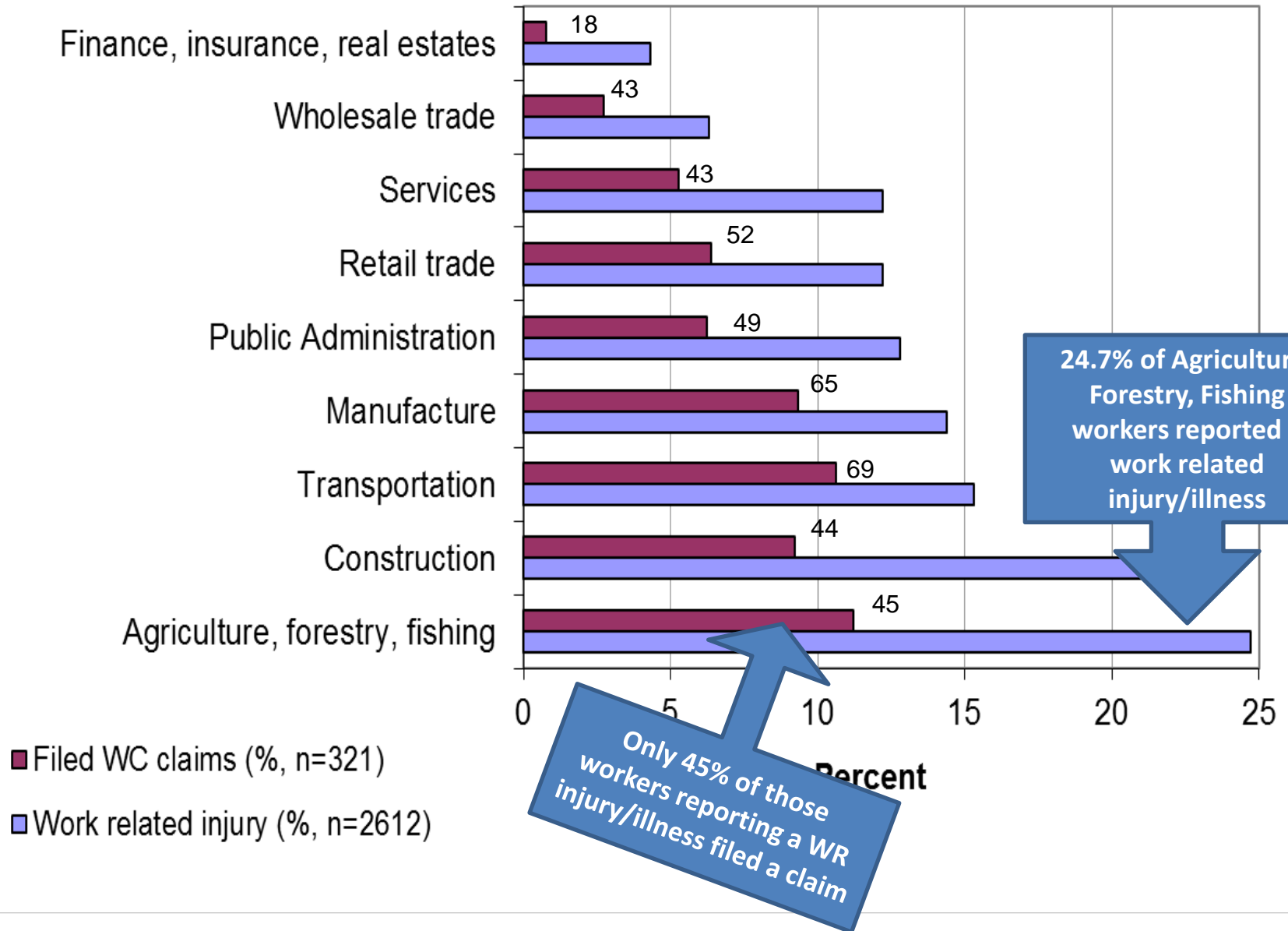
JOEM 48: 914-922 (2006)



Washington State Department of
Labor & Industries



Work-related injury or illness and WC claim filing, by industry (9 groups)



Work Injury Burden and Underreporting (2002)

(n=2612)

- 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))

JOEM 48: 914-922 (2006)



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Prevalence of Depression and Frequent Mental Distress

WA BRFSS 2006 & 2008

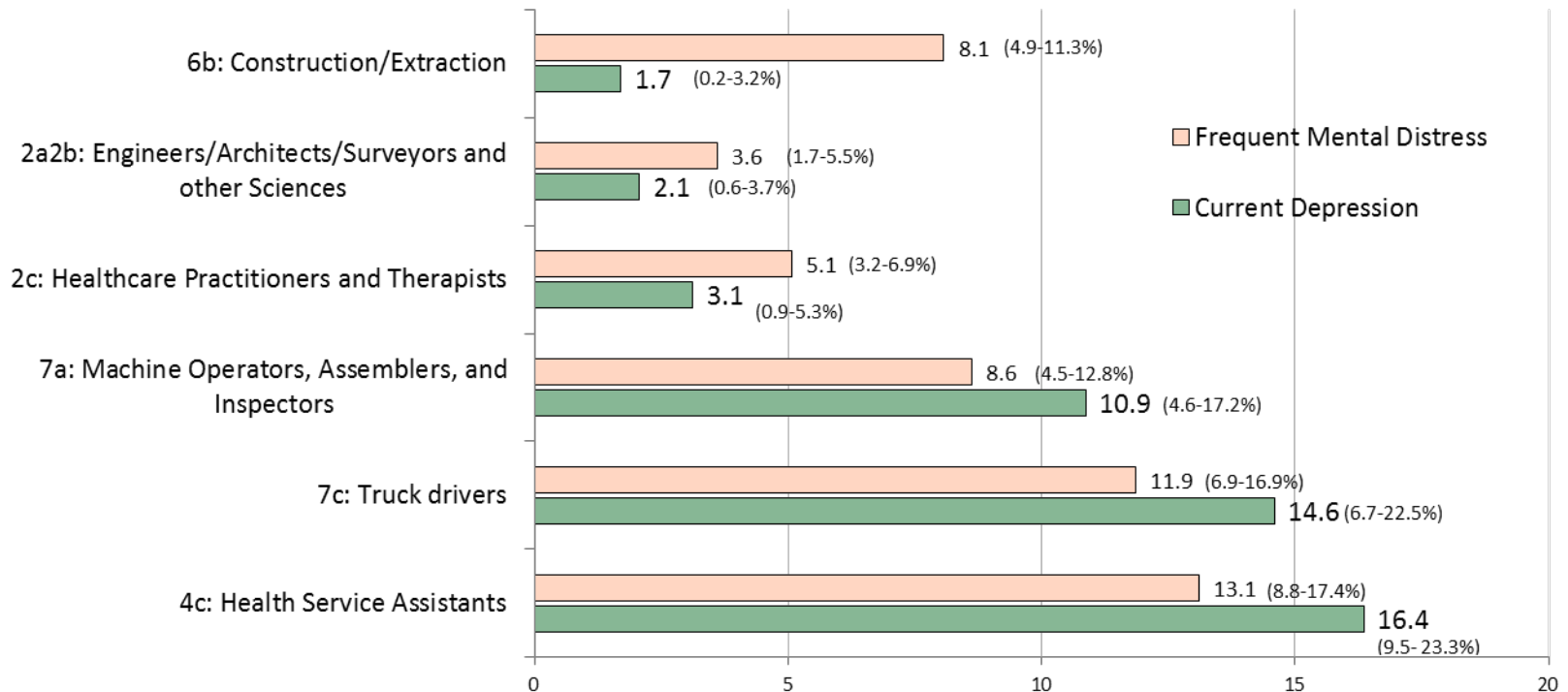
- State added questions (Anxiety & Depression):
 - Patient Health Questionnaire 8 (PHQ-8)
 - Health Related Quality of Life
- Mental health outcomes:
 - Current Depression [PHQ-8]
 - Frequent Mental Distress (FMD) [reported “mental health not good” for ≥ 14 days during the past 30 days]



Prevalence of Depression and FMD

WA BRFSS 2006 & 2008 (N=20,560, 20 occupational groups)

Prevalence of depression: 5.2%; FMD: 7.5%



AJIM 55:893–903 (2012)

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)

	% (95%CI)	PR (95% CI)
Technicians, NEC	3.0 (0.2-5.3)	0.4 (0.2-0.9)
Truck Drivers	1.6 (0 -3.4)	0.2 (0.1-0.7)
Janitors and Cleaners	17.1 (6.5-27.7)	2.5 (1.3-4.7)
Secretaries	16.6 (3.7-29.5)	2.4 (1.1-5.4)

PLoS ONE: 2012;7(11):e48806.

Asthma & Work-related Asthma

BRFSS Asthma Call-Back Survey (ACBS)

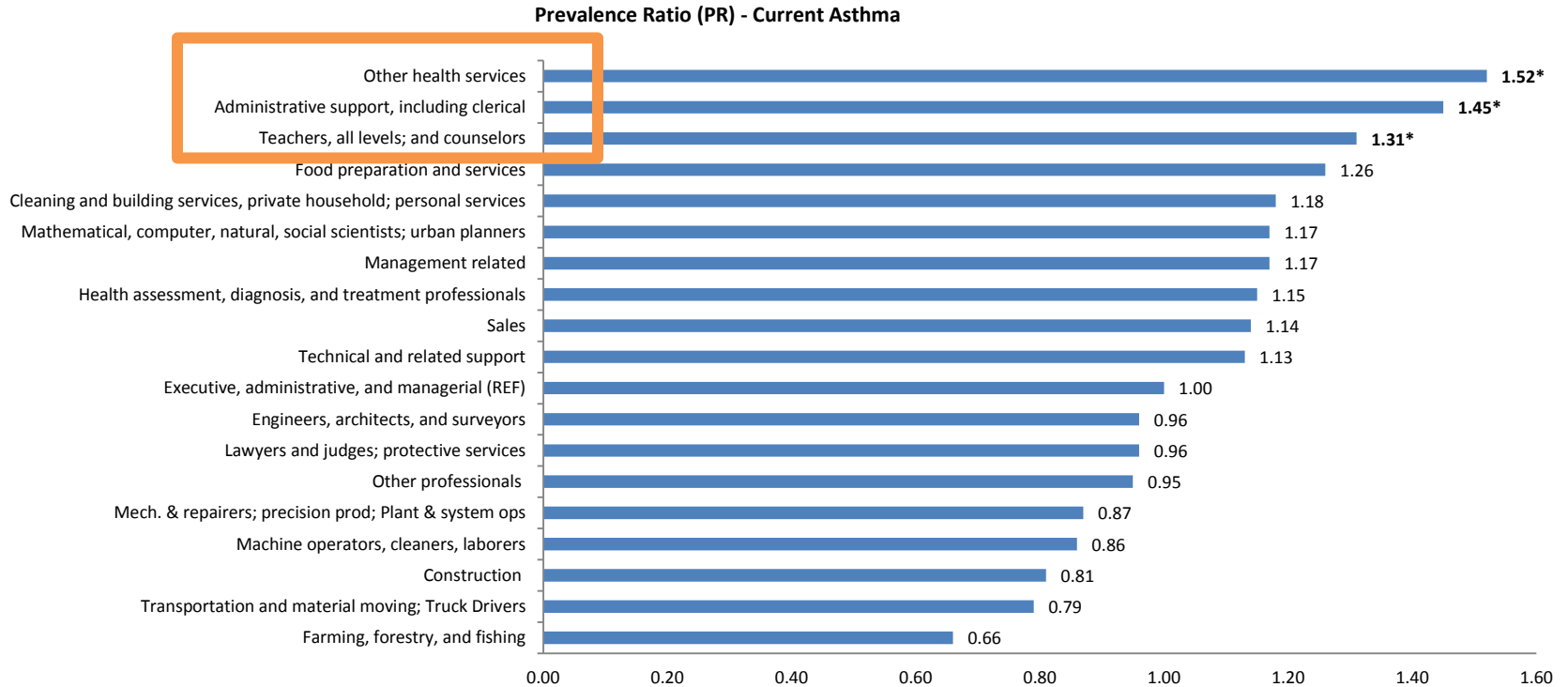
2006-2009

- 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



*Bold font identifies significance at $p < 0.05$

All data weighted to account for BRFSS survey sampling

■ Prevalence Ratio (PR) - Current Asthma

Work related exposures, awareness, and impact, WA BRFSS ACBS 2006-2009.

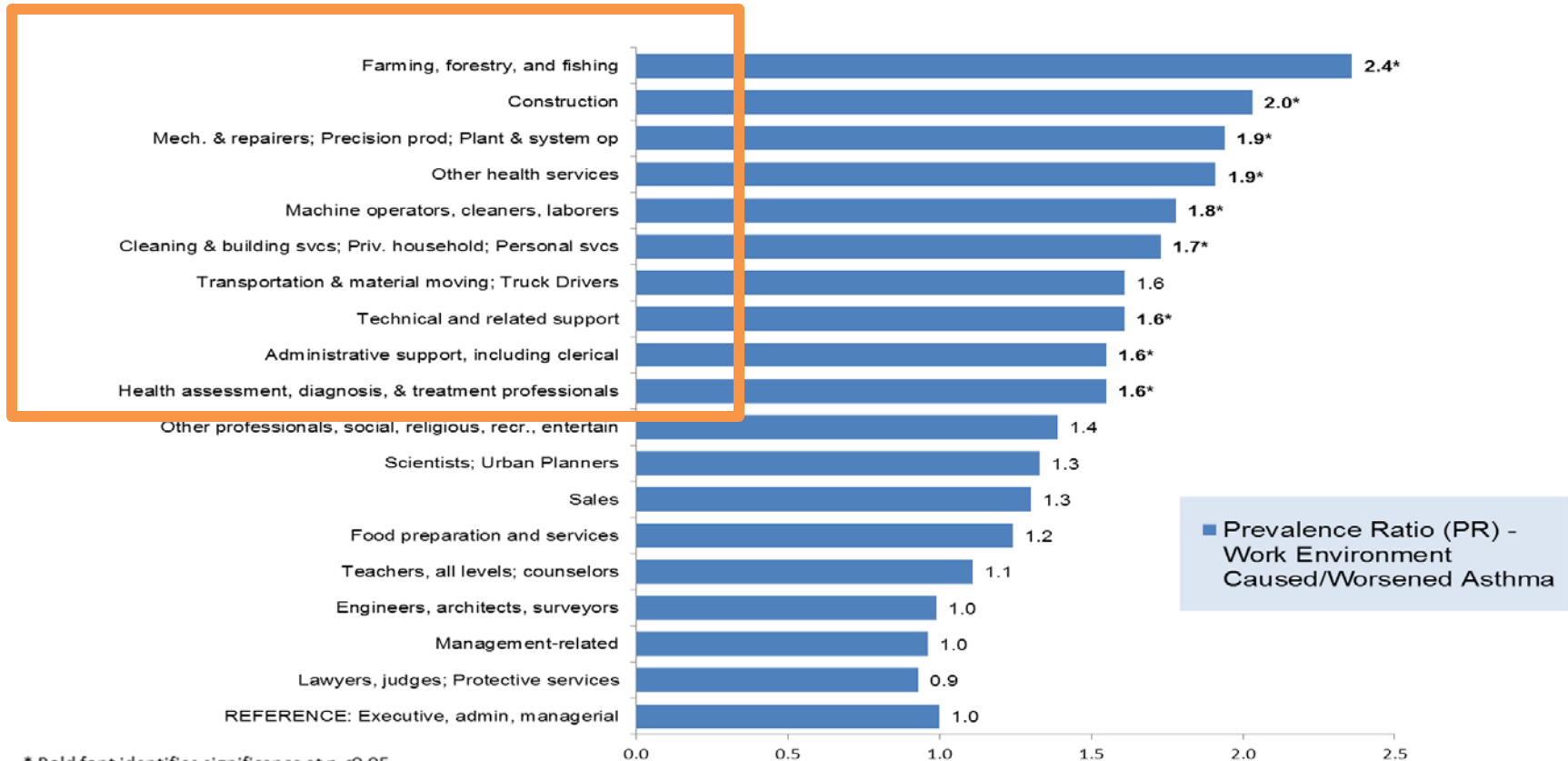
ACBS Question	N (<i>weighted frequency*</i>)	% (95% CI)*
Asthma symptoms caused or worsened by any current or past job (n=1,421)	930 (459,310)	55.1 (50.4-59.9)
Ever discussed asthma being work-related with a health-care professional (n = 1,673)	271 (119,141)	10.7 (8.6-12.8)
Ever changed or quit job because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

* Data weighted to account for BRFSS survey sampling.

Asthma & Work-related Asthma

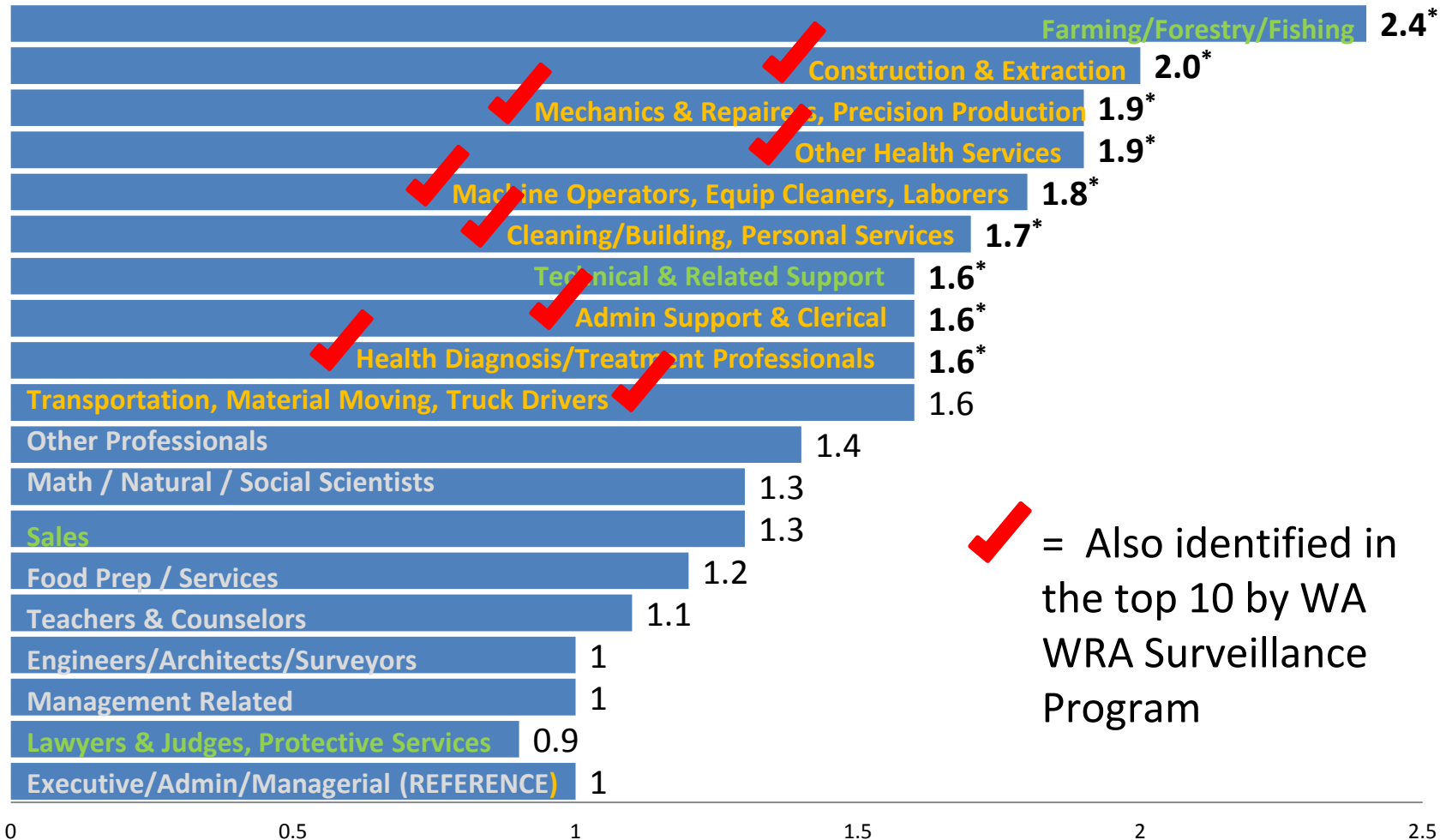
BRFSS Asthma Call-Back Survey (ACBS)

2006-2009



* 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



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

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



Obesity Prevalence by Occupation in WA

WA BRFSS 2003, 2005, 2007, 2009

■ 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

WA BRFSS 2003, 2005, 2007, 2009

Occupational Group	Obesity prevalence	% Adequate fruit and vegetable intake	% Vigorous Leisure Time Physical Activity (LTPA)
All occupations	25%	23%	34%
Truck drivers	39%	16%	31%
Transportation and material moving	38%	20%	31%
Protective services	34%	20%	51%
Cleaning and building services	30%	19%	28%
Health diagnosing occupations	12%	38%	45%

Obesity Prevalence by Occupation in WA

WA BRFSS 2003, 2005, 2007, 2009

- 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

Occupational Health Issue	Identified Industry/Occupation*
Asthma & work-related asthma (WRA)	<u>Current Asthma:</u> Teachers & Counselors; Administrative Support & Clerical; Other Health Services. <u>Potential WRA:</u> 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>

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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