

Distribution of Asthma by Occupation in Washington State, 2006-2009.

Naomi J. Anderson, MPH¹; Z. Joyce Fan, PhD¹; David K. Bonauto, MD, MPH¹, Edmund Rauser, BS, PE¹

1- Washington State Department of Labor & Industries, Safety & Health Assessment & Research for Prevention (SHARP) Program.

OBJECTIVES

Work-related asthma is the most common occupational lung disease. Workplace exposures likely cause or exacerbate asthma in a significant portion of adult workers. However, studies that examine asthma by industry or occupation are not common (1-3). We estimate the prevalence of self-reported asthma by occupation in Washington State (WA).

METHODS

The Behavioral Risk Factor Surveillance System (BRFSS) Asthma Call-Back Survey (ACBS) is conducted yearly with BRFSS respondents who identify as ever having been told by a health care professional (HCP) that they had asthma ('lifetime asthma'), and agreed to be called back for the ACBS, which is conducted within 2 weeks of participation in the BRFSS. The ACBS asks more questions regarding symptoms, medical treatment, costs and insurance, and environmental and work-related exposure. WA BRFSS and ACBS data for 2006-2009 was analyzed. WA BRFSS includes questions on industry and occupation. Prevalence ratios (PR) for current asthma in ACBS respondents were calculated by 19 occupational groups (STATA 12.1); the reference group was Executive, Administrative, and Managerial occupations.

RESULTS

There were 92,467 respondents on the WA BRFSS and 6,099 respondents to the WA BRFSS ACBS in 2006-2009 (Table 1). Of the ACBS respondents 2,511 (41.7%) were currently employed with self-reported lifetime asthma and had coded industry and occupation data from WA BRFSS (Table 1).

Table 1. Prevalence of Lifetime and Current Asthma in WA BRFSS and ACBS, 2006-2009.

BRFSS					ACBS**				
n	#	% (95% CI)*	Lifetime Asthma	Current Asthma	% Current/Lifetime (95% CI)	Lifetime Asthma	Current Asthma	% Current/Lifetime (95% CI)	
			#	% (95% CI)*		#	% (95% CI)*		
All	92,467	13,701	14.8 (14.4-15.1)	9,050	9.0 (8.7-9.3)	61.2 (59.9-62.5)	6,099	4,035	63.4 (61.0-65.8)
Employed	46,442	6,401	13.9 (13.5-14.4)	3,928	8.1 (7.7-8.4)	58.1 (56.4-59.9)	2,660	1,682	60.3 (56.8-63.7)
Employed with I/O coding	41,935	5,833	14.0 (13.6-14.5)	3,582	8.1 (7.8-8.5)	57.9 (56.1-59.7)	2,511	1,531	60.6 (57.0-64.2)

* Data weighted to account for BRFSS survey sampling.

** ACBS sample is a subset of the BRFSS sample, all have lifetime asthma (ever been told by a HCP that you had asthma), and agreed to participate in the ACBS.

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References:

1. Knudsen GE, Mazurek JM, Storey E. 2013. Occupation Held at the Time of Asthma Symptom Development. Am J Ind Med. 56:1165-1173.
2. Arif AA, Delclos GL, Whitehead LW, Tortolero SR, Lee ES. 2003. Occupational Exposures Associated with Work-Related Asthma and Work-Related Wheezing Among U.S. Workers. Am J Ind Med. 44:368-376.
3. Syamial G, Mazurek JM, Bang KM. 2009. Prevalence of Lifetime Asthma and Current Asthma Attacks in U.S. Working Adults: An Analysis of the 1997-2004 National Health Interview Survey Data. J Occup Environ Med. 51:1066-1074.

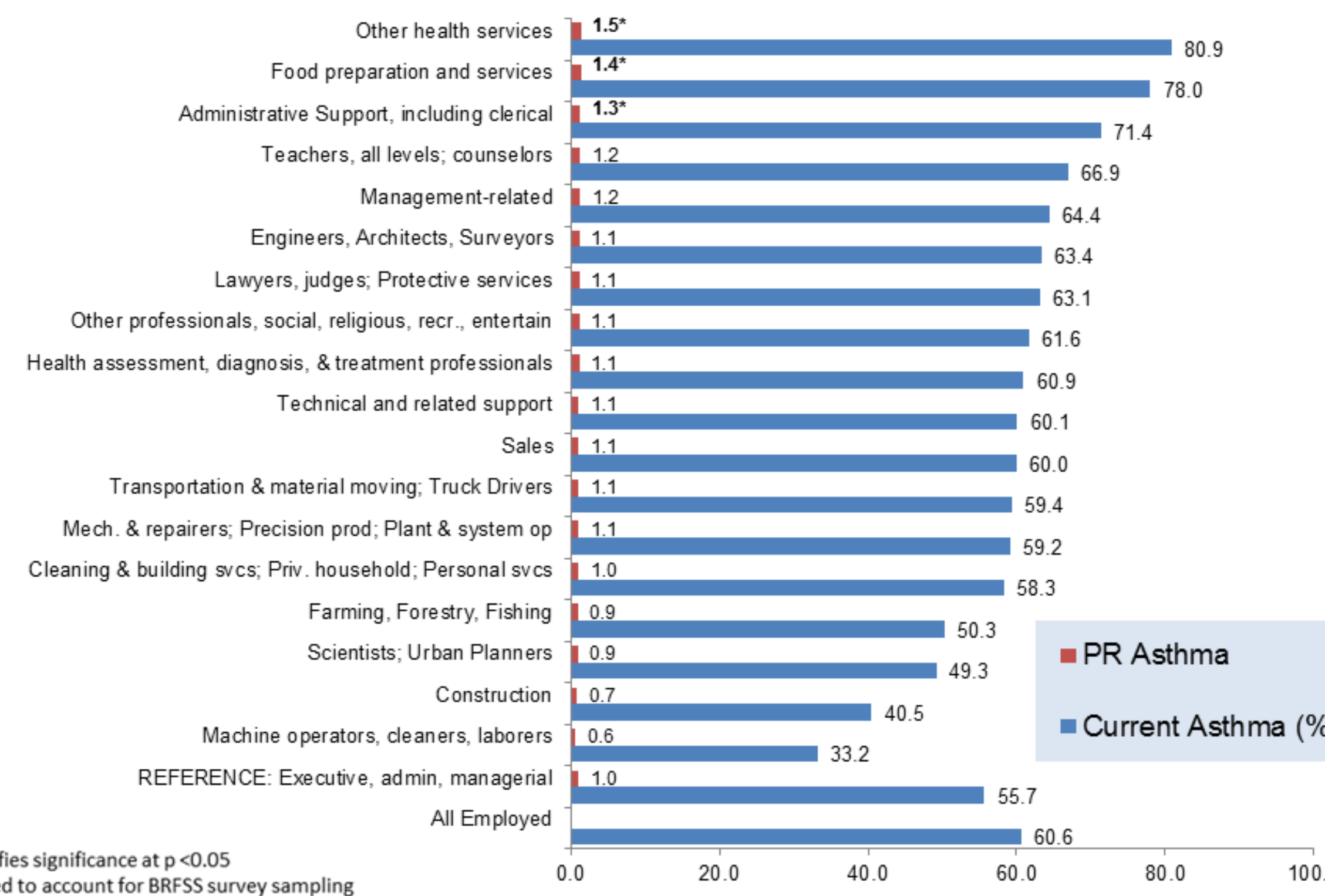


Figure 1. Prevalence of current asthma in 19 occupational groups, WA BRFSS ACBS 2006-2009 (N=2,511).

- Of WA workers who were ever told by a HCP that they had asthma (lifetime asthma) and agreed to be in the ACBS, 60.6% (95% Confidence Interval (CI) 56.9-64.2%) had current asthma.
- When compared to the reference group, Administrative Support, Including Clerical (PR 1.3, 95% CI 1.1-1.6%), Food Preparation and Services (PR 1.4, 95% CI 1.1-1.8%), and Health Services (PR 1.5, 95% CI 1.2-1.8%) had significantly higher PRs of current asthma (Figure 1).

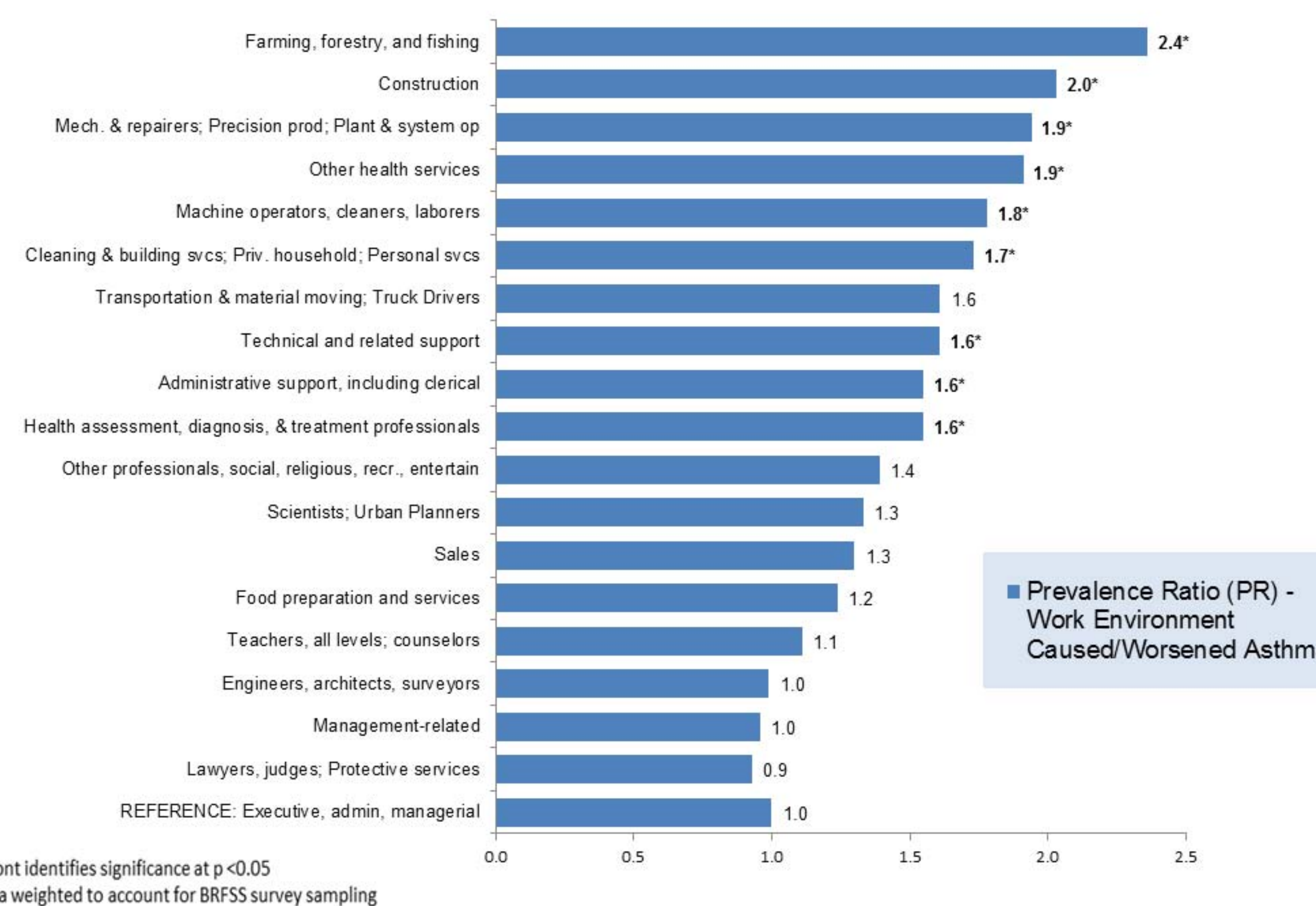


Figure 2. Differences in self-reported prevalence of work exposure to chemicals, smoke, fumes or dust "caused or worsened" asthma symptoms, by 19 occupational groups, WA BRFSS ACBS 2006-2009 (N=1,421).

- Further examination of workers who responded that their asthma symptoms were caused or aggravated by work exposures identified several occupations with PRs significantly higher than that of the reference group, including Precision Production occupations, and Plant and System Operators, Other Health Services, and Administrative Support, including Clerical (Figure 2).
- Many of the identified occupations with higher PRs for current asthma and asthma symptoms caused/aggravated by work exposures, confirm similar occupational groups identified previously as occupation groups with higher prevalence of current asthma or asthma symptom development when employed (1) – office and administrative support, and personal care and service occupations; and agriculture-related occupations, mechanics and repairers, and equipment cleaners (2).

Table 2. Work related exposures, awareness, and impact, WA BRFSS ACBS 2006-2009.

	N	Weighted Frequency*	% (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.

- Approximately half of workers (55.1%, 95% CI 50.4-59.9) believed their asthma symptoms were caused or aggravated by their current or past job(s);
- However, only 10.7% (95% CI 8.6-12.8) had ever spoken with a health-care professional about their asthma being work-related.

Limitations:

Occupation currently held by a worker with asthma responding to BRFSS may not be the occupation where their asthma developed or was worsened (1). In our data, 28.7% of respondents indicated that they had ever changed or quit their jobs because work exposures caused or aggravated their asthma (Table 2).

CONCLUSIONS

Some occupations appear to have higher prevalence of asthma than others, and self-reported work-relatedness also varies by occupation. The use of occupation data to discern these differences is potentially valuable for targeting prevention efforts to reduce the burden of disease and for health-care professionals engaged in worker care. WA has included Industry/Occupation questions on the BRFSS as a State-added module since 2002, which allowed us to analyze a variety of BRFSS questions by industry and occupation. Routine collection of industry and occupation information in BRFSS and other health data collection systems would help in identifying populations with higher burdens of asthma and other outcomes of interest. Additional work exploring the work-related factors by occupational groups is ongoing.