

## STATE SPOTLIGHT Wisconsin



This state uses yearly data from the Behavioral Risk Factor Surveillance System (BRFSS) to track the prevalence of the following health issues and behaviors:

- Occupational health.
- Asthma (Core BRFSS and Asthma Call-Back Survey/ACBS).
- Alcohol use and binge drinking.
- Mental health.
- Adverse childhood experiences.
- Chronic diseases and their risk factors.

The Wisconsin Asthma Program and Occupational Health Program used three yearly data sets from the BRFSS industry and occupation (IO) module and the ACBS to identify occupations in the state whose workers may be at high risk for asthma.

### Background

To optimize their quality of life, individuals with asthma often can manage the chronic respiratory disease through a long-

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State BRFSS Website  
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### New Hampshire

White Paper  
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<http://bit.ly/2vC1HJ2>

### Iowa

Iowa Public Health Tracking Portal  
BRFSS Report: <http://bit.ly/2vSOhrm>

### Wisconsin

Study on Bariatric Surgery  
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### Other Resources

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Physical Activity-Cognitive Function Linked in Adults  
<http://bit.ly/2qGnPmO>

Residents of US/Europe Rate Their Health  
<http://bit.ly/2rpvT8B>

term, multifaceted approach that includes patient education, behavior changes, asthma trigger avoidance, medications, and frequent medical follow-up. (1) Targeted prevention programs may help high-risk populations improve their asthma management. (2)

Work-related asthma (WRA) occurs when:

- On-the-job conditions cause the respiratory disease (occupational asthma).
- One's existing asthma is aggravated by work (work-exacerbated asthma).

In Wisconsin, more than half of the state's currently employed adults with asthma attribute their disease to work, said Carrie Tomasallo, PhD, MPH, senior epidemiologist in the Bureau of Environmental and Occupational Health, in Wisconsin's Division of Public Health.

"Public-health practitioners know that a workplace can contribute to the burden, progression, and severity of chronic disease," said Dr. Tomasallo. "But asthma burden has not been described very extensively in Wisconsin workers by specific industry or occupation."

Dr. Tomasallo adds that previous state estimates of current asthma prevalence among employed adults by IO used small numbers of annual respondents,(3) which can lessen reliability of the findings. Also, it is not clear if occupations associated with high prevalence of current asthma are the same occupations associated with a high prevalence of WRA.

Wisconsin's BRFSS Director, Dr. Anne Ziege, worked with the University of Wisconsin Survey Center to administer the BRFSS IO module and ACBS in 2013, 2014, and 2015. With the IO data, researchers studied how work conditions may jeopardize workers' health, highlighted disparities in disease prevalence, and improve targeting of specific industries and occupations for workplace prevention and wellness programs.

Dr. Tomasallo and her colleagues merged data from the BRFSS IO module and the ACBS to look at both current asthma and WRA prevalence by occupation.

### **Details of the Research Project**

Staff from the National Institute of Occupational Safety and Health (NIOSH) coded the Wisconsin BRFSS IO text fields from 2013 to 2015 to 2002 Census Industry and Occupation codes, recoding them to 10 occupational groups for analysis. Data from the 2013–2015 BRFSS were merged with ACBS data for the WRA prevalence sub-analysis. The researchers estimated weighted employed population

COPD and Flu  
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Colorectal Cancer Screening among  
US Vets  
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Prostate Health/ BRFSS Report  
<http://bit.ly/2rv674P>

Colorectal Cancer Screens/ACEs Link  
<http://bit.ly/2qGcOBJ>

prevalence of current asthma from BRFSS and WRA from ACBS, both overall and by occupational group during 2013–2015. In multivariate analysis, they estimated adjusted prevalence ratios to describe the association between occupational group and current asthma prevalence, after adjusting for other potential factors. They hypothesized that the occupations identified as being high-risk for current asthma would also be the high-risk occupations for work-related asthma as well.

## Results

“Our hypothesis was correct in that service workers—specifically those in health-care support and building/grounds maintenance—were identified as having high WRA prevalence and current asthma prevalence,” said Dr. Tomasallo. “The analysis of WRA, however, showed that workers in construction trades and motor-vehicle operators also are at high-risk.”

From 2013 to 2015, 15,379 Wisconsin residents responded to BRFSS interviews that included the IO module; of these respondents, 8,041 were currently employed or employed within the last year (i.e., workers). Wisconsin workers were more likely to be male than female, to be in the youngest age group of 18 to 44 years and white (85.0%). Compared with the unemployed population, workers were significantly more likely to be male (53.8% vs. 41.5%) and to be in the younger age group (54.6% vs. 28.0%). In addition, the employed population had a greater percentage of Hispanics than the unemployed (5.9% vs. 3.9%).

Among workers with current asthma, more were female, aged 45 to 59 years, and white (79.4%). Compared with workers without asthma, workers with current asthma were significantly more likely to be female (58.9% vs. 45.0%) and a member of a minority group (black: 9.7% vs. 4.7%; other races: 5.7% vs. 3.9%).

The prevalence of current asthma among workers was 8.4% (95% CI 7.3-9.4). Current asthma prevalence was highest among Service- (12.1%), Office/Administrative Support- (10.7%), and Professional and related (9.0%) occupations. All of these groups showed significantly higher asthma prevalence than the occupation groups with lowest prevalence: Farming, Construction and Installation occupations, 3.6%. Among the Service occupations, the subcategories of Building and Grounds Maintenance workers (15.8%) and Healthcare Support occupations (16.2%) had the highest asthma prevalence. Multivariate analyses found that compared with the lowest risk occupations, elevated adjusted prevalence ratios (PR) for current asthma were associated with Service- (PR 2.5, 95% CI 1.3-4.7), Office and Administrative Support- (PR 2.3, 95% CI 1.2-4.3) and Professional (PR 2.0, 95% CI 1.1-3.7)

occupations, after adjustment for age, sex, household income, and obesity (all  $P < 0.05$ ).

The ACBS indicated that 51.8% of currently employed adults with asthma had disease that was caused or made worse by work. Analysis by occupation confirmed high WRA prevalence among the Service subcategories above (69.4% of current asthmatics reported WRA); however, highest WRA prevalence was identified among Construction/Extraction- (99.8%) and Transportation/Material Moving- (84.9%) occupations. A similar methodology was used by Washington State to study the distribution of asthma by occupation.(4)

“The Washington group also identified different high-risk occupations when they looked at WRA vs. current asthma prevalence; however, both of our analyses highlighted health-care support, cleaning and building services and construction occupations with higher prevalence of self-reported WRA,” Dr. Tomasallo said.

Dr. Tomasallo added that one could argue that the ACBS provides more-reliable information about WRA than simply looking at the BRFSS current asthma prevalence estimates stratified by occupation, which may miss occupations that are at particular risk for WRA. Another explanation for the differences in identified occupation groups is that current occupation may not be the same as the occupation associated with onset of asthma, as workers may move from jobs where exposures cause or worsen asthma symptoms. One major limitation of this analysis is the small sample size of the annual Wisconsin BRFSS and call-back surveys and the necessity to collapse occupations.

“Linking the BRFSS IO data to ACBS data and aggregating across multiple states would allow us to confirm these results and expand analyses to include asthma control status and self-management practices, as well as specific industries and occupations,” said Dr. Tomasallo. “In the meantime, we plan to expand Wisconsin BRFSS analysis to address additional occupational issues.”

### **Dissemination**

The team presented the results at a breakout session at the 2017 Council of State and Territorial Epidemiologists (CSTE) Annual Conference in June 2017. When published, the conference archive of this presentation will become available at this link: <http://www.csteconference.org/2017/archives/>

The findings will be added to Wisconsin’s Occupational Health webpage <https://www.dhs.wisconsin.gov/occupational->

[health/index.htm](#) and Wisconsin's Asthma Program webpage <https://www.dhs.wisconsin.gov/asthma/index.htm>.

The Wisconsin Occupational Health Program also plans to present these findings at its semiannual Occupational Surveillance Advisory Group meeting this October; participants have been considering outreach and intervention strategies for vulnerable worker groups.

#### References:

1. [Behavioral Risk Factor Surveillance System Asthma Call-Back Survey History and Analysis Guidance](#); Accessed August 16, 2016.
2. [Surveillance for Certain Health Behaviors among States and Selected Local Areas — Behavioral Risk Factor Surveillance System, United States, 2011](#); *MMWR Morb Mortal Wkly Rep.* 2014;63(SS09):1-149. Accessed August 16, 2016.
3. Dodd KE, Mazurek JM. Asthma among Employed Adults, by Industry and Occupation — 21 States, 2013. *MMWR Morb Mortal Wkly Rep.* 2016;65:1325–1331. DOI: <http://dx.doi.org/10.15585/mmwr.mm6547a1>. Accessed August 14, 2017.
4. Anderson NJ, Fan ZJ, Reeb-Whitaker C, Bonauto DK, Rauser E. Distribution of asthma by occupation: Washington State Behavioral Risk Factor Surveillance System Data, 2006–2009. *Journal of Asthma.* 2014;51(10):1035–1042. doi:10.3109/02770903.2014.939282.

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