NH Occupational Health Surveillance Program | Institute on Disability RESEARCH

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Asthma Prevalence among New Hampshire Workers, Behavioral Risk Factor Surveillance System, 2014-2016

Introduction

New Hampshire has some of the highest rates of asthma across the country, with 2014-2016 CDC estimates putting it as the state with the highest adult asthma prevalence, affecting 13.2% of New Hampshire adults total. In 2016, 13.5% of New Hampshire adults who had asthma and had ever been employed had been told by their healthcare provider that their asthma was work-related.[i]

Work-related asthma (WRA) includes work-exacerbated asthma (pre-existing or concurrent asthma worsened by factors related to the work environment) and occupational asthma (new onset asthma attributed to the work environment).[ii,iii] Workplace exposures such as chemicals, indoor air pollution, dust, cleaning materials, cutting oils, smoke, paint, latex, wood smoke, and mold can worsen pre-existing asthma or cause asthma to develop.

The proportion of WRA among persons with current asthma may differ within various industry and occupation groups. To discern what industry and occupation groups of workers may be at highest risk for asthma, we used the New Hampshire Behavioral Risk Factor Surveillance System (BRFSS) survey. This information can be useful to prioritize and guide prevention strategies within high-risk industries and occupations.

Methods

The Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing nationwide surveillance system conducted jointly by state health departments and the Centers for Disease Control and Prevention (CDC). The survey collects data annually on a variety of health behaviors and health outcomes through random digit dial telephone and cell phone interview surveys (learn more at http://www.cdc.gov/brfss/). Since 2006, an increasing number of states/territories have implemented the Asthma Call-Back Survey (ACBS) to those BRFSS respondents who reported an asthma diagnosis (https://www.cdc.gov/brfss/acbs/). The ACBS collects additional information on asthma, including work-relatedness.

Since 2011, the New Hampshire BRFSS included additional questions in its survey

about a respondent's industry and occupation. These data along with asthma prevalence data (as reported in the core BRFSS and the ACBS) were used to calculate current asthma prevalence by industry and occupation for 2014-2016.

Current asthma was defined as a survey respondent reporting that a doctor, nurse, or other health professional had ever told them they had asthma and the respondent also reported that they currently had asthma. An employed respondent was defined as an adult who was currently employed, self-employed, or had been out of work for less than one year at the time of the BRFSS interview.

Text responses for occupation and industry reported by New Hampshire BRFSS respondents were coded into the most recent U.S. Census North American Industry Classification System (NAICS) and Standard Occupational Classification (SOC) codes by a combination of expert coders in the National Institute for Occupational Safety and Health (NIOSH) and the NIOSH Industry & Occupation Computerized Coding System (NIOCCS).

The American Community Survey (ACS) is conducted by the U.S. Census Bureau each year. ACS five year estimate data were combined (2013-2017) to estimate the numbers of New Hampshire workers aged 16 years or older grouped by the same NAICS and SOC industry and occupation categories as in the BRFSS analysis.[iv]

Analysis for this report was conducted using SAS Software. Standard analysis methods were used to account for the complex sample designs and weighting of the BRFSS.

For this report, statistical significance was determined by comparing the 95% confidence intervals of estimates. If the confidence intervals did not overlap, the estimates were considered statistically significant.

New Hampshire Workers

A New Hampshire worker was defined as a person who was employed for wages, self-employed, or out of work for less than one year at the time of their interview. These individuals were asked these two questions:

- Industry: "What kind of business or industry do you work in, for example, hospital, elementary school, clothing manufacturing, restaurant?"
- Occupation: "What kind of work do you do, for example, registered nurse, janitor, cashier, auto mechanic?"

The workers surveyed included those who worked for small businesses and contractors or were self-employed.

Industry and occupation variables are important for describing the burden and distribution of various public health diseases, behaviors, and conditions. Industry groups encompass a variety of occupations, and occupation groups are found in many different industries.

Occupation categories are classified into nearly 450 broad occupations (98 minor groups and 23 major groups). Detailed occupations in the SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together (https://www.bls.gov/soc/).

Industry categories are classified into 20 key sectors. Five sectors are mainly goods-producing sectors and fifteen are entirely services-providing sectors. Establishments are grouped into industries based on the activity in which they are primarily engaged. Establishments using similar raw material inputs, similar capital equipment, and similar labor are classified in the same industry. (https://www.bls.gov/bls/naics.htm)

Understanding the burden and distribution of work-related asthma by both occupation and industry help us target high risk workers for interventions to prevent illness, as well as for promoting healthy behaviors and better control of conditions like asthma.

Results

There are approximately 713,000 workers aged 16 years or older in New Hampshire. The four top industries (with the four highest numbers of employees) from 2013-2017 are Health Care and Social

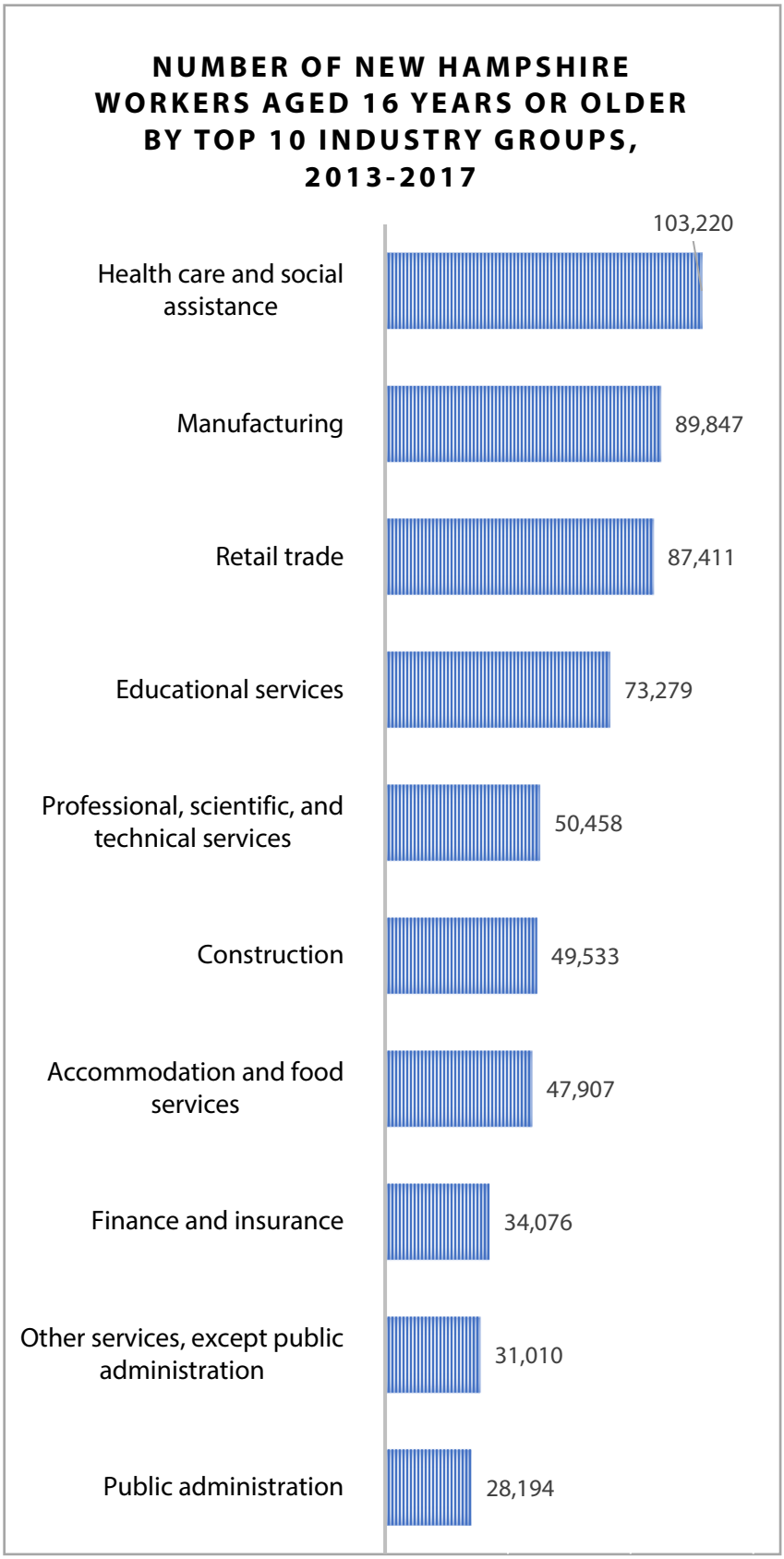


Table 1. Source of Data: 2013-2017 American Community Survey (ACS) 5-Year Estimates

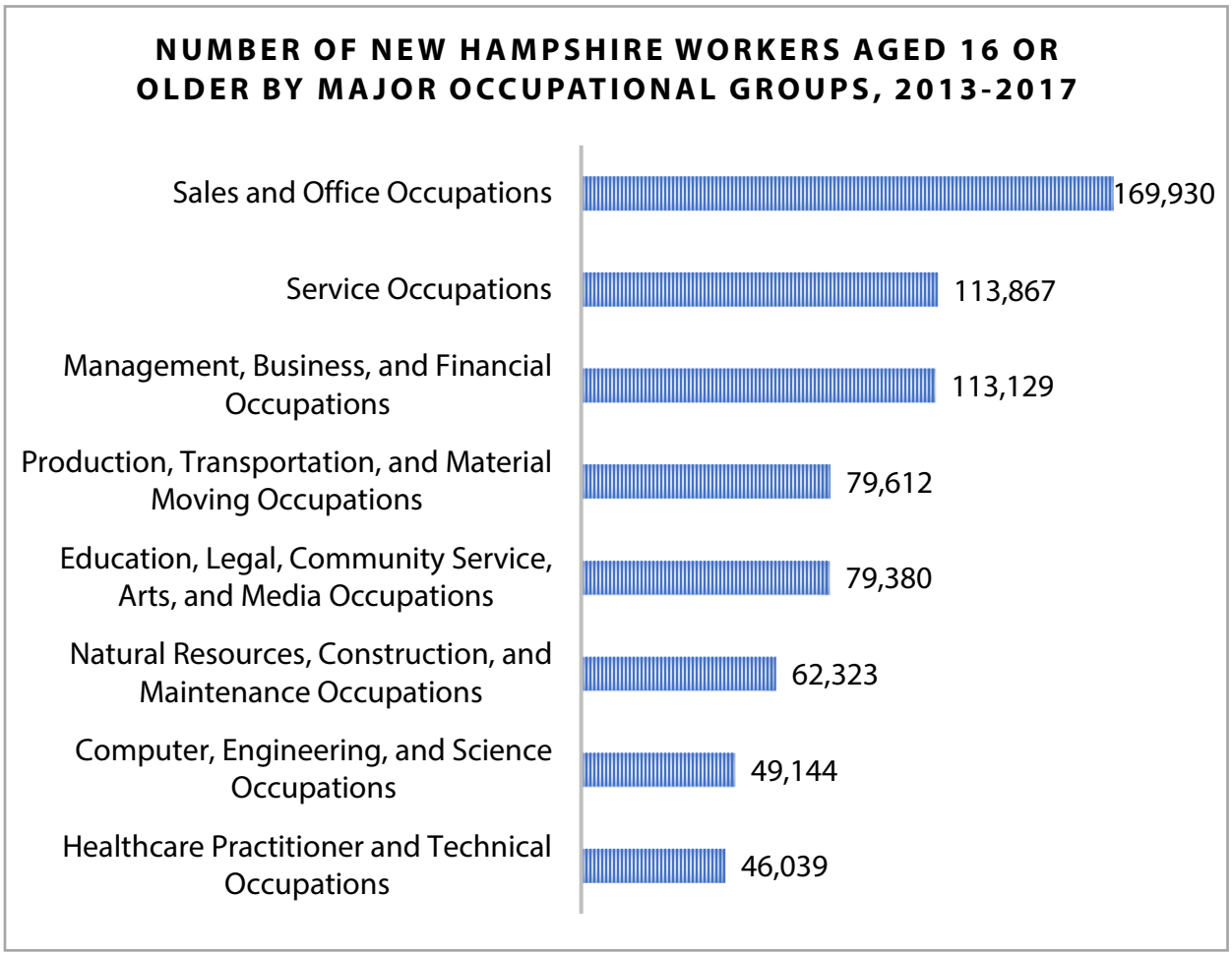


Table 2. Source of Data: 2013-2017 American Community Survey (ACS) 5-Year Estimates

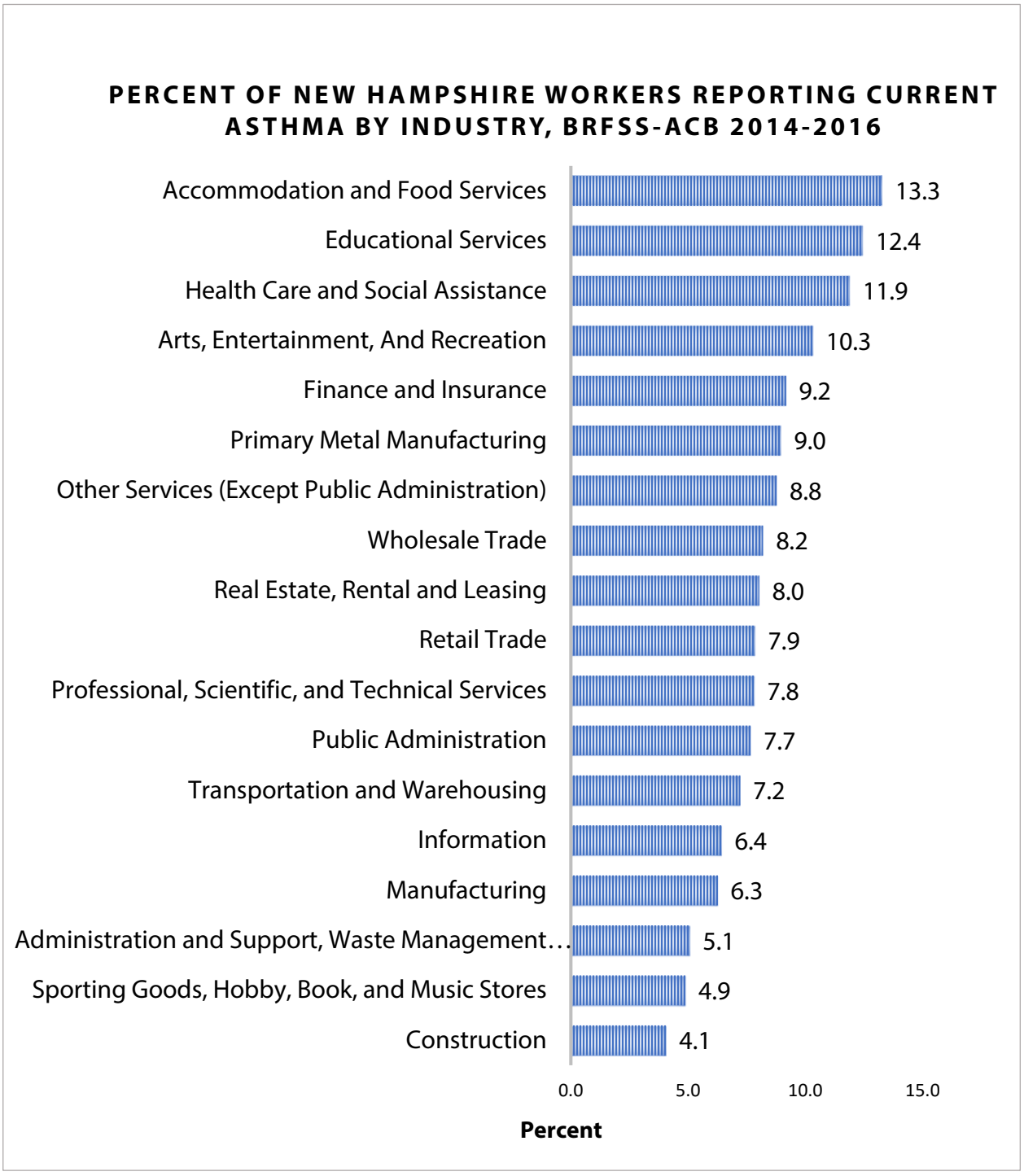
Assistance; Manufacturing; Retail Trade, and Educational Services.

The four top occupations (*with the four highest numbers of employees*) for 2013-2017 are Sales and Office Occupations; Service Occupations; Management, Business, and Financial Occupations; and Production, Transportation, and Material Moving Occupations.

Current Asthma by Industry

The burden of asthma in a given industry or occupation is the result of a variety of factors including the proportion of workers with asthma and the number of workers employed in each industry or occupation.

An analysis of NH BRFSS asthma prevalence for 2014-2016 by industry found a significantly higher proportion of working adults with current asthma employed in Accommodation and Food Services (13.3%) compared with the average proportion for New Hampshire adult workers with current asthma. This industry group includes travel and hotel accommodation and restaurants and drinking establishments.



Current Asthma by Occupation

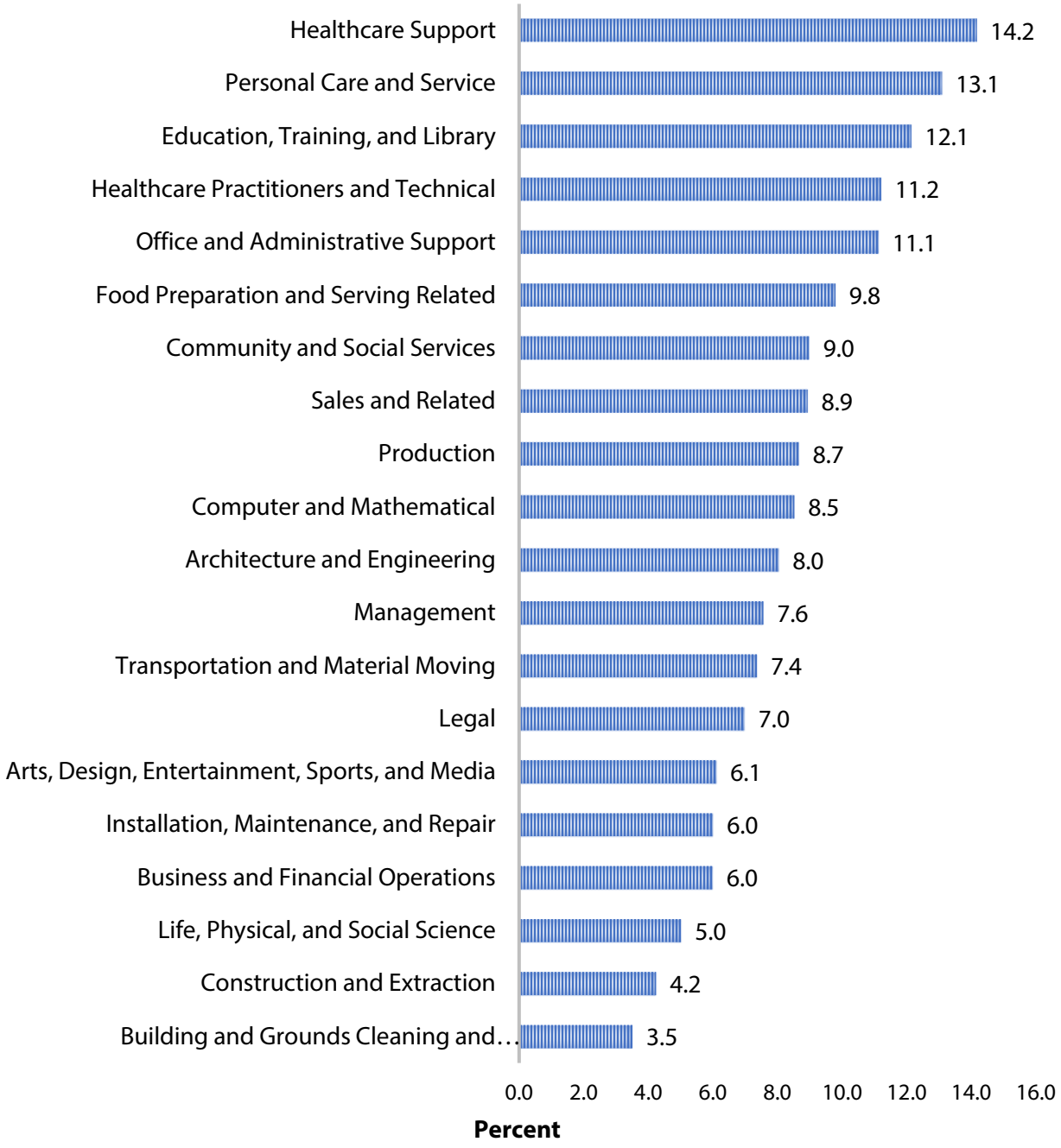
An analysis of current asthma prevalence by occupation found a significantly higher proportion of working adults with current asthma employed in Healthcare Support (15.4%) compared with the average proportion for New Hampshire adult workers with current asthma. Healthcare

Support occupations include nursing home health aids, occupational/physical therapy workers, dental, veterinary, and medical assistants.

Asthma and Work

In the period of 2014-2016, 21.8% of adults with current asthma ever employed reported they had ever discussed work and asthma

PERCENT OF NEW HAMPSHIRE WORKERS REPORTING CURRENT ASTHMA BY OCCUPATION, BRFSS-ACB 2014-2016



with their doctor or health professional. In the same period, 14.8% of adults reported they had ever been told by a doctor or other health professional that their asthma was work related.

The proportion of adults with asthma who believed their asthma was caused or made worse by their current job was higher among those with a high school education or less, compared with those who had graduated from college, and higher among those reporting a household income below $35,000.

WORK-RELATED ASTHMA AMONG NEW HAMPSHIRE ADULTS WITH CURRENT ASTHMA, EVER EMPLOYED OUTSIDE HOME, 2014-2016 BRFSS ADULT ASTHMA CALL BACK SURVEY

	Percent	95% Confidence Interval	
Ever discussed work and asthma with doctor (2014-2016)	21.8	16.6	27.0
Have ever been told by doctor or other health professional that their asthma was work related (diagnosed with work related asthma)	14.8	10.4	19.2

NEW HAMPSHIRE ADULTS WITH CURRENT ASTHMA, WHO WERE CURRENTLY EMPLOYED AND WHO REPORTED THEY BELIEVE THEIR ASTHMA IS CAUSED OR MADE WORSE BY THEIR CURRENT JOB, 2015 BRFSS ADULT ASTHMA CALL BACK SURVEY

Characteristic	Percent	95% Confidence Interval	
Total	24.5	17.1	31.9
Sex			
Male	20.9	9.5	32.4
Female	26.4	16.8	35.9
Age			
18 to 44	23.7	12.3	35.0
45 to 64	23.6	14.9	32.3
65 or older	27.4	5.9	48.9
Education			
High school or less	31.8	14.5	49.0
Technical school or some college	25.5	12.0	39.0
College graduate or more	19.7	10.1	29.2
Household Income			
Less than $35,000	36.4	17.1	55.6
$35,0000 to less than $75,000	12.2	5.0	19.4
$75,000 or more	21.8	11.0	32.5

Limitations

The data used in this study were based on self-reported survey responses. Inaccurate reporting by respondents may result in under- or overestimating the prevalence rates or other measures. Industry and occupation categories are purposefully

broad, due to small numbers in three years of data. Therefore, more detailed occupation or industry types are not available.

Discussion

Our study shows that the industries with the highest proportion of New Hampshire workers reporting current asthma included Accommodation and Food Services; Educational Services; and Healthcare and Social Assistance. These include restaurants and bars, hotels, schools, and hospitals, physicians' offices, outpatient centers, labs, nursing homes, and child and youth services.

We found that workers in the following occupations have the highest prevalence for asthma: Healthcare Support; Personal Care and Service; and Education, Training and Library. These include healthcare workers in supporting positions (home health aids, occupational/physical therapy workers, dental, veterinary, and medical assistants), service providers (animal care and service, entertainment and gaming workers, personal care aids, fitness trainers, hair and nail salon workers, and childcare workers), and teachers, librarians, teachers assistants, and paraprofessionals.

Workplace Exposures

Service oriented occupations represented in our results are potentially exposed to a number of well-known asthma-related substances in the workplace. For example, in Healthcare Support, workers may be exposed to anesthetic agents, biocides, disinfecting agents, formaldehyde, latex, and adhesives. In Personal Care and Service, and Educational Services occupations, workers can be exposed to cleaning products, mold, dust mites, pesticides, cosmetic products, hair dyes, and bleaches and straightening products. In addition to the exposures mentioned here, Food and Accommodation workers may be exposed to baking flours or cereal dust. There are also environmental substances that may be encountered at work that can make asthma symptoms worse, including tobacco smoke, smoke from burning wood, air pollution and allergens from plant pollen, animal dander, and perfumes. Workers who are exposed to both environmental and workplace irritants are at higher risk. Fortunately, when potential substances are recognized, work-related allergies and asthma can often be prevented, or their effects minimized.

Prevention

Best practices involving control of environmental triggers can lead to reduction of exposures to asthma-causing agents in all industries. For example, in Service and Education Support occupations, replacing cleaning products with products without hazardous chemicals such as ethylene oxide or formaldehyde is one way to reduce exposure. In general, using non-toxic or natural products, especially those with Green Seal certification (https://www.greenseal.org/), are alternatives that can be effective in reducing

the prevalence of asthma among workers. In Education, the Environmental Protection Agency offers the "Tools for Schools" Action Kit (U.S. EPA Creating Healthy Indoor Air Quality in Schools at www.epa.gov/iaq-schools), which provides best practices, industry guidelines, sample policies, and a sample indoor air quality management plan to improve school air. It is especially important to ensure that leaks and moisture problems in schools are thoroughly dried within 24-48 hours to prevent mold growth. Make sure schools are dusted and vacuumed thoroughly and regularly and keep classrooms free of clutter. If stuffed toys are present, ensure they are washable and wash them regularly in hot water. Use Integrated Pest Management (IPM) to prevent cockroach and other pest problems (e.g., store food in tightly sealed containers and place dumpsters away from the building).

In industries where latex is used (Healthcare, Animal Health), switching to latex-free alternatives has been shown to be effective in reducing asthmagen exposure. For those in Food Service, using pre-mixed or ready-to-bake products may help to reduce the exposure to flours, wheat, and cereal dust.

Overall, proper ventilation and use of personal protective equipment (where needed) such as respirators, eye protection and gloves, while they do not provide absolute protection, will help in limiting risk of exposure to certain asthmagens. The Occupational Safety and Health Administration respiratory protection standard requires employers to establish and maintain an effective respiratory protection program, including a medical evaluation, when employees must wear respirators to protect against workplace hazards. (OSHA Respiratory Protection Standard at: www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134)

Recommendations

Workers should seek regular medical care for their asthma, even when symptoms are not apparent, and should work with their medical providers to gain a good understanding of their asthma medications and triggers. Workers and others with asthma should ask their medical providers for an "asthma action plan" with clear steps for living with asthma. Workers should also avoid potential asthma triggers in their lives outside of work. Medical providers should ask their patients with asthma about their work and consider possible exposures in the workplace when assessing asthma triggers. A short medical removal period may help some workers with asthma.

In order to further investigate the relationship between asthma and work in the future, ensuring the capture of industry and occupation data in the BRFSS will be crucial. This information will help to expedite efforts to reduce exposures to asthmagens in workplaces where it is most prevalent. It can help improve prevention and control strategies to workers who,

because of their occupation or the materials they handle, are at high risk for the burden of work-related asthma.

For more information, please go to the National Institute for Occupational Safety and Health (NIOSH) website for work-related asthma at: www.cdc.gov/niosh/topics/asthma/default.html

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