Wisconsin Occupational Health Indicators Report

2009–2018

Wisconsin Department of Health Services | Bureau of Environmental and Occupational Health | Occupational Health Program
P-45104-2020 (08/2020)

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Introduction

The Division of Public Health's Bureau of Environmental and Occupational Health is moving Wisconsin forward to meet the vision of Healthiest Wisconsin 2020,[1] the State Health Plan: "everyone living better, longer" by:

- Tracking occupational injuries, illnesses, and death in Wisconsin.
- Investigating circumstances around workplace illness, injury, and death in Wisconsin.
- Participating in national work groups and local coalitions.
- Linking environmental health, protection, and preparedness, with occupational safety, community coalitions, and governmental agencies.
- Developing and disseminating materials to educate workers and administrators about workplace hazards and how to prevent them.
- Evaluating the effectiveness of workplace interventions.

The Occupational Health Program created this report to be an added tool to move us toward this vision. It provides an update to the last surveillance report, released in 2016.[2] The Wisconsin Occupational Health Program maintains a federally funded occupational health surveillance system and bases its activities around collecting detailed information for 25 indicators identified by the Council for State and Territorial Epidemiologists (CSTE) and the National Institute for Occupational Safety and Health (NIOSH).

Occupational health indicators are summary measures that describe key aspects of adverse health outcomes associated with working in Wisconsin. More specifically, an occupational health indicator is a measure of a work-related disease or injury, or a factor associated with occupational health such as workplace exposures. The Wisconsin occupational health indicators describe key trends in occupational fatalities, non-fatal injuries, and health effects. These measures can be used as a foundation for developing appropriate intervention and prevention strategies and designing programs to address key occupational health concerns.

The 25 indicators in this report include:

1. Non-fatal injuries and illnesses reported by employers.
2. Work-related hospitalizations.
3. Fatal work-related injuries.
4. Amputations reported by employers.
5. Amputations identified in state workers' compensation system.
6. Hospitalization for work-related burns.
7. Musculoskeletal disorders reported by employers.
8. Carpal tunnel syndrome cases identified in state workers' compensation system.
9. Pneumoconiosis hospitalizations.
10. Pneumoconiosis mortality.

11. Acute work-related pesticide poisonings reported by Wisconsin Poison Control Center.
12. Incidence of malignant mesothelioma.
13. Elevated blood lead levels among adults.
14. Workers employed in industries with high risk for occupational morbidity.
15. Workers employed in occupations with high risk for occupational morbidity.
16. Workers employed in industries and occupations with high risk for occupational mortality.
17. Occupational safety and health professionals.
18. Occupational safety and health administration (OSHA) enforcement activities.
19. Workers' compensation awards.
20. Low back disorder hospitalizations.
21. Work-related asthma.
22. Work-related severe traumatic injury hospitalizations.
23. Influenza vaccination coverage among health care personnel.
24. Occupational heat-related emergency department visits.
25. Hospitalizations for and with occupational eye injuries.

Data tables for each indicator and information on data sources are provided in the appendix.

Key findings

Over the last decade, many of the occupational health indicators have reflected a decline in work-related disease or injury, even as the percentage of people going into high-risk occupations and industries has increased.

- The total rate of pneumoconiosis hospitalizations has decreased by 71% from 2009 to 2018.
- The incidence rate of carpal tunnel syndrome has decreased by 65% from 2009 to 2017.
- The rate of work-related low back hospitalizations and surgeries decreased by over 60% between 2009 and 2014.
- The total rate of work-related hospitalizations has decreased by 41% from 2009 to 2018.
- The incidence rate of mesothelioma decreased by 23% from 2009 to 2017.
- The total rate of work-related musculoskeletal disorders has decreased by 19% from 2011 to 2017.
- The total rate of work-related injury and illness has decreased by 14% from 2009 to 2018.

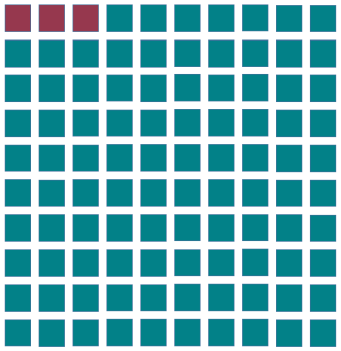
Technical notes

- The demographics presented may not add up to 100 due to rounding errors.
- In 2015, there was a change in coding of medical conditions from ICD-9 to ICD-10, which may have created significant changes in counts and rates in 2015–16.
- We have chosen not to present analyses for the statistical significance of indicator time trends for two reasons: graphic presentation of the data provides adequate descriptive information, and each of the trend statistics methods currently used requires an understanding of its assumptions and application to these data to appropriately interpret the statistic.

2018 Employment Demographics

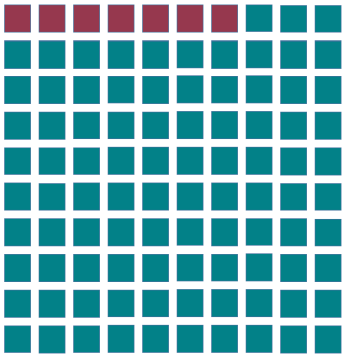
Research has shown relationships between demographic characteristics of workers and the risk of occupational injury or illness. Understanding the basic characteristics of a state's workforce is important to assessing possible occupational health risks. The following graphics represent the demographic breakdown of the Wisconsin workforce.

Percentage of civilian workforce



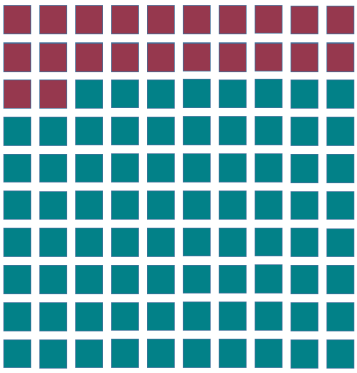
Unemployed (3%)

Civilian workforce



Self-employed (7%)

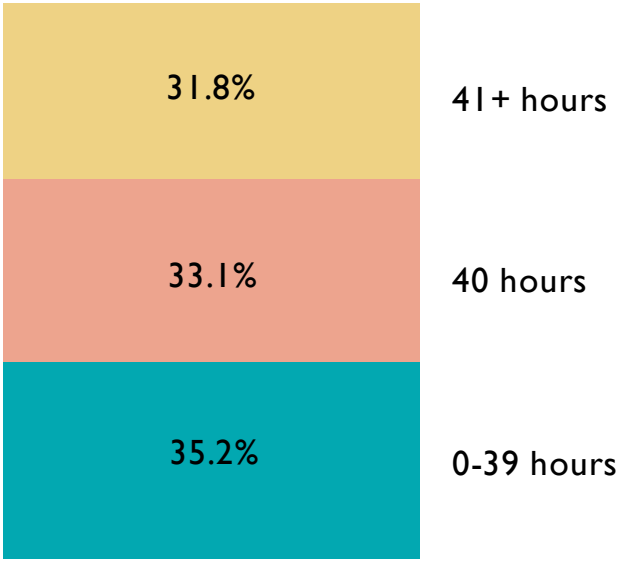
Private or government employed



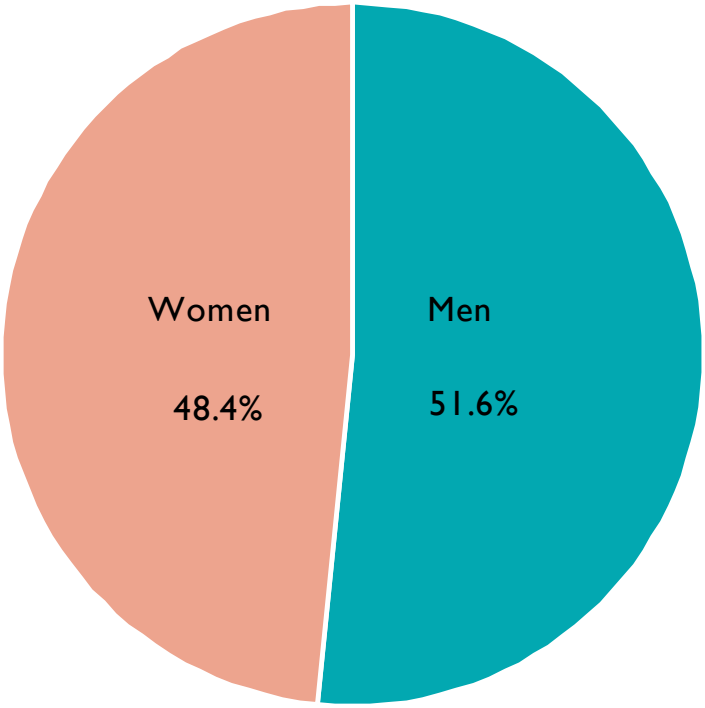
Employed part-time (22%)

Employed full-time

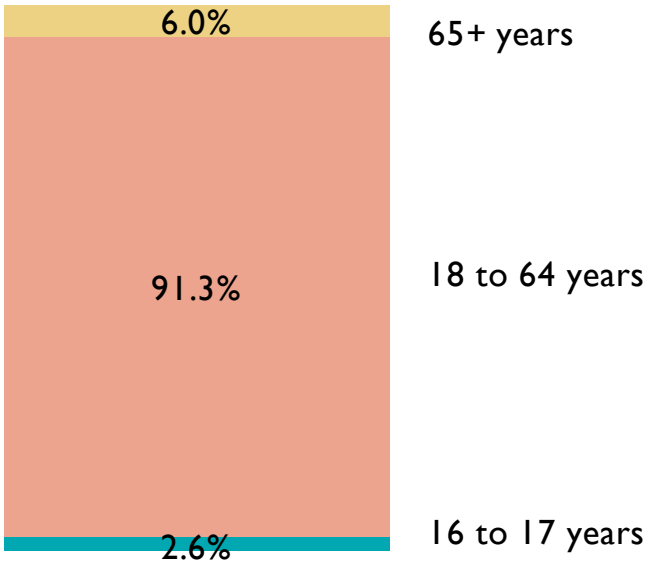
Percentage of workforce by hours worked



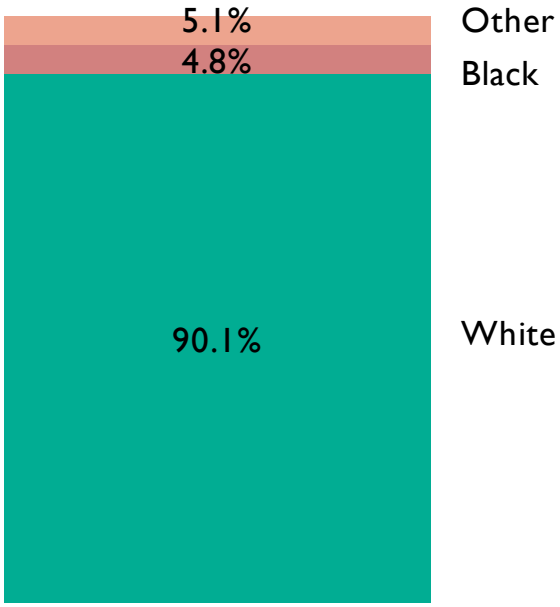
Percentage of civilian employment by sex



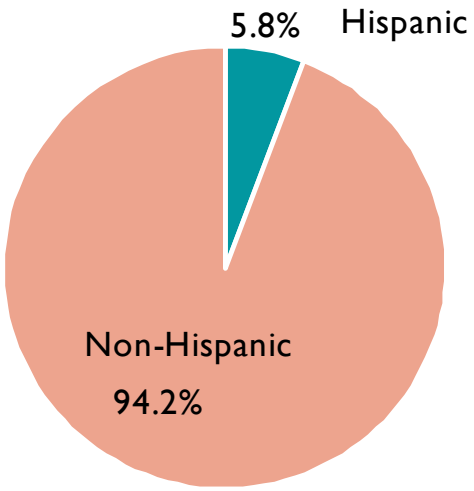
Percentage of civilian employment by age group



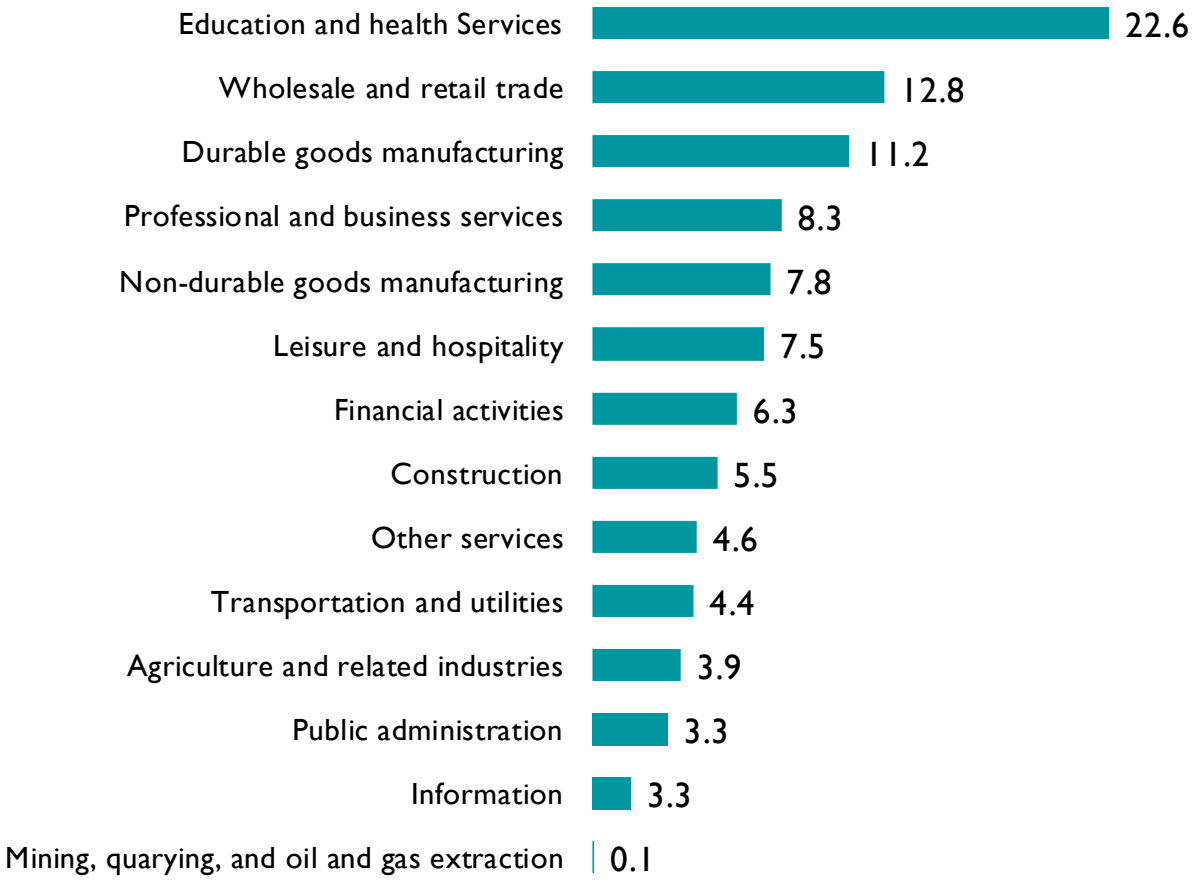
Percentage of civilian employment by race



Percentage of civilian employment by Hispanic origin

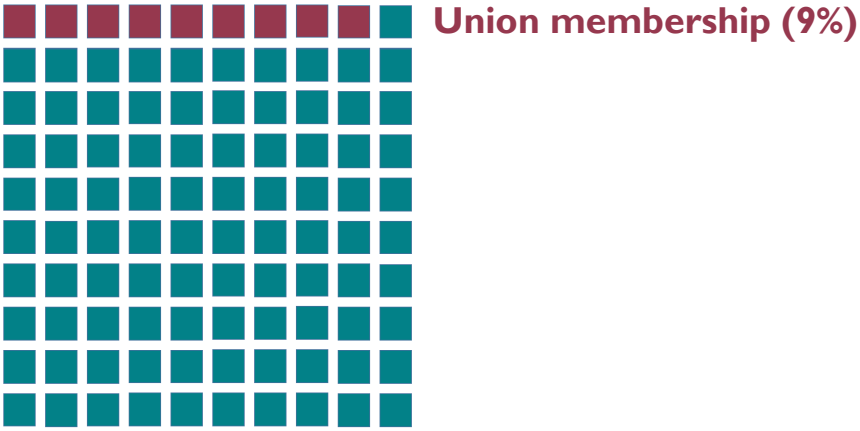


Percentage of civilian employment by industry



Percentage of civilian employment by occupation

Percentage of civilian employment by union membership



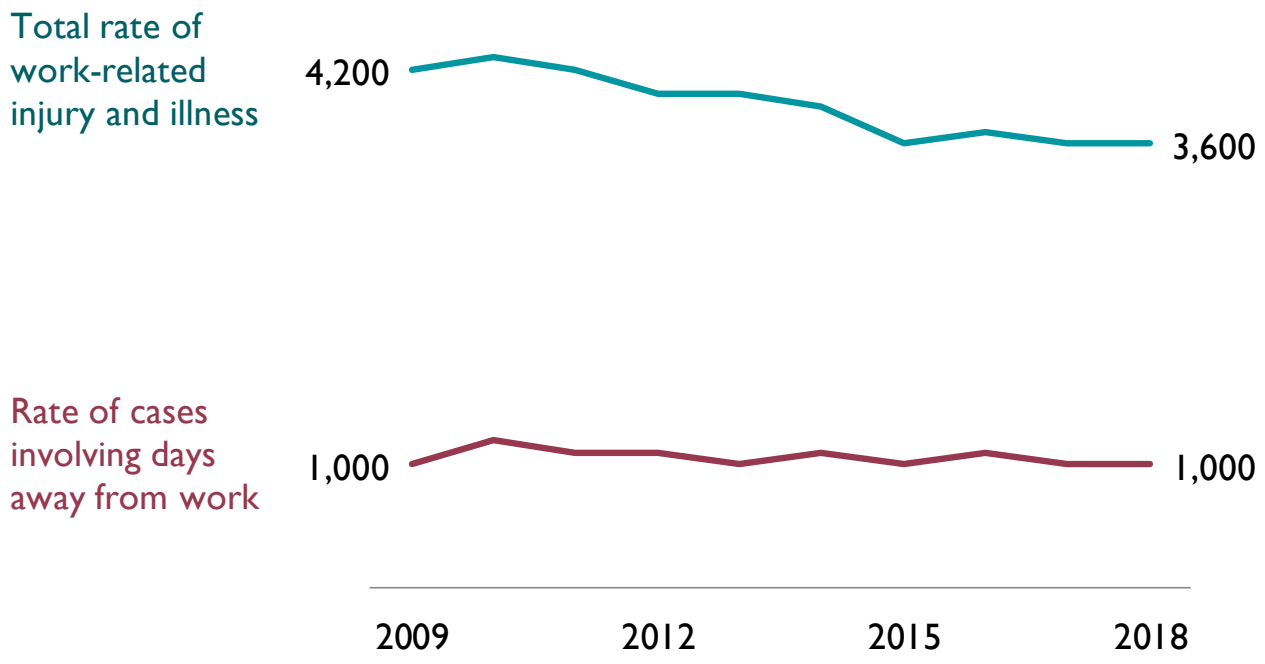
CSTE/NIOSH Indicators

1: Non-Fatal Injuries and Illnesses Reported by Employers

This indicator tracks work-related injuries or illnesses that result in an employee having to take time away from work and is based on data collected by the Bureau of Labor Statistics (BLS) in the annual Survey of Occupational Injuries and Illnesses (SOII). Examples of work-related injuries include falls, burns, fractures, electric shocks, cuts, amputations and needle-sticks. Examples of work-related illnesses include asthma, some types of cancer, asbestosis, carpal-tunnel syndrome, frostbite, and hearing loss. Injuries and illnesses prevent an employee from participating in normal activities and adversely impact the employee, the employee's family, and the employer. Work related injuries and illnesses are preventable with proper training and control of occupational hazards.

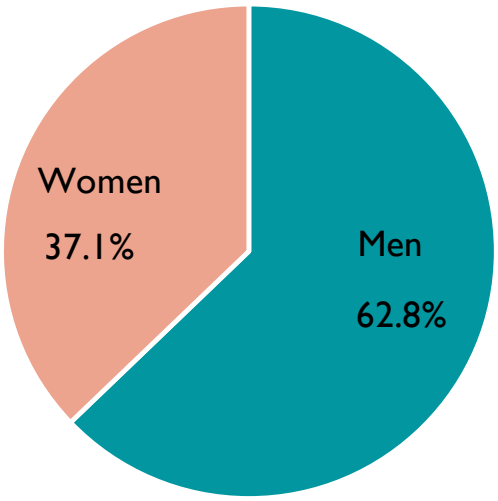
In Wisconsin, the rate of non-fatal work-related injuries decreased by 14% from 2009 to 2018 (4200 to 3600 cases per 100,000 workers). The rate of cases involving days away from work remained the same (1000 cases per 100,000 workers).

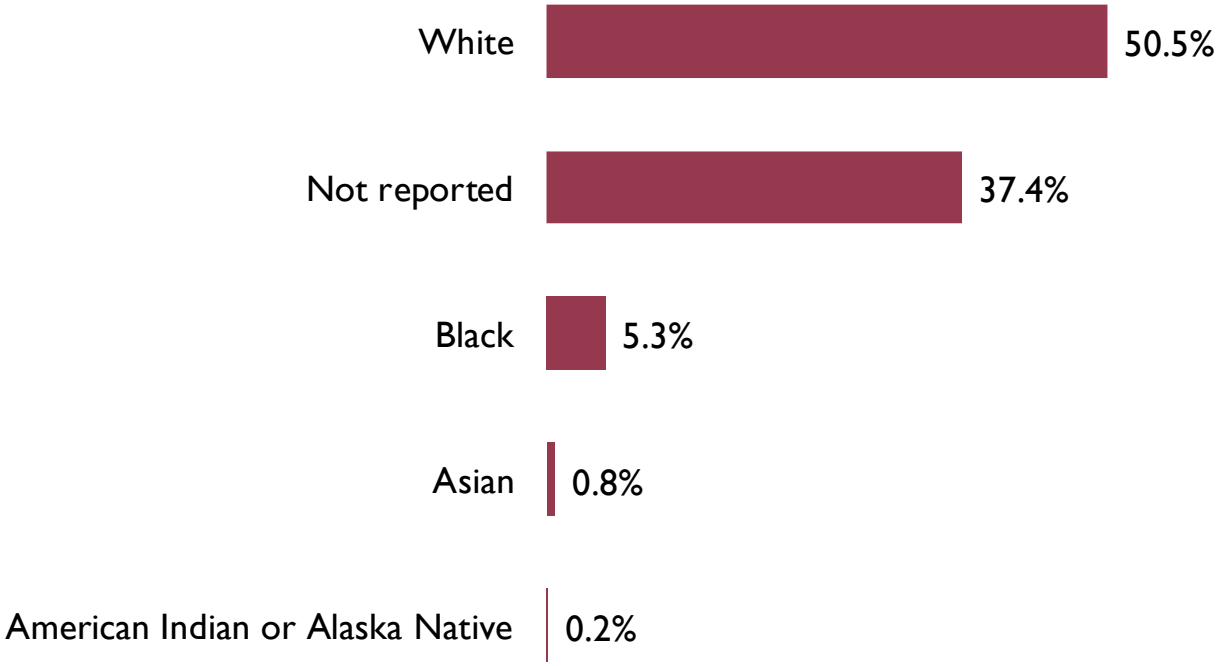
Rate of work-related injury and illness per 100,000 full-time employees, 2009–2018



1: Non-Fatal Injuries and Illnesses Reported by Employers

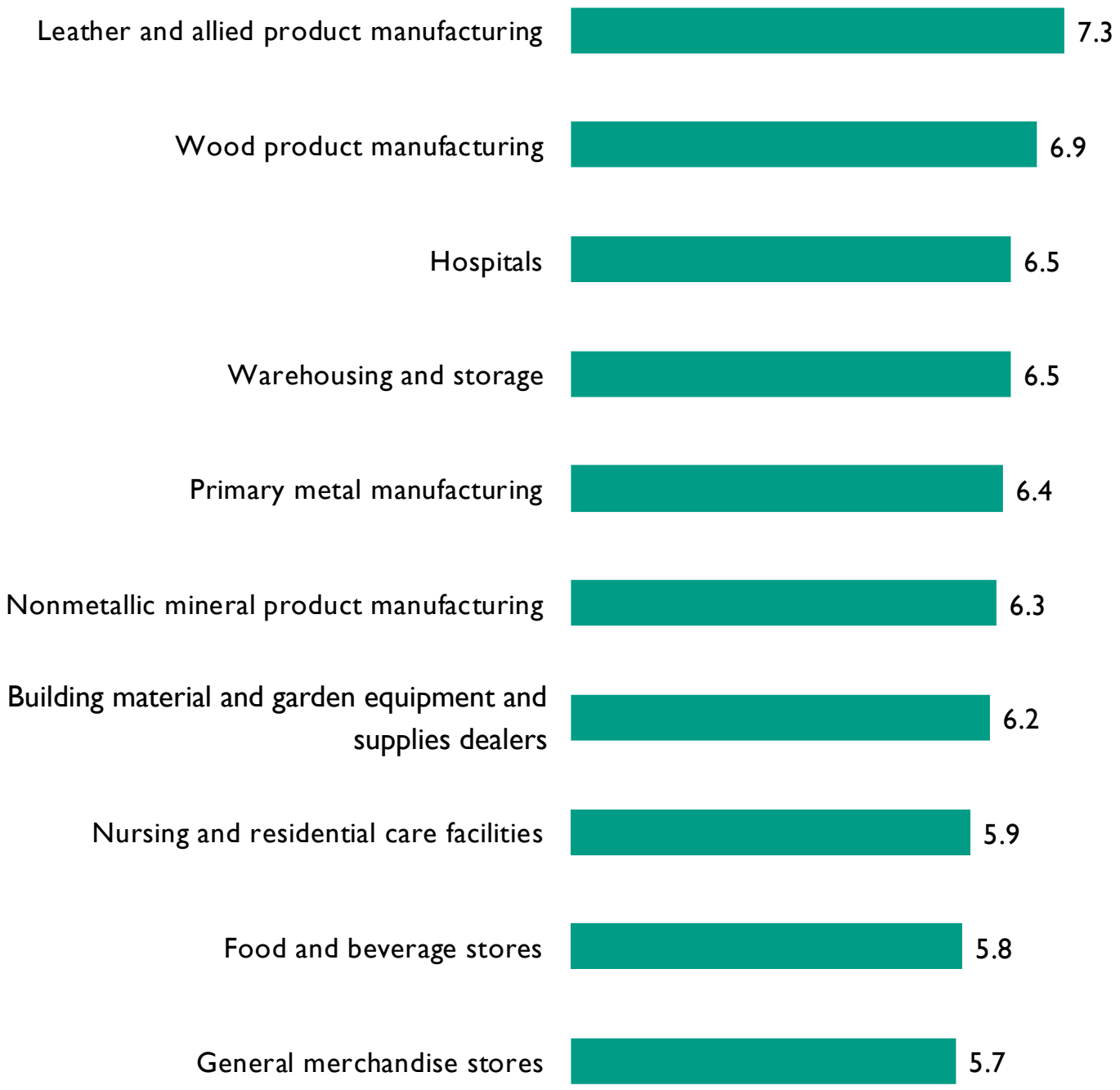
Demographic distribution of non-fatal injuries and illnesses in private industry by sex and race, 2018





1: Non-Fatal Injuries and Illnesses Reported by Employers

Rate of non-fatal injuries and illness by industry per 100,000 employees ages 16+ years, 2018



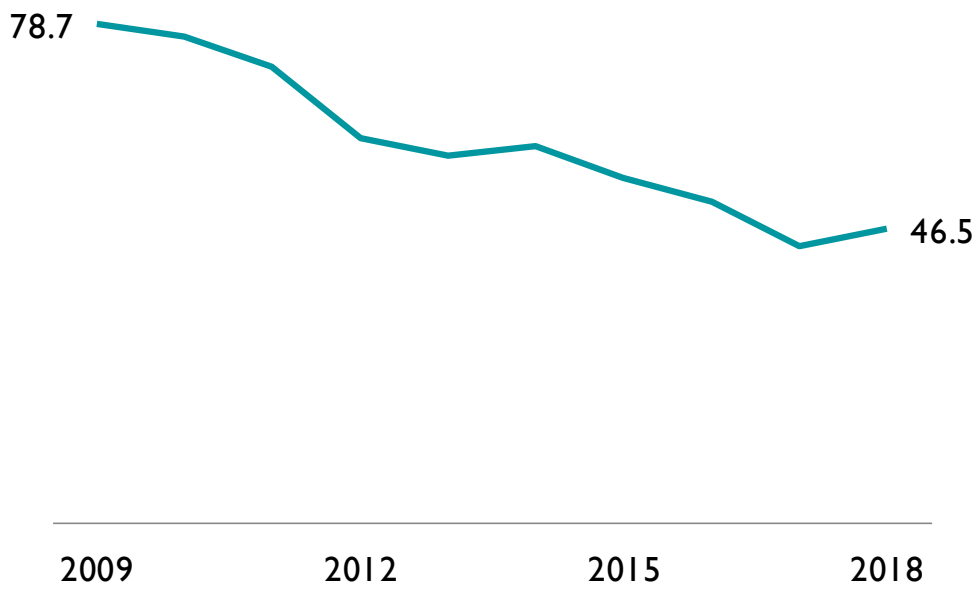
2: Work-Related Hospitalizations

This indicator represents the number of hospitalizations that occur from work-related injuries or illnesses. Work-related hospitalizations are defined in this indicator as hospitalizations in which workers' compensation is the payer source. Tracking of these significant adverse health effects can help to document the burden of occupational injuries and illnesses; design, target, and evaluate the impact of prevention efforts over time; and identify settings in which workers may continue to be at high-risk for injury or illness.

Individuals hospitalized with work-related injuries and illnesses have some of the most serious and costly work-related adverse health outcomes. According to CSTE, approximately 3% of workplace injuries and illnesses nationwide result in hospitalizations, and hospital charges for work-related conditions exceed $3 billion annually.[3] Most identified work-related hospitalizations are for treatment of musculoskeletal disorders and acute injuries.

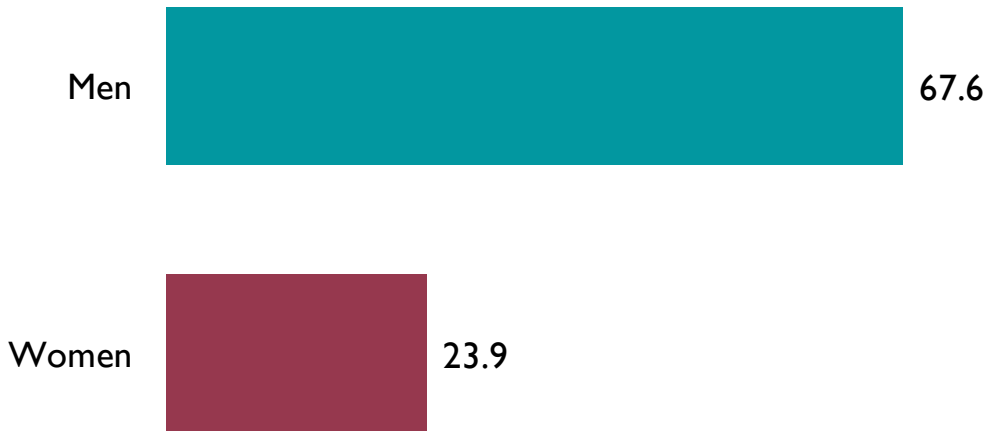
In Wisconsin, the rate of hospitalizations decreased 41% from 2009 to 2018 (78.7 to 46.5 per 100,000 full-time employees).

Total rate of work-related hospitalizations per 100,000 employees ages 16+ years, 2009-2018



2: Work-Related Hospitalizations

Total rate of work-related hospitalizations by gender per 100,000 employees ages 16+ years, 2018



Total rate of work-related hospitalizations by race and ethnicity per 100,000 employees ages 16+ years, 2018

2: Work-Related Hospitalizations

Rates of work-related hospitalizations by county per 100,000 employees ages 16+ years, 2018.

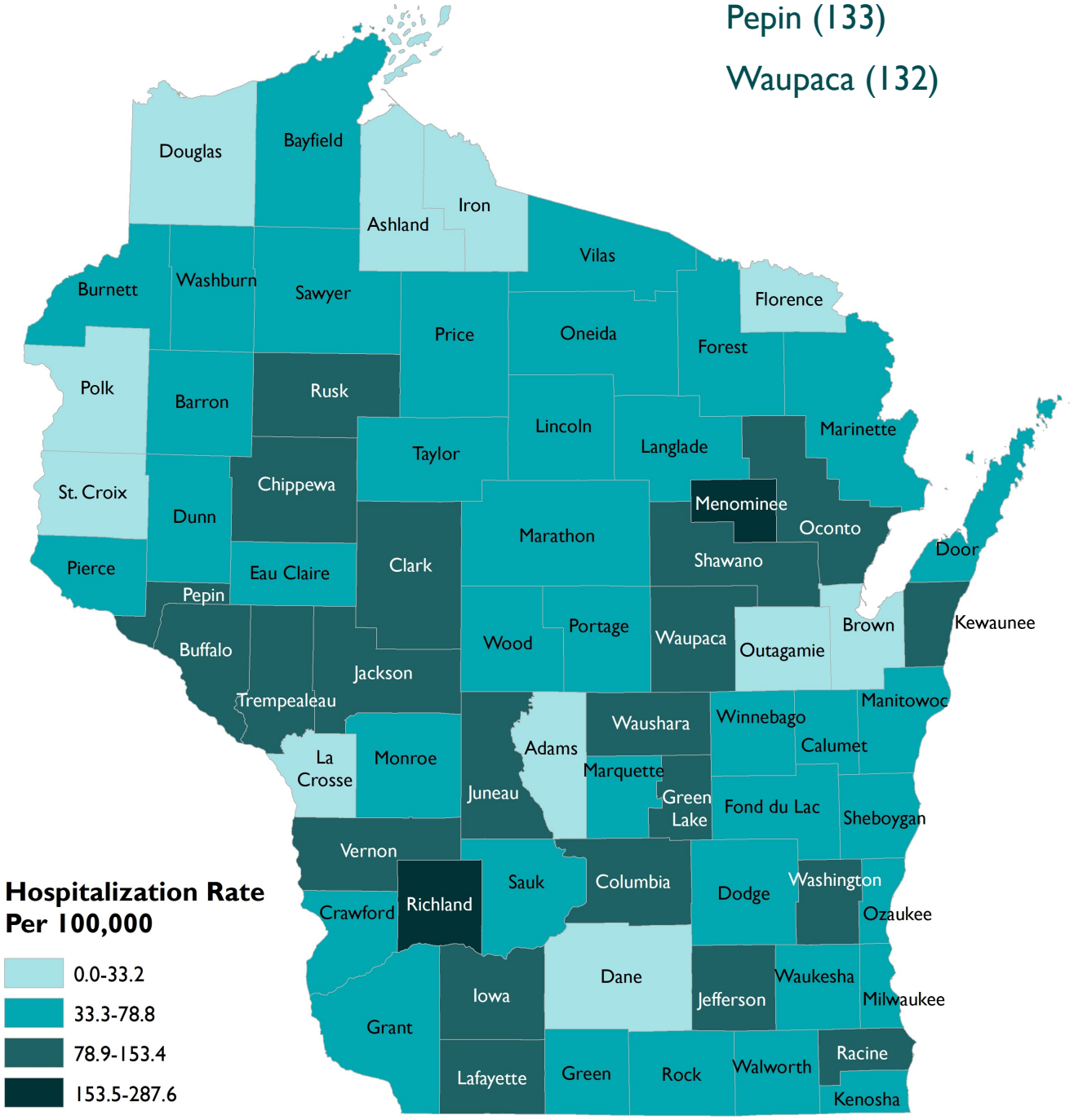
The counties with the highest hospitalization rates are: Menominee (288)

Richland (204)

Oconto (153)

Pepin (133)

Waupaca (132)

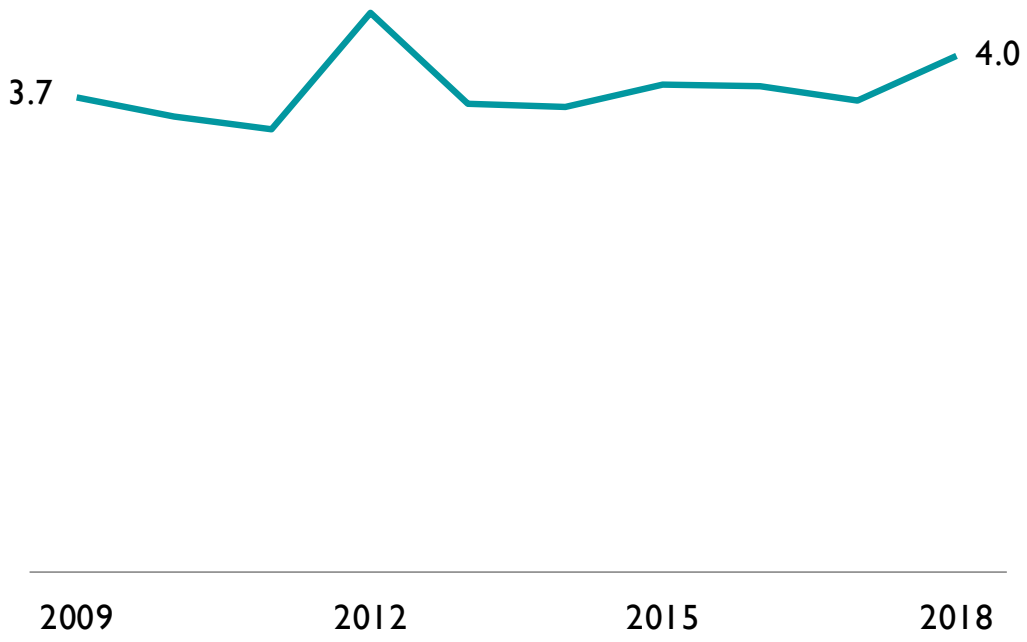


3: Fatal Work-Related Injuries

It has been estimated that the total medical and indirect costs of fatal work-related injuries and diseases in 2018 were over $6 billion in the U.S.[4] In 2018, the fatal injury rate was 3.5 fatalities per 100,000 full-time workers.[5] Monitoring of rates and trends of work-related deaths serves as a critical tool in identifying new hazards and evaluating health and safety practices to prevent fatal injuries in the workplace.

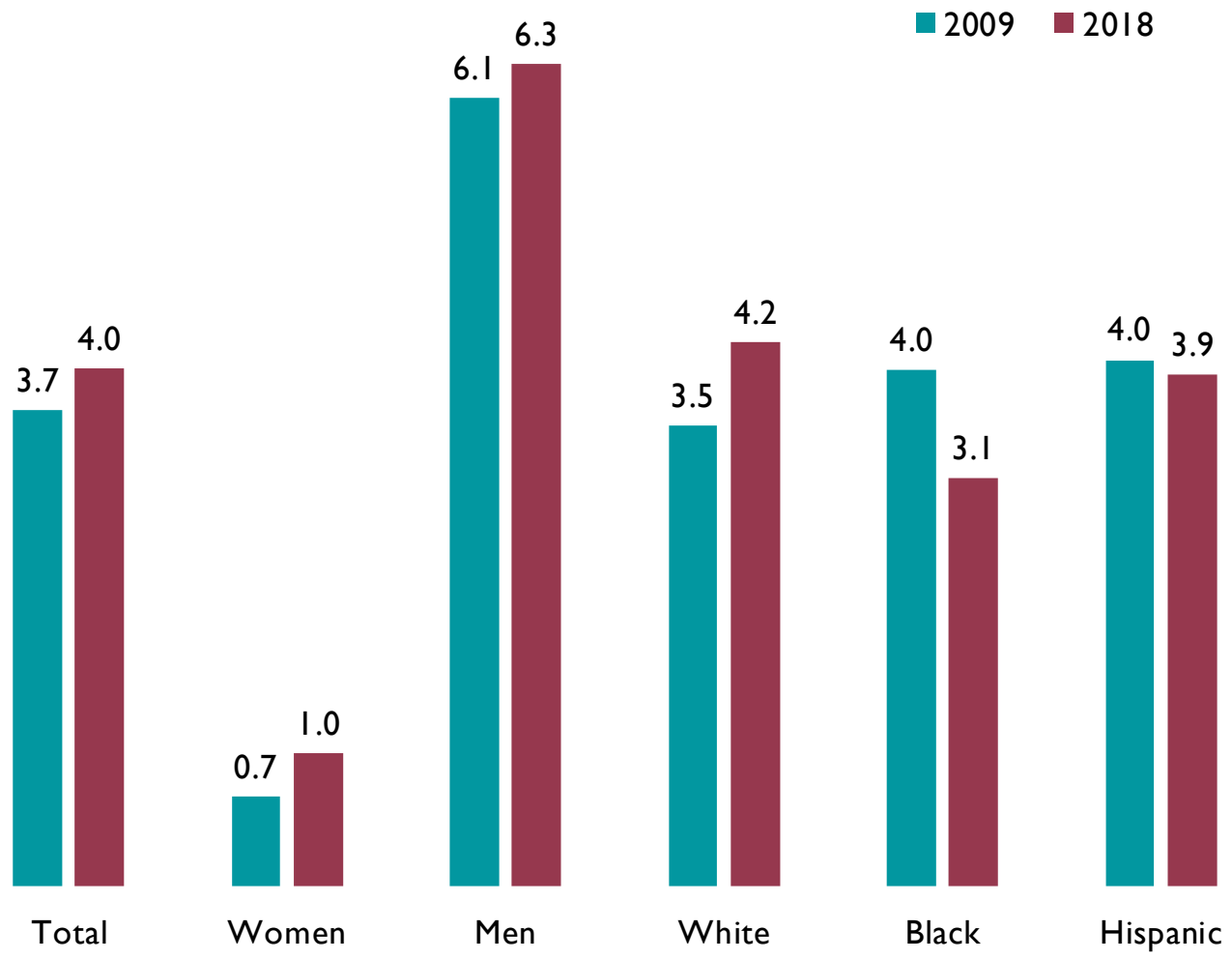
In Wisconsin, the total rate of fatal work injuries increased 7.5% from 2009 to 2018 (3.7 to 4.0 per 100,000 full-time employees). During the same time period, the national rate has remained relatively stable at 3.5 per 100,000.

Total rate of fatal work-related injuries per 100,000 full-time employees ages 16+ years, 2009-2018



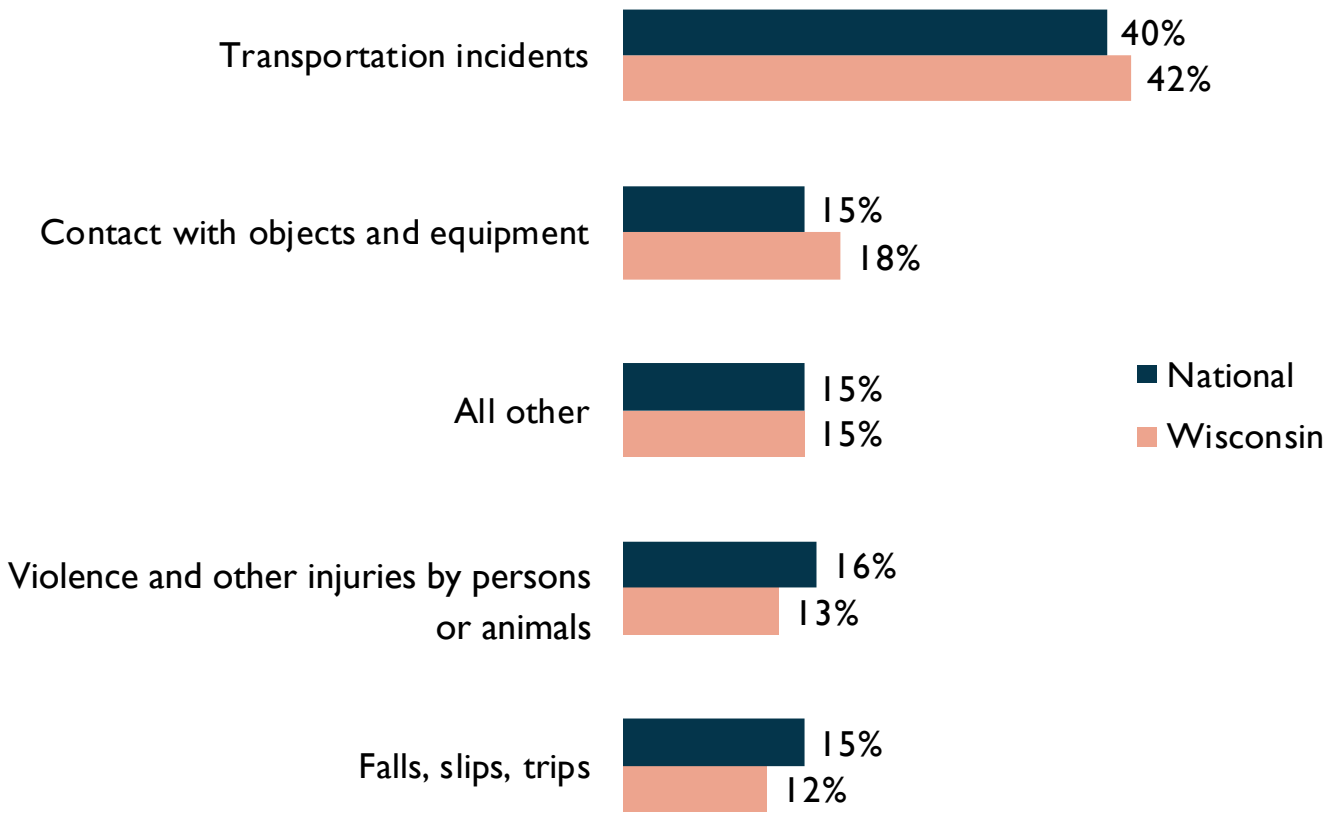
3: Fatal Work-Related Injuries

Total rate of fatal work-related injuries by race and gender per 100,000 full-time employees ages 16+ years, 2009 and 2018



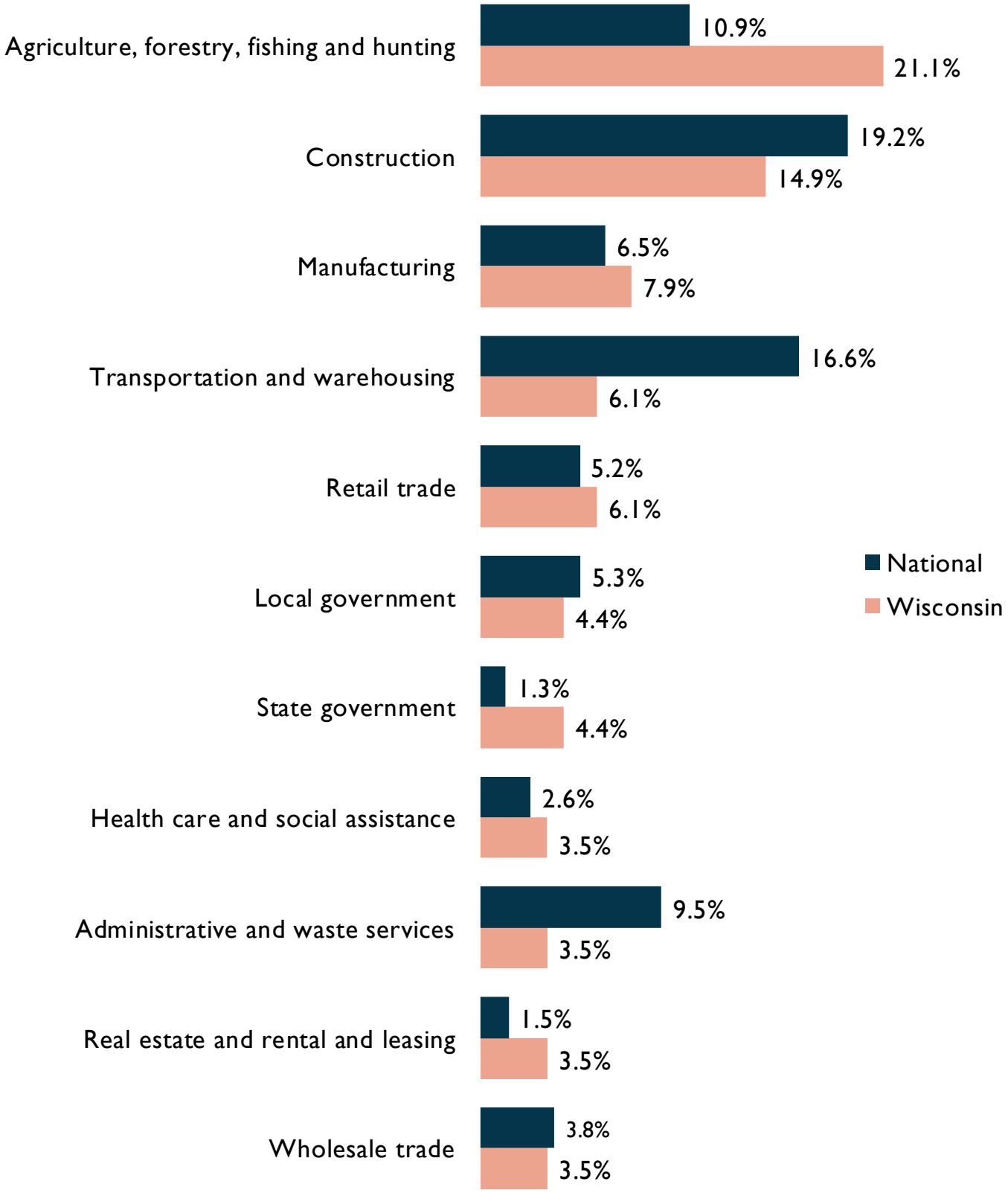
3: Fatal Work-Related Injuries

Percent of fatal work-related injuries by event, National and Wisconsin, 2018



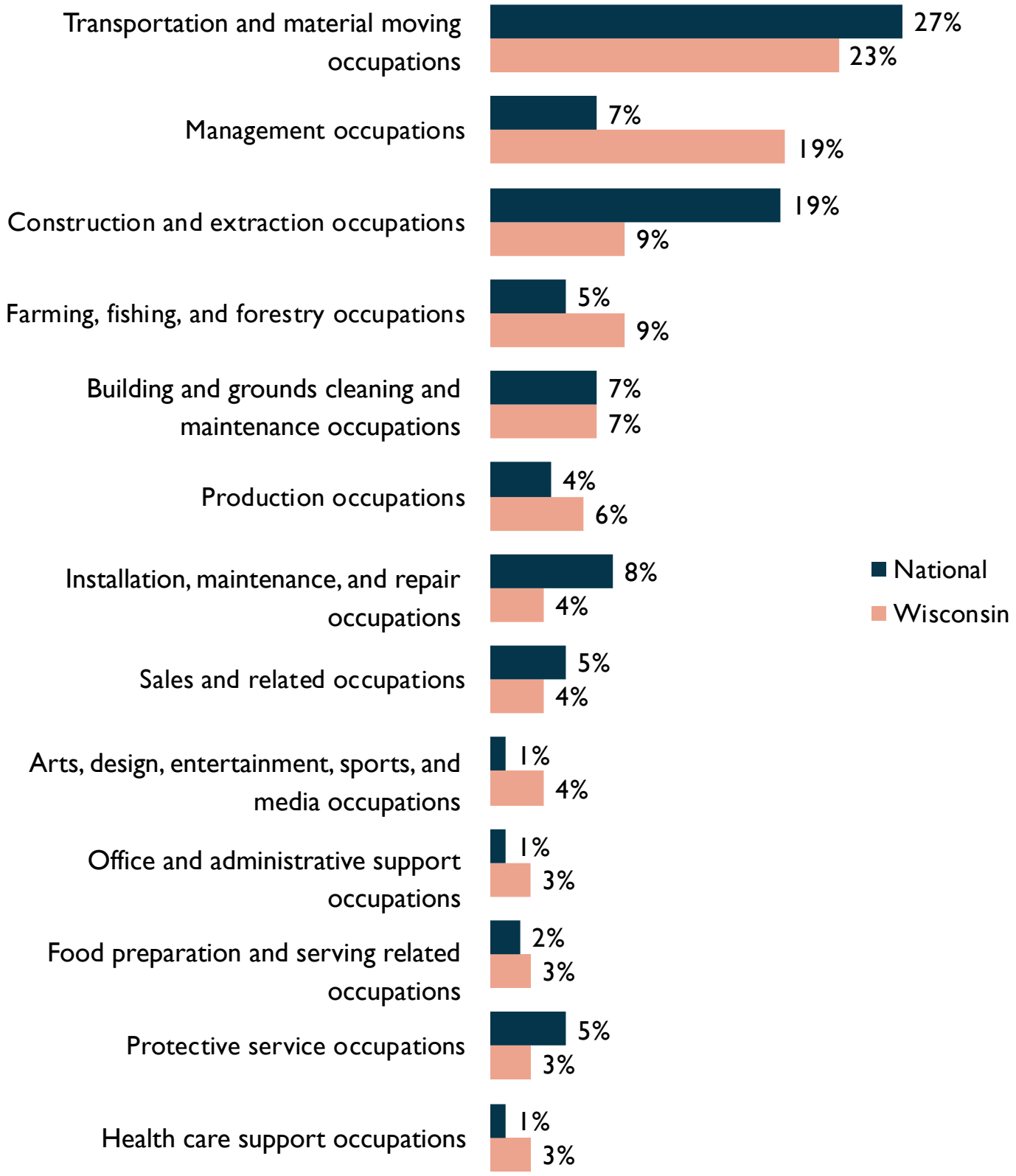
3: Fatal Work-Related Injuries

Top ten industries with fatalities, National and Wisconsin, 2018



3: Fatal Work-Related Injuries

Top ten occupations with fatalities, National and Wisconsin, 2018

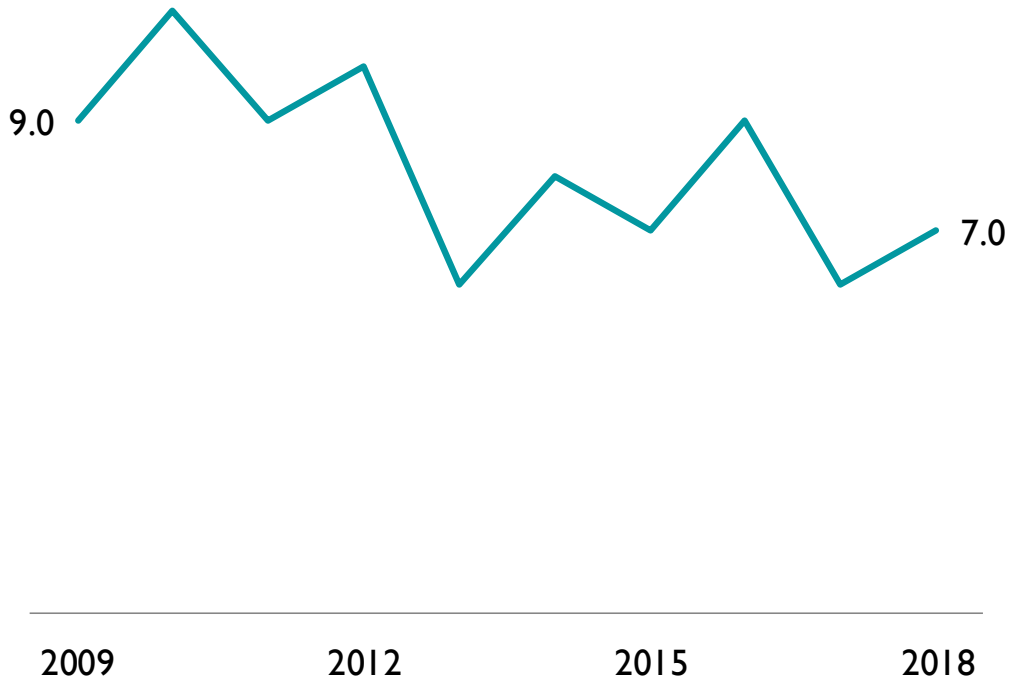


4: Amputations Reported by Employers

An amputation is defined as full or partial loss of a protruding body part—an arm, hand, finger, leg, foot, toe, ear, or nose. An amputation is a preventable injury, and may greatly reduce a worker's job skills and earning potential as well as significantly affect general quality of life. Amputations are widespread and involve a variety of activities and equipment, from workers operating unguarded or inadequately safeguarded machines, to using forklifts, trash compactors, and powered and non-powered hand tools.

In Wisconsin, the incidence rate of work-related amputations reported by employers decreased 22% from 2009 to 2018 (9.0 to 7.0 per 100,000 employees). The annual variation noted in Wisconsin is in part due to the small numbers of amputations reported. Employers are only required to report the details of an injury when a worker misses more than one day of work. Furthermore, workers may not be counted if they are placed on restrictive duty and do not miss work.

Incidence rate of work-related amputations reported by employers per 100,000 full-time employees, 2009-2018



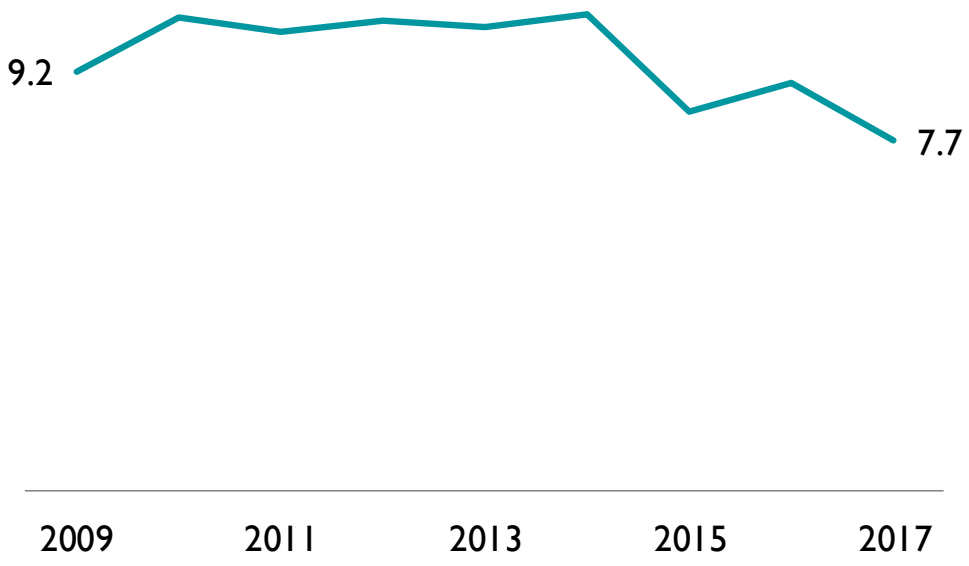
5: Amputations Identified in State Workers' Compensation Systems

This amputation indicator utilizes state workers' compensation claims data to characterize the numbers, rates, and trends of amputations across the U.S. Annually, the indicator measures the number of amputation cases with work-time loss, identified in the state workers' compensation claims, per 100,000 workers covered by state workers' compensation systems. Males were more likely to experience a nonfatal work-related amputation with days away from work. [6]

Note: Two indicators measure the number of amputations that occur due to work-related activities: amputations reported by employers through data collected by the BLS in the annual SOII (Indicator 4) and amputations that involve workers' compensation claims (Indicator 5). While these two indicators measure similar outcomes, the data used to create each indicator produce different estimates of the number of amputations with lost work time. It is important to examine both indicators to obtain the best estimate for amputations with lost work time.

In 2016, the latest year for national data, the national average rate of amputations was 4.6 per 100,000. In that year, Wisconsin had the highest rate (8.9) of the 21 states reporting data to CSTE. In Wisconsin, the incidence rate of amputations filed declined by 16% from 2009 to 2017(9.2 to 7.2 per 100,000 workers covered by worker's compensation).

Incidence rate of work-related amputations filed with Wisconsin Worker's Compensation (WC) per 100,000 workers covered by WC, 2009-2017

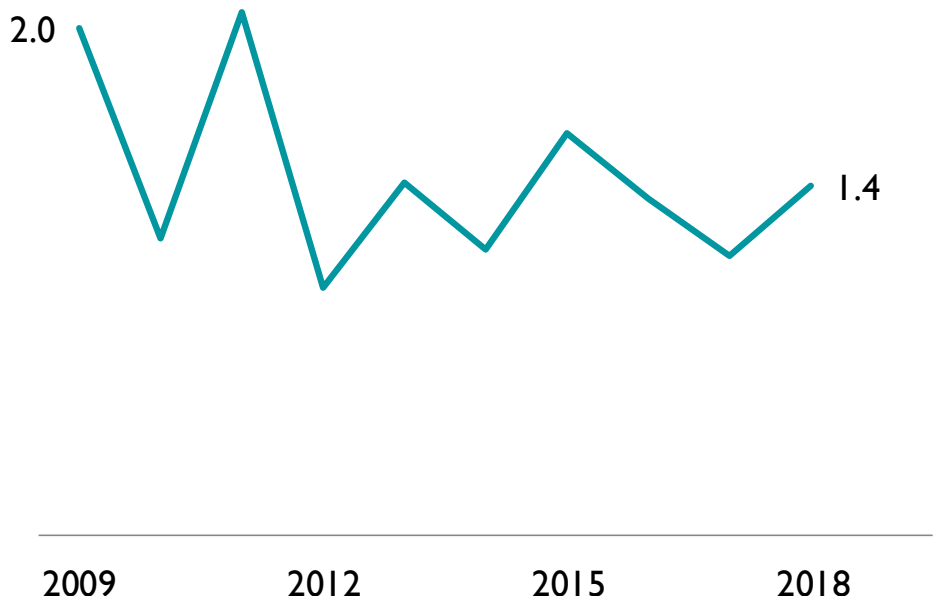


6: Hospitalizations for Work-Related Burns

Burns encompass injuries to tissues caused by contact with dry heat (fire), moist heat (steam), chemicals, electricity, friction, or radiation. To track the incidence of hospitalizations for burns related to work activity, this indicator utilizes data from hospital discharge records in which workers' compensation is the anticipated payer. Although work-related hospitalized burns are unusual events, they are some of the most devastating, painful, and expensive injuries to treat. Many burns result in disfigurement, often leaving the individual unable to maintain their current position in the workforce. In addition, burns are the most common cause of work-related hospitalization for young workers. It is estimated that of all burns, 30-40% occur in occupational settings.[7] According to the New England Regional Burn Program, 55% of all burns among adults are work-related, with younger people and males more frequently hurt.[8]

In Wisconsin, the total rate of hospitalizations for work-related burns decreased 30% from 2009 to 2018 (2.0 to 1.4 per 100,000 full-time employees).

Total rate of hospitalizations for work-related burns per 100,000 employees ages 16+ years, 2009-2018



7: Musculoskeletal Disorders Reported by Employers

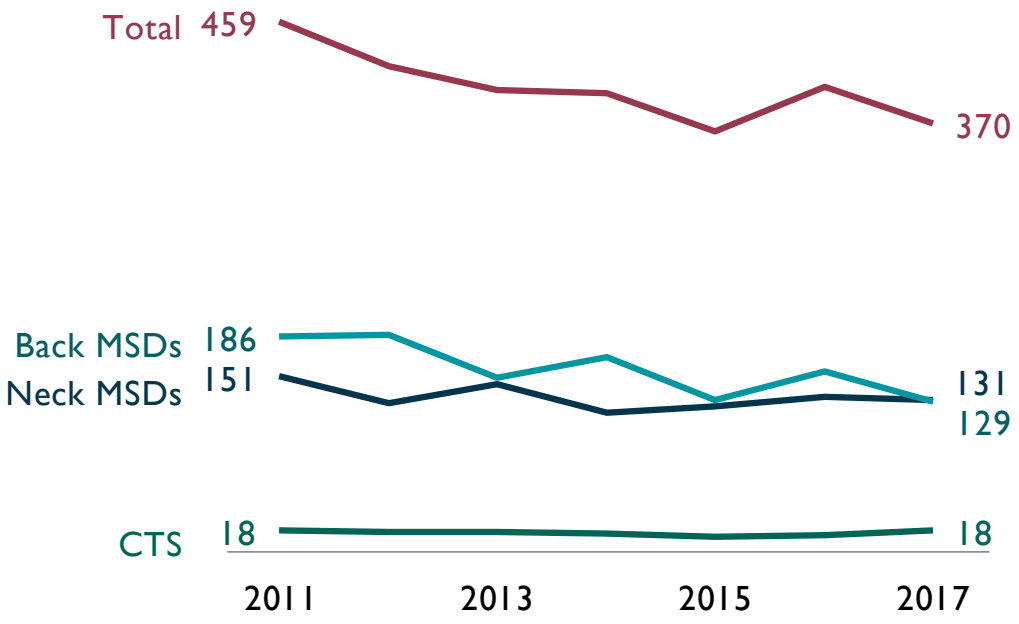
Work-related musculoskeletal disorders (MSDs) are injuries or disorders of muscles, tendons, nerves, ligaments, joints, or spinal discs that are caused or aggravated by work activities. Workplace risk factors for MSDs include repetitive forceful motions, awkward postures, use of vibrating tools or equipment, and manual handling of heavy, awkward loads. MSDs also can be caused by single, traumatic events such as falls.

This occupational health indicator is based on data collected by the BLS in the annual SOII. The BLS definition of MSDs includes sprains, strains, pain, hurt back, carpal tunnel syndrome, and hernia in which the event leading to the condition is reported as overexertion, repetitive motion, or bending, reaching, or twisting. MSDs that resulted in days away from work accounted for one-third of all lost workdays cases reported by private sector employers.

Note: Two indicators measure the number of carpal tunnel syndrome (CTS) cases that occur due to work-related activities: CTS cases reported by employers (one component of Indicator 7) and CTS cases that involve workers' compensation claims (Indicator 8). While these two indicators measure similar outcomes, the data used to create each indicator will produce different estimates of the number of CTS cases with lost work time. It is important to examine both indicators to obtain the best estimate.

In Wisconsin, the incidence rate of all MSDs decreased 19% from 2011 to 2017. The rate for back MSDs and neck MSD decreased by 30% and 13% respectively. During that time period, CTS cases stayed the same.

Total rate of work-related musculoskeletal disorders per 100,000 full-time employees, 2011-2017

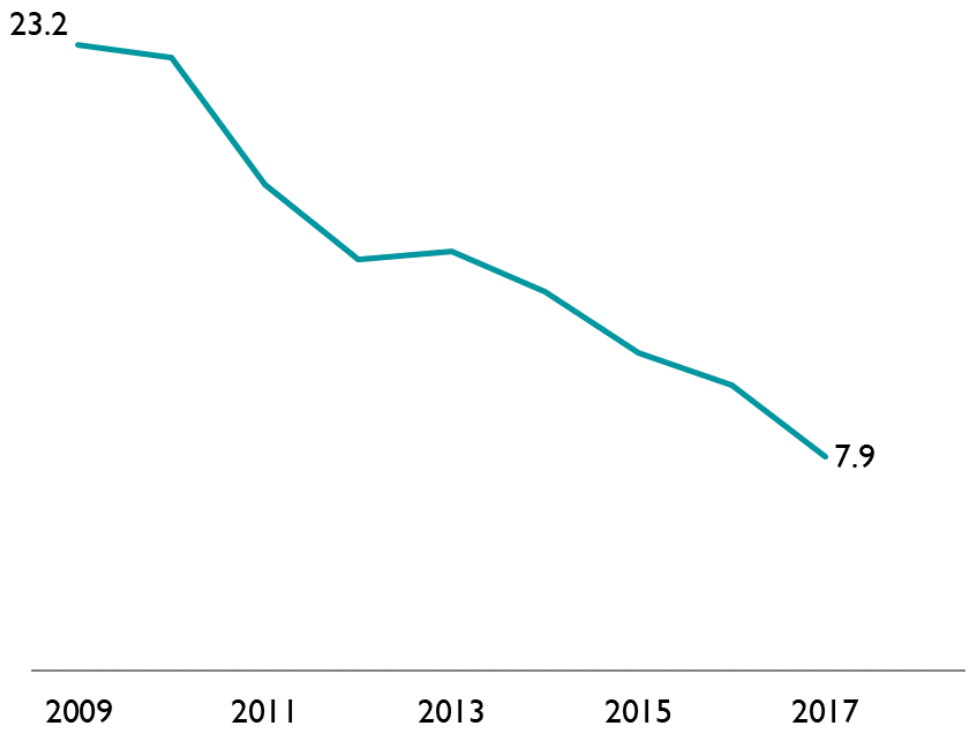


8: Carpal Tunnel Syndrome Cases Identified in State Workers' Compensation System

The U.S. Department of Labor defines Carpal Tunnel Syndrome (CTS) as a disorder associated with the peripheral nervous system, which includes nerves and ganglia located outside the spinal cord and brain. Symptoms include numbness, tingling, weakness or muscle atrophy in the hand and fingers when the median nerve at the wrist is compressed. CTS is caused by repetitive movements at the wrist which increase the pressure within the carpal tunnel. Activities often reported as initiating the symptoms include: keyboarding, driving, talking on the phone, crocheting, and other activities which involve maintaining a certain wrist position for prolonged time periods.

In 2016, the latest year for national data, the national average rate of CTS was 9.5 per 100,000. In that year, Wisconsin was slightly above average (10.5) of the 20 states reporting data to CSTE. In Wisconsin, the incidence rate of carpal tunnel syndrome cases decreased 65% from 2009 to 2017 (23.2 to 7.9 cases per 100,000 workers covered by worker's compensation). Wisconsin workers' compensation insurance paid an average of $3 million per year for carpal tunnel syndrome alone.[9]

Incidence rate of carpal tunnel syndrome cases filed with Wisconsin Worker's Compensation (WC) per 100,000 workers covered by WC, 2009-2017

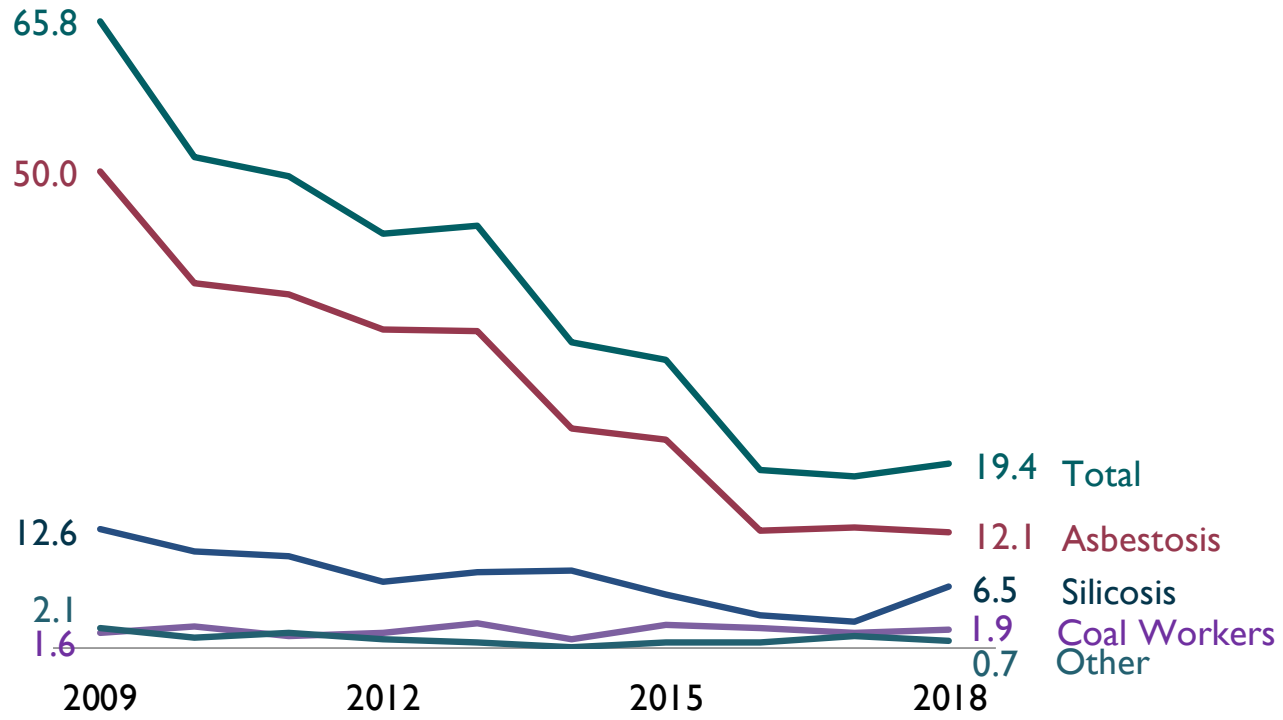


9: Pneumoconiosis Hospitalizations

Pneumoconiosis is a disease of the lungs caused by long-continued inhalation of mineral or metallic dust, and predominantly attributable to occupational exposures. Pneumoconiosis prevalence varies geographically and is influenced by local industrial activities and migration of affected individuals. Common types include silicosis, asbestosis, and coal workers' pneumoconiosis. Complications of various pneumoconioses and other conditions associated with exposure to the same type of pneumoconiosis-causing dusts may include chronic bronchitis, lung cancer, respiratory infections (e.g. tuberculosis), progressive systematic sclerosis and renal disease. Controlling occupational dust exposure is the most effective method of preventing pneumoconiosis.[8]

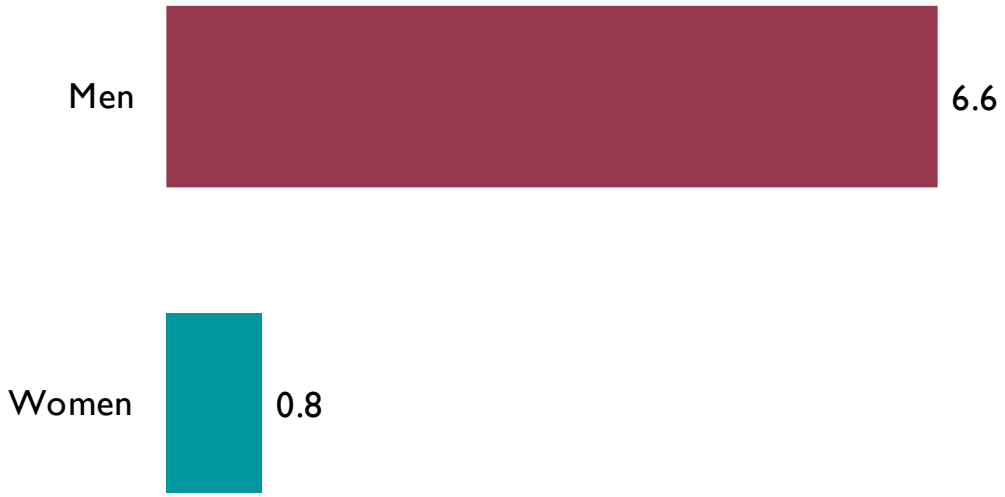
In Wisconsin, the total rate of pneumoconiosis hospitalizations decreased 71% from 2009 to 2018 (65.8 to 19.4 cases per 100,000 full-time employees). Similarly, the rates for asbestosis, silicosis, coal workers' pneumoconiosis and unspecified pneumoconiosis reduced by 76%, 48%, 10% and 56% respectively. There was a slight increase in cases for silicosis in 2018 which may be due to silica exposure in stone fabrication manufacturing. The Occupational Health Program is closely monitoring this and has started conducting interviews for people with suspected silicosis.

Rate of pneumoconiosis hospitalizations per 100,000 people ages 15+ years, 2009-2018

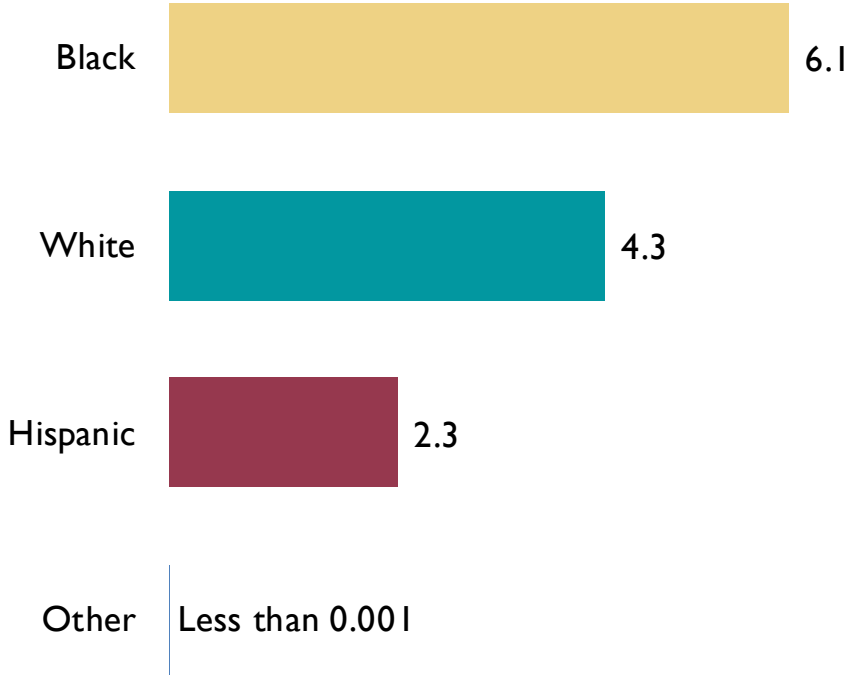


9: Pneumoconiosis Hospitalizations

Rate of pneumoconiosis hospitalizations by gender per 100,000 people ages 15+ years, 2018



Rate of pneumoconiosis hospitalizations by race and ethnicity per 100,000 people ages 15+ years, 2018

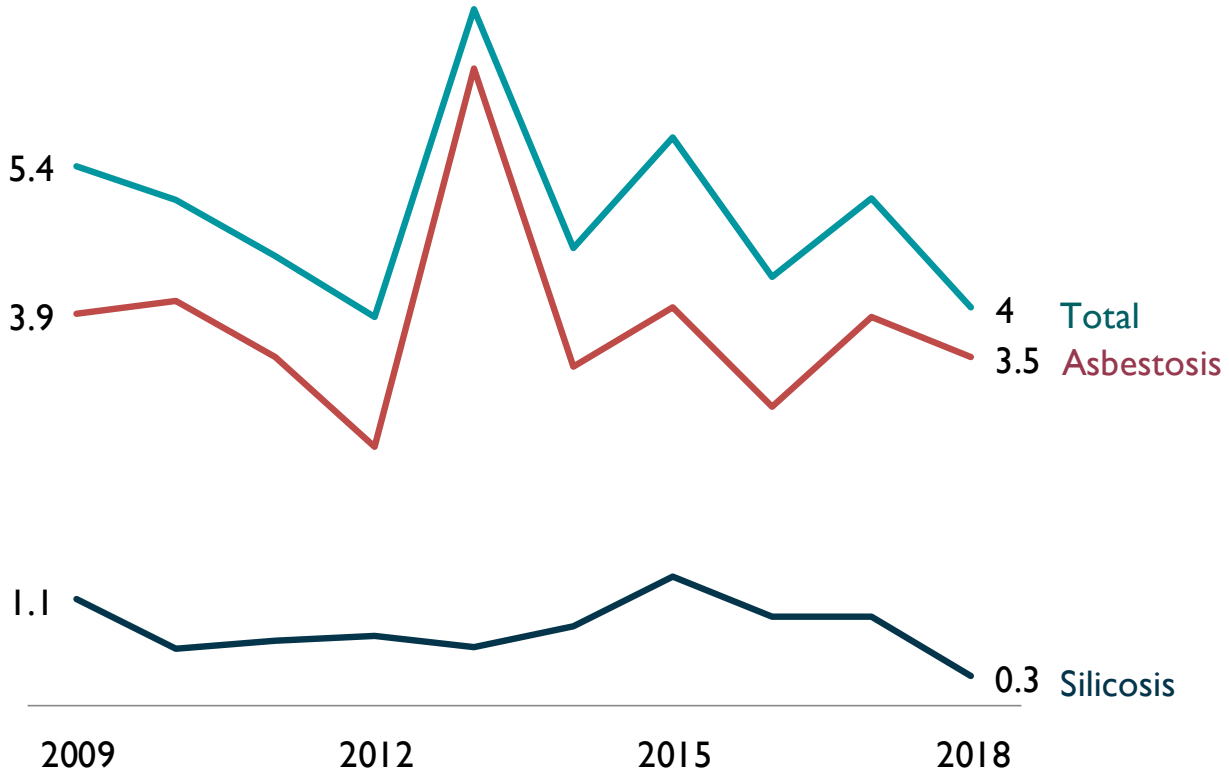


10: Pneumoconiosis Mortality

Overall, the number of deaths from pneumoconiosis has been declining in the U.S. This is primarily due to the reduction in the number of coal workers and the Federal Coal Workers Act which reduces the amount of coal dust in the working environment. However, pneumoconiosis is still more commonly listed as the contributing cause of death than as the underlying cause of death, and deaths from asbestosis have been increasing nationally.

In 2016, the latest year for national data, the national average rate of pneumoconiosis deaths was 5.6 per 1,000,000. In that year, Wisconsin was slightly below average (4.3) of the 25 states reporting data to CSTE. In Wisconsin, the death rates from all pneumoconiosis, asbestosis and silicosis has decreased from 2008-2018. The death rate from all pneumoconiosis decreased 26% while asbestosis and silicosis rates decreased 10% and 18% respectively. Silicosis death rates are suppressed due to low numbers of events in 2010-2014 and 2018. Too few deaths from coal worker's or other pneumoconiosis were reported annually to evaluate trends during this period.

Rate of pneumoconiosis deaths per 1,000,000 people ages 15+ years, 2009-2018



10: Pneumoconiosis Mortality

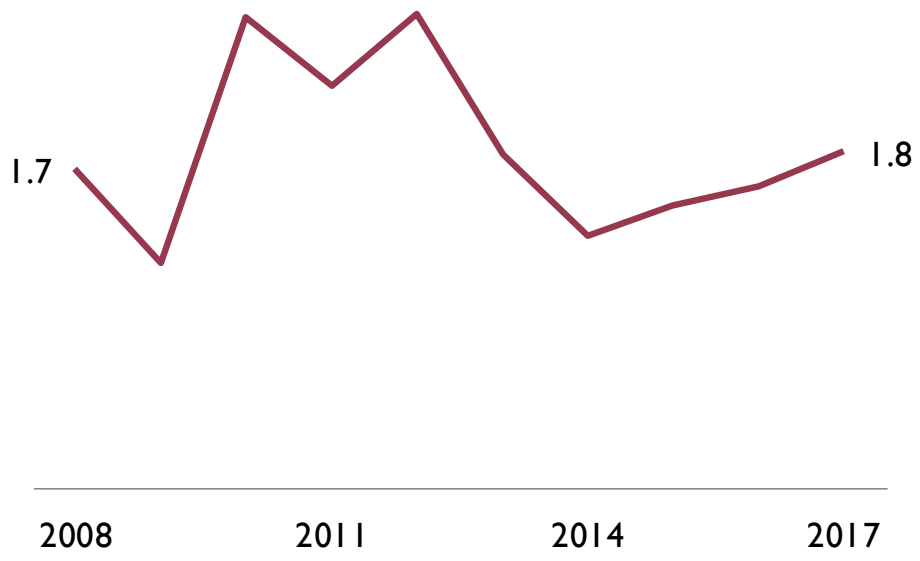
Crude rate of pneumoconiosis deaths by gender per 1,000,000 people ages 15+ years, 2018

11: Acute Work-Related Pesticide Poisonings Reported to Poison Control Centers

Pesticides such as fungicides, herbicides, insecticides, rodenticides and sanitizers are among the few chemicals produced that are specifically designed to kill and cause harm. Workers who handle pesticide chemicals are at greater risk of illness from occupational exposure. Agricultural workers, groundskeepers, pet groomers, and fumigators are a few occupations at risk for exposure to pesticides. In the U.S., approximately 1.1 billion pounds of pesticide active ingredients are used annually, and over 20,000 pesticide products are being marketed.[10] Poison Control Centers (PCCs) across the country actively identify and report cases to the National Poison Data System (NPDS) associated with occupational exposures, most notably acute poisonings and chemical exposures.

In 2016, the latest year for national data, the national average rate of work-related pesticide poisonings was 1.7 per 100,000. In that year, Wisconsin was slightly below average (1.6) of the 28 states reporting data to CSTE. In Wisconsin, the total rate of work related pesticide poisonings increased by 6% from 2009 to 2017 (1.7 to 1.8 cases per 100,000 full-time employees).

Total rate of work-related pesticide poisonings per 100,000 employees ages 16+ years, 2008-2017

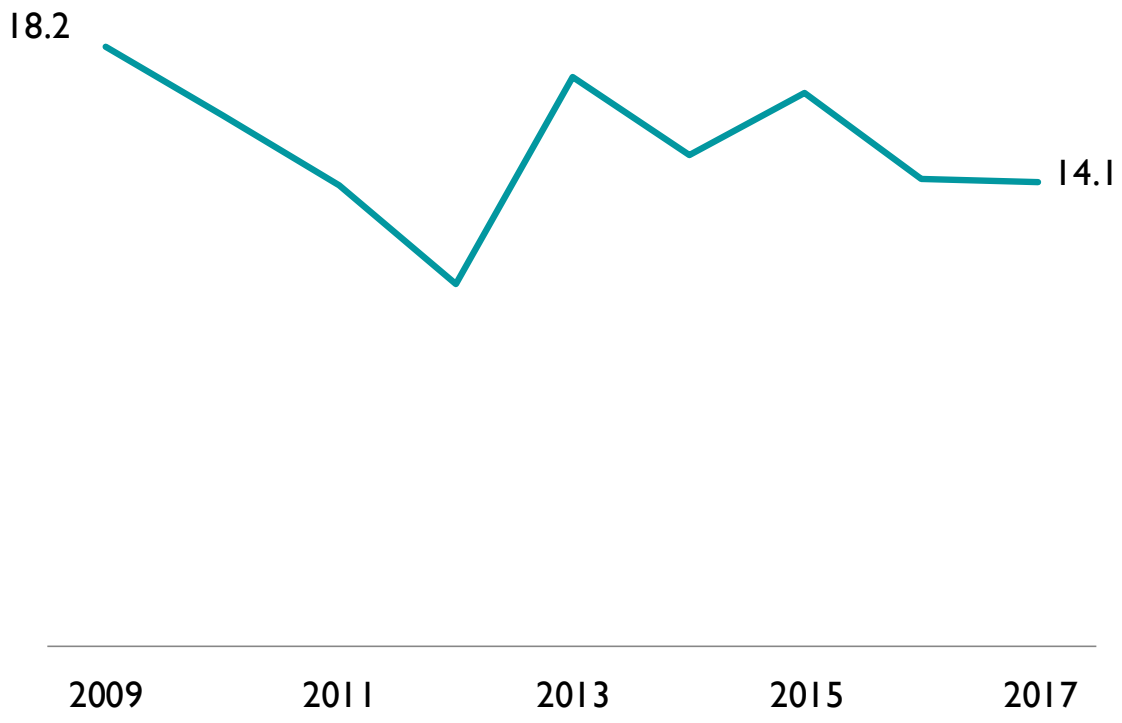


12: Incidence of Malignant Mesothelioma, Ages15 and Older

Malignant mesothelioma is a type of cancer in which malignant cells are found in the lining of the chest or abdomen. While relatively rare, it is a fatal cancer and 3,000 deaths are attributed to the disease annually.[11] It has been estimated that up to 90% of malignant mesothelioma cases are caused by exposure to asbestos. These data can be useful to design, implement, and evaluate the impact of prevention and intervention efforts longitudinally, and to identify previously unrecognized work settings in which workers may be continuously at risk of asbestos exposure.

In 2016, the latest year for national data, the national average for mesothelioma incidence was 10.7 per 1,000,000. In that year, Wisconsin had a rate of 14.2 which was the 4th highest out of 25 states reporting data to CSTE. Overall in Wisconsin, the mesothelioma incidence rate decreased by 23% from 2009 to 2017 (18.2 to 14.1 cases per 1,000,000 residents aged over 15).

Annual age-standardized mesothelioma incidence rate per 1,000,000 residents ages 15+ years, 2009-2017



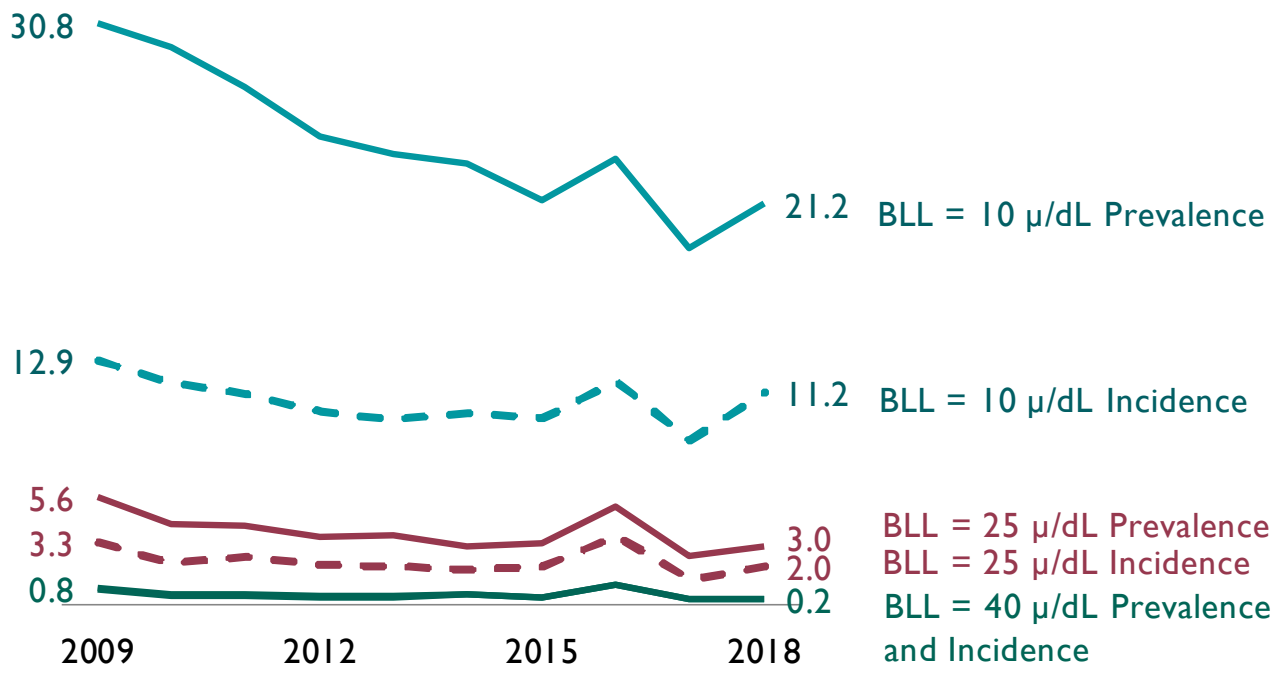
13: Elevated Blood Lead Levels Among Adults

Lead poisoning among adults is a persistent, mainly occupational, public health problem. In 2016, 26 states reported elevated blood lead levels (BLLs) through the national Adult Blood Lead Epidemiology and Surveillance (ABLES) program. Among the 11,695 adults with known exposures at BLLs ≥10 µg/dL, 90.3% had occupational exposures.[12] An elevated BLL is defined as a BLL ≥5 μg/dL of whole blood. Lead adversely affects multiple organ systems and can cause permanent damage. There is increasing concern over the toxicity of low doses of lead and its association with hypertension, adverse effects on cognitive dysfunction, and adverse female reproductive outcomes. The U.S. Department of Labor lists more than 900 occupations that are associated with lead use. Construction workers are at risk of lead poisoning during the maintenance, repainting, or demolition of bridges or other steel structures coated with lead-containing paint. Occupations in the mining and manufacturing industries also expose workers to lead.[13]

It is estimated that about 24,000 U.S. children with elevated blood lead levels are unintentionally exposed to lead brought home by a parent from the workplace. Lead exposure in children can cause irreversible damage to organ systems. Behavioral changes and learning disabilities due to lead poisoning in children can manifest at BLLs as low as 5μg/dL.

In Wisconsin, the prevalence of reported BLLs over 10 µg/dL decreased 31% between 2009 and 2018. Similarly, prevalence of BLLs over 25 and 40 decreased by 46% and 75% respectively. The Incidence rates of BLLs over 10, 25 and 40 decreased by 13%, 39%, and 71% respectively in the same time period.

Prevalence and Incidence Rates of Blood Lead Levels (BLL) ≥ 10,25, and 40 µg/dL per 100,000 employees ages 16+ years, 2009-2018

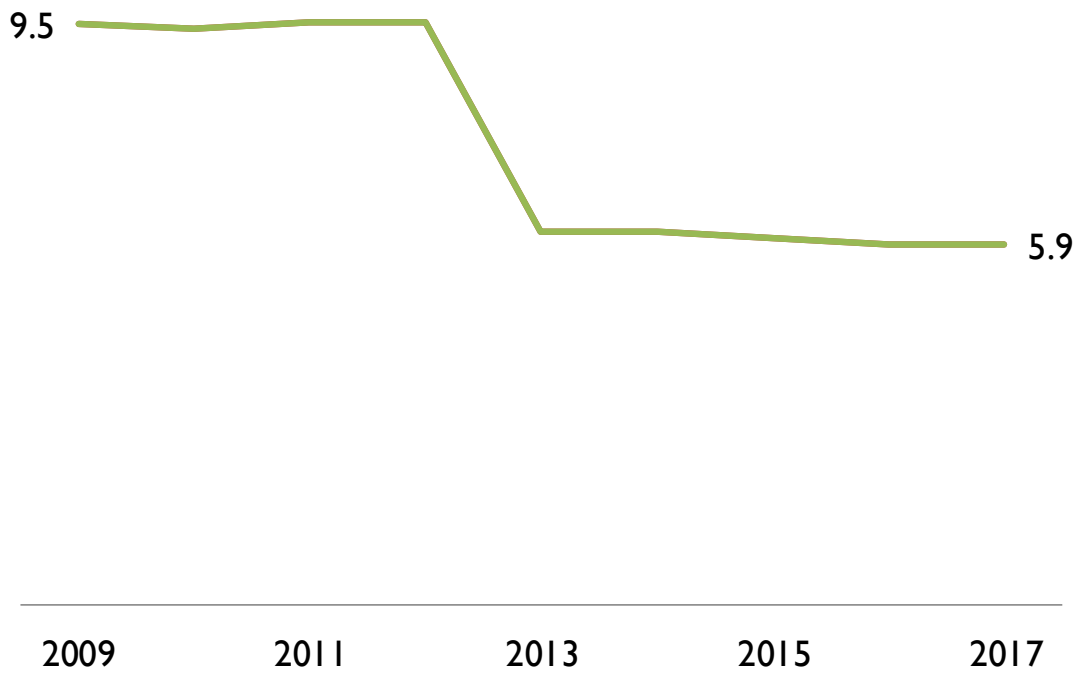


14: Workers Employed in Industries with High Risk for Occupational Morbidity

In 2018, there were 2.8 million reportable work-related injuries and illnesses in the private industry sector nationally. Over half of these cases were of a more serious nature involving days away from work, job transfer, or restriction and occurred at a rate of 1.6 cases per 100 full-time workers. This indicator measures the percent of workers employed in industries with high risk for occupational morbidity.[14] The 55 industries identified in 2008 with rates more than double the national rate, or 7.8 cases per 100 full-time workers or higher, were considered high risk. Many high-risk industries for occupational morbidity are in the manufacturing, health care and social assistance, wholesale trade and transportation and warehousing sectors.

In Wisconsin, the percentage of workers employed in industries with high risk for occupational mortality decreased by 38% from 2009 to 2017 (9.5% to 5.9%).

Percentage of workers in industries at high risk for occupational morbidity, 2009-2018

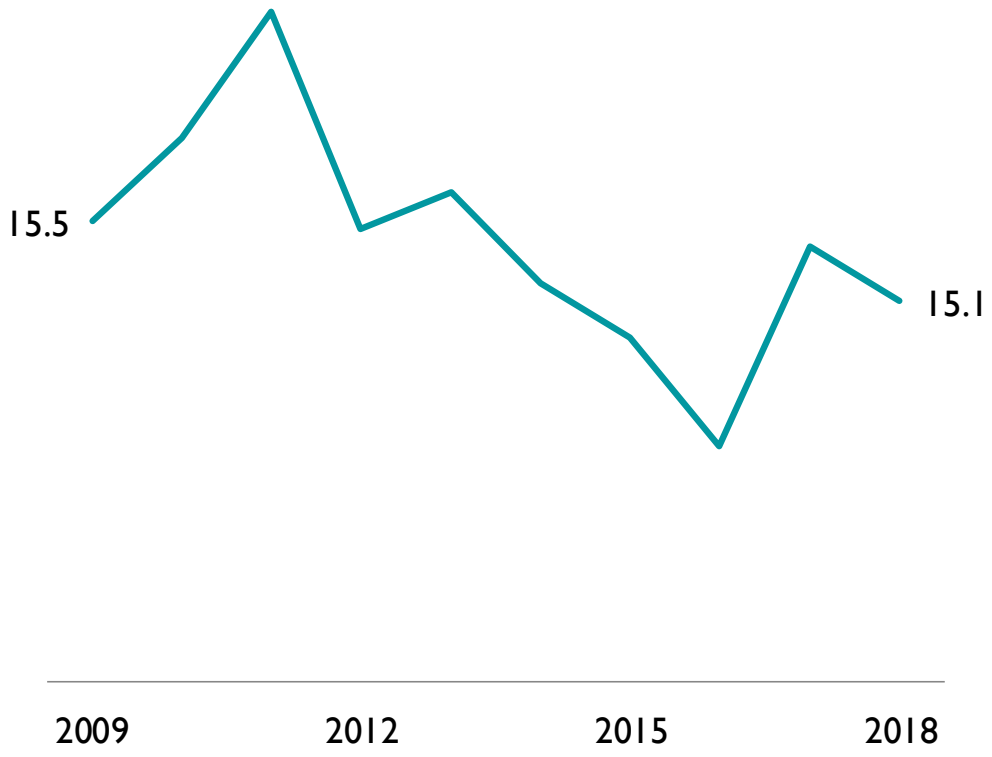


15: Workers Employed in Occupations with High Risk for Occupational Morbidity

Nationally, the Bureau of Labor Statistics (BLS) reported over 1.5 million work-related injuries and illnesses that resulted in "days away from work" in 2018. The risk of these injuries and illnesses was significantly higher in certain occupations. High-risk occupations were based on 61 occupation categories identified in 2008 with "days away from work" injury and illness rates higher than 226.2 cases per 100,000 full-time workers. These occupations accounted for about 1.8 million private sector workers in the U.S. (16.1% of the private sector employment), but 44.1% of OSHA days away from work cases.[2] Examples include truck drivers, janitorial staff and housekeeping, nurses and other health care workers, police and correctional officers, carpenters and other construction workers, and certain types of manufacturing employees.

In 2016, the latest year for national data, the national average for percentage of workers in high-risk occupations for morbidity was 15.8%. In that year, Wisconsin was slightly below average (14.3%) of the 28 states reporting data to CSTE. In Wisconsin, the percentage of workers employed in occupations with high risk for occupational mortality decreased by 3% from 2009 to 2018 (15.5% to 15.1%).

Percentage of workers in occupations at high risk for occupational morbidity, 2009-2018

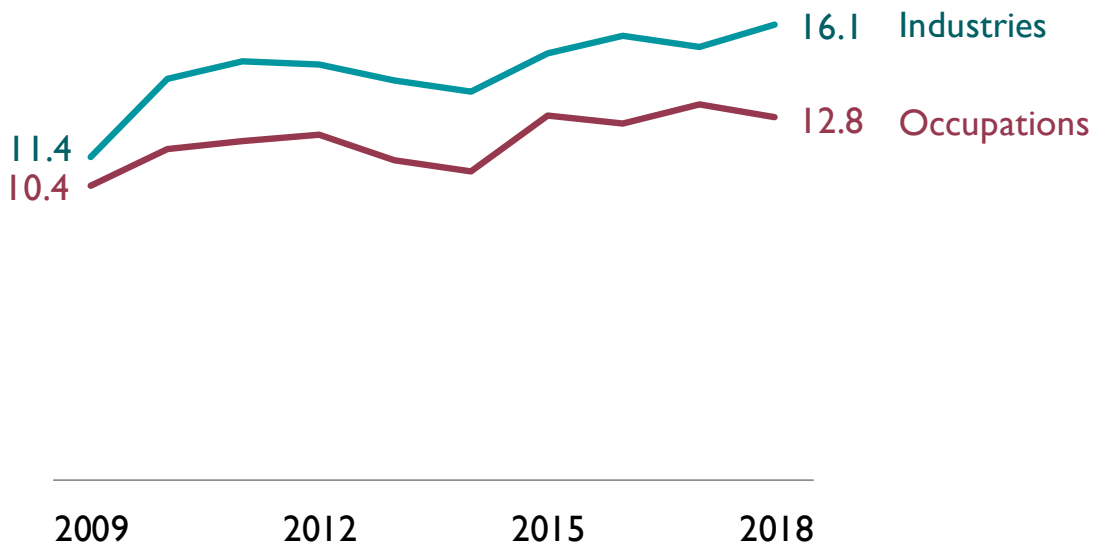


16: Workers Employed in Industries and Occupations with High Risk for Occupational Mortality

This indicator looks at the proportion of workers who work for companies engaged in a particular kind of commercial enterprise (industries) and the proportion of workers who perform an activity as their regular source of livelihood (occupation) that have previously have had a high number of work-related deaths. While the number of these industries and occupations vary among states, these differences can help explain the differences in injury mortality rates among states. Some of the most dangerous jobs are held by logging workers, fishers and fishing-related workers, aircraft pilots and flight engineers, roofers, refuse and recyclable material collectors, mining machine operators, delivery and truck drivers, and farmers, ranchers, and other agricultural managers.

In 2016, the latest year for national data, the national average for percentage of workers in high-risk industries for mortality was 15.6% and occupations for mortality was 12.1%. In that year, Wisconsin was slightly above average in each category (15.7% and 12.6%, respectively) of the 28 states reporting data to CSTE. In Wisconsin, the percentage of workers in high-risk industries increased by 41% from 2009 to 2018. Similarly, the percentage of workers employed in high-risk occupations increased by 23% in the same time period.

Percentage of workers in industries and occupations at high risk for occupational mortality, 2009-2018

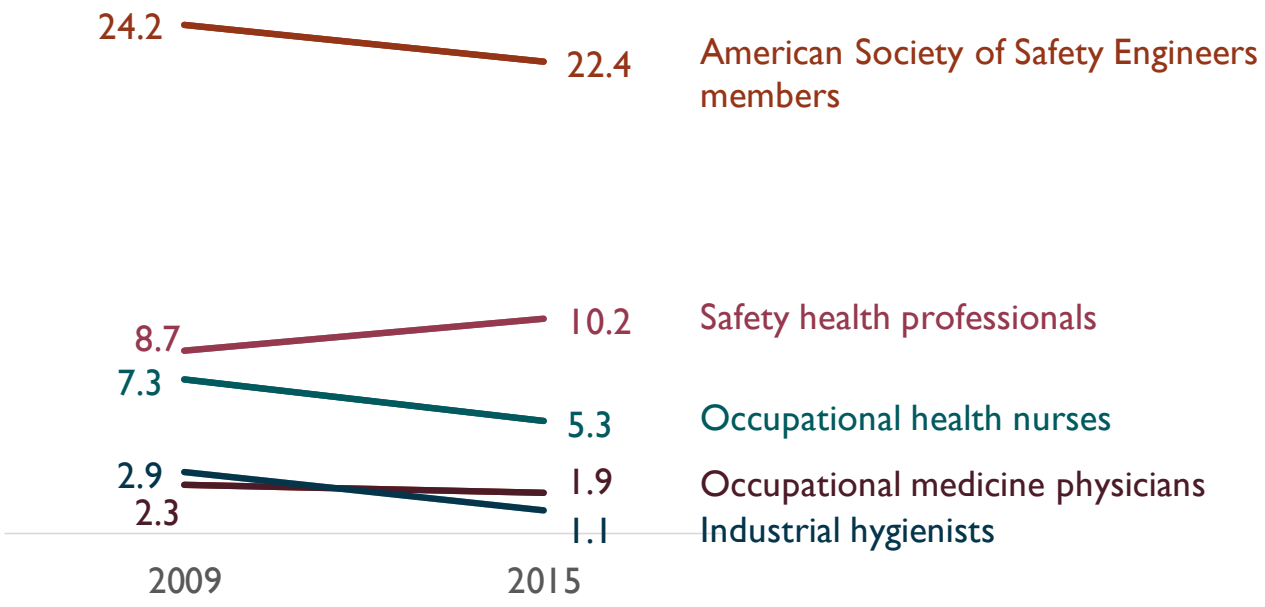


17: Occupational Safety and Health Professionals

In order to reach the goal of reducing workplace illness and injury, there must be sufficient personnel trained to recognize work-related illness, provide care when needed, evaluate workplace hazards, and to implement prevention strategies. In 1989, the American Medical Association (AMA) recommended that there be 100 professionals certified in occupational health per 100,000 employees. Industrial hygienists and safety professionals are typically the primary individuals responsible for evaluating workplaces and making recommendations to prevent occupational injuries and illnesses.

In Wisconsin, the rates of occupational safety and health professionals have been decreasing slightly in almost every category with the exception of board-certified safety health professionals. These trends are happening at the national level as well.

Rate of Occupational Safety and Health Professional per 100,000 workers, 2009-2015

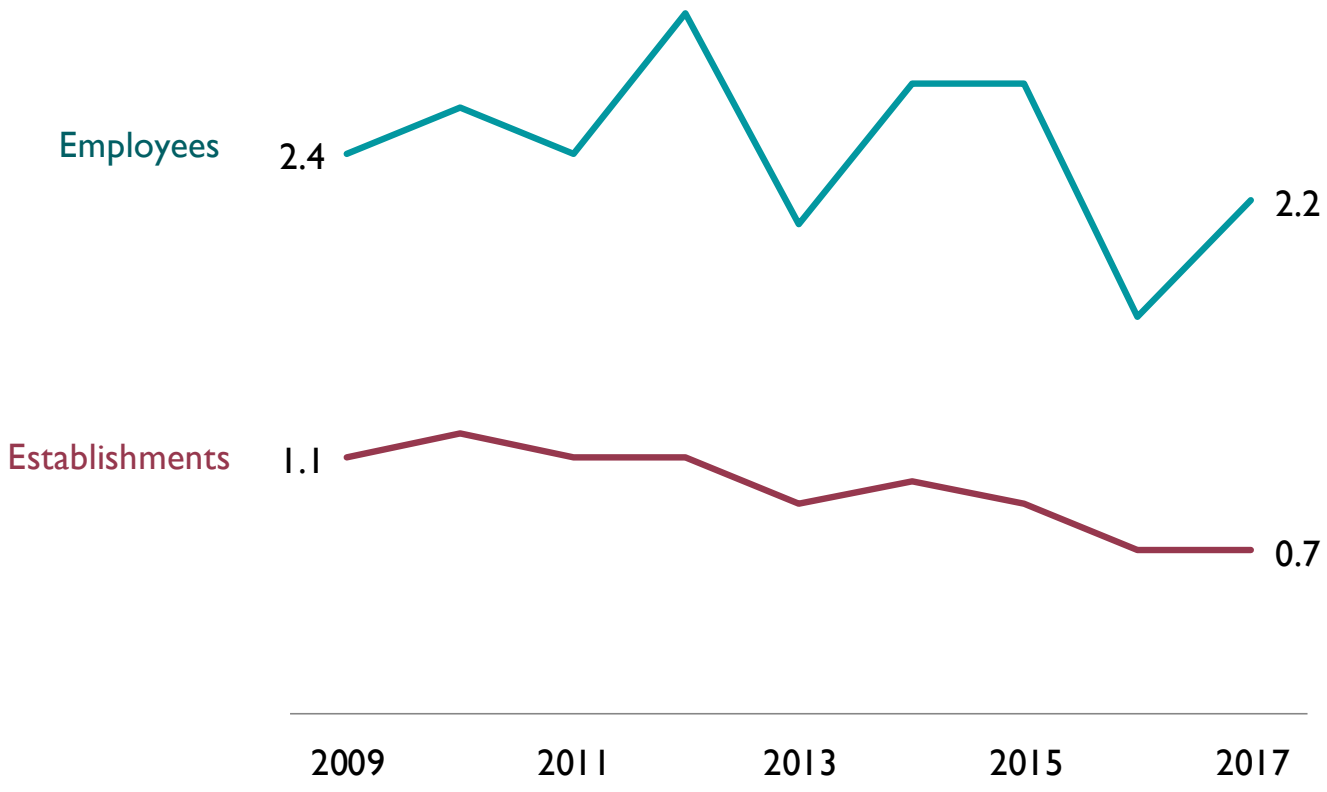


18: Occupational Safety and Health Administration (OSHA) Enforcement Activities

The Occupational Safety and Health Administration (OSHA), established in 1970, has a mission to "assure so far as possible every working man and woman in the nation safe and healthful working conditions." This involves tools such as standards, enforcement activities, and compliance assistance. Employers are responsible for providing a safe and healthful worksite for all of their workers under the OSHA law. The worksites to be inspected are selected both randomly and on the basis of injury incidence rates. Inspections also occur after a fatality, hospitalization of at least three workers, worker complaint or referral from outside agencies or the media.[2]

In Wisconsin, the percentage of OSHA-covered employees decreased 8% while the number of OSHA-covered establishments decreased 36% from 2009 to 2017.

Percentage of OSHA-Covered Employees and Establishments Eligible for Inspection, 2009-2017

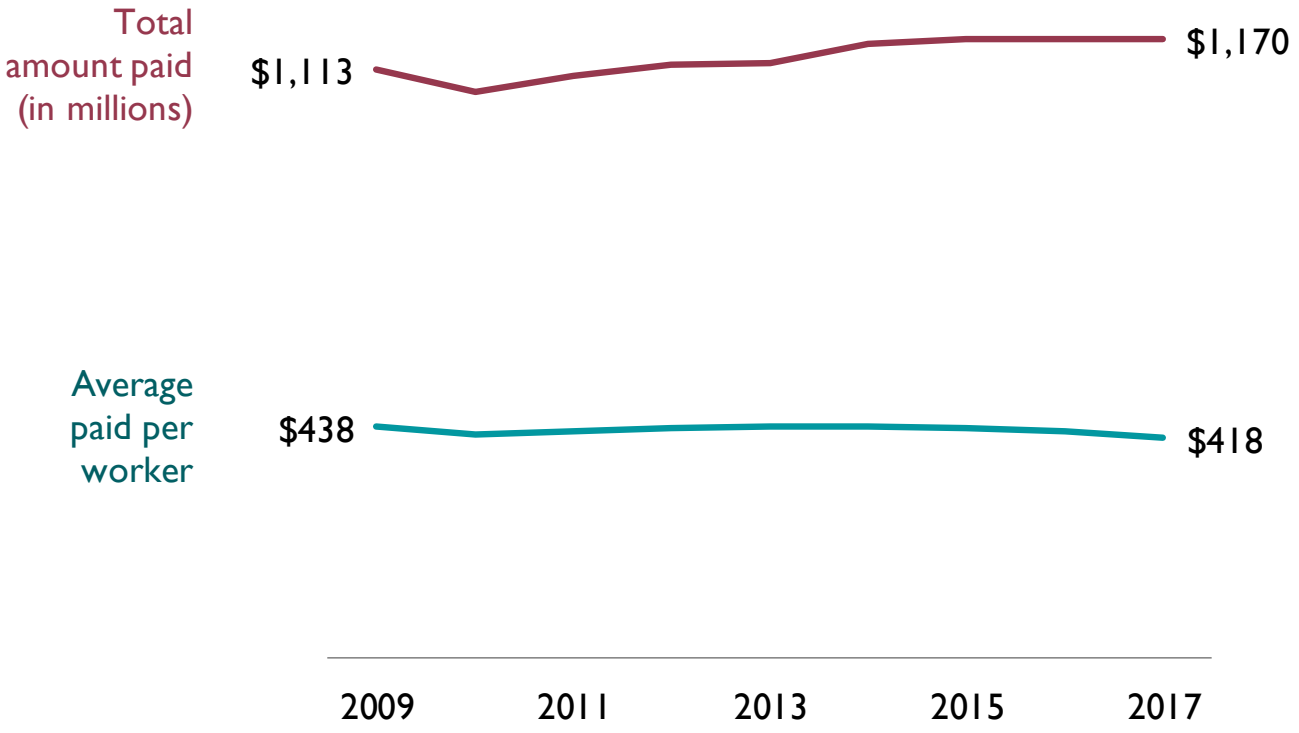


19: Worker's Compensation Awards

Workers' compensation benefits are paid to workers with occupational injuries or illnesses and include payments for medical care and wage-replacement to workers or their surviving dependents. Awards represent known work-related injuries and illnesses, and often more severe cases. This indicator represents the average amount of benefits paid per covered worker to estimate the economic burden of these work-related events.

In Wisconsin, the total amount paid to workers compensation increased 5% from 2009 to 2017 ($1,113,000,000 to 1,170,000,000). The average paid per worker decreased 5% during this same time period.

Total Amount of Worker's Compensation Benefits, 2009-2017

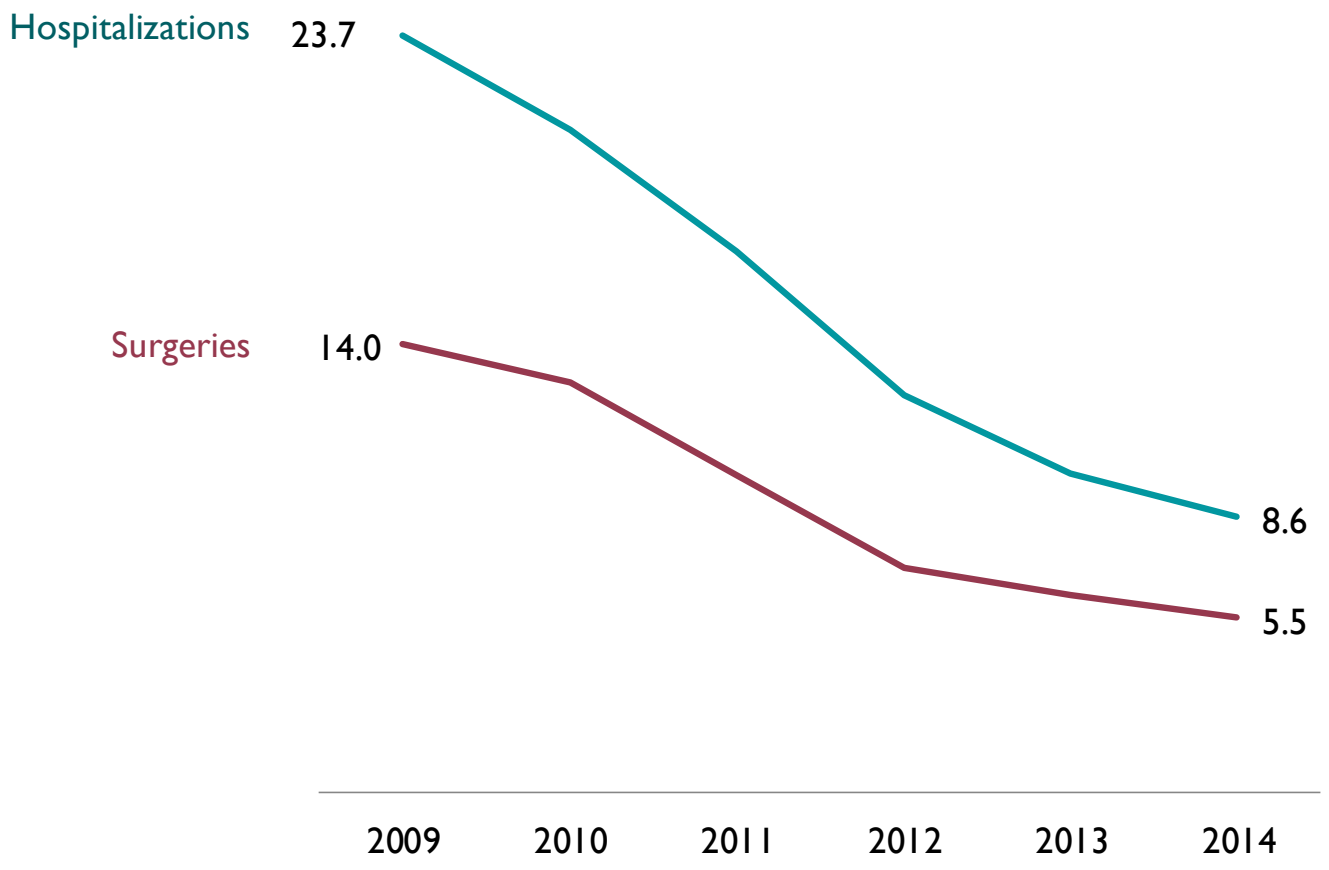


20: Low Back Disorder Hospitalizations

Annually, 15-20% of Americans report back pain, resulting in over 100 million lost workdays and over 10 million physician visits. According to National Health Interview survey data, two-thirds of all low back pain cases are attributable to activities at work.[2] The cost of back pain is also disproportionate, as it represents about 20% of workers' compensation claims, but nearly 40% of the costs. Hospitalizations for work-related back disorders have adverse health effects and financial burdens, including significant functional impairment and disability, high absenteeism, reduced work performance, lost productivity, and high direct medical costs. Well-recognized prevention efforts need to be planned and implemented for high-risk occupational activities to reduce the physical and economic burden of work-related low back disorders.[15,16]

In Wisconsin, the rate of work-related low back disorder hospitalizations decreased 63% from 2009 to 2014 (23.7 to 8.6). Similarly the rate of work-related low back disorder surgeries decreased 61% in the same time period.

Rate of work-related low back hospitalizations and surgeries per 100,000 employees, 2009-2014

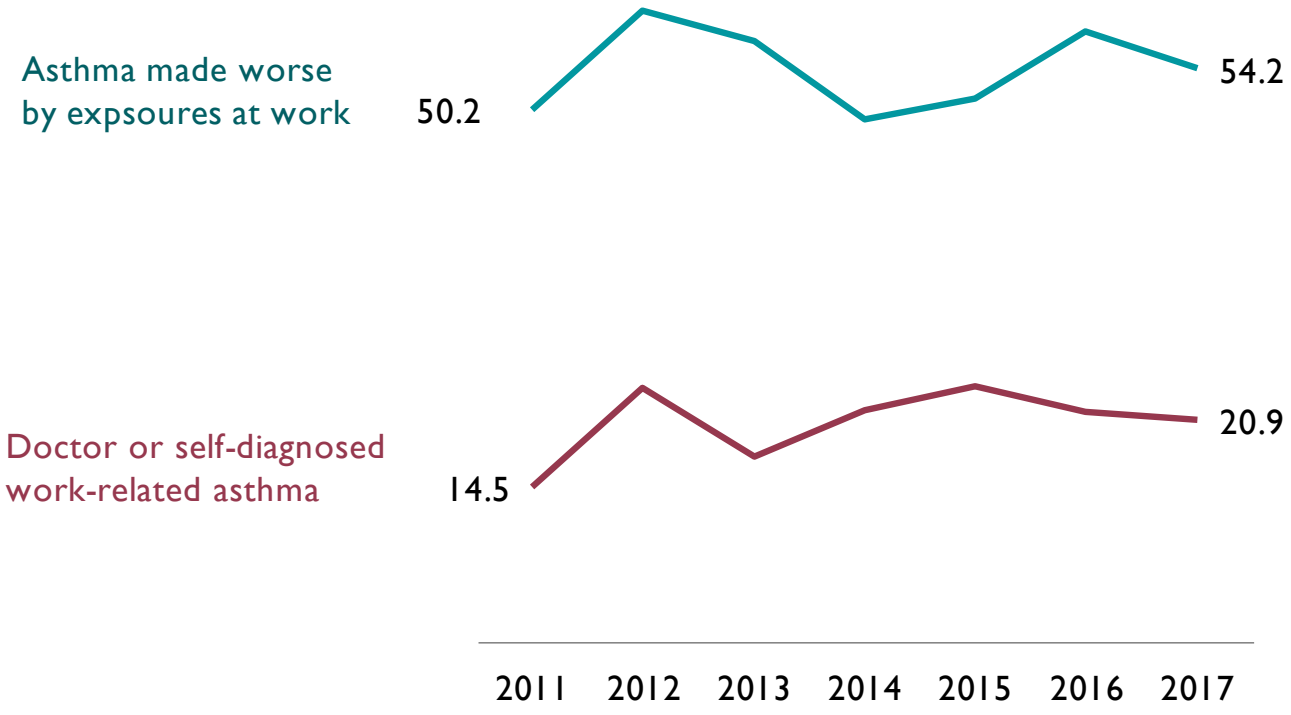


21: Work-Related Asthma

Work-related asthma represents a subset of all asthma and includes both occupational asthma, which is asthma that is caused by workplace exposure, and work-exacerbated asthma, which is asthma that is worsened by work factors. The American Thoracic Society estimates that up to 58% of adult asthma is work-related.[17] Occupational asthma is a chronic inflammatory disease in which the airways overreact to dusts, vapors, gases or fumes that exist in the workplace. With exposure, permanent lung damage can occur and very low levels of exposure may provoke an episode. It has been estimated that 9.7 million adults, or 15% of adult asthma is caused or made worse by occupational exposures.[18] Symptoms of asthma include breathing difficulties; wheezing and shortness of breath; coughing, and chest tightness. Asthma is a debilitating disease that can cause death, but if diagnosed early, occupational asthma can be partially or entirely reversible.[19] Unfortunately, work-related asthma remains underdiagnosed.[20]

In Wisconsin, the proportion of ever-employed adults with current asthma who reported their asthma was made worse by work exposures increased 8% from 2011 to 2017. During the same period, doctor or self-diagnosed work-related asthma increased by 44%.

Proportion of ever-employed adults with current asthma reported to be made worse by exposures at work and those who were diagnosed with work-related asthma, 2011-2017

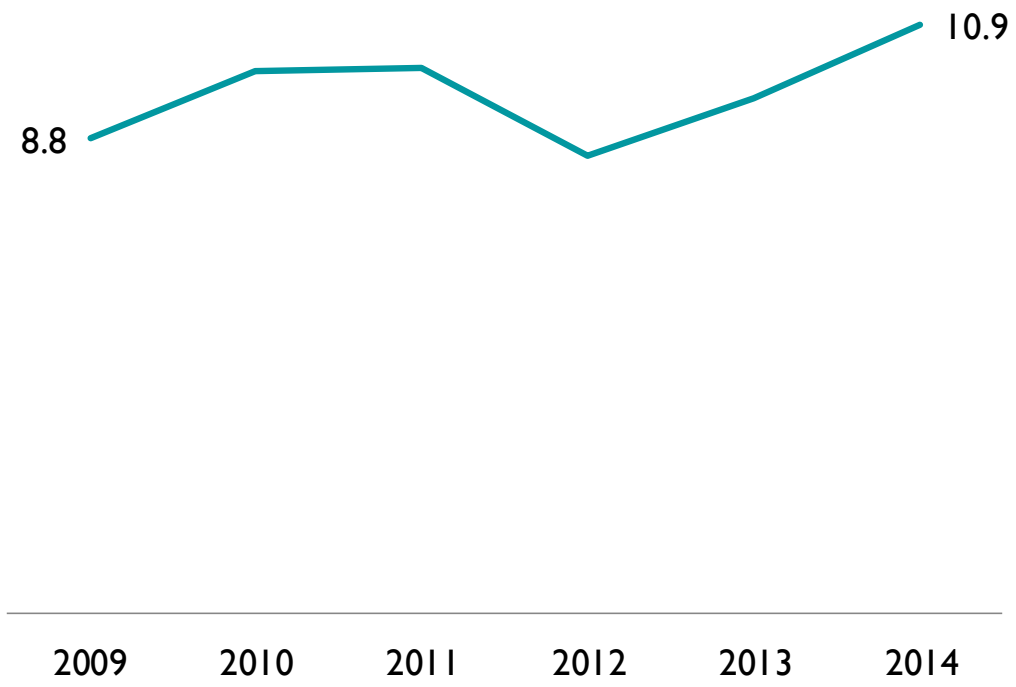


22: Work-Related Severe Traumatic Injury Hospitalizations

This indicator represents the number of severe traumatic injury hospitalizations that occur from work-related injuries and illnesses. Work-related hospitalizations are defined in this indicator as hospitalizations in which workers' compensation is the payer. Severe work-related trauma is a major cause of death and long-term disability for U.S. employees. In 2018, more than 5,250 U.S. workers died from occupational injuries.[21] Recent estimates show that the medical and productivity cost for occupational injuries is approximately $192 billion which is a burden to the workers' compensation system and society as a whole.[22] Tracking significant adverse health effects from severe injuries and illnesses can help to: document the burden of occupational injuries and illnesses; design, target and evaluate the impact of prevention efforts over time; and identify settings in which workers may continue to be at high-risk for injury or illness.

In Wisconsin, the rate of work-related severe traumatic injury hospitalizations increased 24% from 2009 to 2014 (8.8 to 10.9).

Total rate of work-related severe traumatic injury hospitalizations per 100,000 full time employees ages 16+ years, 2009-2014

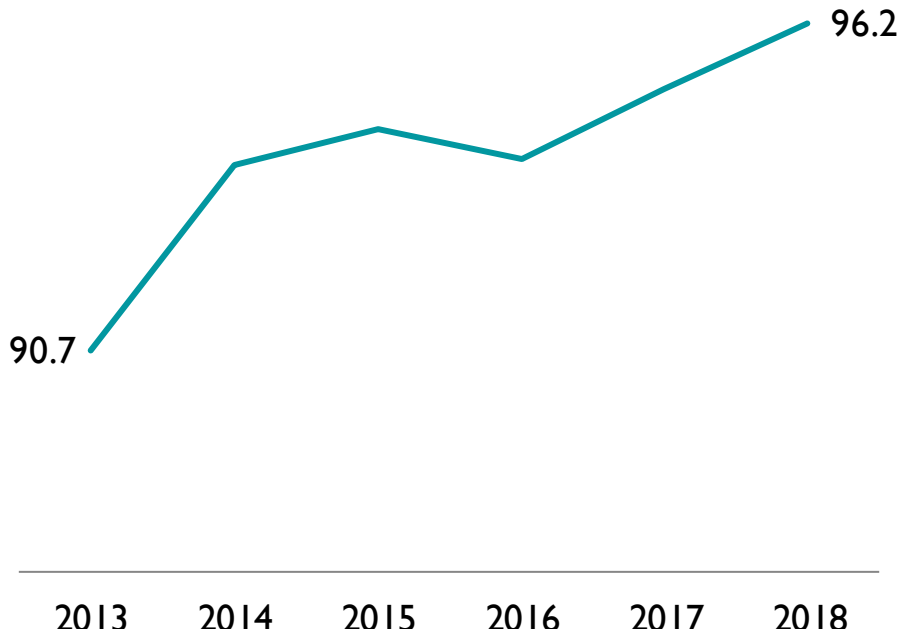


23: Influenza Vaccination Coverage Among Health care Personnel

This indicator represents the percentage of health care personnel (HCP) who have received an influenza vaccination. Influenza is a significant cause of morbidity and mortality. HCP can serve as vectors for influenza transmission because they can acquire it from patients and transmit it to other patients and workers. Overall, poor influenza vaccination coverage among HCP has been demonstrated for years. During 2012-2018, national influenza vaccination coverage among HCP peaked at 90%. Higher influenza vaccination coverage among HCP is associated with reductions in nosocomial influenza among hospitalized patients and nursing home residents.[23] Therefore, CDC recommends that all HCP receive the vaccine annually.[24]

In Wisconsin, the percentage of vaccinated health care personnel increased by 6% from 2013 to 2018 (from 90.2 %to 96.2%). Nationally, the percentage of vaccinated health care personnel increased by 10% in the same time period (81.8% to 90.0%).

Percentage of health care personnel vaccinated, 2013-2018

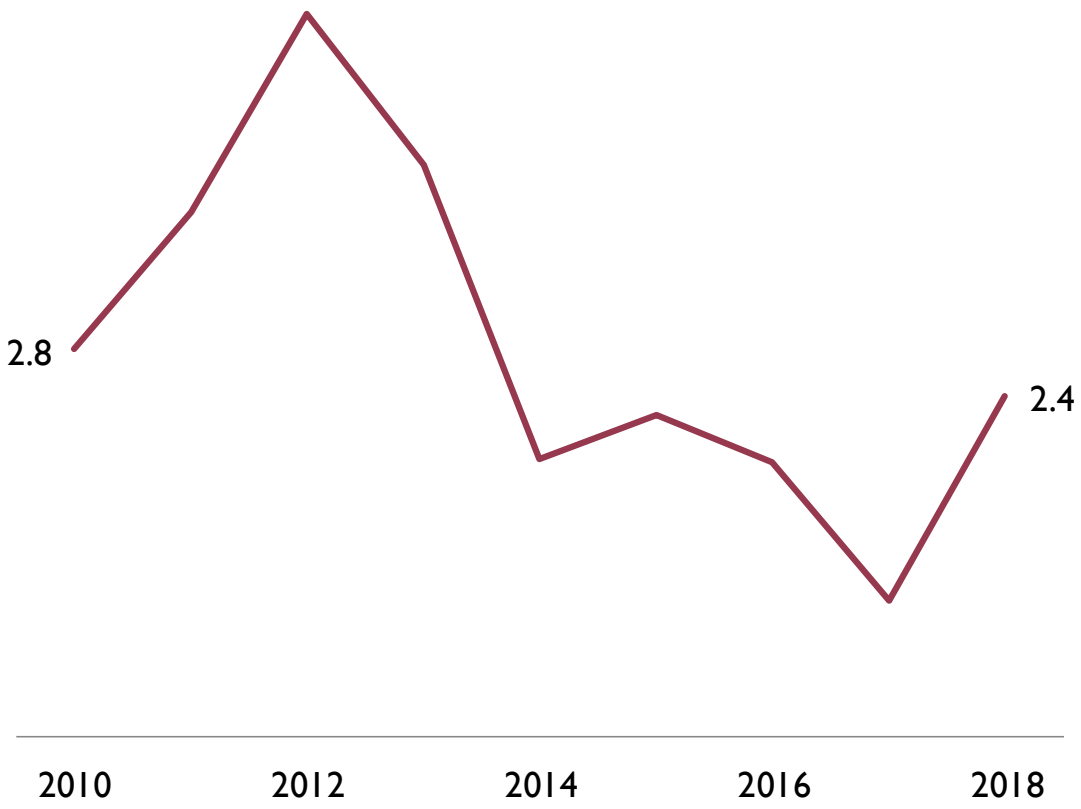


24: Occupational Heat-Related ED Visits

Exposure to environmental heat is a recognized hazard for many occupations, including firefighting, farm work, mining, warehouse labor, utilities management, manufacturing, and disaster response. In these occupations individuals may not be able to maintain thermal equilibrium due to environmental conditions, required clothing type, physical exertion, and use of protective equipment.[25,26] In 2010, approximately 3,470 private sector workers experienced a nonfatal work-related illness due to environmental heat exposure, which required days away from work. Tracking occupational heat illness using emergency department (ED) data helps establish a baseline for epidemiologists to understand the magnitude of the burden of heat illness among workers and to support prevention measures.

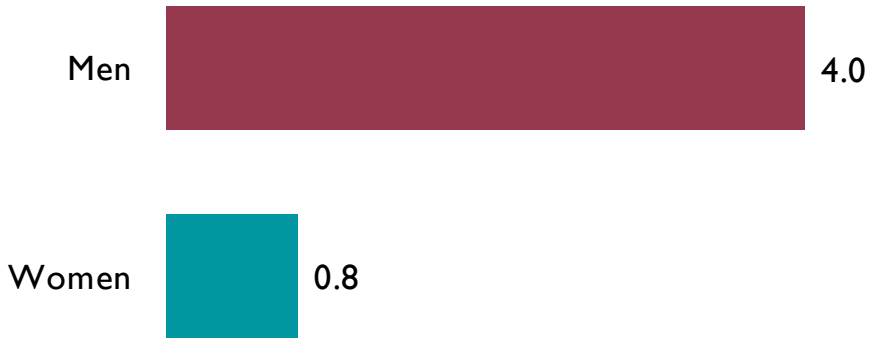
In Wisconsin, the rate of occupational health-related ED visits decreased by 14% from 2010 to 2018 (2.8 to 2.4).

Total rate of occupational heat-related ED visits per 100,000 employees ages 16+ years, 2010-2018

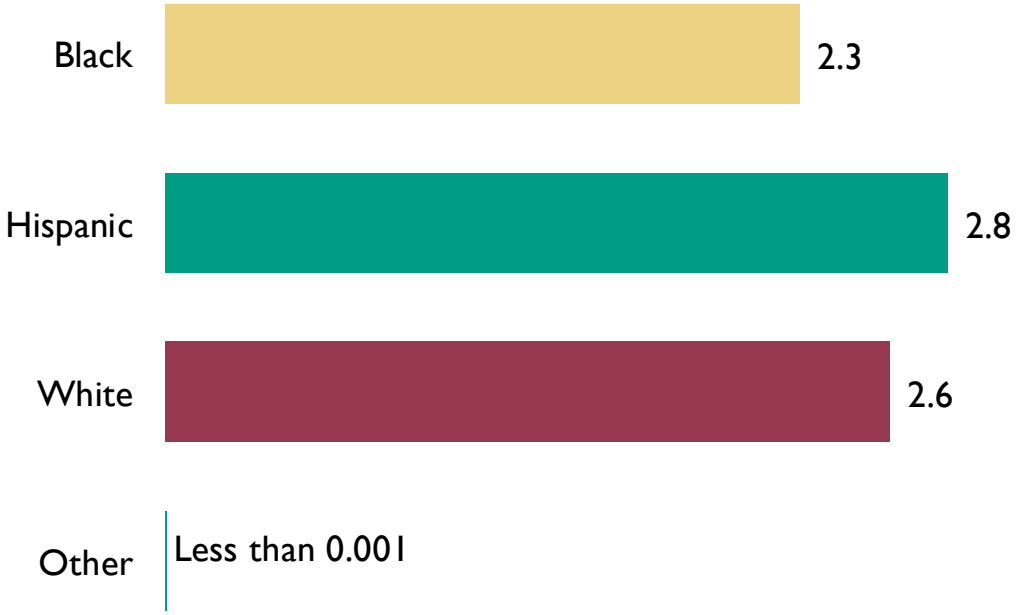


24: Occupational Heat-Related ED Visits

Total rate of occupational heat-related ED visits by gender per 100,000 employees ages 16+ years, 2010-2018



Total rate of occupational heat-related ED visits by race per 100,000 employees ages 16+ years, 2010-2018

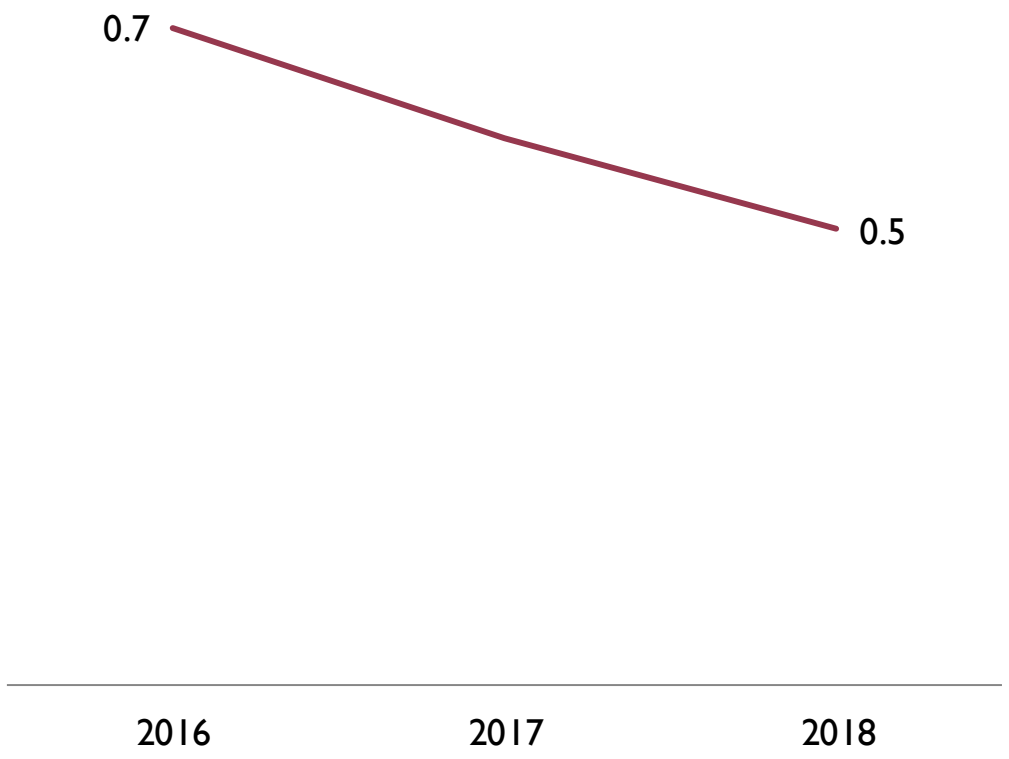


25: Hospitalizations for or with Occupational Eye Injuries

Occupational eye injuries are common yet preventable. According to NIOSH estimates, each day about 2000 U.S. workers sustain a job-related eye injury that requires medical treatment. About one-third of the injuries are treated in hospital emergency departments, and more than 100 of these injuries result in one or more days away from work. In severe cases, ocular trauma can lead to lifetime disability. Although protective eyewear can reduce the risk of eye injury, identifying additional risk factors for eye injuries is integral to preventing them.[27] Estimating the burden of occupational eye injuries and associated risk factors can help target prevention activities.

In Wisconsin, the total rate of hospitalizations for or with occupational eye injuries decreased 31% from 2016 to 2018 (.7 to .5).

Total rate of work-related inpatient hospitalizations for eye injury per 100,000 employees ages 16+ years, 2016-2018



Appendix

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Data Sources

Data Source	Description	Used for Indicator(s)
Adult Blood Lead Epidemiology and Surveillance (ABLES) system	The Wisconsin Adult Blood Lead Epidemiology and Surveillance (ABLES) program is housed within the Occupational Health Program. The ABLES program helps to reduce the burden of lead poisoning in adults in Wisconsin by functioning as a repository of adult laboratory lead test results, tracking those results over time, and developing interventions for industries and workers in industries determined to be at-risk for causing elevated levels of lead in blood. One industry determined to have high risk for lead poisoning is the primary metal industry.	13
Behavioral Risk Factor Survey (BRFS) and Asthma Call-Back Survey (ACBS)	The Wisconsin Behavioral Risk Factor Survey (BRFS) is an annual, statewide telephone survey of a random sample of Wisconsin household residents aged 18 and older that produces estimates representative of the non-institutionalized population living in Wisconsin. The Wisconsin BRFS is housed within the Office of Health Informatics (Division of Public Health, DHS). The Wisconsin BRFS is part of the national Behavioral Risk Factor Surveillance System (BRFSS), which is coordinated by the U.S. Centers for Disease Control and Prevention (CDC). Every state health department, the District of Columbia, and three U.S. territories conduct a survey as part of the system to measure adult health risk behaviors and attitudes and the use of preventive health services. The CDC has included questions on asthma prevalence on the BRFSS since 1999. In 2006, Wisconsin began conducting the adult and child asthma call-back surveys (ACBS), in which adults and children who were identified in the BRFS as having lifetime asthma were invited to participate in an additional survey to provide in-depth information about their asthma history. This “call-back” survey includes detailed questions about symptoms, medication usage, health care utilization, asthma self-management knowledge, household environmental exposures, work-related asthma, and comorbid conditions.	21
Bureau of Labor Statistics (BLS), Current Population Survey (CPS)	The Current Population Survey (CPS) is a monthly survey of households conducted by the Bureau of Census for the Bureau of Labor Statistics. It provides a comprehensive body of data on the labor force, employment, unemployment, persons not in the labor force, hours of work, earnings, and other demographic and labor force characteristics.	1, 2, 3, 4, 6, 7, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 25
Cancer Registry	The Wisconsin population-based cancer registry, the Wisconsin Cancer Reporting System (WCRS), is housed within the Office of Health Informatics (DPH, DHS). The WCRS website provides direct access to information about cancer incidence and mortality in Wisconsin. The WCRS contributes to the understanding of cancer incidence and mortality in Wisconsin, the development of prevention and treatment programs, and the ultimate goal of reducing cancer mortality.	12

Data Source	Description	Used for Indicator(s)
Census of Fatal Occupational Injuries (CFOI)	These reports are a complete study of work-related fatalities that occurred in Wisconsin regardless of coverage by OSHA or Worker's Compensation using a wide variety of reports (death certificates., Worker's Compensation, coroners and medical examiners, OSHA, etc.). The data are collected annually by the Bureau of Labor Statistics, Occupational Safety and Health Statistics unit, part of the Wisconsin State Laboratory of Hygiene (WSLH) and contracted with the U.S. Department of Labor's Bureau of Labor Statistics (BLS).	3
Centers for Disease Control and Prevention (CDC)	The CDC's National Healthcare Safety Network (NHSN) is the nation's most widely used health-care-associated infection tracking system. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate health-care-associated infections. The NHSN has an annual report that we use which has the proportion of health care personnel with an influenza vaccination by state.	23
Council of State and Territorial Epidemiologists (CSTE)	For more than five decades, the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC) have worked together in partnership to improve the public's health by supporting the efforts of epidemiologists working at the state and local level to promote effective use of epidemiologic data to guide public health practice and improve health. CSTE and its members represent two of the four basic components of public health—epidemiology and surveillance.	5, 8, 10, 11, 12, 14, 15, 16, 17
County Business Patterns (CBP)	The U.S. Census Bureau's County Business Patterns (CBP) is an annual series that provides subnational economic data by industry. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. These data are useful for studying the economic activity of small areas; analyzing economic changes over time; and as a benchmark for other statistical series, surveys, and databases between economic censuses. Businesses use the data for analyzing market potential, measuring the effectiveness of sales and advertising programs, setting sales quotas, and developing budgets. Government agencies use the data for administration and planning.	14
Death Certificate Records	Death certificates for deaths occurring in Wisconsin are collected by the Vital Records Unit in the Office of Health Informatics (DPH, DHS). The death certificates are submitted by the 72 County Register of Deeds offices and by two city health offices (West Allis and Milwaukee). Deaths of Wisconsin residents that occur in other states and countries are recorded by those governments and submitted to the Wisconsin Vital Records Unit. In 1999, the coding system used to classify causes of death changed to a newer version: the International Classification of Diseases-9 (ICD-9) to ICD-10.	10

Data Source	Description	Used for Indicator(s)
Emergency Department (ED) Visits	ED data collected by the Wisconsin Hospital Association have been available in Wisconsin since 2002 from the Office of Health Informatics (DPH, DHS). It is important to note that rates are based on the number of ED visits and not the number of unique individuals admitted to the ED with a specific principal diagnosis. All ED rates presented in this report occurred in Wisconsin hospitals for Wisconsin residents only.	21, 24
Inpatient Hospitalizations	Inpatient hospitalization data have been available in Wisconsin since 1989 from the Bureau of Health Information and Policy (DPH, DHS). In October of 2003, the collection of inpatient hospitalization data was transferred to the Wisconsin Hospital Association. Data are reported by all of Wisconsin's acute care, non-federal hospitals. Zip code information collected was used to determine county of residence. If a zip code straddled county boundaries, the patients from that zip code area were randomly allocated to a county based on a probability equal to the proportion of the zip code area's population in each county. It is important to note that rates are based on the number of hospitalizations and not the number of unique individuals admitted to hospitals with a specific principal diagnosis. All hospitalization rates presented in this report occurred in Wisconsin hospitals for Wisconsin residents only.	2, 6, 9, 20, 21, 22, 25
National Academy of Social Insurance (NASI)	The National Academy of Social Insurance (NASI) is a nonprofit, nonpartisan organization made up of the nation's leading experts on social insurance. Its mission is to advance solutions to challenges facing the nation by increasing public understanding of how social insurance contributes to economic security. Social insurance encompasses broad-based systems that help workers and their families' pool risks to avoid loss of income due to retirement, death, disability, or unemployment, and to ensure access to health care. NASI publishes annual workers' compensation reports, with benefits, coverage, and costs by state. These are the only comprehensive national data on this largely state-run program, including estimates of workers' compensation payments—cash and medical—for all 50 states, the District of Columbia, and federal programs providing workers' compensation.	5, 8, 19
Occupational Safety and Health Professional Registries	The numbers of health and safety professionals are collected through current membership rosters of cited organizations, including the American College of Occupational and Environmental Medicine (ACOEM), American Board of Preventive Medicine diplomats database, American Association of Occupational Health Nurses (AAOHN), American Board of Industrial Hygiene, American Industrial Hygiene Association (AIHA), Board Certified Safety Health Professionals (BCSP) member directory, and American Society of Safety Engineers (ASSE).	17

Data Source	Description	Used for Indicator(s)
Occupational Safety and Health Administration (OSHA)	The Occupational Safety and Health Administration (OSHA) serves as the enforcement and inspection arm of Wisconsin workplaces. It routinely conducts inspections and injury investigations, issues fines and warnings, and provides technical assistance. In Wisconsin the state OSHA enforcement activities remain vital to workplace safety and health, targeting the most hazardous workplaces and the employers that have the highest injury and illness rates. By working together, OSHA and the Occupational Health program can address emerging concerns in a timely manner. Interventions developed recently include public service announcements on the use of lifts to reduce injury in health care workers, and training on burn hazards facing restaurant workers.	18
Survey of Occupational Injuries and Illnesses (SOII)	The SOII is the largest nationwide data collection of workplace injury statistics. In Wisconsin, work injury information is requested from approximately 6,000 establishments throughout the state, across all industries each year. These reports provide statistical information on work -related injuries and illnesses (excluding first aid) collected from employers and OSHA records. The data are collected annually by the Bureau of Labor Statistics/Occupational Safety and Health Statistics unit, part of the Wisconsin State Laboratory of Hygiene (WSLH), and contracted with the U.S. Department of Labor's Bureau of Labor Statistics (BLS).	1, 4, 7
Workers' Compensation	The Wisconsin Department of Workforce Development (DWD) is the state agency charged with building and strengthening Wisconsin's workforce. The Workers' Compensation Division provides data to facilitate a variety of research, resulting in statistical information on workers injuries, illnesses, and fatalities.	5, 8, 21
Wisconsin Poison Center (WPC)	The Wisconsin Poison Center, located in Milwaukee, provides 24-hour, toll -free poison information for all individuals in Wisconsin. In addition to assisting with poison exposure treatment, the center strives to provide comprehensive education regarding the prevention of poison injury.	11
U.S. Census Bureau	The primary mission of the Census Bureau is conducting the U.S. Census every 10 years, which allocates the seats of the U.S. House of Representatives to the states based on their population. In addition to the decennial census, the Census Bureau continually conducts dozens of other censuses and surveys, including the American Community Survey, the U.S. Economic Census, and the Current Population Survey.	9, 10, 12

Indicator Tables

All occupational health indicators by year, 2009–2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indicator 1										
Total rate of work-related injury and illness per 100,000 full-time employees	4200	4300	4200	4000	4000	3900	3600	3700	3600	3600
Rate of cases involving days away from work per 100,000 full-time employees	1000	1200	1100	1100	1000	1100	1000	1100	1000	1000
Indicator 2										
Total rate of work-related hospitalizations per 100,000 employees ages 16+ years	78.7	76.8	72.0	60.7	57.8	59.4	54.5	50.6	43.6	46.5
Indicator 3										
Total rate of fatal work-related injuries per 100,000 full-time employees ages 16+ years	3.7	3.5	3.4	4.3	3.6	3.6	3.8	3.7	3.6	4.0
Indicator 4										
Incidence rate of work-related amputations per 100,000 full-time employees	9.0	11.0	9.0	10.0	6.0	8.0	7.0	9.0	6.0	7.0
Indicator 5										
Incidence rate of work-related amputations filed with Wisconsin's Workers' Compensation (WC) per 100,000 workers covered by WC	9.2	10.3	10.1	10.3	10.2	10.4	8.3	8.9	7.7	Not available
Indicator 6										
Total rate of hospitalizations for work-related burns per 100,000 employees ages 16+ years	2.0	1.2	2.1	1.0	1.4	1.1	1.6	1.3	1.1	1.4

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indicator 7										
Total rate of work-related musculoskeletal disorders (MSDs) per 100,000 full-time employees	Not comparable	Not comparable	459	420	400	397	363	403	370	Not available
Rate of Back MSDs per 100,000 full-time employees	Not comparable	Not comparable	186	187	150	168	130	156	129	Not available
Rate of Neck MSDs per 100,000 full-time employees	Not comparable	Not comparable	151	128	144	119	125	133	131	Not available
Rate of carpal tunnel syndrome per 100,000 full-time employees	Not comparable	Not comparable	18	16	16	15	12	13	18	Not available
Indicator 8										
Incidence rate of carpal tunnel syndrome cases filed with Wisconsin WC per 100,000 workers covered by WC	23.2	22.7	18.0	15.2	15.5	14.1	11.8	10.6	7.9	Not available
Indicator 9										
Total rate of pneumoconiosis hospitalizations per 100,000 employees ages 15+ years	65.8	51.5	49.5	43.5	44.4	32.1	30.3	18.7	18.0	19.4
Rate of asbestosis hospitalizations per 100,000 employees ages 15+ years	50.0	38.3	37.2	33.4	33.2	23.0	21.8	12.4	12.7	12.1
Rate of silicosis hospitalizations per 100,000 employees ages 15+ years	12.6	10.1	9.6	7.0	8.0	8.1	5.7	3.5	2.8	6.5
Rate of coal workers' pneumoconiosis hospitalizations per 100,000 employees ages 15+ years	2.1	1.1	1.6	1.0	0.6	0.1	0.6	0.6	1.2	0.7
Rate of other pneumoconiosis hospitalizations per 100,000 employees ages 15+ years	1.6	2.2	1.3	1.6	2.7	1.0	2.5	2.2	1.7	1.9

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indicator 10										
Total rate of pneumoconiosis deaths per 1,000,000 people ages 15+ years	5.4	5.1	4.5	3.9	7	4.6	5.7	4.3	5.1	4
Rate of asbestosis deaths per 1,000,000 people ages 15+ years	3.9	4.1	3.5	2.6	6.4	3.4	4	3	3.9	3.5
Rate of silicosis deaths per 1,000,000 people ages 15+ years	1.1	0.6	0.7	0.7	0.6	0.8	1.3	0.9	0.9	0.3
Indicator 11										
Total rate of work-related pesticide poisonings per 100,000 employees ages 16+ years	1.2	2.5	2.1	2.5	1.8	1.3	1.5	1.6	1.8	Not available
Indicator 12										
Incidence rate of mesothelioma per 1,000,000 residents ages 15+ years	18.2	16.1	14.0	11.0	17.3	14.9	16.8	14.2	14.1	Not available
Indicator 13										
Prevalence rate of blood lead levels (BLL) ≥ 10 µg/dL per 100,000 employees ages 16+	30.8	29.5	27.4	24.8	23.8	23.3	21.4	23.6	18.8	21.2
Incidence rate of blood lead levels (BLL) ≥ 10 µg/dL per 100,000 employees ages 16+	12.9	11.7	11.1	10.2	9.8	10.1	9.9	11.8	8.7	11.2
Prevalence rate of blood lead levels (BLL) ≥ 25 µg/dL per 100,000 employees ages 16+	5.6	4.2	4.1	3.5	3.6	3.0	3.2	5.1	2.5	3.0
Incidence rate of blood lead levels (BLL) ≥ 25 µg/dL per 100,000 employees ages 16+	3.3	2.2	2.5	2.1	2.0	1.8	2.0	3.6	1.3	2.0
Prevalence rate of blood lead levels (BLL) ≥ 40 µg/dL per 100,000 employees ages 16+	0.8	0.5	0.5	0.4	0.4	0.5	0.3	1.0	0.2	0.2
Incidence rate of blood lead levels (BLL) ≥ 40 µg/dL per 100,000 employees ages 16+	0.7	0.4	0.4	0.3	0.3	0.5	0.3	1.0	0.2	0.2
Indicator 14										
Percentage of workers in industries at high risk for occupational morbidity	9.5	9.4	9.5	9.5	6.1	6.1	6.0	5.9	5.9	Not available

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indicator 15										
Percentage of workers in occupations at high risk for occupational morbidity	15.5	16.0	16.7	15.5	15.7	15.2	14.9	14.3	15.4	15.1
Indicator 16										
Percentage of workers in industries at high risk for occupational mortality	11.4	14.2	14.8	14.7	14.1	13.7	15.1	15.7	15.3	16.1
Percentage of workers in occupations at high risk for occupational mortality	10.4	11.7	12.0	12.2	11.3	10.9	12.9	12.6	13.3	12.8
Indicator 17 - Rate of occupational safety and health professionals per 100,000 workers										
American Society of Safety Engineers members	24.2	24.2	Not available	23.8	24.2	22.6	22.4	Not available	Not available	Not available
Safety health professionals	8.7	9.1	Not available	9.7	9.7	10.1	10.2	Not available	Not available	Not available
Occupational health nurses	7.3	7.0	Not available	Not available	6.4	5.9	5.3	Not available	Not available	Not available
Industrial hygienists	2.9	3.1	Not available	2.0	2.4	2.3	1.1	Not available	Not available	Not available
Occupational medicine physicians	2.3	2.2	Not available	1.9	Not available	1.8	1.9	Not available	Not available	Not available
Indicator 18										
Percentage of OSHA-covered employees eligible for inspection	2.4	2.6	2.4	3.0	2.1	2.7	2.7	1.7	2.2	Not available
Percentage of OSHA-covered establishments eligible for inspection	1.1	1.2	1.1	1.1	0.9	1.0	0.9	0.7	0.7	Not available
Indicator 19										
Total amount of worker's compensation benefits paid (in millions)	$1,113	$1,070	$1,099	$1,123	$1,126	$1,163	$1,169	$1,170	$1,169	Not available
Average amount of worker's compensations paid per worker	$438	$424	$430	$434	$438	$438	$435	$428	$418	Not available

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indicator 20										
Rate of work-related low back hospitalizations per 100,000 employees	23.7	20.7	16.9	12.4	10.0	8.6	Not available	Not available	Not available	Not available
Rate of work-related low back surgeries per 100,000 employees	14.0	12.8	9.9	7.0	6.2	5.5	Not available	Not available	Not available	Not available
Indicator 21										
Proportion of ever-employed adults with current asthma reported to be made worse by exposures at work	Not available	Not available	50.2	59.7	56.8	49.4	51.3	57.7	54.2	Not available
Indicator 22										
Total rate of work-related severe traumatic injury hospitalizations per 100,000 full-time employees ages 16+ years	8.8	10.0	10.1	8.5	9.5	10.9	Not available	Not available	Not available	Not available
Indicator 23										
Percentage of health care personnel vaccinated	Not available	Not available	Not available	Not available	90.7	93.8	94.4	93.9	95.1	96.2
Indicator 24										
Total rate of occupational health related ED visits per 100,000 employees ages 16+	Not available	2.8	3.8	5.2	4.1	2.0	2.3	2.0	1.0	2.4
Indicator 25										
Total rate of hospitalizations for occupational eye injuries per 100,000 employees ages 16+ years	Not available	Not available	Not available	Not available	Not available	Not available	Not available	0.67	0.55	0.46