2008-2012

Arizona Occupational Health Hazard Indicators

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Published: June, 2015

Arizona Department of Health Services

Acknowledgements

Arizona Department of Health Services
Arizona Cancer Registry
Bureau of Epidemiology & Disease Control,
Office of Environmental Health
Office of Vital Records
Section of Cost Reporting and Discharge Data Review

Arizona Division of Occupational Safety & Health

Arizona Industrial Commission

Council of State and Territorial Epidemiologists

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Center for Worker Health & Environment

Support for this work was provided by funding from the National Institute for Occupational Safety and Health, Mountain and Plains Education and Research Center, T42 OH009229, and the Western Center for Agricultural Health and Safety.

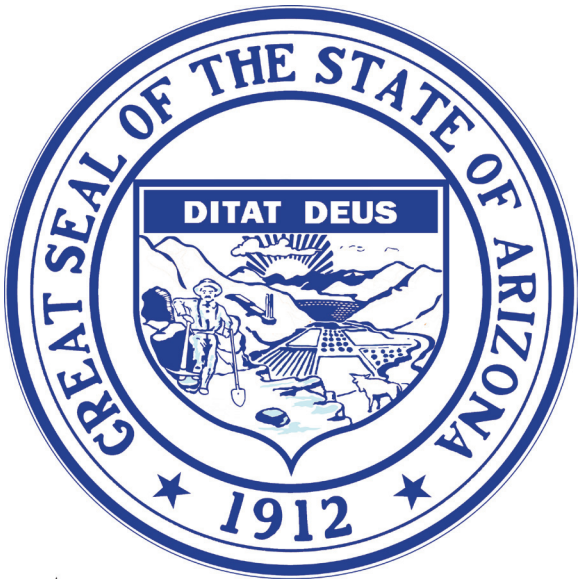

Table of Contents

Executive Summary

This report is an accumulation of workforce statistics such as demographic profiles, workforce safety and health, and the counts and rates of injuries and illnesses for varying occupational health indicators for Arizona from 2008-2012.

Methods, limitations, and future recommendations are included for each indicator.

When appropriate, state statistics are compared with the national statistics to provide further information on Arizona's standing in comparison to the other states.

Significant Findings for 2008-2012

The Arizona workforce demographic profile is similar to the national demographic profile.

An average of 690,530 workers' compensation benefit claims were paid to Arizona workers per year, with each worker covered receiving an average of $295.50 per case.

There was an average of 62,140 total work-related injuries per year with approximately 2,940 of those cases leading to fatalities.

The total number of work-related musculoskeletal disorders, mesothelioma, adults with elevated blood lead levels, and adults with asthma increased within this time range.

The total number of work-related amputations, pneumoconiosis, and lower-back hospitalizations decreased within this time range.

On average, Arizona falls below the national average for occupational injuries and illnesses, but still has many areas that could benefit from interventions and preventative action.

Introduction and Background

Every year in the United States, millions of workers experience a work-related injury or illness. Many of these work-related injuries and illnesses are preventable. A significant proportion results in days away from work or fatalities. Work-related injuries and illnesses can decrease work-productivity and lead to excessive healthcare costs for both the employers and employees. Generating a baseline report of occupational injuries and illnesses is the first step to successful identification and intervention of current and future health hazards.

Many state agencies administer occupational health surveillance programs that help to enhance data collection and analysis of workforce health, safety, and productivity. The purpose of these programs is to develop strategies to prevent and reduce detrimental work-related health effects. Currently, Arizona does not have a systematic program for occupational health surveillance. This document describes the occupational health status of Arizona workers and demonstrates the capacity for a comprehensive, statewide occupational health surveillance program.

This report presents the 21 occupational health indicators (OHI) that the Council of State and Territorial Epidemiologists (CSTE) and the National Institute for Occupational Safety and Health (NIOSH) recognize as important characteristics of workforce health and safety. The data describe the occupational health status of Arizona workers including influential factors such as demographics and industry characteristics. The presented results are based upon the most recent data available; it is recommended that the scope of surveillance should be expanded upon as more data become available.

Methods

The Council of State and Territorial Epidemiologists' (CSTE) document entitled "Using the CSTE Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and their Determinants" (www.cste.org) served as the guideline for data collection. The CSTE Guideline provides detailed methods for each indicator on how to collect data and calculate frequency measurements that are consistent at a national level.

The majority of the data were collected from publicly available, national datasets but some data was acquired through sources that are specific to Arizona.

The report describes the significance, methods, results, limitations, and future recommendations for each occupational health indicator (OHI).

When appropriate, state-to-national comparisons are presented to demonstrate where Arizona ranks on occupational health and safety in relation to other states.

An explanation discussing why data from certain possible indicators are not included can be found in the limitation section for each.

All data sources and websites can be found in the appendix at the end of this report.

Arizona Employment Demographic Profile

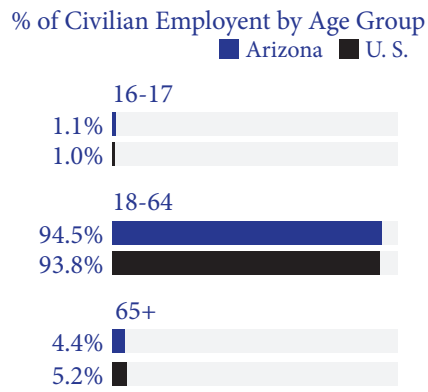

Figure P.1 State-to-national employment comparison by age group. **Source:** BLS Current Population Survey.

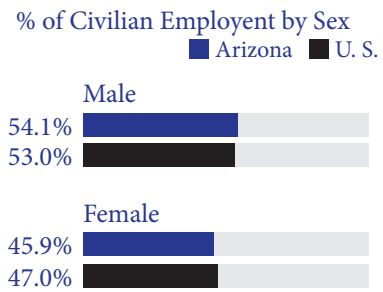

Figure P.2 State-to-national employment comparison by sex. **Source:** BLS Current Population Survey.

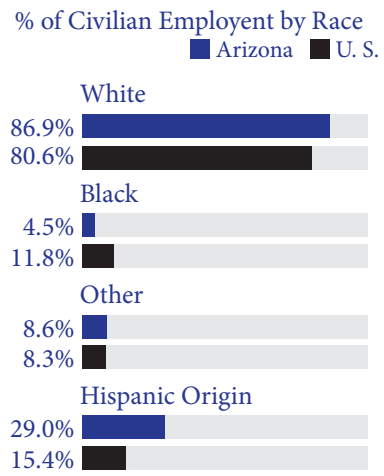

Figure P.3 State-to-national employment comparison by race. **Source:** BLS Current Population Survey

SIGNIFICANCE

Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Research has shown relationships between demographic characteristics of workers and the risk of occupational injury or illness. Understanding the characteristics of a state's workforce will guide development and implementation of preventive strategies and target research efforts.

METHODS

The Bureau of Labor Statistics (BLS) Current Population Survey and BLS Geographic Profiles of Employment and Unemployment provided demographic and employment data. Age, sex, race/ethnicity, and employment characteristics are described for the years 2008-2012 for Arizona and the United States. The BLS data include all persons employed in the civilian noninstitutional population.

RESULTS

- In Arizona, the average age of civilian workers was equivalent to the average age of civilian workers in the United States. (Figure P.1)
- The ratio of male workers to female workers in Arizona is approximately equal to the national ratio of male workers to female workers. (Figure P.2)
- The majority of civilian employees are white. Approximately one-quarter of Arizona residents have a Hispanic origin. (Figure P.3)

EMPLOYMENT CHARACTERISTICS

Between the years 2008-2012, there were at least 2.7 million civilian workers employed in Arizona age 16 years and older. (Table P.1)

The number of employed civilian workers has gradually declined from 2008-2012. (Figure P.4)

In 2012, the percentage of self-employed, civilian workers in Arizona was comparable to the United States at approximately 7%. (Figure P.5)

Year	Arizona	United States
2008	2,954,000	145,362,000
2009	2,836,000	139,878,000
2010	2,850,000	139,064,000
2011	2,732,000	139,869,000
2012	2,770,000	142,469,000

Table P.1 State-to-national comparison of number of civilian workers, ages 16 and older
Source: Bureau of Labor Statistics Current Population Survey

Arizona Employment Demographic Profile

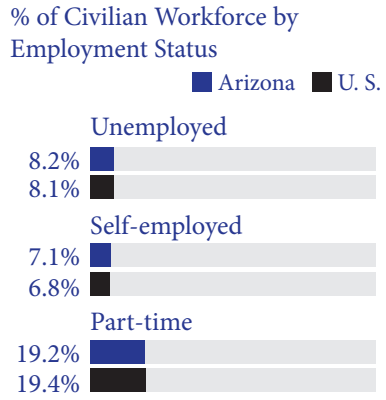

Figure P.4 State-to-national workforce comparison by employment status **Source:** BLS Current Population Survey

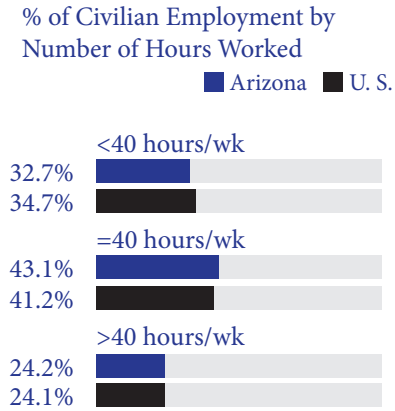

Figure P.5 State-to-national employment comparison by number of hours worked **Source:** BLS Current Population Survey

INDUSTRIES AND OCCUPATIONS

Idustries that employed the most civilian workers in Arizona in 2012 were education and health services, wholesale and retail trade, and professional and business services. The majority of Arizona residents work 40 hours or less in any given work week. These percentages were comparable to the United States. Occupational groups that employed the most civilian workers in Arizona in 2012 were professional and related occupations, service occupations, and management, business and financial operations.

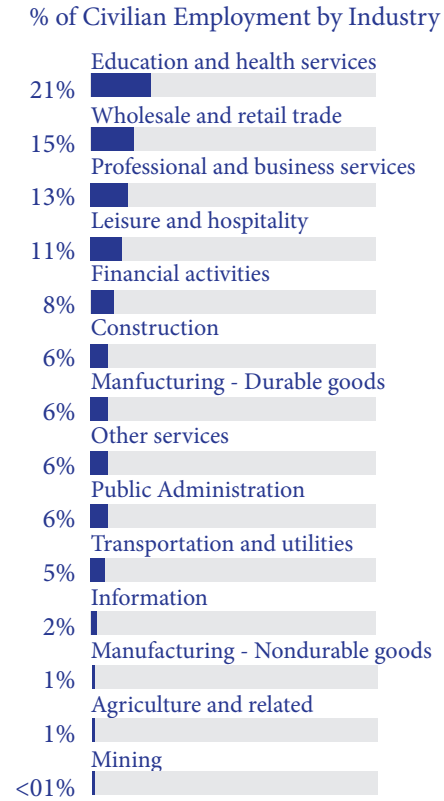

Figure P.6 Employment in Arizona by industry. **Source:** BLS Current Population Survey

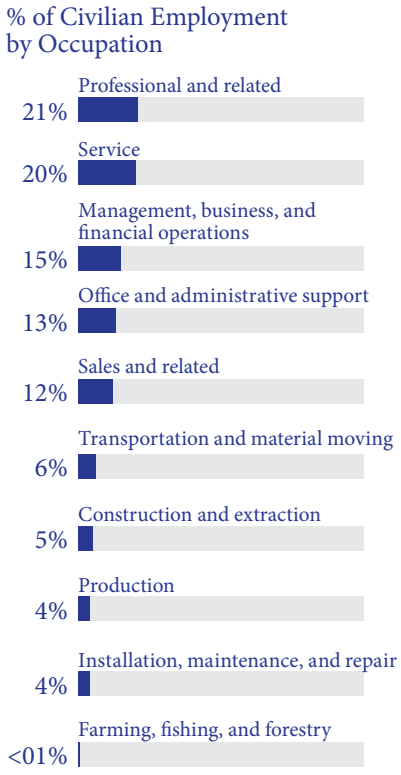

Figure P.7 Employment in Arizona by industry. **Source:** BLS Current Population Survey

SUMMARY

The Arizona workforce is generally comparable to that of the United States overall. However, African-Americans (blacks) represent a smaller proportion of the Arizona workforce than in the United States overall, and Hispanics represent a higher proportion. This likely reflects the demographic characteristics of the state

LIMITATIONS

1. The Bureau of Labor and Statistics did not include self-employed occupations.
2. Estimates are only available for detail and major occupation groups; industry-specific estimates for broad and minor occupation groups are not available.
3. Demographic and workforce characteristics serve as descriptors but do not directly measure occupational risks or hazards in the workforce or for individual workers.
4. The Geographic Profiles data are based on the Current Population Survey (CPS), which is a monthly probability sample of households across the United States.
5. Workers less than 16 years of age, active-duty members of the military, and inmates in institutions were not included.
6. Data may underestimate the percentage of certain racial or ethnic worker populations that do not have permanent residences, or are migratory in nature.

RECOMMENDATIONS

1. Determine how workforce demographics and characteristics impact work-related injuries and illnesses in Arizona.
2. Develop methods for tracking migratory worker populations in order to assess the impact of work-related injuries and illnesses in Arizona.

Indicator 1
Non-fatal Injuries and Illnesses

Arizona's highest incidence rate was 3,700 events per 100,000 FTE in 2008 and its lowest rate was 3,200 events per 100,000 FTE in 2011 and 2012. • The count and rate of all non-fatal injuries and illnesses has gradually decreased from 2008-2012. • From 2010-2012, the count and the rate of cases approached 15,400 cases and 900 cases per 100,000 FTE, respectively.

	All injuries and illnesses		Injuries and illness involving days away from work	
Year	Count	Rate*	Count	Rate*
2008	69,500	3,700	18,300	1,000
2009	62,500	3,500	17,500	1,000
2010	53,700	3,300	15,200	900
2011	55,900	3,200	14,900	900
2012	54,400	3,200	15,400	900

* per 100,000 FTE

Table 1.1 Number and incidence rate of injuries and illnesses in Arizona
Source: BLS Survey of Occupational Injuries and Illnesses

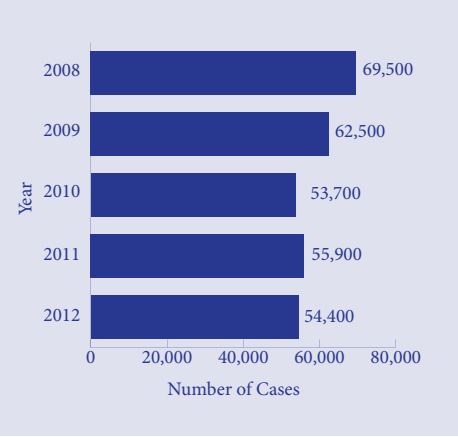

Figure 1.1 All work-related injuries and illnesses in Arizona
Source: BLS Survey of Occupational Injuries and Illnesses

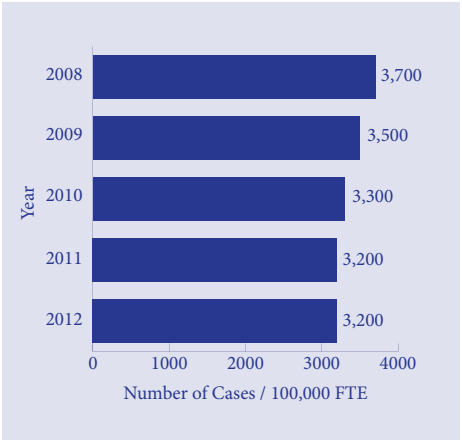

Figure 1.2 Incidence rate of work-related injury and illness in Arizona **Source:** BLS Survey of Occupational Injuries and Illnesses

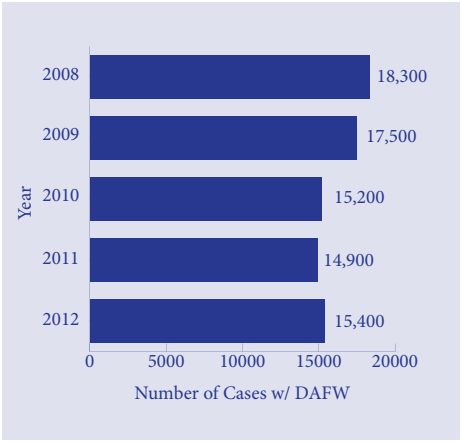

Figure 1.3 Work-related injuries and illnesses involving days away from work (DAFW) in Arizona **Source:** BLS Survey of Occupational Injuries and Illnesses

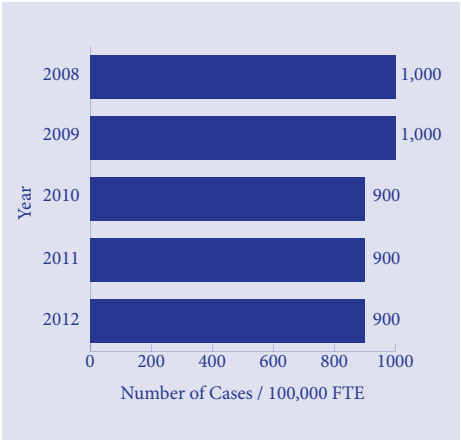

Figure 1.4 Incidence rate of work-related injury and illness involving days away from work in Arizona **Source:** BLS Survey of Occupational Injuries and Illnesses

Indicator 1 (continued)
Non-fatal Injuries and Illnesses

SIGNIFICANCE

Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to further identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.

METHODS

Non-fatal injuries and illnesses were obtained from the BLS Survey of Occupational Injuries and Illnesses (SOII). The incidence rate describes the number of new injuries and illnesses per 100,000 Full-Time Equivalents (FTE) in Arizona in each listed year. FTE measures time on the job, which gives a more accurate representation of at-risk experience than employment status would. Crude rates were calculated for each year using the estimated number of FTE from the Bureau of Labor Statistics Current Population Survey as the denominator.

LIMITATIONS

1. The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error and potential incomplete or inaccurate reporting.
2. The SOII based results may represent undercounting of injury/illness is for several reasons:
   - There is a potential for sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases. Military, self-employed individuals, farms with 10 or fewer employees, and Federal agencies are excluded from the survey.
   - Days away from work (DAFW) does not capture the entire burden of injury/illness since it does not include restricted work activities without loss of workdays.
   - There is potential underreporting by employers.
3. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only.
4. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate state-specific estimates.

RECOMMENDATIONS

1. Determine risk factors that contribute to work-related illness and injuries to guide intervention, education, prevention and regulatory efforts.
2. In the future, cross validation of SOII information with other sources can help estimate the degree of undercount.

Indicator 2
Work-related Hospitalizations

In Arizona, there were at least 2,700 annual hospital discharges with primary payer listed as workers' compensation from 2008-2012. • The annual crude rate of workers hospitalized for a work-related injury or illness ranged from 95 per 100,000 workers in 2009 to 111 per 100,000 workers in 2008.

Year	Count	Rate*
2008	3,278	111.0
2009	2,703	95.3
2010	2,966	104.1
2011	2,910	106.5
2012	2,823	101.9

*per 100,000 FTE

Table 2.1 Number and rate of work-related hospitalizations in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database; BLS Current Population Survey

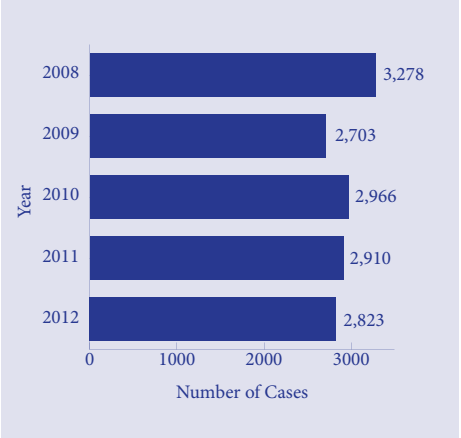

Figure 2.1 Number of inpatient hospitalizations in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database

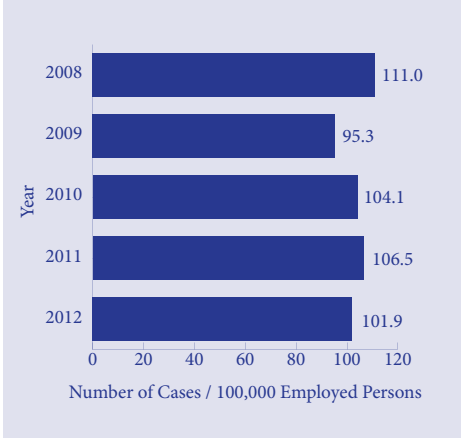

Figure 2.2 Crude rate of inpatient hospitalizations in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database; Bureau of Labor Statistics Current Population Survey)

SIGNIFICANCE

Individuals hospitalized with work-related injuries and illnesses have some of the most serious and costly work-related adverse health outcomes. Tracking of these significant adverse health effects should be undertaken to document the burden of occupational injuries and illnesses, and to identify settings in which workers may be at high risk. Tracking efforts will also be useful for designing, targeting, and evaluating prevention efforts over time.

METHODS

The number of work-related hospitalizations were obtained from Arizona's Department of Health Services, which collects data on all hospital discharges from Arizona licensed hospitals. The data does not include cases of unknown age, cases under 16 years-of age, out-of-state residents, unknown residence, or out-of-state hospitalizations. Discharges from federal, military, and Department of Veteran Affairs hospitals are excluded. Crude rates of hospitalizations per 100,000 employed persons were calculated for each year from 2008-2012 using civilian employment estimates from the Bureau of Labor Statistics Current Population Survey as the denominator.

LIMITATIONS

1. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients, to correctly diagnose work-related conditions, and/or to list the condition as a discharge diagnosis.
2. Residents of one state may be hospitalized in another state and not be reflected in his/her state's hospitalization data.
3. All admissions are counted, including multiple admissions for a single individual.

RECOMMENDATIONS

1. Continue to track inpatient hospitalizations to get a more accurate representation of the overall trend.
2. Age, gender, race/ethnicity, zip code specific counts, and rates can be used to better define the pattern of work-related hospitalizations.
3. Examine the proportion of all hospitalizations in Arizona.

Indicator 3
Fatal Work-related Injuries

In 2008, Arizona fatality rates were in the national average range but then gradually decreased to rates continually lower than overall United States rates. • The annual number of fatal injuries gradually decreased in Arizona from 2008-2012 with an average of 76 fatalities per year. • The range of annual rates of fatal work-related injuries in Arizona was 2.2 per 100,000 workers in 2012 and 3.4 cases per 100,000 workers in 2008.

Year	Arizona	United States
2008	100 (3.4)	5,214 (3.7)
2009	76 (2.7)	4,551 (3.5)
2010	77 (2.7)	4,690 (3.6)
2011	69 (2.5)	4,693 (3.5)
2012	60 (2.2)	4,628 (3.4)

* per 100,000 FTE

Table 3.1 State-to-national comparison of number and incidence rate of work-related injuries, ages 16 and older **Source:** Industrial Commission of Arizona; BLS Census of Fatal Occupational Injuries; BLS Current Population Survey

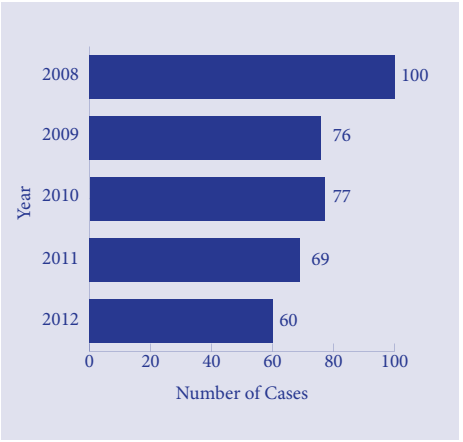

Figure 3.1 Number of work-related injuries in Arizona, ages 16 and older **Source:** Industrial Commission of Arizona

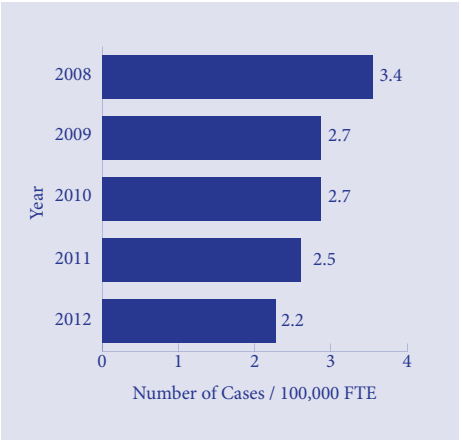

Figure 3.2 Crude fatality rate of work-related injuries in Arizona, ages 16 and older **Source:** Industrial Commission of Arizona; BLS Current Population Survey

SIGNIFICANCE

Multiple factors and risks contribute to work-related fatalities, including workplace/process design, work organization, worker characteristics, economics, and other social factors. Surveillance of work-related fatalities can identify new hazards and case clusters, leading to the development of new interventions and development of new or revised regulations to protect workers.

METHODS

The number and rates of fatal work-related injuries were found for Arizona and the United States from 2008-2012. The counts of fatal work-related injuries were found in BLS Census of Fatal Occupational Injuries (CFOI) and rates were calculated using FTE as the denominator according to the BLS Current Population Survey.

LIMITATIONS

1. CFOI program states are not permitted to release occupation or industry specific data when data are sparse. Such sparse data is categorized under 'others'.
2. The CFOI program, although it has a data element for ICD codes, publishes findings according to the OIIC classification system rather than ICD. Therefore, data from CFOI may not be comparable to causes of death documented on death certificates.

RECOMMENDATIONS

1. Review fatal work-related injury and illness data in Arizona by industry cause, occupation, age, gender, race/ethnicity and injury/illness.
2. Identify the primary risk factors that contribute to work-related fatalities to guide intervention, education, prevention and regulatory efforts.

Indicator 4
Amputations Reported By Employers

The range of amputations reported by employers in Arizona was 30 to 60 annual cases between the years 2008-2012. • It appears that the annual rate of amputations is beginning to level off at 2 cases for every 100,000 FTE.

Year	Estimated Count	Incidence rate*
2008	60	3.0
2009	60	4.0
2010	40	2.0
2011	30	2.0
2012	30	2.0

* per 100,000 FTE

Table 4.1 Number and incidence rate of work-related amputations in Arizona, ages 16 and older **Source:** BLS Occupational Injuries and Illnesses; BLS Fatal Injuries Profiles

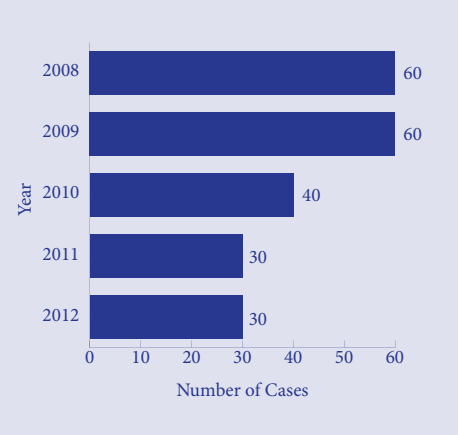

Figure 4.1 Number of work-related amputations involving days away from work in Arizona, ages 16 and older **Source:** BLS Survey of Occupational Injuries and Illnesses

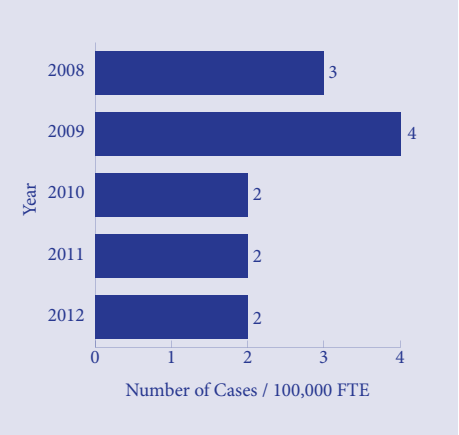

Figure 4.2 Incidence rate of work-related amputations involving days away from work in Arizona, ages 16 and older **Source:** BLS Occupational Injuries and Illnesses; BLS Fatal Injuries Profiles

SIGNIFICANCE

Work-related amputations are serious yet preventable injuries, and control of occupational hazards is the most effective means of prevention.

Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.

METHODS

Data was obtained from the BLS Annual Survey of Occupational Injuries and Illnesses (SOII) that provides annual estimates on the number and incidence rates of work-related amputations involving at least one day away from work.

LIMITATIONS

1. The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error and potential incomplete or inaccurate reporting.
2. The SOII based results may represent undercounting of injury/illness is for several reasons:
   - There is a potential for sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases.
   - Military, self-employed individuals, farms with 10 or fewer employees, and Federal agencies are excluded from the survey.
   - Days away from work (DAFW) does not capture the entire burden of injury/illness since it does not include restricted work activities without loss of workdays.
3. There is potential underreporting by employers.
4. The category of "amputations" includes a wide range of types of amputations (e.g., ranging from a partial digit to a complete leg).

RECOMMENDATIONS

1. Utilize other SOII data elements to better define patterns of work-related amputations in Arizona. These may include, for example, industry-specific counts and rates of injuries, and for cases involving days away from work, counts (not rates) by occupation, length of service, age, gender, race/ethnicity and sources of injury.
2. In the future, include length of lost workdays as an indicator of injury severity.

Indicator 5
Amputations Identified in Workers' Compensation Systems

The number of amputations identified in workers' compensation systems was not identified.

SIGNIFICANCE

Work-related amputations are preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.

METHOD

National Academy of Social Insurance (NASI) tracks the overall number of workers covered by workers' compensation across the United States.

In the state of Arizona, the workers' compensations claims are regulated by a private industry so the number of amputations identified in state workers' compensation systems was unattainable.

LIMITATIONS

1. Workers' compensation data are not complete, as the majority of individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation.
2. Workers' compensation claims may be denied.
3. Self-employed individuals such as farmers and independent contractors, federal employees, railroad, and longshore or maritime workers may not be covered by state workers' compensation systems.
4. In Arizona, workers compensation records are maintained by a private organization and therefore there is limited access for epidemiologic analyses.

RECOMMENDATIONS

1. Facilitate a relationship with the private sector that records and maintains the workers' compensation system.
2. Age, gender, occupation, and industry-specific counts and rates can be used to better define the pattern of occupational injuries/illnesses.
3. Use frequency distributions by events and source of injury to highlight important causes.

Indicator 6
Hospitalizations from Work-related Burns

On average, 65 workers were hospitalized annually for work-related burns from 2008-2012 in Arizona. • The annual crude rate of work-related burn hospitalizations per 100,000 workers ranged from 1.9 to 3.0. • Both the count and the incidence rate of work-related burns was the lowest in 2010 but then have gradually increased over the last few years.

Year	Count	Incidence rate*
2008	87	3.0
2009	57	2.0
2010	53	1.9
2011	83	3.0
2012	76	2.7

* per 100,000 FTE

Table 6.1 Number and incidence rate of work-related burns in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database; BLS Current Population Survey

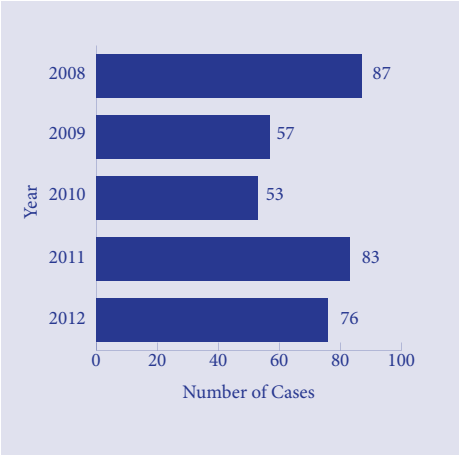

Figure 6.1 Number of work-related hospitalizations due to burns in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database

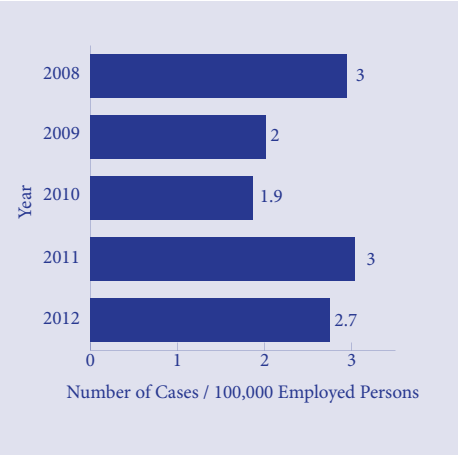

Figure 6.2 Rate of work-related hospitalizations due to burns in Arizona, ages 16 and older
Source: Arizona Department of Health Services' hospital discharge database; BLS Current Population Survey

SIGNIFICANCE

Work-related burns are some of the most devastating injuries affecting workers. Although hospitalized burns are unusual events, they are painful, disabling, and expensive to treat. Many result in significant disfigurement. In addition, burns are the most common cause of work-related hospitalization for young workers.

METHODS

The number of hospitalizations due to work-related burns was obtained from the Arizona Department of Health Services - Hospital Discharge Data Set. Criteria for inclusion were any hospital discharge records with a primary payer of workers' compensation, principle ICD-9-CM diagnosis code between 940-949, and patients aged 16 years and older. The data does not include cases of unknown age, out-of-state residents, unknown residence, and out-of-state hospitalizations. Discharges from federal, military, and Department of Veteran Affairs hospitals are excluded. Rates were calculated using Bureau of Labor Statistics Current Population Survey data for the denominator.

LIMITATIONS

1. Employed individuals less than 16 years old experience work-related burns but corresponding denominator data is not readily available.
2. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients.
3. Residents of one state may be hospitalized in another state and not be reflected in his/her state's hospitalization data.
4. Hospital Discharge records are only available for non-federal, acute care hospitals.

RECOMMENDATIONS

1. Age, gender, race/ethnicity, and zip code specific counts and rates can be used to better define the pattern of burns.
2. Look at the proportion of all burn hospitalizations in Arizona.

Indicator 7
Musculoskeletal Disorders Reported by Employers

Annual counts and rates of musculoskeletal disorders gradually increased in Arizona starting in 2008. • From 2008-2012, there were more musculoskeletal disorders involving the back than neck, shoulder, and upper extremities. • There were at least 4,000 annual musculoskeletal disorders involving days away from work in Arizona from 2008-2012. • Cases of carpal tunnel syndrome have been gradually increasing since 2008 with the highest count being 60 cases per year.

Year	All musculoskeletal disorders	Musculoskeletal disorders of the neck, shoulder, and upper extremities	Carpal tunnel syndrome	Musculoskeletal disorders of the back
2008	5,100 (270)	1,360 (73)	30 (2)	2,630 (139)
2009	4,090 (229)	1,100 (62)	30 (2)	1,920 (108)
2010	4,800 (293)	1,050 (66)	60 (3)	2,260 (138)
2011	5,240 (305)	1,170 (68)	50 (3)	2,200 (128)
2012	5,640 (330)	1,250 (74)	60 (3)	2,290 (134)

* per 100,000 FTE

Table 7.1 Number and rate of musculoskeletal disorders involving days away from work in Arizona **Source:** BLS Injuries, Illnesses, and Fatalitie

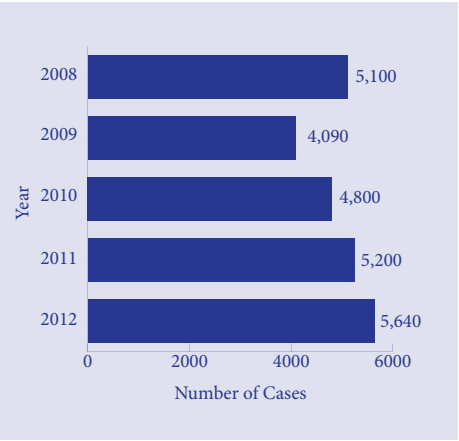

Figure 7.1 Number of all incident musculoskeletal disorders involving days away from work in Arizona **Source:** BLS Injuries, Illnesses, and Fatalities

Figure 7.2 Incidence rate of all musculoskeletal disorders involving days away from work in Arizona **Source:** BLS Injuries, Illnesses, and Fatalities

SIGNIFICANCE

Work-related musculoskeletal disorders (MSD) are preventable and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries helps target prevention programs and activities. Information on reported cases can be used to identify contributory factors and develop improved or new prevention strategies or regulations to protect workers.

METHODS

The BLS Annual Survey of Occupational Injury and Illness (SOII) provided data for musculoskeletal disorders in Arizona. The BLS definition of musculoskeletal disorders involving days away from work includes persons with one or more nature code in combination with an event code. Occupational Injury and Illness Codes include: musculoskeletal system and connective tissue diseases and disorders, carpal tunnel syndrome, tarsal tunnel syndrome, hernia, pinched nerve, herniated disk, meniscus tear, and Raynaud's syndrome as well as other symptoms such as numbness, swelling, and sprains. If these occurred from overexertion, repetitive motion, or via constant vibration, then it is counted as a musculoskeletal disorder.

Indicator 7 (continued) Musculoskeletal Disorders Reported by Employers

LIMITATIONS

1. The SOII is based on a probability sample of employer establishments, not on a census of all employers. As such, SOII estimates are subject to sampling error.
2. There is potential for sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases.
3. SOII excludes approximately 14% of the workforce including the military, self-employed individuals, private household workers, workers on farms with 10 or fewer employees, Federal agencies and, until 2008, state and municipal workers.
4. Although BLS has produced national estimates for state and local governments since 2008, maintenance of logs of OSHA recordable injuries and illnesses by these agencies is voluntary in many states. Therefore, analyses at the state level are limited to private sector workforce only.
5. Some states do not participate in this Federal-State survey, and in some participating states, the sample sizes are insufficient to generate state-specific estimates. Count estimates and rates may not be published/released by BLS due to the reliability of the estimates.
6. The SOII relies on employer reports of injuries and illnesses and is therefore subject to both willful and unintentional underreporting of cases or case details. Employers may place affected workers on restricted work activity, thereby avoiding the reporting of these cases as lost workday cases (which require reporting of additional details).
7. SOII only collects data for the incident year, and does not capture lost work-time that may carry over to a new calendar year.

RECOMMENDATIONS

1. Examine work-related MSD by industry (counts and rates) and by age, gender, race/ ethnicity, occupation, and source of injury/ illness (counts only).

Indicator 8
Carpal Tunnel Syndrome Cases Identified in Worker's Compensation Systems

The number of carpal tunnel syndrome cases identified in workers' compensation systems was not identified.

SIGNIFICANCE

Carpal tunnel syndrome is preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking carpal tunnel syndrome can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.

METHODS

National Academy of Social Insurance (NASI) tracks the overall number of workers covered by workers' compensation across the United States.

In the state of Arizona, the workers' compensations claims are regulated by a private industry so the number of carpal tunnel syndrome cases identified in state workers' compensation systems was unattainable.

LIMITATIONS

1. Workers' compensation data is not complete, as the majority of individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation.
2. Workers' compensation claims may be denied.
3. Self-employed individuals such as farmers and independent contractors, federal employees, railroad, and longshore or maritime workers are not covered by state workers' compensation systems.
4. In Arizona, workers compensation records are maintained by a private organization and therefore there is limited access for epidemiologic analyses.

RECOMMENDATIONS

1. Facilitate a relationship with the private sector that records and maintains the workers' compensation system.
2. Age, gender, occupation, and industry-specific counts and rates can be used to better define the pattern of occupational injuries/illnesses.
3. Identify frequency distributions by events and source of injury to highlight important causes.

Indicator 9
Pneumoconiosis Hospitalizations

The number of pneumoconiosis hospitalizations has decreased in Arizona during the years of 2008-2012. • The rate of hospitalizations due to pneumoconiosis has steadily decreased with the highest rate being 4.8 cases per one-million residents.

Year	Count	Incidence rate*
2008	24	4.8
2009	15	2.9
2010	13	2.6
2011	11	2.1
2012	n/a	n/a

*per 1,000,000 residents

Table 9.1 State-to-national comparison of number and incidence rate of pneumoconiosis hospitalizations, ages 15 and older **Source:** Arizona Department of Health Services' hospital discharge database; United States Census Bureau

Figure 9.1 Number of pneumoconiosis hospitalizations in Arizona, ages 15 and older Source: Arizona Department of Health Services' hospital discharge database

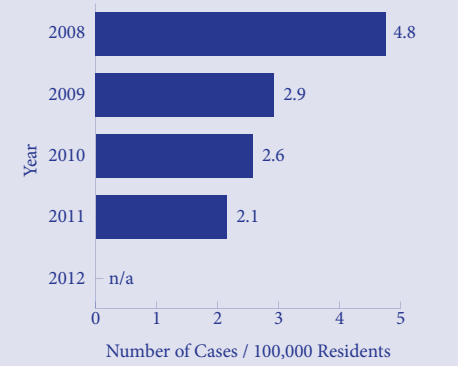

Figure 9.2 Rate of pneumoconiosis inpatient hospitalizations in Arizona, ages 15 and older **Source:** Arizona Department of Health Services' hospital discharge database; United States Census Bureau

SIGNIFICANCE

Pneumoconiosis frequency varies geographically, being largely determined by local industrial activities and migration of affected individuals. **Control of occupational dust exposure is the single most effective means of preventing pneumoconiosis.** Tracking of pneumoconiosis is essential for measuring progress towards elimination of the disease, as well as for targeting prevention and disease management programs.

METHODS

Pneumoconiosis hospitalization data was obtained from the Arizona Department of Health Services' hospital discharge database. Pneumoconiosis cases meeting the following criteria were requested: any diagnosis of ICD-9-CM code 500 through 505 (including asbestosis) and age 15 years and older. Excluded data included patient age unknown, out-of-state residents, unknown state of residence and out-of-state hospitalizations. Discharges from federal, military, and Department of Veteran Affairs hospitals are excluded. Rates were calculated per one-million Arizona residents.

LIMITATIONS

1. Data for 2012 could not be presented because it fell below the required minimum value for privacy purposes.
2. The number of diagnoses listed on discharge summaries may vary by regional practice patterns and by the persons completing the summaries.
3. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients, to diagnose pneumoconiosis, and/or to list pneumoconiosis as a discharge diagnosis.
4. Residents of one state may be hospitalized in another state and not be reflected in his/her state's inpatient hospitalization data.

RECOMMENDATIONS

1. Use age, gender, race/ethnicity, and zip code-specific counts and rates to better define the pattern of hospitalizations.
2. Provide information on the payer to provide insight on utilization of workers compensation benefits.

Indicator 10
Pneumoconiosis Mortality

There was an average of 25 deaths per year from pneumoconiosis in Arizona residents from 2008-2012. • The rate of pneumoconiosis death per one million residents ranged from 3.3 in 2009 to 5.9 the following year. • There is no distinct trend that can be seen in the graphical representation of the data. • National data was unavailable for pneumoconiosis for 2008, 2011, and 2012.

Years	Arizona	United States
2008	25 (4.9)	n/a
2009	17 (3.3)	1,998 (1.9)
2010	30 (5.9)	2,037 (1.9)
2011	29 (5.7)	n/a
2012	23 (4.4)	n/a

*per 1,000,000 residents

Table 10.1 State-to-national comparison of number and rate of pneumoconiosis mortality, ages 15 and older **Source:** Arizona Department of Health Services' vital records database; American Fact Finder

Figure 10.1 Number of deaths due to pneumoconiosis in Arizona, ages 15 and older **Source:** Arizona Department of Health Services' vital records database

Figure 10.2 Death rate of pneumoconiosis in Arizona, ages 15 and older **Source:** Arizona Department of Health Services' vital records database; American Fact Finder

SIGNIFICANCE

Pneumoconiosis frequency varies geographically, being largely determined by local industrial activities and migration of affected individuals. Control of occupational dust exposure is the single most effective means of preventing pneumoconiosis. Tracking of pneumoconiosis is essential for tracking progress towards elimination of the disease, as well as for targeting prevention and disease management programs.

METHODS

Arizona Department of Health Services' Office of Vital Records provided information on pneumoconiosis mortality for the years 2008 to 2012. Pneumoconiosis mortality cases meeting the following criteria were requested: any death of ICD-10-CM code J60-J66 and age 15 years and older. Excluded data included patient age unknown, out-of-state residents, unknown state of residence and out-of-state hospitalizations. Rates were calculated per one million Arizona residents.

LIMITATIONS

1. National numbers were unavailable in 2008, 2011, and 2012, so state-to-national comparisons could not be made for those three years.
2. Causes of death listed on the death certificate and coding of those causes may be inaccurate.
3. The number of contributing cases of death listed on the death certificate may vary by person completing the death certificate and geographic region.
4. Death certificates identify only a small percentage of the individuals who develop pneumoconiosis.

RECOMMENDATIONS

1. Age, gender, race/ethnicity, and county-specific counts and rates can be used to better define the pattern of pneumoconiosis mortality.
2. Because usual occupation and usual industry information is not necessarily indicative of the setting in which the causative exposure occurred, industry- and occupation-specific measures should be interpreted and reported with caution.

Indicator 11
Acute Work-related Pesticide Poisonings Reported to Poison Control Centers

Arizona rates of work-related pesticide poisonings were higher than the national average in 2008 and 2009. • There was an average of 59 pesticide poisoning cases in Arizona for 2008-2011. • More data should be collected to generate a more accurate trend.

Year	Arizona	United States
2008	70 (2.4)	2,171 (1.5)
2009	57 (2.0)	2,040 (1.5)
2010	47 (1.7)	2,871 (2.1)
2011	61 (2.2)	n/a
2012	n/a	n/a

* per 100,000 employed persons

Table 11.1 State-to-national comparison of number and incidence rate of work-related pesticide-associated illnesses and injury, ages 16 and older **Source:** American Association of Poison Control Centers (AAPCC); BLS Current Population Survey

Figure 11.1 Number of work-related pesticide poisonings in Arizona, ages 16 and older **Source:** American Association of Poison Control Centers (AAPCC); BLS Current Population Survey

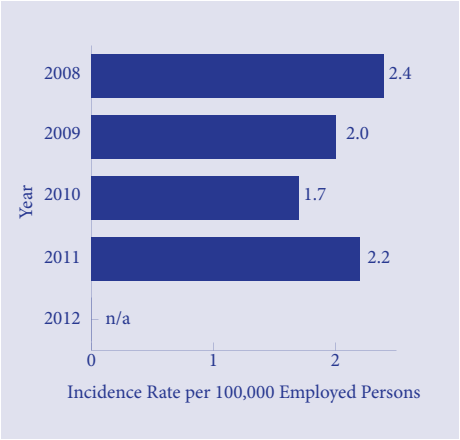

Figure 11.2 Incidence rate of pesticide poisonings in Arizona, ages 16 and older **Source:** American Association of Poison Control Centers (AAPCC); BLS Current Population Survey

SIGNIFICANCE

Workers who handle pesticides are at increased risk for exposure. Poison Control Centers (PCC) are important sources of reports of acute poisonings and chemical exposures. These data can be useful to target prevention. The type of data collected is comparable across states due to the uniformity in case handling by PCC.

METHODS

The American Association of Poison Control Centers collects information on reported cases of work-related pesticide poisoning resulting in acute illness.

Pesticide poisonings include exposures to disinfectants, fungicides, fumigants, herbicides, insecticides, repellents and rodenticides.

The incidence of reported work-related pesticide poisonings per 100,000 employed persons age 16 years and older is calculated for Arizona for the years 2008 to 2012 using the BLS Current Population Survey data for the denominator.

LIMITATIONS

1. The number of pesticide poisonings in Arizona for the year 2012 was unavailable.
2. National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
3. Not all states have poison control centers. State health agencies may have to enter into an agreement with their state-based PCC to obtain local data, or may obtain less timely PCC data from the Toxic Exposure Surveillance System, which is administered by the American Association of Poison Control Centers.

RECOMMENDATIONS

1. Gather more data on pesticide poisonings for the years after 2011 to generate a more accurate trend of cases.
2. Age, gender, pesticide chemical class, and severity-specific counts and rates can be used to better define the pattern of acute occupational pesticide-related illness.
3. Industry and occupation should be analyzed where available.

Indicator 12
Incidence of Malignant Mesothelioma

The rate of malignant mesothelioma cases in Arizona was lower than the rate throughout the United States. • The number and rates of mesothelioma increased from 2008-2011. • The Number of mesothelioma cases for Arizona in 2012 was unavailable so the rate could not be calculated.

Year	Arizona	United States
2008	50 (9.7)	3,003 (20.7)
2009	58 (11.3)	2,921 (20.9)
2010	61 (12.1)	2,850 (20.3)
2011	62 (12.1)	n/a
2012	n/a	n/a

*per million residents

Table 12.1 State-to-national comparison of number and incidence rate of malignant mesothelioma, ages 15 and older **Sources:** Arizona Cancer Registry; American Fact Finder

Figure 12.1 Number of incident mesothelioma cases in Arizona, ages 15 and older **Source:** Arizona Cancer Registry; American Fact Finder

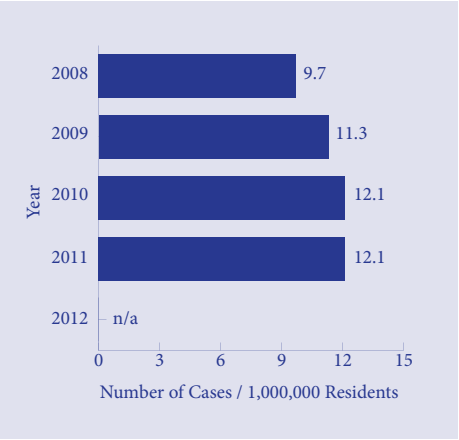

Figure 12.2 Mesothelioma incidence rates in Arizona, ages 15 and older **Source:** Arizona Cancer Registry; American Fact Finder

SIGNIFICANCE

Malignant mesothelioma, while relatively rare, is a fatal cancer largely attributable to workplace exposure to asbestos. Tracking of malignant mesothelioma should be undertaken to document the burden of occupational disease and to identify settings in which workers may be at risk for asbestos exposure. Tracking may also assist with designing, targeting, and evaluating the impact of prevention efforts over time.

METHODS

The Arizona Cancer Registry at the Arizona Department of Health Services provided Mesothelioma data for the years 2008-2011. Age-standardized rates were not calculated due to the small number of cases for multiple age groups. State population estimates were obtained from the United States Census Bureau and served as the denominator to calculate rates.

LIMITATIONS

1. The number of mesothelioma cases in Arizona for the year 2012 was unavailable.
2. National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
3. Data from some existing statewide central cancer registries do not yet meet standards for data completeness and quality.
4. Because CSTE uses a different methodology, the state specific incidence rates calculated using this guidance document may differ from those published by State Cancer Registries.

RECOMMENDATIONS

1. Gather more data on pesticide poisonings for years after 2011 to generate a more accurate trend of cases.
2. Age, gender, race/ethnicity, county counts, and rates can be used to better define patterns of malignant mesothelioma.
3. Because usual occupation and usual industry information is not necessarily indicative of the setting in which the causative exposure occurred, industry- and occupation-specific measures should be interpreted and reported with caution.

Indicator 13
Elevated Blood Lead Levels Among Adults

The number of Arizona adults with blood lead levels greater than 10 µg/dL increased every year from 29 in 2008 to 238 in 2012. This led to an increase in rates as well. The number and rates of adults with blood lead levels above 25 µg/dL have also increased in the same span of time. The number of incident cases have decreased every year indicating a potential peak in adults with elevated blood lead levels. National data is too staggered to make any appropriate comparisons

	Number and prevalence rate* 10 µg/dL and higher		Number and prevalence rate* with 25 µg/dL and higher	
Year	Arizona	United States	Arizona	United States
2008	29 (1.4)	22,861 (n/a)	29 (1.4)	9,325 (3.4)
2009	82 (4.3)	n/a	29 (1.5)	7,676 (2.7)
2010	167 (8.6)	26,667 (14.3)	18 (0.9)	8,432 (4.0)
2011	217 (10.8)	n/a	39 (1.9)	n/a
2012	238 (11.9)	n/a	43 (2.1)	n/a

*per 100,000 employed persons

Table 13.1 State-to-national comparison of number and prevalence rate of adults with elevated blood lead levels, ages 16 and older **Source:** Adult Blood Lead Epidemiology Surveillance (ABLES) program; BLS Current Population Survey

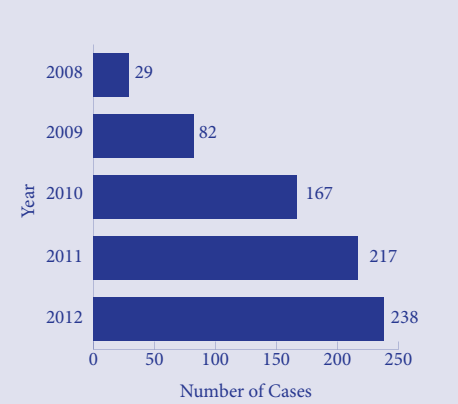

Figure 13.1 Number of Arizona residents with elevated BLL, ages 16 and older **Source:** Adult Blood Lead Epidemiology Surveillance (ABLES) program

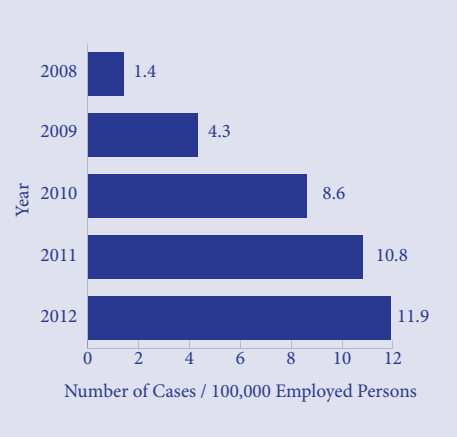

Figure 13.2 Prevalence rate among Arizona residents with elevated BLL, ages 16 and older **Source:** Adult Blood Lead Epidemiology Surveillance (ABLES) program; BLS Current Population Survey

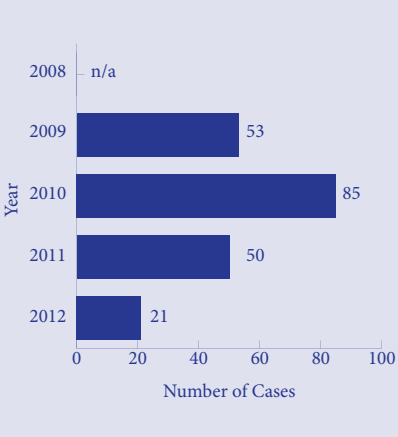

Figure 13.3 Number of incident cases of elevated BLL among Arizona residents, ages 16 and older **Source:** Adult Blood Lead Epidemiology Surveillance (ABLES) program; BLS Current Population Survey

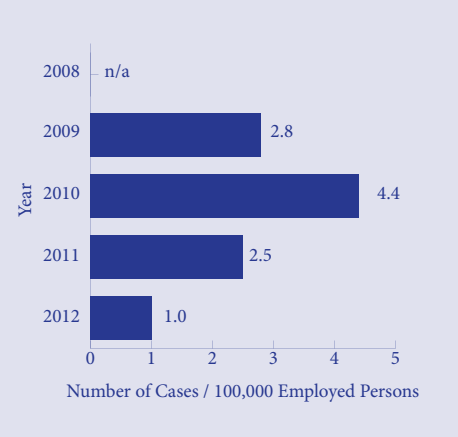

Figure 13.4 Incidence rate among Arizona residents with elevated BLL, ages 16 and older **Source:** Adult Blood Lead Epidemiology Surveillance (ABLES) program; BLS Current Population Survey

Indicator 13 (continued)
Elevated Blood Lead Levels Among Adults

SIGNIFICANCE

Among adults, lead poisoning is a persistent, mainly occupational, health issue that continues to be an important public health problem. The most widely available test for exposure is the blood lead level (BLL). The Federal Occupational Safety and Health Administration (OSHA) lead standards to protect workers from lead-associated health effects include requirements for monitoring BLLs among employees who meet certain exposure criteria. The standards are based on medical information that is now more than 30 years old and are not protective against the adverse health effects of lead. Lower medical removal recommendations have been proposed to protect workers against the adverse health effects of both acute and cumulative lead exposures. It is important to note that the average BLL for the general population is below 1.5 µg/dL.

METHODS

The Adult Blood Lead Epidemiology and Surveillance (ABLES) program at the Arizona Department of Health Services provided blood lead levels for the years 2008-2012. Data was limited to persons 16 years and older and then stratified by varying blood lead levels. • Annual prevalence rates were calculated using the BLS Current Population Survey estimates for numbers of employed persons aged 16 years and older serving as the denominator.

LIMITATIONS

1. National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
2. Some states do not require laboratories to report all BLLs, or have no BLL reporting requirement in place. Even with a reporting requirement, data from laboratories are frequently incomplete.
3. Many workers with significant occupational lead exposure are not appropriately tested. An individual's lead exposure and BLL testing may be done in the same or in different states (which may not be the individual's state of residence).
4. Approximately 10-15% of elevated BLLs among adults can be caused by non-occupational exposures.
5. Not all states may be able to distinguish occupationally exposed individuals from non-occupationally exposed individuals.
6. Not all states may be able to determine both state of employment/exposure and state of residence of their reported cases.

RECOMMENDATIONS

1. Because adverse health effects can begin at BLLs below 10 µg/dL, Arizona should also calculate the number and rate of elevated BLLs at 5 µg/dL.
2. Report numbers and rates for occupational cases only, rather than including both occupationally and non-occupationally exposed persons in the numerator.
3. Include occupationally exposed cases working in Arizona regardless of their state of residence.
4. Age, gender, and race/ethnicity specific counts, and rates can be used to better define the pattern of elevated BLLs.
5. Obtain industry and occupation information to provide additional insight of risky occupations.
6. Follow-up of selected cases and/or clusters can help identify where/how individuals with high BLLs were exposed.
7. Obtaining reports on all BLLs can provide insight about the overall frequency of BLL testing, and allow follow-up of employers not doing required testing.

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

On average, 6.5% of employed people in Arizona worked in high risk industries from 2008-2012. • The percentage of people in Arizona employed in industries with high risk for occupational morbidity was lower than the national percentage. • In the years 2008-2012, the industries with high risk for occupational morbidity that employed the most Arizona workers were: Air transportation • Special food services • Nursing and residential care facilities • Couriers and messengers • Other ambulatory health care services

Year	Arizona	United States
2008	141,613 (6.1)	7,998,334 (6.6)
2009	141,160 (6.7)	8,181,022 (7.1)
2010	134,573 (6.5)	8,045,439 (7.2)
2011	137,906 (6.5)	n/a
2012	140,938 (6.6)	n/a

Table 14.1
State-to-national comparison of number and percentage of people employed in high morbidity risk industries, ages 16 and older
Source: United States Census Bureau

SIGNIFICANCE

Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Concentrating on high-risk industries for non-fatal injuries and illnesses helps prioritize limited resources

METHODS

The United States Census Bureau County Business Patterns reports the percentage of workers employed in industries at high risk for occupational morbidity. High morbidity risk industries are identified based on annual injury and illness incidence rates for private sector workers. The percent of workers in Arizona and United States employed in industries with high risk for occupational morbidity is described for the years 2008-2012. These data were collected from the BLS Current Population Survey.

LIMITATIONS

1. National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
2. The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error.
3. There is a potential for additional sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases.
4. Excluded from the survey are the military, self-employed individuals, farms with 10 or fewer employees, and Federal agencies.
5. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only.
6. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate State-specific estimates.
7. Numbers and rates may not be published/released by BLS due to the reliability of the estimates.
8. Employers vary with respect to how much they may reduce their potential reporting burden by placing affected workers on restricted work activity, thereby avoiding the reporting of lost workday cases (which require reporting of additional details).
9. SOII only collects data for the incident year, and does not capture lost work-time that may carry over to a new calendar year.

RECOMMENDATIONS

1. States could additionally identify their own state-specific high-risk industries and associated employment patterns.

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

On average, 15.5% of employed people in Arizona worked in high risk occupations from 2008-2012. • The percentage of people in Arizona employed in occupations with high risk for occupational morbidity was lower than the national percentage. • In the years 2008-2012, the occupations with high risk for occupational morbidity that employed the most Arizona workers were: Driver/sales workers and truck drivers • Laborers and freight, stock, and material movers • Janitors and building cleaners • Nursing, psychiatric, and home health aides • Maids and housekeeping cleaners.

Year	Arizona	United States
2008	340,438 (15.1)	18,373,120 (16.1)
2009	298,820 (14.2)	16,949,831 (15.6)
2010	292,634 (14.2)	16,679,132 (15.4)
2011	286,919 (13.6)	n/a
2012	314,676 (15.2)	n/a

Table 15.1
State-to-national comparison of number and percentage of people employed in high morbidity risk occupations, ages 16 and older
Source: United States Census Bureau

SIGNIFICANCE
Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Concentrating on high-risk occupations for non-fatal injuries and illnesses helps prioritize limited resources.

METHODS
The percent of workers employed in high-risk occupations were reported in 2008-2012 based on 2000 census codes for employed persons age 16 and older in Arizona and the United States. These data were collected from the BLS Current Population Survey.

LIMITATIONS
1. National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
2. The BLS annual Survey of Occupational Injuries and Illnesses (SOII) is based on injury and illness data maintained by employers and is subject to sampling error, a function of BLS using a probability sample and not a census of all employers.
3. Excluded from the survey are the military, self-employed individuals, farms with fewer than 10 employees, and Federal agencies.
4. The CPS can be used to estimate the private sector employment in the US, excluding the self-employed, but may not match perfectly those workers covered in the SOII

RECOMMENDATIONS
1. States could additionally identify their own state-specific high-risk occupations and assess associated employment patterns

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

On average, 15.2% of employed people in Arizona worked in industries with high-risk for occupational mortality from 2008-2012. • The percentage of people in Arizona employed in industries with high-risk for occupational mortality was lower than the national percentage. • In the years 2008-2012, the industries with high risk for occupational mortality that employed the most Arizona workers were: Construction • Landscaping services • Truck transportation • Services incidental to transportation • Metal ore mining. • On average, 15.2% of employed people in Arizona worked in occupations with high-risk for occupational mortality from 2008-2012. • The percentage of people in Arizona employed in occupations with high-risk for occupational mortality was lower than the national percentage. • In the years 2008-2012, the occupations with high risk for occupational mortality that employed the most Arizona workers were: Driver/sales workers and truck drivers • Grounds maintenance workers • First-line supervisors/managers of construction trades and extraction workers • Security guards and gaming surveillance officers • Human resources, training, and labor relations specialists

	Employed persons in high mortality risk industries		Employed persons in high mortality risk occupations	
Year	Arizona	United States	Arizona	United States
2008	454,450 (17.7)	16,140,941 (16.6)	319,994 (12.5)	20,643,751 (13.0)
2009	387,146 (15.7)	14,714,918 (12.4)	252,576 (10.3)	18,645,204 (12.4)
2010	343,009 (14.2)	18,124,938 (15.4)	242,112 (10.0)	14,471,156 (12.3)
2011	363,152 (15.0)	n/a	287,307 (11.9)	n/a
2012	319,545 (13.3)	n/a	294,000 (12.3)	n/a

Table 16.1 State-to-national comparison of number and percentage of people employed in high risk industries and occupations, ages 16 and older **Source:** United States Census Bureau

SIGNIFICANCE

Multiple factors and risks contribute to work-related fatalities, including workplace and process design, work organization, worker characteristics, economics, and other social factors.

Surveillance of work-related fatalities can identify new hazards and case clusters, leading to the development of new interventions and development of new or revised regulations to protect workers. Concentrating on high-risk occupations and industries for fatalities helps prioritize limited resources.

METHODS

The BLS collects information on the percentage of workers employed in industries and occupations at high risk for occupational mortality. The percent of workers in Arizona and the United States employed in industries and occupations with high risk for occupational mortality is reported for the years 2008-2012. These data were collected from the BLS Current Population Survey.

LIMITATIONS

1 National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.
2 CFOI program counts suicides at work as work-related fatalities, even when the cause of death may not be due to factors at work.
3 CFOI does not count military deaths.
4 To be consistent with Indicators #14 and #15, this indicator has been limited to private sector workers.
5 Unlike Indicators #14 and #15, the self-employed are included.

RECOMMENDATIONS

1 States could report their own high-risk industries and occupations and associated employment patterns.

Indicator 17
Occupational Health and Safety Professionals

Arizona had higher rates of occupational health and safety professionals for medical physicians, health nurses, and safety professionals, compared to the rest of the United States. • For every 100,000 Arizona employees, there are approximately 2 medical physicians, 5 occupational health nurses, 5 industrial hygienists, and 9 safety professionals.

	2009		2010	
	Arizona	United States	Arizona	United States
Occupational medicine physicians	46 (2.4)	2,159 (2.2)	45 (2.3)	2,922 (2.1)
Members of ACOEM	66 (3.4)	2,906 (3.0)	61 (3.1)	4,035 (2.9)
Occupational health nurses	95 (5.0)	3,898 (4.1)	87 (4.5)	5,415 (3.9)
Members of AAOHN	129 (6.8)	4,369 (4.6)	n/a	n/a
Industrial hygienists	89 (4.7)	5,026 (5.1)	95 (4.9)	7,162 (5.2)
Members of AIHA	110 (5.8)	5,737 (5.9)	108 (5.5)	7,772 (5.6)
Safety professionals	164 (8.6)	8,357 (8.6)	168 (8.6)	12,287 (8.8)
Members of ASSE	546 (28.6)	20,863 (21.5)	578 (30.0)	31,247 (22.5)

* Rates were calculated using 100,000 employees as the denominator

Table 17.1 State-to-national comparison of number and rates of occupational health and safety professionals

Source: National Institute of Occupational Safety and Health (NIOSH); BLS - Current Population Survey

SIGNIFICANCE

Work-related injuries and illnesses are preventable. It is important to determine if there are sufficient trained personnel to implement occupational health preventative services.

METHODS

The number and rate (per 100,000 employees) of professionals in Arizona are reported using data from the American College of Occupational and Environmental Medicine (ACOEM), American Association of Occupational Health Nurses (AAOHN), American Industrial Hygiene Association (AIHA), American Society of Safety Engineers (ASSE) and the BLS Current Population Survey for 2009-2010.

LIMITATIONS

1. Number of professionals in each category were only available for the years 2009 and 2010.
2. The numerator data include retired individuals and individuals who may devote the majority of their time to research and limited or no time to provision of actual preventive services.
3. An individual may practice part-time or even full-time in the field of occupational health and not be board certified or a member of the organization representing occupational health professionals.
4. The completeness and frequency of updating addresses varies by each organization.
5. Members are often listed in a database by a preferred address, which may not be the address there they practice.
6. Due to privacy concerns, individuals may opt out of being listed in membership rolls.

RECOMMENDATIONS

1. Find a method to calculate the number of health professionals for the missing years.
2. States could contact the occupational health specialists in the state to confirm address and assess status and nature of activity.

Indicator 18
OSHA Enforcement Activities

From 2008-2012, there was an average of 3.6% of all employees under OSHA jurisdictions whose work areas were inspected in Arizona. • From 2008-2012, there were 1,300 establishments inspected by OSHA in Arizona. This accounts for less than 1% of all establishments under OSHA jurisdiction, which is less than the national average.

	Number of establishments inspected by OSHA		Percentage of all establishments under OSHA jurisdiction inspected by OSHA		Number of employees whose work areas were inspected by OSHA		Percentage of all employees under OSHA jurisdiction whose work areas were inspected	
Year	**Arizona**	**United States**	**Arizona**	**United States**	**Arizona**	**United States**	**Arizona**	**United States**
2008	1,397	100,548	0.9	1.2	27,254	3,961,060	4.1	3.5
2009	1,658	100,245	1.1	1.2	36,667	4,107,815	4.7	3.9
2010	1,041	98,788	0.7	1.1	40,945	3,739,298	5.1	3.6
2011	1,088	n/a	0.8	n/a	24,425	n/a	2.3	n/a
2012	1,307	n/a	0.9	n/a	30,956	n/a	2.0	n/a

Table 18.1 State-to-national comparison of number and percentage of OSHA enforcement activities
Source: National Institute of Occupational Safety and Health (NIOSH)

SIGNIFICANCE

The measures of frequency for this indicator may approximate the added health and safety benefits and protections felt by workers as a result of their worksites being inspected.

METHODS

Enforcement activities conducted on establishments under OSHA jurisdiction (excluding mines and farms) are reported in Arizona for the years 2008-2012. Data sources included OSHA annual reports on inspections and the number of workers covered by these inspections and the BLS on Covered Employers and Wages (ES-202/CEW)

LIMITATIONS

1 National numbers were unavailable for the years 2011 and 2012 so state-to-national comparisons could not be made for those two years.

2 Employers participating in an OSHA Voluntary Protection Program (VPP) or the Safety and Health Achievement and Recognition Program (SHARP) are exempted from routine inspections.

3 Excluding workers from these programs will reduce the numerator, resulting in an underestimate of the protective function. In CEW data, individuals holding more than one job are counted multiple times.

Figure 18.1 Number of establishments in Arizona that were inspected by OSHA
Source: National Institute of Occupational Safety and Health (NIOSH)

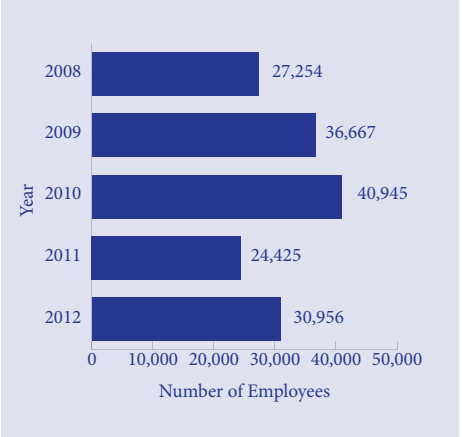

Figure 18.2 Number of employees in Arizona that work in an establishment that was inspected by OSHA
Source: National Institute of Occupational Safety and Health (NIOSH)

RECOMMENDATIONS

1 Collaborate with state or regional OSHA Office to obtain more detailed information on OSHA enforcement activities.

Indicator 19
Workers' Compensation Benefits

There was an average of 690,530 workers' compensation benefits that were paid to Arizona workers from 2008-2011. • The average amount of workers' compensation benefits distributed to a covered worker in Arizona was $295.50 from 2008-2011. • The average amount of workers' compensation benefits distributed to a covered worker has gradually increased.

Year	Total amount of workers' compensation benefits paid	Average amount of workers' compensation benefits paid per covered worker (dollars/covered worker)
2008	691,422	273.40
2009	657,148	280.83
2010	701,747	305.77
2011	711,801	306.02
2012	n/a	n/a

Table 19.1 Number of workers' compensation awards distributed
Source: National Academy of Social Insurance (NASI)

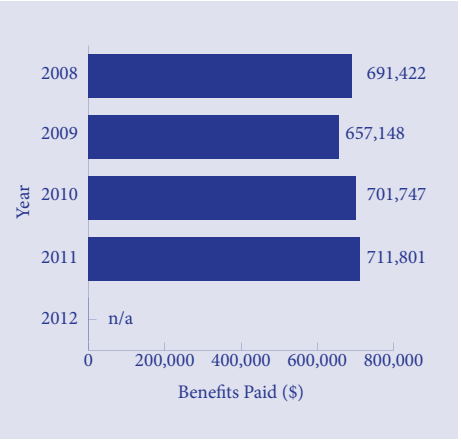

Figure 19.1 Amount of Workers' Compensation Benefits Paid in Arizona
Source: National Academy of Social Insurance (NASI)

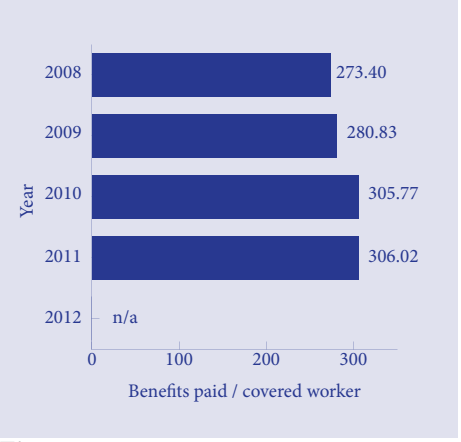

Figure 19.2 Amount of workers' compensation benefits paid per covered worker in Arizona **Source:** National Academy of Social Insurance (NASI)

SIGNIFICANCE

Workers' compensation awards are reviewed to establish whether the reported medical condition is work-related. Accepted awards represent known work-related injuries and illnesses, and often more severe cases. The total and average amounts of benefits paid estimate the burden of these events, which can help justify prevention programs and activities.

METHODS

The National Academy of Social Insurance (NASI) collects and reports estimated annual benefits, coverage and costs associated with workers' compensation programs. The total amount of workers' compensation benefits paid and the average benefit paid per covered worker in Arizona are reported for 2008-2011.

LIMITATIONS

1 Workers' compensation data is not complete, as many individuals with work-related illnesses do not file for workers' compensation.
2 Self-employed individuals (e.g. farmers, independent contractors and small business owners), corporate executives, and domestic and agricultural workers may be exempt from coverage.
3 Federal employees, railroad, and longshore or maritime workers are not covered by state workers' compensation systems.
4 Compensation award payments are frequently made over time, thus annual awards may not reflect the full cost of, injuries and illnesses for a given year.

RECOMMENDATIONS

1 NASI also provides the employers' costs for workers' compensation.
2 State workers' compensation system and state employment data may provide additional information about incidence and costs that would increase the usefulness of these data for prevention efforts.
3 States may supply industry- and occupation-specific counts, costs and rates of accepted workers' compensation claims.
4 Age and gender can also be used to better define the burden of occupational injuries/illnesses.
5 Many states report data collected for the subset of accepted time-loss claims—those involving days away from work—which are likely to have the highest costs to and affects upon workers and employers.

Indicator 20
Work-Related Lower Back Disorder Hospitalizations

From 2008-2012, there was an average of 1,242 work-related lower back hospitalizations, 324 of those hospitalizations requiring surgery. There were no distinct trends in number or rate of lower back hospitalizations with or without surgery.

Year	Number involving surgery	Rate* involving surgery	Total number	Rate*
2008	319	10.8	1,325	44.9
2009	337	11.9	1,213	42.8
2010	350	12.3	1,236	43.4
2011	308	11.3	1,304	47.7
2012	304	11.0	1,131	40.8

*per 100,000 employed persons

Table 20.1 Number and rate of work-related lower back hospitalizations, ages 16 and older.
Source: Arizona Department of Health Services' hospital discharge database; BLS Current Population Survey

SIGNIFICANCE

Hospitalizations for work-related back disorders have serious and costly effects including: high direct medical costs, significant functional impairment and disability, high absenteeism, reduced work performance, and lost productivity. Well-recognized prevention efforts can be implemented for high risk job activities and reduce the burden of work-related low back disorders.

METHODS

All lower back disorder hospitalizations and lower back disorder hospitalizations that required surgery were identified from the Arizona Department of Health Services' hospital discharge database. All cases were Arizona residents ages 16 years and older with a primary payer code indicating workers' compensation. Lower back disorder hospitalizations were identified with a relevant diagnostic code (ICD-9-CM diagnostic code categories: herniated disc, probable degenerative changes, spinal stenosis, possible instability, and miscellaneous). Surgical low back disorder hospitalizations were identified with the same ICD-9-CM diagnostic codes in combination with a relevant surgical procedure code (procedural code categories: laminectomy, discectomy, fusion, other). Excluded data included patient age unknown, out-of-state residents, unknown state of residence and out-of-state hospitalizations

LIMITATIONS

1. Practice patterns and benefit payment systems may affect decisions by health care providers to hospitalize patients, to correctly diagnose work-related conditions, authorize surgery and/or to list the condition as a discharge diagnosis.
2. All admissions are counted, including multiple admissions for a single individual.
3. Aggregation of state data to produce nationwide estimates will be incomplete until hospital discharge data are available in all states.

RECOMMENDATIONS

1. Age, gender, race/ethnicity, zip code specific counts, and rates can be used to better define the pattern of work-related hospitalizations.
2. States that have access to statewide outpatient surgery data can compare trends of outpatient surgery for lower back disorders to data from this indicator.

Indicator 21
Asthma among Adults Caused or Made Worse at Work

Although the percentage varies per year, Arizona typically had a higher percentage of asthma when compared to the national median. The number of respondents who indicated that their current asthma status was caused or made worse by any job appears to vary per year. Despite variations in the yearly responses, the amount of respondents who reported their current asthma status was caused or made worse by any job was fairly high, ranging from 30%-50% per year. These results, while not conclusive, present cause for further study and consideration into the link between occupational exposures and asthma status.

Year	Arizona (Percent)	National (Median Percent)
2008	14.8%	13.6%
2009	15.5%	13.4%
2010	15.6%	13.8%
2011	14.3%	13.5%
2012	13.5%	13.2%

Table 21.1 BRFSS Asthma Question: Have you EVER been told by a doctor, nurse, or other health professional that you had asthma?

Year	Arizona ACBS sample number	Arizona ACBS (Percent)	National Median (Percent)
2008	144	30.6%	47.7%
2009	110	44.3%	45.5%
2010	268	49.8%	46.2%
2011	214	41.7%	48.9%
2012	209	51.6%	55.8%

Table 21.2 Estimated percent reporting their asthma was caused or made worse by any job for current[1] asthma status among adults ever diagnosed with asthma by state/territory - BRFSS Asthma Call-back Survey, United States, 2008-2012
[1] "Yes" response to "Do you still have asthma"

SIGNIFICANCE

Work-related asthma is preventable but often goes undiagnosed by physicians. Research has shown that work-related asthma can have adverse effects on the worker, including increased morbidity, adverse socioeconomic impacts, and difficulty getting and sustaining work. Estimating the burden of asthma caused or made worse by work can help target prevention programs and activities.

METHODS

Data on asthma was collected from the Behavioral Risk Factor Surveillance System (BRFSS), and also the Asthma Call-back Survey (ACBS). The ACBS is an in-depth asthma survey conducted with Arizona respondents who reported an asthma diagnosis during the initial BRFSS data collection. Data from the BRFSS depicts the total percentage of respondents who were ever told they had asthma. The ACBS gathers more detailed data from respondents who originally indicated that they had ever been diagnosed with asthma, including asking participants whether their asthma was caused or made worse by any job for current asthma status. The ACBS results reflect the percentage of adults who responded that their current asthma status was caused or made worse by any job that they have held. The ACBS also includes a question that asks whether their 'asthma was caused or made worse by their current job'. However, there is no data from Arizona for this question.

LIMITATIONS

1. The ACBS survey conducted by Arizona only collected data on a portion of the employment-related health questions.
2. Because it is a telephone health survey, individuals must have a telephone to participate.
3. The ACBS is only conducted in select languages that can vary by state; therefore it does not include individuals who speak all languages.
4. The data is subject to the bias of self-reported data.

RECOMMENDATIONS

1. State programs may want to cross tabulate by variables mentioned above.
2. Increase public health efforts being conducted in relation to occupational exposures and asthma in order to further explore the high percentage from the question in the ACBS.

Appendix - Tables

Appendix - Figures

Figure	Title	Resource / Website	Page
P.1	Percentage of Civilian Employment by Age Group, AZ and US, 2012	Current Population Survey (http://dataferrett.census.gov/)	5
P.2	Percentage of Civilian Employment by Sex, AZ and US, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	5
P.3	Percentage of Civilian Employment by Race, AZ and US, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	5
P.4	Percentage of Civilian Workforce by Employment Status, AZ and US, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	6
P.5	Percentage of Civilian Employment by Number of Hours Worked, AZ and US, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	6
P.6	Percentage of Civilian Employment by Industry, AZ, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	6
P.7	Percentage of Civilian Employment by Occupation, AZ, 2012	BLS Geographic Profile of Employment and Unemployment (http://www.bls.gov/opub/gp/laugp.htm)	6
1.1	Annual Number of Work-related Injuries and Illnesses, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ; http://www.bls.gov/data/)	7
1.2	Annual Work-related Injury and Illness Incidence Rate, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ; http://www.bls.gov/data/)	7
1.3	Annual Number of Cases Involving DAFW, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ; http://www.bls.gov/data/)	7
1.4	Annual Incidence Rate for Cases Involving DAFW, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ http://www.bls.gov/data/)	7
2.1	Annual Number of Inpatient Hospitalizations, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database BLS Current Population Survey (http://www.bls.gov/gps/#tables	9
2.2	Annual Crude Rate of Inpatient Hospitalizations, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database (http://www.bls.gov/gps/#tables) BLS Current Population Survey (www.bls.gov/gps/home.htm)	9
3.1	Annual Number of Fatal Work-related Injuries, AZ, 2008-2012	BLS Census of Fatal Occupational Injuries (http://www.bls.gov/iif/oshcfoi1.htm) BLS Current Population Survey (www.bls.gov/gps/home.htm)	10
3.2	Annual Crude Fatality Rate of Work-related Injuries, AZ, 2008-2012	BLS Census of Fatal Occupational Injuries (http://www.bls.gov/iif/oshcfoi1.htm) BLS Current Population Survey (www.bls.gov/gps/home.htm)	10
4.1	Annual Number of Work-related Amputation Cases Involving DAFW, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ) BLS Fatal Injuries Profiles (http://data.bls.gov/GQT/servlet/InitialPage)	11
4.2	Annual Incidence Rate of Work-related Amputation Cases Involving DAFW, AZ, 2008-2012	BLS Survey of Occupational Injuries and Illnesses (http://www.bls.gov/iif/oshstate.htm#AZ) BLS Fatal Injuries Profiles (http://data.bls.gov/GQT/servlet/InitialPage)	11
6.1	Annual Number of Work-related Burn Inpatient Hospitalizations for Persons, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database BLS Current Population Survey (http://www.bls.gov/gps/#tables)	13
6.2	Annual Rate of Work-related Burn Inpatient Hospitalizations, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database BLS Current Population Survey (http://www.bls.gov/gps/#tables)	13
7.1	Annual Number of Incident Musculoskeletal Disorders Involving DAFW, AZ, 2008-2012	BLS Injuries, Illnesses and Fatalities Report (http://www.bls.gov/iif/msd_state.htm)	14
7.2	Annual Incidence Rate of Musculoskeletal Disorders Involving DAFW, AZ, 2008-2012	BLS Injuries, Illnesses and Fatalities Report (http://www.bls.gov/iif/msd_state.htm)	14
9.1	Annual Number of Pneumoconiosis Inpatient Hospitalizations, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database United States Census Bureau (www.census.gov/popest/)	17
9.2	Annual Rate of Pneumoconiosis Inpatient Hospitalizations, AZ, 2008-2012	Arizona Department of Health Services, Hospital Discharge Database United States Census Bureau (www.census.gov/popest/)	17

Appendix - Figures (continued)