

AGRICULTURE, FORESTRY, AND FISHING: agricultural production—crops agricultural production—livestock and animal specialities agricultural services forestry fishing, hunting, and trapping MINING: metal mining coal mining oil and gas extraction mining and quarrying of nonmetallic minerals, except fuels CONSTRUCTION: building construction—general contractors and operative builders heavy construction other than building construction—contractors construction—special trade contractors MANUFACTURING: food and kindred products tobacco products textile mill products apparel and other finished products made from fabrics and similar materials lumber and wood products, except furniture furniture and fixtures paper and allied products printing, publishing, and allied industries chemicals and allied products petroleum refining and related industries rubber and miscellaneous plastics products leather and leather products stone, clay, glass, and concrete products primary metal industries fabricated 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stations service stations apparel and accessory stores home furniture, furnishings, and equipment stores eating and drinking places miscellaneous retail FINANCE, INSURANCE, AND REAL ESTATE: depository institutions nondepository credit institutions security and commodity brokers, dealers, exchanges, and services insurance carriers insurance agents, brokers, and services real estate holding and other investment offices SERVICES: hotels, rooming houses, camps, and other lodging places personal services business services automotive repair, services, and parking miscellaneous repair services motion pictures amusement and recreation services health services legal services education services social services museums, art galleries, and botanical and zoological gardens membership organizations engineering, accounting, research, management, and related services private households miscellaneous services PUBLIC ADMINISTRATION: executive, legislative, and general government, except finance justice, 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Minnesota Workplace Safety Report 2010



**MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY**
RESEARCH AND STATISTICS

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Minnesota Workplace Safety Report, 2010

August 2012

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This report is available at www.dli.mn.gov/RS/WorkplaceSafety.asp. Information in this report can be obtained in alternative formats by calling the Department of Labor and Industry at 1-800-342-5354 or TTY at (651) 297-4198.

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Other Department of Labor and Industry staff members who contributed to this report were Amy Weisser and Breca Tschida, Minnesota OSHA Workplace Safety Consultation; and Kelly Taylor, Minnesota OSHA Compliance. Allan Williams and Adrienne Kari of the Minnesota Department of Health contributed the statistics for the occupational illness indicators and improved the text. David Berry and William Boyer, Research and Statistics, provided comprehensive editing and recommendations for the presentation of the statistics. Jenny O'Brien of the Communications unit provided final editing.

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Brian Zaidman

Executive summary

In 2010, the number of occupational injury and illness cases in Minnesota's workplaces continued its downward trend after peaking at 159,000 cases in 1996. The most recent survey results show that during 2010, there were an estimated 76,700 recordable injury and illness cases, of which about 21,500 involved one or more days away from work. The comparable figures for 2009 were 78,100 total cases and 21,000 days-away-from-work cases. There were 70 work-related fatalities in 2010, an increase from 61 fatalities in 2009 and 65 fatalities in 2008.

This annual report gives information about Minnesota's job-related injuries, illnesses and fatalities. Data sources for the injuries, illnesses and fatalities are the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries, both conducted jointly by the Minnesota Department of Labor and Industry and the U.S. Bureau of Labor Statistics, and occupational health indicators collected by the Minnesota Department of Health's Center for Occupational Health and Safety. Information about Minnesota OSHA activities and programs is also presented, based on administrative statistics collected by the Minnesota Department of Labor and Industry.

Nonfatal occupational injuries and illnesses

Incidence rates

- Minnesota's total rate of workplace injuries and illnesses was 3.9 cases per 100 full-time-equivalent (FTE) workers in 2010. The rate has decreased 35 percent from the 2002 rate of 6.0 cases per 100 FTE workers.
- The rate of cases with days away from work, job transfer or restriction was 1.9 cases per 100 FTE workers in 2010, 39 percent below the 2002 rate of 3.1 cases.
- The rate of cases with days away from work was 1.1 per 100 FTE workers in 2010, a 35 percent decrease from the 2002 rate of 1.7 cases per 100 FTE workers.

- Minnesota's private-sector total recordable case rate has been slightly above the U.S. rate since 1996. For 2010, the total case rate was 3.8 cases per 100 FTE workers for the state versus 3.5 for the nation.
- National rates for public-sector establishments have only been available since 2008. In 2010, Minnesota's state and local government total recordable case rates were 4.2 cases and 4.1 cases per 100 FTE workers, respectively, below the corresponding U.S. rates of 4.6 cases and 6.1 cases per 100 FTE workers.
- Minnesota's industry sectors with the highest total injury and illness rates per 100 FTE workers were:
 - (1) construction (5.3);
 - (2) privately owned education and health services (5.2); and
 - (3) manufacturing (4.8).
- The industry subsectors with the highest total case rates per 100 FTE workers were:
 - (1) state government nursing home and residential care establishments (19.3);
 - (2) state government hospitals (13.3); and
 - (3) primary metal manufacturing (10.8).
- Among cases with any days away from work, the median number of days away from work was five days. Thirty percent of the cases had only one or two days away from work and 23 percent of the cases had more than 20 days away from work.

Worker and injury characteristics

For cases with one or more days away from work, the SOII provides information about characteristics of the injured workers, their jobs and their injuries.

- Men accounted for 52 percent of all workers and for 59 percent of the injured workers, averaged over 2008 through 2010.
- The percentage of injured workers age 55 and older increased from an annual average of 12 percent during 2000 through 2002 to

20 percent during 2008 through 2010.

- Building and grounds cleaning and maintenance occupations had the highest rate of days-away-from-work cases of all the occupation groups during the 2008 through 2010 period (337 cases per 10,000 FTE workers), followed by transportation and material moving occupations (245 cases) and healthcare support occupations (225 cases).
- Sprains and strains accounted for 47 percent of the 2010 cases with days away from work. The second-highest category was soreness and pain, with 10 percent of the cases.
- Workers injured their back more than any other body part; back injuries accounted for 26 percent of the cases, followed by multiple-part injuries, with 11 percent.
- The most common injury events were falling on the same level and overexertion in lifting.
- The floors and ground surfaces category was the most frequent source of injury, followed by the injured worker's own motion or bodily position and containers.
- Musculoskeletal disorders accounted for 38 percent of the cases with days away from work in 2010.

Fatal occupational injuries

The Census of Fatal Occupational Injuries covers all fatal work injuries in the private and public sectors, regardless of program coverage; thus, it includes federal workers and self-employed workers. However, fatal *illnesses* (such as asbestosis) are excluded.

- Seventy workers were fatally injured while working in Minnesota in 2010. For 2006 through 2010, Minnesota had an average of 69 fatal work injuries a year, consisting of 47 wage-and-salary workers and 22 self-employed people.
- Among industry sectors in 2010, agriculture, forestry, fishing and hunting recorded the

highest number of worker fatalities, with 28. Construction had the second-highest number of fatalities, with nine cases.

- The most frequent causes of Minnesota's fatal work injuries for 2010 were transportation accidents (37 percent) and contact with objects and equipment (24 percent).

Minnesota OSHA activities

Minnesota OSHA activity levels were affected by the three-week state government shutdown in July 2011. During federal-fiscal-year 2011 (October 2010 through September 2011), Minnesota OSHA:

- conducted 2,325 compliance inspections affecting the workplaces of 126,100 workers;
- identified 4,363 violations of OSHA standards, resulting in the assessment of \$4.1 million in penalties;
- conducted 800 worksite consultations that identified safety and health hazards potentially costing employers \$4.0 million in penalties; and
- conducted 443 worksite consultation training and intervention visits, plus many other safety and health presentations and seminars.

Occupational health indicators

- The rate of work-related hospitalizations decreased by 27 percent from 2000 to 2010, to 65 cases per 100,000 workers.
- The rate of hospitalizations for pneumoconioses (which includes asbestosis, silicosis and other dust-related lung diseases) increased by 30 percent from 2000 to 2010.

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1

Introduction

This report, part of an annual series, provides information about Minnesota's job-related injuries, illnesses and fatalities: their incidence, nature and causes; the industries in which they occur; and changes in their incidence over time. The report also provides a summary of Minnesota Occupational Safety and Health Administration (MNOSHA) compliance and safety consultation program activities, and presents Occupational Health Indicator (OHI) statistics gathered by the Center for Occupational Health and Safety of the Minnesota Department of Health. This information is important for improving workplace safety and health and reducing the burden of occupational injuries and illnesses on workers, families and employers.

The latest data shows that Minnesota's employers reported fewer worker injuries and illnesses in 2010 than in previous years. During 2010, there were an estimated 76,700 recordable injury and illness cases; about 21,500 of these cases involved one or more days away from work. The figures for 2009 were 78,100 total cases and 21,000 cases with days away from work. These numbers are much lower than in 2000, when there were 142,500 total cases and 39,200 cases with days away from work.

There were 70 work-related fatal injuries in 2010, an increase from 61 fatalities in 2009 and 65 fatalities in 2008. The number of workplace fatalities in 2010 was lower than the annual average of 73 fatalities for the 2005 through 2009 period.

Each day during 2010, approximately 210 Minnesota workers suffered an OSHA-recordable injury or illness. In addition to the physical and economic effects of injuries and illnesses on workers,¹ employers pay the direct economic costs. Workers' compensation in Minnesota cost an estimated \$1.33 billion in

2010, or \$1.25 per \$100 of covered payroll.² This includes indemnity benefits (for lost wages, functional impairment or death), medical treatment, physical and vocational rehabilitation, dispute resolution, claims administration and other system costs.

For workers' compensation policies written in 2008 (the most current data available), the average amount of benefits paid for a workers' compensation claim is estimated at \$9,390 (adjusted to 2010 wage levels). For claims with cash benefits, 21 percent of all cases, the combined average medical and cash benefit cost estimate is much higher — \$40,200 (adjusted to 2010 wage levels).

Data sources

This report presents statistics from four sources: the U.S. Bureau of Labor Statistics (BLS) annual Survey of Occupational Injuries and Illnesses (SOII); the BLS Census of Fatal Occupational Injuries (CFOI); MNOSHA statistics available from the Minnesota OSHA Operating System Exchange (MOOSE) database for the compliance program and the IMIS Redesigned Information System (IRIS) for the consultation program; and OHI collected by the Minnesota Department of Health. The BLS and CFOI statistics are available through 2010; most MNOSHA statistics are available through federal fiscal year 2011 (October 2010 through September 2011); and the most recent OHI statistics are available through different points, depending on the specific program involved.

Occupational injury and illness survey

The annual SOII, conducted jointly by BLS and state agencies, is the primary nationwide source of workplace injury and illness data. Work

¹ An example of an economic effect on workers is the three-day disability waiting period before workers become eligible for workers' compensation indemnity benefits.

² *Minnesota Workers' Compensation System Report 2010* (www.dli.mn.gov/RS/WcSystemReport.asp). This report provides statistics about workers' compensation benefit costs and is the source of the costs cited.

establishments, randomly selected within industry and establishment size categories, provide data from their OSHA recordkeeping log summaries (OSHA 300A forms) and detailed data about cases with one or more days away from work (from OSHA 301 forms). The SOII is a mandatory survey; businesses selected to participate in the survey are required to provide their data.³ Approximately 4,650 Minnesota work establishments participated in the 2010 SOII. Injury and illness reports were collected from 99.8 percent of the usable establishments in the survey sample.

While the SOII provides the most complete standardized set of data regarding workplace injuries and illnesses, the number of recordable cases from the survey is not an estimate of all workplace injuries and illnesses. The SOII does not include injuries to business owners, sole proprietors, federal government employees, volunteers or family farm workers.⁴

Because of the time needed to produce the survey sample, the SOII does not include most establishments that begin operation within one year of the start of the survey year or any new establishments that begin operation during the survey year, and it is often impossible to collect data from establishments that closed during or immediately after the survey year. Statistical weighting is used to make the collected responses numerically representative of their industry's employment, although the actual injury and illness records for new and closing establishments may differ from establishments under continuous operation.

Employers record work-related injury and illness cases on their OSHA log that:

- result in fatalities;
- result in loss of consciousness;
- require medical treatment other than first aid;
- result in days away from work;
- result in restricted work activity or transfer to another job;
- are significant injuries or illnesses, such as cancer, diagnosed by a health care

professional; or

- are specific other instances, such as contaminated needlesticks, tuberculosis infection, hearing loss and medical removal required under an OSHA standard.

An injury or illness is considered work-related if an event or exposure in the work environment caused or contributed to the injury or illness or significantly aggravated a pre-existing condition. Employers are not to include cases that do not meet the recording and work-relatedness criteria on their SOII submissions.

The OSHA log categorizes recordable cases according to whether they have days off the job, job transfer or work restrictions.

- Cases with days away from work, job restriction or transfer (DART), as a combined group, are those cases with days when the injured worker is off the job *or* working with restrictions. Prior to 2002, cases with days away from work or job restrictions were called lost-workday cases. DART cases consist of:
 - (1) days-away-from-work (DAFW) cases — those with any days off the job other than the day of injury or illness (with or without additional days of restricted work or job transfer); and
 - (2) cases with job transfer or restriction — those with job transfer or restricted work, but no days off work, beyond the day of the injury or illness.
- Other recordable cases are cases that have no days away from work, no job transfer and no work restrictions beyond the initial day of the injury or illness, but meet the guidelines for recording the case.

These case types and other terms used in the SOII and the case types for previous years are more precisely defined in Appendix A. Employers are expected to understand the OSHA recordkeeping requirements well enough to properly identify and classify their cases and to count the days away from work and days of work restriction or job transfer.

DLI survey staff members monitor survey responses and work with employers to correct their case classifications and day counts as necessary. Appendix B presents the information

³ A more complete description of the SOII is available from the BLS website at www.bls.gov/iif/oshsum1.htm.

⁴ Owners and partners in sole proprietorships and partnerships are not considered employees, but corporate officers who receive payment for their services are considered employees.

expected from employers and discusses the common errors made on the OSHA log and the subsequent report of the OSHA log results for the SOII.

For DAFW cases, employers report case and demographic characteristics, type and cause of injury or illness, and the injured worker's gender, age, length of job tenure, occupation and length of time away from work. This information is coded by DLI survey staff members.

Because of changes in OSHA recordkeeping requirements, *the survey results for 2002 and later years are not comparable with the results for prior years*. The recordkeeping changes affected what injuries and illnesses are recordable, how injuries and illnesses are categorized and how days away from work are counted. These changes make direct comparisons between the pre-2002 SOII and later results unreliable. Appendix C presents the recordkeeping changes that took effect in 2002 and how they might affect injury and illness statistics.

The industry and occupation categorization systems have also changed. Industry coding changed from the 1997 Standard Industrial Classification (SIC) system to the 2002 North American Industry Classification System (NAICS)⁵ in the 2003 SOII. The 2009 SOII introduced the 2007 version of NAICS. Occupation coding changed from the 1990 Bureau of Census codes to the 2000 Standard Occupational Classification (SOC) system⁶ in the 2003 SOII. Exact comparisons of industry-specific and occupation-specific rates and numbers with results for earlier years are not possible.

An important issue with the injury and illness survey data is sampling error, the random error in survey statistics that occurs because the statistics are estimated from a sample. This sampling error is greater for smaller categories, such as particular industries, because of smaller sample size. Sampling errors are regularly reported as part of the SOII survey statistics.⁷

⁵ Information about NAICS is available at www.census.gov/eos/www/naics.

⁶ Information about the SOC system is available at www.bls.gov/soc.

⁷ For the 2010 relative standard errors, see tables A1 to A4

While the SOII offers the most complete nationally standardized estimate of occupational injuries and illnesses, there is concern about the extent that the SOII undercounts these cases. Appendix D summarizes some of the research about the reporting of work-related injuries and illnesses and the extent of the undercount in SOII and workers' compensation data. Figures are presented that compare Minnesota's SOII estimates with workers' compensation claims statistics to evaluate whether the SOII provides information that is substantially different from the workers' compensation system.

Fatal injuries

BLS, in cooperation with state and other federal agencies, conducts the nationwide Census of Fatal Occupational Injuries (CFOI), which was created to produce accurate and comprehensive counts of fatal workplace injuries. Fatalities caused by illnesses are excluded.

The CFOI provides a complete count of fatal work injuries by using multiple sources to identify, verify and profile these incidents. Source documents such as death certificates, workers' compensation reports, and federal and state agency administrative records are cross-referenced to gather key information about each workplace fatality. Two or more independent source documents are used to verify the work relationship of each fatal work injury.

The CFOI results were categorized by NAICS industry codes and SOC occupation codes for the first time in 2003. Beginning with the 2009 data, the CFOI program began using the 2007 version of NAICS. Trends and direct comparisons with data from years prior to 2003 are not possible for industries and occupations.

MNOSHA activity measures

The MNOSHA program includes the Compliance unit, which is responsible for occupational safety and health compliance program administration, and the Workplace Safety Consultation unit, which provides free consultation services. Source statistics used in this report come from the MOOSE and IRIS systems, for the compliance and consultation activities, respectively. MNOSHA inspectors

at www.dli.mn.gov/RS/Excel/blssumtables08.xls.

and consultants enter information into their systems following worksite visits. Data for training presentations, voluntary program participation and safety grant activity are maintained in separate file systems.

Occupational health indicators

Epidemiologists at the Minnesota Department of Health's (MDH) Center for Occupational Health and Safety collect statistics for a set of 20 occupational health indicators developed by the Council of State and Territorial Epidemiologists. The measures included in the indicators are collected through various public health programs, including the SOII, CFOI and the workers' compensation system. Other measures use data collected from hospital discharges, cancer registries and poison control centers, among other sources.

Report organization

The next three chapters in this report describe the incidence and characteristics of occupational injuries and illnesses in Minnesota. Chapter 2 presents data about the number and incidence of Minnesota's workplace injuries and illnesses over time, focusing on the state as a whole. Chapter 3 provides statewide injury and illness statistics by industry and establishment size. Chapter 4 describes the characteristics of workers and their injuries for DAFW cases.

Chapter 5 shows statistics about the state's fatal workplace injuries, using data from the CFOI program. Figures show the number of fatalities, the events causing the fatalities and characteristics of the fatally injured workers.

Chapter 6 provides information about MNOSHA compliance and consultation activities and programs to help employers achieve safe and healthful workplaces.

Chapter 7 presents occupational health indicator statistics collected by the Minnesota Department of Health's Center for Occupational Health and Safety. These include measures of work-related hospitalizations, poisonings, lung diseases and blood lead levels.

Appendix A provides a glossary of concepts and terms for understanding and using the SOII data. Appendix B provides some of the major OSHA log requirements and recordkeeping principles that form the basis of the SOII statistics. Appendix C summarizes the major changes in OSHA's recordkeeping rule that became effective in 2002. Appendix D addresses whether the information available from injury and illness case characteristics available from the SOII is different from the information available from claims in the DLI workers' compensation claims database.

Other available statistics

The SOII provides a large volume of information about occupational injuries and illnesses for the United States and most individual states. This information includes the number and incidence of injuries and illnesses by industry and establishment size. For DAFW cases, the survey provides data about the characteristics of injuries and illnesses, including cause, severity (number of days away from work), employee's length of time on the job when injured, occupation and other employee characteristics.

The Minnesota case counts and incidence rates for all detailed industries for survey years 2003 through 2010 are available at www.dli.mn.gov/RS/StatWSH.asp. The injury and illness incidence rates for Minnesota and the U.S., rates for Minnesota's industry sectors from 1988 through 2010, and the case and demographic characteristics tables and charts for private ownership workplaces are also available through this Web page. The Minnesota CFOI tables for 2010 are available at www.dli.mn.gov/RS/Excel/StatFatal.asp.

The national SOII and CFOI statistics are available at www.bls.gov/iif. The national data, because of larger sample sizes, includes more detailed categories than the state data and has smaller sampling errors. The BLS website also provides data for other states.

National and state OSHA Compliance inspection data, accident investigation summaries and lists of frequently cited standards by industry are available at www.osha.gov/oshstats.

The MNOSHA annual report, which provides statistics about MNOSHA activities during federal-fiscal-year 2011, will be available at www.dli.mn.gov/OSHA/PDF/annualreport11.pdf.

Information collected by the Center for Occupational Health and Safety is available at www.health.state.mn.us/divs/hpcd/cdee/occhealth.

The Council of State and Territorial Epidemiologists has a website providing statistics for the 20 occupational health indicators from 28 states for 2000 through the most recent year available at www.cste.org/dnn/ProgramsandActivities/OccupationalHealth/OccupationalHealthIndicators/tabid/85/Default.aspx.

2

An overview of nonfatal workplace injuries and illnesses in Minnesota

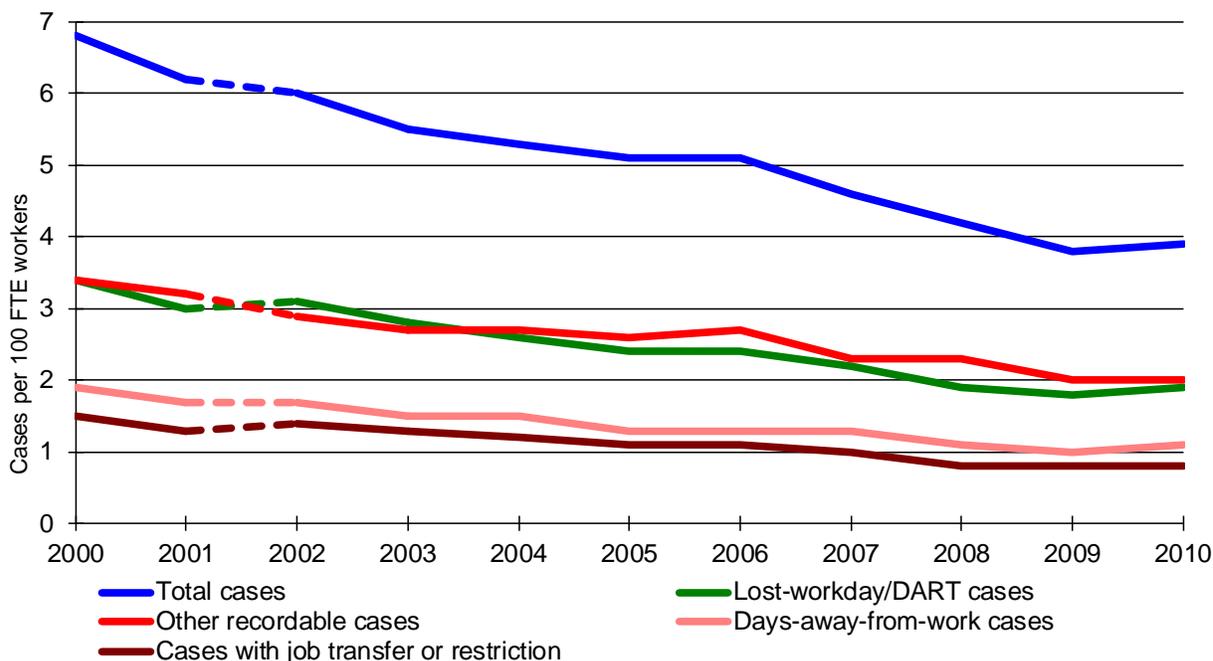
Incidence rates

Incidence rates relate the number of recordable injury and illness cases to total hours of work reported by the surveyed employers. Figure 2.1 shows estimates of the incidence of nonfatal injuries and illnesses for Minnesota for 2000 through 2010, expressed as cases per 100 full-time-equivalent (FTE) workers.

Because of OSHA recordkeeping changes, the 2002 and later estimates are not directly comparable with estimates from earlier years. To highlight this change, there is a break in the data lines between 2001 and 2002.

- After peaking at a rate of 8.6 cases per 100 FTE workers in 1993 and 1994, the total recordable case rate decreased to a rate of 3.8 cases per 100 FTE workers in 2009. The total recordable case rate for 2010 is estimated at 3.9 cases per 100 FTE workers, which is not a statistically significant difference from the 2009 rate.
- The only statistically significant rate change from 2009 to 2010 occurred for DAFW cases, which increased from 1.0 cases per 100 FTE workers in 2009 to 1.1 cases in 2010.

Figure 2.1 Injury and illness cases per 100 FTE workers, Minnesota, 2000-2010



Year of injury	Total recordable cases	Lost-workday/DART cases ¹	Cases with days away from work	Cases with job transfer or restriction ²	Other recordable cases ³
2000	6.8	3.4	1.9	1.5	3.4
2008	4.2	1.9	1.1	0.8	2.3
2009	3.8	1.8	1.0	0.8	2.0
2010	3.9	1.9	1.1	0.8	2.0

1. For 2001 and earlier, lost-workday cases.
 2. For 2001 and earlier, cases with restricted work activity only.
 3. For 2001 and earlier, cases without lost workdays.

Number of cases

The number of cases shows the magnitude of the occupational injury and illness situation in Minnesota, a state with 160,000 work establishments and 2.5 million workers in 2010.

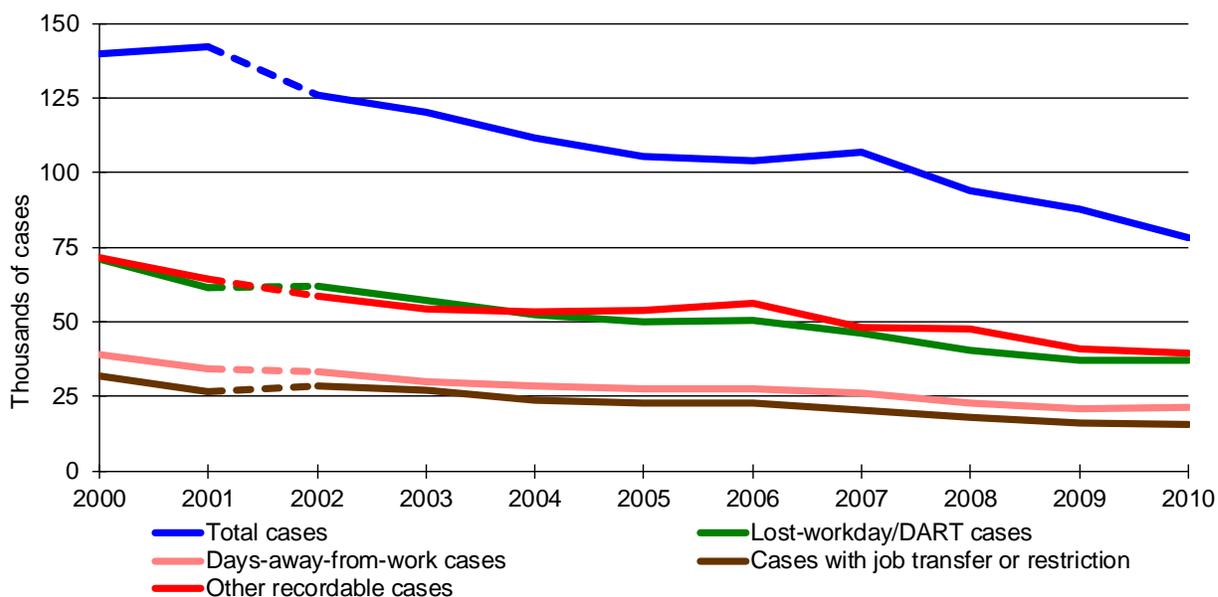
There were an estimated 76,100 OSHA-recordable injury and illness cases in Minnesota in 2010. This is the lowest number of cases ever reported in the SOII for Minnesota.

Figure 2.2 shows estimated numbers of nonfatal injuries and illnesses in Minnesota for 2000

through 2010 for the various case types. Because of OSHA recordkeeping changes, the 2002 and later estimates are not directly comparable with estimates from earlier years. To highlight this caveat, there is a break in the data lines between 2001 and 2002.

- From 2004 to 2010, while employment decreased 1 percent, the estimated number of recordable cases decreased 36 percent.
- The distribution of cases among the various case types in 2010 was similar to the distribution in prior years.

Figure 2.2 Number of injury and illness cases, Minnesota, 2000-2010



Year of injury	Employment (1,000s)	Total recordable cases (1,000s)	Lost workday/ DART cases ¹		Cases with days away from work		Cases with job transfer or restriction ²		Other recordable cases ³	
			Number (1,000s)	Pctg. of total	Number (1,000s)	Pctg. of total	Number (1,000s)	Pctg. of total	Number (1,000s)	Pctg. of total
2000	2,573	142.5	70.9	50%	39.2	28%	31.7	22%	71.6	50%
2008	2,654	87.9	40.4	46%	22.6	26%	17.8	20%	47.5	54%
2009	2,600	78.1	37.2	48%	21.0	27%	16.2	21%	40.9	52%
2010	2,519	76.7	37.3	49%	21.5	28%	15.8	21%	39.4	51%

1. For 2001 and earlier, lost-workday cases.
 2. For 2001 and earlier, cases with restricted work activity only.
 3. For 2001 and earlier, cases without lost workdays.

Comparing Minnesota with the nation

Figure 2.3 compares the rates of total cases, DART cases and DAFW cases in the **private sector** for Minnesota and the United States for 2000 through 2010.⁸

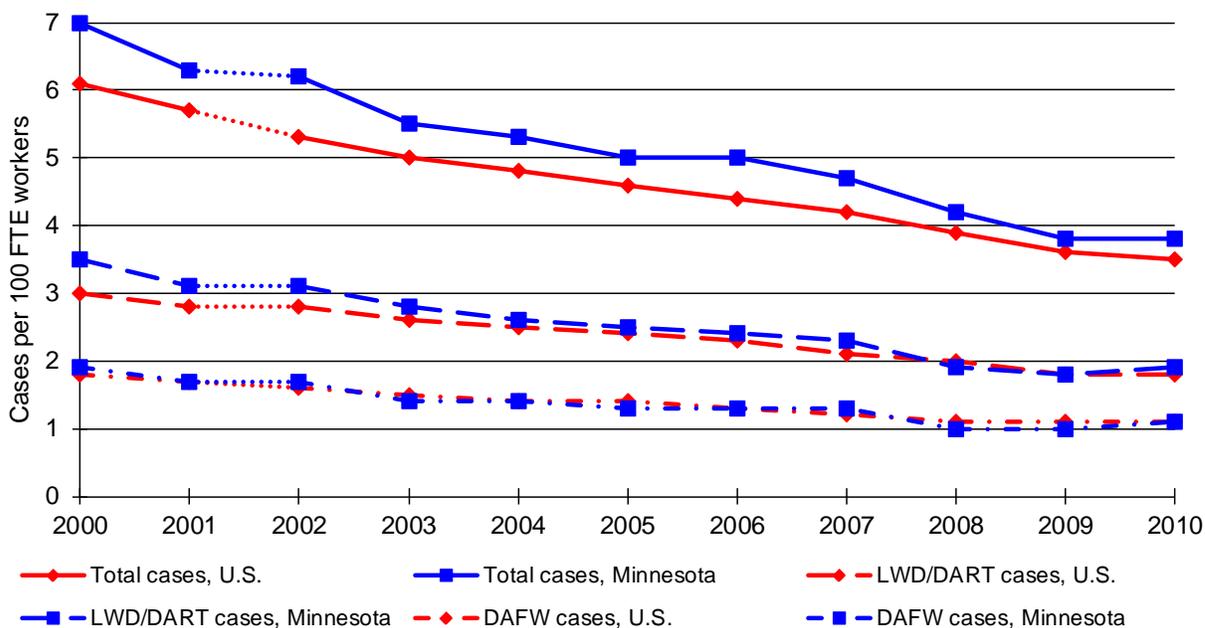
- Minnesota’s 2010 private-sector total case rate was 3.8 cases per 100 FTE workers, while the U.S. rate was 3.5 cases. Minnesota’s total case rate has been above the U.S. rate since 1993.
- Minnesota’s DART rate in 2010 was 1.9 cases per 100 FTE workers and the national rate was 1.8 cases. Relative to the U.S. rate, Minnesota’s lost-workday/DART case rate

was lower in the late 1980s, close during the early 1990s, higher from 1996 to 2003, and has been very close to the U.S. rate since 2004.

- Minnesota’s DAFW case rate has been almost identical to the U.S. DAFW rate since 1996.

Differences in the relative proportions of industries between Minnesota and other states may lead to differences in the overall rates. For example, Minnesota has a higher proportion of total employment in health services, 16.4 percent in 2010, than the nation as a whole, with 14.1 percent. There are variations in reporting between Minnesota and other states, which affect the estimated rates.⁹

Figure 2.3 Injury and illness case incidence rates for Minnesota and the United States, private sector, 2000-2010



	Cases per 100 full-time-equivalent workers					
	Total cases		LWD/DART cases ¹		Days-away-from-work cases	
	Minnesota	U.S.	Minnesota	U.S.	Minnesota	U.S.
2000	7.0	6.1	3.5	3.0	1.9	1.8
2008	4.2	3.9	1.9	2.0	1.0	1.1
2009	3.8	3.6	1.8	1.8	1.0	1.1
2010	3.8	3.5	1.9	1.8	1.1	1.1

⁸ Prior to 2008, participating states had the option to include public-sector worksites in the SOII. Because not all states chose this option, public-sector statistics are not available at the national level prior to 2008.

⁹ John Mendeloff and Rachel Burns, “States with low non-fatal injury rates have high fatality rates and vice versa,” *American Journal of Industrial Medicine*, 2012, e-pub ahead of print.

Since 2008, the combined incidence rates for the public and private sectors are available for both Minnesota and the U.S. Figure 2.4 shows Minnesota’s total case rate, DART rate and DAFW rate were very similar to the corresponding national rates.

These comparisons need to be made cautiously, however, because of differences between the types and proportions of industries in Minnesota and nationally. Also, research shows that employers’ reporting on the SOII is influenced by their state’s workers’ compensation laws, especially the waiting period for indemnity benefits.¹⁰

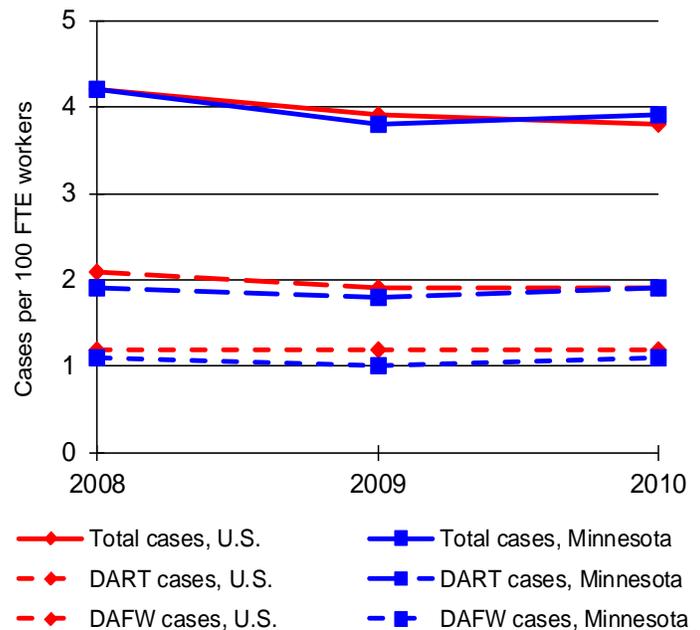
Minnesota relative to other states

The ranking of Minnesota’s incidence rates with those from other states provides a context for the current level and recent trend in Minnesota’s injuries and illnesses. The results reinforce the comparison of Minnesota and the national rates.

Figure 2.5 shows Minnesota’s ranking for injury and illness rates and for the ratio of DART cases to the total case rate. Comparable private-sector data is available for 42 states in 2007, for 41 states in 2008 and 2010, and for 40 states in 2009. Lower rates are ranked lower.

- Minnesota’s rates are near the middle of the states’ rates.
- The total case rate can be divided into two broad categories: the DART case rate and the other recordable case rate (see Appendix A for definitions of the case types). When the DART rate is low compared to the total case rate, this may indicate employers are recording many low-severity cases on their OSHA logs or the state has a low overall severity level. The DART case rate was 49 percent of Minnesota’s total case rate in 2010, the 11th lowest percentage among all the states reporting.

Figure 2.4 Injury and illness incidence rates for Minnesota and the U.S., public and private sectors, 2008-2010



	Cases per 100 full-time-equivalent workers					
	Total cases		DART cases ¹		Days-away-from-work cases	
	Minn.	U.S.	Minn.	U.S.	Minn.	U.S.
2008	4.2	4.2	1.9	2.1	1.1	1.2
2009	3.8	3.9	1.8	1.9	1.0	1.2
2010	3.9	3.8	1.9	1.9	1.1	1.2

1. DART cases include cases with days away from work, job transfer or restriction.

Figure 2.5 Ranking of Minnesota's private-sector injury and illness rates with other states (lowest rate is ranked number 1)

	2007 (42 states)	2008 (41 states)	2009 (40 states)	2010 (41 states)
Incidence rate				
Total cases	24	19	18	23
DART cases	21	15	15	19
DAFW cases	19	8	13	18
Cases with job transfer or restriction	24	19	18	20
Other recordable cases	26	27	22	27
DART rate as percentage of total case rate	14	3	11	11

¹⁰ See figure 1 in Mendeloff and Burns (2012).

Incidence of illnesses

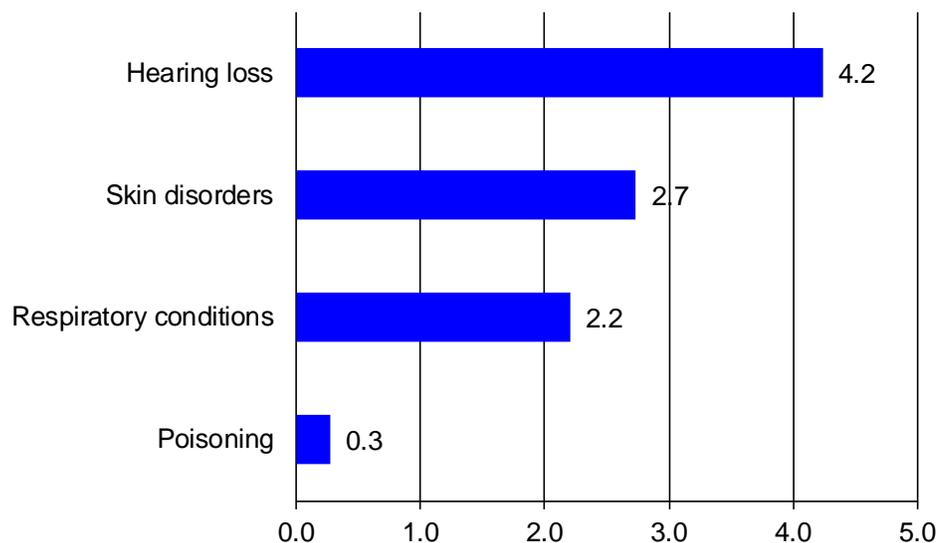
The SOII statistics include estimates of the number and rate of claims of specific illnesses for all case types. These illnesses are skin diseases or disorders, respiratory conditions, poisonings and hearing loss. These illnesses are counted for all case types, unlike the more-detailed data available only for DAFW cases. In 2010, there were an estimated 1,900 cases with one of these illnesses. The rates per 10,000 FTE workers for these conditions are shown in Figure 2.6, averaged over the 2008 to 2010 period because of the large year-to-year fluctuations in incidence rates.

- Noise-induced hearing loss is defined as a change in hearing threshold relative to a baseline audiogram. Hearing loss has the

highest incidence rate of the illnesses.

- The second most common illness type is skin diseases or disorders. These are illnesses involving the worker’s skin that are caused by work exposure to chemicals, plants or other substances.
- Respiratory conditions are illnesses associated with breathing hazardous biological agents, chemicals, dust, gases, vapors or fumes at work.
- Poisoning includes disorders evidenced by abnormal concentrations of toxic substances in blood, other bodily fluids, tissues or the breath that are caused by the ingestion or absorption of toxic substances into the body.

Figure 2.6 Annual average incidence rates per 10,000 FTE workers for specific illnesses, all recordable cases, 2008-2010



	Hearing loss	Skin disorders	Respiratory conditions	Poisoning
2003	[1]	3.5	1.9	1.0
2008	3.8	3.4	2.9	0.1
2009	4.1	2.4	1.6	0.4
2010	4.8	2.4	2.1	0.3

1. Hearing loss was not reported as a separate category until 2004.

3

Injuries and illnesses by industry

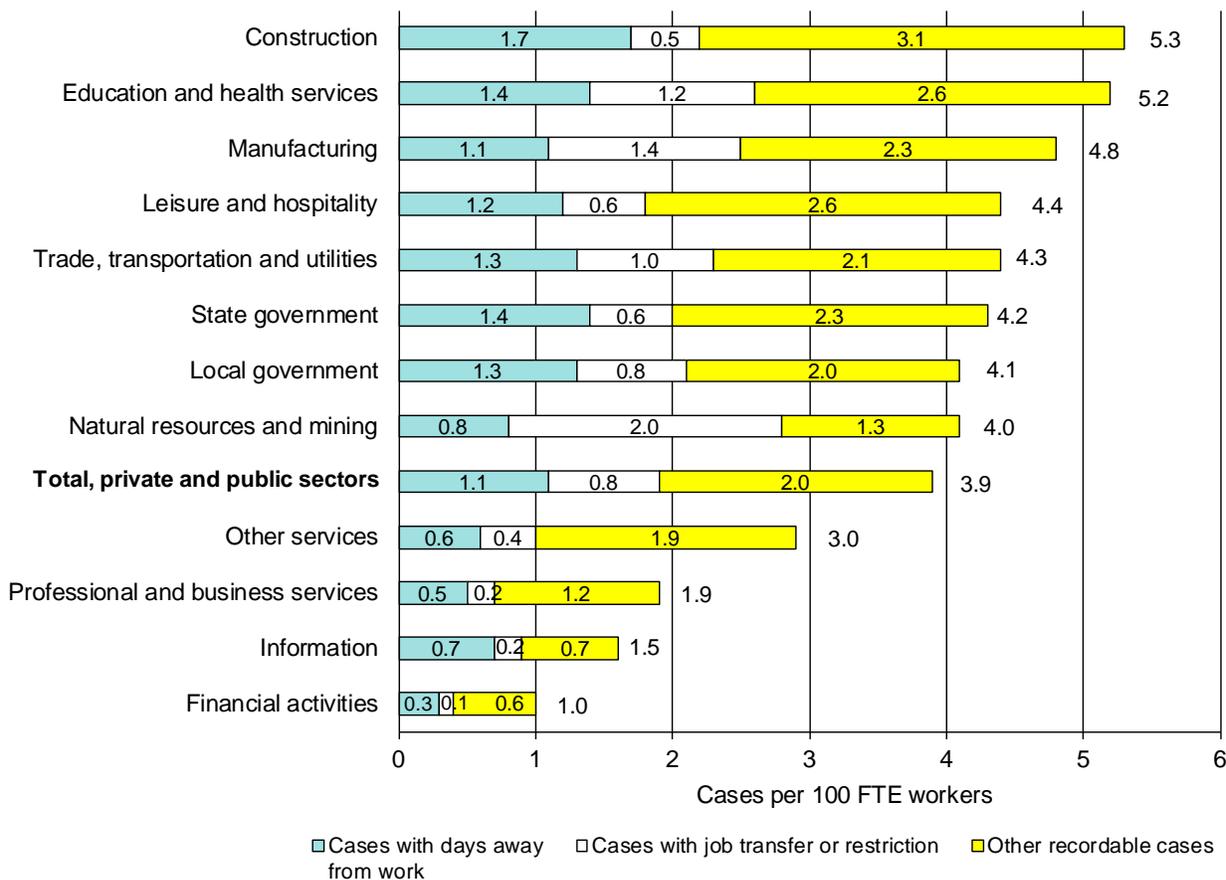
The 2010 injury and illness survey shows:

- construction, private ownership education and health services, and manufacturing had the highest total case rates, with approximately five cases per 100 FTE workers; and
- establishments with 50 to 249 employees had the highest incidence rates, while establishments with 10 or fewer employees had the lowest rates.

Incidence by industry supersector

Industries can be analyzed at different levels of detail. NAICS uses a six-digit hierarchical code in which each successive digit after the second digit indicates a finer level of detail. Industry sectors use the first two NAICS digits. For each type of ownership — private, state government and local government — there are 20 industry sectors in NAICS. For brevity of presentation,

Figure 3.1 Incidence rates by industry supersector¹, 2010



1. Except for state and local government, all supersectors include only privately owned establishments.

the SOII results are often presented in supersectors. The 11 supersectors include from one to four industry sectors. The state government and local government supersectors include all establishments in these ownership types regardless of industry code. Employment in these supersectors is concentrated in education and health services and in public administration.

Figure 3.1 shows Minnesota’s injury and illness rates for the case types by industry supersector and for all industries combined. The supersectors are ranked by their total case rate.

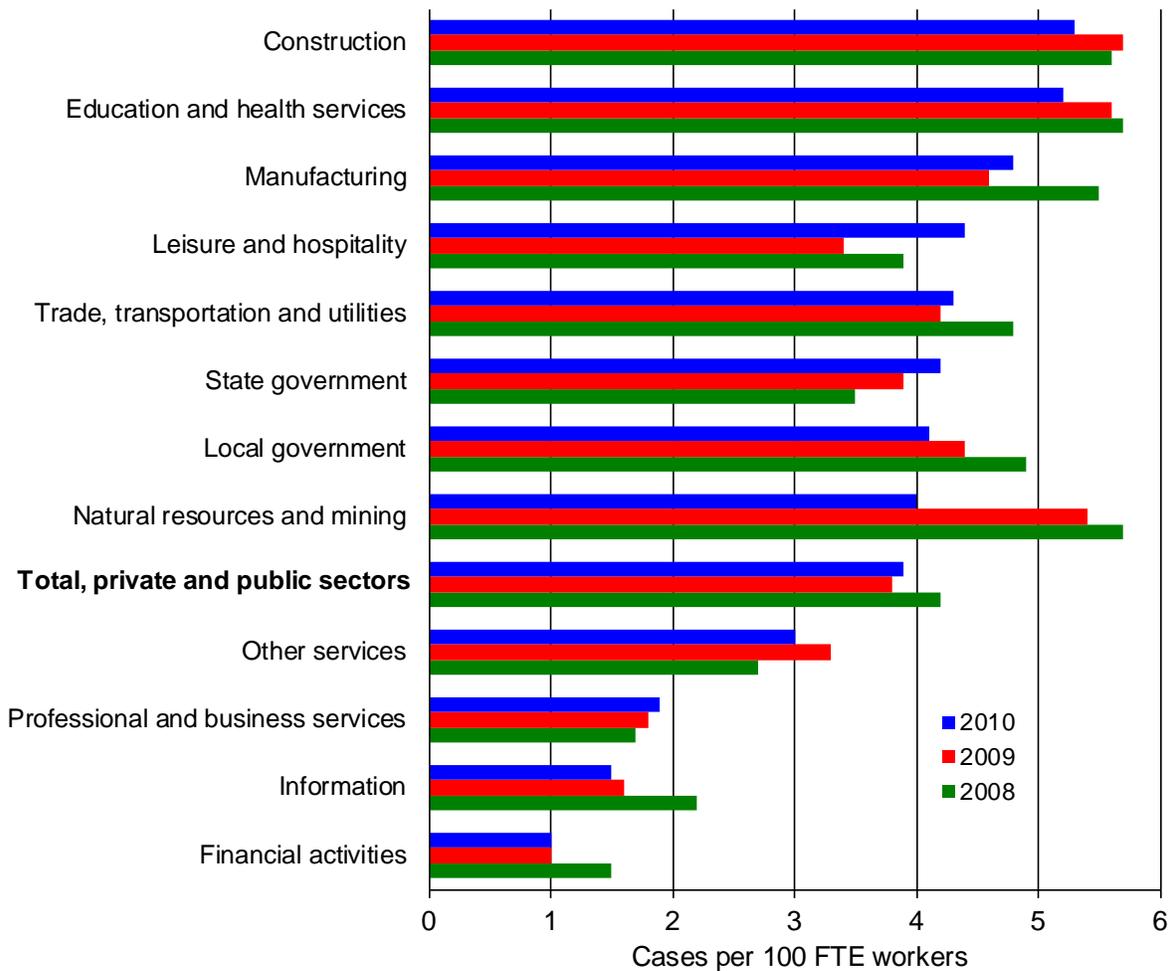
- Construction had the highest total recordable case rate, closely followed by education and health services (privately owned) and manufacturing.

- Construction had the highest rate for DAFW cases.
- Manufacturing and natural resources and mining were the only supersectors with a higher job transfer or restriction case rate than their DAFW case rate.

Figure 3.2 compares the 2010 total recordable case rates for each supersector with its respective 2009 and 2008 rates.

- The 29 percent rate increase for leisure and hospitality was the only change that was a statistically significant difference between 2009 and 2010. (There was too much variation in the natural resources and mining estimate for the rate decrease to be statistically significant.)

Figure 3.2 Rate of total nonfatal occupational injuries and illnesses per 100 FTE workers by industry supersector¹, 2008, 2009 and 2010



1. Except for state and local government, all supersectors include only privately owned establishments.

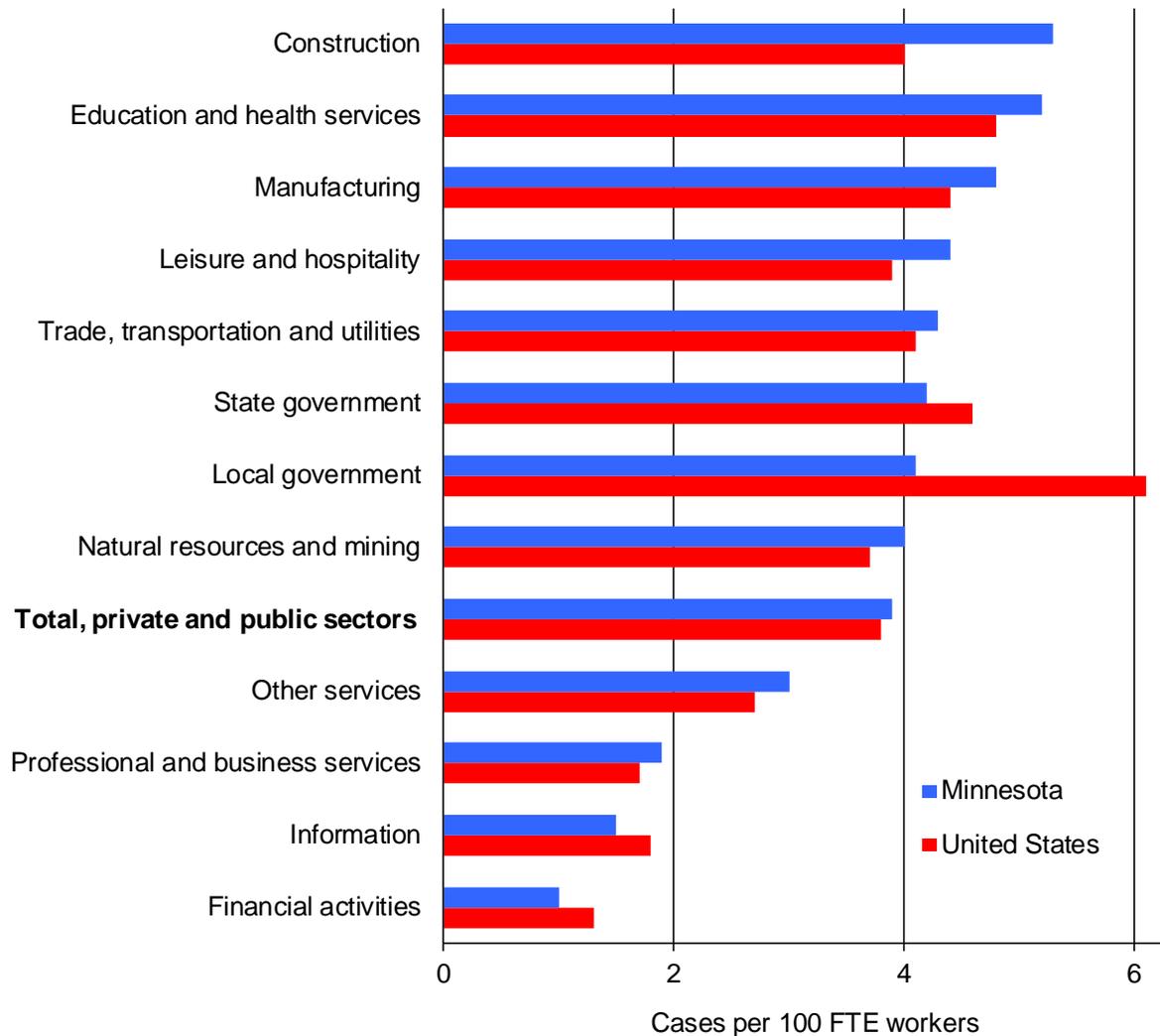
Figure 3.3 compares Minnesota’s 2010 total case incidence rate estimates with the U.S. rate estimates for each supersector.

- Each of the five highest-rate Minnesota supersectors had higher estimated rates than the U.S. rates, but only the education and

health services rate difference was statistically significant.

- Minnesota’s local government rate was significantly lower than the corresponding national rate.

Figure 3.3 Rate of total nonfatal occupational injuries and illnesses per 100 FTE workers by industry supersector¹, Minnesota and United States, 2010

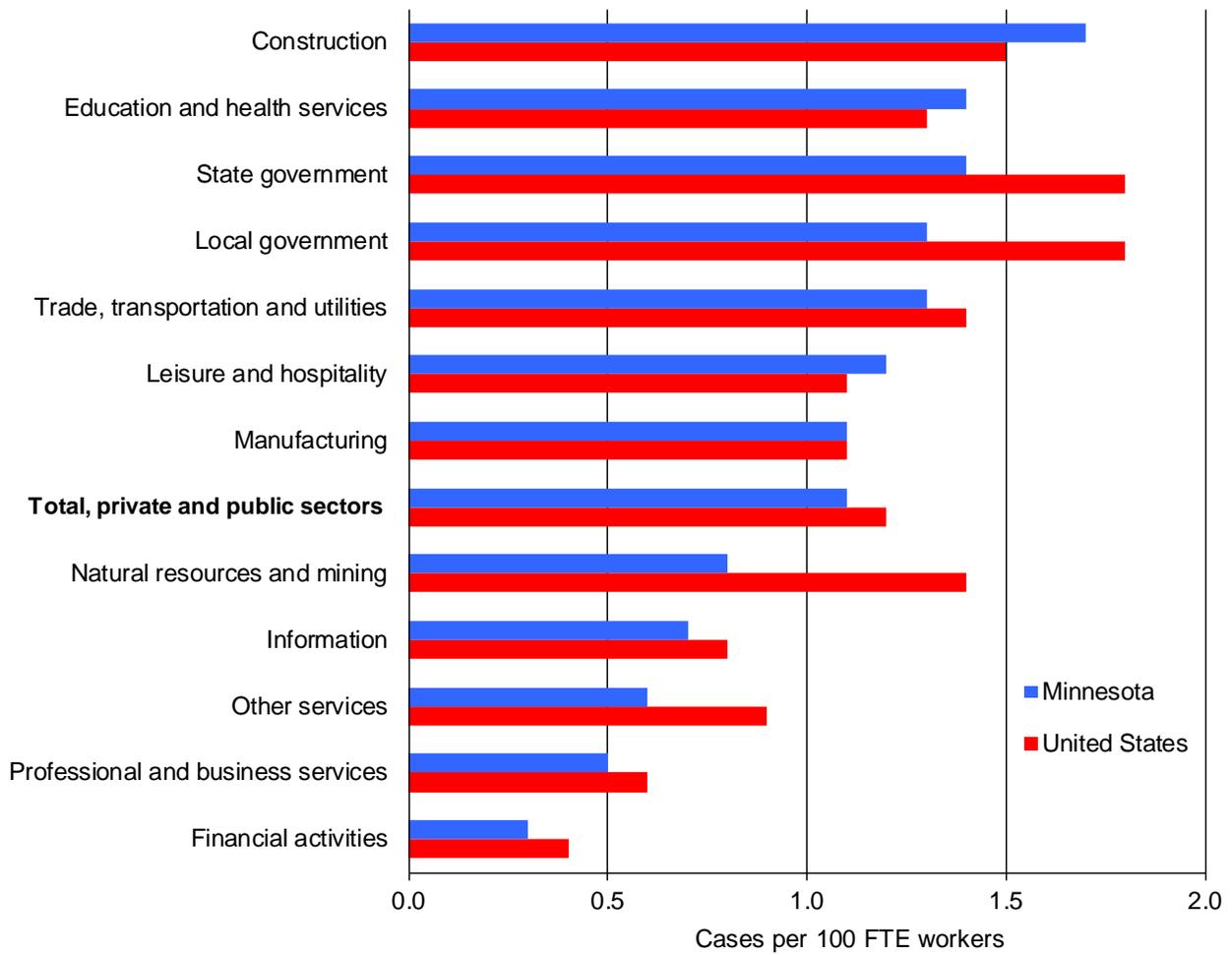


1. Except for state and local government, all supersectors include only privately owned establishments.

Figure 3.4 compares Minnesota’s 2010 DAFW case incidence rates with the U.S. rate for each industry supersector. Minnesota had lower DAFW incidence rates than the corresponding U.S. rates for seven supersectors, had the same rate as the United States for three supersectors and had higher rates for three supersectors.

The greatest difference between a Minnesota rate and the corresponding U.S. rate was 0.6 cases per 100 FTE workers, in natural resources and mining, where Minnesota had the lower rate. However, Minnesota’s detailed industries within this industry sector are different than the industries included in the national figure.

Figure 3.4 Rate of cases with days away from work per 100 FTE workers by industry supersector¹, Minnesota and United States, 2010

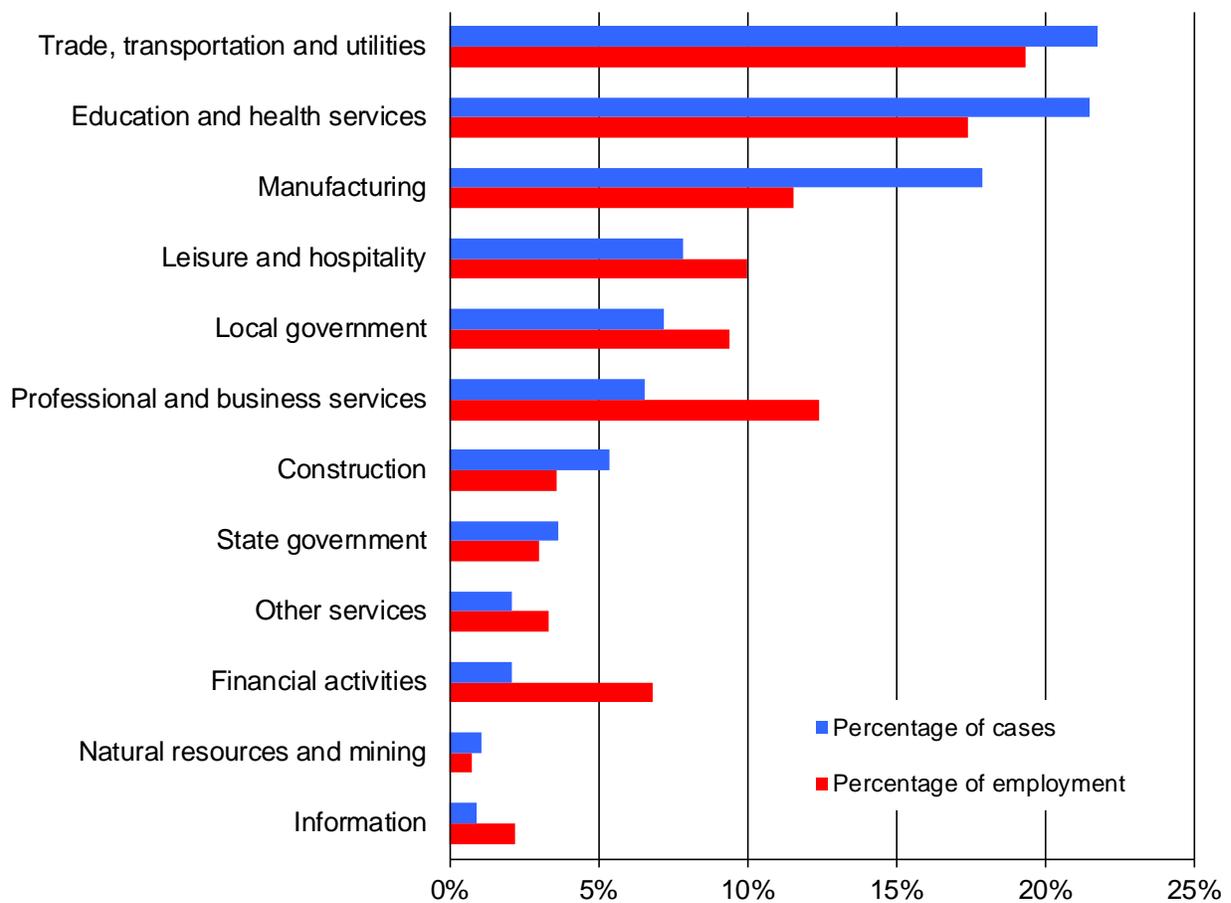


1. Except for state and local government, all supersectors include only privately owned establishments.

Figure 3.5 compares the percentage of workers employed in each supersector with its percentage of total cases reported.

- The three industry supersectors with the largest percentages of cases accounted for 61 percent of the injury and illness cases and for 48 percent of employment.
- Trade, transportation and utilities, with 19 percent of Minnesota’s employment, accounted for 22 percent of the cases.
- Education and health services accounted for 17 percent of employment and 22 percent of the cases.
- Manufacturing had 18 percent of the cases and was the fourth-largest employment supersector, with 12 percent of employment. Manufacturing accounted for more than 20 percent of the cases prior to 2009.

Figure 3.5 Percentage of total cases and employment by industry supersector¹, 2010



1. Except for state and local government, all supersectors include only privately owned establishments.

Results by industry subsector

Some safety and health resources, such as Minnesota OSHA compliance inspections, need to be prioritized to those industries with the highest injury and illness rates and the highest numbers of cases. Figure 3.6 shows the industry subsectors (three-digit NAICS classes) with the highest total case incidence rates in Minnesota.

- Six of the 10 subsectors were on this list last year. The rate for state government hospitals was not published last year and the rate for local government nursing and residential care facilities, which reported the highest rate in 2009, was not publishable for 2010.¹¹
- Three of the subsectors are in the health care sector and two are in manufacturing.

The industry subsectors with the highest DAFW case incidence rates in Minnesota are shown in Figure 3.7. Seven of the subsectors were on this list in 2009.

- The average DAFW rate for the 10 highest rates in 2010 was 4.4 cases per 100 FTE workers, higher than the 2009 average of 3.7, indicating some specific industries are continuing to have serious safety concerns.
- Four of the subsectors are involved in health care and five are in the transportation and warehousing sector.

Figure 3.8 shows the industry subsectors with the highest number of DAFW cases. Three industries were listed in both figures 3.7 and 3.8, showing that most of the industries with the highest DAFW rates are different from the industries with the highest number of cases.

- These 10 industries accounted for 8,630 DAFW cases, 40 percent of the state's total.
- The industries represent a wide variety of Minnesota workplaces. These 10 subsectors come from seven different industry sectors.

¹¹ SOII estimates are not published if the relative standard error of the estimate is too high.

Figure 3.6 Industry subsectors¹ with the highest total case rates, 2010

Industry subsector ²	100 FTE workers
Nursing and residential care (state gov.)	19.3
Hospitals (state gov.)	13.3
Primary metal manufacturing	10.8
Utilities (local gov.)	9.9
Couriers and messengers	9.3
Heavy and civil engineering construction (local gov.)	9.1
Beverage and tobacco product mfg.	9.1
Crop production	9.1
Nursing and residential care	9.0
Warehousing and storage	8.6

1. Industry subsectors use the first three NAICS digits.

2. Industries are private sector unless otherwise noted.

Figure 3.7 Industry subsectors¹ with the highest rates of days-away-from-work cases, 2010

Industry subsector ²	DAFW cases per 100 FTE
Nursing and residential care (state gov.)	11.1
Hospitals (state gov.)	9.3
Heavy and civil engineering construction (local gov.)	5.6
Air transportation	3.1
Warehousing and storage	2.9
Couriers and messengers	2.6
Nursing and residential care	2.6
Hospitals	2.3
Beverage and tobacco product mfg.	2.3
Primary metal manufacturing	2.2
Transit and ground passenger transportation (local gov.)	2.2
Truck transportation	2.2
Justice, public order and safety activities (local gov.)	2.2

1. Industry subsectors use the first three NAICS digits.

2. Industries are private sector unless otherwise noted.

Figure 3.8 Industry subsectors with the highest number of days-away-from-work cases, 2010

Industry subsector ²	DAFW cases ³
Nursing and residential care	1,740
Hospitals	1,670
Specialty trade contractors	840
Food services and drinking places	830
Food manufacturing	690
Educational services (local gov.)	650
General merchandise stores	590
Primary metal manufacturing	560
Merchant wholesalers, durable goods	550
Merchant wholesalers, nondurable goods	510

1. Industry subsectors use the first three NAICS digits.

2. Industries are private sector unless otherwise noted.

3. Numbers of cases are rounded to nearest 10.

Days away from work

For cases with one or more days away from work, the SOII provides statistics about the number of days away from work. As shown in Figure 2.2, only 28 percent of the recordable cases in 2010 were DAFW cases. Days away from work are counted by calendar days, not scheduled work days. The number of days away from work for OSHA recordkeeping and the SOII do not include the day of the event causing the injury or the onset of illness.

Figure 3.9 shows the distribution of DAFW cases by the number of days away from work.

- Nearly one-third of the DAFW cases had only one or two days away from work.

As shown in Figure 3.10, the percentage of DAFW cases with one or two days away from work decreased from 2006 to 2009, while the percentage of cases with more than 30 days away from work increased in 2007 and 2008, but decreased in 2009 and 2010.

Figure 3.11 shows the median number of days away from work by industry supersector. The weighting system used by BLS to compute the SOII estimates sometimes results in large year-to-year variations for supersectors with relatively few DAFW cases. The median varied widely among the industries and by year within industry.

- The median for all industries was five days. The median had been five days from 2000 through 2007, reached six days for 2008 and 2009, and returned to five days in 2010. This change corresponds with the low percentage of cases with one or two days away from work for 2008 and 2009 and the increase in 2010 (Fig. 3.10).
- Construction has had the highest or second-highest median days away for all three years.
- Financial activities has had the lowest median days away for two of the past three years.

Figure 3.9 Distribution of days-away-from-work cases by number of days away from work, 2010

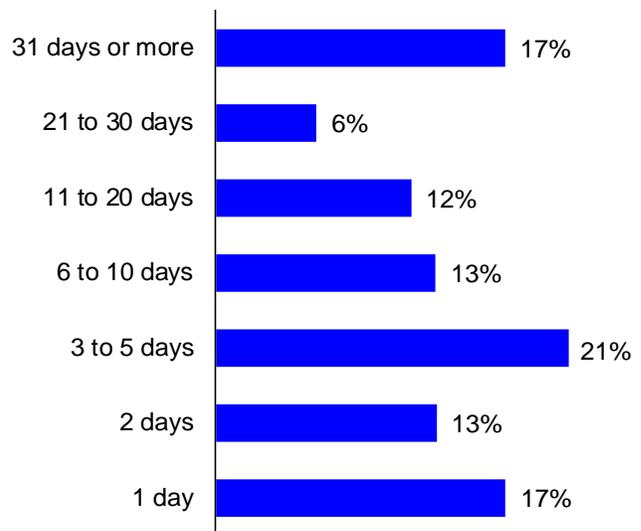


Figure 3.10 Percentage trends of days away from work, 2003 to 2010

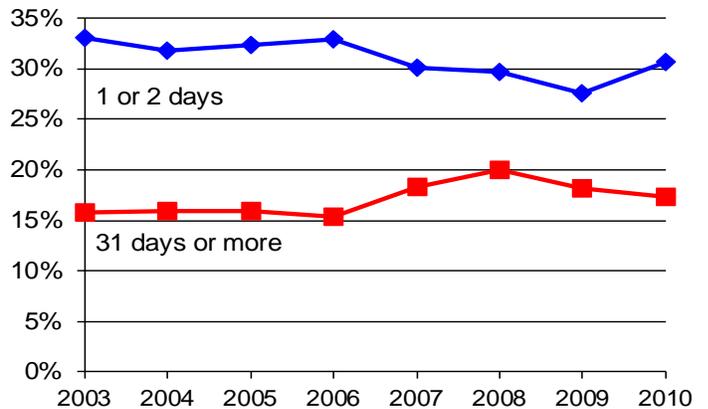


Figure 3.11 Median days away from work by industry supersector¹, 2008-2010

Industry supersector	2008	2009	2010
Construction	11	12	11
Trade, transportation and utilities	7	10	8
Professional and business services	4	5	7
Manufacturing	6	6	6
Total, private and public	6	6	5
State government	8	5	5
Local government	4	4	5
Other services	--	4	5
Natural resources and mining	9	13	4
Leisure and hospitality	12	5	4
Education and health services	5	5	4
Information	7	3	4
Financial activities	3	5	2

-- indicates the value did not meet BLS publication requirements.

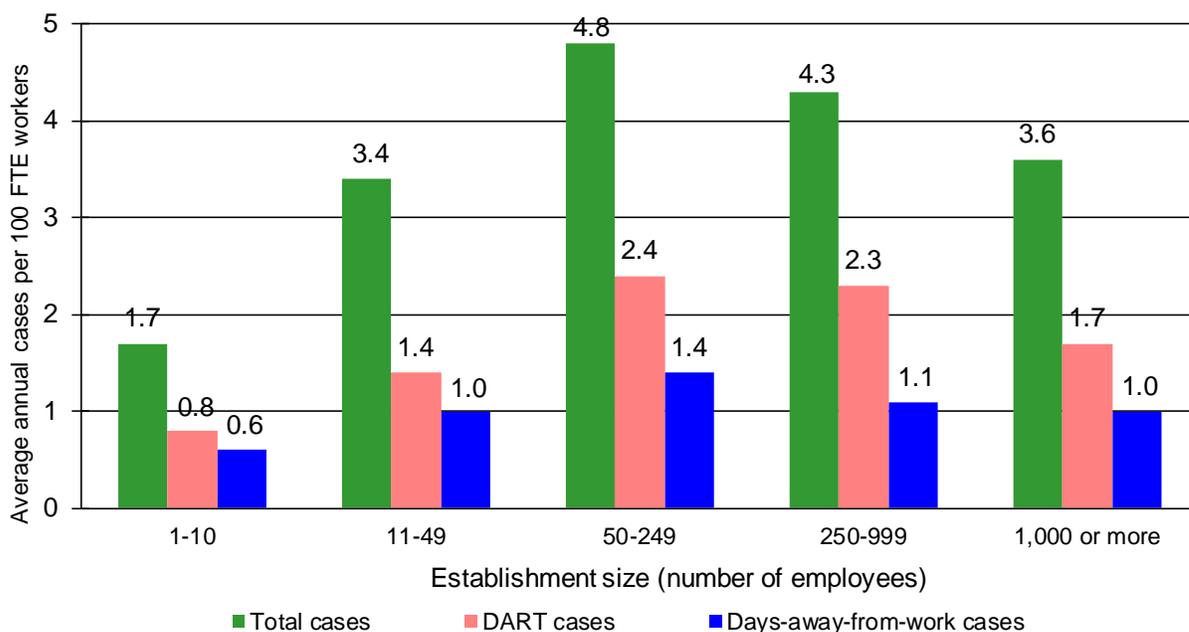
1. Except for state and local government, all supersectors include only privately owned establishments.

Incidence by size

The incidence of reported workplace injuries and illnesses varies by establishment size. Figure 3.12 shows case incidence by case type and establishment size, and presents the total case rates by establishment size and industry. This pattern has been consistent for many years.

- Incidence rates were lowest for the smallest establishments (one to 10 employees). This was also the only size group to show decreases in all three measures.
- Mid-sized establishments (50 to 249 employees) had the highest rates for all three case types. This pattern is also evident for many of the industry supersectors.

Figure 3.12 Injury and illness case incidence rates by establishment size, private sector, 2010



Industry supersector ¹	Total recordable cases per 100 FTE workers by establishment size (number of employees) ²					
	All Sizes	1-10	11-49	50-249	250-999	1,000+
Natural resources and mining	4.0	0.1	2.2	6.9	4.9	--
Construction	5.3	3.8	6.0	6.6	3.0	--
Manufacturing	4.8	--	5.4	5.6	4.6	2.9
Trade, transportation and utilities	4.3	--	4.7	5.3	4.7	5.6
Information	1.5	--	--	1.6	1.6	--
Financial activities	1.0	--	0.6	2.5	0.6	0.6
Professional and business services	1.9	--	1.4	2.8	2.1	1.2
Education and health services	5.2	--	3.2	6.2	5.9	5.6
Leisure and hospitality	4.4	--	3.7	4.6	11.6	5.8
Other services	3.0	--	2.5	6.0	4.2	--
State government	4.2	--	4.0	5.0	3.8	4.0
Local government	4.1	--	2.8	3.9	5.6	3.8

1. Except for state and local government, all supersectors include only privately owned establishments.
 2. Only cells with data meeting BLS publication standards are shown.

4

Characteristics of cases with days away from work

This chapter presents, for cases resulting in one or more days away from work, statistics about the demographic characteristics of the workers, their job characteristics, and the characteristics and causes of their injuries and illnesses. Employers participating in the survey provide descriptions for each DAFW case.¹² DLI Research and Statistics survey staff members code the descriptions into the appropriate categories.

To control for variation due to the sampling and estimation processes, statistics for the worker demographic characteristics and for the job characteristics use the annual average of the 2008, 2009 and 2010 survey results. Results for the injury and illness characteristics are much more stable, so the 2010 results are presented. The 2010 results for all the characteristics are available online at www.dli.mn.gov/RS/StatWSH.asp.

Worker demographic characteristics

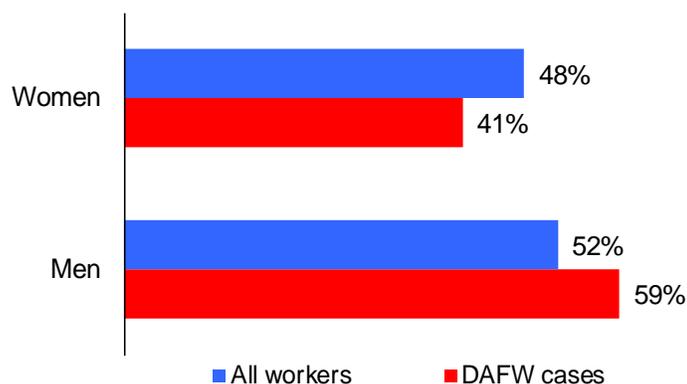
Gender

- The percentage of women among DAFW cases increased from an annual average of 37 percent from 2004 through 2006 to 41 percent during 2008 through 2010 (Figure 4.1). Women comprised 48 percent of Minnesota's employment during each of the years from 2008 through 2010.
- The average DAFW case incidence rates per 10,000 FTE workers¹³ were very similar: 109 cases for men and 102 cases for women.

¹² For employers with a significant number of DAFW cases (more than 15), a sampling scheme is used to select a reduced number of cases. See Appendix B for a variable list.

¹³ Rates for DAFW cases are expressed as cases per 10,000 FTE workers in order to differentiate between values that would be very similar when expressed as cases per 100 FTE workers.

Figure 4.1 Gender of all workers and workers with days-away-from-work cases, 2008-2010



Source: Estimates for gender of all workers from the Current Population Statistics, Geographic Profile of Employment and Unemployment. Bureau of Labor Statistics, www.bls.gov/gps.

Age

- The age distribution of DAFW cases has changed significantly during the past few decades, reflecting the increasing average age of the workforce. During the 2000 to 2010 period, the U.S. labor force decreased by 7 percent for persons with ages between 16 and 24 years, increased by only 2 percent for persons 25 to 54 years, and increased by 61 percent for persons 55 years and older. BLS labor force projections estimate a 12 percent decrease among persons 16 to 24 years old, growth of 2 percent among ages 25 to 54 and growth of 38 percent for people 55 and older between 2010 and 2020.¹⁴
- With the declining DAFW case rate, this means that although there are fewer seriously injured workers, they now tend to be older than those a decade ago.¹⁵
- The age distribution of workers with DAFW cases (Figure 4.2) is very similar to the age distribution of employed workers.¹⁶
- The percentage of workers with DAFW cases who were younger than age 35 decreased from 40 percent in 2000 to 31 percent in 2010, while the percentage of injured workers who were age 55 and older increased from 10 percent to 21 percent (Figure 4.3).
- The estimated incidence rate of DAFW cases during the 2008 through 2010 period was highest for workers 65 and older, at 126 cases per 10,000 FTE workers (Figure 4.4). The lowest rate was for workers 16 to 19 years old (88 cases).
- Except for the youngest workers, the median days away from work increased with age (Figure 4.5, next page). The median for workers between 35 and 44 years old was double the median for workers between 20 and 24 years old, and the median for workers age 65 years and older was nearly double that of the 35 to 44 year olds.

Figure 4.2 Age of workers with days-away-from-work cases, 2008-2010

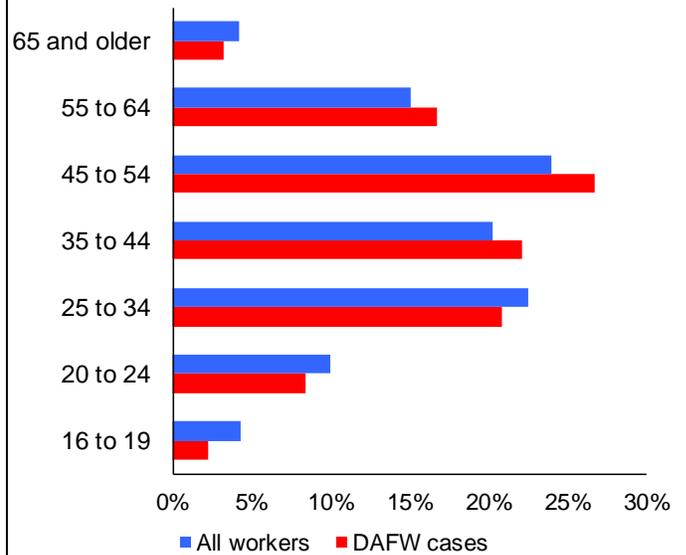


Figure 4.3 Distribution of age of workers with days-away-from-work cases, 2000-2010

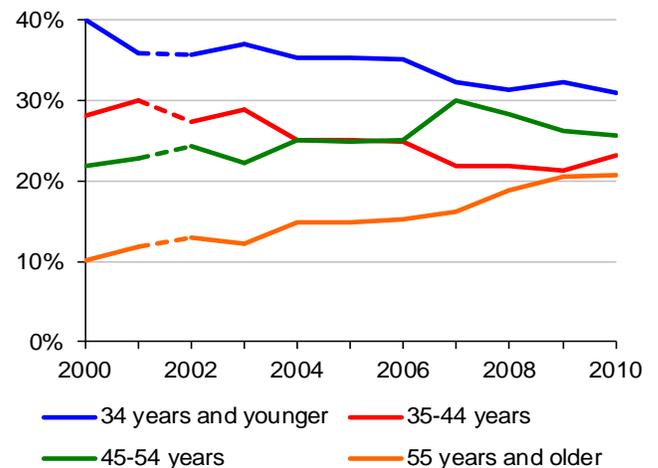
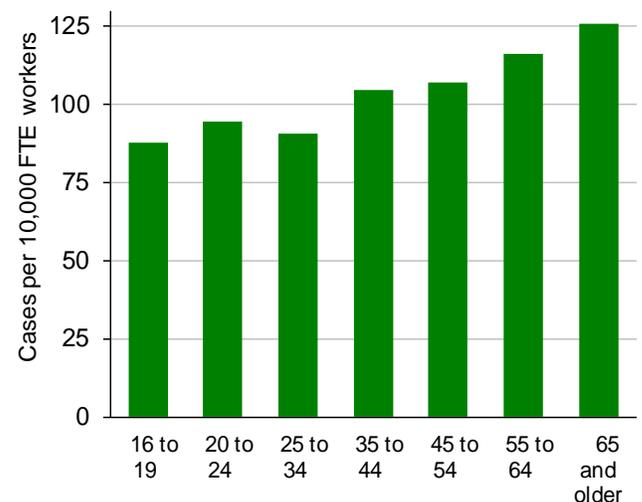


Figure 4.4 Incidence of cases with days away from work by age group, 2008-2010



¹⁴ Employment Projection Program, Bureau of Labor Statistics, U.S Dept. of Labor, www.bls.gov/emp/ep_table_301.htm.

¹⁵ This trend has been analyzed using Minnesota workers' compensation data in "Changing worker demographics lead to changing injury characteristics," COMPACT, February 2005.

¹⁶ Current Population Statistics, Geographic Profile of Employment and Unemployment, 2010. Bureau of Labor Statistics, www.bls.gov/gps.

Race or ethnic origin

Some caution is needed in the analysis of race or ethnic origin, because 33 percent of the survey responses did not include the injured worker’s race or ethnic origin. The survey results reflect the increasing diversity of Minnesota’s workforce.

- Nonwhite and Hispanic workers accounted for an annual average of 16 percent of the cases with a reported race or ethnicity in the 2008 to 2010 period (Figure 4.6), compared to less than 10 percent prior to 1997. The percentage of nonwhite and Hispanic workers among the DAFW cases has remained near 15 percent since 2003 (Figure 4.7). Minnesota’s nonwhite and Hispanic employment was estimated at 13 percent of total employment for 2010.¹⁷
- While the overall number of reported nonwhite/nonHispanic workers with DAFW cases decreased by 35 percent from 2003 to 2010, the number of injured workers identified as Asian has remained very constant. The number of Asian workers with one or more days away from work averaged 250 cases for 2003 through 2005 and averaged 260 cases for 2008 through 2010.

Figure 4.5 Median days away from work by age group, private ownership, 2008-2010

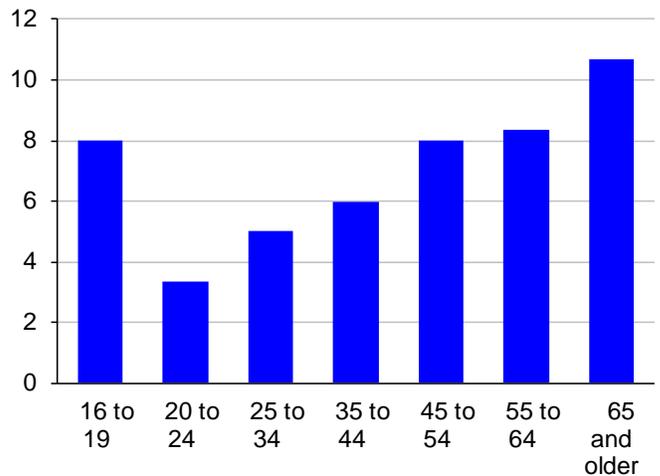


Figure 4.6 Race or ethnic origin of workers with days-away-from-work cases, 2008-2010

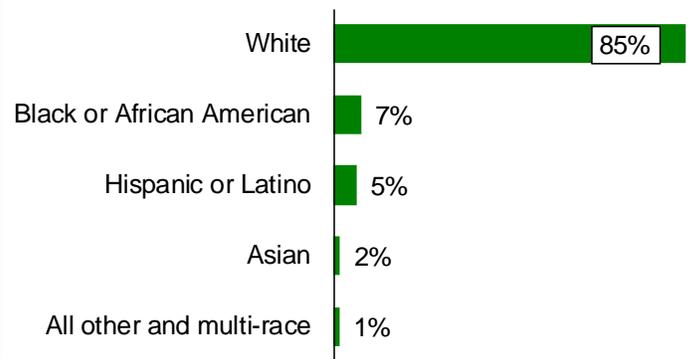
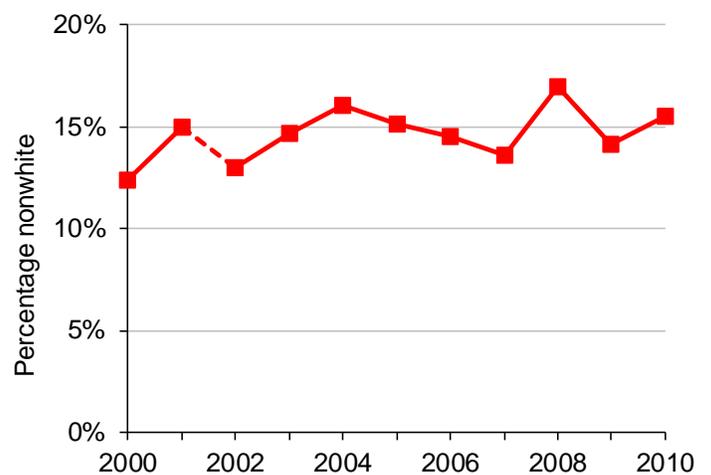


Figure 4.7 Percentage of nonwhite and Hispanic workers among days-away-from-work cases, 2000-2010



¹⁷ U.S. Census Bureau, 2010 American Community Survey. Retrieved from American Factfinder: factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

Job characteristics

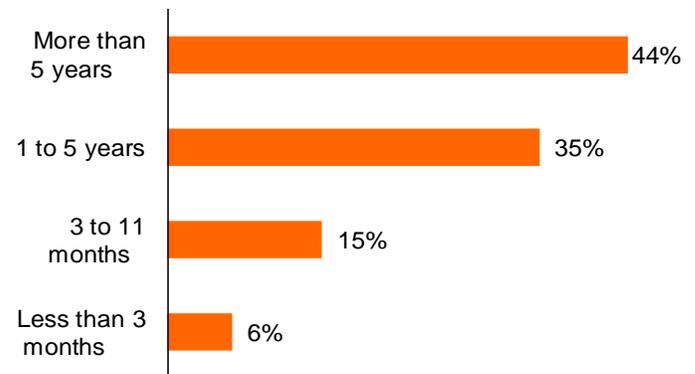
Job tenure

A worker's length of service with an employer is a general measure of the worker's attainment of job skills. Workers with short job tenures include new entrants to the workforce, those who lost jobs but found new jobs during the previous year and workers who had voluntarily changed employers during the previous year.

Young workers usually have shorter job tenure than older workers. The general increase in worker age during the past decade has been accompanied by an increase in average job tenure of injured workers.

- As shown in Figure 4.8, workers with less than one year of service with their employer accounted for an annual average of 21 percent of the DAFW cases during 2008 through 2010. This percentage was below the 27 percent annual average reported from 2005 through 2007.
- According to the *Current Population Survey* statistics for January 2010¹⁸, the median job tenure for the United States increased from 4.1 years in 2008 to 4.4 years in 2010, reflecting large job losses among less-senior workers during the recent recession. The national proportion of wage-and-salary workers with a year or less of tenure with their current employer was 19 percent in 2009 (down from 23 percent in 2008), while 32 percent had from one to five years of job tenure and 49 percent had more than five years.

Figure 4.8 Length of service of workers with days-away-from-work cases, 2008-2010



¹⁸ News release, Bureau of Labor Statistics, *Employee tenure in 2010*, Sept. 14, 2010. State-level job tenure statistics are not published.

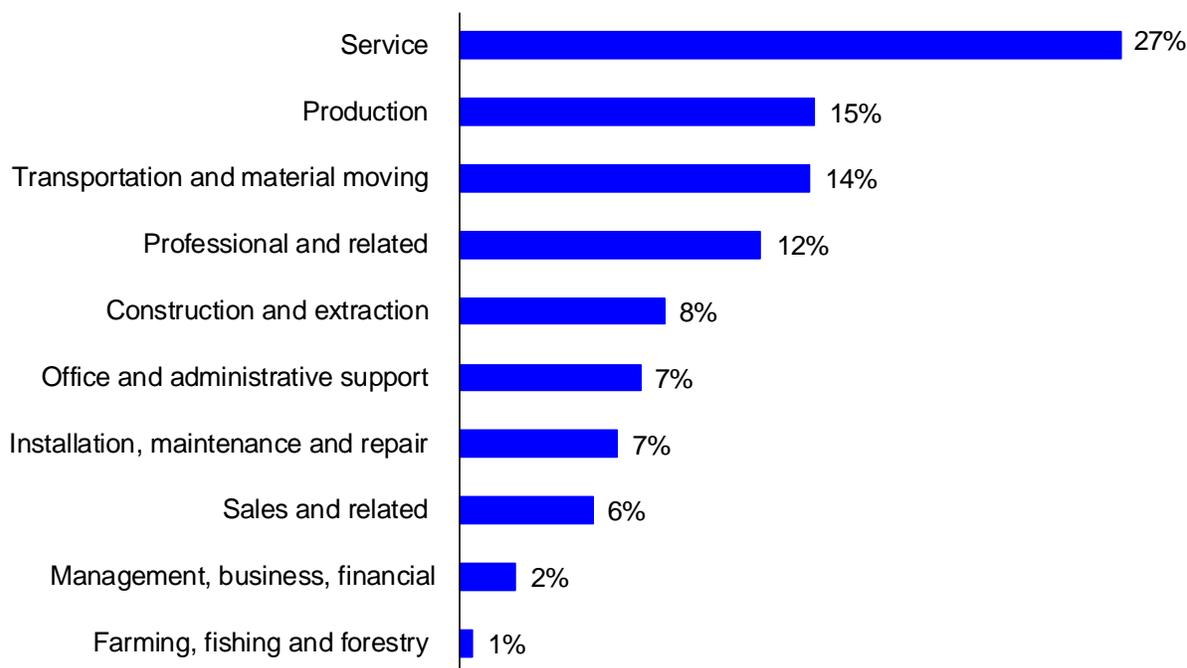
Occupation

Occupation describes a set of characteristics based on the job duties, skills, education or experience needed to accomplish work tasks. Some occupations are concentrated in certain industries, such as nursing aides working in the hospital and nursing home industries. However, many other occupations, such as management, sales and office support, are found in a wide range of industries.¹⁹ Workers in the same or similar occupations often encounter similar work conditions, which affect their safety and health.

Occupation is examined by the distribution of cases by broad occupation category among all workers in Figure 4.9,²⁰ by incidence rates among major occupation groups in privately owned establishments in Figure 4.10 and by the number of cases in detailed occupations in Figure 4.11. A few broad occupation categories are the same as major groups.

- Service occupations, which include nursing aides, law enforcement workers, cooks and building maintenance workers, accounted for an average of 27 percent of the DAFW cases from 2008 through 2010.
- Production occupations, the second-largest occupation group among DAFW cases, include assemblers, food processing workers and woodworkers.
- Transportation and material moving occupations, which includes truck drivers and delivery people, airline workers and unskilled, nonconstruction manual laborers, had the third-highest percentage of cases.
- The professional and related occupations group includes engineers, attorneys, teachers and healthcare practitioners, and was the fourth most common occupation category among DAFW cases.

Figure 4.9 Occupation of workers with days-away-from-work cases, 2008-2010



¹⁹ The 2009 Minnesota occupational staffing matrix, showing occupations by industry, is available at www.positivelyminnesota.com/Data_Publications/Data/Wages,_Benefits,_Careers/Occupational_Staffing_Patterns.aspx.

²⁰ In previous *Workplace Safety Reports*, Figure 4.9 showed the case distribution only among privately owned establishments.

The differences in occupations in major occupation groups for workers in privately owned establishments are revealed by the rate of DAFW cases per 10,000 FTE workers, shown in Figure 4.10. The distribution shows large differences between sets of occupations.

- The incidence rates for the major occupation groups generally follow the degree to which the occupations require physical exertion and exposure to job hazards.
- Among the injured workers in building and grounds cleaning and maintenance, 50 percent were identified as Hispanic or nonwhite workers, and 27 percent were age 55 or older.

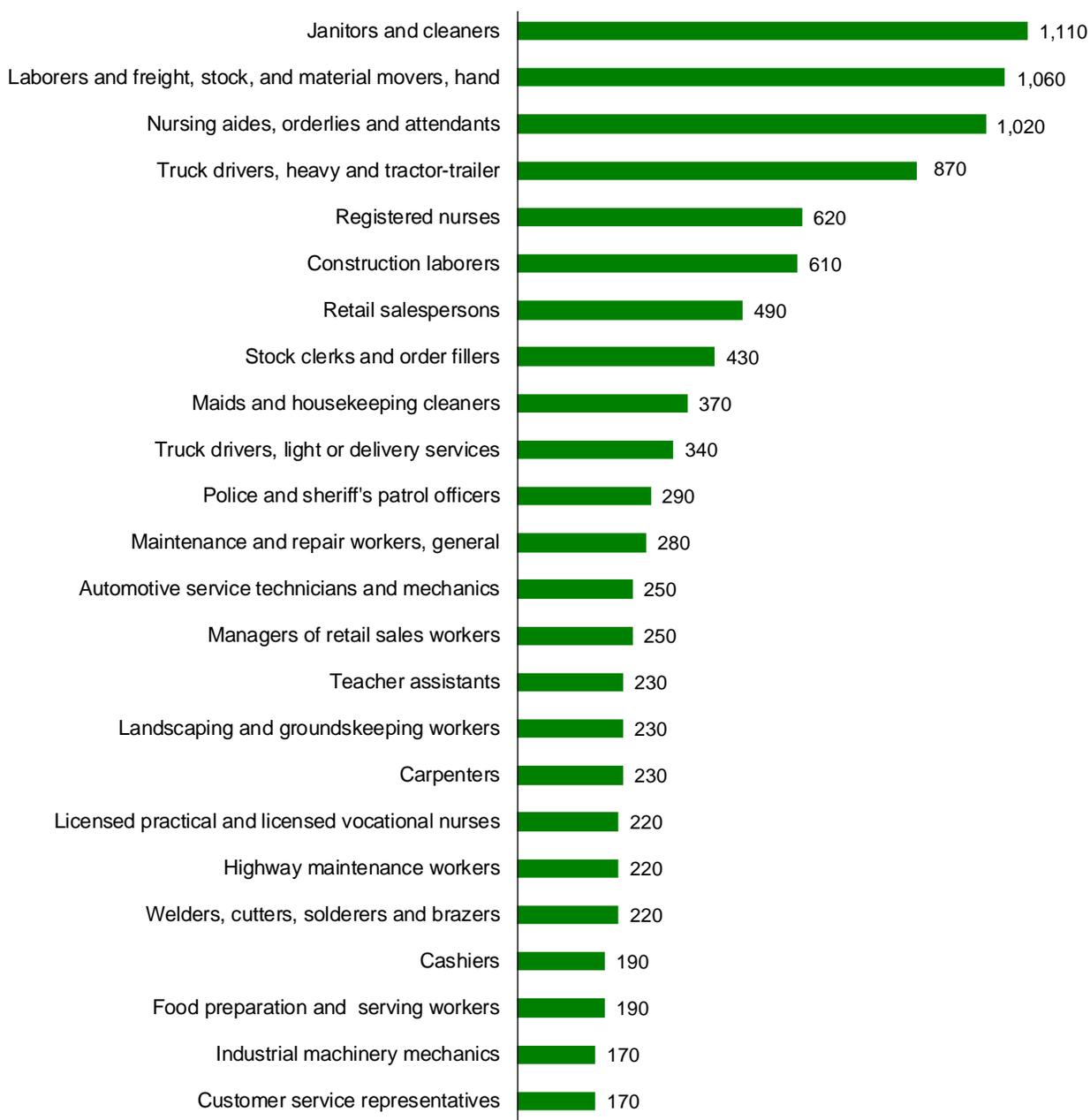
Figure 4.10 Average annual incidence rates of days-away-from-work cases by major occupation group, per 10,000 FTE workers, private sector, 2008-2010



The detailed occupations with an estimated annual average of 170 or more DAFW cases across all ownership types during the 2008 through 2010 period are shown in Figure 4.11. The four specific occupations with at least 800 DAFW cases accounted for 4,440 cases, 19 percent of the estimated annual average number of cases.

- The three healthcare-related occupations on the list — nursing aides, orderlies and attendants, registered nurses and licensed practical and licensed vocational nurses — accounted for an annual average of nearly 1,870 cases, 8 percent of the total annual average.

Figure 4.11 Specific occupations with the highest annual average number of cases, 2008-2010



Injury and illness characteristics

Each DAFW case is characterized by the nature of the injury or illness, the part of the body affected, the event or exposure leading to the injury or illness and the source of the injury or illness.²¹ Additional measures of injury and illness events are the time of day, time on the job and day of the week the injury occurred or illness began.

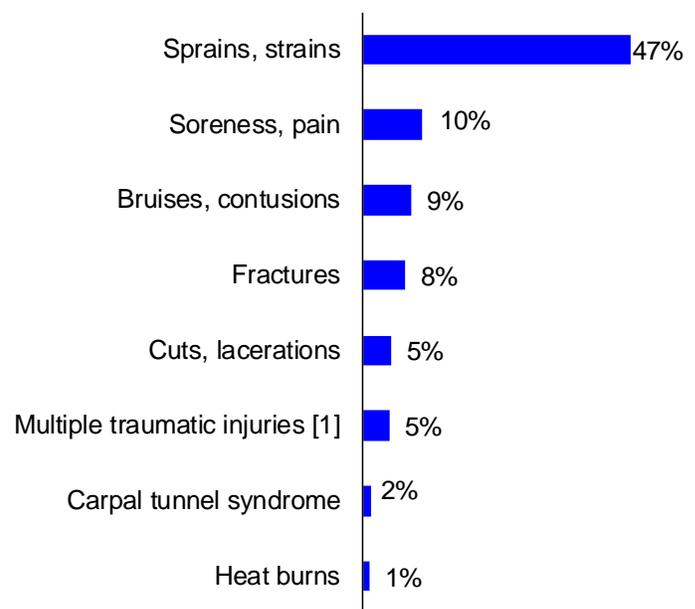
As an example of how these characteristics combine to describe injuries and illnesses, consider a retail store clerk who sprains her back while lifting a box of merchandise. The nature of the injury is a sprain or strain; the part of the body affected is her back; the event is overexertion while lifting; and the injury source is a box (a container).

Nature of injury or illness

The nature of injury or illness identifies the principal physical characteristic(s) of the injury or illness.

- Sprains and strains of muscles, tendons and joints accounted for 47 percent of the DAFW cases (Figure 4.12), compared to 42 percent estimated for 2009. (These include multiple injuries that mention sprains.) The number of sprain and strain cases has dropped by 27 percent since 2003, from an estimated 13,800 cases to 10,050 cases in 2010.
- Sprains and strains occurred primarily to the back (44 percent), knees (11 percent) and shoulders (11 percent).
- Sprains and strains occurred most often from overexertion (55 percent) and falls on the same level (11 percent). Lifting health care patients accounted for 12 percent of the sprains and strains.

Figure 4.12 Nature of injury, 2010



1. Includes some cases with fractures and sprains also counted in other categories.

²¹ Injury characteristics are coded according to the *Occupational injury and illness classification system manual*, www.bls.gov/iif/oshoiics.htm.

Part of body

The part of the body affected identifies the part directly affected by injury or illness.

- Although the back is injured more often than other body parts among cases with days away from work (Figure 4.13), the percentage has decreased from about 30 percent of the cases during most of the 1990s to 26 percent in 2010.
- The estimated number of cases with back injuries has decreased substantially in recent years, from 7,750 cases in 2003 to 5,650 cases in 2010, a 27 percent decline.
- As shown in Figure 4.14, for workers 16 to 44 years old, the percentages of DAFW cases with back injuries were above the overall percentage (25 percent) and, for workers age 45 and older, the percentages were below the overall percentage.
- The most common injuries to multiple body parts were sprains and strains and multiple traumatic injuries. Multiple-body-part injuries occurred most often as a result of falls, overexertion and transportation accidents.
- Women accounted for 59 percent of the workers with injuries to multiple body parts.

Figure 4.13 Part of body injured, 2010

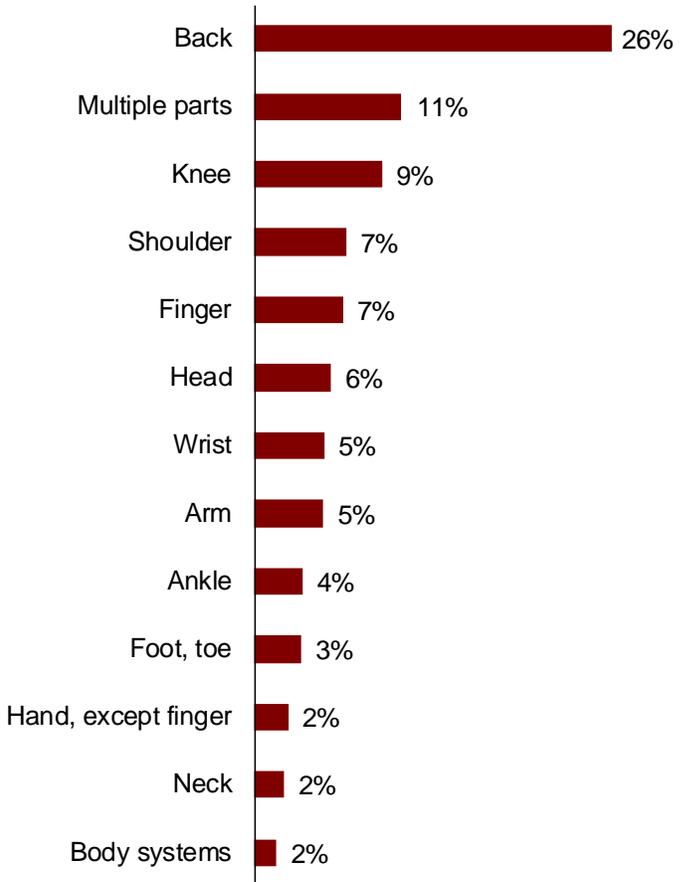
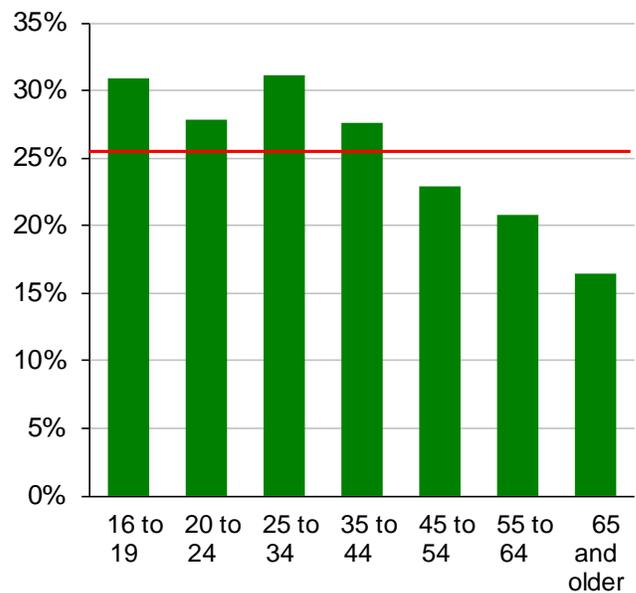


Figure 4.14 Percentage of cases with back injuries within each age group, 2008-2010



Event or exposure

The event or exposure describes the manner in which the injury or illness was produced or inflicted by the source.

- The three most common events (see Figure 4.15) were also in the same order and with nearly the same percentages in 2008 and 2009. The three most common event types accounted for 41 percent of all the DAFW cases in 2010, the same as in 2009.
- Women accounted for 59 percent of the falls on the same level.
- Falls on the same level most often resulted in sprains and strains, fractures and bruises, and the most common body parts injured were multiple parts and the knees.
- Injuries due to overexertion in lifting usually resulted in back strains or back pain. The median duration for cases with overexertion in lifting was four days, compared to a median of five days for all DAFW cases.
- Containers and health care patients were the most frequently reported objects being lifted.

Source of injury or illness

The source of injury or illness identifies the object, substance, bodily motion or exposure that directly produced or inflicted the injury or illness.

- The three most common injury sources remained unchanged from 2009 (see Figure 4.16), although the order of the categories changed. These three sources of injury accounted for 48 percent of all DAFW cases.
- Floors, walkways and ground surfaces was the most common source-of-injury category for six of the past seven years, except for 2007. This source category is usually coded for injuries due to falls. The new coding system being used for 2011 cases will identify the object or location that the worker fell from instead of the surface struck at the end of the fall.

Figure 4.15 Event or exposure, 2010

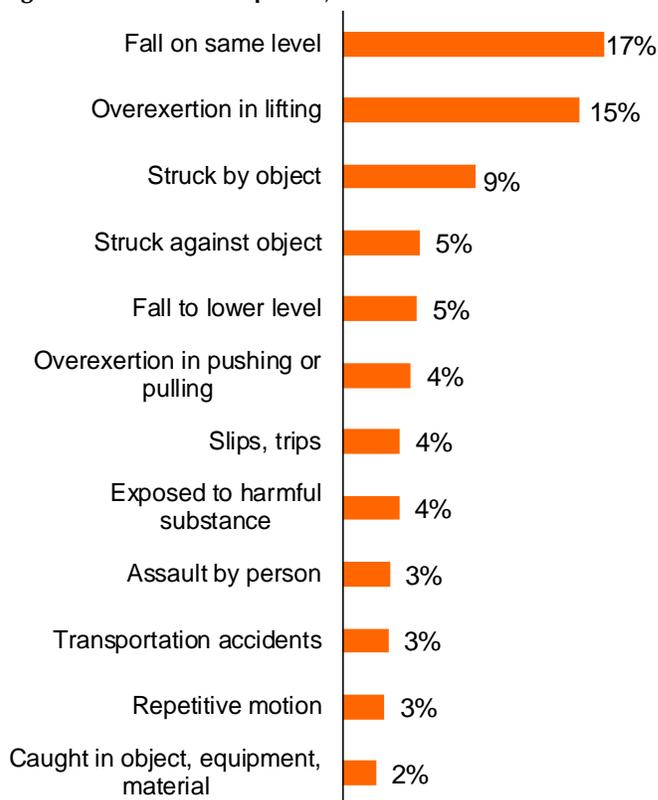
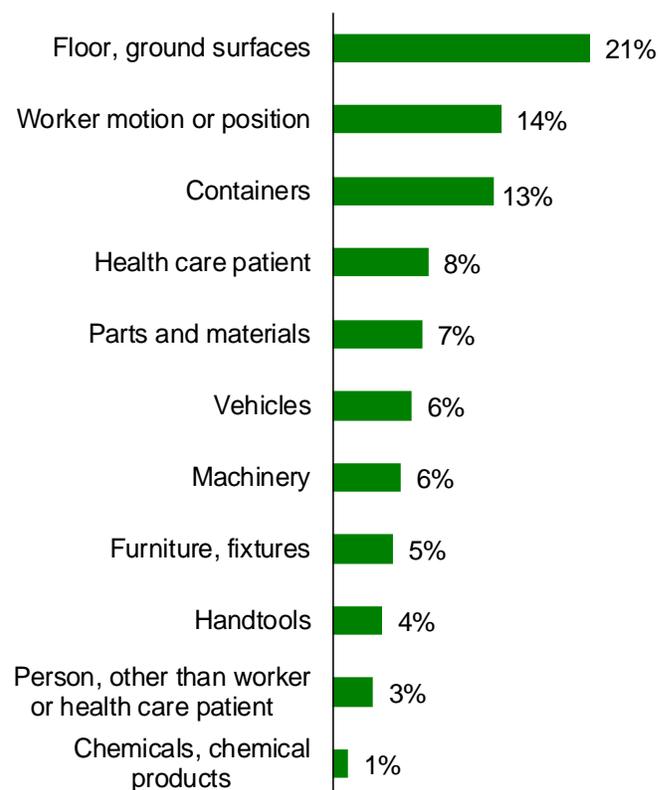


Figure 4.16 Source of injury or illness, 2010



Musculoskeletal disorders

BLS uses the reported injury characteristics to produce an estimate of the number of cases with musculoskeletal disorders (MSDs) among the DAFW cases. Although employers do not directly identify MSDs on the OSHA log, information about the injured body part and the event or exposure is combined to produce this estimate. BLS defines MSDs as disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs that **are not caused** by slips, trips, falls, motor-vehicle accidents or other similar accidents. Because of the recordkeeping changes in 2002 that directly addressed MSD issues (see Appendix A), differences between pre- and post-2002 statistics may be the result of a combination of changes in job safety and the effects of the recordkeeping changes.

- Figure 4.17 shows the estimated number of MSD and non-MSD cases from 2000 to 2010. The number of DAFW cases with MSDs in Minnesota has decreased 39 percent since 2002, reaching a low of 7,620 cases in 2009. During this period, non-MSD cases decreased by 34 percent.
- MSD cases accounted for 38 percent of the DAFW cases in 2010, the highest percentage since 2005.
- The three private-ownership industries with the highest numbers of MSD cases are health care and social assistance, manufacturing and retail trade. These three industries accounted for 59 percent of the MSD cases.

- MSD injuries accounted for 62 percent of the DAFW cases in utilities and for 49 percent of the cases in private-sector health care.
- Among privately owned establishments, the MSD incidence rate decreased from 56 cases per 10,000 FTE workers in 2004 to 42 cases in 2010, a 26 percent drop.
- MSD injuries had a median of seven days away from work, compared to a median of five days for all DAFW cases.

Figure 4.18 shows some demographic characteristics of workers with MSD injuries.

- The number of cases, the percentage of MSD cases among all DAFW cases and the incidence of MSD cases generally increased with age until peaking in the 45- to 54-years age group.
- MSD injuries were least common among workers with less than three months of job tenure.
- Among occupations, MSD cases accounted for 45 percent of the cases among office and administrative support workers. In contrast, only 23 percent of the DAFW case injuries to management, business and financial workers were due to MSDs.

Figure 4.17 Number of days-away-from-work cases with and without musculoskeletal disorders, 2000-2010

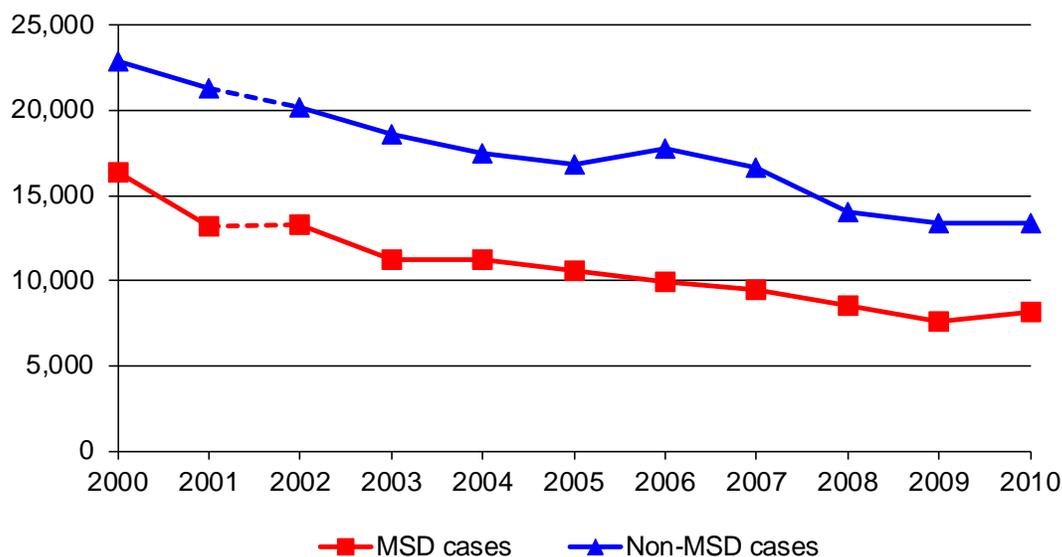


Figure 4.18 Distribution and incidence of MSD cases by worker characteristics, average of 2009 and 2010

Characteristic	Number of DAFW cases	Number of MSD cases	Percentage MSD among cases in row	Incidence rate per 10,000 FTE workers
Total	21,210	7,870	37%	39
Gender				
Male	12,060	4,420	37%	40
Female	9,070	3,440	38%	38
Age				
16 to 19 years	350	130	36%	28
20 to 24 years	1,830	690	38%	38
25 to 34 years	4,490	1,780	40%	37
35 to 44 years	4,710	1,740	37%	41
45 to 54 years	5,460	2,180	40%	44
55 to 64 years	3,560	1,220	34%	40
65 years and older	790	140	19%	25
Length of service with employer				
Less than 3 months	1,130	340	30%	
3 months to 11 months	2,680	970	36%	
1 year to 5 years	7,850	3,100	40%	
More than 5 years	9,460	3,450	36%	
Occupation category				
Management, business, financial	490	120	23%	
Professional and related	2,970	1,040	35%	
Service	6,280	2,430	39%	
Sales and related	1,150	390	34%	
Office and administrative support	1,510	680	45%	
Farming, fishing and forestry	110	40	37%	
Construction and extraction	1,720	480	28%	
Installation, maintenance, repair	1,440	560	39%	
Production	2,800	1,090	39%	
Transportation and material moving	2,730	1,060	39%	

5

Fatal occupational injuries

In 2010, 70 Minnesota workers were fatally injured on the job. This is an increase from the 61 fatalities in 2009. Nationwide, 4,690 workers were fatally injured during 2010 (preliminary total), above the 2009 total of 4,551.

These and other findings are from the nationwide Census of Fatal Occupational Injuries (CFOI), conducted by the BLS with state and other federal agencies. The Department of Labor and Industry collects CFOI data for the state of Minnesota.

The CFOI covers all fatal work injuries, whether the workplaces concerned are covered by the Occupational Safety and Health Act or other federal or state laws, or are outside the scope of regulatory coverage. It includes self-employed and unpaid family workers, including family farm workers, and federal government employees. Work-related fatal illnesses (e.g., asbestosis, silicosis and lead poisoning) are excluded from the CFOI because many occupational illnesses have long latency periods and are difficult to link to work.

The CFOI provides a complete count of fatal work injuries by using multiple sources to identify, verify and profile these incidents. The sources include death certificates, coroners reports, workers' compensation reports and news media reports.

Counting fatalities

The CFOI count of work-related fatalities differs in important ways from other workplace fatality statistics. The CFOI is a count of all work-related deaths caused by injuries and excludes deaths caused by illnesses. Fatalities to all workers, including self-employed workers, are tabulated in the state where they occurred. Thus, a truck driver from Minnesota who works for a Minnesota trucking company but is killed in an accident in Iowa would be counted as an Iowa CFOI fatality.

By contrast, the workers' compensation count of fatality claims includes fatalities caused by injuries and by illnesses, but only includes workers covered by a Minnesota workers' compensation insurance policy. Self-employed workers are not included. A Minnesota truck driver killed in another state would be included in the Minnesota workers' compensation fatality count if Minnesota workers' compensation benefits were paid. For 2010, there is a preliminary count of 36 workers' compensation fatality claims due to injury and illness, below the 2009 count of 45 fatalities.²²

MNOSHA investigates all employee deaths that are under its jurisdiction and result from an accident or illness caused by or related to a workplace hazard. Not included are fatalities caused by traffic accidents (investigated by the Minnesota Department of Public Safety), airplane crashes (National Transportation Safety Board), mining accidents (Mine Safety and Health Administration), federal workers (federal OSHA), railroad workers (Federal Railroad Administration), farm accidents and accidents to the self-employed (investigation agency depends on type of accident).

MNOSHA investigates fatalities to determine cause, whether any MNOSHA standards were violated and whether additional standards might help prevent similar incidents. The MNOSHA-investigated fatalities are shown in Figure 6.3.

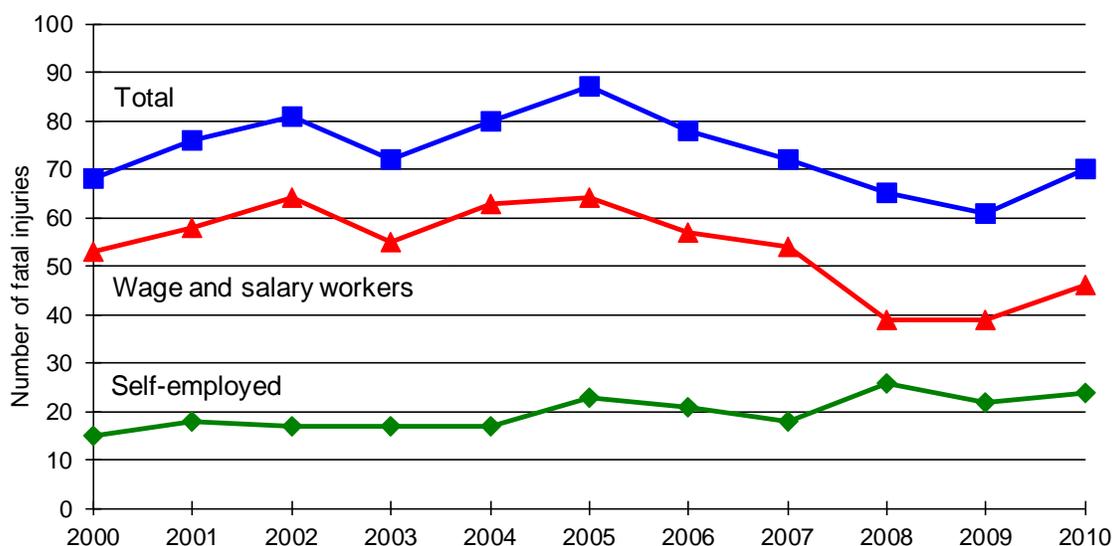
In 2010, MNOSHA investigated 15 fatality events and in 2011, MNOSHA investigated 23 fatality events. The five-year average, from 2007 to 2011, was 19 fatality event investigations a year. There were three construction fatality investigations each year in 2008, 2009 and 2010, and seven investigations in 2011.

²² The number of fatality claims receiving workers' compensation benefits changes as claims are resolved. The 2010 and 2009 fatality counts are current as of June 27, 2012.

Number of fatal injuries

- Minnesota’s number of fatal work injuries had varied from 61 to 87 a year from 2000 through 2010 (Figure 5.1), with the lowest number in 2009. The number of fatalities in 2010 was above the count for 2009, but below the annual average of 73 fatalities for the 2005 to 2009 period.
- For wage-and-salary workers, the annual fatality toll ranged from 39 to 64, with the lowest counts in 2008 and 2009.
- For self-employed workers, the annual fatality figure ranged between 15 and 26 fatalities, with the highest number in 2008.
- The fatality toll for 2006 through 2010 was 346 workers, with a five-year average of 69 fatalities a year. This consisted of 47 wage-and-salary workers and 22 self-employed workers.
- Fatal injuries for the self-employed were 34 percent of the 2010 total, far higher than the estimated 14 percent self-employed share of total state employment in 2009.²³

Figure 5.1 Fatal work injuries, 2000-2010¹



¹ Includes private sector plus local, state and federal government (including resident armed forces). Includes self-employed and unpaid family workers, including family farm workers. Excludes fatal illnesses.

Year of death	Wage & salary workers	Self-employed	Total
2000	53	15	68
2006	57	21	78
2007	54	18	72
2008	39	26	65
2009	39	22	61
2010	46	24	70
Avg. 2006-2010	47.0	22.2	69.2

²³ Based on Nonemployer Statistics Program, U.S. Census Bureau, and the Quarterly Census of Employment and Wages, Minnesota Dept. of Employment and Economic Development.

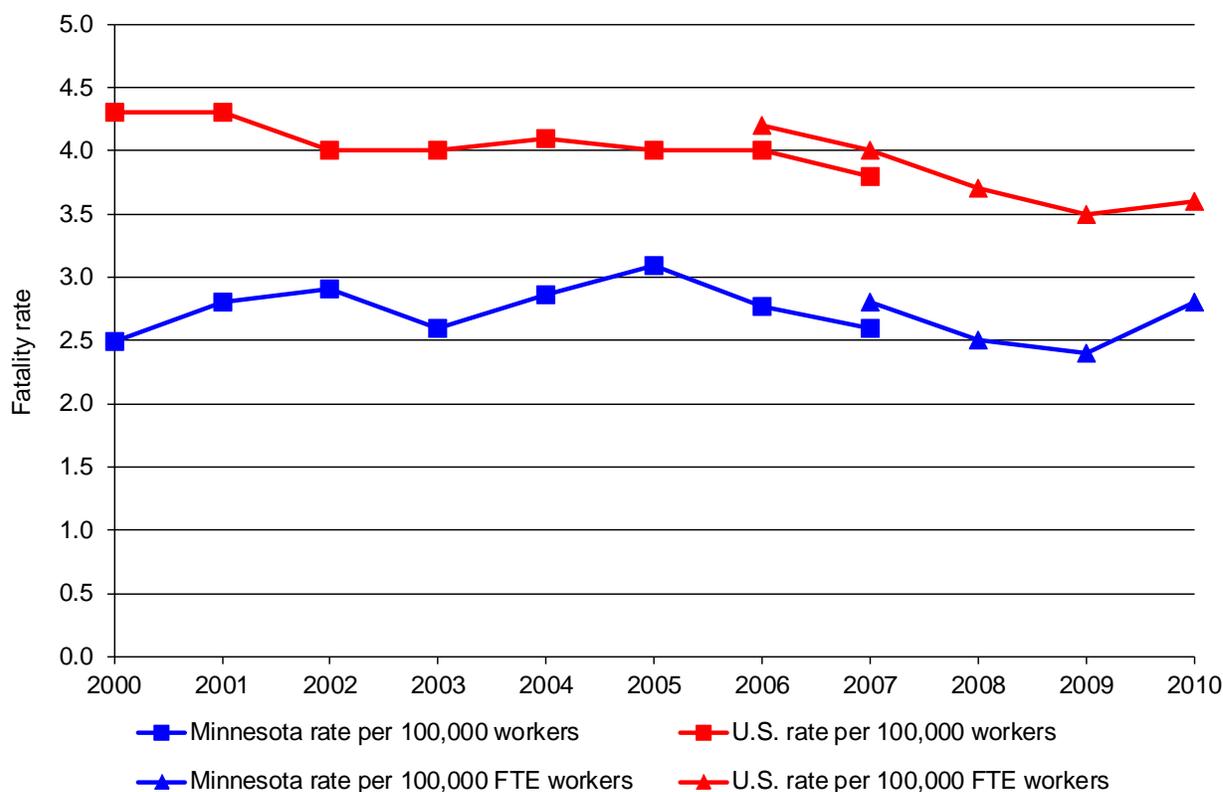
Rate of fatal injuries

Prior to the 2006 results, national and state fatality rates were calculated only as the rate per 100,000 workers. BLS began calculating the rates based on 100,000 full-time equivalent (FTE) workers for the national rate for 2006 and for the states beginning in 2007. The FTE-based rate is considered a more accurate measure of workplace exposure to hazards.

The fatality rates of Minnesota and the U.S. are not directly comparable because of differences in the proportions and types of industries in the state and the nation as a whole.

- Figure 5.2 shows the Minnesota and United States fatality rates per 100,000 FTE workers since 2007. The 2010 fatality rate for Minnesota was 2.8 deaths per 100,000 FTE workers.
- For the entire United States, the fatality rate for 2010 was 3.6 deaths per 100,000 FTE workers, slightly above the 3.5 rate for 2009. The rate was 3.0 for wage and salary workers and 12.6 for self-employed workers.

Figure 5.2 Fatal work injuries per 100,000 FTE workers,¹ Minn. and U.S., 2000-2010



Fatality rates per 100,000 FTE workers

	Minnesota	U.S.
2007	2.8	4.0
2008	2.5	3.7
2009	2.4	3.5
2010	2.8	3.6

1. Excludes workers younger than age 16 or in the military.

Fatalities by metropolitan area

The CFOI program produces fatality counts for metropolitan areas, including those that cross state boundaries. The number of fatalities within metropolitan areas is strongly influenced by the types of industries and occupations in each area. This is one reason why the Minneapolis-St. Paul-Bloomington metropolitan area, with a

61 percent higher population than the Kansas City metropolitan area, had 25 percent fewer fatalities during the 2003-2010 period.

Because there are relatively low annual numbers of fatalities in some of the metropolitan areas, Figure 5.3 shows the combined fatalities by metropolitan area for 2003 through 2010.

Figure 5.3 Number of fatal work injuries for metropolitan areas, 2003-2010

Metropolitan area	Counties	Fatalities
Duluth, MN-WI	MN — Carlton, St. Louis; WI — Douglas	40
Fargo, ND-MN	ND — Cass; MN — Clay	26
Grand Forks, ND-MN	ND — Grand Forks; MN — Polk	25
La Crosse, WI-MN	WI — La Crosse; MN — Houston	24
Minneapolis-St. Paul-Bloomington, MN-WI	MN — Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, Wright; WI — Pierce, St. Croix	211
Rochester, MN	MN — Dodge, Olmsted, Wabasha	32
St. Cloud, MN	MN — Benton, Stearns	27

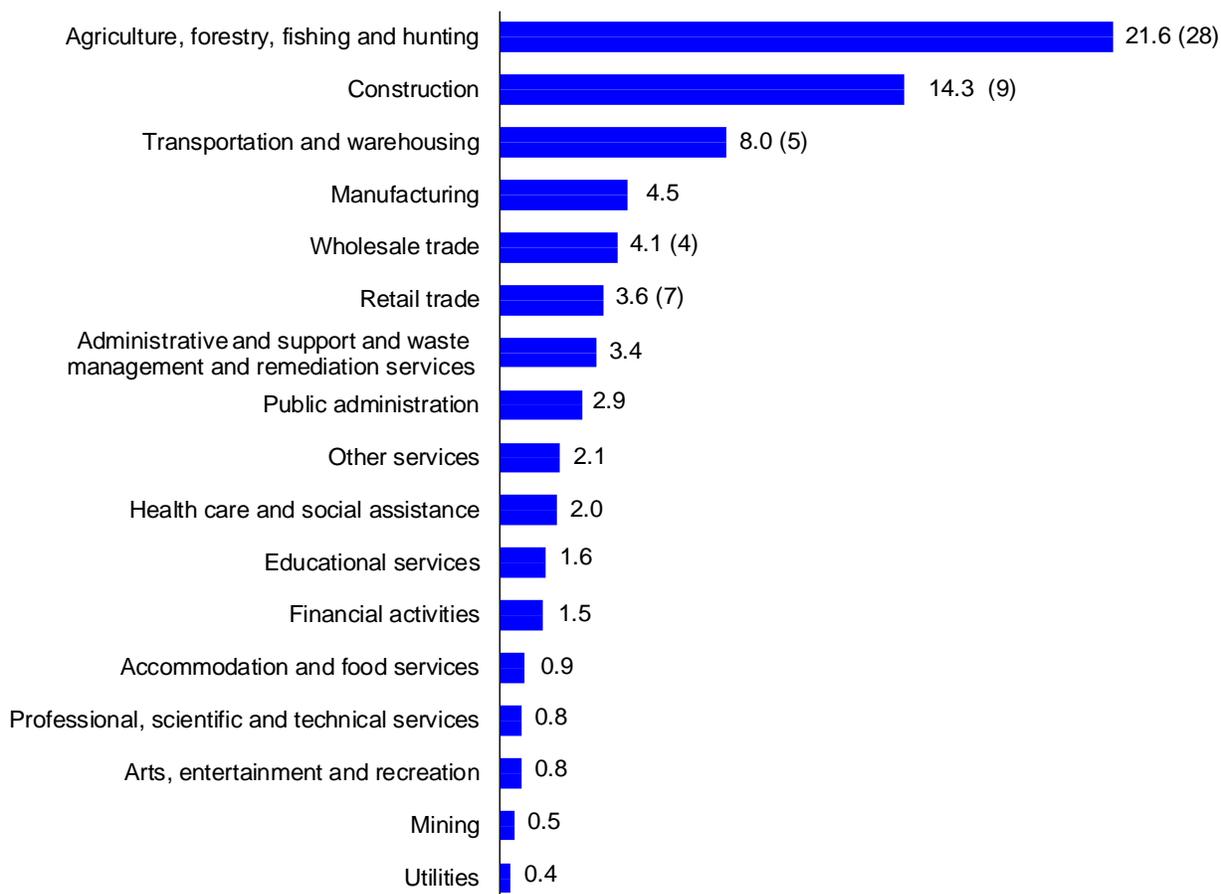
Fatalities by industry sector

Figure 5.4 shows the average number of Minnesota’s fatal work injuries by industry sector for 2003 through 2010. The number of fatal work injuries for 2010 are shown in the parentheses next to some industries.

- The highest number of fatal injuries was in agriculture, forestry, fishing and hunting, with 173 fatalities, an annual average of 21.6 fatalities. This sector also had the highest number of fatalities in 2010 (28 fatalities), an increase from 20 fatalities recorded in 2009 and 25 fatalities in 2008. During the eight-year period, agricultural crop production accounted for 66 percent of the fatalities in this sector, animal production accounted for 26 percent, and forestry and logging accounted for 6 percent. Contact with objects and equipment and transportation accidents were the most common events resulting in these fatalities.

- Construction has the second-highest annual average number of fatalities. The total of nine fatalities reported in 2010, the same as in 2009, was the lowest ever reported in the CFOI for construction. The most common events causing construction fatalities were transportation incidents, contact with objects and equipment, and falls.
- Transportation and warehousing, the third-highest fatality industry sector, had five fatalities in 2010, its lowest total since 2004. The most-common event causing these fatalities was highway transportation accidents.
- Manufacturing had an average of 4.5 fatalities a year from 2003 through 2010. The most common events leading to manufacturing fatalities were contact with objects and equipment and transportation accidents.

Figure 5.4 Average annual number of fatal work injuries by industry sector, 2003-2010 (2010 fatalities shown in parentheses)



Characteristics of fatal injury events

Fatal occupational injuries are described by the type of event causing the fatality, the source of the fatal injury, and the worker's location and activity. Figure 5.5 shows the event or exposure causing fatal work injuries in Minnesota during 2010 and for the 2003 through 2010 period.

- The distribution of events in 2010 was fairly typical compared to the distribution in the eight-year period. The largest difference was the high number of fatalities due to assaults and violent acts in 2010. There were 13 such fatalities in 2010 compared to an annual average of nine.
- The most common event causing fatal injuries in 2010 and for the entire period was transportation accidents, accounting for 37 percent of all fatal work injuries in 2010. These consisted mainly of highway accidents (motor vehicles traveling on roads) and nonhighway accidents (motor vehicles on farm and industrial premises).
- The second most frequent cause of fatalities was contact with objects and equipment. These cases included workers being struck by an object, caught in or compressed by equipment or objects, such as running machinery, and being crushed by collapsing materials.

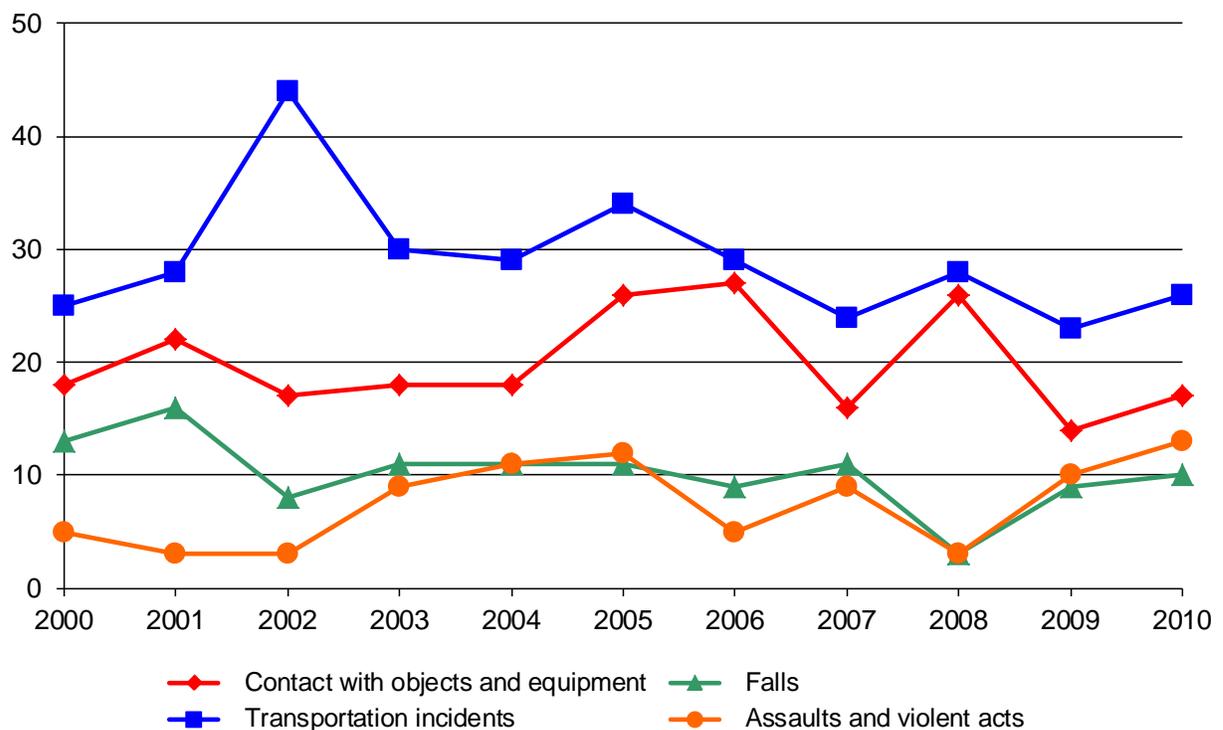
Figure 5.5 Event or exposure causing fatal work injury, 2010 and 2003-2010

Event or exposure	2010		2003-2010	
	Number of fatalities	Percentage of fatalities	Number of fatalities	Percentage of fatalities
Total	70	100.0%	585	100.0%
Transportation accidents	26	37.1%	223	38.1%
Highway accident	15	21.4%	115	19.7%
Collision between vehicles, mobile equipment	7	10.0%	56	9.6%
Noncollision accident	7	10.0%	46	7.9%
Nonhighway accident, except rail, air, water	8	11.4%	55	9.4%
Noncollision accident	7	10.0%	43	7.4%
Pedestrian, nonpassenger struck by vehicle, mobile equipment	--	--	26	4.4%
Contact with objects and equipment	17	24.3%	162	27.7%
Struck by object	8	11.4%	82	14.0%
Struck by falling object	6	8.6%	64	10.9%
Caught in or compressed by equipment or objects	3	4.3%	42	7.2%
Caught in running equipment or machinery	--	--	25	4.3%
Caught in or crushed in collapsing materials	6	8.6%	38	6.5%
Falls	10	14.3%	75	12.8%
Fall to lower level	7	10.0%	64	10.9%
Assaults and violent acts	13	18.6%	72	12.3%
Assaults and violent acts by person(s)	6	8.6%	36	6.2%
Self-inflicted injuries	5	7.1%	22	3.8%
Exposure to harmful substances or environments	4	5.7%	35	6.0%
Contact with electric current	--	--	14	2.4%
Fires and explosions	--	--	17	2.9%

"--" means the number of fatalities did not meet CFOI publication thresholds.

- There were 13 fatalities due to assaults and violent acts in 2010, the highest number of these fatalities since 1993.
- Figure 5.6 shows the trend in the numbers of fatalities among the major event categories. The relative order of the events has remained consistent, with assaults and falls having similar counts.
- The number of fatalities due to transportation incidents has been generally decreasing since 2002, with decreases in five of the past eight years.

Figure 5.6 Number of fatal occupational injury events, 2000-2010



Characteristics of fatally injured workers

Figures 5.7 through 5.10 show the distributions of demographic characteristics and occupations of fatally injured workers.

The characteristics with distributions displayed in bar charts are based on the 585 fatality cases from 2003 through 2010. Using this multi-year data provides a more stable indicator of the characteristics displayed. Because of the low annual number of fatalities, some characteristics with few cases may show large year-to-year changes that are not indicative of long-term trends. For categories with larger numbers of cases, the percentages have remained fairly stable during this time period. The 2010 results do not show important differences from these multi-year results.

Gender

- Men accounted for 91 percent of fatally injured workers in 2010 and for 92 percent of the fatalities from 2003 through 2010. The percentage of men among fatally-injured workers remains at 92 percent for 2003 through 2010 even after excluding fatalities to farmers and ranchers, who accounted for 71 percent of fatalities to self-employed workers.

Age

- Fatally injured workers had a wide age distribution, with the greatest numbers among workers 35 to 44 and 45 to 54 years of age.
- The age of fatally injured workers has been gradually increasing, matching the aging of the entire workforce. The percentage of fatalities to workers 45 years and older increased from 47 percent during the 1992 to 1996 period, to 51 percent during the 1998 to 2002 period, and to 57 percent during the 2003 to 2010 period.

Figure 5.7 Men as percentage of fatally injured workers, 2000-2010

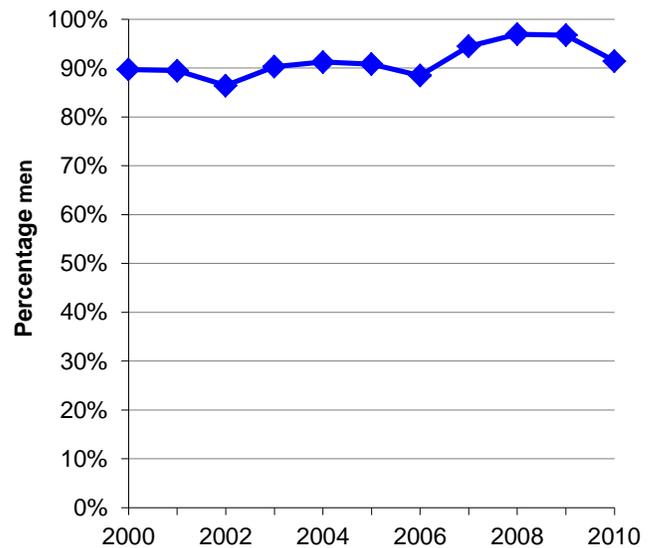
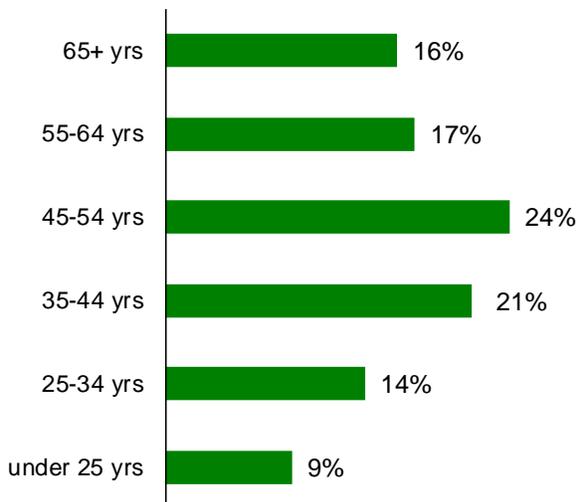


Figure 5.8 Age of fatally injured workers, 2003-2010



Race

- Non-Hispanic white workers accounted for 87 percent of the fatalities in 2010 and for 87 percent of all workers.²⁴
- Since 2000, the percentage of fatalities to nonwhite and to Hispanic workers has ranged from 0 percent to 13 percent, with considerable annual variation. The 2010 percentage matches the previous high percentage set in 2000.

Occupation

- Fatally injured workers were concentrated in the occupation groups of farmers and ranchers, truck drivers and construction trades workers.
- Farmers, ranchers and agriculture-related occupations together accounted for 26 percent of the fatalities from 2003 through 2010.
- Among farmers and ranchers, 36 percent were due to transportation accidents, with two-thirds of these due to non-highway incidents, such as an overturned tractor.
- Among the heavy and tractor-trailer truck drivers, 72 percent of the fatalities were due to transportation accidents.
- Thirty-two percent of the fatalities to construction trades workers were due to falls.

Figure 5.9 Percentage nonwhite or Hispanic fatally injured workers, 2000-2010

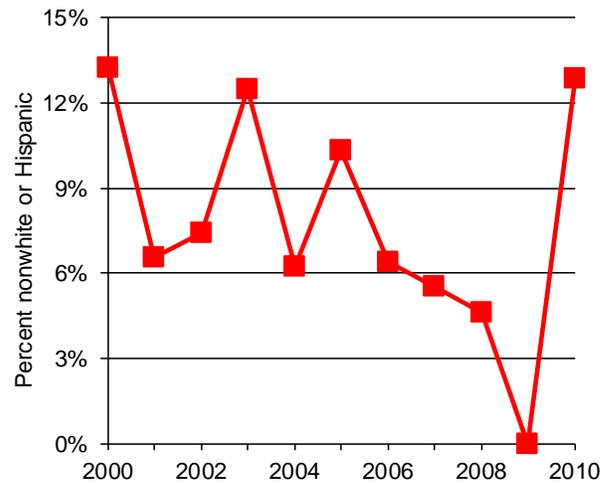
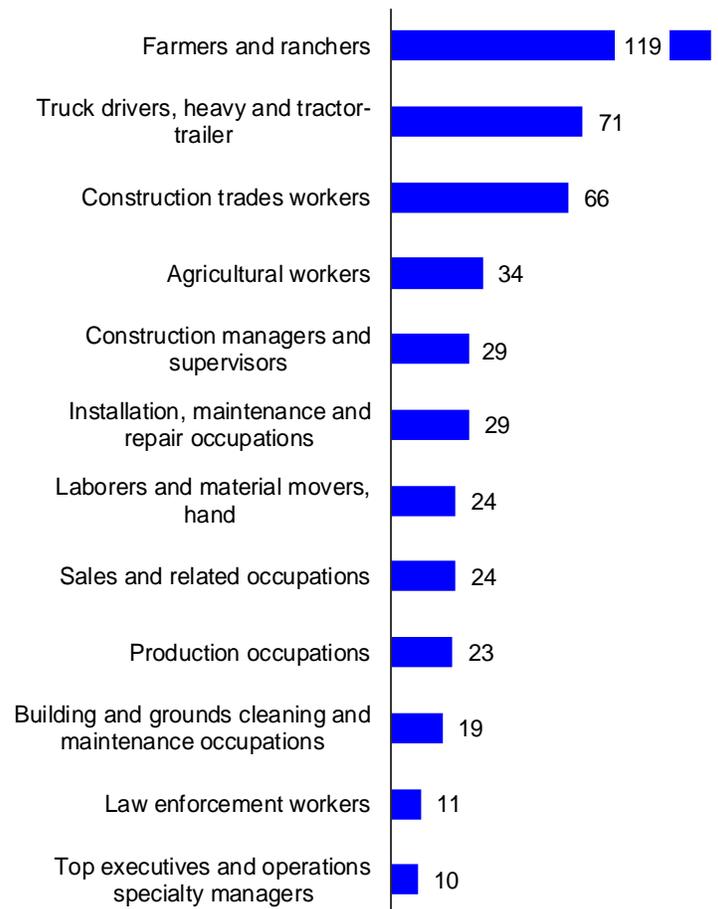


Figure 5.10 Occupations with 10 or more fatally injured workers, 2003-2010



²⁴ U.S. Census Bureau, 2010 American Community Survey. Retrieved from American Factfinder: factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

Worker activity

Worker activity categories indicate each fatally injured worker’s activity at the time of the event.

- Forty percent of the fatalities from 2003 through 2010 occurred while the workers were operating vehicles.
- Vehicular and transportation operations accounted for 75 percent of the fatalities in the transportation and warehousing industry.
- In agriculture, forestry, fishing and hunting, vehicular and transportation operations accounted for 40 percent of the fatalities, while constructing, repairing and cleaning accounted for 25 percent.
- Constructing, repairing and cleaning was the most-common worker activity among the fatalities in construction, with 49 percent of the fatalities.

Location

The location of the fatality indicates, in broad terms, the type of place where the fatal event occurred.

- Streets and highways were the most common fatality location, consistent with the high percentage of transportation-related fatalities.
- Consistent with the high proportion of fatalities in agriculture, farms were the second most common event location for all fatalities, and the location for 79 percent of the fatalities in agriculture, forestry, fishing and hunting.

Figure 5.11 Activity of fatally injured workers, 2003-2010

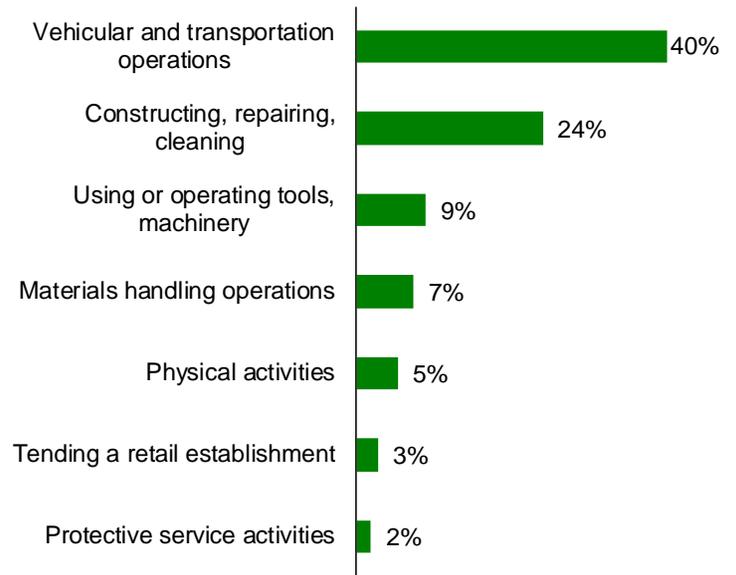
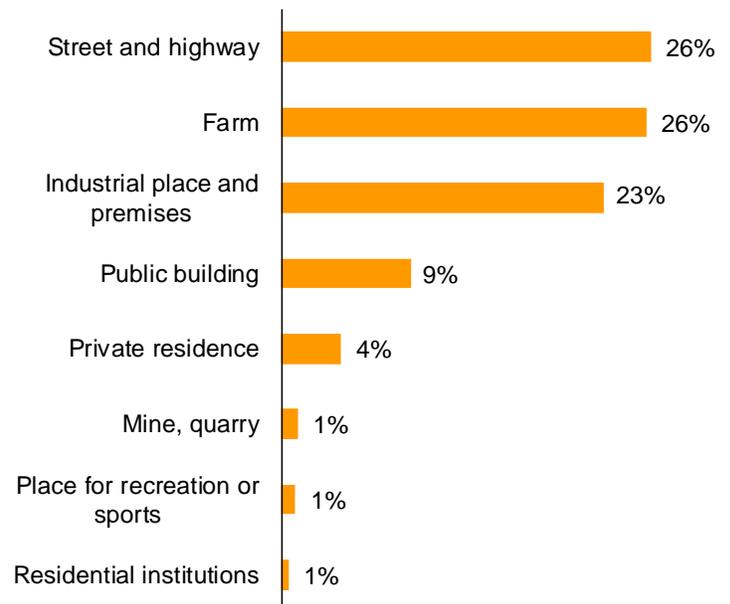


Figure 5.12 Fatal incident location, 2003-2010



6

Workplace safety programs and services of the Department of Labor and Industry

The Department of Labor and Industry (DLI) provides a variety of programs and services to help employers maintain safe and healthful workplaces. Minnesota has an approved state occupational safety and health plan under the federal Occupational Safety and Health Act (OSHA). Minnesota operates its plan under the Minnesota Occupational Safety and Health Act of 1973 (MNOSHA) and its related standards.

DLI administers MNOSHA through two work units, each with a different focus. The Compliance unit is responsible for compliance program administration, which includes conducting enforcement inspections, adoption of standards and operation of other related MNOSHA activities. The Workplace Safety Consultation (WSC) unit provides consultation services, on request, to help employers prevent workplace injuries and illnesses by identifying and correcting safety and health hazards. Both units provide information about workplace safety and health standards.

Occupational safety and health compliance

Workplace inspections

MNOSHA Compliance conducts workplace inspections to determine whether employers are complying with safety and health standards. Inspections are required to be without advance notice. Employers are required to allow the inspector to enter work areas without delay and must otherwise cooperate with the inspection.

The MNOSHA Compliance program is based on a system of inspection priorities. The priorities, from highest to lowest, are

- imminent danger — any condition or practice that presents a substantial probability that death or serious physical harm could occur immediately or before the danger can be eliminated through normal

- enforcement procedures;
- fatal accidents and catastrophes — accidents causing death or the hospitalization of three or more employees;
- employee complaints — not concerning imminent danger;
- referrals — from safety, health and government professionals;
- programmed inspections — targeting high-hazard employers and industries; and
- follow-up inspections — for determining whether previously cited violations have been corrected.

Employers found to have violated MNOSHA standards receive citations for the violations and are assessed penalties on the basis of the seriousness of the violations. These employers are also required to correct the violations. Employers and employees may appeal citations, penalties and the time periods allowed for correcting violations.

Figure 6.1 shows statistics for compliance inspections from federal-fiscal-years (FFY, years begin Oct. 1 of the preceding year) 2000 through 2011. More statistics describing MNOSHA activities are available from the State OSHA Annual Report at www.dli.mn.gov/OSHA/PDF/annualreport11.pdf.

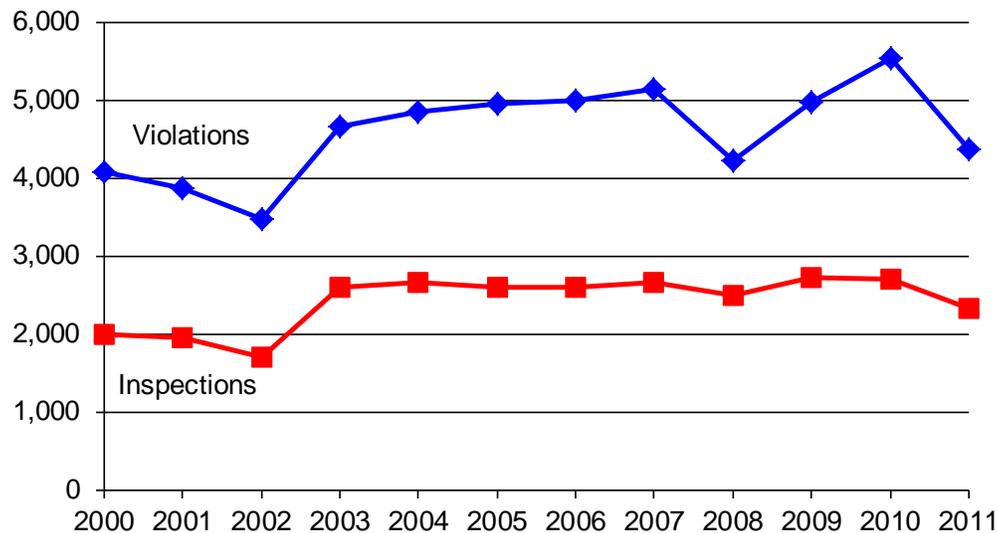
- During the most recent five-year period, FFY 2007 through FFY 2011, an average of 2,600 inspections were conducted annually, covering an average of 139,800 workers (Figure 6.1). MNOSHA Compliance conducted 2,325 inspections in FFY 2011, resulting in the identification of 4,363 violations of OSHA standards. The number of inspections and violations decreased due to the three-week state government shutdown.
- During FFY 2011, 70 percent of inspections resulted in at least one violation cited. Among inspections with violations, 2.7

violations were cited, on average.

- Among private-sector employers, serious, willful and repeat violations accounted for 73 percent of the safety violations and for 67 percent of the health violations cited in FFY 2011. The average penalty for these violations was \$936.
- MNOSHA established the 75/25 Program in FFY 2004. This is a penalty-reduction incentive program available to qualified employers that links workers' compensation claims and MNOSHA Compliance

penalties. This program allows an employer to obtain a 75 percent reduction in penalties if that employer reduces the number of workers' compensation claims submitted by 25 percent within the following one-year period. Participants are encouraged to use WSC services to achieve this goal. Since its inception, 295 employers entered the 75/25 Program and 190 employers completed the program by the end of FFY 2011. Of these, 120 employers successfully achieved the 25 percent claims reduction. Information is available at www.dli.mn.gov/OSHA/75-25Program.asp.

Figure 6.1 MNOSHA Compliance inspections and violations cited, FFY 2000-2011¹



Federal fiscal-year ¹	Inspections conducted	Employees covered ²	Inspections with violations	Violations	Penalties assessed (\$ millions) ³
2000	1,991	84,575	1,368	4,068	\$3.28
2007	2,651	126,260	1,836	5,140	\$3.85
2008	2,483	131,748	1,674	4,225	\$3.20
2009	2,717	139,429	1,959	4,962	\$3.37
2010	2,691	175,239	1,904	5,535	\$3.87
2011	2,325	126,145	1,610	4,363	\$4.11

1. Federal fiscal-years are from Oct. 1 of the preceding year to Sept. 30 of the indicated year.

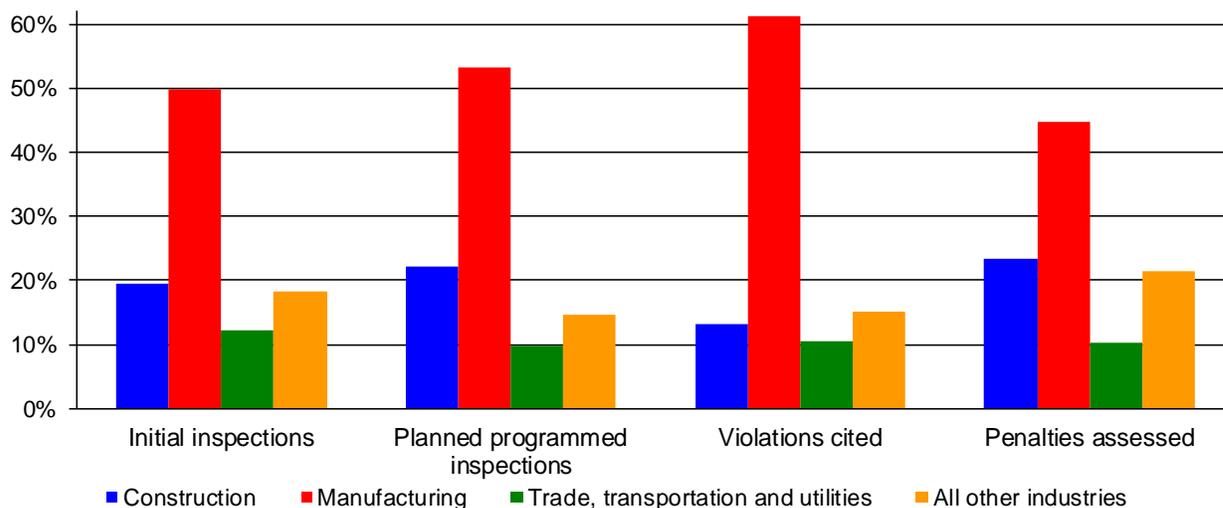
2. "Employees covered" refers to the number of employees who were affected by the scope of the inspection, which is not always all employees at a facility.

3. These are the initial penalty assessment amounts.

Source: Minnesota OSHA Operations System Exchange database.

- As shown in Figure 6.2, the majority of inspections in almost every industry were planned, programmed inspections.
- Manufacturing accounted for 50 percent of the inspections, up from 44 percent in 2010, and for 61 percent of the violations, the same as in 2010. Planned programmed inspections accounted for 88 percent of the inspections.
- Construction accounted for 20 percent of inspections, down from 32 percent in FFY 2010. Construction also accounted for 13 percent of the violations, down from 18 percent in FFY 2010 and 30 percent in FFY 2009. Planned programmed inspections accounted for 94 percent of the visits.
- Construction safety is a major focus for both compliance inspections and outreach efforts. During FFY 2011, 23 percent of programmed inspections were conducted at construction worksites. MNOSHA provides compliance assistance for members of the construction industry responsible for worksite safety to stay current with MNOSHA standards. MNOSHA had five construction seminars, with 264 construction managers, supervisors and employees in attendance.
- As part of an ergonomics focus, MNOSHA Compliance conducted 41 programmed inspections in the meat processing industry and in nursing homes.

Figure 6.2 MNOSHA Compliance inspections by industry, FFY 2011



Industry	NAICS code(s)	Initial inspections	Planned programmed inspections	Violations cited	Penalties assessed ¹
Natural resources and mining	11, 21	17	11	32	\$ 49,600
Construction	23	467	437	585	\$ 979,425
Manufacturing	31-33	1,187	1,045	2,719	\$ 1,882,225
Wholesale trade	42	103	79	212	\$ 187,000
Retail trade	44-45	86	56	124	\$ 83,750
Transportation and warehousing	48-49	88	50	110	\$ 101,625
Utilities	22	15	9	22	\$ 64,325
Information	51	19	16	35	\$ 27,325
Financial activities	52-53	11	4	17	\$ 21,975
Professional and business services	54-56	82	55	101	\$ 356,425
Education	61	41	30	67	\$ 54,450
Health care and social assistance	62	74	56	105	\$ 103,525
Leisure and hospitality	71-72	23	6	56	\$ 36,400
Other services	81	35	4	69	\$ 46,300
State and local government	all	134	108	195	\$ 206,250

1. These are the initial penalty assessment amounts.

Source: Minnesota OSHA Operations System Exchange database.

- MNOSHA Compliance initiated inspections for 23 fatalities during calendar-year 2011 (Figure 6.3).
- From 2007 through 2011, 28 percent of the fatality investigations were in the construction industry. Falls and crushing incidents accounted for 52 percent of the fatalities investigated.
- Figure 6.4 shows MNOSHA Compliance initiated inspections for 39 serious-injury incidents during 2011 and for 178 incidents during the 2007 through 2011 period. During 2011, crushing injuries led to 33 percent of the serious-incident inspections. From 2007 through 2011, 47 percent of the serious injuries investigated involved workers injured by falls and crushing injuries. Additional details about the fatality and serious injury incident investigations are available at www.dli.mn.gov/OSHA/Information.asp.

Figure 6.3 Fatalities investigated by MNOSHA Compliance, 2007-2011

Fatality type	2007	2008	2009	2010	2011	Total
Asphyxiation/chemical exposure	3	1	3	2	1	10
Burn	4	0	0	0	0	4
Crushed by	5	6	5	5	4	25
Drowning	2	0	1	0	2	5
Electrocution	0	2	0	1	2	5
Explosion	1	0	1	0	1	3
Fall	4	2	6	4	7	23
Heat exposure	1	0	0	0	1	2
Natural causes	0	0	0	3	0	3
Struck by	5	1	2	0	5	13
Total	25	12	18	15	23	93
Percent in construction	39%	25%	17%	17%	30%	28%

Figure 6.4 Serious injuries investigated by MNOSHA Compliance, 2007-2011

Serious-injury type	2007	2008	2009	2010	2011	Total
Amputation	1	4	9	4	6	24
Asphyxiation/chemical exposure	1	6	1	3	3	14
Burn	1	1	3	0	0	5
Crushed by	6	8	3	11	13	41
Electrical shock	4	5	2	1	3	15
Environmental stress	0	0	0	0	0	0
Explosion	1	4	1	3	2	11
Fall	14	8	6	7	7	42
Struck by	9	7	4	1	5	26
Total	37	43	29	30	39	178
Percent in construction	41%	33%	17%	23%	36%	31%

Figure 6.5 shows the most commonly cited OSHA standards violations in FFY 2011 for general industry and for construction.

- Violations associated with the A Workplace Accident and Injury Reduction (AWAIR) Act have been at or near the top of the lists for both general industry and construction for many years.
- Other commonly cited violations are associated with the Employee Right-to-Know Act, lockout/tagout procedures and construction fall protection.

Under the AWAIR Act — part of the state's Occupational Safety and Health Act — employers in high-hazard industries must develop and implement a written safety and

health plan to reduce workplace injuries and illnesses.

Under the Employee Right-to-Know Act and its standards — also part of the state's Occupational Safety and Health Act — employers must evaluate their workplaces for the presence of hazardous substances, harmful physical agents and infectious agents, and determine which employees are routinely exposed to these substances and agents. Identified employees must be provided with appropriate training and readily accessible written information about identified hazardous substances and agents in their work areas. Containers, work areas and equipment must be labeled to warn employees of associated hazardous substances or agents.

Figure 6.5 Minnesota OSHA's most frequently cited standards, FFY 2011

Standard ¹	Description	Times cited
General industry		
MN Rules 5206.0700	Employee Right-To-Know training	500
29 CFR 1910.147	Control of hazardous energy (lockout/tagout procedures)	313
29 CFR 1910.305	Electrical wiring methods, components and equipment for general use	244
29 CFR 1910.212	Machine guarding — general requirements	242
MN Statutes 182.653 subd. 8	A Workplace Accident and Injury Reduction (AWAIR) program	179
29 CFR 1910.134	Respiratory protection	152
29 CFR 1910.23	Guarding of floor and wall openings and holes	127
29 CFR 1910.1026	Chromium (VI)	126
29 CFR 1910.151	Emergency eyewash and showers	125
29 CFR 1910.178	Powered industrial trucks (forklifts)	116
Construction		
29 CFR 1926.501	Fall protection	168
29 CFR 1926.652	Excavations — protective system requirements	65
29 CFR 1926.651	Specific excavation requirements	62
MN Statutes 182.653 subd. 8	A Workplace Accident and Injury Reduction (AWAIR) program	48
29 CFR 1926.451	Scaffolds — general requirements	47
MN Rules 5207.1100	Fall protection on elevating work platform equipment	28
29 CFR 1926.405	Electrical wiring methods, components and equipment for general use	23
29 CFR 1926.1053	Ladders	23
29 CFR 1926.100	Head protection	18
29 CFR 1926.1101	Asbestos	13

1. 29 CFR refers to the U.S. Code of Federal Regulations Title 29, which covers the U.S. Department of Labor.

Source: Minnesota OSHA Operations System Exchange database.

Window-washing program

MNOSHA Compliance initiated a local emphasis program targeting window-washing operations during FFY 2011. MNOSHA has a team of 12 investigators trained in the recognition of window-washing operation hazards. MNOSHA Compliance conducted 25 inspections under this emphasis program and has proposed 27 citations including four willful and 22 serious citations. Among the hazardous situations the MNOSHA investigators found were: improper rigging of load lines and life lines, no use of fall protection for attendants on rooftops, improper ladder usage, and improper selection and use of anchorage points. Additional investigators will be trained about the window-washing hazards during FFY 2012.

Partnerships

MNOSHA Compliance continues to support and strengthen relationships with organizations that represent safety and health best practices. It currently has two partnerships in the construction industry — Construction Health and Safety Excellence (CHASE) Minnesota and Minnesota Chapter of Associated Builders and Contractors (MN ABC). During FFY 2011, two new members were added to the CHASE Minnesota partnership and two new members were added to the MN ABC partnership.

Workplace Safety Consultation

WSC offers a variety of workplace safety services. These services are voluntary, confidential and separate from the MNOSHA Compliance unit.

Workplace consultations

WSC offers free consultation services to help employers improve workplace safety by recognizing and correcting safety and health hazards. This service is targeted primarily

toward smaller businesses in high-hazard industries, and is available to public-sector employers. During FFY 2011, WSC conducted 1,243 worksite safety and health visits, training and assistance visits and interventions.

During the consultation visits, the WSC safety and health professionals help employers determine how to improve workplace safety practices and working conditions to comply with, and exceed, MNOSHA regulations and to reduce accidents and illnesses and their associated costs. No citations are issued or penalties proposed as a result of WSC consultations. However, employers are obligated to correct any serious safety and health hazards found. Consultants identify hazards in about 95 percent of the visits. Information about an employer is not reported to MNOSHA Compliance unless the employer fails to correct the detected safety and health hazards within a specified period.

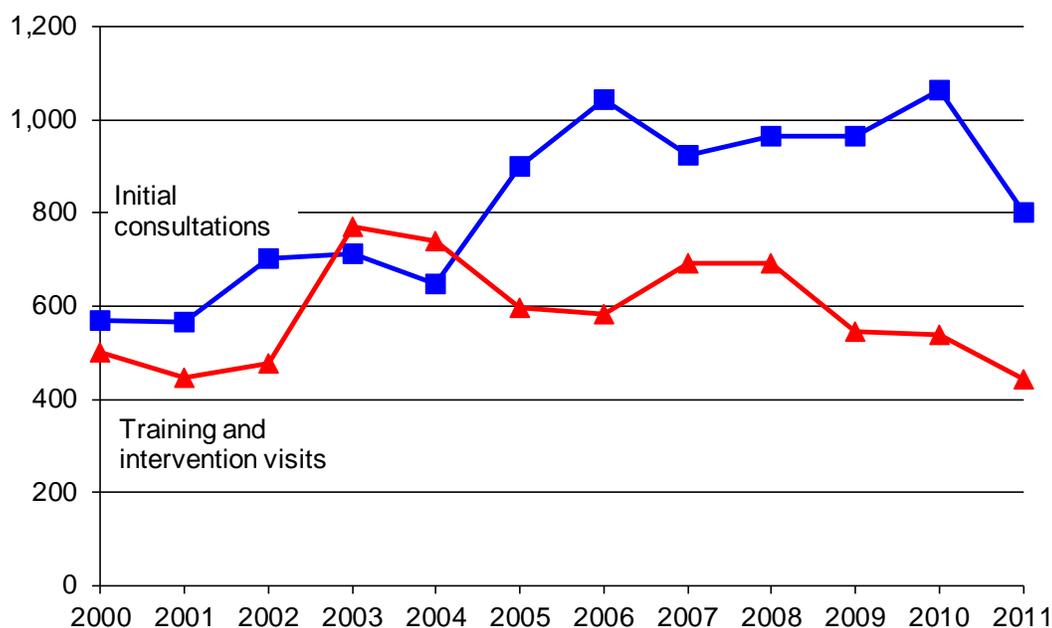
Figure 6.6 shows statistics for WSC visits to worksites for FFY 2000 through 2011.

- Since FFY 2005, the annual number of initial consultation visits has remained at or above 900 visits.
- During the past three years, an average of 16,700 employers and employees received training from WSC consultants.
- WSC visits in FFY 2011 identified safety and health hazards that could have cost employers approximately \$4.0 million in MNOSHA Compliance penalties, about \$5,000 per consultation.

Figure 6.7 shows statistics for WSC services to worksites for some industries during FFY 2011.

- Construction sites accounted for 45 percent of initial consultation visits, followed by manufacturing with 22 percent.

Figure 6.6 Workplace Safety Consultation visit activity, FFY 2000-2011



Federal fiscal-year ¹	Initial consultation visits	Visits with identified hazards	Potential penalties avoided ² (\$ millions)	Training and intervention visits	People receiving training and interventions
2000	570	553	\$1.96	502	13,420
2007	923	890	\$3.73	693	20,506
2008	965	918	\$3.56	691	23,394
2009	966	925	\$3.72	544	17,670
2010	1,064	1,045	\$3.81	539	16,597
2011	800	745	\$4.01	443	15,818

1. Federal fiscal years are from Oct. 1 of the preceding year to Sept. 30 of the indicated year.

2. Potential penalty amounts expressed using average serious penalty value for each year.

Source: Minnesota OSHA IRIS database.

Figure 6.7 Workplace Safety Consultation activity for selected industries, FFY 2011

Industry	NAICS code	Initial visits	Training assistance
Construction	23	362	39
Manufacturing	31-33	177	55
Trade, transportation and utilities	42-49, 22	37	8
Nursing and residential care	623	48	16
State and local government	92	62	17

Source: Minnesota OSHA IRIS database.

Loggers' Safety Education Program

The Loggers' Safety Education Program (LogSafe) provides logging industry safety training through four-hour seminars throughout the state. The goal of the program is to help reduce injuries and illnesses in the logging industry through on-site consultation services, outreach and training seminars. Since 2009, WSC has contracted out its spring and fall LogSafe seminar training programs.

WSC also provides assistance to companies that are involved in tree-cutting and trimming activities. During FFY 2011, WSC conducted 109 logger/tree-cutting visits and interventions, with 1,094 attendees.

Safety Grants Program

The Safety Grants Program is a state-funded program that awards funds up to \$10,000 to qualifying employers for projects designed to reduce the risk of injury and illness to their employees. Projects must be consistent with the recommendations of a safety and health inspection. Qualified applicants must match the grant money awarded.

During state-fiscal-year 2011, WSC awarded \$1.0 million to 142 employers that matched the grants with more than \$1.8 million of their own funds.

Ergonomics assistance and safe patient-handling

The main responsibilities of the WSC ergonomics program coordinator are to educate Minnesota employers and employees about the recognition and control of risk factors associated with musculoskeletal disorders. Between October 2010 and March 2012, 49 facilities received visits with an ergonomics focus, 29 of which were for safe-patient-handling. There were nine safe-patient-handling training seminars and four general ergonomics training sessions.

With safe-patient-handling legislation enacted in Minnesota requiring all licensed health care facilities in the state to implement a safe-patient-handling program, a big focus of the ergonomics program is safe patient-handling. The legislation

requires a written safe-patient-handling policy and the establishment of a plan to minimize manual lifting of patients in hospitals, nursing homes, outpatient surgical centers and in medical and dental clinics.

WSC provides financial support for the purchase of patient lifting equipment through the Safety Grants Program. During state-fiscal-year 2011, 46 safety grants, totaling \$310,000, were provided to health care facilities.

Through an alliance with the Care Providers of Minnesota, the ergonomics program coordinator has coordinated and conducted eight WSC On-Site Experience joint safety and health visits to facilities that volunteer to host outside facilities during the walk-through portion of their visit. During this full day visit, representatives from facilities are able to observe the process of a MNOSHA inspection and have a chance to ask the consultants questions and see first-hand the benefits a consultation can bring to their establishment. Fifteen outside facilities have participated in the WSC On-Site Experience as training participants.

A sample safe-patient-handling program for nursing homes and a sample safe-patient-handling program for clinics are posted on DLI's website to provide examples for employers.

A facilitated hospital group has been formed and there have been three meetings to discuss safe patient-handling in hospitals.

The safe-patient-handling legislation and resource materials are available at www.dli.mn.gov/WSC/SPHlegislation.asp.

MNSHARP

The Minnesota Safety and Health Achievement Recognition Program (MNSHARP) is a voluntary program that assists small high-hazard employers in achieving safety and health improvements and recognizes them for doing so. The success of these employers in improving the safety climate in their workplaces is apparent in their low rates of OSHA recordable cases and their low workers' compensation costs.

MNSHARP is limited to employers with fewer than 250 workers at the worksite. Participants receive a comprehensive safety and health consultation survey from WSC. If the facility demonstrates a strong commitment to workplace safety and is deemed able to meet all MNSHARP requirements within one year, a one-year action plan is established to correct all identified hazards and management system deficiencies, and the site is granted a limited deferral from MNOSHA scheduled compliance inspections.

During the year, one or more on-site visits are made to provide safety and health assistance and to monitor progress in accomplishing action plan items. If the participant has completed their action plan and the necessary injury and illness reductions are accomplished, the worksite receives a MNSHARP certificate of recognition and is exempted from programmed MNOSHA Compliance inspections for up to two years upon initial certification, and up to three years upon subsequent re-certification.

Four new participants were certified into MNSHARP during FFY 2011, bringing the total to 43 certified programs. The majority of the program participants are manufacturers.

In FFY 2008, WSC launched one of the nation's first safety and health achievement recognition programs for the construction industry. MNSHARP Construction provides incentives and on-site support for large, long-term (18 months or longer) construction worksites and works with the general contractors to develop, implement and continually improve the effectiveness of their workplace safety and health programs.

The total case incidence rates of the general-industry MNSHARP employers during 2011 averaged 52 percent below the 2010 national rate for their industries; their DART rates averaged 52 percent below their national industry rates. For construction projects, the total case rates averaged 78 percent below the national rate and the DART rates averaged 50 percent lower.

For more information about MNSHARP, visit www.dli.mn.gov/WSC/MNSHARP.asp.

MNSTAR

The Minnesota Star (MNSTAR) program is a voluntary program patterned after the federal Voluntary Protection Program.²⁵ It is available to Minnesota employers of all sizes. Compared to MNSHARP, MNSTAR has more rigorous requirements and confers a higher level of recognition on certified employers. MNSTAR relies mainly on employer self-assessment and requires an extensive application, including submission of written safety and health policies and procedures. An application cannot be accepted until the worksite requests and receives a full-service safety and health consultation visit. The consultant evaluates safety and health hazards, reviews mandated safety and health programs, and provides a partial assessment of overall safety and health management. Employers that demonstrate a high-level of safety and health management effectiveness can apply for MNSTAR status. After review of the application, an on-site and comprehensive assessment of the worksite's safety and health management system is completed. MNSTAR status is awarded if all eligibility requirements have been met, including an injury and illness rate below the state and national averages for their industry.

MNSTAR recognition exempts employers from programmed MNOSHA Compliance inspections for three years upon initial certification, and up to five years upon subsequent re-certification. Merit status is also available for employers that demonstrate a high level of safety and health management effectiveness, but have not fully met all eligibility requirements for MNSTAR.

During FFY 2011, there were 31 employers with full MNSTAR certification and three employers in Merit status. This includes three companies receiving initial certification for MNSTAR status and two companies reaching Merit status.

During 2011, the total case incidence rates of the general-industry MNSTAR employers averaged 34 percent below the 2010 national rates for their industries; their DART rates averaged 41 percent below the national rates. For contractor employers, the total case rates averaged 66 percent below the national rate and the DART

²⁵ See www.osha.gov/dcsp/vpp.

rates averaged 100 percent below the national rate.

For more information about MNSTAR, visit www.dli.mn.gov/WSC/MnStar.asp.

Workplace safety and health seminars and outreach activities

Both the MNOSHA Compliance and WSC units provide training and outreach activities to help employers and employees improve the safety and health conditions at their worksites. Some of the training is directed to company safety directors to provide information for their own safety training programs.

Compliance staff members present information about MNOSHA standards and other workplace safety topics to employer organizations, safety professionals, unions and labor-management organizations. Many MNOSHA Compliance outreach services are presented at meetings, conferences and employer groups organized by the Midwest Center for Occupational Health and Safety, Minnesota Health and Housing Alliance, Associated General Contractors of Minnesota, American Society of Safety Engineers and the Minnesota Safety Council. During FFY 2011, Compliance staff members provided outreach presentations to 4,478 participants.

WSC provides seminars and training opportunities to help employers and employees understand and comply with safety and health regulations, and to develop and implement mandatory programs, including Employee Right-To-Know, AWAIR and labor-management safety committees. During FFY 2011, WSC conducted 443 worksite training, intervention and technical assistance visits, reaching more than 15,800 participants.

During FFY 2011, WSC training activities included the following events and projects:

- presentations to 490 employers at contractor re-licensing classes focusing on residential fall protection, Employee Right-to-Know, residential scaffolding and rough terrain forklift use;
- three all-day presentations created in alliance with the Twin Cities Roofers Association about fall protection and rigging techniques, attended by 100 employers and employees;
- five 10-hour construction certification courses for minority, women, youth and apprenticeship organizations;
- developed first-of-its-kind Pro-10 training courses in alliance with Labor Users Contractors (LUC); training course will become a requirement for union locals and contractors.

MNOSHA performance

In its five-year strategic plans, MNOSHA sets strategic and performance goals to reduce injury and illness rates and fatality rates for the industries within its jurisdiction. The strategic plan includes a set of emphasis industries that are identified through a combination of factors, including the number of workers in the industry and the industry's DART rate. The current strategic plan is available at www.dli.mn.gov/OSHA/PDF/stratplan09-13.pdf.

Establishments in the emphasis industries receive considerable attention from MNOSHA. During FFY 2011, 58 percent of programmed compliance inspections and 81 percent of the consultation initial visits were in these emphasis industries.

The case count and rate estimates of days-away-from-work cases for the emphasis industries in the current strategic plan are shown in Figure 6.8. The majority of emphasis industries are in the manufacturing sector. In 2010, the emphasis industries accounted for 18 percent of Minnesota's workplaces, for 28 percent of the workers and for 41 percent of the cases with one or more days away from work.

The 20 percent decrease in the number of cases with days away from work for the emphasis industries is believed to be due, in large part, to the effects of the recession on the construction industry and manufacturing.

Figure 6.8 Minnesota OSHA emphasis industries for the 2009-2013 strategic plan

Industry	NAICS code	Establishments 2010	Wage-and-salary employment 2010	DAFW cases			DAFW rate		
				Average 2006-2008	2010	Pct. change	Average 2006-2008	2010	Pct. change
Logging	1133	180	800	na	na	na	na	na	na
Utilities, except nuclear ¹	221	400	12,700	120	130	8%	1.1	1.1	0%
Construction	23	16,750	87,900	2,230	1,270	- 43%	2.1	1.7	- 19%
Food manufacturing ²	311	740	43,400	640	690	8%	1.5	1.6	7%
Grain facilities ^{2,3}	31111, 31121, 42451	520	8,600	na	na	na	na	na	na
Animal slaughtering and processing ²	3116	140	15,600	180	170	- 6%	1.1	1.0	- 9%
Beverage and tobacco product mfg.	312	60	2,200	60	50	- 17%	2.6	2.3	- 12%
Wood product manufacturing	321	370	10,600	310	120	- 61%	2.2	1.3	- 41%
Petroleum refineries	32411	10	1,400	na	na	na	na	na	na
Nonmetallic mineral product mfg.	327	330	7,800	230	90	- 61%	2.3	1.2	- 48%
Primary metal mfg. ⁴	331	90	5,300	210	110	- 48%	3.0	2.2	- 27%
Foundries ⁴	3315	50	3,500	na	na	na	na	na	na
Transportation equipment mfg.	336	230	9,500	260	130	- 50%	2.0	1.5	- 25%
Furniture and related product mfg.	337	590	8,100	260	150	- 42%	2.2	1.9	- 14%
Building material and garden equipment and supplies dealers	444	1,610	23,800	330	170	- 48%	1.4	0.8	- 43%
Warehousing and storage	493	220	6,000	200	160	- 20%	3.1	2.9	- 6%
Hospitals ⁵	622	170	96,600	1,560	1,670	7%	2.4	2.3	- 4%
Nursing care facilities ⁵	6231	410	46,100	1,020	990	- 3%	2.9	3.1	7%
State and local government	all	6,540	339,300	3,630	3,170	- 13%	1.4	1.3	- 7%
Emphasis industry total		29,110	707,800	11,060	8,900	- 20%			
Non-emphasis industry total		135,280	1,827,100	14,400	12,560	- 13%			
State total (excludes federal gov.)		164,390	2,534,900	25,460	21,460	- 16%	1.2	1.1	- 8%
Emphasis percentage of state total		18%	28%	43%	41%				

1. Although nuclear energy establishments are excluded from the emphasis program, the establishments, employment and DAFW statistics include nuclear energy establishments.

2. The food processing subsector includes some establishments in the grain facilities emphasis industry group and all establishments in the animal slaughtering and processing industry. Statistics displayed for food manufacturing include all industries within the subsector.

3. Grain facilities includes animal food manufacturing (NAICS 31111), flour milling and malt manufacturing (NAICS 31121), and grain and field bean merchant wholesalers (NAICS 42451).

4. Foundries is an industry group in the primary metal manufacturing subsector. Statistics displayed for primary metal manufacturing include foundries.

5. Data shown for private-sector only; public-sector facilities are included in state and local government.

Sources: BLS Quarterly Census of Employment and Wages and annual Survey of Occupational Injuries and Illnesses

7

Occupational health indicators

Measurements of workplace safety and health encompasses a much wider set of statistics than the counts and rates of injuries and illnesses reported by employers on the SOII, the number of fatal work injuries reported in the CFOI, and even the number of workers' compensation claims. Many illnesses, such as cancers, only develop after very long latencies and often are not included in the SOII or CFOI, and may result in workers' compensation litigation. Fortunately, hospitalization records and other data sources are available to help track the incidence and prevalence of these conditions. This chapter presents measures of the number and rate of cases with a variety of chronic and acute conditions using hospitalization records and other occupational health surveillance indicators.

Minnesota is one of 23 states funded by the National Institute for Occupational Safety and Health (NIOSH) to enhance occupational health surveillance at the state level using a core set of occupational health indicators. These indicators were developed by the Council of State and Territorial Epidemiologists (CSTE) in collaboration with NIOSH and utilize a variety of existing data sources. Epidemiologists at the Minnesota Department of Health's (MDH) Center for Occupational Health and Safety have been implementing this surveillance program since 2010.

The occupational health surveillance activity encompasses a set of 20 occupational health indicators, which include some of the SOII and CFOI statistics already presented in this report.²⁶ States that collect the measures recommended by the indicators can use the information to develop programs to prevent workplace injuries and illnesses. Most of the indicators include measures based on a variety of public health data systems, and with the exception of measures based on workers' compensation and the SOII, do not rely on employer reporting.

²⁶ The indicators and their development are described in detail in "Occupational health indicators: A guide for tracking occupational health conditions and their determinants," CSTE, March 2012. www.cste.org/webpdfs/Occupational/OHIndicatorDocumentApril2012.pdf

The 20 CSTE occupational health indicators are:

1. non-fatal injuries and illnesses reported by employers;
2. work-related hospitalizations;
3. fatal work-related injuries;
4. amputations reports by employers;
5. amputations identified in state workers' compensation systems;
6. hospitalizations for work-related burns;
7. musculoskeletal disorders;
8. carpal tunnel syndrome cases identified in state workers' compensation systems;
9. pneumoconiosis hospitalizations;
10. pneumoconiosis mortality;
11. acute work-related pesticide poisonings reports to poison control centers;
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 occupations and industries with high risk for occupational morbidity;
17. occupational health and safety professionals;
18. OSHA enforcement activities;
19. workers' compensation awards; and
20. work-related low back disorder hospitalizations.

In this chapter, measures for six of the indicators are presented. The text for the description of the indicators was taken or adapted from the CSTE occupational health indicators guide (see footnote 26) and from the CSTE Internet pages describing the indicators, www.cste.org/dnn/ProgramsandActivities/OccupationalHealth/OccupationalHealthIndicators/t/abid/85/Default.aspx.

The full set of occupational health indicator statistics will be published in a report by the MDH Center for Occupational Health and Safety later this year and will also be posted on its website at www.health.state.mn.us/ochealth.

Work-related hospitalizations (indicator 2)

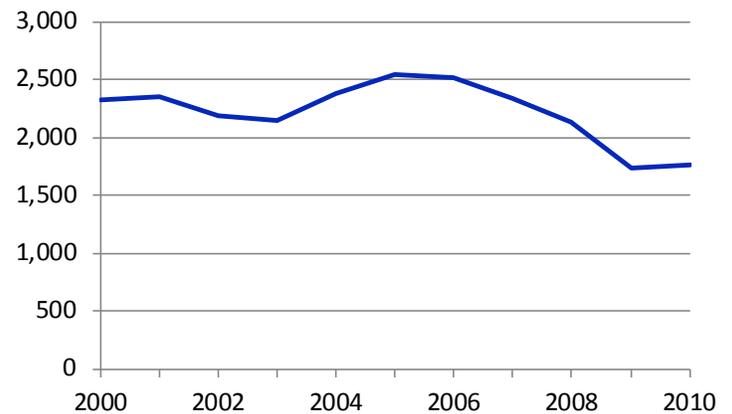
Individuals hospitalized for work-related injuries and illnesses have some of the most serious and costly adverse work-related health conditions. This indicator includes the number of hospitalizations for people age 16 years or older with workers' compensation listed as the primary payer on the hospital discharge records and the rate of work-related hospitalizations per 100,000 employed persons age 16 years or older. The designation of workers' compensation as primary payer is a proxy for the work-relatedness of hospitalized injuries.

Some limitations of this indicator (and some of other indicators) are that:

- hospital discharge records are only available for non-federal, acute care hospitals;
- only workers covered by their state's workers' compensation system have work-relatedness indicated on their discharge records; and
- only workers hospitalized in their state of residence are counted, which this excludes workers who live in a neighboring state but work in Minnesota and are hospitalized in Minnesota, and Minnesota residents who work in Minnesota and are hospitalized in a neighboring state.

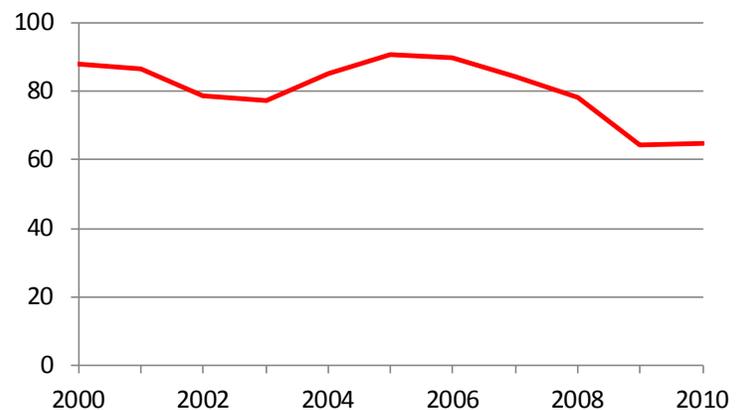
The hospitalization trends do not match the trends for days-away-from-work (DAFW) cases in the SOII for the entire period. While the SOII cases show a continuous, slow decrease, the hospitalization trends do not decrease until after 2005. The DAFW rate decreased by 42 percent from 2000 to 2010 and by 15 percent from 2005 to 2010, while the work-related hospitalization rate decreased by 27 percent and 29 percent, respectively.

Figure 7.1 Number of work-related hospitalizations, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Figure 7.2 Rate of work-related hospitalizations per 100,000 workers, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

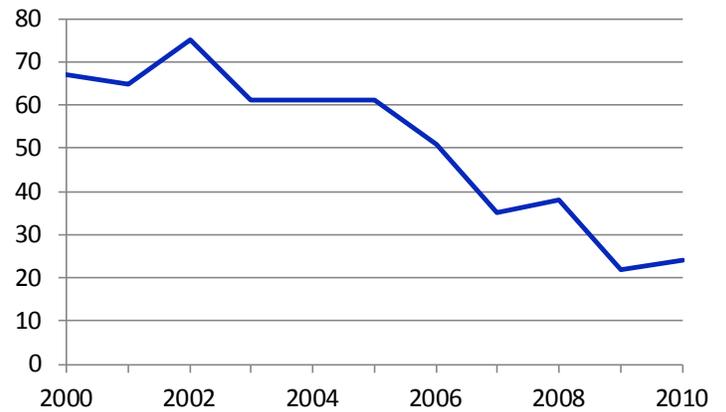
Hospitalizations for work-related burns (indicator 6)

Burns encompass injuries to tissues caused by contact with dry heat (fire), moist heat (steam), chemicals, electricity, friction or radiation. Burns are among the most expensive work-related injuries to treat and can result in significant disability. Thermal and chemical burns are the most frequent types of work-related burn injury. NIOSH estimates that 30 to 40 percent of burns are work-related, with higher rates among males and younger workers.

This indicator includes the number of hospitalizations for people age 16 years or older with burns, and with workers' compensation listed as the primary payer on the hospital discharge records and the rate of work-related burn hospitalizations per 100,000 employed persons age 16 years or older.

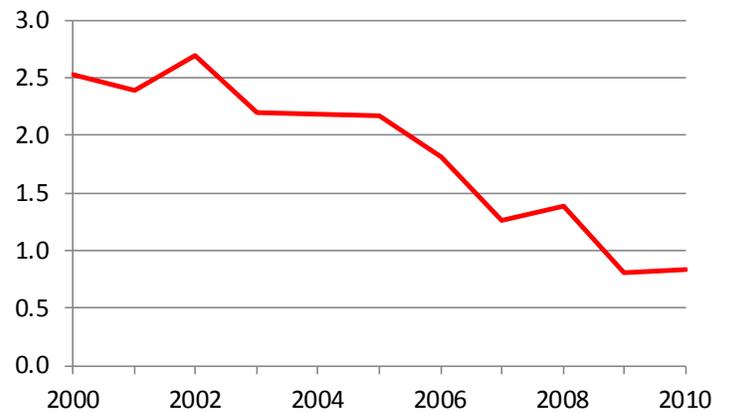
The same set of limitations presented for all work-related hospitalizations also applies to this indicator.

Figure 7.3 Number of hospitalizations for work-related burns, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Figure 7.4 Rate of hospitalizations for work-related burns per 100,000 workers, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Pneumoconiosis hospitalizations (indicator 9)

Pneumoconiosis is a term for a class of nonmalignant lung diseases caused by the inhalation of mineral dust, nearly always in occupational settings. Most cases of pneumoconiosis develop only after many years of cumulative exposure; thus they are usually diagnosed in older individuals, often long after the onset of exposure. Pneumoconiosis includes: silicosis, asbestosis, coal workers’ pneumoconiosis and, less commonly, pneumoconiosis due to a variety of other mineral dusts, including talc, aluminum, bauxite and graphite.

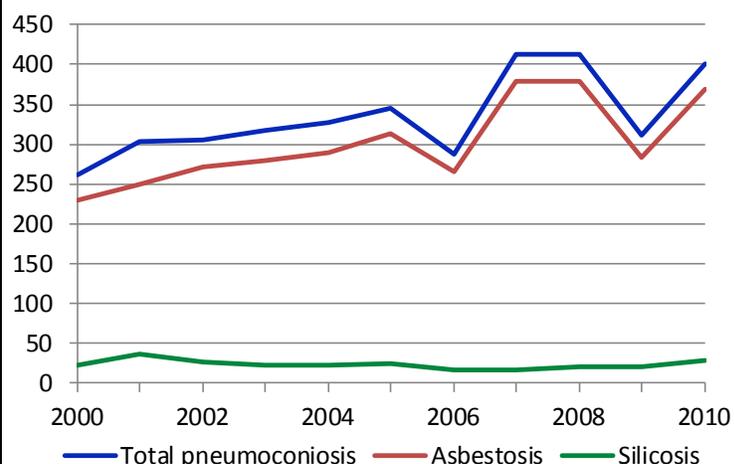
Complications of various pneumoconioses and other conditions associated with exposure to the same dusts include respiratory infection (including tuberculosis), chronic bronchitis, emphysema, lung cancer, pleuritis, progressive systemic sclerosis, renal disease and respiratory failure. These diseases are incurable and may ultimately result in death.

State-based hospital discharge records are a useful population-based surveillance data source for quantifying pneumoconiosis even though only a small number of individuals with pneumoconiosis are hospitalized for that condition. Because of the long latency between exposure and hospitalization, pneumoconioses are not measured by the SOII. Thus, hospital discharge records are an important source for quantifying the burden of pneumoconiosis, even though it captures only hospitalized cases. Also because of the long latency of these diseases, it may be many years before reductions in occupational exposures affect the number of hospitalizations.

The figures show the numbers and rates of hospital discharges for Minnesota residents age 15 years or older with a primary or contributing diagnosis of any pneumoconiosis and the number of discharges for asbestosis and silicosis.

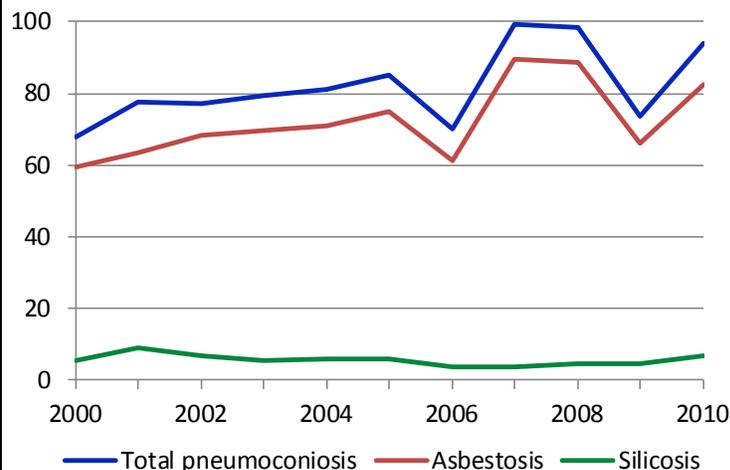
The total pneumoconiosis rate increased by 39 percent from 2000 to 2010, although there have been large annual variations since 2005.

Figure 7.5 Number of hospitalizations for pneumoconiosis, people age 15 and older, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Figure 7.6 Rate of hospitalizations for pneumoconiosis per million residents age 15 and older, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

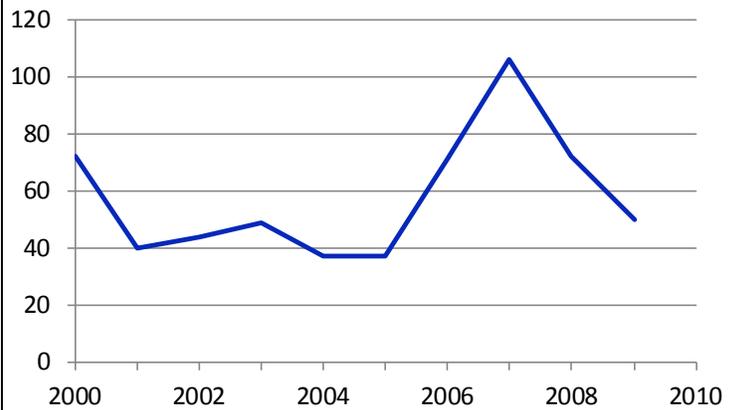
Acute work-related pesticide poisonings associated illness and injury (indicator 11)

A pesticide is a substance or mixture of substances used to prevent or control undesired insects, plants, animals, or fungi. Adverse health effects from exposure vary depending on the amount and route of exposure and the type of chemical used. Agricultural workers and pesticide applicators are at greatest risk for the more severe pesticide poisonings.

Poison Control Center (PCC) records are used for monitoring acute pesticide poisonings, although only approximately 10 percent of acute occupational pesticide-related illness cases are reported to PCCs. PCC records include information used to identify cases associated with occupational exposure.

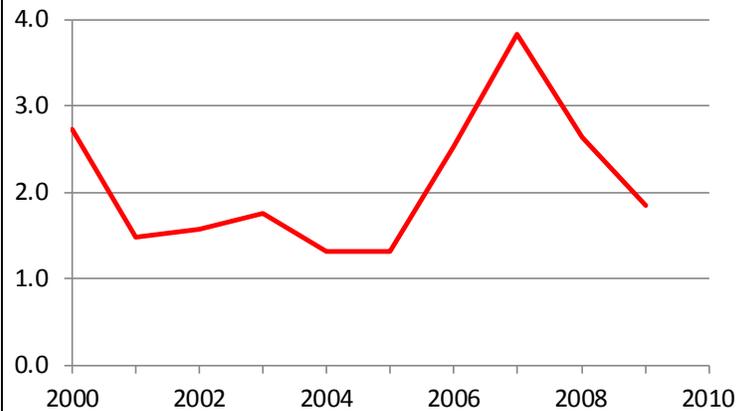
The indicator includes the reported number of work-related pesticide poisoning cases and the rate of cases per 100,000 employed people age 16 years or older.

Figure 7.7 Number of reported work-related poisoning cases, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Figure 7.8 Rate of reported work-related poisoning cases per 100,000 workers, 2000-2010



Source: CSTE indicators data, Minnesota Department of Health.

Incidence of malignant mesothelioma (indicator 12)

Malignant mesothelioma is a rare but highly fatal cancer of the thin membranes surrounding the chest cavity (pleura) or abdominal cavity (peritoneum). The only well-established risk factor for mesothelioma is exposure to asbestos and related fibers. It has been estimated that as many as 90 percent of cases are caused by exposure to asbestos. The five-year relative survival from mesothelioma is less than 10 percent. Most cases of malignant mesothelioma are caused by occupational exposures. Close family members of workers exposed to asbestos may inhale particles brought home on the worker’s body and clothing.

Mesothelioma is a disease of long latency, typically with 20 to 40 years between exposure and onset of disease. The incidence of mesothelioma in the United States has risen steadily since the 1960s, reflecting high levels of asbestos use and occupational exposure to asbestos during World War II through the 1970s. In the 1970s, new OSHA regulations limited workplace exposures and the Environmental Protection Agency began regulating asbestos use.

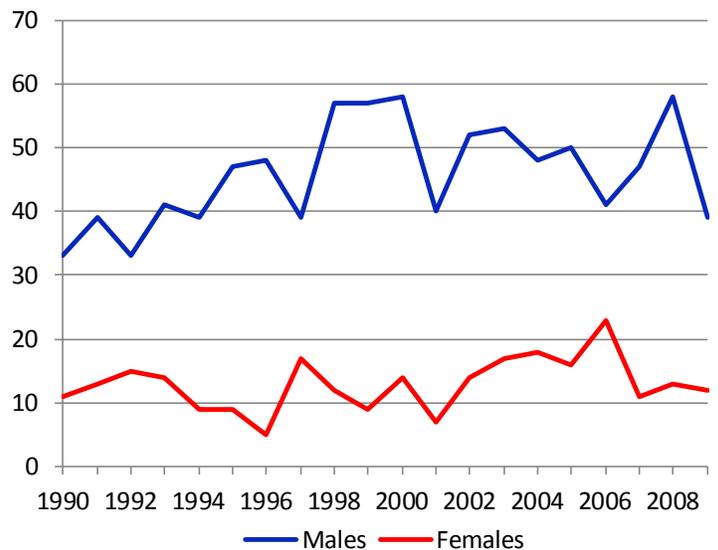
The incidence of mesothelioma among males increased significantly in Minnesota by an average of 4.2 percent a year from 1988 to 1999, and then began to stabilize or decrease slightly.²⁷ Because the delay between exposure to asbestos and development of mesothelioma is so long, it is likely that the increasing rates during the 1990s reflected exposures that occurred before the hazards of asbestos were well known.

About 80 percent of mesotheliomas diagnosed in Minnesota and 85 percent of the deaths are among people age 65 or older. Mesothelioma is about four times more common among men than women, reflecting that most exposures to asbestos occurred occupationally in jobs primarily held by men. The mesothelioma incidence rate is highest among males in the northeast region of Minnesota, more than double the statewide average rate for 1998 through 2008. MDH is studying the cause of this increased rate and whether it is related to the iron mining

²⁷ The source for mesothelioma incidence and mortality in Minnesota is: *Cancer in Minnesota, 1988-2008 Report to the Legislature 2012*, Minnesota Department of Health, 2012. www.health.state.mn.us/divs/hpcd/cdee/mcss/documents/2012mcssreport.pdf

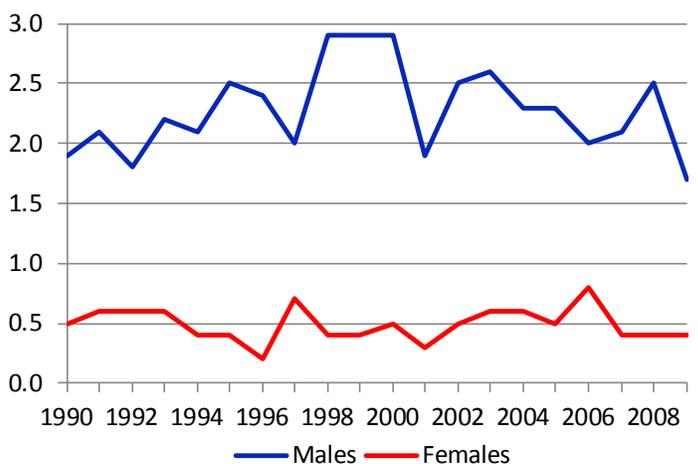
industry.

Figure 7.9 Number of new malignant mesothelioma cases, by gender, 1990-2009



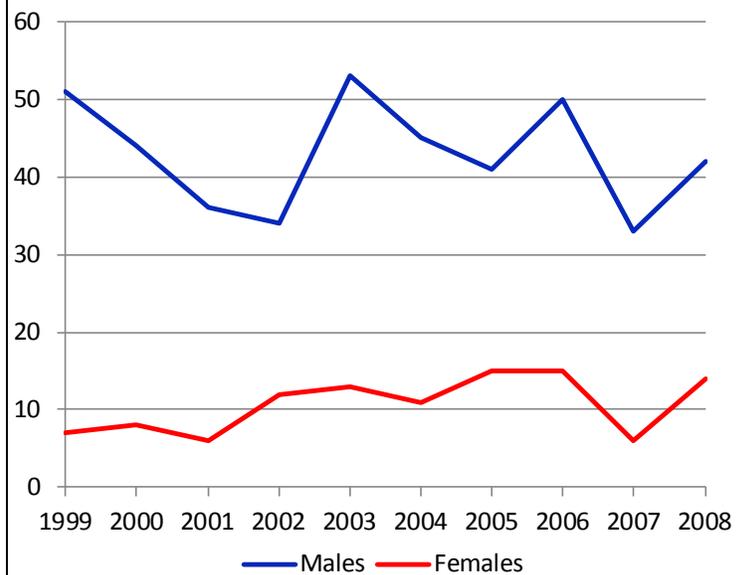
Source: Minnesota Cancer Surveillance System, Minnesota Department of Health.

Figure 7.10 Rate¹ of new malignant mesothelioma cases per 100,000 people, by gender, 1990-2009



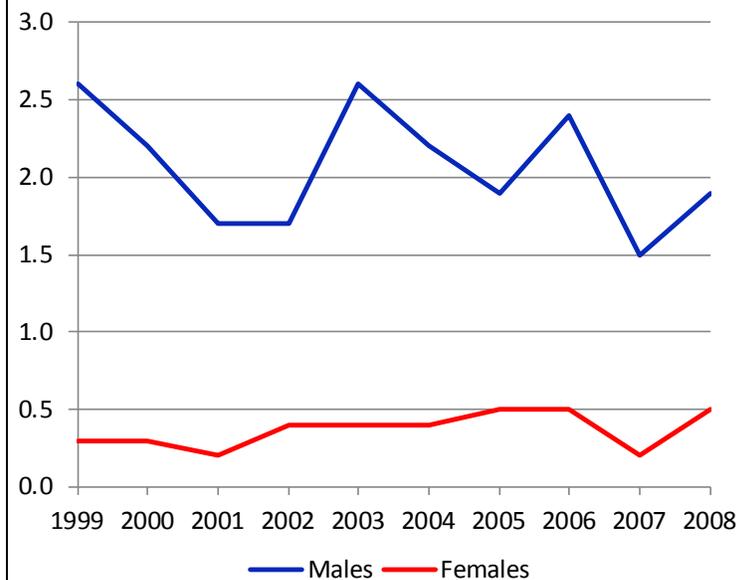
1. Rates are age-adjusted to the 2000 U.S. standard population.
Source: Minnesota Cancer Surveillance System, Minnesota Department of Health.

Figure 7.11 Number of deaths due to mesothelioma, by gender, 1999-2008



Source: Minnesota Center for Health Statistics, Minnesota Department of Health.

Figure 7.12 Rate¹ of deaths due to mesothelioma per 100,000 persons, by gender, 1999-2008



1. Rates are age-adjusted to the 2000 U.S. standard population.
 Source: Minnesota Center for Health Statistics, Minnesota Department of Health.

Elevated blood lead levels among adults (indicator 13)

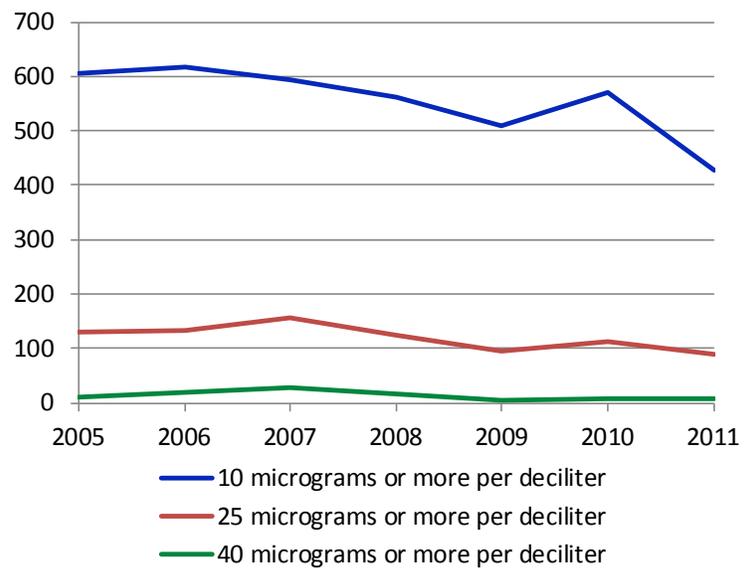
Lead poisoning among adults is primarily due to occupational exposure. Lead adversely affects multiple organ systems and can cause permanent damage. Exposure to lead in adults can cause anemia, nervous system dysfunction, kidney damage, hypertension, decreased fertility and miscarriage. Workers bringing lead dust home on their clothing can expose their close family members to lead.

The blood lead level (BLL) is the best biological indicator of recent lead exposure. A BLL of 25 micrograms per deciliter ($\mu\text{g}/\text{dL}$) or greater for adults is considered “elevated.” Federal OSHA requires employers regularly monitor the BLLs of workers where airborne lead in the workplace exceeds certain levels. When a worker’s BLL is 40 $\mu\text{g}/\text{dL}$ or greater, the employer is required to offer an annual medical exam and other medical interventions depending on the BLL. The average BLL for the general population is less than 2 $\mu\text{g}/\text{dL}$.

Health care professionals and laboratories in Minnesota are required to report all BLL results to MDH. The Adult Blood Lead Epidemiology and Surveillance (ABLES) program at MDH collects and maintains the dataset of all adult BLLs. The data is then provided to the Center for Occupational Health and Safety for this indicator.

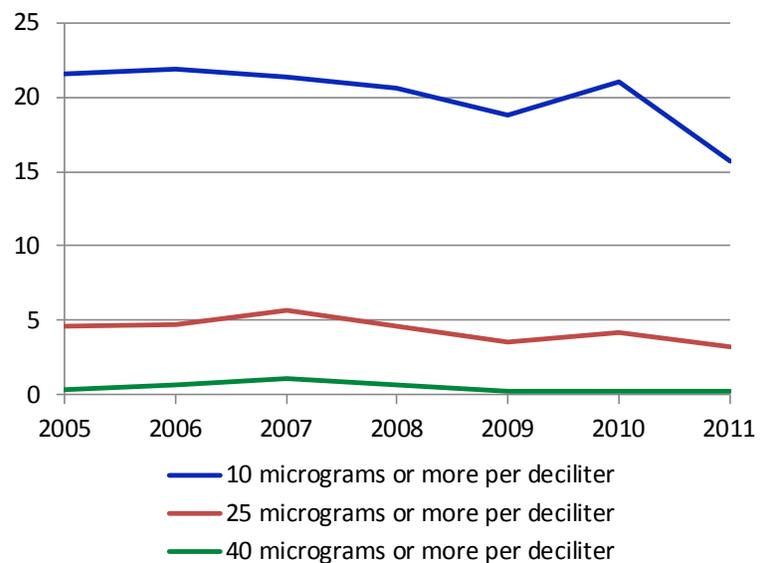
Lower medical removal recommendations have been proposed to protect workers against the adverse health effects of both acute and cumulative lead exposures.

Figure 7.13 Number of new cases with elevated blood lead levels, 2005-2011



Source: CSTE indicators data, Minnesota Department of Health.

Figure 7.14 Rate of new cases with elevated blood lead levels per 100,000 workers, 2005-2011



Source: CSTE indicators data, Minnesota Department of Health.

Appendix A

Definitions of key concepts in the Survey of Occupational Injuries and Illnesses

The U.S. Bureau of Labor Statistics conducts the annual Survey of Occupational Injuries and Illnesses (SOII) to provide nationwide and state-level information about work-related injuries and illnesses, including their number and incidence.²⁸ The survey includes all cases recorded by employers on their OSHA log. Employers with 11 or more employees are required to use the log to record workplace injuries and illnesses, conforming with definitions and recordkeeping guidelines set by the Occupational Safety and Health Administration.²⁹ Employers with 10 or fewer employees participating in the survey record their cases on the OSHA log for the survey year. The SOII data is collected from the OSHA log and from incident reports for cases with at least one day off the job. Employers are notified of their selection for participation in the SOII in December prior to the start of the data collection year.

Work-related injuries and illnesses are new conditions that are caused by, or pre-existing conditions significantly aggravated by, events or exposures in the work environment.

Recordable cases, for 2002 and later years, include work-related injuries and illnesses that result in death, loss of consciousness, days away from work, restricted work activity or job transfer, or medical treatment (beyond first aid). It also includes significant work-related injuries or illnesses diagnosed by a physician or other licensed health care professional. These include any work-related case involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum.

Additional criteria that result in a recordable case include:

- any needlestick injury or cut from a sharp object that is contaminated with another person's blood or other potentially infectious material;
- hearing loss involving a standard threshold shift in hearing in one or both ears;
- any case requiring an employee to be medically removed under the requirements of an OSHA health standard; or
- tuberculosis infection as evidenced by a positive skin test or diagnosis by a physician or other licensed health care professional after exposure to a known case of active tuberculosis.

Some of the differences between recordable cases before and after 2002 are discussed in Appendix C. Information about the recordkeeping guidelines is available at www.dli.mn.gov/OSHA/Recordkeeping.asp.

Occupational injury is any wound or damage to the body resulting from an event in the work environment.

Occupational illness is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to factors associated with employment. It includes acute and chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion or direct contact.

For injuries prior to 2002, the following definitions apply.

Days away from work (DAFW) are days after the injury or onset of illness when the employee would have worked but does not because of the injury or illness.

Days of restricted work activity are days after the injury or onset of illness when the employee works reduced hours, has restricted duties or is temporarily assigned to another job because of the injury or illness.

²⁸ The survey and other BLS occupational safety and health statistics are described in greater detail in Chapter 9 of the *BLS handbook of methods*, at www.bls.gov/opub/hom/homtoc.htm.

²⁹ This is a count of the total number of employees in the firm, across all establishments.

Lost-workday (LWD) cases involve days away from work, days of restricted work activity or both.

1. *Lost-workday cases involving days away from work* are cases that result in DAFW or a combination of DAFW and days of restricted work activity.
2. *Lost-workday cases involving restricted work activity* are cases that result in restricted work activity only.

Cases without lost workdays are recordable cases with no days away from work or days with restricted work activity.

For injuries in 2002 and later, the following definitions apply.

Days away from work, days of restricted work activity or job transfer (DART) are cases that involve days away from work, days of restricted work activity or job transfer, or both.

1. *Cases involving days away from work* require at least one day away from work with or without days of job restriction.
2. *Job transfer or restriction cases* occur when, as a result of a work-related injury or illness, an employer or health care professional keeps or recommends keeping an employee from doing the routine functions of his or her job or from working the full workday the employee would have been scheduled to work before the injury or illness occurred.

Other recordable cases are cases that meet the recordability thresholds but do not involve death, days away from work, or days of restricted work activity or job transfer.

For all survey years, the following definitions apply.

Publishable industry data is summary data about an industry selected for publication in the survey that meets BLS reliability and confidentiality criteria. As part of the survey sample selection process, states decide which industries will include enough surveyed companies to provide potentially publishable data. The remaining industries are grouped into residual industries that provide data for the next-

higher level of categorization.

The reliability criteria consider changes in an industry's employment during the survey period, the relative standard error for the number of lost-workday cases and whether there is a minimum level of employment in that industry. The confidentiality criteria ensure that the identity of data providers and the nature of their data cannot be determined.

Median days away from work is the measure used to summarize the length of work absences among the cases with days away from work. The median is the halfway point in the distribution — half the cases involved more days and half involved fewer days.

Incidence rates represent the number of injuries and illnesses per 100 full-time-equivalent workers. They are calculated as: $(N/EH) \times 200,000$ where:

N = number of injuries and illnesses;
 EH = total hours worked by all employees during the calendar year; and
 200,000 = base for 100 full-time-equivalent workers (working 40 hours a week, 50 weeks a year).

Incidence rates for characteristics of DAFW cases are based on 10,000 full-time equivalent workers.

Nature of injury or illness names the principal physical characteristic of a disabling condition, such as sprain/strain, cut/laceration or carpal tunnel syndrome.

Part of body affected is directly linked to the nature of the injury or illness cited, for example, back sprain, finger cut, or wrist and carpal tunnel syndrome.

Event or exposure signifies the manner in which the injury or illness was produced or inflicted, for example, overexertion while lifting or fall from a higher level.

Source of injury or illness is the object, substance, exposure or bodily motion that directly produced or inflicted the disabling condition cited. Examples are a heavy box, a toxic substance, fire/flame and bodily motion of the injured worker.

Appendix B

Key concepts in OSHA recordkeeping

The data recorded by employers on the OSHA 300 Log of Work-Related Injuries and Illnesses (OSHA log) and the Form 301: Injury and Illness Incident Report (incident report) are the foundation for the data used in the Survey of Occupational Injuries and Illnesses (SOII). The survey includes all nonfatal cases recorded by participating employers on their OSHA 300 logs. Injuries and illnesses logged by employers conform to definitions and recordkeeping guidelines set by OSHA.

It is critical for the validity of the SOII that employers provide complete and accurate information, conforming to OSHA's recordkeeping requirements.

For each recordable case (see the definitions of recordable cases and work-related injuries and illnesses in Appendix A), employers enter the following information on the OSHA log:

- employee's name (unless the injury or illness qualifies as a "privacy case");
- employee's job title;
- the date of injury or onset of illness;
- the location where the event occurred;
- a description of the injury or illness and the object or substances that directly injured or made the person ill;
- classification of the seriousness of the case by its most-serious outcome (most-serious to least-serious are fatality, days away from work, job transfer or work restriction, and other recordable (see definitions in Appendix A));
- the number of days the injured or ill worker was away from work;
- the number of days the injured or ill worker was on job transfer or restriction; and
- classification of the case as an injury or an illness and, if it is an illness, indication of the illness category (skin diseases or disorders, respiratory conditions, poisoning, hearing loss or all other illnesses).

In addition to making a log entry, the employer must also complete an incident report or a Minnesota workers' compensation First Report of Injury form for each recordable case. The SOII uses these reports for the cases with days away from work to generate statistics about injured workers and the characteristics of their injuries and illnesses (see Chapter 4 of this report).

Information on the incident report (or a comparable form) includes:

- employee's name;
- employee's date of birth;
- employee's date hired;
- employee's gender;
- time employee began work;
- time of event;
- text description of the employee's activity just before the incident occurred;
- text description of how the injury occurred;
- text description of the injury or illness, including the part of the body affected and how it was affected; and,
- text description of the object or substance that directly harmed the employee.

The information used by the survey is copied by employers from the OSHA log and the incident report and transferred to the SOII reporting forms between January and July of the following year, with the majority of reports coming before April. For employers reporting early in the period, information about durations away from work or job restrictions for cases that occurred during the final months of the year may be less accurate. The recordkeeping requirements instruct employers to update the OSHA log information as more information becomes available.

Accurate OSHA recordkeeping is an employer responsibility that requires training and the availability of technical advice. Given the infrequency of workplace injuries and illnesses and the complexity of the forms, recordkeeping

errors are common. Many errors are uncovered and corrected during the editing process of the SOII data collection.

Employers also confuse the OSHA recordkeeping requirements and the Minnesota workers' compensation reporting requirements, and apply workers' compensation rules for determining work-relatedness and coverage to the OSHA log. For example, mental stress claims without physical injury are not covered by the Minnesota workers' compensation system, but are recordable on the OSHA log.

Among the common OSHA log errors are:

- counting cases where only first aid (or no aid at all) was provided;
- classifying a case into more than one case type when both days away from work and job restriction occurred;
- classifying a case into the wrong case type when both days away from work and job restriction occurred;
- counting a case in more than one year when days away from work or job restriction occur in multiple years;
- counting only scheduled workdays instead of calendar days; and
- including the day of the injury in the count of days away from work.

The Minnesota Department of Labor and Industry provides OSHA recordkeeping advice for employers through multiple channels. The Web page at www.dli.mn.gov/OSHA/Recordkeeping.asp includes:

- links to the OSHA log forms;
- text of the OSHA recordkeeping requirement;
- a series of Recordkeeping 101 and Recordkeeping 201 features from the quarterly MNOSHA newsletter, *Safety Lines*; and
- *Ten tips for improving your OSHA log.*

Employers may contact the MNOSHA Compliance or Workplace Safety Consultation units or the SOII staff in the Research and Statistics unit for recordkeeping assistance. MNOSHA compliance inspectors and WSC consultants also provide on-site log review and assistance during worksite visits.

The federal OSHA recordkeeping site also provides resources for employers at www.osha.gov/recordkeeping. This includes the *OSHA recordkeeping handbook* and training presentation slides and scripts.

Appendix C

Major changes to OSHA's recordkeeping rule in 2002

OSHA instituted changes in its recordkeeping requirements, effective Jan. 1, 2002, to remove some of the subjectivity involved in making decisions about what injuries and illnesses employers need to record on the OSHA Log of Work-Related Injuries and Illnesses. Improving the employers' recordkeeping consistency should improve the quality of the estimates produced by the BLS Survey of Occupational Injuries and Illnesses (SOII), which relies on the OSHA log records.

To disseminate information about the new recordkeeping requirements, all employers participating in the 2002 SOII were sent new OSHA log packets with introductory material. The Minnesota Department of Labor and Industry's Workplace Safety Consultation consultants traveled throughout the state during 2002, conducting 53 training sessions about the new recordkeeping requirements.

Additional information about the recordkeeping requirements and the changes to the OSHA log for 2004 and later is available at www.dli.mn.gov/OSHA/Recordkeeping.asp.

The following are some of the major changes and how they may have affected the SOII estimated number of cases after the changes were implemented.

- Where a pre-existing (non-work-related) condition is present, a case is recordable only if a significant aggravation by a workplace event or exposure occurs. A significant aggravation is any of the following, if caused by the occupational event or exposure:
 1. death;
 2. loss of consciousness;
 3. one or more days away from work;
 4. one or more days of restricted work or job transfer; or
 5. medical treatment.

Under the old requirements, any aggravation of a pre-existing condition by a workplace event or exposure makes a case recordable. This change tends to reduce the number of cases.
- An aggravation of a case where signs or symptoms have not been resolved is not a new case, even if the aggravation was caused by a new event or exposure. Previously, each new event or exposure was treated as a new case. **This change tends to reduce the number of cases.**
- Under the previous requirements, a cumulative trauma disorder was considered a new case if no care was received for the previous 30 days. The new requirements have no such criteria. In the absence of a new work-related event or exposure, the reappearance of signs or symptoms may be treated as part of the previous case. **This change tends to reduce the number of cases.**
- Under the previous requirements, all work-related illnesses were recordable. Under the new requirement, work-related illnesses are recordable only if they meet the general recording criteria applicable to all injuries and illnesses. **This change tends to reduce the number of cases.**
- Restricted work activity occurs when an employee cannot perform all of his or her routine job functions, which are defined as any duty regularly performed at least once a week. The previous requirements defined normal job duties as any duty the worker would be expected to do throughout the year. **This change tends to reduce the number of cases of restricted work activity.**
- Restricted work activity limited to the day of injury does not make a case recordable. Under the previous requirements, restricted

- work limited to the day of injury was a recordable case. **This change tends to reduce the number of cases of restricted work activity and may also reduce the total number of cases.**
- The counting of days away from work and days of restricted work activity changed from work days to calendar days. To the extent that employers previously only counted work days, **this tends to increase the number of cases of days away from work and days of restricted work activity. This will also increase the number of days for both categories.**
 - The new criteria allow employers to cap the number of days at 180. Previously, there was no cap on the count of days. This change will not affect the calculation of the median number of days away from work or the distribution of cases by days away from work.
 - Changes and clarifications to what is considered first aid (not recordable) and what is considered medical treatment (recordable) may result in slight changes in the number of recordable cases. The new criteria include a comprehensive list of first aid, so that less discretion is needed to know when a case should or should not be recorded. To the extent that different employers may have interpreted treatments and first aid differently, **it is unclear how the total number of recordable cases will be affected.**
 - A significant injury or illness diagnosed by a licensed health care provider is recordable, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid or loss of consciousness. This list includes cancer, chronic irreversible diseases, a fractured or cracked bone, or a punctured eardrum. The previous criteria only included fractures and second- and third-degree burns. **This may slightly increase the total number of cases.**
 - All work-related needlestick injuries and cuts from sharp objects that are contaminated with another person's blood or other potentially infectious material are recordable as injuries. Previously, these cases were recordable only if they met the criteria for all injuries or if sero-conversion was present. **This will increase the number of reported needlestick cases.**
 - Work-related musculoskeletal disorders (MSDs) are recordable when general recording criteria are met. Previously, MSDs were recordable under the general criteria or when identified through a clinical diagnosis or diagnostic test. **This tends to reduce the number of MSD cases.**

Appendix D

Comparison of estimates from the annual Survey of Occupational Injuries and Illnesses and workers' compensation records

This appendix compares characteristics of SOII cases and workers' compensation claims to provide readers and policymakers with information to gauge the consistency of the measures of work-related injuries and illnesses. Decisions about workplace safety at work establishments and at the state policy level should be based upon an understanding of the scope and limitations of the available data and confidence in their quality.

The first two comparisons in this appendix examine the number and rate of cases in both programs. These are followed by comparisons of worker gender and age, the part of body injured and the event or exposure leading to the injury or illness. Before examining the two systems, some background is provided on the issues involved in counting work-related injuries and illnesses, why different programs produce different estimates, and why it is very likely that substantial numbers of cases go unreported and uncounted.

The undercount of work-related injuries and illnesses

During the past decade, research by economists and epidemiologists has found many work-related injuries and illnesses are not included in the estimates provided by the SOII. While the BLS acknowledges the SOII is not a complete count of work-related injuries and illnesses, especially long-latency illnesses, recent research has shown cases that should be included on OSHA logs and SOII reports are missing.³⁰

The SOII collects OSHA-recordable injuries and illnesses, which are not necessarily the same as cases reported to state workers' compensation

systems. Some differences between OSHA-recordable cases and Minnesota workers' compensation claims are presented on the DLI website at www.dli.mn.gov/OSHA/PDF/rcdkpg201_10.pdf.

Readers interested in reviewing the research addressing the reporting of workplace injuries and illnesses and the undercount of cases in the SOII and in workers' compensation systems are invited to start with this short list of recent studies and articles and to continue with the studies referenced by them. Some of these studies discuss reasons why there are systemic differences between workers' compensation claims, OSHA log cases and the SOII estimates. As Ruser details (in his article listed below), BLS is continuing to research the undercount issue and to seek ways to improve the accuracy of the SOII estimates.

- Emily A. Spieler and John F. Burton Jr., "The lack of correspondence between work-related disability and receipt of workers' compensation benefits," *American Journal of Industrial Medicine*, 2012, 55, pp. 487-505. This paper examines the legal, administrative and social factors that result in many workers with work-related injuries and illnesses not receiving workers' compensation benefits, including reasons why some workers don't file claims and why insurance companies deny liability for benefits.
- Arthur Oleinick and Brian Zaidman, "The law and incomplete database information as confounders in epidemiologic research on occupational injuries and illnesses," *American Journal of Industrial Medicine*, 2010, 53, pp. 23-36. This study looks at the correspondence between Minnesota's SOII estimates for days-away-from-work (DAFW) cases and the number of claims in

³⁰ Many of the same studies also show workers' compensation claims totals are missing similar amounts of injury and illness cases. See the studies listed later in this appendix.

DLI's workers' compensation claims database. Adjustments were made to both counts to create data files that represent the same set of cases. Their results show the SOII undercounted workers' compensation claims by 10 percent from 1998 to 2001.

- Nicole Nestoriak and Brooks Pierce, "Comparing workers' compensation claims with establishments' responses to the SOII," *Monthly Labor Review*, May 2009, pp. 57-64. These BLS economists examine the correspondence between Wisconsin's SOII DAFW cases and workers' compensation claims to uncover reasons why some workers' compensation claims are not captured by the SOII process. They find workers' compensation claim status indicator is highly related to the propensity that a workers' compensation claim is also reported on the SOII – cases that received their benefits through the dispute resolution system were much less likely to be reported on the SOII. They also find injuries that are more severe, easily identifiable or have a sudden onset are more likely to be recorded in both systems.
- John Ruser, "Examining evidence on whether BLS undercounts workplace injuries and illnesses," *Monthly Labor Review*, August 2008, pp. 20-32. Ruser, writing as the Assistant Commissioner of the BLS with responsibility for the SOII program, details the BLS programs to examine the undercount, discusses the systemic reasons why the SOII does not count all work-related injuries and illnesses, and reviews the undercount research.
- Leslie I. Boden and Al Ozonoff, "Capture-recapture estimates of non-fatal workplace injuries and illnesses," *Annals of Epidemiology*, June 2008, pp. 500-506. This research study linked DAFW cases reported on the SOII with workers' compensation claims in six states, including Minnesota. They find substantial underreporting in both systems and in all states. For Minnesota, they estimated the SOII captures 68 percent of the work-related injuries and illnesses, and the workers' compensation claims database captures 65 percent of the cases.

DLI published a report comparing employers' workers' compensation claims with their OSHA logs: Eleni Messiou and Brian Zaidman, "Comparing workers' compensation claims and OSHA data initiative cases," 2005. (This report is available

at www.dli.mn.gov/RS/ClaimsOshaData.asp.)

This study looks at the characteristics of OSHA log cases that were not in DLI's workers' compensation claims database and workers' compensation cases that were not included in the employers' OSHA logs. They find many of the failures to match cases in the two systems were due to misidentification of cases on OSHA logs and differences in reporting deadlines and updating information in the OSHA and workers' compensation programs.

Number of injuries and illnesses

The estimated number of workers' compensation claims and the number of workers' compensation indemnity claims are compared to the estimated number of OSHA-recordable cases and the estimated number of days-away-from-work (DAFW) cases, respectively, in Figure D.1. The methodology for estimating the number of workers' compensation claims is provided in Appendix C of the *Minnesota Workers' Compensation System Report – 2010* (www.dli.mn.gov/RS/PDF/wcfact10.pdf).

The workers' compensation claims estimation procedure used by DLI calculates the developed number of workers' compensation claims, which is the estimated number of claims that will ultimately be known. For example, the reported number of workers' compensation indemnity claims for 2010, counted on Oct. 1, 2011, nine months after the end of the year, was multiplied by a development factor of 1.124 to produce the developed claims estimate. The estimates change annually, as additional claims information becomes available.

In contrast, the SOII counts OSHA-recordable cases from one month to six months after the end of the year being measured. The SOII estimates are a snapshot of the number of claims that are known very soon after they occurred and are not updated as employers learn additional information. This is the most important reason why the annual estimates of DAFW cases, which includes cases with one or more days of disability, are not significantly greater than the

estimates of indemnity claims, which have more than three days of disability. Claims development also affects the comparison of total workers' compensation claims and total recordable cases.

The number of workers' compensation claims and the estimated number of OSHA-recordable injuries and illnesses cases are in the same range of values and the trends in the cases are similar.

- For the 2003 to 2010 period, the total number of workers' compensation claims decreased by 24 percent while the estimated number of OSHA-recordable cases decreased by 31 percent. For the 2003 to 2010 period, the estimated number of workers' compensation indemnity claims decreased by 21 percent while the estimated number of DAFW cases decreased by 28 percent.

Rate of injuries and illnesses

The estimated workers' compensation claims rate and the estimated workers' compensation indemnity claims rate are compared to the estimated OSHA-recordable case rate and the estimated DAFW case rate, respectively. The methodology for estimating the rate of workers'

compensation claims is provided in Appendix C of the *Minnesota Workers' Compensation System Report – 2010* (www.dli.mn.gov/RS/PDF/wcfact10.pdf).

Because the rates are based on the estimated numbers of claims, the same precautions issued for the comparison of the number of injuries and illnesses must be taken into consideration. The workers' compensation rates and the SOII rates are calculated using the same SOII estimates of total hours worked to convert the estimated claims and case numbers into rates.

Figure D.2 on page 69 shows the rate of workers' compensation claims and the rate of OSHA-recordable injuries and illnesses cases are in the same range of values and the trends in the cases are similar.

- For the 2003 to 2010 period, the rate for all workers' compensation claims decreased by 21 percent while the rate for OSHA-recordable cases decreased by 29 percent.
- For the 2003 to 2010 period, the workers' compensation indemnity claims rate decreased by 18 percent while the DAFW case rate decreased by 27 percent.

Figure D.1 Estimates of workers' compensation claims and SOII cases, 2003-2010

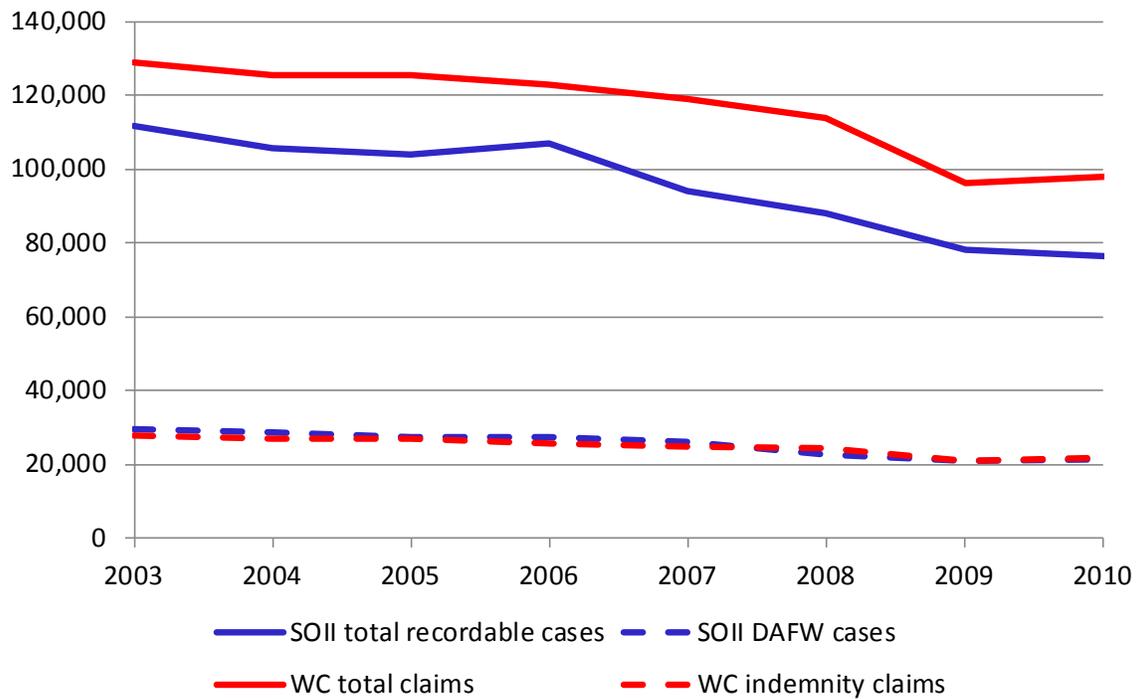
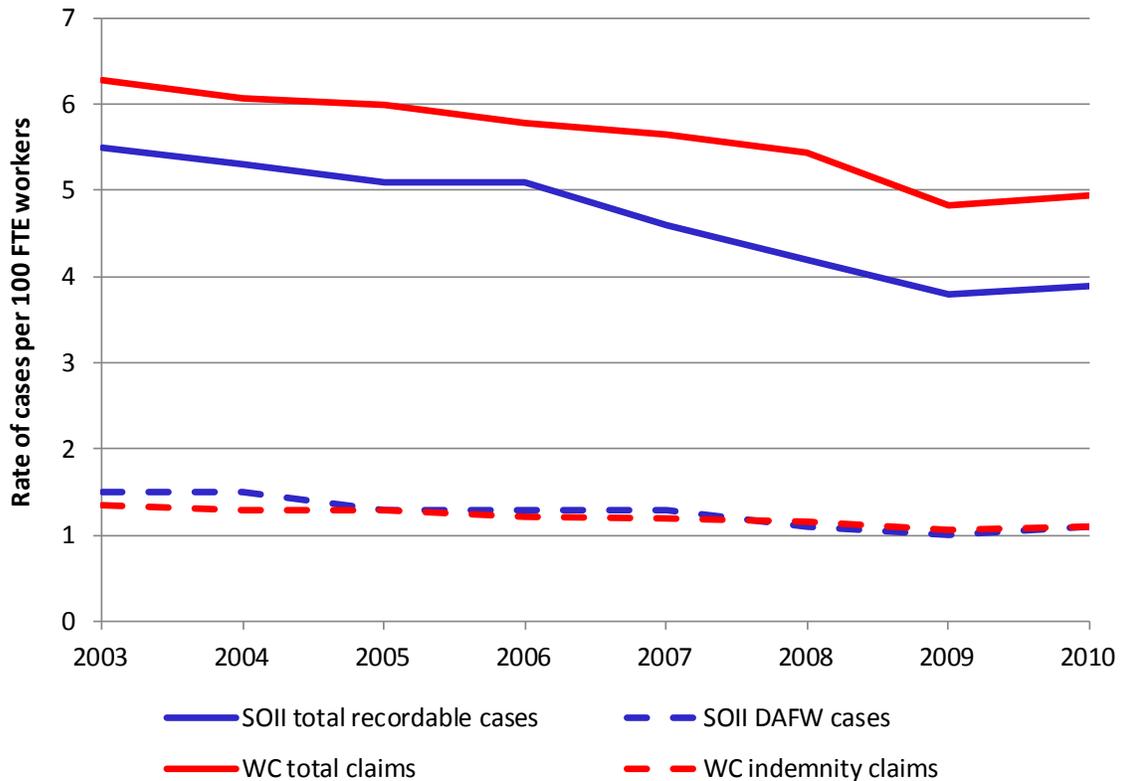


Figure D.2 Estimates of workers' compensation claim rates and SOII case rates per 100 full-time-equivalent workers, 2003-2010



Injured worker characteristics

This report presents information about two sets of characteristics in Chapter 4, those concerning the injured worker and those concerning the injury or illness. Two worker characteristics and two injury characteristics that are available in both systems were selected for presentation in this appendix. These characteristics are only available for workers' compensation indemnity claims and the SOII DAFW cases. Only injuries and illnesses that were occurred in 2010 are compared.

As shown in Figures D.3 and D.4, the distributions of cases by gender and age are very similar, and are consistent with a large amount of overlap of cases in the two systems.

Figure D.3 Percentage of cases by gender, 2010

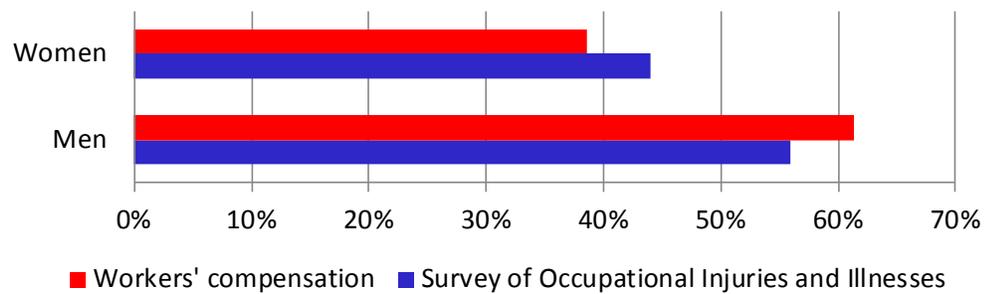
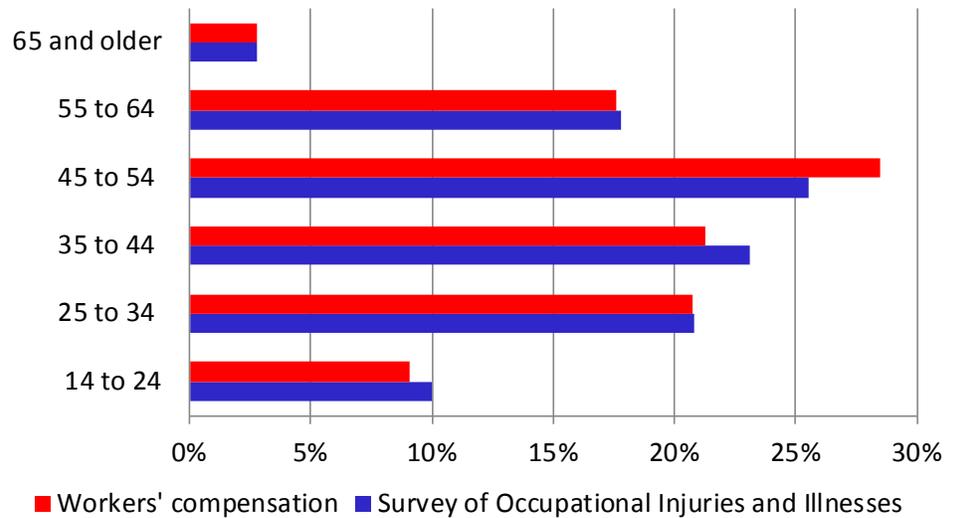


Figure D.4 Percentage of cases by age of worker, 2010



Injury characteristics

As shown in Figures D.5 and D.6, the distributions of cases by part of body injured and event or exposure are very similar, and are consistent with a large amount of overlap of cases in the two systems.

Some of the differences in the injury characteristics are due to differences in coding practices between the DLI staff members reading and coding the workers' compensation and SOII injury reports.

The higher percentage of head injuries for the SOII is due to the high percentage of head injuries that involve only one or two days away from work, 62 percent, compared to 31 percent for all DAFW cases.

Figure D.5 Percentage of cases by part of body injured, 2010

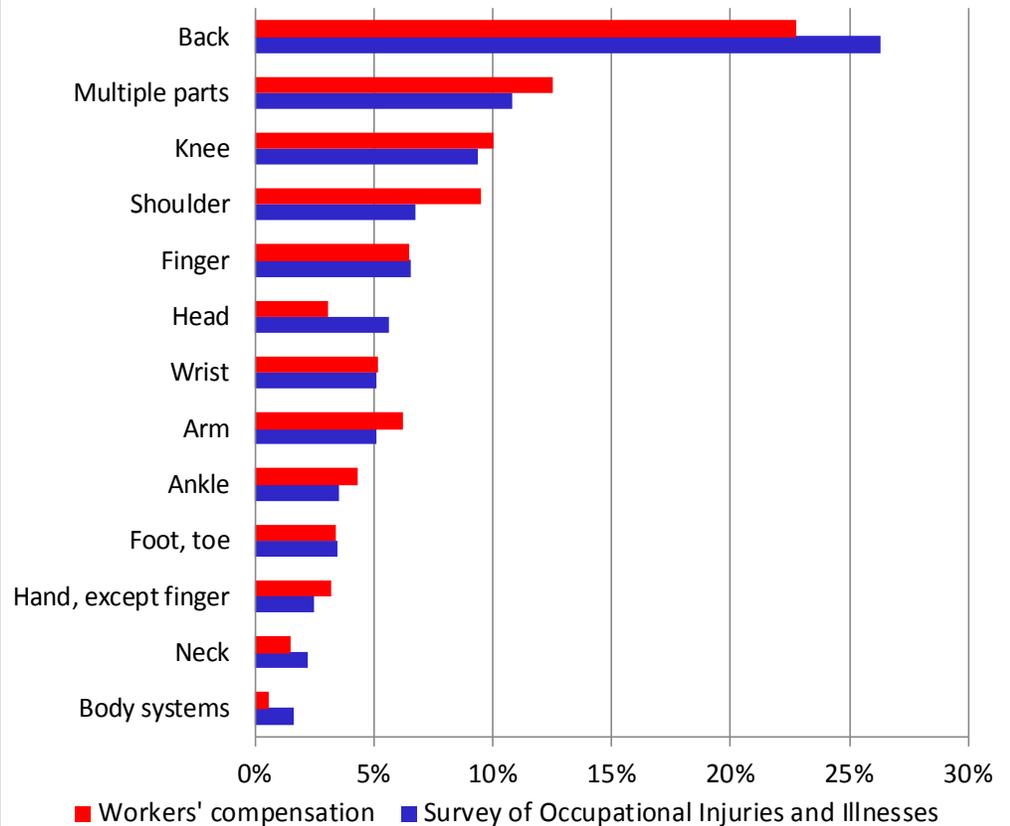


Figure D.6 Percentage of cases by event or exposure, 2010

