

# Occupational Health Indicators in North Dakota: A Baseline Occupational Health Assessment 2004-2008

Prepared by:

Anna Briggs, MPH<sup>1</sup>

Kaylan Stinson, MSPH<sup>2</sup>

Corey Campbell, MS<sup>3</sup>

Yvonne Boudreau, MD, MSPH<sup>3</sup>

Pat McGovern, PhD, MPH, RN<sup>1</sup>

<sup>1</sup>The Midwest Center for Occupational Health and Safety

University of Minnesota School of Public Health

<sup>2</sup> Mountain and Plains Education and Research Center

University of Colorado Denver - Colorado School of Public Health

<sup>3</sup> National Institute for Occupational Safety and Health

Western States Office, Denver, CO



**The Midwest Center for Occupational Health and Safety**

**MOUNTAIN  
& PLAINS ERC**  
*A NIOSH Education and Research Center for  
Occupational & Environmental Health & Safety*



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## Executive Summary

The Midwest Center for Occupational Health and Safety (MCOHS) and the Mountain and Plains Education and Research Center (MAP ERC), in collaboration with the National Institute for Occupational Safety and Health (NIOSH) Western States Office, Denver, have prepared this data-driven report to provide a baseline occupational health status of workers in North Dakota (ND). The purpose of this assessment is to provide the state with the data needed to examine the benefits of conducting state-wide occupational health surveillance, to help describe potential emerging issues, and to assist in determining priorities for prevention of work-related injuries and illnesses. The reader is cautioned that the data and analyses presented herein are descriptive in nature and are not intended to offer causal explanations or identify worker tasks, experience, training or control measures. Further, the design of the report does not account for changes in state or national economic and demographic conditions or changing workforce characteristics. Highlights of the report are listed below:

- The average annual rate of fatal work-related injuries in ND (7.3 per 100,000 workers) is higher when compared to the overall US rate (3.9 per 100,000 workers).
- The rate of work-related pesticide poisonings from 2004 - 2008 was 3.3 per 100,000 workers and increased between 2007-2008.
- ND has a higher percentage of workers employed in occupations (17%) and industries (21%) with a high risk for occupational mortality when compared to the US (14% and 10.5%, respectively).
- The average benefit paid per worker covered by Workers' Compensation (\$276) in ND was much lower when compared to the US (\$415) between 2004-2008.

For the years 2004 to 2008, rates of work-related fatalities in ND were higher than overall US rates. The percent of workers employed in industries and occupations at high risk for occupational mortality was higher than national percentages. Priorities and future directions for prevention and intervention should focus on industries and occupations experiencing a disproportional rate of fatal work-related injuries and illnesses.

There is a significant gap in data and need for workplace health surveillance in ND for non-fatal work-related injuries and illnesses. ND is one of seven states that does not participate in the Survey of Occupational Injuries and Illnesses (SOII). The SOII collects data on nonfatal work-related injuries and illnesses reported by employers. These data are helpful in describing the burden of injuries and illnesses that occur in the workplace. Additionally, ND is one of ten states that does not participate in the Adult Blood Lead Epidemiology and Surveillance (ABLES) program (<http://www.cdc.gov/niosh/topics/ABLES/ables.html>). The ABLES program is a state-based surveillance program of laboratory-reported adult blood lead levels. The program objectives are to build state capacity to initiate, expand, or improve adult blood lead surveillance programs to accurately trend adult lead levels related to work exposure and to help guide effective interventions.

## Recommendations

The authors of this report believe that the collection of the Occupational Health Indicators, as developed by NIOSH, and the Council of State and Territorial Epidemiologists (CSTE), is useful in improving specific data collection for ND and that the resultant characterization of occupational injury and illness is instrumental in setting priorities for prevention efforts within the state. However, it is only a first step in developing a comprehensive occupational health surveillance program for ND. The following recommendations are offered to help facilitate that process. The first four recommendations can be accomplished with minimal resources and within a short time frame. The remaining recommendations may take a longer period of time and expanded funding to complete.

- Helping state and county agencies recognize the importance of state-based occupational health surveillance is the first step in developing a comprehensive and effective state-based occupational health surveillance program. One way to do this is to hold a meeting with key stakeholders (public, private and labor organizations) to discuss the importance of state-based occupational health surveillance, how to effectively implement surveillance activities, and what resources are needed.
- Actively seek funding (state, federal and foundation) to support state-based occupational safety and health activities. This includes applying for funding for a state-based surveillance program through the NIOSH cooperative agreement.
- Explore ways and identify resources needed to participate in the Survey of Occupational Injuries and Illnesses (SOII) to obtain data on non-fatal work-related injuries and illnesses.
- Explore ways and identify resources needed to participate in the in the NIOSH Adult Blood Lead Epidemiology and Surveillance (ABLES) program to obtain data on blood lead levels in ND residents.
- Commit to establishing minimum state-based activities in occupational safety and health as recommended by CSTE and NIOSH, will plans to expand to comprehensive activities. (see Guidelines for Minimum and Comprehensive State-Based Public Health Activities in Occupational Safety and Health, NIOSH Publication No. 2008-148. Available at <http://www.cdc.gov/niosh/docs/2008-148/>)
- Examine key indicators presented in this report in greater depth to target future state-specific surveillance and intervention efforts in occupations and industries of greatest concern. Where appropriate, extend years of analysis and conduct trend analyses.
- Expand mandatory disease reporting in ND to include occupational and environmental disease and injury.
- Participate in meetings and other activities with NIOSH and other states collecting occupational health and safety data.

## Introduction

Each year, thousands of workers in North Dakota (ND) are exposed to workplace conditions that result in occupational illnesses and injuries. At present, there is no comprehensive, state-wide surveillance system in ND that provides routine data collection, analysis and the development of intervention and prevention strategies for a variety of work-related health effects. The development of a comprehensive occupational health surveillance system is essential for the identification and prevention of workplace related injuries and illnesses and can assist with assuring workplaces are safer and healthier.

In recognition of the need for state-based occupational health surveillance programs nationwide, the National Institute for Occupational Safety and Health (NIOSH) and the Council of State and Territorial Epidemiologists (CSTE) developed a list of occupational health indicators (OHIs) for the purpose of describing the demographics and the baseline health of working populations, tracking occupational health trends over time and comparing state data to national data. The goal is to guide state priorities in workplace injury and illness prevention and intervention. Of the 20 indicators, 13 report injury and illness resulting from occupational hazards; three describe potential workplace health and safety hazards; two examine intervention activities; one measures harmful exposures in the workplace; and one describes the socio-economic impacts of work-related injuries and illnesses.

The purpose of this project is to describe the baseline occupational health status of workers in ND using the OHIs with the target objective of building capacity for occupational health surveillance in ND.

Specifically, the goals of this report are to:

- Identify state and national data sets describing occupational health pertinent to ND
- Develop a systematic approach to identifying and accessing available data sources
- Collect and compile available data from 2004 to 2008
- Describe the status of worker health in ND
- Determine gaps in the data
- Define the greatest needs for workplace health surveillance
- Determine priorities for prevention and workplace intervention efforts
- Recommend future directions

The indicators presented in this report describe core data to inform and guide the development of programs to prevent work-related injuries and illnesses. The report is a product of the Midwest Center for Occupational Health and Safety in collaboration with the Mountain and Plains Education and Research Center (MAP ERC). Both centers aim to improve occupational and environmental health and safety through education, research, and community partnership, and are funded by the Centers for Disease Control and Prevention/NIOSH. This report represents the views of the authors and should not be considered the official views of the sponsoring agency or any other institution.

We would like to thank and acknowledge the ND Department of Public Health, ND Workforce Safety and Insurance, NIOSH and CSTE for their help in accessing data that contributed to this report.

## Methods

Using the CSTE *Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and their Determinants*, found at [www.cste.org](http://www.cste.org) (May 2010 update), a core set of data was abstracted from existing ND and national datasets for the years 2004-2008 (when available). Exceptions for years are noted in the methods section of each OHI. When appropriate, state and national data are compared.

Detailed methods are described in the CSTE Guidelines. As of the date of this report, eighteen indicators are complete, one is not publically available (Indicator 2: work-related hospitalizations), and two are not completed because the data are not available (Indicator 4: amputations reported by employers, and Indicator 13: elevated blood lead levels among adults). Each OHI presented in this report is described in terms of its significance, specific methods, results, limitations and recommendations. It should be noted that some of the OHIs are based on small numbers and as a result, crude numbers, percentages and rates can change considerably from one year to the next. A list of data sources can be found at the end of this report.

## Occupational Health Indicators

- Employment and Demographic Profile
- 1 Non-fatal Injuries and Illnesses
- 2 Work-related Hospitalizations
- 3 Fatal Work-related Injuries
- 4 Amputations Reported by Employers
- 5 Amputations Identified in State Workers' Compensation
- 6 Hospitalizations for Work-related Burns
- 7 Musculoskeletal Disorders Reported by Employers
- 8 Carpal Tunnel Syndrome Cases Identified in State Workers' Compensation
- 9 Pneumoconiosis Hospitalizations
- 10 Pneumoconiosis Mortality
- 11 Acute Work-related Pesticide Poisonings Reported 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 in Occupations and Industries with High Risk for Occupational Mortality
- 17 Occupational Health and Safety Professionals
- 18 OSHA Enforcement Activities
- 19 Workers' Compensation Awards
- 20 Work-Related Low Back Disorder Hospitalizations

## North Dakota Employment Demographic Profile

### Significance

Understanding the diversity of workers and the characteristics of working populations is essential in the assessment of occupational health and work-related injury and illness prevention. It allows for more detailed analysis of worker subgroups who may be experiencing higher than expected rates of work-related injuries or illnesses and helps in the planning and development of prevention activities that are culturally appropriate.

### Methods

The demographic and employment characteristics for ND and US civilian workers were obtained from the Bureau of Labor Statistics (BLS) Current Population Survey and BLS Geographic Profiles of Employment and Unemployment. Age, sex, race/ethnicity and employment characteristics are described for the years 2004 to 2008 for both ND and the US.

### Results

#### Demographics

##### Age

- Between 2004 and 2008, over 92% of civilian workers employed in ND were between the ages of 18 and 64 years.

Figure P.1 Employed ND and US Civilian Workers by Age, 2004-2008

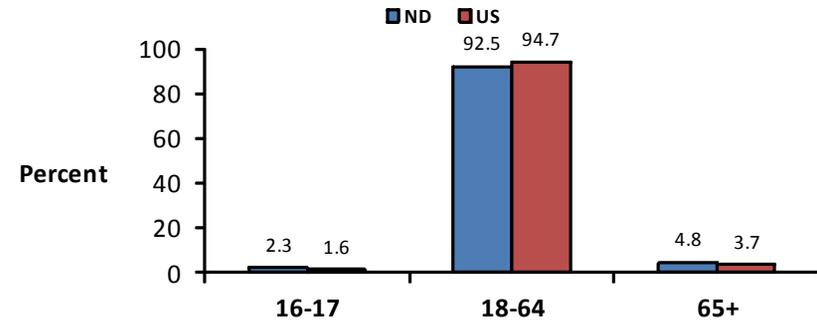
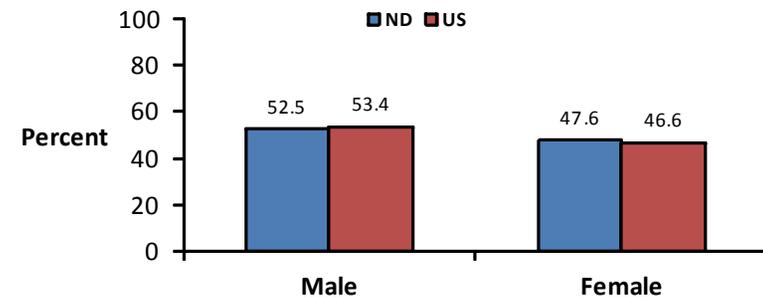


Figure P.2 Employed ND and US Civilian Workers by Sex, 2004-2008



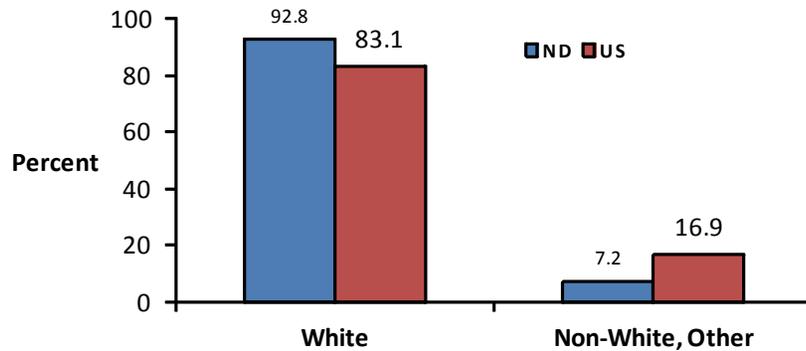
##### Sex

- The distribution of sex for ND and the US civilian workers from 2004 to 2008 was similar. Overall, there were slightly more male workers than female workers.

## Race/Ethnicity

- The majority of civilian workers in ND and the US from 2004 to 2008 were White.

**Figure P.3 Employed ND  
and US Civilian Workers by Race and Ethnicity,  
2004-2008**



## Limitations

- Demographic and workforce characteristics are helpful to describe the workforce, but do not directly measure occupational risks or hazards.
- Data from the Current Population Survey, a monthly probability sample of households in the United States, provide only an estimate.
- Workers under the age of 16, active-duty military and inmates are not included in the estimates.
- The percentage of racial or ethnic workers may be underestimated if they do not have permanent residences or are migratory. Thus, in states that experience high rates of seasonal employment, the demographic data are likely to underestimate the size of the population at risk for work-related injuries and illnesses.

## Recommendations

- Determine how workforce demographics and characteristics impact work-related injuries and illnesses in ND.
- Develop methods for tracking migratory worker populations in order to assess work-related injuries and illnesses among this population in ND.

### Employment Characteristics

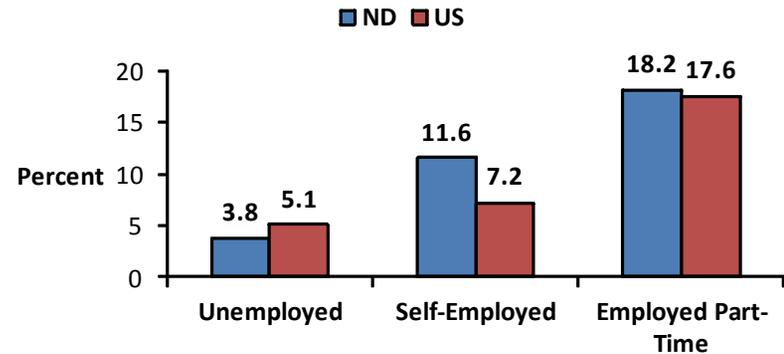
More than 347,000 civilian workers per year were employed in ND for the years 2004 to 2008. Table P.1 shows the number of civilian workers in ND and the US by year.

**Table P.1 Number of Civilian Workers Employed, ND and US, 2004-2008**

Year	North Dakota	United States
2004	347,000	139,252,000
2005	349,000	141,730,000
2006	355,000	144,427,000
2007	358,000	146,047,000
2008	361,000	145,882,476

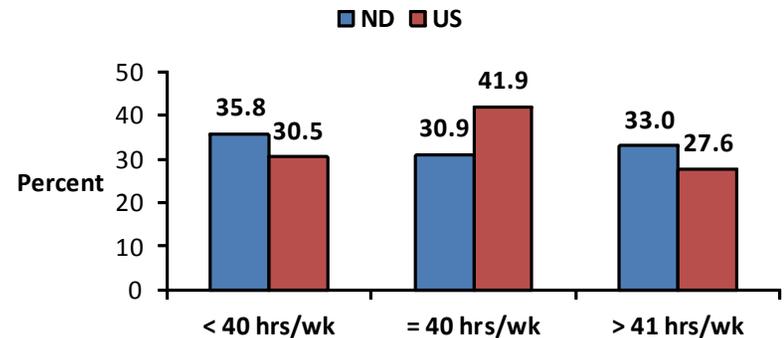
- Between 2004-2008 the average unemployment rate in ND was 3.8, ranging from 3.4 in 2004 to 5.6 in 2008. The average unemployment rate during this time was slightly lower in ND than the US. Figure P.4. shows the employment status of ND and US civilian workers for 2004-2008.
- Approximately 11.6% of civilian workers in ND were self-employed during 2004-2008, slightly higher than the US (Figure P.4)
- On average between 2004-2008, fewer than 19% of civilian workers in ND and the US were employed part-time.

**Figure P.4 Employed ND and US Civilian Workers by Employment Status, 2004-2008**



- The majority of civilian workers employed in ND and the US from 2004 to 2008 were employed full-time and worked at least a standard work week of 40 hours or greater. (Figure P.5)

**Figure P.5 Employed ND and US Civilian Workers by Hours Worked, 2004-2008**



### Industries and Occupations

- Industries that employed the most civilian workers in ND and the US from 2004 to 2008 were Education and Health Services; Wholesale and Retail Trade; and Agricultural and related. Figure P.6 represents the distribution of ND workers in each industry.

- Occupational groups that employed the most civilian workers in ND and the US from 2004 to 2008 were Professional and Related Occupations; Management, Business and Financial Operations; and Service. The following graph distribution represents the percentage of ND workers in each occupational group.

Figure P.6 Employed ND Civilian Workers by Industry (%)

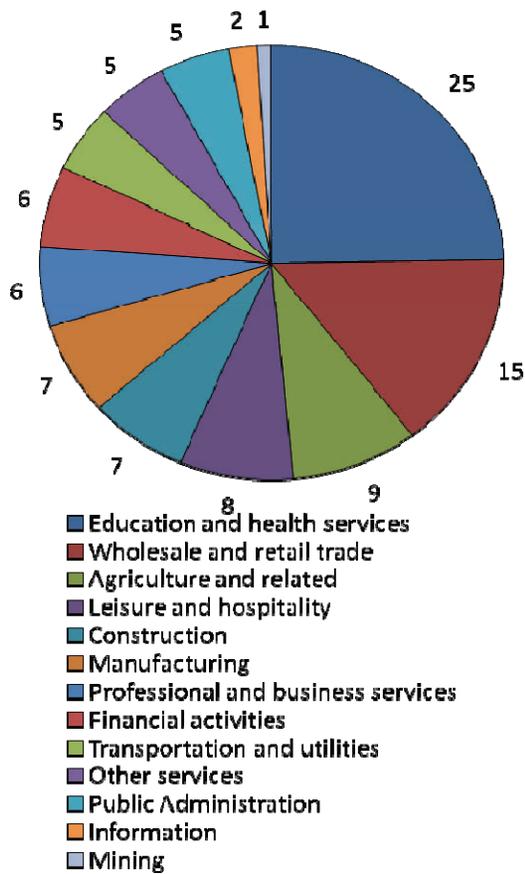
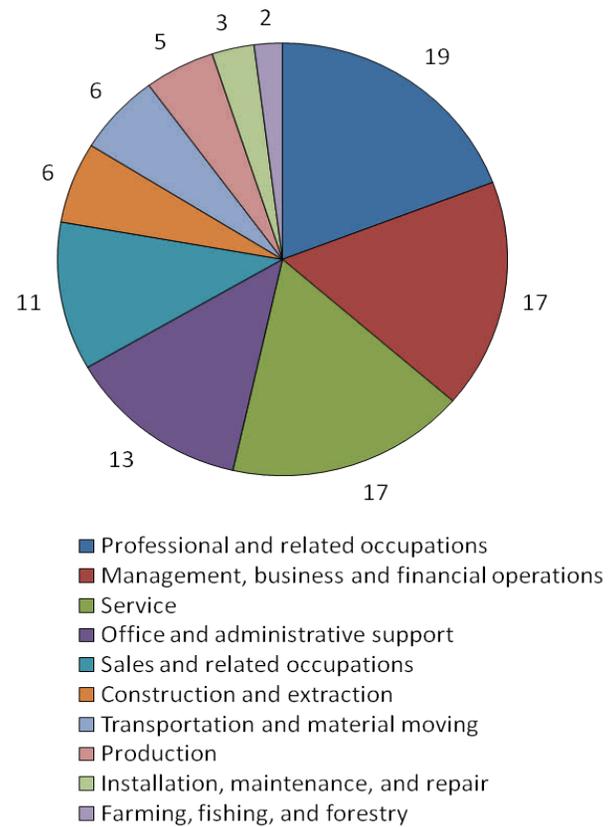


Figure P.7 Employed ND Civilian Workers by Occupation (%)



## Indicator 1: Non-fatal Injuries and Illnesses

### Significance

The identification of non-fatal work-related injuries and illnesses and associated factors, risks and exposures is useful for intervention, education, prevention and regulatory efforts. Work-related **injuries** are typically one-time events and include burns, falls, strains, sprains or fractures, electric shocks, being struck by a falling object or getting caught in machinery and associated amputation. Work-related **illnesses** are usually a result of cumulative exposure to hazardous materials or repetitive motions. Examples include occupational asthma, asbestosis, pneumoconiosis (dust-induced lung disease), mesothelioma, and carpal tunnel syndrome, among others.

### Methods

The CSTE guidance to calculate *Occupational Health Indicator #1: Non-Fatal Injuries and Illnesses Reported by Employers* is based on data from the Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII). The SOII is a survey of sampled establishments throughout the United States that is designed to provide an estimate of the number and rate of work related injury and illnesses reported by employers. The SOII data comes from employer injury logs maintained as part of the Occupational Safety and Health Administration's record-keeping requirements.

North Dakota is one of eight states that does not participate in administration of the BLS SOII; thus, state-level SOII data are not available to calculate indicator #1 based on the CSTE methodology. As an alternative method to evaluate Indicator #1, workers' compensation claims data from the National Academy of Social Insurers (NASI) was used. NASI provides estimates of workers' compensation benefits,

costs, and coverage for each state. Injury and illness claim rates are based on the number of claims per 100 workers covered by workers' compensation in ND.

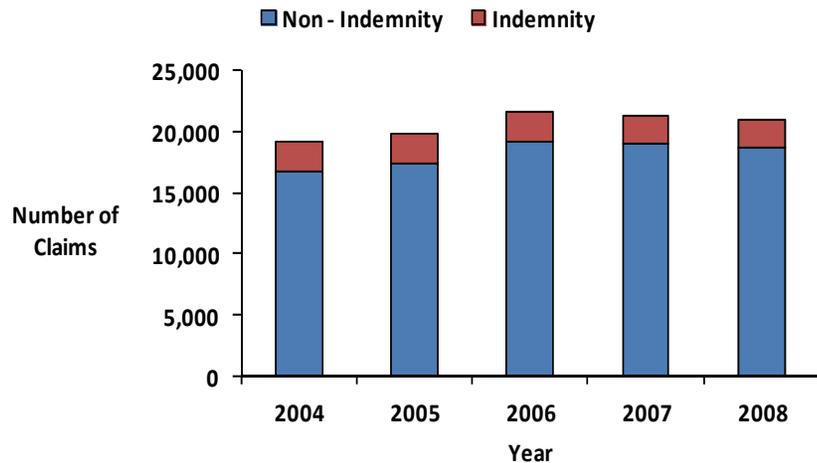
### Results

- ND Workers' Compensation injury claims increased from 6.3 to 6.4 per 100 workers covered from 2004 to 2008, with a high of 6.8.
- ND Workers' Compensation claims involving five or more days away from work (indemnity claims) decreased overall from 0.8 to 0.7 per 100 workers covered between 2004 and 2008 (Table 1.1 and Figure 1.1).
- 

**Table 1.1 Estimated Non - Fatal Work - Related Injury and Illness Claims, ND, 2004 - 2008**

Year	Total Workers Covered	Non-Fatal Work-Related Injury & Illness Claims, Number (Incidence Rate per 100 Workers Covered)	
		All Claims	Indemnity Claims
<b>2004</b>	302,000	19,166 (6.3)	2,465 (0.8)
<b>2005</b>	309,000	19,873 (6.4)	2,472 (0.8)
<b>2006</b>	316,000	21,576 (6.8)	2,454 (0.8)
<b>2007</b>	323,000	21,285 (6.6)	2,283 (0.7)
<b>2008</b>	330,000	21,042 (6.4)	2,287 (0.7)

**Figure 1.1 Distribution of Non-Fatal Work-Related Injury Claims by Indemnity Status, ND, 2004-2008**



### Limitations

- Work-related illness with longer latency periods or work-related illness difficult to associate with the workplace may not be included.
- The number of workers' compensation claims filed may underestimate the number of non-fatal injuries and illnesses because not all individuals with work-related injuries and illnesses file for workers' compensation benefits.
- The variability in workers' compensation laws across states limit the opportunity to utilize these data to make state-to state comparisons.

### Recommendations

- ND should participate in the Survey of Occupational Injuries and Illnesses (SOII). The SOII collects data on work-related injuries and illnesses reported by employers. Data for work-related injuries and illnesses are very limited in ND and SOII participation would provide data that are helpful in describing the burden of injuries and illnesses that occur in the workplace.
- Describe non-fatal work-related injuries and illnesses in ND by industry, occupation, type of injury/illness, and claims resulting in days away from work for a more comprehensive surveillance data set.
- Determine risk factors that contribute to work-related illness and injuries to guide intervention, education, prevention and regulatory efforts.

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## Indicator 2: Work-related Hospitalizations

### **Significance**

Describing and tracking work-related hospitalizations are useful for identifying high-risk occupations and targeting prevention.

### **Methods**

Because of the fees associated with obtaining hospital records data, we were not able to obtain data on work-related hospitalizations.

### **Recommendations**

- Describe injuries and illnesses in ND by industry, occupation, age, gender, race/ethnicity and type of injury/illness in hospital and Emergency Room discharge summaries and reports to ND surveillance programs.
- Determine the factors that contribute to work-related injury/illnesses to guide intervention, education, prevention and regulatory efforts.

## Indicator 3: Fatal Work-related Injuries

### Significance

Fatal work-related injuries are defined as injuries that occur at work and result in death. **Unintentional** injuries include falls, electrocutions, acute poisonings and motor vehicle crashes occurring during work-related travel. **Intentional** injuries include homicides and suicides that occur at work. Workplace fatalities involve many risk factors, including workplace design and procedures and social interactions. The identification of these risk factors and exposures through surveillance of work-related fatalities is useful for intervention, education, prevention and regulatory efforts.

### Methods

The rates of fatal work-related injuries are reported for the years 2004 to 2008 for both ND and the US. Numerator data were obtained from the Census of Fatal Occupational Injuries (CFOI) and rates were calculated using the BLS Current Population Survey as the denominator.

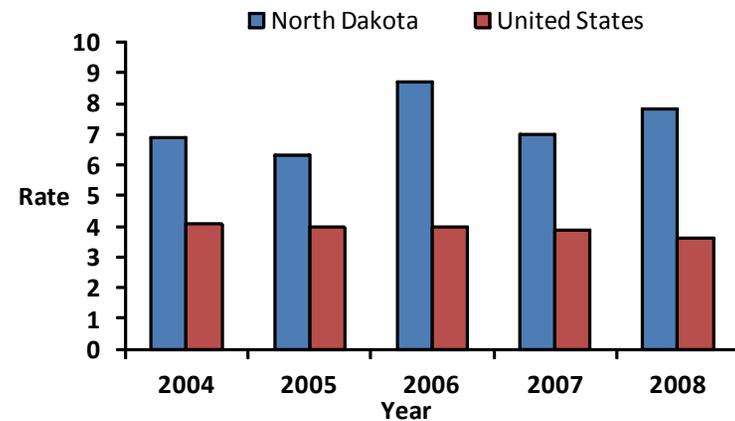
### Results

- Between 2004-2008, the average annual rate of fatal work-related injuries in ND was 7.3 per 100,000 workers, compared to 3.9 per 100,000 in the US. (Table 3.1 and Figure 3.1)
- Work-related injury fatality rates in ND were much higher than overall US rates for the time period 2004 to 2008. (Table 3.1 and Figure 3.1)

**Table 3.1 Fatal Work-Related Injuries, ND and US, 2004 - 2008**

Year	Number and fatality rate of work-related injuries per 100,000 employed persons age 16 and older	
	North Dakota	United States
2004	24 (6.9)	5,764 (4.1)
2005	22 (6.3)	5,734 (4.0)
2006	31 (8.7)	5,840 (4.0)
2007	25 (7.0)	5,657 (3.9)
2008	28 (7.8)	5,214 (3.6)

**Figure 3.1 Rate of Fatal Work-Related Injuries per 100,000 Workers, ND and US, 2004-2008**



**Limitations**

- Since work-related fatalities are reported by the state in which the fatality occurred and not the state of the worker's residence, rates may overestimate risk if the work-related fatalities involved workers who were out-of-state residents. Likewise, rates may be underestimated if fatalities occurred in other states.
- The ND numerator data may include the fatalities of people younger than 16 and military personnel.

**Recommendations**

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

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## Indicator 4: Work-related Amputations with Days Away from Work Reported by Employers

### **Significance**

Most work-related amputations involve full or partial loss of fingers. Less common amputations involve the arm, leg, foot, toe, nose or ear. Work-related amputations can be prevented through the identification and control of occupational hazards and the implementation of safety procedures and regulations.

### **Methods**

In ND, data on amputations reported by employers are not available because ND is one of seven states that does not participate in the Survey of Occupational Injuries and Illnesses (SOII).

### **Recommendations**

- ND should participate in the Survey of Occupational Injuries and Illnesses (SOII).

## Indicator 5: Amputations Identified in Workers' Compensation System

### Significance

Most work-related amputations involve full or partial loss of fingers. Less common amputations involve the arm, leg, foot, toe, nose or ear. Work-related amputations can be prevented through the identification and control of occupational hazards and the implementation of safety procedures and regulations.

### Methods

Workforce Safety & Insurance (WSI) details workers' compensation claims in ND as derived from the first report of injury (FROI) filed by the employer, medical provider or worker. Claims are reported as medical claims and indemnity claims (five or more consecutive days away from work). Annual incidence rates are calculated using the numbers of workers covered by workers' compensation provided by WSI (2009).

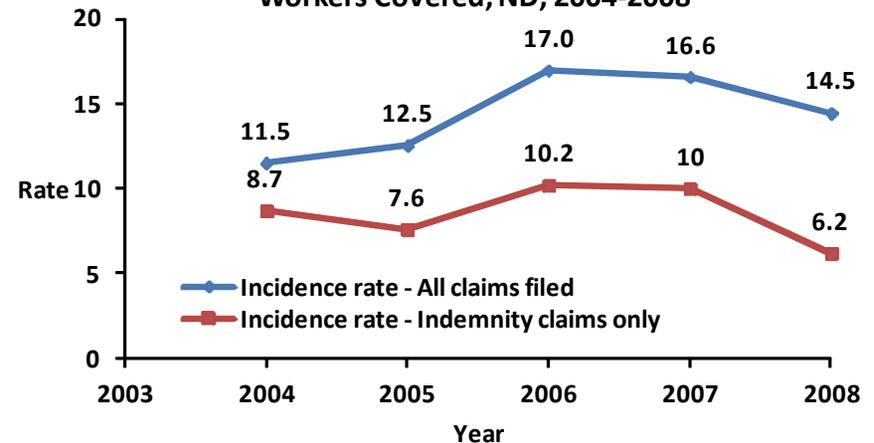
### Results

- Annually, an average of 14 medical, and nine indemnity claims per 100,000 workers in ND were filed for an amputation for the years 2004 to 2008. (Table 5.1 and Figure 5.1)
- The annual incidence rate of amputations filed with the WSI per 100,000 workers covered ranged from 11.3 to 16.7 for the years 2004 to 2008. (Table 5.1 and Figure 5.1)
- The annual incidence rate of amputations filed with WSI per 100,000 workers covered ranged from 6.2 to 10.2 for claims resulting in five or more consecutive days off of work for the years 2004 - 2008. (Figure 5.1)

**Table 5.1 Estimated Work-Related Amputations Involving Days Away from Work, ND and US, 2004 - 2008**

Year	Number of amputation claims filed	Annual incidence rate of amputation claims filed per 100,000 workers covered
2004	35	11.3
2005	30	12.3
2006	54	16.7
2007	54	16.4
2008	48	14.2

**Figure 5.1 Annual Incidence Rate of Amputations Filed with Workers' Compensation per 100,000 Workers Covered, ND, 2004-2008**



**Limitations**

- The number of workers' compensation claims filed may be underestimated because not all individuals with work-related injuries and illnesses file for workers' compensation.
- Those workers who are self-employed (e.g., farmers, independent contractors), who work in small businesses or who are federal employees may not be covered by state workers' compensation insurers and therefore are not included in these estimates.
- Differences in eligibility criteria and availability of data of workers' compensation programs limit these data from being compared with other states or overall US data.

**Recommendations**

- Review amputation data by industry, occupation, age, gender, race/ethnicity and other characteristics to identify important risk factors and patterns and to help guide intervention, education, prevention and regulatory efforts.

## Indicator 6: Hospitalizations From Work-related Burns

### Significance

Work-related burns include injuries to tissues caused by contact with dry heat (fire), moist heat (steam), chemicals, electricity, friction or radiation. Describing and tracking hospitalizations from work-related burns are useful for identifying high risk occupations or work processes and targeting prevention.

### Methods

Hospitalization data were not available for ND. Numerator and denominator data were obtained from the North Dakota Workforce Safety and Insurance (WSI) document “Detailed Claims and Injury Characteristics for Fiscal Years 2004-2008.” Work-related burn data were obtained from hospital discharge records for persons age 16 years of age or older with a primary payer of workers’ compensation. Heat and chemical related burns are those records with a principle ICD-9-CM diagnosis code between 940-949. Indemnity claims are those claims which resulted in five or more days of missed work. Rates were calculated using BLS Current Population Survey data for the denominator.

### Results

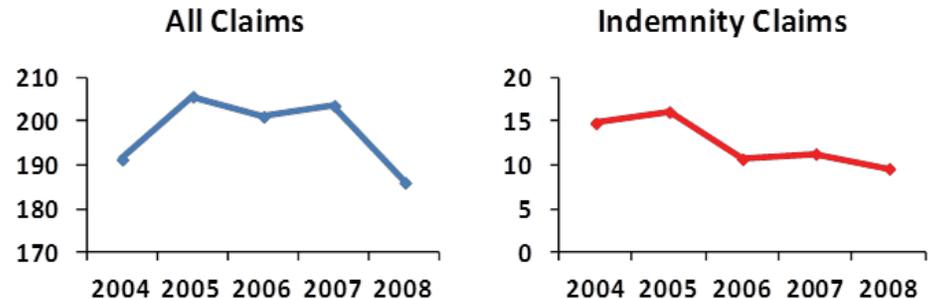
- Between 2004-2008, the rate of burn claims reported to workers’ compensation ranged from 186 to 205 claims per 100,000 workers. The number of indemnity claims ranged from 9.6 to 16.1 claims per 100,000 works. (Table 6.1 and Figure 6.1)

- Between 2004 and 2008, an average of 197.6 claims per 100,000 workers were reported to workers’ compensation in ND. During this same time period, an average of 12.5 claims per 100,000 were indemnity claims. (Table 6.1 and Figure 6.1)

**Table 6.1 Work-Related Burns Reported to Workers Compensation, ND, 2004 - 2008**

Year	Number and Incidence Rates Per 100,000 Workers Covered	
	All Claims	Indemnity Claims
<b>2004</b>	582 (191)	45 (15)
<b>2005</b>	640 (206)	50 (16)
<b>2006</b>	640 (201)	34 (11)
<b>2007</b>	664 (204)	37 (11)
<b>2008</b>	618 (186)	32 (10)

**Figure 6.1 Work - Related Burn Claims per 100,000 Workers Covered, ND, 2004 - 2008**



### **Limitations**

- Denominator data for workers less than 16 years old are not readily available; as a result, workers less than 16 years of age are excluded from these calculations.
- Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients.
- Residents of one state may be hospitalized in another state and therefore may not be reflected in his/her state's hospitalization data.
- All admissions are counted, including multiple admissions for a single individual.
- Until hospital discharge data are available in all states, aggregation of state data to produce nationwide estimates will be incomplete.
- Data on race/ethnicity are not collected in some states and are incomplete and/or of questionable validity in others.
- Hospital discharge records are only available for non-federal, acute care hospitals.

### **Recommendations**

- Review work-related burn hospitalizations by industries/occupations. Target those industries/occupations with the most hospitalizations for work-related burns to guide education, prevention and intervention efforts.

## Indicator 7: Musculoskeletal Disorders Reported by Employers

### Significance

Work-related musculoskeletal disorders (MSDs) and injuries affect the muscles, tendons, nerves, ligaments, joints and spinal discs and significantly impact the ability of workers to perform their jobs effectively. Contributing work activities include repetitive motion, placing hands or limbs in awkward positions, using equipment that vibrates and handling heavy objects. Work-related MSDs can be prevented through the identification and control of occupational hazards and the implementation of safety procedures and regulations.

### Methods

The BLS Survey of Occupational Injury and Illness (SOII) data were unavailable for ND, and, therefore, data were extracted from the North Dakota “Workforce Safety and Insurance (WSI) Detailed Claims and Injury Characteristic for Fiscal Years 2004 - 2008.” This report details workers’ compensation claims and incident filings for injuries in ND for fiscal years 2004 through 2008. The information on the characteristics of the injury or illness is derived from the first report of injury (FROI) filed by the employer, medical provider, or worker.

Both the total number, and indemnity claims are reported. (Table 7.1) In the ND Workers Compensation system, indemnity claims are those injuries that require more than five consecutive days off work.

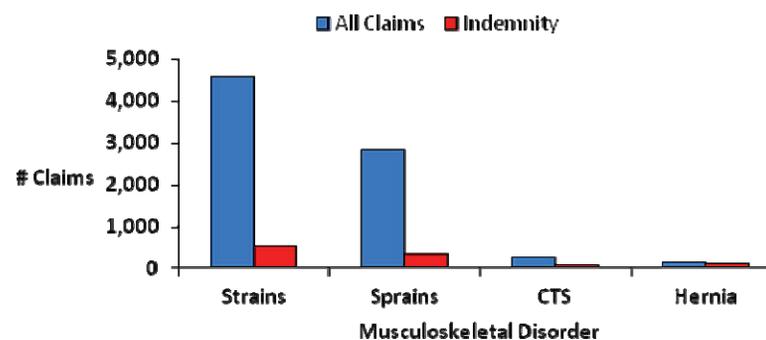
Work - related MSDs are estimated for ND for the years 2004 - 2008 (Table 7.1). Total claims and

incidence rates per 100,000 workers covered are presented for claims from sprains, strains, carpal tunnel syndrome (CTS), and hernia (Table 7.1 and Figure 7.1). Claims from back injuries are presented in Indicator 20.

**Table 7.1 Work - Related Musculoskeletal Claims Reported to Workers’ Compensation , ND, 2004 - 2008**

Year	Number and Incidence Rates Per 100,000 Workers Covered	
	All Claims	Indemnity Only
2004	7,141 (2,347)	1,048 (344)
2005	7,212 (2,317)	1,062 (341)
2006	8,075 (2,537)	1,088 (342)
2007	8,351 (2,562)	1,027 (315)
2008	8,234 (2,479)	1,012 (305)

**Figure 7.1 Estimated Work-Related Musculoskeletal Disorders Reported to Workers’ Compensation, ND, 2004-2008**



## Results

- Between 2004 - 2008, the rate of all MSD claims per 100,000 workers covered in ND increased with a high of 8,351 in 2007 and a five-year average of 7,803. Indemnity claims stayed steady within this time frame (Table 7.1).
- Strains and sprains were the most common type of MSD claim, accounting for 95% of claims within this indicator.

## Limitations

- MSDs may be under-reported and/or under-recorded.
- Self-employed, household workers and workers on farms with fewer than 11 employees are excluded.
- Differences in eligibility criteria and availability of data of workers' compensation programs limit these data from being compared with other states or overall US data.
- The number of MSDs may be underestimated because not all individuals with work-related injuries and illnesses file for workers' compensation.
- The number of MSDs may be underestimated due to the fact that the treating physician may or may not recognize the condition as work-related.

## Recommendations

- ND should participate in the Survey of Occupational Injuries and Illnesses (SOII). The SOII collects data on work-related injuries and illnesses reported by employers. Data for work-related injuries and illnesses are very limited in ND and SOII participation would provide data that are helpful in describing the burden of injuries and illnesses that occur in the workplace.
- Examine work-related MSDs by industry, age, gender, race/ethnicity, occupation and source of injury/illness to help guide intervention and prevention efforts.

## Indicator 8: Carpal Tunnel Syndrome Cases Identified in Workers' Compensation Systems

### Significance

Work-related carpal tunnel syndrome (CTS) may be caused by trauma or fractures of the hand or wrist or physical hazards, such as high exertional force and high repetition, placing hands or limbs in awkward positions or using equipment that vibrates. Symptoms include burning, tingling and numbness of fingers which can lead to difficulty in gripping and holding objects. Work-related CTS can be prevented through the identification and control of occupational hazards and the implementation of safety procedures and regulations.

### Methods

Workforce Safety & Insurance (WSI) details workers' compensation claims in ND as derived from the first report of injury (FROI) filed by the employer, medical provider, or worker. Claims are reported as medical claims and indemnity claims (five or more consecutive days away from work). National rates are not reported due to varying Workers' Compensation systems. Annual CTS claims are reported for ND, 2004-2008.

### Results

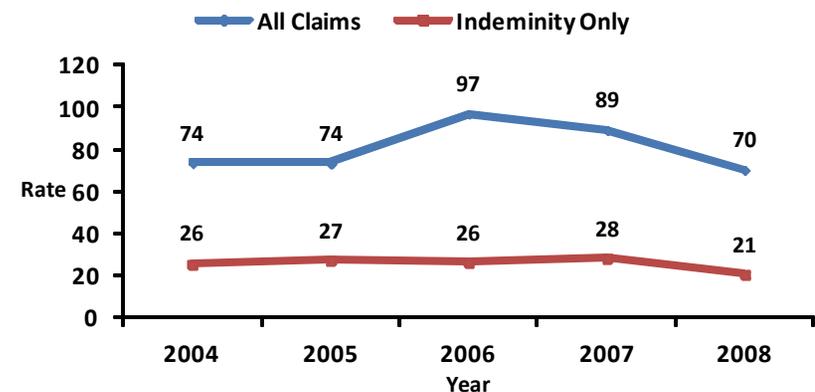
- Between 2004 and 2008, an average of 257 workers' compensation claims were filed in ND. Of these claims, on average, 81 indemnity claims were filed each year. (Table 8.1 and Figure 8.1)

**Table 8.1 Carpal Tunnel Syndrome Claims Filed with State Workers' Compensation, ND, 2004 - 2008**

Year	2004	2005	2006	2007	2008
All Claims	224 (74)	229 (74)	307 (97)	290 (89)	233 (70)
Indemnity Only	78 (26)	85 (27)	84 (26)	92 (28)	68 (21)

- The annual incidence rate of CTS claims filed in ND ranged from 70 to 97 claims per 100,000 workers covered for. (Table 8.1 and Figure 8.1)
- The number of claims filed with workers' compensation for work-related CTS has risen over the five year period.

**Figure 8.1 Rate of Carpal Tunnel Syndrome Claims Filed per 100,000 Workers Covered, ND, 2004-2008**



## **Limitations**

- The number of CTS cases may be underestimated because not all individuals with work-related injuries and illnesses file for workers' compensation.
- The number of CTS cases may be underestimated due to the fact that the treating physician may or may not recognize the condition as work-related.
- Those workers who are self-employed (e.g. farmers, independent contractors), who work in small businesses or who are federal employees may not be covered by state workers' compensation insurers and therefore are not included in these estimates.
- Differences in eligibility criteria and availability of data of workers' compensation programs limit these data from being compared with other states or overall US data.
- Self-employed, household workers and workers on farms with fewer than 11 employees are excluded.

## **Recommendations**

- Review the incidence of CTS by industry, occupation, age, gender, race/ethnicity and other characteristics.
- Identify primary risk factors that contribute to CTS to target prevention efforts.
- Identify and track other forms of repetitive motion injury.
- Educate primary care physicians and workers on the relationship between work-place exposure and risks and the development of CTS.

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## Indicator 9: Pneumoconiosis Hospitalizations

### Significance

Pneumoconioses are lung diseases caused by dust exposure in the workplace. Pneumoconioses include silicosis, asbestosis, coal workers' pneumoconiosis and pneumoconiosis due to a variety of other mineral dusts, including talc, aluminum, bauxite, and graphite. Complications of pneumoconiosis that may cause hospitalizations include respiratory infections, tuberculosis, chronic bronchitis, emphysema, lung cancer, pleuritis, progressive systemic sclerosis, renal disease and respiratory failure. Controlling and monitoring exposure to dust and ongoing medical surveillance are important in preventing pneumoconioses.

### Methods

Pneumoconiosis hospitalization data was obtained from the ND Department of Health. Pneumoniocosis cases meeting the following criteria were requested: any diagnosis of ICD-9-CM code 500 through 505 (including asbestosis), for persons aged 15 years and older. Excluded data, included persons with an unknown age or state of residence, out-of-state residents hospitalized in ND, and residents who were hospitalized out-of-state.

### Results

- Crude and age-standardized hospitalization rates were not calculated due to the small number (<5) of cases per year.

### Limitations

- Due to the voluntary nature of the ND inpatient hospital database, the number of patients with a pneumoconiosis diagnosis cannot be accurately reflected.
- Discharge summaries may vary, including the number of diagnoses listed and who completed the summary, but may not include pneumoconiosis as the contributing cause of hospitalization.
- Not all cases of pneumoconiosis may be hospitalized for pneumoconiosis-related complications because of insurance coverage and how a physician may diagnose the condition. Typically, only the small number of the most severe cases are hospitalized; therefore, hospitalization rates likely underestimate the true burden of pneumoconiosis among workers.
- Pneumoconioses occur many years after a worker's first exposure to hazardous dust. The latency from time of exposure to detection of disease averages 20 to 40 years. Therefore, rates in 2004 to 2008 may reflect past exposures from the 1960s to the 1980s.

### Recommendations

- Identify data sources that estimate the rate of outpatient (non-hospitalized) cases of pneumoconiosis.
- Obtain pneumoconiosis hospitalization data from a source that is not voluntary.

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## Indicator 10: Pneumoconiosis Mortality

### Significance

Pneumoconioses are lung diseases caused by dust exposure in the workplace. Pneumoconioses include silicosis, asbestosis, coal workers' pneumoconiosis and pneumoconiosis due to exposures to a variety of other mineral dusts, including talc, aluminum, bauxite, and graphite. Controlling occupational exposure through monitoring, surveillance and prevention programs can prevent pneumoconioses.

### Methods

The ND Department of Health's Division of Vital Records Program provided information on pneumoconiosis mortality. Mortality rates and age-standardized rates were not calculated due to the small number of cases reported each year and multiple age groups.

### Results

- Pneumoconiosis mortality numbers and rates were not included due to the small number (<5) of deaths per year.

### Limitations

- The estimated incidence of mortality from pneumoconiosis does not necessarily represent current exposures, primarily because of the long latency between a person's first dust exposure and development of disease.

### Recommendations

- Review mortality by type of pneumoconiosis, age, gender and race/ethnicity.

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

### Significance

An estimated one billion pounds of pesticides are used each year in the US to protect food and control disease. Agricultural workers and those applying pesticides have the highest risk of over-exposure to potentially harmful pesticides. The Environmental Protection Agency estimates that 20,000 to 40,000 work-related pesticide poisonings occur each year.

### Methods

The American Association of Poison Control Centers collects information on reported cases of work-related pesticide poisoning resulting in acute illness. Pesticide poisonings include exposures to disinfectants, fungicides, fumigants, herbicides, insecticides, repellents and rodenticides. The incidence of reported work-related pesticide poisonings per 100,000 employed persons age 16 years and older is calculated for ND and the US for the years 2004 to 2008 using the BLS Current Population Survey data for the denominator.

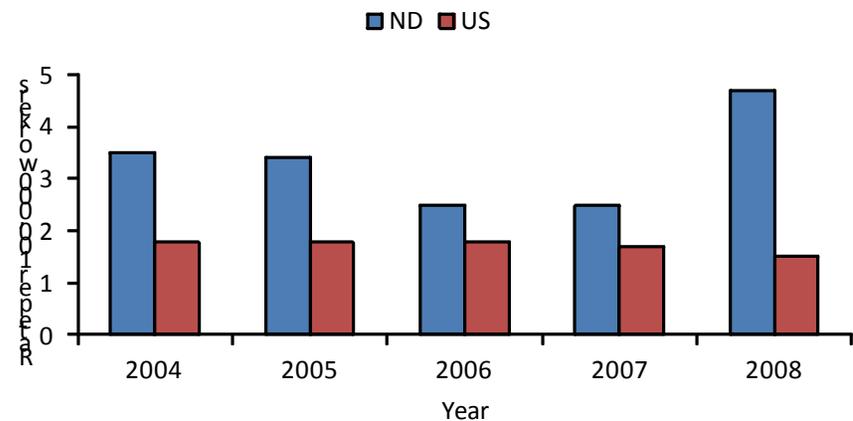
### Results

- Between 2004 and 2008, an average of 12 work related pesticide poisonings were reported to Poison Control Centers in ND, ranging from nine to 17 work-related pesticide poisonings reported each year (Table 11.1).
- Between 2004 and 2008, the rate of work-related pesticide poisonings reported to Poison Control Centers in ND ranged from 2.5 to 4.7 per 100,000 workers, averaging 3.3 work related pesticide poisonings per 100,000 workers during these years. (Table 11.1 and Figure 11.1)

**Table 11.1 Rates of work-related Pesticide Poisonings Reported to Poison Control Centers per 100,000, ND and US, 2004—2008**

Year	Number and rate per 100,000 employed Over Age 16	
	North Dakota	United States
2004	12 (3.5)	2,476 (1.8)
2005	12 (3.4)	2,593 (1.8)
2006	9 (2.5)	2,560 (1.8)
2007	9 (2.5)	2,458 (1.7)
2008	17 (4.7)	2,171 (1.5)

**Figure 11.1 Work-Related Pesticide Poisonings Reported to Poison Control Centers, ND and US, 2004-2008**



**Limitations**

- Not all work-related pesticide exposures resulting in illness are reported to Poison Control Centers.
- Most reported work-related pesticide poisonings are acute exposures to pesticides; chronic long-term exposures are usually not reported to Poison Control Centers.

**Recommendations**

- Review reported work-related pesticide poisonings by age, gender, race/ethnicity, industry, occupation, severity and illness in order to better target prevention efforts.

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## Indicator 12: Incidence of Malignant Mesothelioma

### Significance

Mesothelioma is a rare, fatal cancer of the lining that surrounds the chest and abdominal cavities. Primarily attributable to asbestos exposure, onset of the disease may not occur for 20 to 40 years after exposure. The number of mesothelioma deaths in the US is expected to have peaked in 2010. However, occupational and environmental exposure to asbestos continues to occur. Mesothelioma can be prevented by controlling occupational exposure through monitoring, surveillance and prevention programs.

### Methods

Mesothelioma data by year and age group were provided by the ND Department of Health on behalf of the North Dakota Statewide Cancer Registry. Age-standardized rates were not calculated due to the small number of cases for multiple age groups. State population estimates were obtained from the US Census Bureau for the denominator. Nationwide estimates are not available because not all states meet current reporting standards.

### Results

- Annually, an estimated (average) 8.6 per one million ND residents were diagnosed with mesothelioma from 2004 to 2008. (Table 12.1)
- Between 2004 and 2008, Mesothelioma diagnosis incidence rates have ranged from as low as five to as high as 13 per one million ND workers. (Table 12.1)

**Table 12.1 Incidence of Malignant Mesothelioma, ND, 2004 - 2008**

Year	Number and incidence per one million residents
2004	13 (26)
2005	6 (12)
2006	9 (18)
2007	5 (10)
2008	10 (20)

### Limitations

- The estimated incidence does not necessarily represent current exposures, primarily because of the long latency associated with the disease.

### Recommendations

- Review the incidence of mesothelioma by age, gender, race/ethnicity, occupation, industry and exposure history for prevention efforts.

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## Indicator 13: Elevated Blood Lead Levels Among Adults

### Significance

Exposure to elevated levels of lead in the workplace can cause anemia, hypertension, and nerve and kidney damage and lead to fertility and pregnancy problems. Lead remains a substantial health problem in the US due to occupational and environmental exposures. Occupational exposure may occur in workers engaged in the manufacture of storage batteries, mining of lead and zinc ores, working in firing ranges and painting and paper hanging. The average Blood Lead Level (BLL) of the general population is less than 2 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ).

### Methods

ND is one of 10 states that does not participate in the national Adult Blood Lead Epidemiology and Surveillance (ABLES) program and the ND Department of Health (DOH) does not collect data on elevated BLLs in adults. As a result, data are not available for this indicator.

### Recommendations

- Encourage the ND DOH to include adult elevated blood levels as a reportable occupational health condition in ND.

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

### Significance

In 2008, the U.S. Bureau of Labor Statistics (BLS) reported an estimated total of 3.7 million injury and illness cases within the private sector workforce. This equates to an estimated incidence rate of 3.9 cases per 100 full-time-equivalent workers. Workers in certain industries sustain a higher percentage of injuries and illnesses resulting in days away from work. Industry categories that are at highest risk for occupational morbidity are determined every five years based on those industries with injury and illness rates more than double the national injury and illness rate average. The last five year period for this calculation was 2003 to 2007 and the most recent period is 2008 to 2012. Work-related injuries and illnesses are preventable and control of occupational hazards is the most effective means of prevention. Concentrating on specific industries that may be at high-risk for non-fatal injuries and illnesses will help prioritize limited resources.

### Methods

The US Census Bureau County Business Patterns reports the percentage of workers employed in industries at high risk for occupational morbidity. High morbidity risk industries are identified based on annual injury and illness incidence rates for private sector workers. The percent of workers in ND and US employed in industries with high risk for occupational morbidity is described for the years 2004 to 2008.

### Results

Approximately 8.1% of the workforce in ND and 6.5% of the workforce in the U.S. from 2004 to 2007 were employed in industries with a disproportionately high risk for non-fatal injuries and illnesses. (Table 14.1)

**Table 14.1 Percentage of Workers Employed in Industries with High Risk for Occupational Morbidity, ND and US, 2004-2008**

Year	North Dakota	United States
2004	8.0	6.6
2005	8.3	6.6
2006	8.4	6.5
2007	8.1	6.4
2008	7.5	6.5

*\*2008 data collected according to an updated list of high-risk industries and are not comparable to prior years.*

- For the years 2004-2007, the highest morbidity industries in ND included:

- Nursing and Residential Care Facilities
- Wood Products Manufacturing
- Couriers and Messengers
- Sugar Manufacturing
- Plate Work and Fabricated Structural Product Manufacturing

- Some of these industries, including Woods Products, have very small work forces.

### **Limitations**

- Since the County Business Patterns estimates are calculated in March of each year, new employees for that year may not be counted.
- The ranking of high-risk industries may differ by region.
- Estimates are based on a probability sample of private sector employers and does not include all employers.
- Estimates are based on injury and illness data maintained by employers and are subject to sampling error.
- Estimates do not include the military, small farms and federal agencies.

### **Recommendations**

- Identify high-risk industries in ND for prevention efforts.
- Identify regionally important high risk industries in ND for prevention activities.

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

### Significance

In 2008, the BLS reported an estimated 1.1 million injuries and illnesses that resulted in “days away from work” (DAFW). This equates to a rate of 113 DAFW cases per 100,000 FTEs. The risk of these injuries and illnesses is significantly higher in certain occupations. Occupational categories that are at highest risk for occupational morbidity are determined based on those occupations with injury and illness rates more than double the national DAFW injury and illness rate annual average. The last five-year period for this calculate was 2003 to 2007 and the most recent period is 2008 to 2012. Work-related injuries and illnesses are preventable and control of occupational hazards is the most effective means of prevention. Concentrating on occupations at high-risk for nonfatal injuries and illnesses will help prioritize limited resources.

### Methods

The percent of workers employed in high-risk occupations are reported from 2004 to 2008 based on 2000 census codes for employed persons age 15 or older in ND and the US . These data were collected from the BLS Current Population Survey.

### Results

Approximately 11.5% of the workforce in ND from 2004-2007 were employed in occupations with high risk for occupational morbidity. (Table 15.1 and Figure 15.1)

**Table 15.1 Percentage of Workers Employed in Occupations with High Risk for Occupational Morbidity, ND and US, 2004 - 2008**

Year	North Dakota	United States
2004	12.6	11.0
2005	10.7	11.2
2006	11.5	11.5
2007	11.0	11.4
2008	11.1	11.0

*\*2008 data collected according to an updated list of high-risk occupations and are not comparable to prior years.*

- For the years 2004-2007, the highest morbidity occupations in ND included:

- Driver/Sales Workers and Truck Drivers
- Nursing/Psychiatric, and Home Health Aides
- Carpenters
- Laborers and Freight, Stock, and Material Movers
- Construction Laborers
- Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics

**Limitations**

- The ranking of high-risk occupations may differ by state and/or industry.
- Estimates do not include the military, small farms and federal agencies.

**Recommendations**

- Identify high-risk occupations in ND to help guide prevention efforts.

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

### Significance

Each year, over 4,600 cases of work-related fatalities are reported to the Census of Fatal Occupational Injuries (CFOI) Program administered by the Bureau of Labor Statistics (BLS). On an average day, 13 workers die in the US as a result of injuries sustained at work. The risks for these occupational fatalities are significantly higher in certain industries and occupations. Occupation and industry categories that are at highest risk for occupational mortality are determined every five years based on those occupations and industries with fatality rates more than double the national annual average. The last five-year period for this calculation was 2003 to 2007 and the most recent period is 2008 to 2012. Prevention efforts should target these highest risk occupations and industries.

### Methods

The BLS collects information on the percentage of workers employed in industries and occupations at high risk for occupational mortality. The percent of workers in ND and the US employed in industries and occupations with high risk for occupational mortality is reported for the years 2004 to 2008.

### Results

- Approximately 21% of workers in ND and 14% in the US were employed in industries at high risk for mortality from 2004 to 2007. (Table 16.1 and Figure 16.1)

For the years 2004-2007, the highest mortality industries in ND included:

- Construction
- Crop Production
- Animal Production
- Truck Transportation
- Support Activities for Mining

- Approximately 17% of workers in ND and 10.5% in the US were employed in occupations at high risk for mortality from 2004 to 2008. (Table 16.1 and Figure 16.2)
- For the years 2004-2007, the highest mortality occupations in ND included:

- Farmers and Ranchers
- Drivers/Sales Workers and Truck Drivers
- Miscellaneous agricultural workers
- First-line Supervisors/Managers of Construction Trades and Extraction Workers
- Construction Laborers
- Electricians

**Table 16.1 Workers Employed in Industries and Occupations at High Risk for Occupational Mortality, ND and US, 2004-2008**

Year	% of workers employed in high risk <u>industries</u>		% of workers employed in high risk <u>occupations</u>	
	ND	US	ND	US
2004	20.9	13.9	17.6	10.2
2005	20.3	14.2	17.7	10.5
2006	20.4	14.5	17.6	10.7
2007	21.8	14.4	17.4	10.7
2008	21.2	13.9	16.3	10.4

*\*2008 data collected according to an updated list of high-risk occupations and industries and are not comparable to prior years.*

**Limitations**

- The ranking of high-risk occupations and industries may differ by state and/or industry.
- Determination of high risk industries and occupations based on Current Population Survey estimates may be unstable from year-to-year.
- Suicides that take place at the workplace are considered work-related fatalities even though these deaths may not be necessarily caused by work-related factors.
- Deaths reported are for the private sector only and exclude military deaths.

**Recommendations**

- Identify the primary risk factors that contribute to fatalities in high risk industries and occupations to develop prevention intervention strategies.

## Indicator 17: Occupational Health and Safety Professionals

### Significance

The goals of occupational safety and health professionals are to identify hazardous conditions, materials and practices in the workplace and assist employers and workers in eliminating or reducing the attendant risks. An adequate number of these professionals in the fields of occupational medicine, occupational health nursing, industrial hygiene and safety are needed to ensure safe workplaces.

### Methods

The number of professionals and rate per 100,000 employees in ND for 2004 to 2008 are reported using data from the American College of Occupational and Environmental Medicine (ACOEM), American Association of Occupational Health Nurses (AAOHN), American Industrial Hygiene Association (AIHA), American Society of Safety Engineers (ASSE) and the BLS Current Population Survey.

### Results

- For every 100,000 employees in ND for the years 2004 to 2008, on average, there was one occupational medicine physician and two occupational health nurses. For the same time period, on average, there was one industrial hygienist and four safety professionals per 100,000 employees. (Table 17.1)

### Limitations

- Other occupational safety and health fields are not included, such as health physics, ergonomics, or occupational health psychology.
- Member lists include retired and part-time professionals and, therefore, may overestimate the number of active occupational and safety professionals.

### Recommendations

- Recruit and retain critical occupational health and safety professionals to work in ND.
- Increase the number of students in the occupational safety and health professional curricula and training programs.

**Table 17.1 Number of Occupational Safety and Health Professionals and Rate per 100,000 Employees,  
ND, 2004-2008**

	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Occupational medicine physicians, # (rate)</b>	<b>2 (0.6)</b>	<b>2 (0.6)</b>	<b>1 (0.3)</b>	<b>1 (0.3)</b>	<b>2 (0.6)</b>
<b>ACOEM members, # (rate)</b>	<b>7 (2.0)</b>	<b>7 (2.0)</b>	<b>7 (2.0)</b>	<b>10 (2.8)</b>	<b>10 (2.8)</b>
<b>Occupational health nurses, # (rate)</b>	<b>6 (1.7)</b>	<b>6 (1.7)</b>	<b>7 (2.0)</b>	<b>6 (1.7)</b>	<b>5(1.4)</b>
<b>AAOHN members, # (rate)</b>	<b>9 (2.6)</b>	<b>9 (2.6)</b>	<b>9 (2.5)</b>	<b>8 (2.2)</b>	<b>9 (2.5)</b>
<b>Industrial hygienists, # (rate)</b>	<b>4 (1.2)*</b>	<b>4 (1.1)</b>	<b>5 (1.4)</b>	<b>4 (1.1)</b>	<b>4 (1.1)</b>
<b>AIHA members, # (rate)</b>	<b>9 (2.6)</b>	<b>11 (3.2)</b>	<b>9 (2.5)</b>	<b>8 (2.2)</b>	<b>11 (3.0)</b>
<b>Safety professionals, # (rate)</b>	<b>10 (2.9)</b>	<b>13 (3.7)</b>	<b>17 (4.8)</b>	<b>14 (3.9)</b>	<b>12 (3.3)</b>
<b>ASSE members, # (rate)</b>	<b>35 (10.1)</b>	<b>48 (13.8)</b>	<b>41 (11.5)</b>	<b>37 (10.3)</b>	<b>40 (11.1)</b>

\* Includes 1 retiree

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## Indicator 18: OSHA Enforcement Activities

### Significance

The US Department of Labor Occupational Safety and Health Administration (OSHA) conducts investigations and inspections at worksites to ensure compliance with employee safety and health standards and regulations. Investigations and inspections typically occur at worksites in the event of work-related fatal and non-fatal injuries, hospitalizations, employee complaints and outside referrals. Random inspections are also conducted at high-risk worksites. OSHA jurisdiction in ND includes private and federal employers and employees.

### Methods

Enforcement activities within establishments under OSHA jurisdiction in ND (excluding mines and farms) for the years 2004 through 2008 are reported. Data sources were OSHA annual reports on inspections covered and the number of workers covered by these inspections and the BLS Quarterly Census of Employment and Wages (ES-202/QCEW).

### Results

- Approximately 1.5% of worksites in ND were inspected by OSHA each year between 2004 and 2008. (Table 18.1)
- On average between 2004 and 2008, 3.4% of OSHA-covered employees work areas were inspected by OSHA each year. (Table 18.1)

**Table 18.1 Percent of Establishments Under OSHA Jurisdiction Whose Work Areas Were Inspected by OSHA, ND, 2004 - 2008**

Year	Establishments under jurisdiction	Establishments inspected, # (%)	Covered employees eligible for inspection	Covered employees inspected, # (%)
2004	15,314	246 (1.6)	157,436	5,777 (3.7)
2005	13,860	226 (1.6)	164,164	5,818 (3.5)
2006	16,436	343 (2.1)	167,542	4,539 (2.7)
2007	28,910	323 (1.1)	167,996	6,593 (3.9)
2008	25,356	266 (1.0)	169,201	5,612 (3.3)

### Limitations

- The percent of worksites inspected may be overestimated since multiple inspections may occur at the same worksite in the same year.
- Only enforcement activities are measured.

### Recommendations

- Obtain details of enforcement activities.
- Increase the number of inspections for better enforcement to help prevent future work-related injuries and illnesses.

## Indicator 19: Workers' Compensation Benefits

### Significance

Workers' compensation is a state-based social insurance program that covers work-related injuries and illnesses. Benefits include lost wages, related medical expenses, disability payments, and survivor benefits. Amounts of paid benefits represent the direct financial burden of work-related injuries and illnesses. A 'covered worker' is defined as a worker who is eligible for workers' compensation benefits in the event of a work-related injury or illness. Workers who may not be covered by state workers' compensation include those who are self-employed, corporate executives, federal employees, small business owners, farmers and agricultural workers.

### Methods

The National Academy of Social Insurance (NASI) collects and reports estimated annual benefits, coverage and costs associated with workers' compensation programs. The average benefit paid per covered worker in ND and the US is reported for 2004 to 2008.

### Results

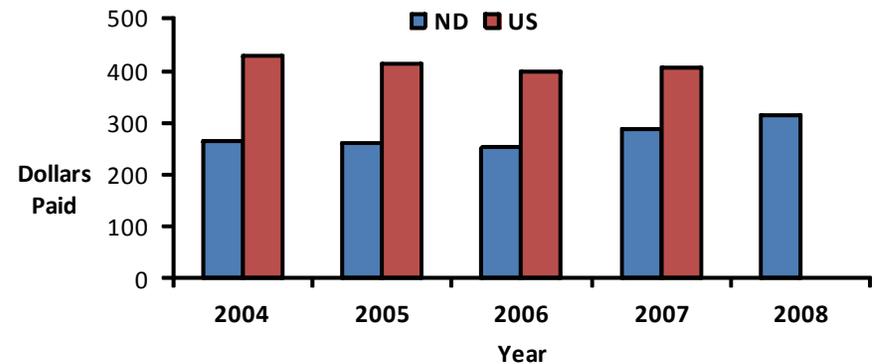
- The average benefit paid to ND workers per year from 2004 to 2008 ranged from \$252 to \$313 and, nationwide, from \$400 to \$428. (Table 19.1 and Figure 19.1)
- The estimated total amount of benefits paid in ND from 2004 through 2008 ranged from \$80.1 million to \$105.6 million. (Table 19.1 and Figure 19.1)

**Table 19.1 Average Workers' Compensation Benefit Paid per Covered Worker, ND and US, 2004-2008**

Year	Total benefit paid in thousands, \$		Benefit paid per covered worker, \$	
	ND	US	ND (NASI)	US
2004	82,237	52,648,566	266	428
2005	82,033	51,949,416	260	414
2006	81,297	51,059,066	252	400
2007	95,418	52,087,023	289	404
2008	105,837	54,209,118	313	424

- Nationwide, the estimated total amount of benefits paid ranged from \$51.1 billion to \$54.2 billion. (Table 19.1 and Figure 19.1)

**Figure 19.1 Average Workers' Compensation Benefit Paid per Covered Worker, ND and US, 2004-2008**



**Limitations**

- Not all individuals with work-related injuries and illnesses file a workers' compensation claim.
- Since payments are made over time, annual awards may not reflect the full cost of injuries and illnesses for that year.
- Data do not describe the indirect burden of work-related injuries or illnesses (retraining and replacement worker costs, lost wages, administrative costs).

**Recommendations**

- Ascertain details of awards, including industry, occupation, and cost to employer to target prevention efforts and further describe the economic costs of occupational injuries.

## Indicator 20: Work-Related Low Back Disorder Hospitalizations

### Significance

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

### Methods

Hospital discharge data are not available in ND. Workforce Safety & Insurance (WSI) details workers' compensation (WC) claims in ND as derived from the first report of injury (FROI) filed by the employer, medical provider or worker. Claims are reported as medical claims and indemnity claims (five or more consecutive days away from work). Annual numbers of lower back-lumbar spine claims per 100,000 workers covered are reported for 2004-2008. US data are not shown here because of varying WC systems. Annual number of upper back-thoracic spine and spinal cord claims are also reported here because they were excluded from musculoskeletal disorder hospitalization claims (Indicator 7).

### Results

- Between 2004-2008, the average number of lower back and upper back claims reported to the ND workers' compensation were 2,935 and 567, respectively. Indemnity claims were 445 and 42, respectively. The number of workers' compensation claims for spinal cord injuries were not reported due to the small

number (<5) of claims filed per year. Overall, low back claims were more common than upper back claims. (Table 20.1).

- In ND, the number of lower back-lumbar spine WC claims ranged from 863 to 969 per 100,000 workers covered and the number of indemnity claims ranged from 116 to 175 per 100,000 workers covered (Table 20.2 and Figure 20.1).

**Table 20.1 Annual Upper Back, Lower Back, and Spinal Cord WC claims, ND, 2004 - 2008**

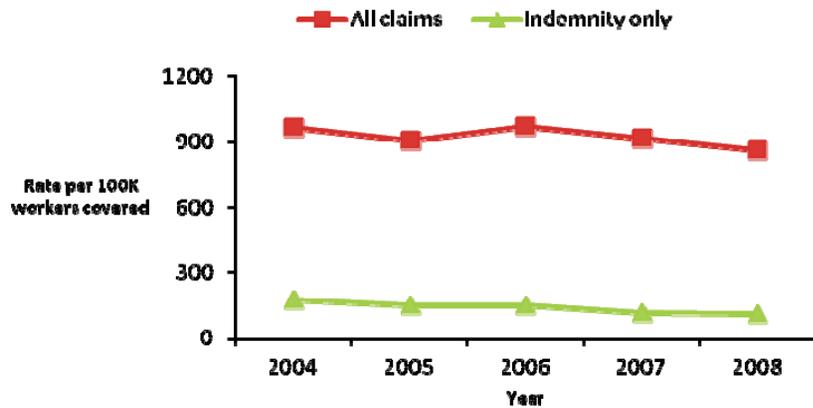
	Lower Back		Upper Back		Spinal Cord	
	All	Indemnity	All	Indemnity	All	Indemnity
<b>2004</b>	2,932	532	606	42	0	0
<b>2005</b>	2,816	470	527	32	0	0
<b>2006</b>	3,079	486	635	50	9	0
<b>2007</b>	2,981	377	574	45	5	*
<b>2008</b>	2,865	362	493	43	*	*
<b>Average</b>	<b>2,935</b>	<b>445</b>	<b>567</b>	<b>42</b>	*	*

\* suppressed value. Less than 5 claims filed.

**Table 20.2 "Lower Back - Lumbar Spine" WC Claims, Total and Rate per 100,000 Workers Covered, ND, 2004 - 2008**

Year	All claims	Indemnity only
<b>2004</b>	964 (15)	175 (22)
<b>2005</b>	905 (14)	151 (19)
<b>2006</b>	968 (14)	153 (20)
<b>2007</b>	914 (14)	116 (17)
<b>2008</b>	863 (14)	109 (16)

**Figure 20.1 Annual “Lower Back-Lumbar Spine” WC Claims, ND, 2004-2008**



**Limitations**

- Many individuals with work-related injuries do not file for WC or fail to recognize work as the cause of their injury.
- Additionally, self-employed individuals, such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers, are not covered by state WC systems.
- Data between states may not be comparable due to differences in benefit adequacy in states’ WC programs.
- Self-employed, household workers and workers on farms with fewer than 11 employees are excluded.
- The number of WC claims filed may be underestimated because not all individuals with work-related injuries and illnesses file for WC.

- The number of claims filed with WC may be underestimated due to the fact that the treating physician may or may not recognize the condition as work-related.

**Recommendations**

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

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## Conclusions

Occupational injuries and illnesses remain a significant problem in the US. The Bureau of Labor Statistics (BLS) reported that 4,551 workers in private industry died as a result of work-related injuries in 2009, a rate of 3.5 per 100,000 full-time equivalent workers. In 2009, there were 1.2 million cases of on-the-job injuries and illnesses reported to the BLS that required days away from work. The National Safety Council estimated that on-the-job injuries (both fatal and non-fatal) cost society \$182.2 billion in lost wages, productivity, administrative expenses, health care and other costs in 2008.

Occupational health surveillance is the systematic monitoring of health events and exposures among working populations. The purpose of occupational health surveillance is to collect, analyze and disseminate data on work-related cases and exposures, and to partner and plan interventions, prevention programs and campaigns to reduce the burden of work related injuries and illnesses.

A significant gap in data and need for workplace health surveillance in ND exists for non-fatal work-related injuries and illnesses. ND is one of seven states that does not participate in the Survey of Occupational Injuries and Illnesses (SOII) and one of 10 states that does not participate in the Adult Blood Lead Epidemiology and Surveillance (ABLES) program. Both of these programs help to characterize the burden of work-related injury and illness, guide intervention strategies for the reduction of occupational exposures and are areas in which intervention and prevention programs have been successful in reducing the number of cases.

Of note, the rates of work-related fatalities in ND (2004-2008) were higher than overall US rates (ND 7.3 vs. US 3.9). The percent of workers employed in industries and occupations at high risk for occupational mortality was higher than the US percentage, but this may not totally explain why the ND fatality rates remain high when the national rate has decreased over time. Occupationally-related fatalities result in a significant burden on individual ND families and society as a whole and being able to accurately characterize the type of risks that are associated with high-risk industries and occupations is a first step in planning intervention for prevention.

The rate of work-related pesticide poisonings in ND was higher compared to overall US rates. Agricultural workers are often a minority population or are members of a farm family with little resources for safety programs. Workers in rural areas often have limited access to healthcare and occupational health and safety professionals and need a better surveillance system to help characterize the problem accurately to guide intervention prevention measures. The current OHIs do not specifically address disparity issues, but other data sources should be considered for their use in helping to characterize health disparity issues in ND.

## Data Sources

**American Association of Occupational Health Nurses (AAOHN)** <http://www.aaohn.org/>

**American Association of Poison Control Centers** <http://www.aapcc.org/DNN/>

**American College of Occupational and Environmental Medicine (ACOEM)** <http://www.acoem.org/>

**American Industrial Hygiene Association (AIHA)** <http://www.aiha.org/Content>

**American Society of Safety Engineers (ASSE)** <http://www.asse.org/>

**Census Bureau County Business Patterns** <http://www.census.gov/econ/cbp/index.html>

**Census of Fatal Occupational Injuries (CFOI)** <http://www.bls.gov/iif/oshcfoi1.htm>

**Current Population Survey:** <http://www.bls.gov/cps/>

**Geographic Profiles of Employment and Unemployment** <http://www.bls.gov/gps/>

**Healthcare Cost and Utilization Project (H-CUP)** <http://www.ahrq.gov/data/hcup/>

**National Academy of Social Insurance (NASI)** <http://www.nasi.org/>

**Occupational Safety and Health Administration** <http://www.osha.gov/>

**Council for State and Territorial Epidemiologists** <http://www.cste.org/dnn/>

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U.S. Census Bureau 2001 Statistical Abstract. Costs of Unintentional Injuries: 2008. <http://www.census.gov/compendia/statab/2011/tables/11s0198.pdf>

For an electronic copy of this report please contact Anna Briggs at [brigg096@umn.edu](mailto:brigg096@umn.edu)