North Carolina Occupational Health Trends, 2010

Putting Data to Work
November, 2013

INTRODUCTION

The workplace contains a variety of hazards that may affect people's health. Workers may be exposed to chemicals, dust, heavy machinery, heat, noise, biological agents and other conditions. During 2010, about 79,500 North Carolinians were injured or became ill while at work. Of these, 139 (0.1%) were fatal [1]. Workplace injuries and illnesses have high human and economic costs to workers, employers, and to North Carolina. In 2010, workers' compensation claims alone in North Carolina cost more than $1.3 billion, with more than $360 on average paid per covered worker [1]. Work-related injuries and illnesses can be prevented, and successful approaches toward making workplaces safer begin with having data to better understand the health status of the worker population.

METHODS

This report uses the Council of State and Territorial Epidemiologists (CSTE) Occupational Health Indicators (OHI) to track work-related injuries and illnesses in North Carolina. The indicators are a set of standardized measures that allow states to uniformly collect data from easily obtainable, statewide and national sources on occupational injury and illness [2]–[4].

In this report, we present a basic description of worker demographics in North Carolina and 12 occupational health indicators for 2010. Descriptive statistics were used and include counts, rates and percentages. Counts for numerators were derived from available state and national databases, and counts for denominators were derived from state census estimates (see Discussion section for more details). Rates were calculated per annual number of fulltime-equivalent workers (FTEs), per annual number of all employed persons aged 16 years and older, or per annual number of residents for conditions where the workplace is presumed to be the most likely source of exposure. Comparisons to national data were done where possible to highlight potential problem areas impacting North Carolina for focus of further investigations.

RESULTS

Table 1. Employment Demographics and Characteristics of the North Carolina Workforce, ≥16 Years of Age, 2010		
	North Carolina	**US**
Total number employed (in thousands)	**4,094**	**139,064**
Percentage of civilian employment by:	%	
Sex		
Males	51.9	52.8
Females	48.1	47.2
Age group (years)		
16 to 17	1.0	1.1
18 to 64	94.9	94.4
65+	4.1	4.5
Race		
Non-Hispanic White	75.3	82.1
Non-Hispanic Black	19.2	10.8
Hispanic[1]	7.7	14.3
Other	5.5	7.1
Employment status		
Workforce unemployed	10.5	9.6
Self-employed	6.7	7.0
Part-time jobs[2]	17.3	19.7
Number of hours worked		
<40 hours[3]	33.3	35.8
40 hours	43.0	40.6
41+ hours	23.7	23.5
Major Industry Sector and Occupation Group Distribution		
Industry Sector	%	
Education and health services	25.1	23.1
Wholesale and retail trade	14.1	14.2
Professional and business services	9.3	11.0
Leisure and hospitality	9.3	9.0
Construction	7.4	6.5
Manufacturing: Nondurable Goods	6.3	3.8
Financial activities	6.1	6.7
Manufacturing: Durable Goods	6.0	6.3
Other services	4.8	4.9
Public administration	4.7	5.0
Transportation and utilities	4.0	5.1
Information	1.9	2.3
Agriculture	1.2	1.6
Mining	<0.05	0.5
Occupation Group	%	
Professional and related occupations	23.4	22.2
Service	17.2	17.7
Management, business and financial operations	14.7	15.1
Office and administrative support	11.8	13.0
Sales and related occupations	10.9	11.1
Production	6.9	5.8
Construction and extraction	5.6	5.2
Transportation and material moving	5.1	5.9
Installation, maintenance, and repair	4.0	3.5
Farming, fishing, and forestry	0.4	0.7

[1] Persons identified as Hispanic may be of any race (White, Black, Other)

[2] Persons who work 1-34 hrs/week are considered part-time. Working ≥35 hrs/week is considered full-time.

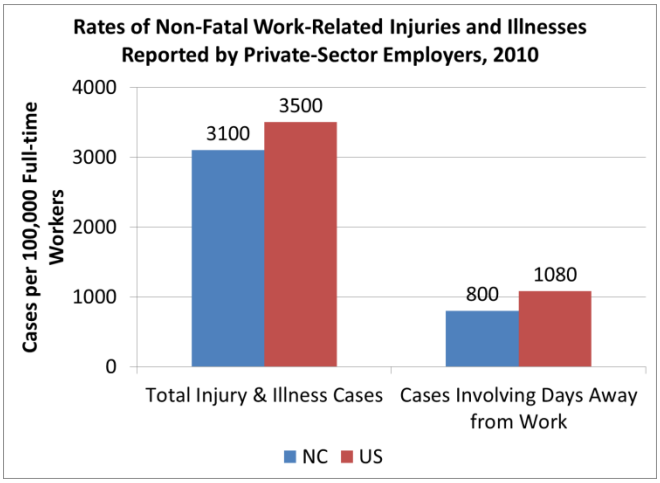
[3] < 40 hrs/week = 0-39 hrs/week (persons who worked 0 hours during the week of the survey due to vacation, sick leave, or other leave are included here.)

Sources: NC data from BLS Geographic Profile of Employment and Unemployment; US data from BLS Current Population Survey

1. Non-fatal work-related injuries and illnesses reported by employers, 2010

Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities [4].

- In 2010, private-sector employers in North Carolina reported an estimated 79,500 work-related injuries and illnesses, with a rate of 3,100 injuries and illnesses per 100,000 full-time-equivalent (FTE) workers.
- Of these cases, 21,400 (26.9%) resulted in at least one day of work lost, and 9,260 (11.6%) resulted in more than 10 days of work lost. The rate of cases resulting in at least one day of work lost was 800 cases per 100,000 FTE workers.

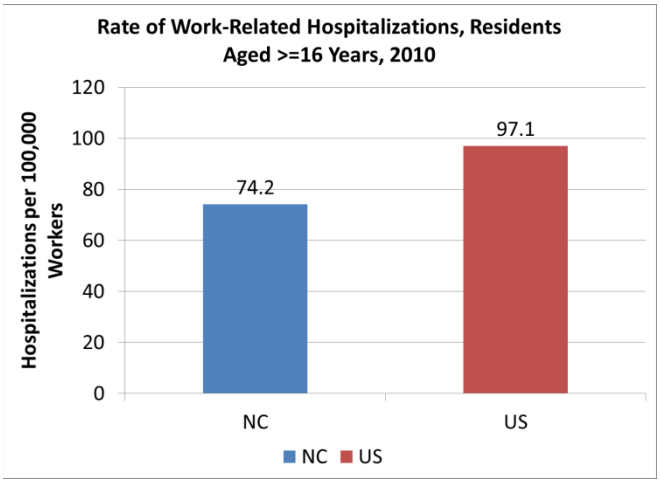


Source: Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII).

2. Work-related hospitalizations, 2010

Individuals hospitalized with work-related injuries and illnesses have some of the most serious and costly work-related adverse health outcomes. Tracking of these adverse health effects will help document the burden of occupational injuries and illnesses to identify high risk settings for workers [4].

- In 2010, 3,038 work-related hospitalizations were reported from acute-care North Carolina hospitals. There were 74.2 work-related hospitalizations per 100,000 workers.
- Of the 3,038 work-related hospitalizations, 2,188 (72%) hospitalizations being male, and 850 (28%) female.

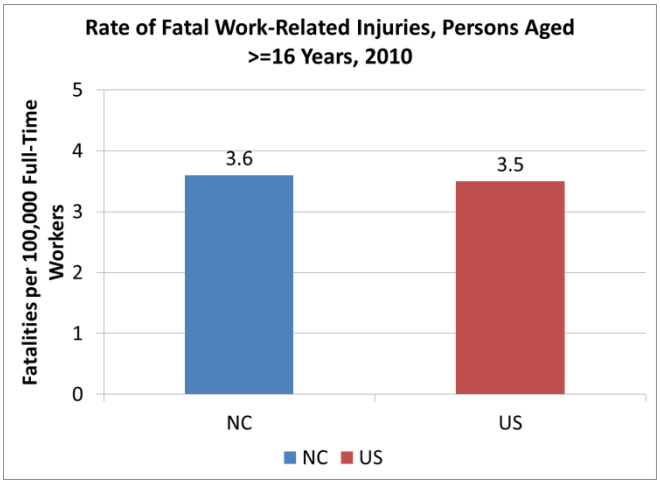


NOTE: U.S. data from 2009.
Sources: NC Inpatient Hospital Discharge Database and the National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

3. Fatal work-related injuries, 2010

Multiple factors and risks contribute to work-related fatalities. Surveillance of work-related fatalities can identify new hazards and case clusters, leading to the development of new interventions and development of new or revised regulations to protect workers [4].

- 139 workers were fatally injured at work during 2010 in North Carolina, with an estimated rate of 3.6 injuries per 100,000 FTE workers.
- The majority of these fatalities occurred in the 45-54 age range (22.3%) and among non-Hispanic White workers (66.2%).

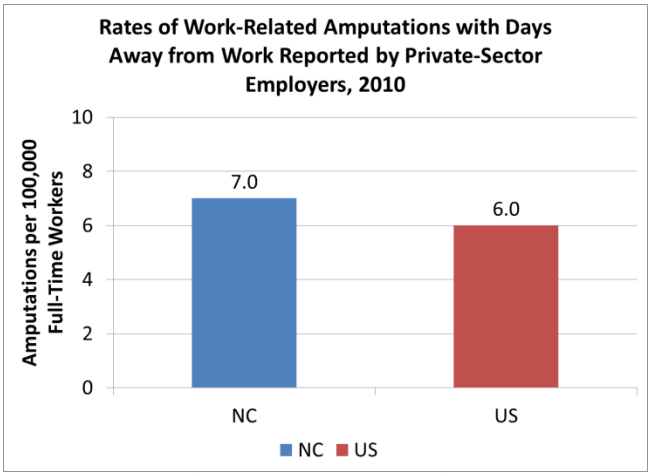


Sources: BLS Census of Fatal Occupational Injuries (CFOI). Workforce estimates from the BLS Current Population Survey.

4. Amputations with days away from work reported by private sector employers, 2010

Work-related amputations are a preventable serious injury. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers [4].

- The estimated number of work-related amputations with days away from work in 2010 for North Carolina was 180, with a rate of 7 per 100,000 FTE workers.
- Almost half (44.4%) of these amputations occurred among non-Hispanic White workers, followed by non-Hispanic Blacks (27.8%) and Hispanics (16.7%). All amputations were of the fingers or fingertips, with over half (55.6%) resulting in 31 or more days lost from work for workers.

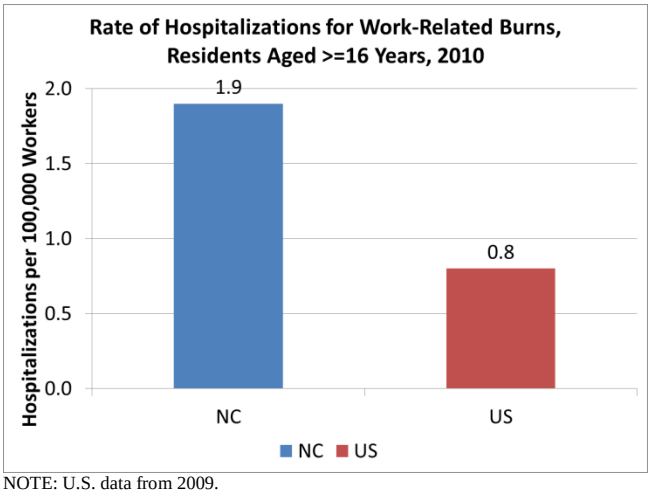


Source: Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII).

5. Hospitalizations for work-related burns, 2010

Work-related burns are some of the most devastating injuries affecting workers. Burns are the most common cause of work-related hospitalization for young workers. Although hospitalized burns are unusual events, they are painful, disabling, and expensive to treat. Many result in significant disfigurement [4].

- In 2010, there were 77 acute-care hospitalizations for burns, for which the primary source of payment was workers' compensation, with an estimated rate of 1.9 hospitalizations per 100,000 workers.
- The greatest proportion of work-related burn cases (29.9%) occurred among workers 25-34 years of age.

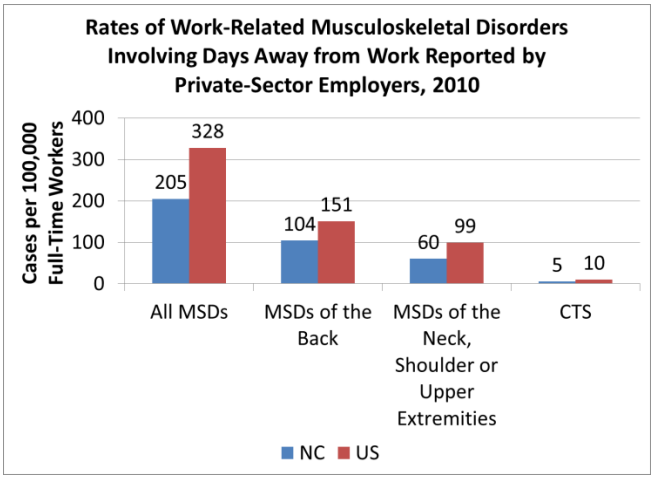


NOTE: U.S. data from 2009.
Sources: NC Inpatient Hospital Discharge Database and National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

6. Musculoskeletal disorders (MSD) resulting in days away from work reported by private-sector employers, 2010

MSDs are soft-tissue disorders of non-traumatic origin that are caused or exacerbated by interaction with the work environment. Muscles, tendons and supporting structures of the lower back, neck, shoulders and upper extremities are usually involved. Carpal tunnel syndrome (CTS) is the most frequently diagnosed work-related hand/wrist injury. Characteristics signs and symptoms include pain and weakness in the three central fingers of the hand. Work-related physical risk factors include highly repetitive or forceful hand work such as pinching, sustained awkward wrist postures and hard-arm vibration. Risk is greater if these factors occur simultaneously [5].

- There was an estimated 5,200 reported cases of MSDs involving days lost from work among private sector workers during 2010, with a rate of 205 cases per 100,000 FTE workers.
- Of the reported MSD cases, more than half (51.2%) involved MSDs of the back, and 1520 (29.2%) involved the neck, shoulder and upper extremities, and with the respective rates of 104 and 60 cases per 100,000 FTE workers.
- 130 (2.5%) reported MSDs were CTS cases, with a rate of 5 cases per 100,000 FTE workers.

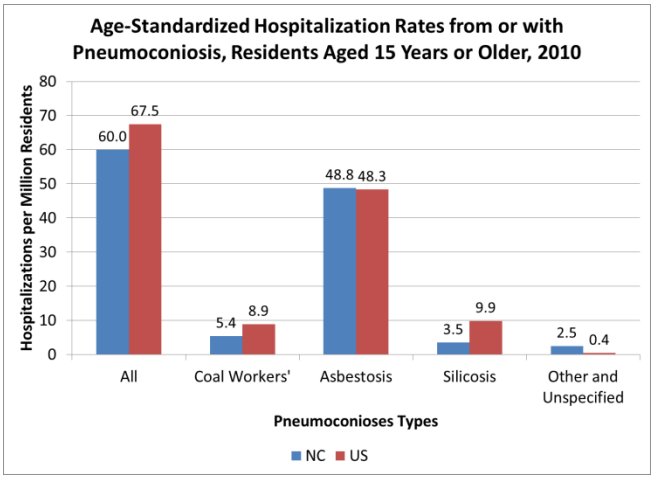


Source: Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII)

7. Hospitalizations from or with pneumoconioses, 2010

Pneumoconioses are a group of lung conditions resulting from chronic inhalation of substances such as fibers and dust into the lungs, usually in an occupational setting [6]. The most common forms of pneumoconioses are asbestosis, silicosis, and coal workers' pneumoconiosis. Except for rapidly progressive forms of silicosis, there is a latency period of up to 10 to 20 years between exposure and development of clinically apparent disease. Severe cases of pneumoconiosis can lead to lung impairment, disability, and premature death.

- In 2010, there were 473 reported hospitalizations in North Carolina with pneumoconiosis listed as a primary or secondary diagnosis, with an age-adjusted rate of 60 hospitalizations per million residents.
- Asbestosis hospitalizations comprise the majority (81%) of pneumoconiosis hospitalizations, with a rate of 48.8 hospitalizations per million residents.

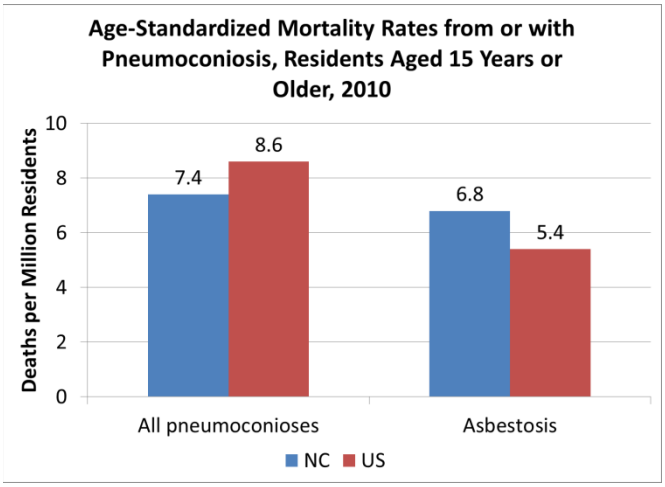


NOTE: U.S. data from 2009.
Sources: NC Inpatient Hospital Discharge Database and the National Hospital Discharge Survey. Population estimates from the U.S. Census.

8. Mortality from or with pneumoconioses, 2010

Nearly all pneumoconioses are attributable to occupational exposure, and millions of workers are at risk. Pneumoconiosis is more commonly listed as a contributing cause of death than as the underlying cause of death. Tracking of pneumoconiosis is essential for tracking progress towards elimination of the disease, as well as for targeting prevention and disease management programs [4].

- In 2010, 55 deaths were reported for North Carolina residents for which the underlying or contributing cause of death was listed as pneuomoconiosis, with 7.4 deaths per million residents.
- Asbestosis comprised more than 90.9% of these mortalities from pneumoconiosis in 2010, with a mortality rate of 6.8 deaths per million residents.

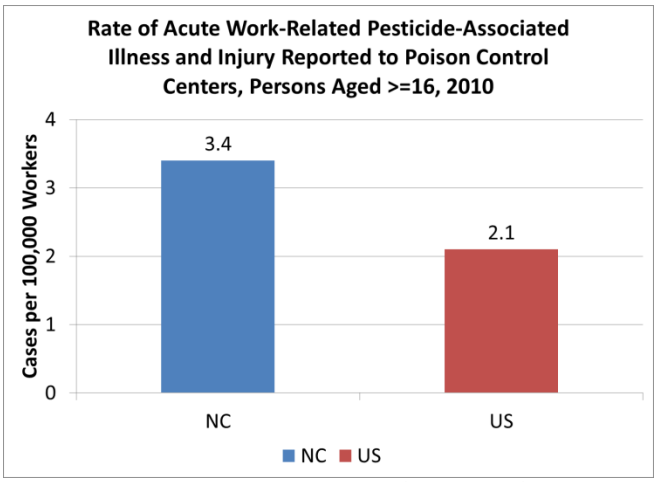


NOTE: U.S data from 2008
Source: North Carolina Death Certificate File and the National Center for Health Statistics. Population estimates from the U.S. Census.

9. Acute work-related pesticide-associated illness and injury reported to Poison Control Centers, 2010

Workers who handle pesticides are at increased risk for exposure. Poison Control Centers (PCCs) are important sources of reports of acute poisonings and chemical exposures. These data can be useful to target prevention. The type of data collected is comparable across states due to the uniformity in case handling by PCCs [4].

- In 2010, there were 140 cases of work-related pesticide poisonings reported to North Carolina poison control center, with a rate of 3.4 cases per 100,000 workers among workers aged 16 years and older.

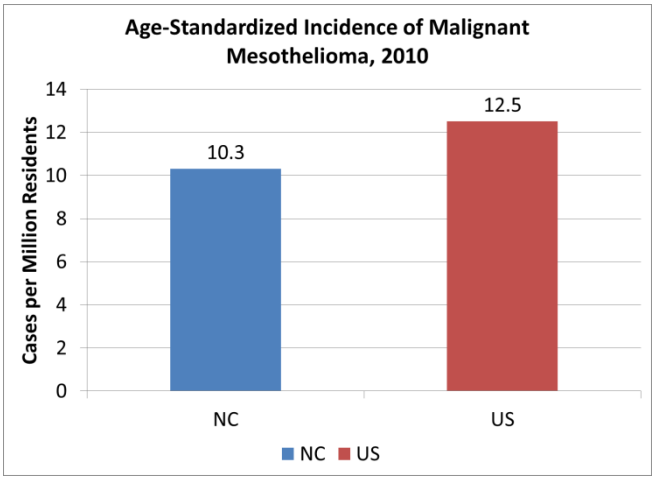


Sources: Toxic Exposure Surveillance System. Workforce estimates from the BLS Current Population Survey.

10. Incidence of malignant mesothelioma, 2010

Mesothelioma is a rare cancer of the thin membrane that surrounds the lungs and other organs, which may develop years after chronic exposure to asbestos. This disease is almost always fatal within a few months of diagnosis. Generally, the risk of acquiring mesothelioma is almost 10 times more likely when exposed to asbestos in an occupational setting as compared to not being exposed to asbestos [7], [8].

- In 2010, 80 newly diagnosed mesothelioma cases were reported in North Carolina, with an age-standardized rate of 10.3 cases per million residents.

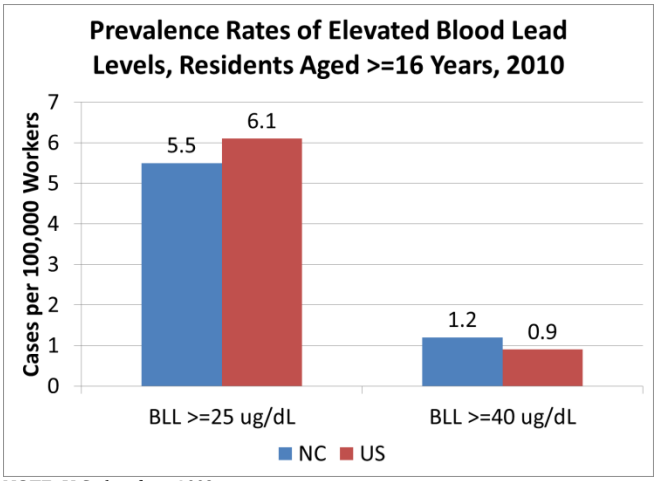


NOTE: U.S. data from 2008.
Sources: North Carolina Central Cancer Registry and the North American Association of Central Cancer Registries. Population estimates from the U.S. Census.

11. Elevated blood lead levels among adults, 2010

Lead is a toxic metal commonly found in the environment and also the workplace, where worker exposure can be common. Blood lead level (BLL) is a biological indicator that can be used to identify recent lead exposure. Even at low doses, lead exposure can become toxic and may result in acute and chronic life-threatening cardiovascular, kidney and reproductive outcomes, as well as impairment of brain and nervous system functions [5], [9].

- In 2010, 227 cases of elevated BLL≥25 µg/dL were reported in residents aged ≥16 years in North Carolina, with a prevalence rate of 5.5 cases per 100,000 employed persons. Of these cases, 182 (80%) were newly reported cases in 2010, with an incidence rate of 4.4 cases per 100,000 employed persons.
- 50 cases of elevated BLL≥40 µg/dL were reported in North Carolina during 2010 in residents aged ≥16 years, with a prevalence rate of 1.2 cases per 100,000 employed persons. Of these cases, 42 (84%) were newly reported cases in 2010, with an incidence rate of 1 case per 100,000 employed persons.



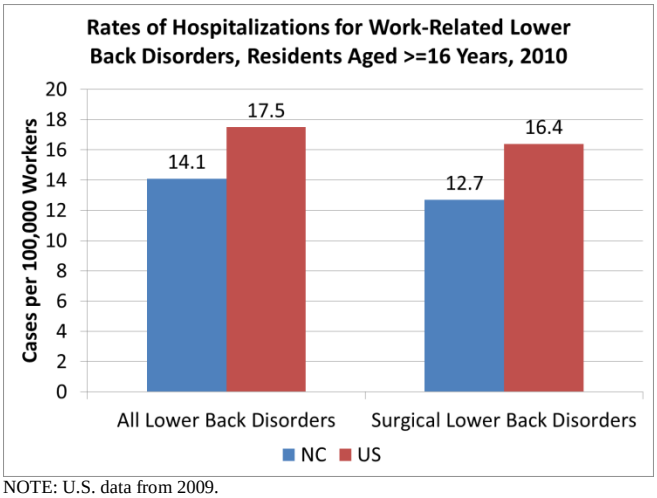
NOTE: U.S. data from 2009.
Sources: Adult Blood Lead Epidemiology Surveillance System (ABLES). Workforce estimates from the BLS Current Population Survey.

12. Hospitalizations for work-related lower back disorders, 2010

The National Health Interview survey data estimates that two-thirds of all low back pain cases are attributable to occupational activities. The total cost of this productive time lost to back pain is estimated to be in excess of $19.8 billion dollars. Hospitalizations for work-related back disorders have serious and costly effects, and well-recognized prevention efforts can be implemented for high risk job activities to reduce the burden of work-related lower back disorders [4].

- In 2010, there were 578 hospitalizations for lower back disorders for which the payer source was workers' compensation, with 14.1 hospitalizations per 100,000 employed persons.

- 519 (89.9%) involved surgery for lower back disorders, with a rate of 12.7 hospitalizations per 100,000 employed persons.



NOTE: U.S. data from 2009.
Sources: NC Inpatient Hospital Discharge Database and the National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey

RESULTS (cont.)

In North Carolina, there are slightly more males (51.9%) in the workforce than females (48.1%). About 95% of the workforce are between the ages of 18 and 64, and are predominantly non-Hispanic White (75.3%). The unemployment percentage in our state is 10.5 percent, which is slightly higher than the national average (9.6%). The percentage distribution of civilian employment by gender and age group are similar to the national percentage distributions. However, percentage distribution of Hispanics employed in North Carolina is about half (7.7%) that of the US (14.3%), and percentage distribution of non-Hispanic Blacks employed in North Carolina is almost double that of the United States. The percentage of part-time job holders in North Carolina (17.3%) is also much lower than the national percentage of part-time job holders (80.3%). The percentage distribution of number of hours worked for North Carolina workers is similar to the national percentage distribution. Education and health services is the predominant industry in North Carolina, followed by wholesale and retail trade, and professional business services tied with leisure and hospitality. Professional and related occupations are the predominant occupation in North Carolina, followed by service, and management, business and financial operations. Percentage distribution of major industry sectors and occupation groups are also similar to those of the national percentage distribution for all industry sectors and occupations, except the percentage of manufacturing of nondurable goods industry is higher in North Carolina than in the rest of the nation.

For condition-specific OHIs, when national rates are used as a comparison, most rates of North Carolina's conditions evaluated in this report are lower. For instance, the rate of work-related hospitalizations in North Carolina (74.2 hospitalizations per 100,000 workers) was much lower than the national rate (97.1 per 100,000). However, some OHIs have rates higher than the national average. Work-related fatal injuries in North Carolina are slightly higher than national rates. Additionally, reported rates for amputations resulting in days away from work, as well as work-related acute pesticide-associated poisonings and elevated blood-lead levels $\geq$40 μg/dL are also higher than national rates. Reported rate of hospitalizations for burns for which the primary source of payment was workers' compensation was double that of the national rate in North Carolina during 2010. Hospitalizations and mortality rates from or with asbestosis are also higher than national rates, with more than 80 percent of all reported pneumoconiosis hospitalizations, and more than 90 percent of all reported pneumoconiosis mortalities resulting from asbestosis.

DISCUSSION

Data presented in this report are intended to offer a descriptive profile of the health status of the North Carolina workforce, as well as compare it to the national workforce. Health effect indicators with rates or counts are higher than their national counterparts can be considered potential problem areas that can be the priority focus of further investigations. However to better understand how to address these problem areas, more in-depth investigations should focus on identifying at-risk industry and occupational groups, and other risk factors contributing to the observed rates. Given current data source limitations, most indicators in this report are likely conservative and may underestimate the true extent of injury and illness among workers in North Carolina. Factors that may contribute to this underestimation may include the exclusion of at-risk populations from surveillance, such as;

- the military or small farms,
- variations in coding the causes of injury, illness, or death,
- underreporting by employees and health care providers of occupational injuries and illnesses,
- inadequate health care provider recognition of occupational injuries and illnesses,
- failure by employers and/or health care providers to report cases according to applicable state laws,
- difficulties attributing exposure to diseases due to long latency periods or multifactorial causes, and
- random variations inherent in the populations at risk.

Data selection methods may also influence counts and rates. For instance, when compiling data for indicators using state hospital discharge data, work-related cases are selected for analysis if there is indication within the data source that workers' compensation was utilized as the primary payment source for hospital visits. This method of selection does not take into account workers who have work-related injuries or illnesses, but do not use workers' compensation as the primary payment source, despite visiting a hospital for a work-related illness or injury. Changes in reporting

laws or programmatic development of surveillance activities in certain years may also contribute to changes counts and rates. Explanations of data sources are provided in the Appendix, and a complete description of methodology for generating OHIs can be found on CSTE's website: "Occupational Health Indicators: A Guide for Tracking Work-Related Health Effects and their Determinants" on the CSTE website (www.CSTE.org).

The OHI data alone do not provide all the necessary information for managing state occupational health programs, but will help raise awareness about occupational health status of workers, present potential starting points for further investigations, as well as help open a dialogue between state partners to help determine how to prevent injuries and illnesses in the workplace. OHI data gathered using state-based database sources are also not comparable across states because reporting and data collection practices differ between states. Indicator data is most informative when compiled over time, minimizing problems of rate instability. OEEB is currently compiling OHI data for multiple years to better examine trends in our state.

APPENDIX

DATA SOURCE DESCRIPTIONS, LIMITATIONS & NOTES
(Presented in alphabetical order)

Adult Blood Lead Epidemiology and Surveillance System (ABLES) – (Indicator #11)
The national Adult Blood Lead Epidemiology and Surveillance (ABLES) Program is a state-based surveillance program designed to build state surveillance capacity for cases of laboratory-reported elevated adult blood lead levels. It is funded by the Centers for Disease Control and Prevention (CDC) and the National Institute of Occupational Safety and Health (NIOSH). Mandatory reporting requirements in North Carolina requires laboratories throughout the state to report any blood lead level (BLL) 40 μg/dL and above for individuals 18 years and older to the Occupational and Environmental Epidemiology Branch, NC Division of Public Health. Data is then submitted biannually to NIOSH and aggregated for the national database.

ABLES defines a case as an individual reported with a BLL $\geq$10 μg/dL. A prevalent case is one that is reported at least once in the calendar year. An incident case is one that is reported within the calendar year, but not in the immediately preceding calendar year.

Limitations: Because rates calculated for this indicator include both occupational and non-occupational reported cases in the numerators, but denominators only include employed persons, the rates presented in this report may overestimate the incidence of lead exposure in North Carolina's employed population. In the United States, up to about 95 percent of elevated BLL$\geq$25 among adults are attributable to work-related exposures [9]. Rates may also be underestimated in some capacity, even though North Carolina requires employers to report incidences of occupational lead exposure, data from testing laboratories or occupational lead registries may still be incomplete, and many workers with significant occupational lead exposure may not be appropriately tested. Workers may also choose to not be tested, depending on industry, occupation, and work status. Additionally cases of lead exposure in occupational versus non-occupational settings can be indistinguishable. Some workers may also have BLL tests conducted outside of state, which are not captured in these counts, and data on state of employment/exposure or state of residency may be determined in all cases.

Notes: The national incidence and prevalence rates in this report for cases of elevated blood lead levels are estimated from the 41 states that provide data and participate in the ABLES program as of 2010.

Census of Fatal Occupational Injuries (CFOI) – (Indictor #3)
The Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) is a Federal-State cooperative program that uses multiple sources to identify, verify, and profile fatal worker injuries. Information about each workplace fatal injury – occupation and other worker characteristics, equipment involved, and circumstances of the event – is obtained by cross-referencing source documents. Data compiled by the CFOI program are issued annually. Because it is a census, CFOI data is considered complete.

CFOI includes all fatalities resulting from non-intentional injuries (motor vehicle crashes, falls, etc.) and intentional injuries (homicides, suicides, etc.) that occur at work. Private wage, salary, self-employed, and public-sector workers are comprehensively counted in this census. Fatalities occurring during commute to or from work are excluded, as well as deaths resulting from acute or latent illnesses which can be difficult to identify as work-related.

Limitations: CFOI reports work-related fatalities by the state in which the fatal incident occurred, but not necessarily state of residence or state of death. However, denominator data used for calculating rates is based on state of residence, and therefore state rates may overestimate risk if deceased persons working in North Carolina were out-of-state residents, and underestimate risk if deceased workers were North Carolina residents fatally injured on the job outside the state.

Notes: Fatal occupational injury rates are calculated using full-time equivalent workers (FTE) in the denominator, which takes into account number of hours worked. However, prior to 2009, these rates were calculated using the

number of persons employed. Comparing fatality rates in this report with rates published in reports prior to 2009 should be done so with this caveat in mind.

North Carolina Central Cancer Registry (NCCCR) – (Indicator #10)
The NCCCR at the North Carolina Division of Public Health is responsible for recording all cancers diagnosed and treated in the state of North Carolina through the CCR Health Registry Network, a web-based database that collects both record-level data and North American Association of Central Cancer Registries (NAACCR) file format data. Data are submitted by all health care facilities that diagnose or treat cancer in the state, and are used for cancer surveillance, planning and evaluation of public health programs, public health research, public education, and requests from the public. A case record is defined as a recorded incidence of primary malignant cancer, coded using International Classification of Diseases, Ninth and Tenth Revisions (ICD-9 and ICD-10) for mortality codes; and International Classification of Diseases for Oncology, Second Edition (ICD-O-2) for primary site codes. Key data elements include diagnosis information, demographics, and first course of treatment.

North Carolina Death Certificate File (NCDCF) – (Indicator #8)
The NCDCF contains information on all deaths of North Carolina residents. Funeral directors or persons burying a body are responsible for filing a death certificate or fetal death certificate with the local registrar prior to final disposition and within 72 hours after a death. Death is reported to and filed with the NC Office of Vital Records and the NC State Center for Health Statistics compiles this data. A case record is defined as the death of a North Carolina resident or a person who dies in the state of North Carolina. Fetal deaths are excluded. Data elements collected include personal identifiers and demographics, place of injury, date of death, place of occurrence (county and state), residence (complete), cause of death coded using the Tenth Revision of the International Classification of Diseases (ICD-10), manner of death, autopsy findings and work injury or not.

Limitations: Because counts are only based on data reported to the NC Office of Vital Records, rates may be underestimated based on the accuracy level of reporting practices of funeral directors or persons burying a body. Demographic and other descriptive data acquired at the time of reporting are also limited based on accuracy of reporting practices. Deaths of North Carolina residents that take place outside the state of residence may not be counted among this data, and persons who die in North Carolina whom are also counted in this database may not necessarily be residents of the state, and can overestimate the rate calculations.

North Carolina Inpatient Hospital Discharge Database (NCIHDD) – (Indicators #2, #5, #7 and #12)
The NCIHDD database contains case-specific discharge data for patients admitted to non-federal government facilities in North Carolina, and includes demographic, diagnostic, payer and cost information. The NC State Center for Health Statistics (SCHS) manages this database. A case record is defined as any inpatient discharge from an acute stay in a non-federal government hospital. Because this database does not contain specific information regarding work-relatedness of a patient's injury or illness, selection of cases where workers' compensation insurance was designated as the payer source was the method used to identify work-related hospitalizations for Indicators 5 and 7. Additionally, all pneumoconioses cases selected for analysis in Indicator 7 are considered to be work-related because it has been well established that nearly all pneumoconioses are attributable to occupational exposures [4].

Limitations: Counts from database for numerators used to calculate rates for Indicators #2, #6 and #14 reflect the number of hospitalizations, not the number of patients. Therefore, individuals hospitalized multiple times may be counted more than once in this database, and rates of hospitalization for these conditions may be overestimated when using these counts. Additionally, North Carolina residents who are hospitalized out of state for injury or illness are not included in this database. Furthermore, not all workers are covered by workers' compensation, and those who are covered may not use it as a payment source, and so use of workers' compensation payment method to select for work-related hospitalizations may underestimate the actual rates of hospitalizations for these conditions. Worker's compensation payment source may also be more sensitive in identifying occupational injuries rather than illnesses, as occupational illnesses have more non-specific markers due to long latency periods between exposure and onset of disease.

Survey of Occupational Injuries and Illnesses (SOII) – (Indicators #1, #4 and #6)

Nonfatal occupational injury and illness national estimates are derived from the Bureau of Labor Statistics annual Survey of Occupational Injuries and Illnesses (SOII). SOII provides injury and illness summary data, counts and rates for a variety of employer, employee, and case characteristics. The survey captures data from OSHA logs of workplace injuries and illnesses maintained by employers. The estimates cover nearly all private-sector industries, as well as state and local government (as of 2008 data). A case in SOII is defined as a non-fatal occupational injury or illness that involves lost work time, medical treatment other than first aid, restriction of work or motion, loss of consciousness, or transfer to another job.

Limitations: SOII data is based on sample data, not census data, of all employers in North Carolina, and therefore data are estimates subject to sampling error. The military, self-employed, household workers, small farms with fewer than 11 employees, municipal workers, and Federal government agencies, are excluded from the SOII. The SOII survey also underreports work-related injuries and illnesses with long latency periods that may not manifest symptoms until years after exposure, as SOII data are collected shortly after the end each calendar year.

Notes: BLS publishes case rates per 100 FTEs (equivalent full-time workers) or per 10,000 FTEs. Rates presented in this report were converted to injury/illness cases per 100,000 FTEs by multiplying BLS rates by 1000 or 10, respectively.

National Poison Data System (NPDS) – (Indicator #9)
NPDS is maintained by the American Association of Poison Control Centers (AAPCC). Data regarding poisoning conditions from poison control centers (PCCs) throughout the country are uploaded to NPDS in near-real time. PCC clinical specialists in poison information collect data immediately and on-site, provide consultation 24 hours/day to callers with concerns over actual or potential exposure to toxic substances, and are nationally accessible to calls from the public or from health professionals. Data elements gathered by PCCs generally include demographics, intentionality of exposure, whether the exposure was work-related, location of exposure (workplace, etc.), route, duration and reason for exposure; type of substance(s) involved, symptoms, therapies, and medical outcomes. PCC data are useful for monitoring pesticide poisonings nationally because PCC services are provided to almost the entire United States population. However, calls to state and regional PCCs are estimated to only capture about 10 percent of acute occupational pesticide-related illness cases [10], [11].

Limitations: PCCs rely on passive surveillance methods in which data only comes from exposure sources that chose to report exposures to PCCs, and so calls to poison centers do not include all chemical and poison exposures. Therefore, rates calculated using PCC data may underestimate the true extent of work-related pesticide and related chemical exposures. Reporting practices of chemical and poison exposures reported to PCCs tend to vary across the country, and even among different ethnic groups, due to differences in reporting laws by state, awareness levels of PCCs in different populations, and differences in levels of expertise and perceived need by healthcare professionals. For instance, more experienced healthcare professionals may manage acute pesticide poisonings onsite themselves, making them less likely to use PCCs for technical advice, and therefore certain cases may not be reported at all. It is estimated that PCC incidence of exposure calls may even be underreported by half [10], [11]. It is necessary for affected individuals or healthcare professionals to know about and know how to use PCCs other than just for technical consultation, and to report work-related cases.

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