

# Putting Data to Work

## Occupational Health Indicators for Massachusetts

April 2011

Occupational Health Surveillance Program • Massachusetts Department of Public Health

More than three million individuals work in Massachusetts in over 200,000 workplaces. These workers drive our economy from the cutting edge sector of biotechnology and health care to the traditional jobs in fishing and construction. While work is fundamental to well being, working conditions can also negatively effect health. This is most obvious in jobs such as construction where many dangers are well recognized, but exposure to chemicals, chronic wear and tear, and stress at work can also take a toll.

Each year, thousands of Massachusetts workers are injured on the job or become ill as a result of exposure to health and safety hazards at work. These work-related health conditions result in substantial human and economic costs not only for workers and employers but also for society at large.<sup>1</sup> Workers' compensation claims alone in Massachusetts cost approximately \$843 million in 2008<sup>2</sup> and there is increasing evidence that for many individuals with work-related injuries or illnesses, workers' compensation insurance does not pay for their medical care.<sup>3,4</sup> Work-related injuries and illnesses can be prevented. Successful approaches to making the workplace safer begin with having the data necessary to understand the problems.

In 2003, the Council of State and Territorial Epidemiologists (CSTE) recommended a set of occupational health indicators for use by the states.<sup>5</sup> These indicators are a set of common public health surveillance measures that allow states to uniformly collect and report available occupational illness, injury and risk data. Computed over time, these indicators allow states to track trends in the occupational health status of the working population and guide efforts to prevent work-related injuries and illnesses.

In this brief report, we present a profile of the Massachusetts workforce and fifteen occupational health indicators for the Commonwealth based on the most recent data available for each indicator. Whenever possible, we also present national data and information by race and ethnicity. This year we have added two state specific indicators: numbers and rates of sharps injuries among hospital workers and work-related injuries to teens treated in emergency departments. The information used to generate these indicators is gathered from a variety of existing state data sources – as no single data source is adequate to describe occupational health problems in the state. Combining information from multiple sources into a single document provides a composite picture of the occupational health status of working people in Massachusetts. A more extensive report tracking these indicators over time is in progress.

Given the limitations of the data sources currently available to capture work-related health conditions in Massachusetts, most of the indicators in this report are believed to be conservative – i.e. tend to underestimate the extent of the problem. Technical notes and a description of the data sources, including the limitations of each of the data sources used in generating these indicators are included at the end of the report. A detailed description of the methodology for generating these indicators is available in "Occupational Health Indicators: A Guide for Tracking Work-Related Health Effects and their Determinants" on the CSTE website ([www.CSTE.org](http://www.CSTE.org)).



## Profile of Massachusetts Workforce

<b>Distribution by Demographic and Employment Characteristics, 16 Years of Age and Older, 2009</b>	
Total number employed (in thousands)	<b>3,193</b>
	<b>%</b>
Male	50.7
Female	49.2
Age (years):	
16-17	1.7
18-64	93.7
65 and older	4.6
Race/ethnicity:*	
White	88.5
Hispanic <sup>1</sup>	6.2
Other	6.1
Black	5.4
Unemployed	9.1
Self-employed	6.7
Employed part-time <sup>2</sup>	23.1
Hours work/week:	
< 40 hours/week <sup>3</sup>	42.4
40 hours/week	33.0
> 40 hours/week	24.5
<b>Distribution by Major Industry Sector and Occupation Group, 16 Years of Age and Older, 2009</b>	
<b>INDUSTRY SECTOR</b>	<b>%</b>
Educational and health services	27.9
Professional and business services	13.4
Wholesale and retail trade	12.7
Manufacturing	8.8
Leisure & Hospitality	8.5
Financial activities	7.1
Construction	5.2
Public administration	4.7
Transportation and utilities	4.3
Other services	4.2
Information	2.3
Agriculture and related industries	0.5
Mining	0.0
<b>OCCUPATION GROUP</b>	<b>%</b>
Professional and related occupations	27.7
Service	17.2
Management, business and financial operations	16.5
Office and administrative support	12.8
Sales and related	10.0
Construction and extraction occupations	4.5
Transportation and material moving	4.1
Production	3.9
Installation, maintenance, and repair	2.8
Farming, fishing, and forestry occupations	0.3

<sup>1</sup> Persons identified as Hispanic may be of any race (White, Black, Other)

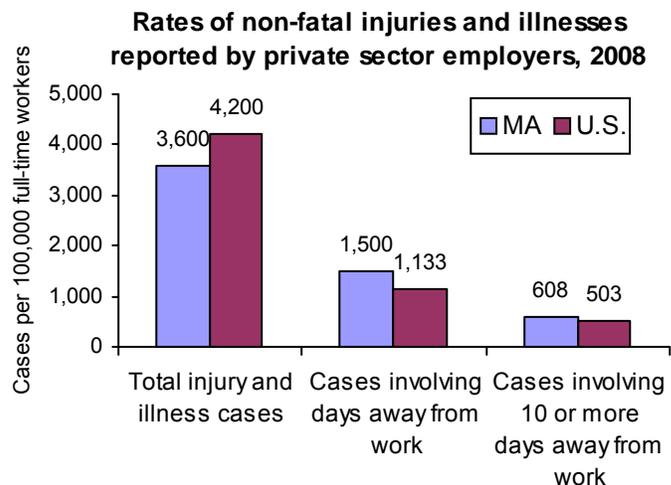
<sup>2</sup> Persons who work 1-34 hrs/week are considered part-time. Working ≥35 hrs/week is considered full-time.

<sup>3</sup> < 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.)

Source: BLS Geographic Profile of Employment and Unemployment

### Indicator 1: Non-fatal injuries and illnesses reported by employers, 2008

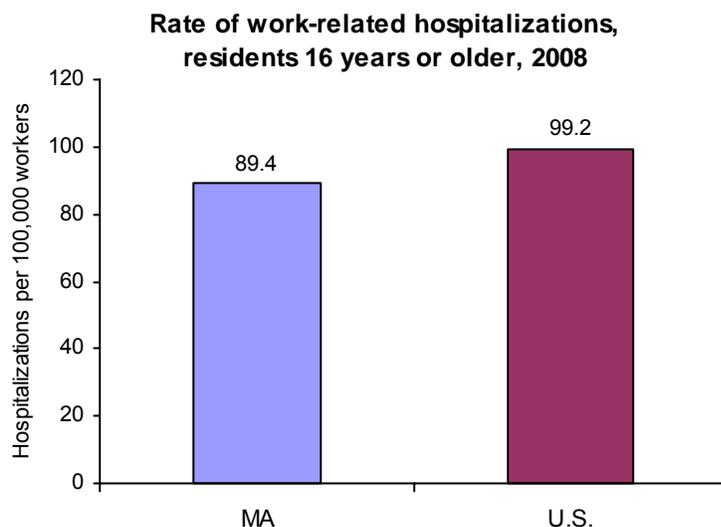
- Private sector employers in Massachusetts reported an estimated 82,600 injuries and illnesses to workers in 2008. The corresponding rate of injuries and illnesses was 3,600 per 100,000 full-time workers.
- Of these cases, 33,300 (40%) resulted in at least one lost day of work, and 13,930 (17%) resulted in more than 10 days of work lost. The rate of cases resulting in at least one lost day of work was 1,500 per 100,000 full-time workers, and the rate of cases resulting in more than 10 days of work lost was 608 per 100,000 full-time workers.
- For the first time in 2008, data on injuries and illnesses among public sector workers in Massachusetts were reported by state and local agency employers. There were estimated 12,500 injuries and illnesses among state and municipal workers. The corresponding rate of injuries and illnesses was 4,100 per 100,000 full-time workers. Data from this first year of collection should be considered preliminary.



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

### Indicator 2: Work-related hospitalizations, 2008

- There were 2,855 hospitalizations in Massachusetts acute care hospitals for which workers' compensation was the payer in 2008. The rate of work-related hospitalizations was 89.4 per 100,000 workers.
- There were 218 work-related hospitalizations among Hispanic workers and 2,357 among White non-Hispanic workers; yet the rate of work-related hospitalizations among Hispanic workers was approximately 38% higher than the rate for White non-Hispanic workers in MA (122 verses 88.2 per 100,000 workers, respectively). The rate of work-related hospitalization for Asian workers, based on 18 cases, was lower than that for White non-Hispanic workers. This finding is consistent with results reported previously for Massachusetts.<sup>6</sup>

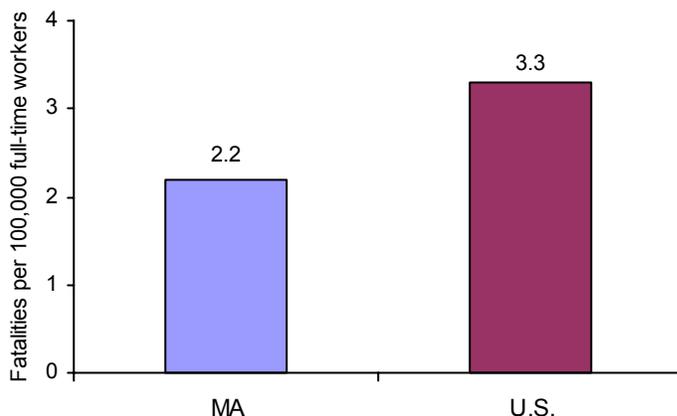


Sources: MA Inpatient Hospital Discharge Dataset and the National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

### Indicator 3: Fatal work-related injuries, 2009

- In 2009, 62 workers were fatally injured on the job in Massachusetts. The rate of fatal work-related injuries was 2.2 per 100,000 full-time workers.\*
- Forty-eight of the victims were White, non – Hispanic, five were Hispanic, four were Black and three were Asian. The rate for Hispanic workers was 2.8 per 100,000 full-time workers, exceeding the rate of 2.0 per 100,000 full time workers for White non-Hispanics. While the higher rate for Hispanics is based on small numbers, this finding is consistent with previous reports of high rates of fatal work-related injuries among Hispanics compared to White workers in Massachusetts and the nation.<sup>7,8</sup>

Rate of fatal work-related injuries, persons 16 years or older, 2009

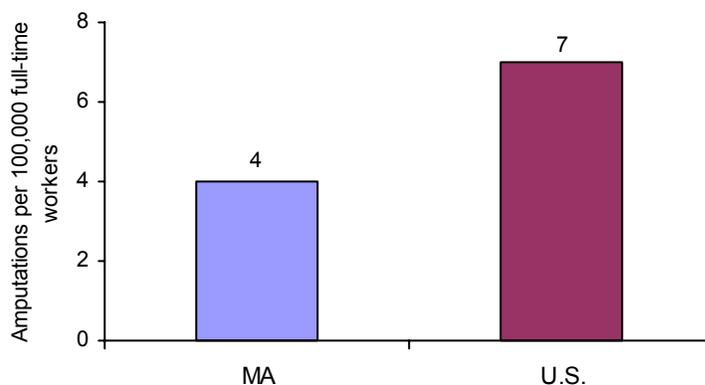


Sources: BLS Census of Fatal Occupational Injuries. Workforce estimates from the BLS Current Population Survey.

### Indicator 4: Amputations reported by private sector employers, 2008

- The estimated number of amputations involving lost work days reported among private sector workers in Massachusetts was 100 in 2008. The rate was 4 amputation cases per 100,000 full-time workers.

Rate of work-related amputations involving days away from work reported by private sector employers, 2008



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

### Indicator 5: Amputations identified in the workers' compensation system, 2008

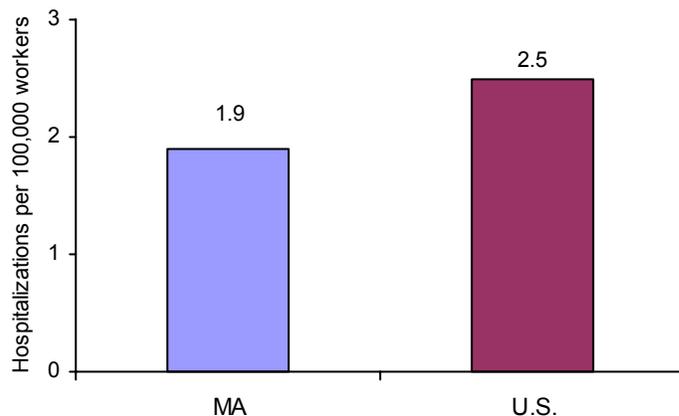
- In 2008, 187 workers' compensation claims for amputations resulting in five or more lost workdays among public and private employees were filed with the Massachusetts Department of Industrial Accidents. The rate of amputation claims was 5.8 per 100,000 covered workers.

\* Prior to 2009, fatal occupational injury rates were calculated using the number of persons working rather than full-time employee equivalents (full-time workers) in the denominator. Caution should be used in comparing rates for 2009 and with those in previous reports. Rates over time based on full time workers are available upon request.

### Indicator 6: Hospitalizations for work-related burns, 2008

- In 2008, there were 61 hospitalizations for burns in Massachusetts acute care hospitals for which workers' compensation was the payer. The rate of hospitalizations was 1.9 per 100,000 workers.
- The rate of work-related hospitalizations for burns among Hispanic workers was over five times the rate for White non-Hispanic workers (8.5 versus 1.4 per 100,000 workers, respectively). Though based on a small number of events (n=15), the disproportionate burden of work-related burn hospitalizations among Hispanics is consistent with previously observed higher rates of work-related burn hospitalizations among Hispanics as compared to White, non-Hispanics.<sup>6</sup>

Rate of hospitalizations for work-related burns, residents 16 years or older, 2008



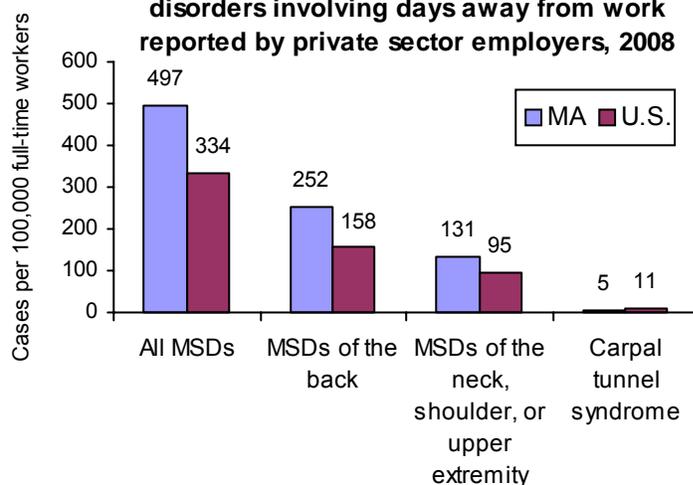
Sources: MA Inpatient Hospital Discharge Dataset and National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

### Indicator 7: Musculoskeletal disorders reported by private sector employers, 2008

Work-related musculoskeletal disorders (MSDs) are injuries or disorders of the muscles, tendons, nerves, ligaments, joints, or spinal discs that are caused or aggravated by work activities.

- In 2008, there were an estimated 11,380 cases of musculoskeletal disorders (MSDs) involving lost work days reported among private sector workers in Massachusetts. The rate of MSD cases was 497 per 100,000 full-time workers. These cases accounted for more than one-third (34%) of all lost workday cases reported.
- Of the MSD cases reported, 5,780 (51%) involved the back (including the spine and spinal cord), and 2,990 (26%) involved the neck, shoulder, or upper extremity. The rate of cases involving the back was 252 per 100,000 full-time workers, and the rate of cases involving the neck, shoulder, or upper extremity was 131 per 100,000 full-time workers.
- The estimated number of carpal tunnel syndrome cases (see definition of carpal tunnel syndrome on next page) in Massachusetts involving lost work days was 110. The rate of carpal tunnel syndrome cases was 5 per 100,000 full-time workers.

Rates of work-related musculoskeletal disorders involving days away from work reported by private sector employers, 2008



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

### Indicator 8: Carpal tunnel syndrome cases identified in the state Workers' Compensation system, 2008

Carpal tunnel syndrome (CTS) is a type of musculoskeletal disorder which affects the median nerve of the wrist. Symptoms range from burning, tingling, or numbness in the fingers to difficulty gripping or holding objects.

- In 2008, 291 workers' compensation claims for carpal tunnel syndrome involving five or more lost workdays among public and private sector employees were filed with the Massachusetts Department of Industrial Accidents. The rate of carpal tunnel syndrome claims was 9.1 per 100,000 covered workers.

### Indicator 9: Pneumoconiosis hospitalizations, 2008

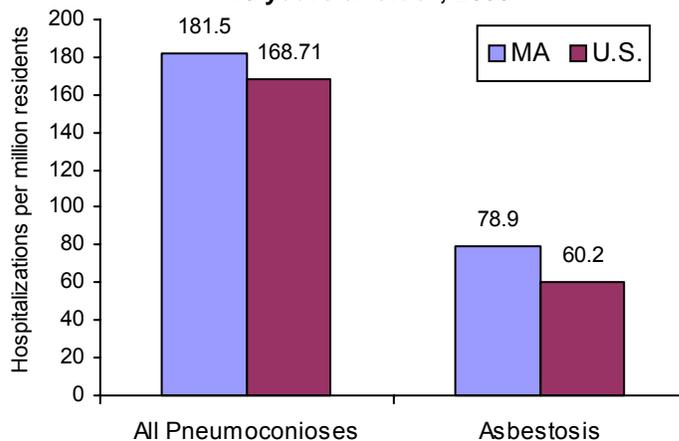
Pneumoconiosis is a class of non-malignant lung diseases (including silicosis, asbestosis, and coal workers' pneumoconiosis) caused by the inhalation of mineral or metallic dust particles (primarily coal, silica, or asbestos), nearly always in an occupational setting. The cases that are observed in the present result from worker exposures which occurred in the past, as there is a typically long latency period for this disease (about 10-15 years).

- In 2008, there were 1,055 hospitalizations in Massachusetts acute care hospitals with pneumoconiosis listed as a principal or secondary discharge diagnosis. The rate of hospitalizations was 181.5 per million residents.
- Close to 93% (981) of these hospitalizations were for asbestosis. There were 97 silicosis-related hospitalizations, 24 hospitalizations for coal worker's pneumoconiosis, and 20 hospitalizations for other and unspecified pneumoconiosis. The rates of hospitalizations for silicosis and coal worker's pneumoconioses were 6.6 and 3.5 per million residents, respectively.
- The majority of hospitalizations for pneumoconiosis in MA were among White non-Hispanic residents (95%). About 2% (N=22) were Black non-Hispanic residents. The rate for White non-Hispanic residents exceeded that for Black non-Hispanics.

### Indicator 10: Pneumoconiosis mortality, 2008

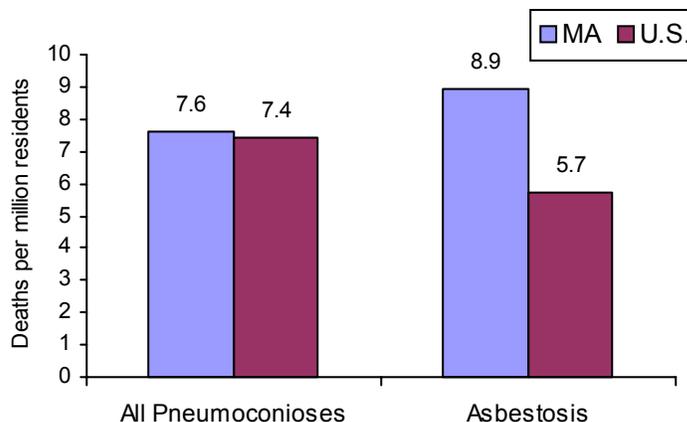
- There were 46 deaths among Massachusetts residents for which pneumoconiosis was listed as the underlying or contributing cause of death. The corresponding mortality rate was 7.6 deaths per million residents.
- Asbestosis accounted for almost all of these deaths (45/46). The rate was 7.4 deaths per million residents.

Age-standardized rates of hospitalizations from or with select pneumoconiosis, residents 15 years or older, 2008



Sources: MA Inpatient Hospital Discharge Dataset and the National Hospital Discharge Survey. Population estimates from the U.S. Census.

Age-standardized mortality rates for pneumoconiosis, residents 15 years and older, 2008



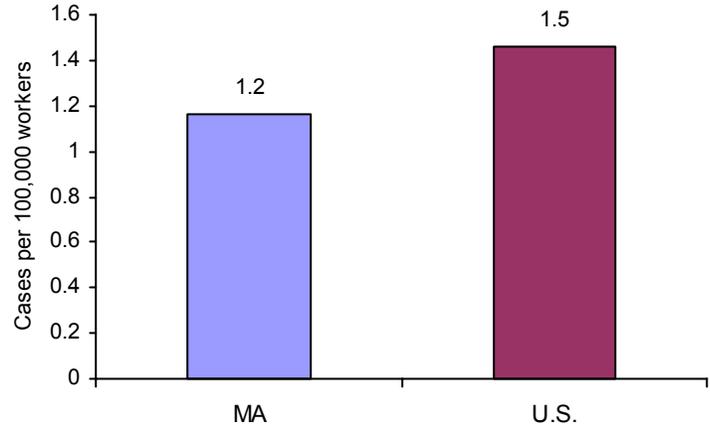
Source: Massachusetts Registry of Vital Records and Statistics and the National Center for Health Statistics. Population estimates from the U.S. Census.

### Indicator 11: Acute work-related pesticide associated illness and injury reported to Poison Control Centers, 2009

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- In 2009, 37 cases of work-related pesticide poisoning were reported to the Massachusetts poison control center. The rate of work-related pesticide poisonings was 1.16 per 100,000 workers.

**Rate of work-related pesticide-associated poisoning, persons 16 years or older, 2009**



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

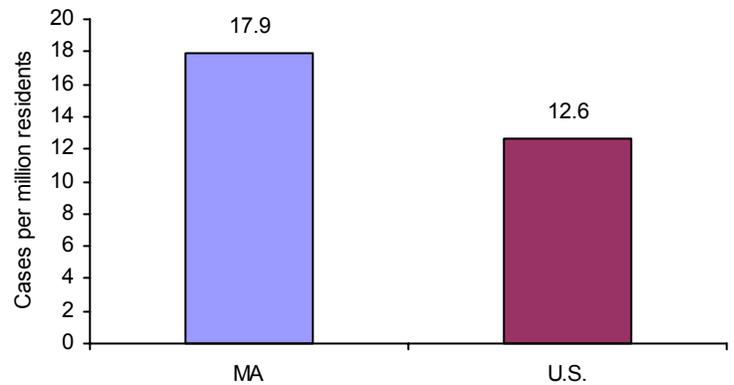
### Indicator 12: Incidence of malignant mesothelioma, 2007

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Malignant mesothelioma is a rare yet highly fatal cancer of the thin lining of the chest or abdomen. Prior exposure to asbestos, primarily in the workplace, has been reported in 62-85% of all mesothelioma cases.<sup>9</sup>

- In 2007, 102 cases of newly diagnosed, malignant mesothelioma were reported to the Massachusetts Cancer Registry. The rate of malignant mesothelioma cases was 17.9 per million residents.

**Age-standardized incidence rate of malignant mesothelioma, residents 15 years or older, 2007**



Sources: Massachusetts Cancer Registry and the North American Association of Central Cancer Registries. Population estimates from the U.S. Census.

### Indicator 13: Elevated blood lead levels among adults, 2010

The blood lead level (BLL) is a biological indicator of recent exposure to lead, a toxic metal found in the environment and workplace.

- In 2010, 175 prevalent cases of elevated blood lead levels (BLL  $\geq$  25  $\mu\text{g}/\text{dl}$ ) in residents 16 years or older were reported to the Massachusetts Occupational Lead Poisoning Registry. Of these, 49 (28%) had BLLs  $\geq$  40  $\mu\text{g}/\text{dl}$ . The rates per 100,000 workers were 5.5 for BLLs  $\geq$  25  $\mu\text{g}/\text{dl}$  and 1.5 for BLLs  $\geq$  40  $\mu\text{g}/\text{dl}$ .
- Of these 175 cases, 137 were newly identified (incident) cases of elevated BLLs that had not been reported in the previous calendar year. Of these new cases, 36 (26%) had BLLs  $\geq$  40  $\mu\text{g}/\text{dl}$ .

### Indicator 14: Hospitalizations for work-related low back disorders

- In 2008, there were 493 hospitalizations for low back disorders in Massachusetts for which workers' compensation was the payer. The rate of hospitalizations was 23.9 per 100,000 employed persons.
- Of these 493 hospitalizations, 372 involved surgery for low back disorders. The rate of work-related surgical low back disorder hospitalizations was 18.0 per 100,000 employed persons. (National data for this indicator not yet available).
- The rate of hospitalization for work-related low back disorders among Hispanic workers in MA was 21.3 per 100,000 workers. The rates for White non-Hispanic workers and Black non-Hispanic workers were 12.5 and 15.6 per 100,000 workers respectively. These rates are not significantly different from one another.

### Massachusetts-Specific Indicators

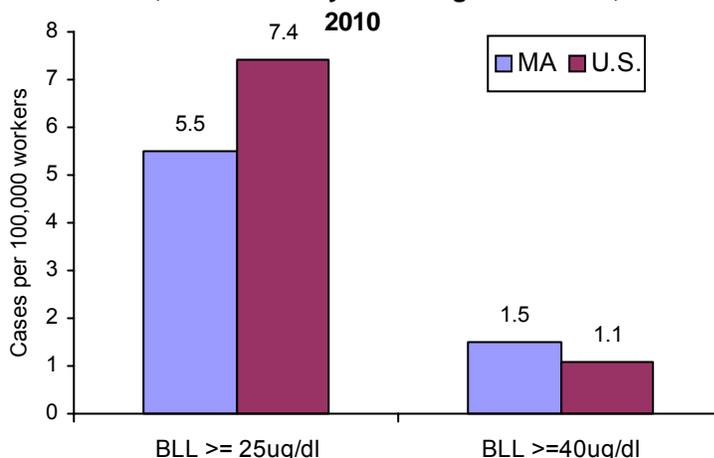
#### Emergency department visits for injuries to teen workers 15-17 years old, 2008

In 2008, there were 565 emergency department (ED) visits for work-related injuries to teens under age 18; the rate of ED visits for these teens was 1.9 per 100 full time equivalent (FTE) workers.

#### Sharps injuries among hospital workers, 2009

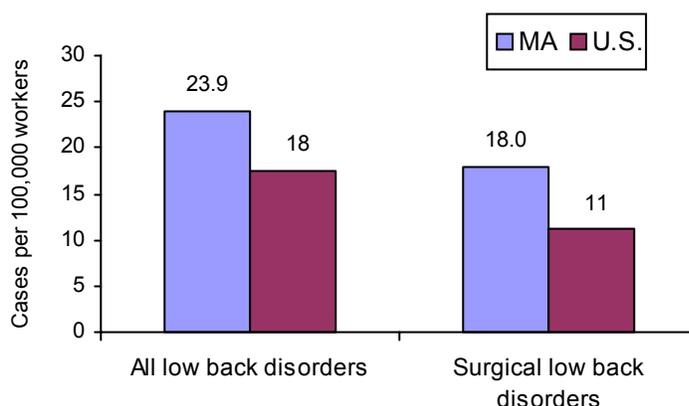
In 2009, there were 2,889 sharps injuries among hospital workers in MDPH licensed hospitals. The sharps injury rate was 15.8 injuries per 100 licensed beds.

### Prevalence rates of elevated blood lead levels, residents 16 years of age and older, 2010



Sources: Adult Blood Lead Epidemiology Surveillance System (ABLES). U.S. data for 2006. Workforce estimates from the BLS Current Population Survey.

### Rates of hospitalizations for work-related low back disorders, residents 16 years or older, 2008



Sources: MA Inpatient Hospital Discharge Dataset and the National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

## Data Source Descriptions & Technical Notes

### Adult Blood Lead Epidemiology and Surveillance System (ABLES) – Indicator 13

Massachusetts is one of 37 states participating in the ABLES, funded through the CDC National Institute for Occupational Safety and Health (NIOSH). The Massachusetts Occupational Lead Registry collects reports of adult Blood Lead Levels (BLLs) of 15 micrograms/deciliter or greater among persons 15 years of age or older from clinical laboratories. Data from registries in Massachusetts and other states are periodically forwarded to the NIOSH ABLES program where they are aggregated.

ABLES defines a prevalent case as a person reported at least once in the calendar year with a BLL greater than or equal to 25 µg/dL (or 40 µg/dL). An incident case is a person with a BLL greater than or equal to 25 µg/dL (or 40 µg/dL) who was reported in the calendar year, but not reported in the immediately preceding calendar year with a BLL greater than or equal to 25 µg/dL (or 40 µg/dL). States have found that approximately 90% of cases reported are due to occupational exposures.

*Limitations:* The rates in Indicator 13 include all reported cases (both occupational and non-occupational) in the numerators, whereas the denominators are limited to employed persons. As a result, the rates of reported cases per 100,000 employed persons may be slightly overestimated if some cases were the result of non-occupational exposures. Although the Occupational Health and Safety Administration requires employers to provide blood lead testing for lead exposed workers, not all employers do so. Self-employed individuals may not seek testing. Thus, some workers with elevated blood levels are not captured by occupational lead registries.

*Technical note in generating indicators:* The U.S. incidence and prevalence rates for cases of elevated blood lead levels in this report are estimated from the 37 states with an Adult Blood Lead Epidemiology Surveillance (ABLES) Program.

### Census of Fatal Occupational Injuries – Indicator 3

The Census of Fatal Occupational Injuries (CFOI), conducted by the Bureau of Labor Statistics (BLS) in the U.S. Department of Labor, is a federal-state cooperative program that compiles an annual census of fatal occupational injuries at both the state and national levels. To be included in the fatality census, the deceased person must have been employed (working for pay, compensation, or profit) at the time of the incident, engaged in a work activity, or present at the incident site as a requirement of his or her job. Private wage and salary workers, the self-employed, and public sector workers are covered by the census. Fatalities that occur during a regular 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. The census includes unintentional injuries (e.g., falls, electrocutions, motor vehicle crashes) and intentional injuries (homicide and suicide). CFOI uses multiple data sources to identify and document work-related injury deaths, and CFOI counts are considered a complete or nearly complete ascertainment of work-related injury deaths. In Massachusetts, CFOI is conducted by the Massachusetts Department of Public Health in conjunction with BLS.

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

*Technical note in generating indicator:* The Hispanic employed workforce is reportedly underestimated by 10 percent.<sup>11</sup> The occupational fatality rate for Hispanic workers for Indicator 3 was computed using the Current Population Survey estimate for numbers employed, adjusted for this underestimation.

### Massachusetts Cancer Registry – Indicator 12

The Massachusetts Cancer Registry (MCR) at the Massachusetts Department of Public Health is responsible for the collection of information regarding all newly diagnosed cases of cancer in Massachusetts. In 2005, cases were reported by acute care hospitals, one medical practice association, pathology laboratories, one radiation/oncology facility, endoscopy centers, dermatologists, and urologists. Diagnoses in the MCR are coded according to the International Classification of Diseases for Oncology. Information collected include age, gender, race, ethnicity, occupation, industry, diagnoses describing cancer site and histology, as well as other morphological factors. The MCR is a member of the North American Association of Central Cancer Registries (NAACCR), and adheres to standards as set by NAACCR, Commission on Cancer/American College of Surgeons, National Cancer Institute, and the Centers for Disease Control and Prevention/National Program of Cancer Registries.

### **Massachusetts Hospital Discharge Dataset – Indicators 2, 6, 9 and 14**

In Massachusetts, patient discharge records from all licensed acute care hospitals are collected by the Division of Health Care Finance and Policy which compiles the Hospital Discharge Dataset (HDD). This data set contains information about patient demographics, diagnoses, hospital charges and source of payment. Because the HDD contains no specific information about the work-relatedness of the patient's injury or illness, the designation of workers' compensation insurance as the expected payer is used as a probable indicator of a work-related hospitalization (Indicators 2 and 6). By definition, pneumoconioses (Indicator 9) are considered to be work-related.

*Limitations:* Repeat hospitalizations of the same individual cannot be readily identified; therefore, Indicators 2, 6, and 9 in this report reflect the number of hospitalizations, not the number of injuries, illnesses or patients. Not all workers are covered by workers' compensation, and some individuals who are eligible for workers' compensation do not use it. Therefore, use of workers' compensation as payer to identify work-related hospitalizations likely underestimates the true extent of hospitalizations for occupational conditions. Workers' compensation as payer is more sensitive in identifying work-related injuries than illnesses due to the non-specificity of many occupational diseases or the long latency between exposure and disease onset. The HDD does not include Massachusetts residents hospitalized out of state.

*Technical note in generating indicators:* The Hispanic employed workforce is reportedly underestimated by 10 percent.<sup>11</sup> Hospitalization rates for Hispanic workers for Indicators 2, 6, 9, and 14 were computed using the Current Population Survey estimate for numbers employed, adjusted for this underestimation.

### **Massachusetts Registry of Vital Records and Statistics, MDPH – Indicator 10**

Pneumoconiosis mortality data in this report are based on information on death certificates compiled by the Massachusetts Registry of Vital Records and Statistics and analyzed by the staff within the Division of Research and Epidemiology. Physicians and medical examiners assign the cause of death through a system that acknowledges the possibility of multiple causes. Death diagnoses are coded according to the tenth revision of the International Classification of Diseases. Demographic information on the certificates, such as age, race, Hispanic ethnicity, gender, educational attainment, marital status, occupation, and industry is recorded by the funeral director based on information provided by an informant, usually a family member, or, in the absence of an informant, based on observation or omitted. Resident data include all deaths that occur to residents of the Commonwealth, regardless of where they happen.

### **Massachusetts Sharps Injury Surveillance System – Massachusetts Specific Indicator**

The Massachusetts Department of Public Health requires licensed acute and non-acute care hospitals to report all sharps injuries among hospital workers to the MDPH on an annual basis, in accordance with 105 CMR 130.1007. A sharps injury is defined as a bloodborne pathogen exposure incident that is the result of events involving a contaminated sharp device that pierces the skin or mucous membranes and occurs during the performance of a worker's job duties. The Massachusetts Sharps Injury Surveillance System collects data on sharps injuries to workers in Massachusetts hospitals. Information such as the occupation of the healthcare worker, department in which the injury occurred, type of device involved in the injury, whether or not the device was a safety device, procedure for which the device was used or intended, and how the injury occurred is collected for each injury. The Massachusetts Sharps Injury Surveillance System is supported through a MDPH cooperative agreement with the CDC-National Institute for Occupational Safety and Health.

*Limitations:* Underreporting of sharps injuries by employees has been documented in a number of studies, thus the numbers reported to MDPH by hospitals are believed to be conservative estimates. Sharps injury rates presented in this report are defined as the number of reported sharps injuries per 100 licensed beds. These rates are only approximate measures of risk as they do not take into account the number of devices used. This information is not available.

### **Massachusetts Workers' Compensation Data – Indicators 5 and 8**

Workers' compensation is a no-fault insurance system designed to provide medical benefits and lost wage replacement to workers who sustain work-related injuries or illnesses. Massachusetts law requires both private and public sector employers, with rare exceptions, to maintain workers' compensation insurance coverage. All injuries or illnesses arising out of the course of employment that result in five or more lost work days must be reported to the Massachusetts Department of Industrial Accidents (DIA), where the records are entered into the electronic case management system.

*Limitations:* In Massachusetts, the workers' compensation system excludes railroad workers, seafarers, police officers, firefighters, shipyard and harbor workers and federal employees who are covered by other insurance systems. The self-employed are also excluded. (In 2004, the Massachusetts workers' compensation law was changed to allow self-employed workers to carry workers' compensation coverage voluntarily). A number of studies conducted in various states have demonstrated that not all work-related injuries and illnesses among workers eligible for workers' compensation are reported to state workers' compensation systems. There are substantial differences among the workers' compensation systems across states that preclude inter-state comparisons and national workers' compensation data are not available. The data are best used to track trends within a state over time.

*Technical note in generating indicators:* The estimate for the number of persons covered by Massachusetts worker's compensation (the rate denominator) was reported by the National Academy of Social Insurance (NASI). NASI approximates the number of workers covered by workers' compensation insurance by utilizing state unemployment insurance (UI) data. The number of amputation or carpal tunnel syndrome cases may differ depending on which dataset was used to identify them (BLS SOII or Workers' Compensation). These datasets differ with respect to what population is covered (e.g., the Workers' Compensation dataset includes public sector as well as private sector workers) and how cases are reported (e.g., for the BLS SOII, only a sample of employers report cases).

### **Survey of Occupational Injuries and Illnesses (SOII) – Indicators 1, 4, and 7**

The Survey of Occupational Injuries and Illnesses (SOII), conducted by the Bureau of Labor Statistics (BLS) in the U.S. Department of Labor, provides annual estimates of the numbers and incidence rates of work-related injuries and illnesses among private sector workers at the state and national levels. Information is collected from a sample of employers on all work-related injuries and illnesses that resulted in one or more of the following: loss of consciousness, restricted work activity, job transfer, or medical treatment beyond simple first aid. In Massachusetts, the SOII is conducted by the Division of Occupational Safety within the Executive Office of Labor and Workforce Development, in conjunction with BLS.

*Limitations:* Because the SOII is based on a sample—and not a census—of all employer establishments, the SOII findings are estimates subject to sampling error. The self-employed, farms with fewer than 11 employees, private households, federal agencies, the military, as well as state and municipal workers, are excluded from the SOII. These sectors collectively comprise approximately 21% of the U.S. workforce. In addition, it is well recognized that the survey undercounts work-related illnesses, especially long-latency illnesses that may not appear until years after individuals have left their place of employment. There is also evidence that injuries are underreported.

*Technical note in generating indicators:* BLS publishes case rates per 100 FTEs (equivalent full-time workers) or per 10,000 FTEs. The rates presented in this report were calculated by multiplying the BLS rates by 1000 or 10 to generate injury/illness cases per 100,000 FTEs.

### **Teens at Work Injury Surveillance System – Massachusetts Specific Indicator**

The MDPH Teens at Work (TAW) Injury Surveillance System uses multiple data sources, primarily workers' compensation claims for injuries resulting in five or more lost workdays and emergency department records, to identify nonfatal work related injuries to teens less than 18 years of age. Data in this report are from the statewide data set of emergency department visits. The Teens at Work Injury Surveillance System is supported through a MDPH cooperative agreement with the CDC-National Institute for Occupational Safety and Health.

In Massachusetts, data on emergency departments visits from all licensed acute care hospitals are collected by the Division of Health Care Finance and Policy which compiles the Emergency Department (ED) data set. This data set contains information about patient demographics, diagnoses, hospital charges and source of payment. Because the ED data set contains no specific information about the work-relatedness of the patients' injury, the designation of workers' compensation insurance as the expected payer is used as a probable indicator of a work-related emergency department visit.

*Limitations:* Repeat emergency department visits by the same individual cannot be readily identified; therefore, this indicator reflects the number of emergency department visits, not the number of injuries or patients. Not all workers are covered by workers' compensation, and some individuals who are eligible for workers' compensation do not use it. Therefore, use of workers' compensation as payer to identify work-related emergency department visits likely underestimates the true number of work-related emergency department visits by teens. The ED data set does not include Massachusetts residents treated in emergency departments out of state.

## **Toxic Exposure Surveillance System (TESS) – Indicator 11**

Poison control centers (PCCs) are available nationwide to provide assistance 24 hours/day to callers with concerns over actual or potential exposure to substances. The types of information gathered by PCCs include demographics, type of substance(s) involved, symptoms, intentionality of exposure, whether the exposure was work-related, location of exposure (e.g., workplace), and medical outcome. Centers submit data in real-time to the American Association of Poison Control Centers for inclusion in their Toxic Exposure Surveillance System. PCC data are useful for monitoring pesticide poisonings nationally because PCCs service almost the entire U.S. population, even though calls to state and regional PCCs are estimated to capture only approximately 10% of acute occupational pesticide-related illness cases.<sup>10</sup>

*Limitations:* PCCs rely on reported cases. To report a work-related case, the affected individual or a health care worker has to know about the PCC, consider it a source of assistance for addressing a work-related illness, and know how to contact the PCC. Because of the passive surveillance system design, it is likely that PCC data underestimate the true extent of work-related chemical exposures. Furthermore, health care workers with more experience in managing work-related poisoning may be less likely to use PCCs. Thus, under-reporting may vary by state to some degree according to the experience and expertise of the health care workforce in the state.

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