

Putting Data to Work

Occupational Health Indicators for Massachusetts

April 2008

Occupational Health Surveillance Program • Massachusetts Department of Public Health

More than three million individuals work in Massachusetts in over 200,000 workplaces. Each year, thousands of these 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 society at large.¹ Workers' compensation claims alone in Massachusetts cost approximately \$900 million in 2005.² 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.³ These indicators are a set of public health surveillance measures that allow states to uniformly collect and report available occupational illness, injury and risk data. Computed over time, these indicators will allow states to track trends in the occupational health status of the working population and guide efforts to prevent work-related injuries and illnesses. 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).

This report includes a State Employment Profile and thirteen occupational health indicators for Massachusetts based on the most recent data available for each indicator. National data are included for comparison, when available. The information used to generate these thirteen indicators is gathered from a variety of existing state data sources—as no single data source is adequate to characterize occupational health concerns in the state. Combining information from multiple sources into a single indicator document provides a composite picture of the occupational health status of working people in Massachusetts. Technical notes and a description of the data sources used in generating these indicators are included at the end of the report.

Massachusetts Employment Profile, 2004

Number Employed (in thousands) 3,226

<u>% Unemployed</u>	5.1	<u>% Self-employed</u>	7.3
% Male	51.6	<u>% Employed part-time ⁱⁱ</u>	21.8
<u>% Female</u>	48.4	% Work < 40 hours/week ⁱⁱⁱ	38.8
% Ages 16-17	1.9	% Work 40 hours/week	35.4
% Ages 18-64	94.4	<u>% Work > 40 hours/week</u>	25.8
<u>% Ages 65 and Older</u>	3.7		
% White	89.9		
% Black	5.6		
<u>% Other</u>	4.5		
<u>% Hispanic ⁱ</u>	6.6		

ⁱ Persons identified as Hispanic may be of any race (White, Black, Other)

ⁱⁱ Persons who work one to 34 hrs/week are considered part-time. Working at least 35 hrs/week is considered full-time.

ⁱⁱⁱ < 40 hrs/week = zero to 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: Bureau of Labor Statistics (BLS) Current Population Survey and Geographic Profile of Employment and Unemployment.

Distribution of the Massachusetts Workforce by Major Industry and Occupation Sectors, 16 Years of Age and Older, 2004

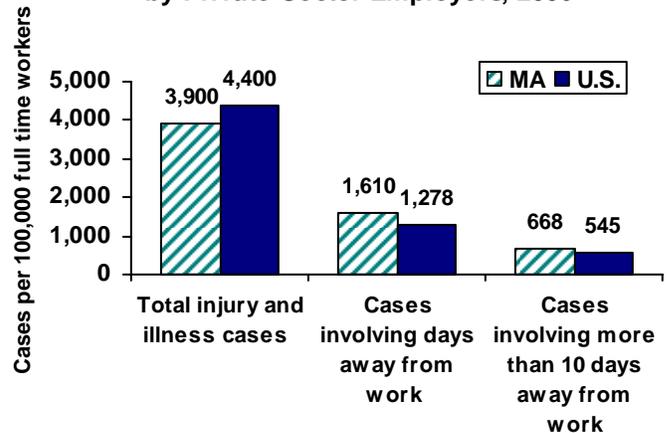
Number Employed (in thousands)		3,226	
INDUSTRY		OCCUPATION	
% Education and Health Services	25.4	% Professional and related occupations	25.5
% Wholesale and Retail Trade	14.2	% Service	16.3
% Professional and Business Services	13.0	% Mgmt., Business, and Financial Operations	15.0
% Financial Activities	7.9	% Office and Administrative Support	14.0
% Leisure and Hospitality	7.4	% Sales and related occupations	11.0
% Manufacturing – Durable goods	7.1	% Construction and Extraction	5.8
% Construction	6.9	% Production	5.2
% Other Services	4.5	% Transportation and Material Moving	4.0
% Manufacturing – Non-durable goods	3.6	% Installation, Maintenance, and Repair	3.0
% Transportation and Utilities	3.6	% Farming, Fishing, and Forestry	0.2
% Public Administration	3.4		
% Information	2.7		
% Agriculture and related industries	0.3		
% Mining	0.1		
Source: BLS Geographic Profile of Employment and Unemployment.			

Occupational Health Indicators 1 - 13

Indicator 1: Non-fatal Work-related Injuries and Illnesses Reported by Private Sector Employers, 2006

- Private sector employers in Massachusetts reported an estimated 87,900 injuries and illnesses to workers in 2006. The corresponding rate of injuries and illnesses was 3,900 per 100,000 workers.
- Of these cases, 35,850 (41%) resulted in at least one lost day of work, and 14,870 (17%) resulted in more than 10 days of work lost. The rate of cases resulting in at least one lost day of work was 1,610 per 100,000 workers, and the rate of cases resulting in more than 10 days of work lost was 668 per 100,000 workers.

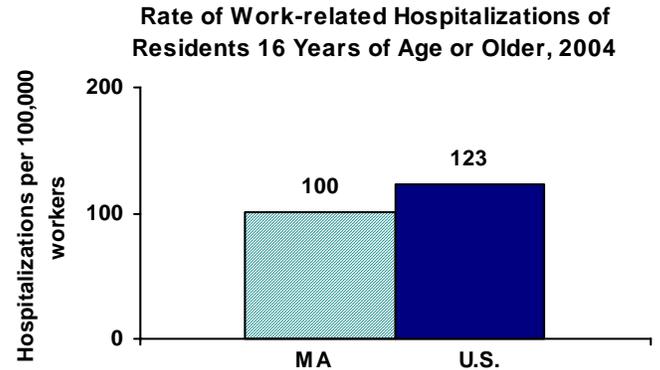
Rates of Non-fatal Injuries & Illnesses Reported by Private Sector Employers, 2006



Source: BLS Survey of Occupational Injuries and Illnesses.

Indicator 2: Work-related Hospitalizations, 2004

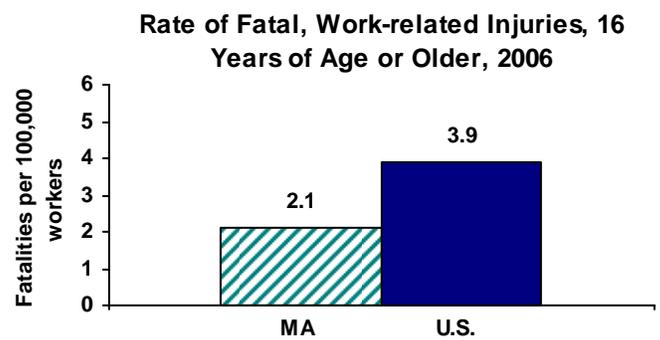
- There were 3,231 hospitalizations in Massachusetts acute care hospitals for which workers' compensation was the payer. The rate of work-related hospitalizations was 100 per 100,000 workers.



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

Indicator 3: Fatal Work-related Injuries, 2006

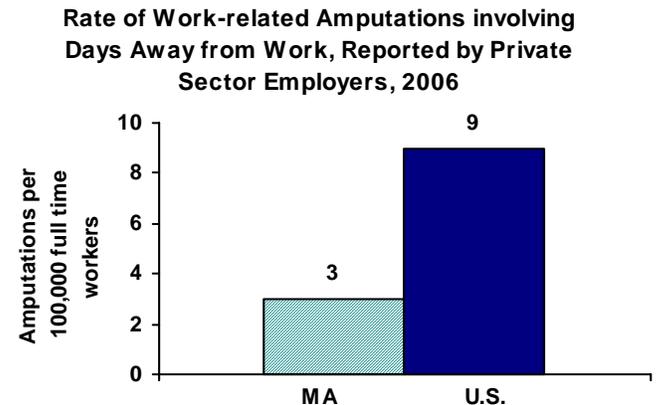
- In 2006, 66 workers were fatally injured on the job in Massachusetts. The rate of fatal work-related injuries was 2.1 per 100,000 workers.



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

Indicator 4: Work-related Amputations involving Days Away from Work, Reported by Private Sector Employers, 2006

- There were an estimated 60 amputations reported among private sector workers in Massachusetts. The rate was three amputation cases per 100,000 workers.
- The majority of cases (83%) were finger amputations. Half of all amputations resulted in 31 or more days of lost work.



Source: BLS Survey of Occupational Injuries and Illnesses.

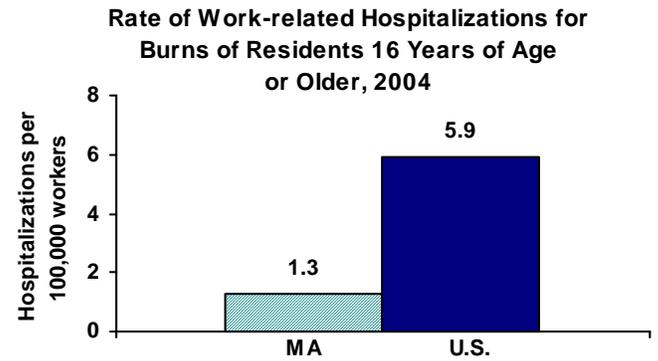
Indicator 5: Amputations Identified in the Massachusetts Workers' Compensation System, 2005

- In 2005, 240* workers' compensation claims for amputations resulting in five or more lost workdays were filed with the Massachusetts Department of Industrial Accidents. The rate of amputation claims was 7.7 per 100,000 covered workers.

* This estimate differs from the amputation estimate reported for Indicator 4 in 2005 (170). For further explanation, refer to the technical note section for Indicator 5 at the end of this report.

Indicator 6: Hospitalizations for Work-related Burns, 2004

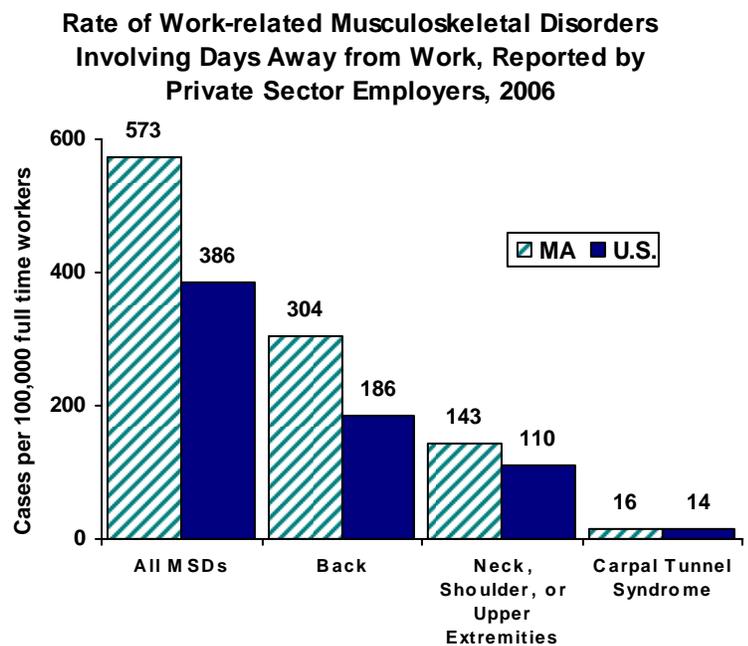
- In 2004, there were 41 hospitalizations for burns in Massachusetts acute care hospitals for which workers' compensation was the payer. The rate of hospitalizations was 1.3 per 100,000 workers.
- These work-related burn hospitalizations accounted for 16% of all burn hospitalizations among Massachusetts residents 16-64 years of age.



Sources: Ma Inpatient Hospital Discharge & National Hospital Discharge Survey. Workforce estimates from the BLS Current Population Survey.

Indicator 7: Work-related Musculoskeletal Disorders involving Days Away from Work, Reported by Private Sector Employers, 2006

- There were an estimated 12,770 cases of musculoskeletal disorders (MSDs) reported among private sector workers in Massachusetts. The rate of MSD cases was 573 per 100,000 workers. These cases accounted for more than one-third (35.6%) of all lost workday cases reported.
- Of the MSD cases reported, 6,770 (53%) involved the back (including the spine and spinal cord), and 3,160 (24.7%) involved the neck, shoulder, or upper extremity. The rate of cases involving the back was 304 per 100,000 workers, and the rate of cases involving the neck, shoulder, or upper extremity was 143 per 100,000 workers.
- The number of carpal tunnel syndrome cases involving lost work time was 350. The rate of carpal tunnel syndrome cases was 16 per 100,000 workers.



Source: BLS Survey of Occupational Injuries and Illnesses.

Indicator 8: Cases of Carpal Tunnel Syndrome Identified in the Massachusetts Workers' Compensation System, 2005

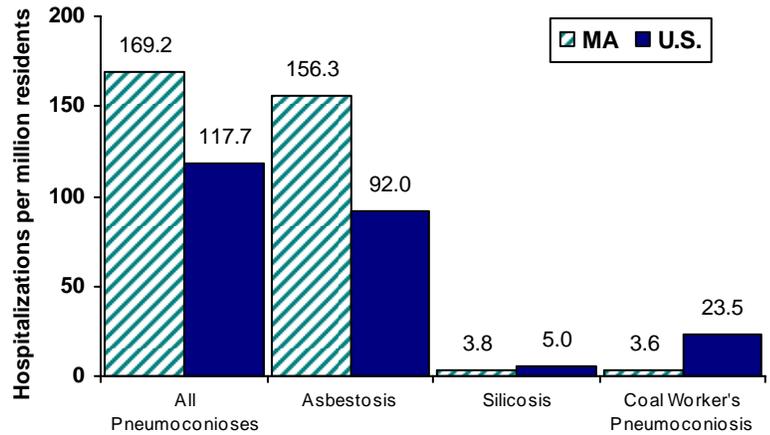
- In 2005, 543* workers' compensation claims for carpal tunnel syndrome involving five or more lost workdays were filed with the Massachusetts Department of Industrial Accidents. The rate of carpal tunnel syndrome claims was 17.5 per 100,000 covered workers.

* This estimate differs from the carpal tunnel syndrome estimate reported for Indicator 7 in 2005 (460). For further explanation, refer to the technical note section for Indicator 8 at the end of this report.

Indicator 9: Hospitalizations for Pneumoconiosis, 2004

- Pneumoconiosis is a class of non-malignant lung diseases caused by the inhalation of mineral or metallic dust particles (primarily coal, silica, or asbestos), nearly always in an occupational setting.
- In 2004, there were 934 hospitalizations in Massachusetts acute care hospitals with pneumoconiosis listed as a principal or secondary discharge diagnosis. The rate of hospitalizations was 169.2 per million residents.
- Close to 93% of these hospitalizations were for asbestosis. There were 21 silicosis-related hospitalizations, 20 hospitalizations for coal worker’s pneumoconiosis, and 21 hospitalizations for other and unspecified pneumoconiosis. The rates of hospitalizations for asbestosis, silicosis, and coal worker’s pneumoconioses were 156.3, 3.8, 3.6 per million residents, respectively.

Age-standardized Rates of Hospitalizations from or with Select Pneumoconioses, 2004

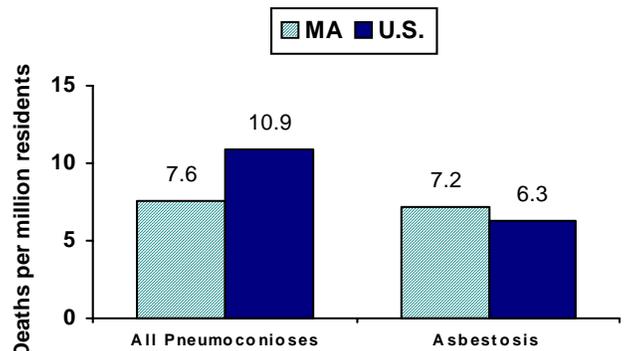


Sources: MA Inpatient Hospital Discharge & the National Hospital Discharge Survey. Population estimates from the U.S. Census.

Indicator 10: Pneumoconiosis Mortality, 2004

- There were 42 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. All decedents were 55 years of age and older.
- Asbestosis accounted for 95% (40/42) of these deaths. The rate was 7.2 deaths per million residents.
- Deaths from silicosis, coal worker’s pneumoconiosis, and other/unspecified pneumoconioses were few (<5) so rates were not calculated for these conditions.

Age-standardized Mortality Rates from or with Select Pneumoconioses, 2004

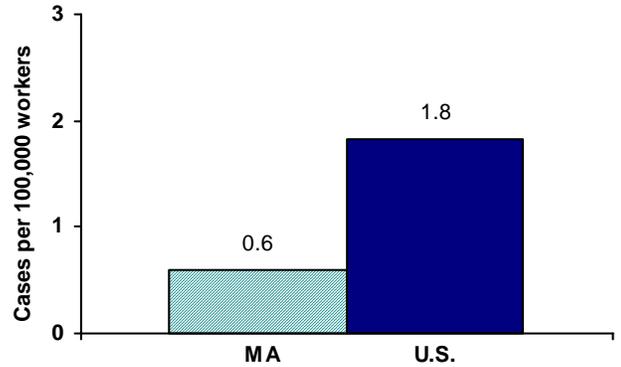


Sources: Massachusetts Vital Records (Death File) & the National Center for Health Statistics. Population estimates from the U.S. Census.

Indicator 11: Work-related Pesticide Poisonings Reported to Poison Control Centers, 2005

- In 2005, 19 cases of work-related pesticide poisoning were reported to the Massachusetts poison control center. The rate of work-related pesticide poisonings was 0.6 per 100,000 workers.

Rate of Work-related Pesticide-associated Poisonings, 2005

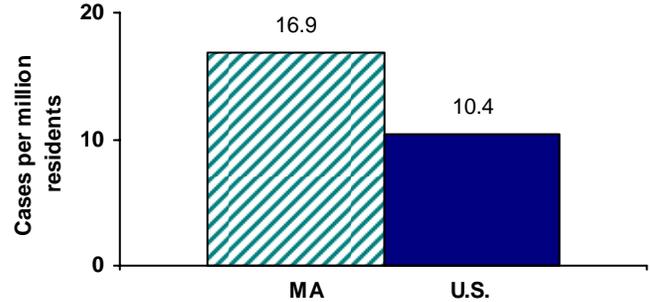


Sources: American Association of Poison Control Centers. Workforce estimates from the BLS Current Population Survey.

Indicator 12: Incidence of Malignant Mesothelioma, 2004

- 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 estimated to occur in 62-85% of all mesothelioma cases.⁴
- In 2004, 92 cases of newly diagnosed, malignant mesothelioma were reported to the Massachusetts Cancer Registry. The rate of malignant mesothelioma cases was 16.9 per million residents.

Age-standardized Incidence Rate of Malignant Mesothelioma, 2004

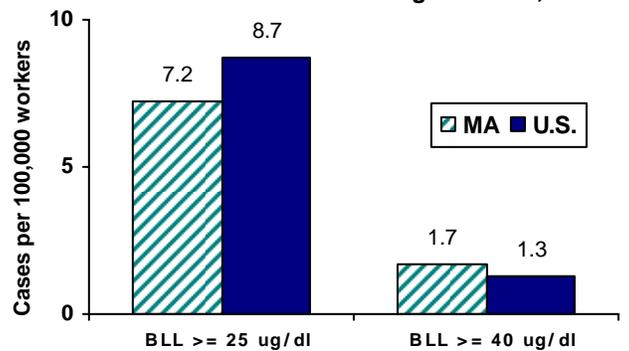


Sources: MA Cancer Registry & the North American Assoc. of Central Cancer Registries. Population estimates from the U.S. Census.

Indicator 13: Elevated Blood Lead Levels among Adults, 2004

- In 2004, 230 prevalent cases of elevated blood lead levels (BLL ≥ 25 $\mu\text{g}/\text{dl}$) in residents 16 years or older were reported to the Massachusetts Occupational Lead Poisoning Registry. Of these, 53 (23%) had BLLs ≥ 40 $\mu\text{g}/\text{dl}$. The rates per 100,000 workers were 7.2 for BLLs ≥ 25 $\mu\text{g}/\text{dl}$ and 1.7 for BLLs ≥ 40 $\mu\text{g}/\text{dl}$.
- Of these 230 cases, 177 were newly identified (incident) cases of elevated BLLs that had not been reported in the previous calendar year. Of these new cases, 38 (21.5%) had BLLs ≥ 40 $\mu\text{g}/\text{dl}$.

Prevalence Rates of Elevated Blood Lead Levels in Residents 16 Years of Age or Older, 2004



Sources: Adult Blood Lead Epidemiology Surveillance (ABLES) Program. 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.

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 2004, 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, and 9

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.

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 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.

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.⁵

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.

References

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