

Using Massachusetts Workers' Compensation Data to Identify Priorities for Preventing Occupational Injuries and Illnesses among Private Sector Workers

**Findings from an Analysis of Massachusetts Workers'
Compensation Lost Wage Claims, 2014-2016**

Massachusetts Department of Industrial Accidents

**Massachusetts Department of Public Health
Occupational Health Surveillance Program**

**Massachusetts Department of Labor Standards
Occupational Safety and Health Statistics Program**



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This report can be found online at: <https://www.mass.gov/orgs/departments-of-industrial-accidents/news>.

Executive Summary

Introduction

Work-related (WR) injuries and illnesses continue to be a significant problem in Massachusetts, imposing substantial costs to workers and their families, employers and society at large. These injuries and illnesses are preventable, and better information about where and how individuals are injured or made ill at work is essential to focus prevention resources where they are needed most.

Workers' Compensation (WC) claims records, maintained by the Massachusetts Department of Industrial Accidents (DIA), are a valuable source of information about WR injuries and illnesses that can be used to target prevention efforts. But until now, these administrative records could not be readily analyzed to describe patterns of WR injuries and illnesses across industries throughout the state. With a grant from the federal government, DIA collaborated with the Departments of Public Health and Labor Standards to prepare the WC claims data for analysis. This report, based on these claims data, presents previously unavailable information about patterns of WR injuries and illnesses among private sector workers in Massachusetts. The central aims of this analysis were to identify common types of events leading to WR injury or illness and to prioritize industries for targeting prevention efforts and research.

Findings are based on an analysis of WC lost wage claims filed for private sector workers who were injured or made ill at work during 2014-2016. (Most claims were for injuries, therefore hereinafter, when the term "injury" is used it encompasses both injuries and illnesses unless otherwise noted.) In Massachusetts, workers are eligible for WC lost wage benefits when an injury results in five or more lost work days. Thus the findings in this report reflect more serious WR injuries.

Methods

New information processing techniques were applied to mine narrative text in the claims records to identify events leading to injury, such as falls, overexertion in lifting, pushing, etc., and violence. Counts and rates of all WC claims by industry were calculated. Rates are expressed as the number of claims per 1,000 full time workers. The WC claim rate indicates the probability or risk of a worker being injured. In a large industry, many workers can be injured but the rate may be low. Conversely, in a small but high risk industry, the number of workers injured can be low but the rate - or risk - can be high. Both rates and counts of claims need to be taken into consideration in targeting prevention efforts. Accordingly, we used a "Prevention Index" approach, which takes both counts and rates into account, to prioritize industries for prevention and research in this report. A high Prevention Index (PI) rank (1,2,3..) indicates a greater burden of injury and a higher priority for prevention.

Industries were classified according to the North American Industry Classification System (NAICS) into sectors (2-digit NAICS), subsectors (3-digit NAICS) and more detailed industry groups (4-digit NAICS). PIs based on all WC claims filed were used to rank 19 industry sectors and 78 subsectors for prevention. In order to inform allocation of prevention resources *within* the broad sectors, such as transportation and manufacturing, we ranked detailed industry

groups by PI within each of the sectors. To provide information about where attention should be focused to prevent specific types of events, such as falls and violence, PIs based on claims for specific events were used to rank industry subsectors for prevention within nine common event categories.

The PI approach is most useful when compelled to compare findings across many industries as we have done in this report. It is best thought of as a framework for considering different approaches to prevention rather than a standalone priority score. An industry's specific rank is less important than where the industry falls in the range of ranked industries. Ultimately many factors go into determining prevention priorities – but the counts and rates, coupled with information about events leading to injury in this report, are a critical starting point.

A final section of this report presents the rate of WC claims by city/town where the injured workers lived (i.e., claims per 1,000 employed residents), providing information that can inform public health planning and preventive action at the community level. These findings illustrate another way in which the WC claims data can now be used to target interventions to reduce WR injuries.

Preventing WR injuries and illnesses in Massachusetts and the associated human and economic costs requires the combined effort of many stakeholders-- employers, trade associations, workers, unions, insurers, health and safety professionals, and community organizations -- as well as government agencies. The findings presented in this report are intended to guide and promote these efforts. Lessons learned from this project have led to steps for sustained improvements in the WC data system to allow routine use of the claims data to generate actionable information on WR injuries and illnesses to protect the health of workers. Input from stakeholders is welcome on the types of reports that would be useful in the future.

Findings

Overview

- A total of 93,123 WC lost wage claims were filed for injuries or illnesses to private sector workers in 2014-2016 in Massachusetts, an average of 31,041 claims per year. The average annual WC claim rate was 10.9 per 1,000 full-time workers.
- Over 95% of claims were for injuries and about 4% for illnesses, a finding consistent with reports from other states that work-related illnesses are poorly captured in WC claims.
- A majority (57%) of claims were filed for males, and the WC claim rate for males (11.4 per 1,000 full-time workers) was 27% higher than that for females (9.0).
- The WC claim rate was highest (12.6) for workers aged 55-64. The rate for 18-24 year olds (young adults) was 9.8, 30% higher than the rate (7.6) for the 16-17 year olds, who are protected by child labor laws, and also higher than the rate (8.9) for those aged 25-34.
- Most of the injuries were strains and sprains (51%) followed by contusions, crushings, bruises (12%), fractures (9%) and cuts, lacerations, punctures (8%).

Events leading to injury

- The most common event category was Overexertion and bodily reaction, which accounted for close to 38% of claims. Within this broad category, overexertion in lifting, pushing, etc.^a was the most common single event, accounting for more than a quarter (29%) of all claims.
- Fall, slip, trip was the next most common event category (29% of all claims), over half of which were on the same level. Contact with object or equipment led to 19% of the claims. Violence and Transportation incidents each accounted for about 5%.
- Overexertion in lifting, pushing, etc. was most common event for both males (30%) and females (28%) but the distribution of other events varied by sex. For example, injured females were much more likely than males to have experienced an intentional injury/violence by another person (4.9% vs 1.5%). Injured males were more likely than injured females to have been struck by object/equipment (13% vs. 8%).
- Leading events varied markedly by age of injured workers. For the workers age 65 and older, fall on the same level was the leading event (36%). For those 25-64 years, overexertion in lifting, pushing, etc. was the most common event (30%). In the youngest age group (16-24 years), workers were almost equally likely to have been injured as a result of being struck by objects (20%) as by overexertion in lifting, pushing, etc. (22%).

Priority industries for prevention based on all WC claims filed

Industry sectors (2-digit NAICS) – 19 sectors

The five top ranked industry sectors by Prevention Index (PI) based on all WC claims were:

- | | |
|-------------------------------------|----------------------------------|
| • Transportation and Warehousing | Claims rate: 29.3; Count: 6,777 |
| • Construction | Claims rate: 18.3; Count: 7,794 |
| • Health Care and Social Assistance | Claims rate: 12.4; Count: 20,482 |
| • Retail Trade | Claims rate: 12.1; Count: 10,879 |
| • Wholesale Trade | Claims rate: 13.4; Count: 5,283 |

Industry subsectors (3-digit NAICS) - 78 subsectors

The five top ranked industry subsectors by Prevention Index based on all WC claims were:

- | | |
|---|----------------------------------|
| • Couriers and messengers | Claims rate: 46.4.; Count: 1,580 |
| • Truck transportation | Claims rate: 34.2; Count: 1,782 |
| • Wholesalers, non-durable goods | Claims rate: 24.1; Count 3,168 |
| • Nursing and residential care facilities | Claims rate: 19.8; Count: 5,506 |
| • Specialty trade contractors | Claims rate: 18.8; Count: 5,515 |

^a Overexertion in lifting, pushing, etc. results from strenuous physical effort directed at moving an object or person. It may involve lifting, pushing, pulling, turning, wielding, holding, carrying, or throwing. The injury can arise from a single exertion or from repeated exertions such as repetitive heavy lifting. This event category is referred to as “overexertion involving outside sources” by the Bureau of Labor Statistics.

- Five of the top ten subsectors were in the Transportation and Warehousing sector. These five subsectors had among the highest rates of all subsectors.
- Overexertion in lifting, pushing, etc. was the most common event accounting for a substantial proportion of claims in all but three of the top 25 industry subsectors ranked by PI.
- Although violence by person accounted for 4.5% of claims across all industries, it was among the leading events in three of the four subsectors that fall within the broad Health Care and Social Assistance sector: nursing and residential care facilities (16% of claims); hospitals (8% of claims); and social assistance (19% of claims).
- Falls to a lower level was among the leading events in two of the three subsectors of the Construction sector: specialty trade contractors (13%) and construction of buildings (17%). Falls to a lower level accounted for 5% of claims across all industries.

Industry groups (4-digit NAICS) within Sectors

Tables that present findings by 4-digit NAICS industry groups ordered by Prevention Index (PI) score within industry sectors are included in this report. These tables provide information useful for identifying prevention priorities based on all WC claims filed within the broad industry sectors.

Priority industries for prevention within common event categories

Below is an excerpt from a table presenting findings by industry subsectors (3-digit NAICS) within the event category: overexertion in lifting, pushing, etc. The subsectors are ordered by “*within event*” Prevention Index (PI). Similar tables for other common events are included in the report. These tables provide information useful for identifying priorities for prevention of WR injuries and illnesses due to specific events. The “*within event*” PI indicates how the industry subsector ranked for prevention of injuries and illnesses due the specific event. The overall PI is included in these tables to provide a larger context. The overall PI indicates how the industry subsector ranked among all subsectors based on all WC claims. For example, in this table, nursing and residential care facilities ranks highest (#1) for prevention of injuries resulting from overexertion in lifting, pushing, etc., and ranks slightly lower (#4) among all subsectors and all events.

*Excerpted Table 4.3 Top 25 industry subsectors by Prevention Index (PI) for "Overexertion in lifting, pushing, etc." event category **
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate**	Within event			Overall PI Rank
				count rank	rate rank	PI rank	
623	Nursing and residential care facilities	1,740	6.2	2	7	1	4
622	Hospitals	2682	4.8	1	11	2	9
424	Merchant wholesalers, nondurable goods	846	6.4	7	6	3	3
492	Couriers and messengers	386	11.3	13	1	4	1
484	Truck transportation	434	8.3	10	4	5	2
493	Warehousing and storage	272	8.7	18	3	6	6
445	Food and beverage stores	912	3.9	5	16	7	12
238	Specialty trade contractors	1,078	3.7	4	17	8	5
481	Air transportation	257	11.1	20.5	2	9	7
444	Building material and garden supply stores	334	4.7	15	12	10	10
562	Waste management and remediation services	184	4.9	25	10	11	13
488	Support activities for transportation	146	6.1	28	8	12	18
All claims in event category		20,252	2.4				

... *Full Table on page 49*

NAICS: North American Industry Classification System

* Event coded as '71' according to BLS Occupational Injury and Illness Classification System. For PI Ranks, industries scoring the lowest (1,2,3...) are prioritized higher. ** Rates expressed as WC claims per 1,000 full-time workers.

WC claims by city/town of injured worker residence

Average annual WC claim rates by city/town were computed as the total number of WC lost wage claims per 1,000 employed residents in the Massachusetts city/town where injured workers lived. These residence based rates ranged from a high of 18.2 to a low of 1.3 with a statewide rate of 8.2 WC claims per 1,000 employed residents.

Introduction

Work-related (WR) injuries and illnesses continue to be a significant problem in

Massachusetts, imposing substantial human and economic costs. Each week, 1-2 workers are fatally injured in the Commonwealth; and according to conservative estimates from the Bureau of Labor Statistics, over 70,000 Massachusetts workers are injured or experience acute illnesses as a result of exposure to hazards in the workplace each year.¹

Nationwide, the costs of WR injuries and illnesses have been estimated to exceed \$249 billion.² While the full costs of WR injuries and illnesses in Massachusetts have not been estimated, over \$1.14 billion were paid in workers' compensation benefits in 2016.³ That year, the total paid by employers for insurance premiums was \$1.2 billion.⁴ These figures do not include the costs to employers of lost productivity, and employee turnover. The human suffering and the financial toll on workers and their families likewise remain unmeasured. Additionally, the burden of WR injuries and illnesses in Massachusetts is not born equally. Low wage workers, including many immigrant and minority workers, are disproportionately employed in more dangerous jobs.^{5,6}

WR injuries and illnesses are preventable and significant progress has been made in reducing workplace risks over the last several decades.⁷ Yet much remains to be done to address both persistent problems -- such as falls in construction and lifting hazards in health care -- and new challenges related to the introduction of new technologies, an increasingly diverse workforce, and the changing nature of work and employer-employee relationships.^{8,9,10} Successful approaches to making workplaces safer begin with having the data necessary to identify existing and emerging hazards. **Information about where and how individuals are injured or made ill at work is essential to focus prevention resources where they are needed most.**

Workers' Compensation (WC) claims records are a valuable source of information about WR injuries and illnesses that can be used to target prevention efforts and have been used extensively for this purpose in some states.^{11,12,13} The WC claims data in Massachusetts, which are maintained by the Department of Industrial Accidents (DIA), have been used for focused studies of injuries and illnesses among public sector and younger workers, but until now, these administrative records could not be readily analyzed to describe patterns of WR injuries and illnesses across industries and worker groups.^{14,15,16} In 2015, Massachusetts received a federal grant from the Centers for Disease Control and Prevention to structure and code the WC claims data to "maximize its use for public health surveillance and research" -- in other words -- for ongoing tracking of WR injuries and illnesses to inform prevention and research efforts. The Occupational Health Surveillance Program in the Massachusetts Department of Public Health (DPH) joined with DIA, with help from expert data coders at the Massachusetts Department of Labor Standards (DLS), to carry out this work. This report is the first result of this collaborative effort.

In this report, we present findings from an analysis of WC lost wage claims filed for private sector workers in Massachusetts from 2014-2016. In Massachusetts workers are eligible for WC lost wage benefits when an injury or illness results in five or more days away from work, thus the findings in this report reflect more serious WR injuries and illnesses. The central aims of this

analysis were to identify common events leading to injuries and illnesses, to prioritize industries for targeting prevention efforts, and inform future research.

The findings in this report begin with an overview of WC claims by worker and injury characteristics (sex, age, and nature of injury or illness). This is followed by newly available information on event leading to injury or illness that provides insight about the types of workplace hazards that need to be addressed. In the next sections, a “Prevention Index” is used to prioritize industries for prevention. The Prevention Index takes into account information about both the number of lost wage claims filed and the likelihood of workers being injured (rate of lost wage claims) in each industry. Priorities based on all WC claims are presented by industry subsectors and by more detailed industry groups. Industries are also ranked by Prevention Index within nine common event categories. Ultimately, many factors go into setting priorities for preventing WR injuries and illnesses, including injury severity, the availability of effective interventions, consideration of more vulnerable populations such as young or older workers, and prior efforts. However, the number of WC claims and the likelihood of being injured presented in this report are a critical place to start.

In the final section of this report, rates of WC claims are mapped by city/town where the injured workers lived, providing information that can inform public health planning and preventive action at the community level. Each city/town is also ranked by Prevention Index taking information about the number of WC claims as well as the likelihood of workers being injured (the WC claim rate) into account. This special topic report illustrates another way in which the WC data can now be used to target interventions to improve worker safety and health.

Preventing WR injuries and illnesses in Massachusetts and the associated human and economic costs requires the combined effort of many stakeholders-- employers, trade associations, workers, unions, insurers, health care providers, health and safety professionals, and community organizations -- as well as government agencies. **The findings presented in this report are intended to guide and promote these efforts.** Lessons learned from this effort have led to steps for sustained improvements in the WC data system to allow routine use of the claims data to generate actionable information on WR injuries and illness to protect worker health. **Input from stakeholders is welcome on the types of reports that would be useful in the future.**

Methods

The Massachusetts Workers' Compensation System

Massachusetts law requires public sector and private sector employers, with rare exceptions^b to maintain WC insurance to cover cost of medical care and partial replacement of lost wages related to work-related injuries or illnesses. As noted, an injured/ill worker is eligible for lost wage (indemnity) payments if they have been unable to work for more than five days as a result of their injury or illness.^c The WC system is a private insurance carrier system in Massachusetts and is overseen by the Department of Industrial Accidents (DIA) which is responsible for monitoring the claims process and adjudicating disputed claims. DIA also administers a health and safety grant program, facilitates injured worker access to vocational rehabilitation services, and maintains an investigation unit to assure compliance with the law.

The Workers' Compensation Database

Employers, including the self-insured, must submit *First Reports of Injury* (FROIs) for all WR injuries or illnesses resulting in 5 or more lost workdays. FROIs must be submitted within seven days of the fifth lost work day to DIA where they are maintained in a centralized WC database. Since January 2014, employers have been required to submit these FROI "lost wage" reports to DIA electronically. Each year since then, an increasing number of FROIs have been submitted electronically to DIA predominately by employers' insurers through the Electronic Data Interchange.^d FROIs may also be submitted through DIA's web portal or via secure e-mail. Approximately 80% of the claims enter the WC database through FROIs. Some claims enter the system when they are filed by employees, who have the option of filing lost wage claims directly beginning 30 days post injury, and some claims enter the system through insurers' notification of payment or non-payment.

When multiple forms are submitted for a single claim, the information from these forms are linked together in the database. The information in this database constitutes claims filed; the database does not include comprehensive information about the status of claims (whether claim accepted or denied). Workers can also file claims for medical benefits whether their injuries or illnesses result in 5 or more days of lost work time or not. Records for these medical-only claims, which are estimated to account for a majority of all WC claims in Massachusetts, are not submitted to DIA and therefore not included in the database.^e

Study Dataset

DIA records of lost wage claims for private sector workers with dates of injury between 2014-2016 were analyzed for this report. A total of 93,123 claims were included in the study file.^f

^b Exceptions include police, firefighters, the military, federal government, maritime, railroad, part time household workers, and the self-employed. Some of these groups are covered under other compensation programs.

^c Depending on the time of day, this may or may not include the day of injury.

^d The Electronic Data Interchange (EDI) is a portal that allows for exchange and processing of data between workers' compensation agencies and data providers (e.g., insurers, employers) according to standards developed by the International Association of Industrial Accidents Boards and Commissions (IAIABC) that cover the transmission of information. DIA accepts only the FROI transactions through the EDI.

^e Personal correspondence with the Department of Industrial Accidents (DIA).

^f Claims were extracted from the database on April 30, 2017 to allow for delays in claim filing. The total number of claims filed between January 1, 2014 and April 30, 2014 was 127,642. Excluded were 16,815 claims filed for public sector workers and 15,958 claims with *dates of injury* outside of the study period (January 2014-December 2016). Also excluded were 1,726 duplicate claims, leaving 93,123 claims in the final study file.

Studies of analyses of lost wage claims for public sector workers in Massachusetts have been published previously.^{14,15}

The following key data elements in the claims records were used in this analysis:

Worker: date of birth, gender, address of residence, and a narrative description of regular occupation. Worker race and ethnicity information is not available in the WC database.

Employer: name, address, federal employer identification number, insurance carrier, and, for insurer-reported claims only, the North American Industry Classification (NAICS) code and address where the incident occurred if different than the primary employer address.

Injury description: date of injury, and American National Standards Institute (ANSI) codes for nature of injury, and body part affected. For claims submitted by employers, codes (up to 7 per claim) are selected by the persons completing the claim record from a list on the back of the DIA FROI form.¹⁷ Insurers submitting claims electronically use the Workers' Compensation Insurance Organization (WCIO) coding structure to code nature of injury and body part and submit only one nature of injury code per claim.¹⁸ For these claims, DIA converts these WCIO nature and body part codes to ANSI codes per regulation.

Incident: date of injury, a narrative description of how the injury occurred, and, for insurer reported claims only, a WCIO code for cause of injury.¹⁹

Data Coding

Industry: the type of establishment^g or business in which the person was working when injured.

Employer information in the claims records was used to code claims according to the North American Industry Classification System (NAICS – 4 digit level). NAICS codes were obtained by linking the study dataset with the Unemployment Insurance (UI) file for private sector establishments maintained by the Department of Unemployment Assistance which assigns NAICS codes for Massachusetts establishments. This involved iterative linkages and extensive manual review of linked WC-UI records for firms with multiple establishments and multiple NAICS codes.^h

North American Industry Classification System (NAICS)

Developed in cooperation with Canada and Mexico, the North American Industry Classification System (NAICS) groups establishments into industries based on the activities in which they are primarily engaged.

Establishments using similar raw materials, equipment and labor are classified as the same industry. NAICS is a hierarchical coding structure that groups "economic activity" into 20 (2-digit) industry sectors, 100 (3-digit) sub-sectors and 317 (4-digit) NAICS industries.^a See Appendix A.

^a Industries are further divided into narrower categories (5 and 6 digit), but these more detailed industry codes were not available for this analysis.

Event: the type of event or exposure that caused the injury or illness such as a fall or a violent act. A combined human-machine approach was used to assign 2-digit event codes

^g An establishment refers to a single location and is comparable to the familiar use of the word "facility." A firm is an organizational entity, comparable to the familiar use of the word "company." A single firm often consists of many separate establishments, all of which may be involved in different business activities and therefore may have different industrial classifications.

^h The linkage of the UI and WC data was carried out under a Memorandum of Understanding between DIA and the Department of Unemployment Assistance to assure confidentiality of the UI and WC data.

according to the Bureau of Labor Statistics (BLS) Occupational Injury and Illness Coding System (OIICS) based on information in the incident narratives.²⁰ Approximately 19,000 claims narratives were manually coded by expert OIICS coders at DLS. These manually assigned codes were used to train a machine learning algorithm. Machine learning methods were developed and applied to the remaining incident narratives to electronically code the event. We learned from previous studies as well as an earlier pilot study we conducted that the confidence level assigned to each algorithm-assigned code could be used to improve accuracy of the final coded dataset by filtering out narratives for manual coding that the algorithm had classified at a low confidence level. An additional set of 20,000 narratives were pulled out for manual coding. Overall, approximately 57% were coded electronically, and this percentage is expected to increase significantly with future applications of this algorithm. For claims with missing or insufficient incident narratives, the WCIO cause of injury code when available was used to assign OIICS event codes at the 1-digit level.ⁱ

Regular Occupation: the type of work a person does to earn a living, i.e. job title. The occupation of the worker was coded according to the Standard Occupational Classification system (SOC) using the NIOSH Industry and Occupation Computerized Coding system (NIOCCS).^{21,22}

Nature of Injury and Body Part: ANSI codes for nature of injury and body part affected provided in the WC dataset were used in the analysis.

Data Analysis: The distribution of claims by the key data elements were tabulated. Statewide WC claim rate, overall and by sex, age and industry were calculated as the average annual number of claims over the three-year period divided by the average annual number of full time employee equivalents (FTEs).^{j,k} These rates are presented as WC claims per 1,000 full-time workers. Information on the number of private sector employees overall and by industry (averaged over four quarters) was obtained from the BLS' Quarterly Census of Employment and Wages (QCEW) for Massachusetts. Information on the average number of hours worked per employee by industry from the MA American Community Survey (ACS) Public Use Microdata Sample (PUMS) file was used to adjust QCEW employee counts to generate FTE estimates overall, by age, sex, and by both broad industry sectors and subsectors and detailed industry groups. WC claim rates by city/town of residence were calculated as the number of WC claims per 1,000 employed residents, as FTE information was not available at the city/town level. Also, the challenges posed in assigning industry (NAICS) codes to firms with multiple establishments in different locations precluded using 'place of employment' data in the calculation of rates. Employment data for city or town where workers live was obtained from the MA ACS Full Sample file. See Appendix B for a description of the employment data sources used.

ⁱ WCIO Cause of Injury codes could not be directly cross walked to OIICS event codes at the 2- digit level.

^j A full-time employee equivalent is 2,000 hours (40 hours per week x 50 weeks). In other words, one FTE is equivalent to one employee working full time for a year.

^k WC claims filed for workers under age 16 were excluded from rate computations due to lack of comparable employment data for these younger workers.

The Prevention Index

The WC claim rate indicates the probability or risk of a worker being injured at work. In a large industry, many workers can be injured but the rate may be low. Conversely, in a small but high-risk industry the number of workers injured can be low but the rate or risk can be high. **Both rates and counts of WC claims need to be taken into consideration when targeting prevention efforts.**

In this study, we used a Prevention Index (PI) that takes both counts and rates of WC claims into account in order to rank industries overall and within industry sector for prevention purposes. Industries were ranked by claims count and by claim rate.²³ The PI for an industry was calculated as the average of the claim count rank and the claim rate rank ($[\text{count rank} + \text{rate rank}]/2$). The PI was then rank ordered with 1 being the highest rank. In the case of a tie, the rate rank was used as the tie breaker. **Industries that have high counts and high rates (higher burden of work-related injury and illness) have a higher Prevention Index rank (PI rank = 1,2,3...) indicating a higher priority for prevention than industries with lower counts and rates.** See Figure 1 below.

PIs based on all WC claims filed were used to rank industry sectors and subsectors for prevention, as well as industry groups within sectors. In addition, PIs based on claims for specific events were used to rank industry subsectors for prevention within nine common event categories. PIs were calculated only for industry categories with 15 or more WC claims in the three-year study period.¹

Figure 1. The Prevention Index Framework

	High WC claim rate	Low WC claim rate
High number of WC claims	Higher priority industries	
Low number of WC claims		Lower priority industries

The PI is one of a number of factors to be considered in setting priorities for interventions, as we have done in this analysis. It is most useful when comparing findings across many industries. It is best thought of as a framework for considering different approaches to prevention – rather than a stand-alone priority score.²⁴ As such, the differences between individual PI ranks is less important than where the industry falls in Figure 1 above, along with consistency with other

¹ Also excluded from rate and PI rank computations were 2 industry groups with no reported employment in 2014 – 2016.

surveillance and research findings. Industries with both high counts and high rates of claims warrant more comprehensive, multi-pronged approaches to intervention and prevention that include technical assistance, education, enforcement, and policy development. However, a small industry with relatively low counts of claims but high rates should not be ignored. Targeted technical assistance or enforcement in individual workplaces may be an effective approach, particularly if a specific type of event (e.g., worker being caught in a machine) has been identified as a reoccurring problem. At the same time, the needs of a large industry with high numbers of injuries and illnesses distributed across many workplaces but low rates in any single workplace may warrant different approaches to prevention. This situation may be better suited to a broader educational campaign to reach the large number of workers and multiple employers, and may be most effective when tailored to specific types of events common within larger industries. It may also require delving more deeply into the data. Ultimately, many factors go into determining prevention priorities, but the numbers and the rates by industry, coupled with information about events leading to injury in this report are a critical starting point. A more detailed description of the study methods and more detailed tables are available upon request from the Massachusetts Department of Public Health, Occupational Health Surveillance Program.

Limitations

There are several study limitations that need to be considered when interpreting the findings in this report. Information on some of the key data elements (e.g., industry, occupation, event/cause of injury) in the claims records was incomplete, either because information was missing or the information provided could not be coded. Determining NAICS codes for firms with multiple establishments at one or numerous locations was challenging as claims did not always include information about the specific workplace where employees report or where the injury occurred. Also, there is a chance of some misclassification when coding data elements in large administrative databases. As noted earlier, information on claim status (accepted or denied) was not available – although DIA reports that approximately 89% of lost time claims are paid by insurers or not contested. Additionally, the WC claims records do not include information about worker race or ethnicity which would allow us to examine racial and ethnic inequities in occupational health risks. Likewise, claims records in Massachusetts do not include specific information about injury severity.

Finally, not all workers are covered by workers' compensation, and some injured workers who are covered do not apply for benefits for a variety of reasons (e.g. employer injury reporting practices, administrative barriers, worker fear of retribution, availability of other medical insurance, or lack of union representation).^{25, 26,27,28, 29} Workers with more serious injuries have been found to be more likely to apply.^{30,31} In a 2007 telephone survey of Massachusetts households, only 60% of workers who reported having medically treated work injuries in the year prior reported that their medical treatment was paid for by workers' compensation insurance.³² This survey, however, did not distinguish between more or less serious injuries. It is also well recognized that most workers' with long latency occupational diseases that manifest only years after exposure to job hazards do not enter the workers' compensation system.^{33,34} Thus, while this report provides important new information for targeting prevention efforts, the findings provide only a glimpse of the full extent of the problem of serious work-related injuries among private sector workers in Massachusetts.

Findings

Overview

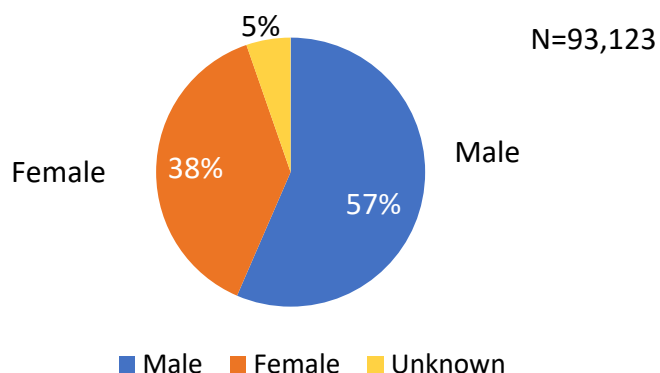
- A total of 93,123 Workers' Compensation lost wage claims were filed for Massachusetts private sector workers with dates of injury in 2014-2016 - an average of 31,041 claims per year.
- The average annual rate of claims filed was 10.9 per 1,000 full-time workers (FTE).

1. Worker and injury characteristics

By Sex

Fig 1.1.a Distribution of Workers' Compensation lost wage claims by sex

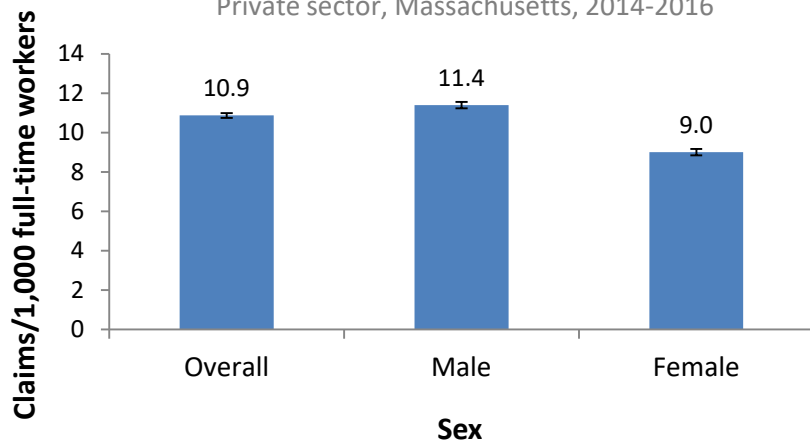
Private Sector, Massachusetts, 2014-2016



- A majority (57%) of claims were filed for males compared to 38% for females.
- Males were estimated to make up 50.3% of the workforce in 2014-2016.

Fig. 1.1.b Average annual rate of Workers' Compensation lost wage claims by sex

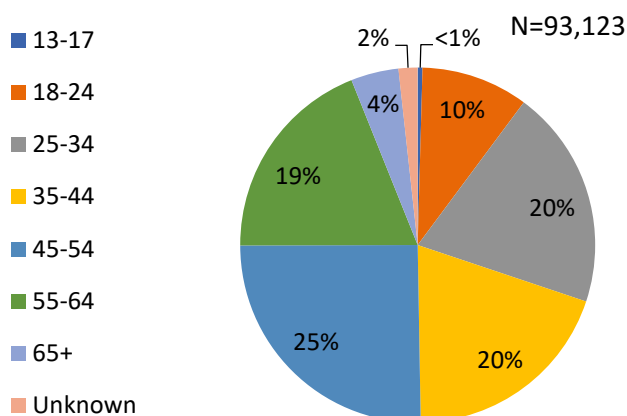
Private sector, Massachusetts, 2014-2016



- The rate of claims filed for males was 27% higher than the rate for females.

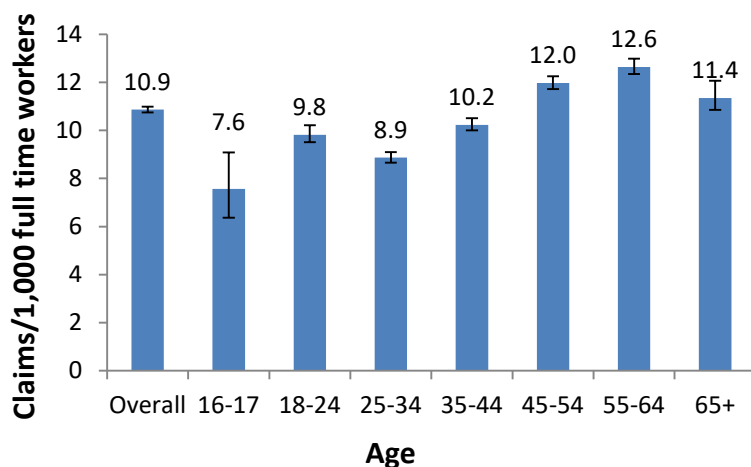
By Age

Figure 1.2.a Distribution of Workers' Compensation lost wage claims by age
Private Sector, Massachusetts 2014-2016



- The average age of workers filing claims was 44 years (range 13 – 89 years). The majority of claims were for workers 25 - 64 years of age. A little over 10% of injured workers were under age 24 and 4% were 65 or older.

Figure 1.2.b Average annual rate of Workers' Compensation lost wage claims by age
Private sector, Massachusetts 2014-2016



- The rate of claims was highest for workers aged 55-64 followed by that for workers aged 45-54. The rate for those 65 and older was lower than that for the 55-64 year olds.
- The claim rate for 18-24 year olds (young adults) was almost 30% higher than the rate for the youngest age group (16-17) and higher than that for 25-34 year olds.

Are there special protections for young workers?

Workers less than 18 years old are prohibited from working in many high hazard jobs under federal and state child labor laws.

To learn about the laws protecting Massachusetts youth, view "Child Labor Laws in Massachusetts" poster available at: www.mass.gov/dph/teensatwork

By Nature of Injury or Illness

Table 1.1 Distribution of injuries and illnesses reported in Workers' Compensation lost wage claims
Private Sector, Massachusetts 2014-2016

Injury/Illness*	Number	Percent**
All	92,636	100
Injuries	88,394	95.4
Sprain, strain	47,504	51.3
Contusion, crushing, bruise	10,808	11.7
Fracture	8,181	8.8
Cut, laceration, puncture	7,815	8.4
Injury NEC ‡	4,361	4.7
Multiple injuries ‡	3,125	3.4
Concussion	2,037	2.2
Hernia rupture	1,498	1.6
Burn from heat	1,260	1.4
Dislocation	976	1.1
Other injury §	427	0.5
Amputation or enucleation	402	0.4
Illnesses	3,462	3.7
Other illness §	1,337	1.4
Inflammation of joints	1,139	1.2
Carpal tunnel syndrome	541	0.6
Mental disorders	445	0.5
Symptoms, exposures, or ill-defined conditions	780	0.9
Non-classifiable/missing	7,223	

NEC = Not elsewhere classified.

*Injury/Illness categories based on the American National Standards Institute (ANSI) classification. ** Percentages computed excluding claims with non-classifiable nature or claims missing nature codes. 92% of claims had information on Nature of Injury. ‡ These categories are discreet ANSI codes, available for selection by claims filers. § Injury/Illness categories with ≤400 injuries/illnesses were combined into 'Other Injury' or 'Other Illness', respectively. See Appendix C for details.

- More than one injury or illness can be reported per claim. A total of 92,636 work-related health conditions were reported in 85,891 claims with classifiable information for nature of injury.
- The great majority (95.4%) were injuries. The small proportion of reported illnesses (3.7%) is not unique to this study and was to be expected in workers' compensation claim data. (See box below).
- The most common injury reported was sprain, strain (51.3%). Over one-third (36.0%) of these involved the back (data not shown).
- Contusion, crushing, bruise (11.7%) was the next most common injury followed by fracture (8.8%).
- Of the 402 amputations reported, 86% involved one or more fingers (data not shown).

Why are occupational illnesses particularly difficult to identify as work-related, and consequently, why are they poorly captured in workers' compensation claims?

One reason is that many work-related illnesses have long latency between initial exposures to a job hazard and the appearance of symptoms. In addition, many illnesses, such as asthma, can be caused by both occupational and non-occupational factors and therefore identifying the work-relatedness of the condition can be difficult.

2. Events Leading to Injury or Illness

Table 2.1 Distribution of Workers' Compensation lost wage claims by event

Private Sector, Massachusetts, 2014-2016

Event*	Number	Percent**
All Claims	72,242	100.0
Overexertion & bodily reaction	27,485	38.1
Overexertion in lifting, pushing, etc.	20,252	28.6
Other overexertion & bodily reaction	3,983	5.6
Repetitive motion, micro-tasks	1,320	1.9
Unspecified or NEC	1,332	1.9
Fall, slip, trip	20,472	28.7
Fall same level	11,938	16.9
Slip trip without fall	4,150	5.9
Fall lower level	3,772	5.3
Other, unspecified or NEC	510	<.01
Contact with object or equipment	13,898	19.2
Struck by	7,868	11.1
Struck against	2,531	3.6
Caught in or compressed	2,092	3.6
Other, unspecified or NEC	1,097	1.6
Transportation incident	3,948	5.5
Roadway – motor vehicle incident	3,302	4.5
Other, unspecified or NEC	570	<.01
Violence involving person or animal	3,301	4.6
Intentional injury by person	2,028	2.9
Other, including intention unknown	1,223	1.7
Exposure to harmful substance or environment	2,837	3.9
Temperature extremes (including hot objects)	1,142	1.6
Other or NEC	1,695	2.3
Fire and explosion	31	<.01
Non-classifiable/missing event	20,881	

NEC: Not elsewhere classified.

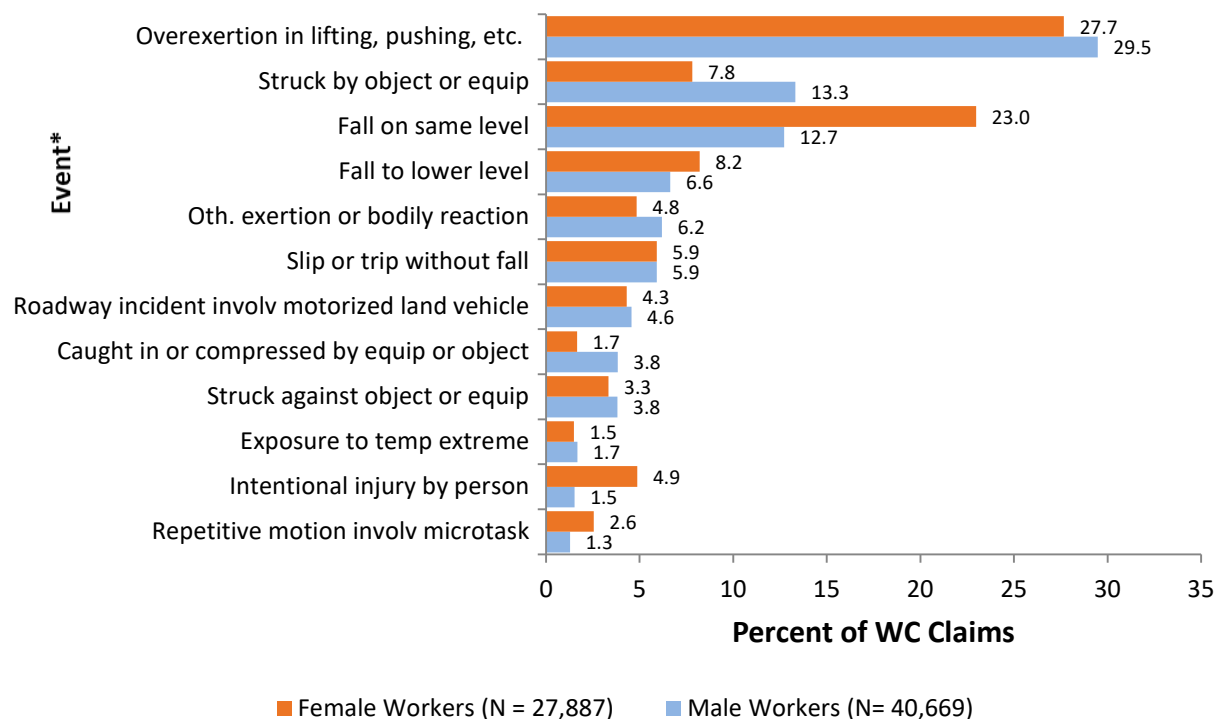
*Event coded according to BLS Occupational Injury & Illness Classification System. **Percentages computed excluding claims with missing event or non-classifiable event. 78% of claims had 1-digit event information; 76% of claims had 2-digit event information.

- The most common event category was Overexertion & bodily reaction, which accounted for 38.1% of claims with known event.
- Within this broad category, overexertion in lifting, pushing, etc. was the most common single event, alone accounting for more than a quarter (28.6%) of all claims.
- Falls were the next most common event (28.7%), over half of which were on the same level, followed by Contact with objects or equipment (19.2%).
- Most Transportation incidents involved on-the-road motor vehicle or pedestrian-related incidents.
- Most of the Violence related incidents involved Intentional injury by persons.
- Among claims caused by Exposure to harmful substances or environments, contact with hot objects (i.e. burns) was the most common single event.

By Sex

Figure. 2.1 **Distribution of Workers' Compensation lost wage claims by detailed event for male and female workers***

Private Sector, Massachusetts 2014-2016 N=68,556



*Events coded according to the BLS Occupational Injury and Illness Classification System (OIICS). Percentages computed excluding claims with missing event or sex information. 74% of claims had event and sex information. Detailed event categories presented are those with 1,000 or more claims (among males and females).

- Overexertion in lifting, pushing, etc. was the leading event for both injured males (27.7%) and females (29.5%). However, the distribution of claims related to many of the other events varied by sex.
- Injured males were much more likely than injured females to have been struck by (13.3% vs. 7.8%) or caught in/compressed by objects or equipment (3.8% vs. 1.7%).
- Injured females were much more likely than injured males to have:
 - Fallen on the same level (23.0% vs 12.7%)
 - Experienced an intentional injury by another person (4.9% vs. 1.5%)
 - Sustained an injury or illness due to repetitive motion involving micro- tasks (e.g., key entry, use of hand tools or instruments) (2.5% vs 1.3%)

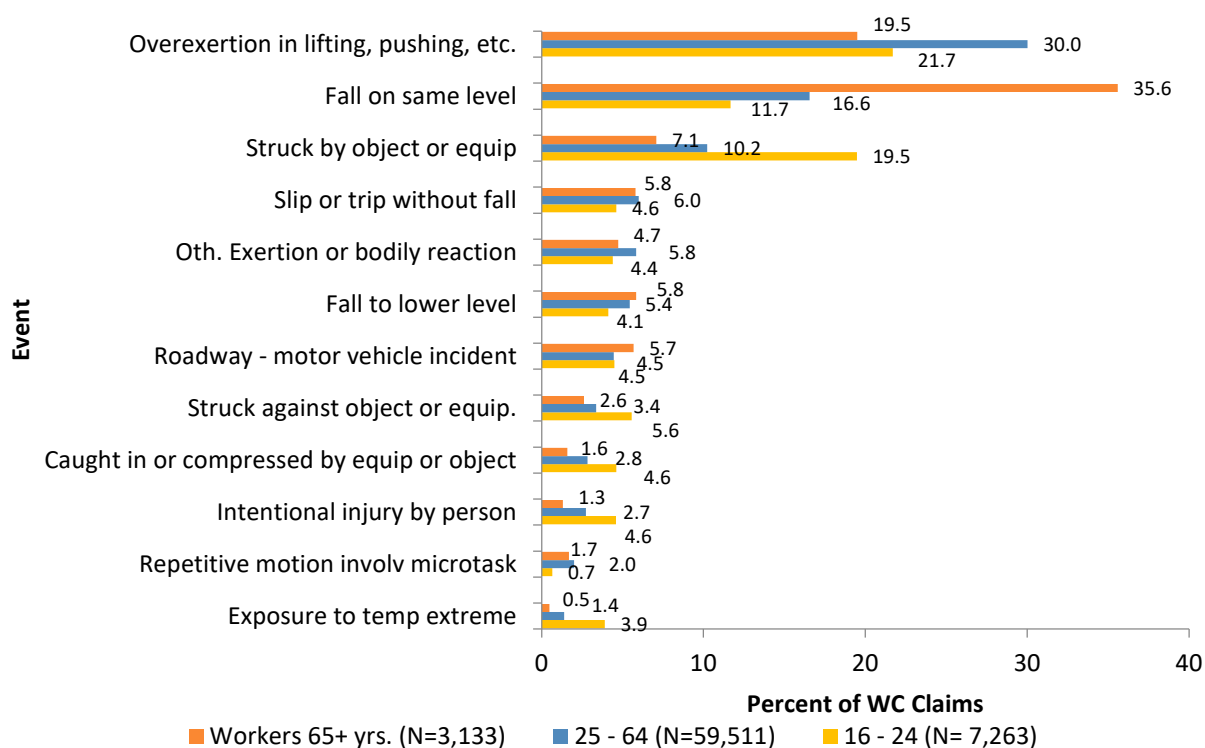
Overexertion in lifting, pushing, etc. (referred to by BLS as “overexertion involving outside sources”) results from strenuous physical effort directed at moving an object or person. It may involve lifting, pulling, pushing, turning, welding, holding, carrying, or throwing. The injury can arise from a single exertion or from repeated exertions such as repetitive heavy lifting. (OIICS:71)

Other overexertion or bodily reaction includes incidents in which the injury or illness resulted from unnatural positions, such as prolonged sitting or standing, or personal movements such as walking, climbing, or bending. (OIICS:73)

By Age

Figure 2.2 Distribution of Workers' Compensation lost wage claims by detailed event for three age groups*

Private Sector, Massachusetts, 2014-2016 N= 67,304



*Event coded according to the BLS Occupational Injury and Illness Classification System (OIICS). Percentages computed excluding claims with missing event or sex information. 72% of claims had 2-digit event and age information available. Detailed event categories presented are those with 1,000 or more claims (among the 3 age groups).

- Leading events differed markedly by age of injured workers.
- For workers aged 65 and older, fall on the same level was the leading event (35.6%).
- For workers aged 25-64, the largest age group, overexertion by lifting, pushing, etc. was the most common event (30%).
- Among the youngest age group, injured workers were almost equally likely to have been injured as a result of being struck by an object or equipment (19.5%) as overexertion from lifting, pushing, etc. (21.7%).
- Several other events, while less frequent, stand out as being of concern for young workers: intentional injuries (4.6%) and exposure to extreme temperature which were predominantly burns (3.9%) (data not shown).

Protecting Young Workers from Injury

Young workers are by definition inexperienced workers and inexperienced workers of all ages are at higher risk of getting injured on the job.^a Also, younger workers often work in jobs with higher than average injury rates and frequently they do not receive any health or safety training. DPH and DIA have for many years collaborated with other Massachusetts agencies to promote the health and safety of young workers through the YES Team. (<https://www.mass.gov/massachusetts-youth-employment-and-safety-team-yes-team>)

^a Breslin FC, Day D, Tompa E, et al., (2007). Non-Agricultural Work Injuries among Youth: A Systematic Review. Am J of Prev Med, 32(2):151-62.

3. Industries ranked by Prevention Index based on all Workers' Compensation claims

Organization of findings

This section presents findings using the Prevention Index (PI) approach to prioritize private sector industries for prevention based on the numbers and rates of all workers' compensation claims filed. Industries are categorized according the North American Industry Classification System (NAICS), a hierarchical coding system that adds detail about an industry with the addition of digits to the end of the code. Industries are first divided into broad industry **sectors** (2-digit NAICS codes, with 19 total sectors). Within sectors there are **subsectors** (3-digit NAICS codes; 78 subsectors in Massachusetts with 15 or more claims). Within subsectors, there are **industry groups** (4-digit NAICS codes; 228 industry groups in Massachusetts with 15 or more claims). (See example of NAICS coding structure in blue box below).

WC claim rates were computed only for those subsectors and groups with 15 or more claims during the study period.^m Findings are presented for industry sectors, subsectors, and industry groups within sectors. Details on the common events and occupations are provided at the subsector level only.

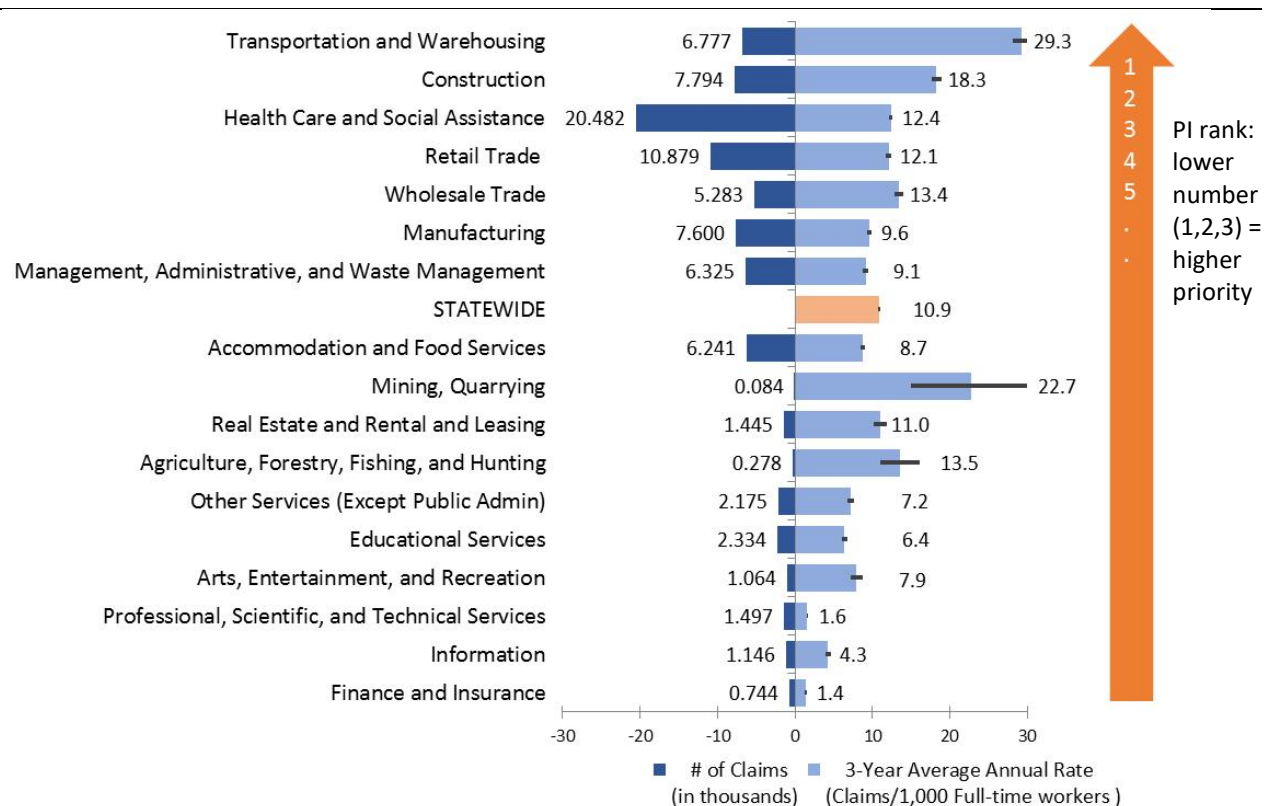
Example of the NAICS Coding Structure	
NAICS code	<u>Industry Sector, Subsector, Industry Group</u>
<u>62</u>	<u>Health Care and Social Assistance Sector</u>
621	<i>Ambulatory health care services</i>
6211	Office of physicians
6212	Office of dentists
6213	Office of other health care practitioners
6214	Outpatient care centers
6215	Medical and diagnostic laboratories
6216	Health care services
6219	Other ambulatory health care services
622	<i>Hospitals</i>
6221	General medical and surgical hospitals
6222	Psychiatric and substance abuse hospitals
6223	Specialty except psychiatric and substance abuse hospitals
623	<i>Nursing and residential care facilities</i>
6231	Nursing care facilities
6232	Residential intellectual development disability, mental health & substance abuse facilities
6233	Continuing care retirement communities
6239	Other residential care facilities
624	<i>Social assistance</i>
6241	Individual and family services
6242	Community food and housing and emergency relief services
6243	Vocational rehabilitation services
6244	Child care services

The full North American Industry Classification System (NAICS), the 2012 version, is available at <https://www.census.gov/eos/www/naics/> The NAICS coding up to the 4-digit level is included in Appendix A of this report.

^m Also excluded from rate and PI calculations were two industry groups with no reported employment in 2014 – 2016.

Industry Sector (2-digit NAICS)

Fig 3.1. Number and rate of Workers' Compensation lost wage claims by Industry Sector (2-digit NAICS) ordered by Prevention Index*
Private Sector, Massachusetts, 2014-2016 N=82,867



*Percentages computed excluding claims with non-classifiable industry codes. 89% of claims had Information on industry available. Additionally, findings on claims within the Utilities sector are not presented due to DUA confidentiality restrictions. Sector 55 (Management of Companies) is grouped with Sector 56 (Administrative and Support and Waste Management and Remediation Services) to align these data with the denominator data. Horizontal orange bar represents the overall statewide rate with all claims included (10.9 claims/1,000 full-time workers). Solid orange arrow represents the order/direction of the Prevention Index rank - lowest priority industry sector (17) to highest priority (1).

- Workers' Compensation claims were filed for workers in 19 industry sectors, ranging from a low of 84 claims in Mining/Quarrying (essentially quarrying in Massachusetts) to a high of 20,482 claims for workers in Health Care and Social Assistance (Figure 3.1).
- The leading industry sectors by Prevention Index (PI) for all claims were Transportation and Warehousing, which had the highest WC claim rate at 29.3/1,000 full time workers, followed by Construction with a rate of 18.3, and Health Care and Social Assistance which had a rate of 12.4 but the largest number of claims. These were followed by the Wholesale and Retail Trade sectors both of which had rates higher than the statewide claims rate of 10.9.

- The Mining Quarrying sector is an example of a sector with a low number of claims and lower PI ranking but a high rate – a rate of 22.7 claims/1,000 full time workers compared to the statewide claim rate of 10.9.

There is substantial variation in health and safety risks across industries *within* these broad industry sectors. Tables on the following pages provide PI rankings of industries based on all claims at the subsector level (3-digit NAICS) and at the industry group level (4-digit NAICS) within sectors. These tables provide more detailed information for targeting prevention efforts.

Industry Subsectors (3-digit NAICS) ranked by Prevention Index

There were 78 industry subsectors with 15 or more claims filed during 2014-2016 for which PIs were computed. These subsectors were ranked by PI to guide prevention and research efforts. The 25 leading subsectors are listed along with the most common events and most frequently reported occupations of injured workers in Table 3.1. The table of all 78 subsectors ranked by PI with leading events and occupations is included in Appendix F.

Subsectors

- Five of the top 10 subsectors were in the Transportation and Warehousing sector; these five subsectors had among the highest rates of all subsectors.
- Hospitals, which employ more workers than any other single industry in the state, had the highest numbers of claims and a claim rate (13.9) higher than the overall statewide rate (10.9/1,000 full time workers).
- Both the nursing and residential care facilities subsector as well as specialty trade contractors had a high rate and a high number of claims (> 5,000 each).
- Restaurants and drinking places are an example of a subsector with a high number of claims (close to 5,000) and a rate (8.1) lower than the overall state rate.

Events within subsectors

- Overexertion in lifting, pushing, etc. was the most common event accounting for a substantial proportion of claims in most subsectors.
- Exceptions among top ranking subsectors by PI were: the transit and ground transportation subsector (NAICS 485) where a roadway/traffic incident was the most common event and the subsector, social assistance (NAICS 624), where fall on the same level was the most common. The restaurant and drinking places subsector (NAICS 722) also reported fall on the same level as the leading event.
- Violence was among the leading event in three subsectors in Table 3.1, all within the Health Care and Social Assistance sector: nursing & residential care facilities (16% of claims); hospitals (8% of claims); and social assistance (19% of claims.).

- Falls to a lower level was among the leading events in two of the three subsectors of the broad Construction sector : specialty trade contractors (13%) and construction of buildings (17%). Falls to a lower level accounted for 5% of claims across all industries.
- Struck by object was a common event in many subsectors, accounting for more than 15% of claims in all three construction subsectors listed in Table 3.1, as well as in administrative & support services (NAICS 561) which includes temporary employment agencies, fabricated metal products manufacturing (NAICS 332), and restaurants and drinking places (NAICS 722).

What do the most common occupations of injured workers within industry subsectors tell us?

The most common occupations listed in Table 3.1 provide insight into the specific jobs that may be considered as prevention priorities within subsectors. The percentages presented, however, reflect in part the distribution of jobs in these subsectors and do not necessarily provide measures of differential risk of injury or illness across occupation groups. Occupation specific rates, not presented in the report, would provide information about differences in the likelihood of being injured across occupations.

Definition of select subsectors

NAICS 238: Specialty trade contractors - Industries in this subsector include establishments whose primary activity is to carry out specific activities like pouring concrete, plumbing, painting and electrical work involved in building construction but that are not responsible for the entire projects. The work may involve new construction, additions, maintenance or repairs.

NAICS 484: Truck transportation - Industries in this subsector include establishments whose primary activity is to provide over-the-road transportation of cargo (freight) using tractor trailers and relatively large trucks. The freight transported fall into the category of general or specialized.

NAICS 424: Merchant wholesalers, non-durable goods - Non-durable goods are goods that are expected to last less than 3 years and include, for example, paper products, chemicals, drugs, textile and clothing, footwear, groceries, alcoholic beverage, books, and petroleum products. Merchant wholesalers sell these goods to other businesses.

NAICS 492: Couriers and messengers –Industries in this subsector provide intercity, local, and/or international delivery of parcels and documents--including express delivery services. Articles to be delivered are those that may be handled by one person without using special equipment. The restriction to small parcels partly distinguishes these establishments from those in other transportation industries. This subsector does not include the Post Office.

NAICS 516: Administrative and support services – This is a broad subsector that includes establishments engaged in activities that support the day-to day operations of other agencies, for example personnel administration and billing and record-keeping and logistics. It includes establishments that offer a combination of services such as janitorial, maintenance, and security to support operations within facilities. Employment services, including temporary employment agencies, are in this subsector.

NAICS 624: Social assistance – Industries in this subsector provide services and resources directly to their clients across a wide variety of areas including many individual and family services such as counseling, day care, emergency relief, and vocational rehabilitation.

**Table 3.1. Top 25 industry subsectors* by Prevention Index (PI), with most common events and occupations,
Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
492	Couriers & messengers	1,580 (14)	46.4 (1)	1	Overexertion - lifting... (40%)	Other overexertion or bodily reaction (10%)	Fall same level (10%)	Couriers & messengers (62%) Laborers & freight, stock, & material movers (12%) Inspectors, testers, sorters, & weighers (8%)
484	Truck transportation	1,782 (12)	34.2 (3)	2	Overexertion - lifting... (31%)	Fall same level (16%)	Struck by object (11%)	Heavy & tractor-trailer truck drivers (70%) Laborers & freight, stock & material movers (15%) Bus & truck mechanics & diesel engine Specialists (3%)
424	Merchant wholesalers, non-durable goods	3,168 (8)	24.1 (8)	3	Overexertion - lifting... (39%)	Fall same level (13%)	Struck by object (10%)	Driver/sales workers (19%) Light truck or delivery services drivers (16%) Heavy & tractor-trailer truck drivers (16%)
623	Nursing & residential care facilities	5,506 (3)	19.8 (13)	4	Overexertion - lifting... (38%)	Fall same level (19%)	Violence by person (16%)	Nursing assistants (44%) Personal care aides (8%) Registered nurses (5%)
238	Specialty trade contractors	5,515 (2)	18.8 (16)	5	Overexertion - lifting... (25%)	Struck by object (16%)	Fall lower level (13%)	Construction laborers (18%) Plumbers, pipefitters, & steamfitters (12%) Carpenters (11%)
493	Warehousing & storage	829 (24)	26.6 (5)	6	Overexertion - lifting... (48%)	Struck by object (11%)	Fall same level (10%)	Inspectors, testers, sorters, weighers (33%) Laborers & freight, stock, & material movers (31%) Industrial truck & tractor operators (14%)

Table 3.1. Top 25 industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims (Continued)
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
481	Air transportation	767 (27)	33.2 (4)	7	Overexertion - lifting... (45%)	Fall same level (12%)	Struck by object (9%)	Flight attendants (43%) Reservation & transportation ticket agents & travel clerks (26%) Customer service representatives (16%)
485	Transit & ground passenger transportation	1,279 (21)	21.8 (10)	8	Roadway incident (38%)	Fall same level (15%)	Overexertion - lifting... (14%)	Bus drivers, transit & intercity (40%) Taxi drivers & chauffeurs (27%) Bus drivers, school or special client (13%)
622	Hospitals	7,720 (1)	13.9 (31)	9	Overexertion - lifting... (41%)	Fall same level (17%)	Violence by person (8%)	Registered nurses (36%) Nursing assistants (14%) Surgical technologists (5%)
444	Building materials & garden supplies	1,362 (18)	19.2 (15)	10	Overexertion - lifting... (37%)	Struck by object (15%)	Fall same level (12%)	Retail salespersons (22%) Light truck or delivery services drivers (18%) Laborers & freight, stock & material movers (9%)
452 ¥	General merchandise stores §	1,871 (11)	15.5 (24)	11	--	--	--	Retail salespersons (18%) First-line supervisors of retail sales workers (14%) Stock clerks and order fillers (12%)
445	Food and beverage stores	3,388 (7)	14.5 (28)	12	Overexertion - lifting... (37%)	Fall same level (16%)	Struck by object (14%)	Laborers & freight, stock, & material movers (22%) Stock clerks and order fillers (12%) First-line supervisors of retail sales workers (11%)

Table 3.1. **Top 25 industry subsectors* by Prevention Index (PI), with most common events and occupations,**
Workers' Compensation (WC) lost wage claims (Continued)
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
562	Waste management & remediation	784 (26)	21 (12)	13	Overexertion - lifting... (30%)	Struck by object (13%)	Fall same level (11%)	Heavy & tractor-trailer truck drivers (49%) Laborers & freight, stock, & material movers (18%) Hazardous materials removal workers (7%)
236	Construction of buildings	1,513 (15)	16.7 (23)	14	Overexertion - lifting... (24%)	Struck by object (17%)	Fall lower level (17%)	Carpenters (39%) Construction laborers (29%) Supervisors of construction trades & extraction workers (7%)
312 ¥	Beverage manufacturing	465 (39)	41.4 (2)	15	--	--	--	Industrial truck & tractor operators (14%) Light truck or delivery services drivers (13%) Driver/sales workers (12%)
311	Food manufacturing	1,280 (20)	17.6 (21)	16	Overexertion - lifting... (24%)	Fall same level (18%)	Struck by object (13%)	Packaging & filling machine operators & tenders (15%) Food processing workers, all other (8%) Laborers & freight, stock & material movers (7%)
561	Administrative & support services	5,255 (4)	11.2 (39)	17	Overexertion - lifting... (22%)	Struck by object (16%)	Fall same level (16%)	Landscaping & grounds keeping workers (15%) Laborers & freight, stock & material movers (12%) Construction laborers (6%)
488	Support activities for transportation	512 (35)	21.3 (11)	18	Overexertion - lifting... (34%)	Fall same level (15%)	Struck by object (13%)	Heavy & tractor-trailer truck drivers (24%) Reservation & transportation ticket agents & travel clerks (21%) Aircraft mechanics & service technicians (6%)

Table 3.1. **Top 25 industry subsectors* by Prevention Index (PI), with most common events and occupations,**
Workers' Compensation (WC) lost wage claims (Continued)
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
237	Heavy & civil engineering construction	765 (28)	17.9 (19)	19	Overexertion - lifting... (23%)	Struck by object (20%)	Fall same level (13%)	Construction laborers (45%) Supervisors of construction trades & extraction workers (8%) Heavy & tractor-trailer truck drivers (7%)
441	Motor vehicle & parts dealers	1,474 (17)	12.5 (35)	20	Overexertion - lifting... (28%)	Fall same level (16%)	Struck by object (12%)	Automotive service technicians & mechanics (33%) Light truck or delivery services drivers (15%) Tire repairers & changers (12%)
332	Fabricated metal products manufacturing	1,295 (19)	12.8 (34)	21	Overexertion - lifting... (29%)	Struck by object (17%)	Fall same level (11%)	Metal workers, plastic workers, all other (12%) Machinists (11%) Welders, cutters, solderers, & brazers (7%)
721	Accommodation (hotels/motels)	1,278 (22)	12.9 (33)	22	Overexertion - lifting... (28%)	Fall same level (19%)	Struck by object (14%)	Maids & housekeeping cleaners (35%) Cooks, restaurant (9%) Janitors & cleaners, except maids & housekeeping cleaners (8%)
624	Social assistance	2,835 (9)	8.9 (47)	23	Fall same level (22%)	Overexertion - lifting... (21%)	Violence by person (19%)	Preschool teachers, except special education 13%) Personal care aides (10%) Social workers, all other (7%)
621	Ambulatory health care services	3,973 (6)	8.1 (50)	24	Overexertion - lifting... (35%)	Fall same level (20%)	Roadway incident (11%)	Emergency medical technicians & paramedics (21%) Registered nurses (13%) Home health aides (12%)

Table 3.1. Top 25 industry subsectors* by Prevention Index (PI), with most common events and occupations,
Workers' Compensation (WC) lost wage claims (Continued)
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
722	Restaurants and drinking places	4,963 (5)	8.1 (51)	25	Fall same level (22%)	Struck by object (21%)	Overexertion - lifting... (13%)	Cooks, restaurant (23%) Waiters and waitresses (12%) Food service managers (8%)

*Based on the 78 industry subsectors (3-digit NAICS) with 15 or more WC claims filed during 2014-2016 and for which Prevention Indices (PI) were computed. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher. § Event coded according to BLS Occupational Injury and Illness Classification System at 2-digit level. Occupation coded according to the BLS Standard Occupational Classification System at the 6-digit level. Event and occupation percentages computed excluding claim records with missing information. ¥ Event data was available for less than 60% of the claims within industry subsector; most common events not included for these industries.

Rates expressed as WC claims per 1,000 full-time workers. The complete table of all 78 subsectors ranked by PI is included in Appendix F.

Industry groups (4-digit NAICS) ranked by within Sector Prevention Index

There were 228 industry groups with 15 or more claims filed during 2014-2016 for which PIs based on all WC lost wage claims were calculated. These industry groups were compared with all other industry groups in the state (assigned an overall PI rank) and separately with only the industry groups in their sector (assigned a “*within sector*” PI rank). The “*within sector*” PI rank provides information useful for identifying sector specific prevention priorities. The PI rankings of industry groups within sectors are presented in the following tables. Industry groups in these tables are ordered by the “*within sector*” PI rank. The overall PI ranks for the 4-digit industry groups are also included in these tables to provide a larger context.

Table 3.2 All industry groups in the Agriculture, Forestry, Fishing, Hunting, Mining, Quarrying sectors ordered by *within sector* Prevention Index (PI)*

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014 - 2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI rank
				count rank	rate rank	PI rank**	
1129	Other animal production	87	32.2	1	1	1	67
2123 §	Nonmetallic mineral mining and quarrying	74	24.7	2	2	2	76
1114	Greenhouse and nursery production	54	13.0	3	4	3	140
1121	Cattle ranching and farming	16	16.6	6	3	4	158
1112	Vegetable and melon farming	38	12.0	4	5	5	162
1113	Fruit and tree nut farming	29	11.5	5	6	6	173

Rates expressed as WC claims per 1,000 full-time workers.

* There were six industry groups in the combined AFFH sector and the Mining/Quarrying sector with 15 or more claims for which PI were computed. ** For PI Rank, industries scoring the lowest (1,2,3...) are prioritized higher. § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

- Within the AMQ sectors, the top 3 industries by Prevention Index were: Other animal production (1129), Nonmetallic mineral mining and quarrying (2123) and Greenhouse and nursery production (1114).

Table 3.3 All industry groups in the Construction sector ordered by *within sector* Prevention Index (PI)
All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014 - 2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
2381	Building foundation and exterior contractors	1,165	27.8	3	1	1	6
2383	Building finishing contractors	1,305	21.0	2	4	2	14
2361	Residential building construction	970	21.0	4	5	3	15
2382	Building equipment contractors	2,153	15.1	1	8	4	27
2373	Highway, street, and bridge construction	334	22.0	7	3	5	26
2389	Other specialty trade contractors	892	19.1	5	6	6	21
2372	Land subdivision	51	26.5	10	2	7	93
2371	Utility system construction	314	16.9	8	7	8	42
2362	Nonresidential building construction	543	12.3	6	9	9	53
2379	Other heavy construction	66	9.4	9	10	10	155
23	All Construction	7,794	18.3				

Rates expressed as WC claims per 1,000 full-time workers.

**For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Construction sector, the top 3 industries by Prevention Index were: Building foundation and exterior contractors (2381), Building finishing contractors (2383) and Residential building construction (2361).

Table 3.4 Top 25 industry groups in Manufacturing sector ordered by *within sector* Prevention Index (PI)*
All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
3121	Beverage mfg.	465	41.4	2	1	1	13
3321 §	Forging and stamping	230	38.2	9	2	2	29
3273	Cement and concrete product mfg.	188	27.8	12	6	3	40
3114	Fruit and vegetable preserving and specialty	134	27.9	21	5	4	44
3115	Dairy product mfg.	168	21.3	16	10	5	47
3323	Architectural and structural metals mfg.	253	17.1	8	18	6	51
3116	Animal slaughtering and processing	148	22.8	18	9	7	49
3118	Bakeries and tortilla mfg.	452	15.5	3	24	8	43
3279	Other nonmetallic mineral products	125	26.3	22	7	9	54
3222	Converted paper product mfg.	292	14.5	6	26	10	61
3261	Plastics product mfg.	490	13.3	1	31	11	50
3117	Seafood product preparation and packaging	135	19.1	20	15	12	70
3364	Aerospace product and parts mfg.	431	12.5	4	33	13	62
3372	Office furniture and fixtures mfg.	107	19.2	24	14	14	74
3326	Spring and wire product mfg.	61	34.0	37	4	15	72
3162	Footwear mfg.	78	19.6	30	13	16	89
3133 §	Textile and fabric finishing mills	96	17.7	27	16	17	85
3328	Coating, engraving, and heat treating metals	180	13.3	13	30	18	80
3262	Rubber product mfg.	72	21.2	33	11	19	84
3119	Other food mfg.	158	13.8	17	27	20	86
3221	Pulp, paper, and paperboard mills	103	16.9	26	19	21	92
3371	Household and institutional furniture mfg.	88	17.2	28	17	22	96
3231	Printing and related support activities	296	8.9	5	41	23	90
3219	Other wood product mfg.	103	16.3	26	21	24	97
3329	Other fabricated metal product mfg.	177	11.2	14	36	25	100
Industry groups not included in top 25 ranked by PI but among the 5 top industry groups ranked by either count or rate							
3211 §	Sawmills and wood preservation	25	35.5	58	3	30	112
31-33	All Manufacturing	7,600	9.6				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 64 industry groups in the Manufacturing sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable. See Appendix D for the complete table of all industry groups in the manufacturing sector and their claim counts, claim rates, and within sector PI rankings.

- Within the Manufacturing sector, the top 3 industries by Prevention Index were: Beverage manufacturing (3121), Forging and stamping (3321) and Cement and concrete product mfg. (3273). Appendix D contains the complete table of all industry groups in this sector.

Table 3.5 All industry groups in the Wholesale Trade sector ordered by *within sector* Prevention Index (PI)*
All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
4248	Alcoholic beverage merchant wholesalers	691	47.2	2	1	1	5
4244	Grocery and related product wholesalers	1559	28.7	1	2	2	2
4241	Paper and paper product merchant wholesalers	436	28.1	4	3	3	18
4231	Motor vehicle and parts merchant wholesalers	307	19.9	5	4	4	35
4233	Lumber and const. supply merchant wholesalers	271	16.0	7	6	5	58
4249	Misc. nondurable goods merchant wholesalers	240	15.5	8	8	6	65
4235 §	Metal and mineral merchant wholesalers	93	18.1	13	5	7	82
4251	Electronic markets and agents and brokers	437	5.6	3	15	8	109
4237	Hardware and plumbing merchant wholesalers	189	12.3	10	9	9	87
4247	Petroleum merchant wholesalers	67	15.7	15	7	10	121
4238	Machinery and supply merchant wholesalers	216	8.8	9	13	11	110
4234	Commercial equip. merchant wholesalers	299	5.4	6	16	12	123
4239	Misc. durable goods merchant wholesalers	118	10.2	12	11	13	130
4246	Chemical merchant wholesalers	56	10.7	17	10	14	152
4242	Druggists' goods merchant wholesalers	81	6.4	14	14	15	170
4236	Electric goods merchant wholesalers	129	4.8	11	17	16	163
4232	Furniture and furnishing merchant wholesalers	56	9.6	17	12	17	161
4243	Apparel and piece goods merchant wholesalers	26	2.9	18	18	18	216
42	All Wholesale Trade	5,283	13.4				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 18 industry groups in the Wholesale Trade sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. §Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

- Within the Wholesale Trade sector, the top 3 industries by Prevention Index were: Alcoholic beverage merchant wholesalers (4248), Grocery & related product wholesalers (4244) and Paper and paper product merchant wholesalers (4241).

Table 3.6 All industry groups in the Retail Trade sector ordered by *within sector* Prevention Index (PI) *

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Over all PI Rank
				count rank	rate rank	PI rank**	
4529	Other general merchandise stores	998	23.8	3	2	1	12
4441	Building material and supplies dealers	1255	19.8	2	4	2	16
4451	Grocery stores	3173	16.3	1	7	3	22
4543	Direct selling establishments	416	24.3	8	1	4	24
4413	Auto parts, accessories, and tire stores	541	20.3	6	3	5	25
4521	Department stores	873	10.9	5	10	6	52
4411	Automobile dealers	879	10.4	4	11	7	55
4533	Used merchandise stores	115	17.9	17	6	8	78
4471	Gasoline stations	299	8.8	10	13	9	88
4422	Home furnishings stores	152	9.0	14	12	10	120
4461	Health and personal care stores	474	7.2	7	19	11	91
4421	Furniture stores	113	11.7	18	9	12	118
4442	Lawn and garden equipment and supplies stores	107	14.0	20	8	13	107
4542 §	Vending machine operators	24	19.5	26	5	14	136
4532	Office supplies, stationery, and gift stores	156	7.2	13	18	15	132
4452	Specialty food stores	129	7.7	16	16	16	135
4541	Electronic shopping and mail-order houses	168	6.7	12	20	17	133
4541	Sporting goods, hobby, and musical instrument stores	174	6.3	11	21	18	134
4481	Clothing stores	310	5.5	9	23	19	117
4412	Other motor vehicle dealers	54	8.6	22	14	20	171
4539	Other miscellaneous store retailers	112	7.5	19	17	21	143
4431	Electronics and appliance stores	141	5.5	15	22	22	146
4531	Florists	34	8.4	24	15	23	186
4453	Beer, wine, and liquor stores	84	3.6	21	25	24	187
4482	Shoe stores	51	4.2	23	24	25	198
4483	Jewelry, luggage, and leather goods stores	26	2.8	25	27	26	218
4512	Book stores and news dealers and music stores	18	3.0	27	26	27	222
44-45	All Retail Trade	10,879	12.1				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 27 industry groups in the Retail Trade sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

- Within the Retail Trade sector, the top 3 industries by Prevention Index were: Other general merchandise stores (4529), Building material and supplies dealers (4441) and Grocery stores (4451).

Table 3.7 All industry groups in the Transportation & Warehousing sector, ordered by *within sector* Prevention Index (PI)*

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
4921	Couriers and express delivery services	1,502	48.8	1	1	1	1
4841	General freight trucking	1,103	35.3	2	4	2	4
4811	Scheduled air transportation	763	34.6	4	5	3	7
4881	Support activities for air transportation	271	37.2	8	3	4	23
4842	Specialized freight trucking	679	32.6	5	6	5	9
4931	Warehousing and storage	829	26.6	3	8	6	11
4851	Urban transit systems	156	42.2	10	2	7	37
4859	Other ground passenger transportation	320	29.0	7	7	8	19
4854	School and employee bus transportation	465	18.0	6	15	9	34
4922	Local messengers and local delivery	78	23.8	12	10	10	73
4884	Support activities for road transportation	134	20.4	11	12	11	64
4853	Taxi and limousine service	234	18.3	9	14	12	48
4852	Interurban and rural bus transportation	45	26.2	15	9	13	98
4855	Charter bus industry	59	19.1	13	13	14	106
4889	Other support activities for transportation	40	23.6	16	11	15	105
4885	Freight transportation arrangement	57	8.4	14	16	16	169
48-49	All Transportation and Warehousing	6,777	29.2				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 16 industry groups in the Transportation & Warehousing sector with 15 or more claims for which PI were computed. **For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Transportation & Warehousing sector, the top 3 industries by Prevention Index were: Couriers and express delivery services (4921), General freight trucking (4841), and Scheduled air transportation (4811).

Table 3.8 All industry groups in the Finance and Insurance sector ordered by *within sector* Prevention Index (PI)*

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
5221	Depository credit intermediation	299	2.1	1	1	1	144
5241	Insurance carriers	217	1.6	2	2	2	166
5242	Insurance agencies and brokerages	108	1.5	3	3	3	195
5231	Securities and commodity contracts brokerage	51	1.1	4	4	4	213
5222	Non-depository credit intermediation	16	0.8	6	5	5	228
5239	Other financial investment activities	40	0.4	5	6	6	220
52	All Finance and Insurance	744	1.4				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 6 industry groups in the Finance & Insurance sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Finance & Insurance sector, the top 3 industries by Prevention Index were: Depository credit intermediation (5221), Insurance carriers (5241), and Insurance agencies and brokerages (5242).

Table 3.9 All industry groups in the Information sector ordered by *within sector* Prevention Index (PI)*

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
5171	Wired telecommunications carriers	728	20.1	1	1	1	20
5111	Newspaper, book, and directory publishers	210	5.3	2	2	2	138
5121	Motion picture and video industries	64	4.8	3	3	3	193
5151	Radio and television broadcasting	35	2.8	4	5	4	210
5152	Cable and other subscription programming	17	4.8	8	4	5	215
5172	Wireless telecommunications carriers	18	1.7	7	6	6	226
5112	Software publishers	34	0.4	5	8	7	223
5191	Other information services	18	0.7	7	7	8	227
51	All Information	1,146	4.3				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 8 industry groups in the Information sector with 15 or more claims for which PI were computed. **For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Information sector, the top 3 industries by Prevention Index were: Wired telecommunications carrier (5171), Newspaper, book, and directory publishers (5111), and Motion picture and video industry (5121).

Table 3.10 All industry groups in the Real Estate, Rental, and Leasing sector ordered by *within sector* Prevention Index (PI)*

Workers' Compensation (WC) lost wage claims

Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
5322 §	Consumer goods rental	182	20.2	3	1	1	45
5313	Activities related to real estate	531	11.5	1	4	2	60
5311	Lessors of real estate	295	9.4	2	6	3	83
5323	General rental centers	45	17.2	7	2	4	127
5324	Machinery and equipment rental and leasing	109	15.2	6	3	5	99
5321	Automotive equipment rental and leasing	147	11.2	4	5	6	108
5312	Offices of real estate agents and brokers	126	6.4	5	7	7	145
53	All Real Estate and Rental and Leasing	1,445	11.0				

Rates expressed as WC claims per 1,000 full-time workers

* There were 7 industry groups in the Retail Trade sector with 15 or more claims for which PI were computed. **For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. . § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

- Within the Real Estate, Rental, and Leasing sector, the top 3 industries by Prevention Index were: Consumer goods rental (5322), Activities related to real estate (5313), and Lessors of real estate (5311).

Table 3.11 All industry groups in the Professional, Scientific, and Technical Services sector ordered by *within sector* Prevention Index (PI)

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI rank
				count rank	rate rank	PI rank**	
5419	Other professional and technical services	271	6.3	1	1	1	119
5413	Architectural and engineering services	262	2.2	2	4	2	150
5416	Management and technical consulting services	258	1.8	3	5	3	156
5418	Advertising, PR, and related services	86	2.3	7	3	4	196
5414	Specialized design services	21	2.4	9	2	5	224
5417	Scientific research and development services	227	1.3	4	7	6	167
5412	Accounting and bookkeeping services	115	1.6	6	6	7	191
5415	Computer systems design and related services	172	0.7	5	9	8	178
5411	Legal services	85	1.0	8	8	9	199
54	All Professional, Scientific, and Technical Services	1,497	1.6				

Rates expressed as WC claims per 1,000 full-time workers.

** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Professional, Scientific, and Technical Services sector, the top 3 industries by Prevention Index were: Other Professional and technical services (5419), Architectural and engineering services (5413), and Management and technical consulting services (5416).

Table 3.12 All industry groups in the Administrative and Support and Waste Management and Remediation Services and Management of Companies and Enterprises sectors ordered by *within sector* Prevention Index (PI)

All Workers' Compensation (WC) lost wage claims

Private sector, Massachusetts 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
5621	Waste collection	406	29.7	3	1	1	17
5617	Services to buildings and dwellings	2146	14.2	2	4	2	31
5613	Employment services	2448	13.0	1	5	3	36
5629	Remediation and other waste services	238	16.4	6	2	4	59
5622	Waste treatment and disposal	140	15.4	7	3	5	81
5616	Investigation and security services	334	6.4	4	7	6	104
5611	Office administrative services	121	6.1	8	8	7	149
5511	Management of companies and enterprises	286	1.4	5	12	8	151
5612	Facilities support services	30	9.2	12	6	9	181
5619	Other support services	71	5.6	9	9	10	182
5615	Travel arrangement and reservation services	50	2.7	11	10	11	207
5614	Business support services	55	2.6	10	11	12	204
56	All Administrative, Waste Management/Remediation & Management of Companies	6,325	9.1				

Rates expressed as WC claims per 1,000 full-time workers.

** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the combined two sectors of Administrative and Support and Waste Management and Remediation Services and Management of Companies and Enterprises, the top 3 industries by Prevention Index were: Waste collection (5621), Services to buildings and dwellings (5617), and Employment services (5413).

Table 3.13 All industry groups in the Educational Services sector ordered by *within sector* Prevention Index (PI)*
 Workers' Compensation (WC) lost wage claims
 Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Over all PI Rank
				count rank	rate rank	PI rank**	
6111	Elementary and secondary schools	776	12.1	2	1	1	46
6113	Colleges and universities and professional schools	1397	5.9	1	2	2	75
6116	Other schools and instruction	93	2.7	3	4	3	189
6115	Technical and trade schools	20	4.2	5	3	4	217
6117	Educational support services	27	2.4	4	5	5	219
61	All Educational Services	2,334	6.4				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 5 industry groups in the Information sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Educational Services sector, the top 3 industries by Prevention Index were: Elementary and secondary schools (6111), Colleges and universities and professional schools (6113), and Other schools and instruction (6116).

Table 3.14 All industry groups in the Health Care and Social Assistance sector ordered by *within sector* Prevention Index (PI)

All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
6231	Nursing care facilities	2993	20.4	2	3	1	8
6219 §	Other ambulatory health care services	949	38.7	6	1	2	3
6232	Residential mental health facilities	1377	22.4	5	2	3	10
6221	General medical & surgical hospitals	6793	14.1	1	9	4	28
6233	Community care facilities for the elderly	804	15.3	7	7	5	38
6216	Home health care services	1526	13.9	4	10	6	33
6243	Vocational rehabilitation services	478	18.7	11	4	7	32
6241	Individual & family services	1600	7.3	3	13	8	69
6239	Other residential care facilities	326	18.6	13	5	9	39
6223	Other specialty hospitals	686	11.4	8	11	10	56
6222	Psychiatric & substance abuse hospitals	241	16.5	15	6	11	57
6244	Child day care services	505	8.0	10	12	12	79
6242	Community food, housing, emergency and other relief services	235	14.8	16	8	13	71
6214	Outpatient care centers	452	6.9	12	14	14	95
6211	Offices of physicians	554	3.4	9	17	15	115
6213	Offices of other health practitioners	262	5.9	14	15	16	124
6215	Medical & diagnostic laboratories	90	5.3	18	16	17	175
6212	Offices of dentists	140	2.4	17	18	18	176
62	Health Care and Social Assistance Sector	20,482	12.3				

Rates expressed as WC claims per 1,000 full-time workers.

§ This industry group is made up of a range of establishments including ambulance services, blood and organ banks, pace maker monitoring services and other ambulatory health care services not provided through offices of health care providers, home care providers, outpatient care centers or medical and diagnostic laboratories. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Health Care and Social Assistance sector, the top 3 industries by Prevention Index were: Nursing care facilities (6231), Other ambulatory health care services (6219), and Residential mental health facilities (6232).

What are the common injuries faced by workers in hospitals and nursing homes?

Musculoskeletal disorders (MSDs) that occur while manually lifting, transferring, or repositioning patients are among the most common injuries among workers in hospitals and nursing homes. One Massachusetts study of hospital workers estimated that in one year hospital workers in the state lost at least 21,500 days of work as a result of MSDs associated with patient handling. Many studies have found that safe patient handling programs involving use of equipment to minimize manual handling of patients have been successful in reducing worker injuries and the associated costs - and can reduce risks to patients as well. See: www.mass.gov/files/documents/2016/07/ov/ergo-sph-hospitals-2014.pdf

Table 3.15 All industry groups in the Arts, Entertainment & Recreation sector ordered by *within sector* Prevention Index (PI)*

Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
7113	Promoters of performing arts and sports	146	11.2	2	2	1	113
7112	Spectator sports	89	13.3	4	1	2	122
7139 §	Other amusement and recreation industries	586	7.6	1	4	3	77
7111	Performing arts companies	82	8.6	5	3	4	148
7121	Museums, historical sites, zoos, and parks	93	6.6	3	5	5	159
71	Arts, Entertainment, and Recreation Sector	1,064	7.9				

Rates expressed as WC claims per 1,000 full-time workers.

* There were 5 industry groups in the Arts, Entertainment, & Recreation sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. Two industry groups, Gambling industries and Amusement parks/arcades, excluded due to no available employment data from the QCEW. § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

- Within the Arts, Entertainment & Recreation sector, the top 3 industries by Prevention Index were: Promoters of performing arts and sports (7113), Spectator sports (7112), and Other amusement and recreation industries (7139).

Table 3.16 All industry groups in the Accommodation and Food Services sector ordered by *within sector* Prevention Index (PI) *

Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
7223 §	Special food services	856	17.1	3	1	1	30
7211	Traveler accommodation	1264	13.2	2	2	2	41
7225	Restaurants	4029	7.4	1	3	3	63
7224	Drinking places, alcoholic beverages	76	4.9	4	4	4	185
72	Accommodation and Food Services Sector	6,241	8.7				

Rates expressed as WC claims per 1,000 full-time workers

* There were 4 industry groups in the Accommodation & Food Services sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher. § Includes food service contractors, caterers and mobile food services.

- Within the Accommodation and Food Services sector, the top 3 industries by Prevention Index were: Special food services (7223), Traveler accommodation (7211), and Restaurants (7225).

Table 3.17 All industry groups in the Other Services sector ordered by *within sector* Prevention Index (PI)*

**All Workers' Compensation (WC) lost wage claims
Private sector, Massachusetts, 2014-2016**

NAICS code	Industry Title	WC claims count	WC claim rate	Within sector			Overall PI Rank
				count rank	rate rank	PI rank**	
8111	Automotive repair and maintenance	585	10.4	1	4	1	66
8123	Dry-cleaning and laundry services	287	13.8	3	3	2	68
8114	Household goods repair and maintenance	89	17.1	8	1	3	94
8113	Commercial machinery repair and maintenance	119	13.9	7	2	4	102
8129	Other personal services	221	9.6	4	6	5	101
8134	Civic and social organizations	321	6.2	2	8	6	111
8133	Social advocacy organizations	169	7.7	5	7	7	129
8122	Death care services	74	10.3	10	5	8	142
8139	Professional and similar organizations	75	3.3	9	10	9	194
8121	Personal care services	121	2.2	6	13	10	184
8132	Grantmaking and giving services	39	4.5	12	9	11	202
8141	Private households	39	2.4	12	12	12	211
8112	Electronic equipment repair and maintenance	32	3.3	13	11	13	209
81	All claims in Other Services sector	2,175	7.2				

Rates expressed as WC claims per 1,000 full-time workers

* There were 13 industry groups in the Other services sector with 15 or more claims for which PI were computed. ** For PI Rank, industry groups scoring the lowest (1,2,3...) are prioritized higher.

- Within the Other services sector, the top 3 industries by Prevention Index were: Automotive repair & maintenance (8111), Dry-cleaning & laundry services (8123), and Household good repair and maintenance (8114).

4. Industries ranked by Prevention Index (PI) within common event categories

Information about events leading to injury provides insight about the types of workplace hazards that need to be addressed. This section focuses on nine common events and applies the PI approach to prioritize industry subsectors for intervention within these event categories (listed below in order of frequency of claims).

- Overexertion in lifting, pushing, etc.
- Fall on the same level
- Struck by object
- Slip, trip, without fall
- Other exertion or bodily reaction
- Fall to lower level
- Roadway motor vehicle incident
- Violence by persons
- Caught in or between object

Together these events accounted for 85% of all claims for which event was known. Industry subsectors ranked by Prevention Index (PI) based on claims filed for each event type are presented in the following Tables.

Table 4.1 Top 25 industry subsectors by Prevention Index (PI) for "Overexertion in lifting, pushing, etc." event category*

**Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016**

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI Rank
				count rank	rate rank	PI rank**	
623	Nursing and residential care facilities	1,740	6.2	2	7	1	4
622	Hospitals	2682	4.8	1	11	2	9
424	Merchant wholesalers, nondurable goods	846	6.4	7	6	3	3
492	Couriers and messengers	386	11.3	13	1	4	1
484	Truck transportation	434	8.3	10	4	5	2
493	Warehousing and storage	272	8.7	18	3	6	6
445	Food and beverage stores	912	3.9	5	16	7	12
238	Specialty trade contractors	1,078	3.7	4	17	8	5
481	Air transportation	257	11.1	20.5	2	9	7
444	Building material and garden supply stores	334	4.7	15	12	10	10
562	Waste management and remediation services	184	4.9	25	10	11	13
488	Support activities for transportation	146	6.1	28	8	12	18
621	Ambulatory health care services	1,150	2.3	3	35	13	24
336	Transportation equipment manufacturing	167	4.2	26	14	14	38
236	Construction of buildings	293	3.2	17	24	15	14
311	Food manufacturing	247	3.4	22	22	16	16
452	General merchandise stores	344	2.8	14	30	17	11
312	Beverage and tobacco product manufacturing	79	7.0	40	5	18	15
441	Motor vehicle and parts dealers	328	2.8	16	31	19	20
561	Administrative and support services	907	1.9	6	42	20	17
326	Plastics and rubber products manufacturing	143	3.6	31	18	21	31
237	Heavy and civil engineering construction	146	3.4	28	21	22	19
322	Paper manufacturing	104	4.0	35	15	23	35
332	Fabricated metal product manufacturing	270	2.7	19	32	24	21
423	Merchant wholesalers, durable goods	395	2.2	12	39	25	26
All Claims in event category		20,252	2.4				

Rates expressed as WC claims per 1,000 full-time workers.

* Event coded as '71' according to BLS Occupational Injury and Illness Classification System. There were 68 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the "Overexertion in lifting, pushing, etc." event category, the top 3 industries by Prevention Index were: Nursing and residential care facilities (623), Hospitals (622), and Merchant wholesalers, nondurable goods (424).

Table 4.2 Top 25 industry subsectors by Prevention Index (PI) for “Fall on the same level” event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
623	Nursing and residential care facilities	860	3.1	3	2	1	4
622	Hospitals	1105	2.0	1	10	2	9
484	Truck transportation	219	4.2	12	1	3	2
424	Merchant wholesalers, nondurable goods	290	2.2	10	8	4	3
311	Food manufacturing	179	2.5	15	6	5	16
238	Specialty trade contractors	503	1.7	7	17	6	5
485	Transit and ground passenger transportation	139	2.4	19	7	7	8
445	Food and beverage stores	399	1.7	8	18	8	12
624	Social assistance	517	1.6	6	21	9	23
492	Couriers and messengers	98	2.9	25	4	10	1
722	Food services and drinking places	882	1.4	2	27	11	25
721	Accommodation	175	1.8	16.5	16	12	22
441	Motor vehicle and parts dealers	194	1.7	13	20	13	20
561	Administrative and support services	644	1.4	5	30	14	17
481	Air transportation	68	2.9	33	3	15	7
452	General merchandise stores	189	1.6	14	22	16	11
621	Ambulatory health care services	665	1.4	4	32	17	24
236	Construction of buildings	151	1.7	18	19	18	14
454	Non-store retailers	82	1.9	28	11	19	29
488	Support activities for transportation	65	2.7	35	5	20	18
237	Heavy and civil engineering construction	80	1.9	30	12	21	19
611	Educational services	396	1.1	9	39	22	34
562	Waste management and remediation services	66	1.8	34	15	23	13
444	Building material and garden supply stores	107	1.5	23	26	24	10
713	Amusements, gambling, and recreation	124	1.4	22	28	25	42
All Claims in event category		11,938	1.4				

Rates expressed as WC claims per 1,000 full-time workers

* Event coded as '42' according to the BLS Occupational Injury and Illness Classification System. There were 62 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Fall on the same level” event category, the top 3 industries by Prevention Index were: Nursing and residential care facilities (623), Hospitals (622), and Truck transportation (484).

Table 4.3 Top 25 industry subsectors by Prevention Index (PI) for "Struck by" event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
238	Specialty trade contractors	712	2.4	2	5	1	5
236	Construction of buildings	204	2.3	7	6	2	14
484	Truck transportation	147	2.8	11	3	3	2
237	Heavy and civil engineering construction	123	2.9	18	2	4	19
561	Administrative and support services	675	1.4	3	20	5	17
424	Merchant wholesalers, nondurable goods	207	1.6	6	18	6	3
445	Food and beverage stores	351	1.5	5	19	7	12
722	Food services and drinking places	812	1.3	1	24	8	25
332	Fabricated metal product manufacturing	162	1.6	9	17	9	21
444	Building material and garden supply stores	135	1.9	14	14	10	10
311	Food manufacturing	129	1.8	16.5	16	11	16
562	Waste management and remediation services	82	2.2	25	8	12	13
488	Support activities for transportation	54	2.3	29	7	13	18
492	Couriers and messengers	71	2.1	26	10	14	1
327	Nonmetallic mineral product manufacturing	48	2.6	33	4	15	27
452	General merchandise stores	149	1.2	10	27	16	11
493	Warehousing and storage	62	2.0	27	11	17	6
481	Air transportation	49	2.1	31.5	9	18	7
441	Motor vehicle and parts dealers	140	1.2	13	28	19	20
721	Accommodation	129	1.3	16.5	25	20	22
622	Hospitals	369	0.7	4	38	21	9
321	Wood product manufacturing	34	4.4	42	1	22	40
623	Nursing and residential care facilities	198	0.7	8	37	23	4
423	Merchant wholesalers, durable goods	144	0.8	12	36	24	26
713	Amusements, gambling, and recreation	101	1.1	20	29	25	42
All Claims in event category		7,868	0.9				

Rates expressed as WC claims per 1,000 full-time workers.

* Event coded as '62' according to the BLS Occupational Injury and Illness Classification System. There were 59 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Struck by” event category, the top 3 industries by Prevention Index were: Specialty trade contractors (238), Construction of buildings (236), Truck transportation (484).

Table 4.4 Top 25 industry subsectors by Prevention Index (PI) for "Slip, trip, without fall" event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
484	Truck transportation	121	2.3	9	2	1	2
424	Merchant wholesalers, nondurable goods	181	1.4	7	5	2	3
492	Couriers and messengers	82	2.4	12	1	3	1
238	Specialty trade contractors	253	0.9	2	11	4	5
623	Nursing and residential care facilities	229	0.8	3	13	5	4
622	Hospitals	384	0.7	1	17	6	9
562	Waste management and remediation services	63	1.7	16.5	3	7	13
444	Building material and garden supply stores	63	0.9	16.5	9	8	10
237	Heavy and civil engineering construction	50	1.2	22.5	6	9	19
236	Construction of buildings	65	0.7	15	16	10	14
561	Administrative and support services	208	0.4	5	26	11	17
454	Non-store retailers	45	1.0	25	7	12	20
441	Motor vehicle and parts dealers	76	0.6	13	19	13	29
481	Air transportation	34	1.5	28.5	4	14	7
445	Food and beverage stores	115	0.5	10	24	15	12
621	Ambulatory health care services	202	0.4	6	28	16	24
722	Food services and drinking places	228	0.4	4	32	17	25
485	Transit and ground passenger transportation	47	0.8	24	14	18	8
311	Food manufacturing	50	0.7	22.5	18	19	16
721	Accommodation	58	0.6	20	21	20	22
452	General merchandise stores	62	0.5	18	23	21	11
611	Educational services	133	0.4	8	33	22	34
531	Real estate	52	0.5	21	22	23	33
423	Merchant wholesalers, durable goods	68	0.4	14	30	24	26
493	Warehousing and storage	26	0.8	33	12	25	6
All Claims in event category		4,150	0.5				

Rates expressed as WC claims per 1,000 full-time workers

* Event coded as '41' according to the BLS Occupational Injury and Illness Classification System. There were 44 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Slip, trip, without fall” event category, the top 3 industries by Prevention Index were: Truck transportation (484), Merchant wholesalers, nondurable goods (424), Couriers and messengers (492).

Table 4.5 Top 25 industry subsectors by Prevention Index (PI) for "Other overexertion or bodily reaction" event category*

**Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016**

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
492	Couriers and messengers	100	2.9	11	1	1	1
238	Specialty trade contractors	295	1.0	2	10	2	5
424	Merchant wholesalers, nondurable goods	151	1.1	6	8	3	3
484	Truck transportation	80	1.5	12	3	4	2
485	Transit and ground passenger transportation	75	1.3	13	7	5	8
622	Hospitals	372	0.7	1	21	6	9
481	Air transportation	40	1.7	27.5	2	7	7
623	Nursing and residential care facilities	170	0.6	4	26	8	4
493	Warehousing and storage	41	1.3	26	5	9	6
236	Construction of buildings	63	0.7	16.5	18	10	14
444	Building material and garden supply stores	50	0.7	19	17	11	10
445	Food and beverage stores	132	0.6	8	28	12	12
562	Waste management and remediation services	39	1.0	29	9	13	13
561	Administrative and support services	200	0.4	3	36	14	17
488	Support activities for transportation	31	1.3	33.5	6	15	18
721	Accommodation	63	0.6	16.5	23	16	22
517	Telecommunications	44	0.8	24	16	17	28
441	Motor vehicle and parts dealers	73	0.6	15	25	18	20
611	Educational services	159	0.4	5	35	19	34
336	Transportation equipment manufacturing	37	0.9	30.5	11	20	38
311	Food manufacturing	48	0.7	21	22	21	16
454	Non-store retailers	37	0.9	30.5	15	22	29
624	Social assistance	126	0.4	9	39	23	23
711	Performing arts and spectator sports	28	0.9	36	14	24	46
322	Paper manufacturing	24	0.9	38	13	25	35
All Claims in event category		3,983	0.5				

Rates expressed as WC claims per 1,000 full-time workers

* Event coded as '73' according to the BLS Occupational Injury and Illness Classification System. There were 50 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Other overexertion or bodily reaction” event category, the top 3 industries by Prevention Index were: Couriers and messengers (492), Specialty trade contractors (238), Merchant wholesalers, nondurable goods (424).

Table 4.6 Top 25 industry subsectors by Prevention Index (PI) for "Fall to lower level" event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI Rank
				count rank	rate rank	PI rank**	
238	Specialty trade contractors	587	2.0	1	2	1	5
236	Construction of buildings	203	2.2	3	1	2	14
484	Truck transportation	98	1.9	7	3	3	2
424	Merchant wholesalers, nondurable goods	126	1.0	5	8	4	3
561	Administrative and support services	282	0.6	2	13	5	17
562	Waste management and remediation services	60	1.6	15	4	6	13
531	Real estate	70	0.7	12	9	7	33
237	Heavy and civil engineering construction	42	1.0	17	6	8	19
492	Couriers and messengers	33	1.0	23	7	9	1
444	Building material and garden supply stores	39	0.6	19	14	10	10
311	Food manufacturing	40	0.5	18	15	11	16
624	Social assistance	91	0.3	9	26	12	23
327	Nonmetallic mineral product manufacturing	20	1.1	30.5	5	13	27
722	Food services and drinking places	136	0.2	4	32	14	25
454	Non-store retailers	29	0.7	26	11	15	29
621	Ambulatory health care services	122	0.2	6	31	16	24
811	Repair and maintenance	35	0.4	21.5	16	17	32
623	Nursing and residential care facilities	79	0.3	10.5	27	18	4
423	Merchant wholesalers, durable goods	54	0.3	16	23	19	26
441	Motor vehicle and parts dealers	36	0.3	20	22	20	20
445	Food and beverage stores	62	0.3	14	29	21	12
622	Hospitals	96	0.2	8	35	22	9
611	Educational services	79	0.2	10.5	33	23	34
488	Support activities for transportation	16	0.7	34.5	10	24	18
713	Amusements, gambling, and recreation	30	0.3	24.5	21	25	42
All Claims in event category		3,772	0.4				

Rates expressed as WC claims per 1,000 full-time workers.

* Event coded as '43' according to the BLS Occupational Injury and Illness Classification System. There were 37 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the "Fall to lower level" event category, the top 3 industries by Prevention Index were: Specialty trade contractors (238), Construction of buildings (236), Truck transportation (484).

Table 4.7 Top 25 industry subsectors by Prevention Index (PI) for "Roadway motor vehicle incident" event category*

**Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016**

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
485	Transit & ground passenger transportation	353	6.0	2	1	1	8
484	Truck transportation	108	2.1	8	2	2	2
621	Ambulatory health care services	361	0.7	1	9	3	24
624	Social assistance	247	0.8	3	8	4	23
441	Motor vehicle and parts dealers	118	1.0	7	5	5	20
238	Specialty trade contractors	169	0.6	5	11	6	5
492	Couriers and messengers	37	1.1	14.5	4	7	1
488	Support activities for transportation	36	1.5	16.5	3	8	18
623	Nursing and residential care facilities	143	0.5	6	14	9	4
561	Administrative and support services	194	0.4	4	16	10	17
562	Waste management and remediation services	33	0.9	18	6	11	13
811	Repair and maintenance	44	0.6	13	12	12	32
424	Merchant wholesalers, nondurable goods	61	0.5	12	15	13	3
532	Rental and leasing services	27	0.8	23	7	14	30
454	Non-store retailers	29	0.7	20	10	15	29
423	Merchant wholesalers, durable goods	67	0.4	11	19	16	26
236	Construction of buildings	36	0.4	16.5	17	17	14
722	Food services and drinking places	104	0.2	9	26	18	25
237	Heavy and civil engineering construction	23	0.5	25	13	19	19
541	Professional and technical services	70	0.1	10	30	20	48
813	Membership associations and organizations	29	0.3	20	22	21	50
425	Electronic markets and agents and brokers	25	0.3	24	20	22	57
517	Telecommunications	22	0.4	27	18	23	28
622	Hospitals	37	0.1	14.5	31	24	9
812	Personal and laundry services	28	0.3	22	24	25	45
All Claims in event category		3,202	0.4				

Rates expressed as WC claims per 1,000 full-time workers

* Event coded as '26' according to the BLS Occupational Injury and Illness Classification System. There were 31 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Roadway motor vehicle incident” event category, the top 3 industries by Prevention Index were: Transit & ground passenger transportation (485), Truck transportation (484), Ambulatory health care services (621).

Table 4.8 Industry subsectors by Prevention Index (PI) for "Violence by person" event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
623	Nursing and residential care facilities	728	2.6	1	1	1	4
624	Social assistance	433	1.4	3	2	2	23
622	Hospitals	533	1.0	2	3	3	9
611	Educational services	296	0.8	4	4	4	34
621	Ambulatory health care services	135	0.3	5	6	5	24
813	Membership associations and organizations	30	0.3	8	5	6	50
561	Administrative and support services	58	0.1	7	8	7	17
722	Food services and drinking places	62	0.1	6	9	8	25
485	Transit and ground passenger transportation	15	0.3	10	7	9	8
445	Food and beverage stores	16	0.1	9	10	10	12
All Claims in event category		2,787	0.3				

Rates expressed as WC claims per 1,000 full-time workers

*Event coded as either '11' or '12' according to the BLS Occupational Injury and Illness Classification System. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the “Violence by person” event category, the top 3 industries by Prevention Index were: Nursing and residential care facilities (623), Social assistance (624), Hospitals (622).

Table 4.9 Top 25 industry subsectors by Prevention Index (PI) for "Caught in/compressed by" event category*
Workers' Compensation (WC) lost wage claims
Private Sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC claims count	WC claim rate	Within event			Overall PI rank
				count rank	rate rank	PI rank**	
311	Food manufacturing	101	1.4	5	2	1	16
332	Fabricated metal product manufacturing	84	0.8	6	6	2	21
561	Administrative and support services	249	0.5	1	14	3	17
238	Specialty trade contractors	147	0.5	2	15	4	5
484	Truck transportation	42	0.8	10	8	5	2
424	Merchant wholesalers, non-durable goods	76	0.6	7	13	6	3
493	Warehousing and storage	31	1.0	17	4	7	6
326	Plastics and rubber products manufacturing	33	0.8	15.5	7	8	31
237	Heavy and civil engineering construction	33	0.8	15.5	9	9	19
322	Paper manufacturing	24	0.9	20	5	10	35
622	Hospitals	112	0.2	4	23	11	9
722	Food services and drinking places	116	0.2	3	25	12	25
327	Nonmetallic mineral product manufacturing	19	1.0	26.5	3	13	27
811	Repair and maintenance	34	0.4	13.5	16	14	32
313	Textile mills	18	1.9	29	1	15	41
236	Construction of buildings	36	0.8	12	18	16	14
445	Food and beverage stores	64	0.3	8	22	17	12
441	Motor vehicle and parts dealers	37	0.3	11	21	18	20
323	Printing and related support activities	21	0.6	23	10	19	53
562	Waste management and remediation services	22	0.6	21	12	20	13
492	Couriers and messengers	21	0.6	23	11	21	1
623	Nursing and residential care facilities	51	0.2	9	26	22	4
339	Miscellaneous manufacturing	26	0.4	19	17	23	58
444	Building material and garden supply stores	28	0.4	18	19	24	10
423	Merchant wholesalers, durable goods	34	0.2	13.5	24	25	26
All Claims in event category		2,092	0.2				

Rates expressed as WC claims per 1,000 full-time workers

* Event coded as '64' according to the BLS Occupational Injury and Illness Classification System. There were 34 industry subsectors with 15 or more claims in this event category. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher.

- Within the "Caught in/compressed by" event category, the top 3 industries by Prevention Index were: Food manufacturing (311), Fabricated metal product manufacturing (332), Administrative and support services (561).

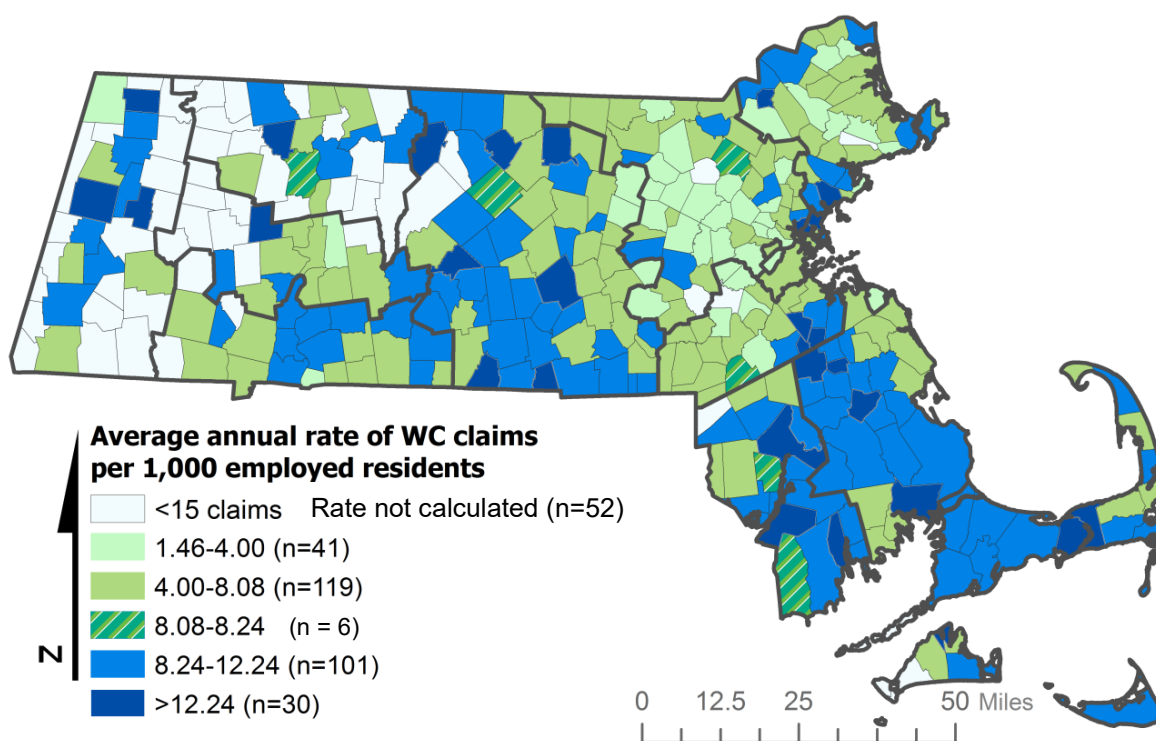
5. WC claims by city/town where injured worker resided

WC claims in Massachusetts are filed regionally based on where claimants reside. To provide information useful to the DIA operations, average annual WC claim rates by city/town were computed as the total number of WC lost wage claims per 1,000 employed residents in the city/town where injured workers lived. These residence based rates are measures of the burden of occupational injury at the community level, and findings could likewise be useful to health care providers and city/town public health planners responsible for identifying and addressing the health needs of local residents. Statewide government agencies or organizations that provide occupational health and safety services could also use these geographic findings to inform allocation of injury prevention resources. Many people commute outside of their communities for work; however, it was not possible with the currently available data to generate rates based on city/town where injured workers were employed.

Figure 5.1 below depicts claim rates geographically by city/town. Rates ranged from a high of 18.2 to a low of 1.3 with a statewide rate of 8.2 WC claims per 1,000 employed residents. Of the 30 communities with the highest rates of WC claims (darkest shade in Fig. 5.1), 40% (N=12) were located in the southeastern region of Massachusetts. The five communities with the highest rates in the state were Brockton, New Bedford, Fall River, Lawrence, and Tisbury.

Fig 5.1. Rate of Workers' Compensation lost wage claims by City or Town of Injured Worker Residence

Private Sector, Massachusetts, 2014-2016 N=84,945 *



Number of employed residents used in rate calculations was estimated from the 5-Year Full Sample of the American Community Survey (See Appendix B). Rates calculated only for cities/towns with 15 or more claims reported; only Devens, MA did not have an ACS estimate for employed residents and therefore, a rate could not be calculated. *Ninety-one percent (N = 84,945) of total claims were filed for in-state (MA) residents. Ninety percent confidence intervals (90% CI), computed for each rate, are provided in Appendix E.

These findings indicate that the burden of occupational injury varies across cities and towns in Massachusetts. Many factors contribute to these differences in rates including not only the presence and type of local industry but also the demographic and socio-demographic characteristics of a community's resident population. It is known, for example, that low wage, immigrant and minority workers are disproportionately employed in higher risk jobs.^{5,6} Communities with higher proportions of low wage, immigrant and minority workers therefore can be expected to have higher rates. Previous analyses using Massachusetts WC claims data showed that teens injured at work were more likely to live in neighborhoods with a higher percentage of residents living in poverty and a higher percentage of residents who were non-White, less educated, spoke limited English, and were employed in blue-collar/manual labor jobs.³⁵ Community settings such as schools, job training programs, churches/faith centers, and community health centers can serve as important venues for providing health and safety information and services to the most vulnerable workers who might otherwise not be reachable through their jobs or employer.³⁶

We also applied the Prevention (PI) approach to ranking cities and towns for prevention. Ranks based on PI were somewhat similar to those based on rates alone (Fig. 5.1), identifying a majority (two-thirds) of the 30 communities with the highest WC claim rates. Smaller towns with low numbers of WC claims but high rates ranked lower when applying the PI approach but, as was discussed above in reference to small industries with high rates (p. 16), these towns should not be overlooked when targeting prevention efforts. See Appendix E for the count of claims, claim rate, claim rate rank, and PI rank by Massachusetts city or town.

Occupational Health and Safety Resources for Employers and Workers

Electronic Library of Construction Occupational Safety & Health (eLCOSH)

eLCOSH provides a wide range of user-friendly safety and health training materials and resources for workers, employers, and researchers interested in construction health and safety. www.elcosh.org/

Department of Industrial Accidents (DIA) Office of Safety

The Massachusetts Department of Industrial Accidents (DIA) Office of Safety has grants available for providing workplace health and safety training to employers and workers. Any company covered by the Massachusetts Workers' Compensation Insurance Law is eligible to apply for these grants. More information about these DIA grants can be found on their website at www.mass.gov/dia/safety.

Department of Labor Standards On-site Consultation Program

The Massachusetts Department of Labor Standards (DLS) offers free on-site consultation services to help small employers improve their safety and health programs, identify hazards, and train workers. DLS can be contacted at 508-616-0461. More information about DLS can be found on their website at www.mass.gov/dos/consult.

The New England Consortium (TNEC)

TNEC at University of Massachusetts Lowell provides worker health and safety training on hazardous waste operations, chemical emergency response, OSHA 10-hour construction safety, confined space entry and rescue, work zone safety, disaster preparedness, infectious disease preparedness, incident command, and other customized courses. TNEC can be contacted at 978-934-3257 or tnec@uml.edu. Information about TNEC training can be found on their website at www.uml.edu/tnec.

Massachusetts Coalition for Occupational Safety and Health (MassCOSH)

MassCOSH is a nonprofit coalition that promotes workplace safety and health through training and prevention programs. www.masscosh.org

National Institute for Occupational Safety and Health (NIOSH)

NIOSH conducts research, provides education resources, and develops recommendations for the prevention of work-related injury and illness. www.cdc.gov/niosh/

Occupational Safety and Health Administration (OSHA)

OSHA provides occupational safety and health enforcement, training, outreach, education, and assistance aimed at reducing injuries, illnesses, and fatalities among workers. Specific resources are available on many of the topics contains in this report, such as ergonomics and motor vehicle safety. www.osha.gov

Occupational Health Surveillance Program (OHSP)

OHSP collects, analyzes, interprets, and disseminates information about work-related injuries, illnesses, and hazards in Massachusetts. They use this information to target intervention activities, guide the development of prevention programs and policies, and raise public awareness of workplace risks. OHSP also educates workers, employers, and health care providers to address identified occupational health and safety problems, placing special emphasis on reaching underserved worker populations. They also aim to integrate occupational health into other ongoing public health activities at the state and local levels. More information can be found on their website at <https://www.mass.gov/orgs/occupational-health-surveillance-program>

Appendices

Appendix A. North American Industry Classification System (NAICS) Codes and Corresponding Titles

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
11	Agriculture, forestry, fishing and hunting	2212	Natural gas distribution
111	Crop production	2213	Water, sewage and other systems
1111	Oilseed and grain farming	23	Construction
1112	Vegetable and melon farming	236	Construction of buildings
1113	Fruit and tree nut farming	2361	Residential building construction
1114	Greenhouse and nursery production	2362	Nonresidential building construction
1119	Other crop farming	237	Heavy and civil engineering construction
112	Animal production and aquaculture	2371	Utility system construction
1121	Cattle ranching and farming	2372	Land subdivision
1122	Hog and pig farming	2373	Highway, street, and bridge construction
1123	Poultry and egg production	2379	Other heavy construction
1124	Sheep and goat farming	238	Specialty trade contractors
1125	Aquaculture	2381	Building foundation and exterior contractors
1129	Other animal production	2382	Building equipment contractors
113	Forestry and logging	2383	Building finishing contractors
1131	Timber tract operations	2389	Other specialty trade contractors
1132	Forest nursery and gathering forest products	31-33	Manufacturing
1133	Logging	311	Food manufacturing
114	Fishing, hunting and trapping	3111	Animal food manufacturing
1141	Fishing	3112	Grain and oilseed milling
1142	Hunting and trapping	3113	Sugar and confectionery product manufacturing
115	Agriculture and forestry support activities	3114	Fruit and vegetable preserving and specialty
1151	Support activities for crop production	3115	Dairy product manufacturing
1152	Support activities for animal production	3116	Animal slaughtering and processing
1153	Support activities for forestry	3117	Seafood product preparation and packaging
21	Mining, quarrying, and oil and gas extraction	3118	Bakeries and tortilla manufacturing
211	Oil and gas extraction	3119	Other food manufacturing
2111	Oil and gas extraction	312	Beverage and tobacco product manufacturing
212	Mining, except oil and gas	3121	Beverage manufacturing
2123	Nonmetallic mineral mining and quarrying	313	Textile mills
213	Support activities for mining	3131	Fiber, yarn, and thread mills
2131	Support activities for mining	3132	Fabric mills
22	Utilities	3133	Textile and fabric finishing mills
221	Utilities	314	Textile product mills
2211	Power generation and supply	3141	Textile furnishings mills

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
3149	Other textile product mills	3313	Alumina and aluminum production
315	Apparel manufacturing	3314	Other nonferrous metal production
3152	Cut and sew apparel manufacturing	3315	Foundries
3159	Accessories and other apparel manufacturing	332	Fabricated metal product manufacturing
316	Leather and allied product manufacturing	3321	Forging and stamping
3161	Leather and hide tanning and finishing	3322	Cutlery and handtool manufacturing
3162	Footwear manufacturing	3323	Architectural and structural metals mfg.
3169	Other leather product manufacturing	3324	Boiler, tank, and shipping container mfg.
321	Wood product manufacturing	3325	Hardware manufacturing
3211	Sawmills and wood preservation	3326	Spring and wire product manufacturing
3212	Plywood and engineered wood product mfg.	3327	Machine shops and threaded product mfg.
3219	Other wood product manufacturing	3328	Coating, engraving, and heat treating metals
322	Paper manufacturing	3329	Other fabricated metal product manufacturing
3221	Pulp, paper, and paperboard mills	333	Machinery manufacturing
3222	Converted paper product manufacturing	3331	Ag., construction, and mining machinery mfg.
323	Printing and related support activities	3332	Industrial machinery manufacturing
3231	Printing and related support activities	3333	Commercial and service industry machinery
324	Petroleum and coal products manufacturing	3334	Hvac and commercial refrigeration equipment
3241	Petroleum and coal products manufacturing	3335	Metalworking machinery manufacturing
325	Chemical manufacturing	3336	Turbine and power transmission equipment mfg.
3251	Basic chemical manufacturing	3339	Other general purpose machinery manufacturing
3252	Resin, rubber, and artificial fibers mfg.	334	Computer and electronic product manufacturing
3253	Agricultural chemical manufacturing	3341	Computer and peripheral equipment mfg.
3254	Pharmaceutical and medicine manufacturing	3342	Communications equipment manufacturing
3255	Paint, coating, and adhesive manufacturing	3343	Audio and video equipment manufacturing
3256	Soap, cleaning compound, and toiletry mfg.	3344	Semiconductor and electronic component mfg.
3259	Other chemical product and preparation mfg.	3345	Electronic instrument manufacturing
326	Plastics and rubber products manufacturing	3346	Magnetic media manufacturing and reproducing
3261	Plastics product manufacturing	335	Electrical equipment and appliance mfg.
3262	Rubber product manufacturing	3351	Electric lighting equipment manufacturing
327	Nonmetallic mineral product manufacturing	3352	Household appliance manufacturing
3271	Clay product and refractory manufacturing	3353	Electrical equipment manufacturing
3272	Glass and glass product manufacturing	3359	Other electrical equipment and component mfg.
3273	Cement and concrete product manufacturing	336	Transportation equipment manufacturing
3274	Lime and gypsum product manufacturing	3361	Motor vehicle manufacturing
3279	Other nonmetallic mineral products	3362	Motor vehicle body and trailer manufacturing
331	Primary metal manufacturing	3363	Motor vehicle parts manufacturing
3311	Iron and steel mills and ferroalloy mfg.	3364	Aerospace product and parts manufacturing
3312	Steel product mfg. from purchased steel	3365	Railroad rolling stock manufacturing

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
3366	Ship and boat building	44-45	Retail trade
3369	Other transportation equipment manufacturing	441	Motor vehicle and parts dealers
337	Furniture and related product manufacturing	4411	Automobile dealers
3371	Household and institutional furniture mfg.	4412	Other motor vehicle dealers
3372	Office furniture and fixtures manufacturing	4413	Auto parts, accessories, and tire stores
3379	Other furniture related product manufacturing	442	Furniture and home furnishings stores
339	Miscellaneous manufacturing	4421	Furniture stores
3391	Medical equipment and supplies manufacturing	4422	Home furnishings stores
3399	Other miscellaneous manufacturing	443	Electronics and appliance stores
42	Wholesale trade	4431	Electronics and appliance stores
423	Merchant wholesalers, durable goods	444	Building material and garden supply stores
4231	Motor vehicle and parts merchant wholesalers	4441	Building material and supplies dealers
4232	Furniture and furnishing merchant wholesalers	4442	Lawn and garden equipment and supplies stores
4233	Lumber and const. supply merchant wholesalers	445	Food and beverage stores
4234	Commercial equip. merchant wholesalers	4451	Grocery stores
4235	Metal and mineral merchant wholesalers	4452	Specialty food stores
4236	Electric goods merchant wholesalers	4453	Beer, wine, and liquor stores
4237	Hardware and plumbing merchant wholesalers	446	Health and personal care stores
4238	Machinery and supply merchant wholesalers	4461	Health and personal care stores
4239	Misc. durable goods merchant wholesalers	447	Gasoline stations
424	Merchant wholesalers, nondurable goods	4471	Gasoline stations
4241	Paper and paper product merchant wholesalers	448	Clothing and clothing accessories stores
4242	Druggists' goods merchant wholesalers	4481	Clothing stores
4243	Apparel and piece goods merchant wholesalers	4482	Shoe stores
4244	Grocery and related product wholesalers	4483	Jewelry, luggage, and leather goods stores
4245	Farm product raw material merch. whls.	451	Sporting goods, hobby, book and music stores
4246	Chemical merchant wholesalers	4511	Sporting goods and musical instrument stores
4247	Petroleum merchant wholesalers	4512	Book, periodical, and music stores
4248	Alcoholic beverage merchant wholesalers	452	General merchandise stores
4249	Misc. nondurable goods merchant wholesalers	4521	Department stores
425	Electronic markets and agents and brokers	4529	Other general merchandise stores
4251	Electronic markets and agents and brokers	453	Miscellaneous store retailers

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
4531	Florists	492	Couriers and messengers
4532	Office supplies, stationery, and gift stores	4921	Couriers and express delivery services
4533	Used merchandise stores	4922	Local messengers and local delivery
4539	Other miscellaneous store retailers	493	Warehousing and storage
454	Nonstore retailers	4931	Warehousing and storage
4541	Electronic shopping and mail-order houses	51	Information
4542	Vending machine operators	511	Publishing industries, except internet
4543	Direct selling establishments	5111	Newspaper, book, and directory publishers
48-49	Transportation and warehousing	5112	Software publishers
481	Air transportation	512	Motion picture and sound recording industries
4811	Scheduled air transportation	5122	Sound recording industries
4812	Nonscheduled air transportation	515	Broadcasting, except internet
483	Water transportation	5151	Radio and television broadcasting
4831	Sea, coastal, and great lakes transportation	5152	Cable and other subscription programming
4832	Inland water transportation	517	Telecommunications
484	Truck transportation	5171	Wired telecommunications carriers
4841	General freight trucking	5172	Wireless telecommunications carriers
4842	Specialized freight trucking	5174	Satellite telecommunications
485	Transit and ground passenger transportation	5179	Other telecommunications
4851	Urban transit systems	518	Data processing, hosting and related services
4852	Interurban and rural bus transportation	5182	Data processing, hosting and related services
4853	Taxi and limousine service	519	Other information services
4854	School and employee bus transportation	5191	Other information services
4855	Charter bus industry	52	Finance and insurance
4859	Other ground passenger transportation	521	Monetary authorities - central bank
486	Pipeline transportation	5211	Monetary authorities - central bank
4861	Pipeline transportation of crude oil	522	Credit intermediation and related activities
4862	Pipeline transportation of natural gas	5221	Depository credit intermediation
4869	Other pipeline transportation	5222	Nondepository credit intermediation
487	Scenic and sightseeing transportation	5223	Activities related to credit intermediation
4871	Scenic and sightseeing transportation, land	523	Securities, commodity contracts, investments
4872	Scenic and sightseeing transportation, water	5231	Securities and commodity contracts brokerage
4879	Scenic and sightseeing transportation, other	5232	Securities and commodity exchanges
488	Support activities for transportation	5239	Other financial investment activities
4881	Support activities for air transportation	524	Insurance carriers and related activities
4882	Support activities for rail transportation	5241	Insurance carriers
4883	Support activities for water transportation	5242	Insurance agencies and brokerages
4884	Support activities for road transportation	525	Funds, trusts, and other financial vehicles
4885	Freight transportation arrangement	5251	Insurance and employee benefit funds
4889	Other support activities for transportation	5259	Other investment pools and funds

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
53	Real estate and rental and leasing	5621	Waste collection
531	Real estate	5622	Waste treatment and disposal
5311	Lessors of real estate	5629	Remediation and other waste services
5312	Offices of real estate agents and brokers	61	Educational services
5313	Activities related to real estate	611	Educational services
532	Rental and leasing services	6111	Elementary and secondary schools
5321	Automotive equipment rental and leasing	6112	Junior colleges
5322	Consumer goods rental	6113	Colleges and universities
5323	General rental centers	6114	Business, computer and management training
5324	Machinery and equipment rental and leasing	6115	Technical and trade schools
533	Lessors of nonfinancial intangible assets	6116	Other schools and instruction
5331	Lessors of nonfinancial intangible assets	6117	Educational support services
54	Professional and technical services	62	Health care and social assistance
541	Professional and technical services	621	Ambulatory health care services
5411	Legal services	6211	Offices of physicians
5412	Accounting and bookkeeping services	6212	Offices of dentists
5413	Architectural and engineering services	6213	Offices of other health practitioners
5414	Specialized design services	6214	Outpatient care centers
5415	Computer systems design and related services	6215	Medical and diagnostic laboratories
5416	Management and technical consulting services	6216	Home health care services
5417	Scientific research and development services	6219	Other ambulatory health care services
5418	Advertising, pr, and related services	622	Hospitals
5419	Other professional and technical services	6221	General medical and surgical hospitals
55	Management of companies and enterprises	6222	Psychiatric and substance abuse hospitals
551	Management of companies and enterprises	6223	Other hospitals
5511	Management of companies and enterprises	623	Nursing and residential care facilities
56	Administrative and waste services	6231	Nursing care facilities
561	Administrative and support services	6232	Residential mental health facilities
5611	Office administrative services	6233	Community care facilities for the elderly
5612	Facilities support services	6239	Other residential care facilities
5613	Employment services	624	Social assistance
5614	Business support services	6241	Individual and family services
5615	Travel arrangement and reservation services	6242	Emergency and other relief services
5616	Investigation and security services	6243	Vocational rehabilitation services
5617	Services to buildings and dwellings	6244	Child day care services
5619	Other support services	71	Arts, entertainment, and recreation
562	Waste management and remediation services	711	Performing arts and spectator sports

Industry Code (NAICS)	Industry Title	Industry Code (NAICS)	Industry Title
7111	Performing arts companies	8139	Professional and similar organizations
7112	Spectator sports	814	Private households
7113	Promoters of performing arts and sports	8141	Private households
7114	Agents and managers for public figures	92	Public administration
7115	Independent artists, writers, and performers	9211	Executive, legislative, and other general government support
712	Museums, historical sites, zoos, and parks	922	Justice, public order, and safety activities
7121	Museums, historical sites, zoos, and parks	923	Administration of human resource programs
713	Amusements, gambling, and recreation	9231	Admin of human resource programs
7131	Amusement parks and arcades	924	Admin of environmental quality programs
7132	Gambling industries	9241	Admin of environmental quality programs
7139	Other amusement and recreation industries	925	Admin of housing programs, urban planning, and community development
72	Accommodation and food services	9251	Admin of housing programs, urban planning, and community development
721	Accommodation	926	Admin of economic programs
7211	Traveler accommodation	9261	Admin of economic programs
7212	Rv parks and recreational camps	927	Space research and technology
7213	Rooming and boarding houses	9271	Space research and technology
722	Food services and drinking places	928	National security and international affairs
7223	Special food services	9281	National security and international affairs
7224	Drinking places, alcoholic beverages		
7225	Restaurants		
81	Other services, except public administration		
811	Repair and maintenance		
8111	Automotive repair and maintenance		
8112	Electronic equipment repair and maintenance		
8113	Commercial machinery repair and maintenance		
8114	Household goods repair and maintenance		
812	Personal and laundry services		
8121	Personal care services		
8122	Death care services		
8123	Drycleaning and laundry services		
8129	Other personal services		
813	Membership associations and organizations		
8131	Religious organizations		
8132	Grantmaking and giving services		
8133	Social advocacy organizations		
8134	Civic and social organizations		

Appendix B: Description of data sources for Massachusetts Quarterly Census of Employment and Wages (QCEW)

The QCEW data is maintained by the U.S. Bureau of Labor Statistics (BLS). Almost all U.S. employers are required to report monthly employment and quarterly wages for employees in establishments covered under state unemployment insurance (UI) laws to the State UI Program (in Massachusetts, this agency is the Department of Unemployment Assistance). Employment covered by these UI programs represents about 97% of all wage & salary civilian employment in the country. The BLS compiles these data and publishes it at the national level as well as other geographic levels – state, MSA (metropolitan statistical area), and county. The publicly available data for Massachusetts included the following aggregated by NAICS industry: establishment counts & corresponding size range, employment counts (only filled jobs, whether full or part-time, temporary or permanent) and wage information.

Counts of employment (employees) overall and by industry from the Massachusetts QCEW formed the basis of the denominator for all statewide rates presented in this report. However, since the QCEW does not provide information on hours worked by employees in a particular industry or age group, data from the American Community Survey (ACS) data was used to adjust the QCEW data to estimate FTE (full-time equivalent) employees (see below under the American Community Survey). Thus, these ACS-adjusted QCEW FTEs were used as the final denominator in the computation of Workers' Compensation (WC) claims rates by sex, age, and industry.

American Community Survey (ACS)

The ACS, conducted by the U.S. Census Bureau, is an annual, representative survey of over 3.5 million households in the United States that is administered on a continuous basis throughout the year. The ACS samples a percentage of the population in households and group quarters (e.g., institutions, college dormitories, nursing homes); this relatively large sample provides rich information about demographics, housing, and socioeconomic characteristics of the U.S. as a whole and across a variety of geographic areas, e.g., states, public use microdata areas or PUMAs (non-overlapping segments that partition each state into areas containing about 100,000 residents or employed persons), and communities. The ACS data contain information about the place (e.g., state) where individuals work, individuals' employment status (e.g., employed, unemployed) and other information relevant to individuals' work such as industry, occupation, hours worked, income, and class of worker (e.g. private, local govt., federal govt.) which makes these data very useful as denominators in the calculation of occupational injury rates.

The ACS data are subject to the limitations common to many surveys. Samples produce estimates that can never be as precise as tabulations of the whole population. Other kinds of errors can further affect the precision of estimates, and nonrandom (or systematic) error has the potential to bias findings.

Following is more information about the specific Massachusetts ACS data used in this report.

Massachusetts ACS 5-year Public Use Microdata Sample (PUMS) file: This file allows for a custom analysis of ACS data using a weighted 5% sample of actual responses collected from individuals and aggregated over the five year period 2012-2016. In this report, this file was used to generate statewide estimates of both 1) average full-time equivalent workers (FTEs) from hours worked by sex, age, and industry and 2) employee counts by sex, age, and industry. These two estimates, combined as a proportion (FTE/EE), were used to adjust the Quarterly Census of Wages and Employment (QCEW) average annual counts of employees; this ACS-adjusted QCEW estimate served as the denominator in the computation of WC claims rates by sex, age, and industry (see additional detail about the QCEW above). To obtain estimates from the 5-year PUMS file, we adapted a SAS program (originally developed by Karen Louie, California Department of Finance) and shared by Martha Jones PhD., Vanderbilt University.

Massachusetts ACS Sample (Pre-tabulated) file: Since the PUMS file can only be aggregated at the PUMA level (not the city/town level), the full sample ACS file for Massachusetts was used to estimate the counts of employed residents by city or town. WC claim rates by Massachusetts cities and towns where injured workers reside were computed using this estimate as the denominator. This ACS file (already pre-tabulated by city/town) was downloaded from American Factfinder.

Appendix C
**Distribution of Injuries and Illnesses Reported in
Workers' Compensation Lost Wage Claims**
Private Sector, Massachusetts 2014-2016

Nature of Injury/Illness*		Number	Percent
ALL		92,636	100
ANSI Code	Injuries	88,394	95.4
310	Sprain, Strain	47,504	51.28
160	Contusion, Crushing, Bruise	10,808	11.67
210	Fracture	8,181	8.83
170	Cut, Laceration, Puncture	7,815	8.44
995	Other Injury NEC **	4,361	4.71
400	Multiple Injuries **	3,125	3.37
140	Concussion	2,037	2.20
250	Hernia Rupture	1,498	1.62
120	Burn from Heat	1,260	1.36
190	Dislocation	976	1.05
100	Amputation or Enucleation	402	0.43
300	Scratch, Abrasion	187	0.20
130	Burn from Chemical	149	0.16
200	Electric Shock, Electrocution	76	0.08
110	Asphyxia or Strangulation etc	10	0.01
950	Damage to Prosthetic Devices	5	0.01
ANSI Code	Illnesses	3,462	3.70
260	Inflammation of Joints Etc	1,139	1.23
265	Carpal Tunnel Syndrome	541	0.58
540	Mental Disorders	445	0.48
150	Infective or Parasitic Disease UNS	276	0.30
991	Heart Condition Excludes Heart Attack	197	0.21
570	Respiratory Systems, Conditions of	126	0.14
180	Dermatitis UNS	112	0.12
530	Other Disease of the Eye	76	0.08
510	Cardiovascular and Other Conditions	68	0.07
270	Poisoning Systemic UNS	52	0.06
185	Dermatitis: Allergenic or Contact	44	0.05
240	Effects of Environmental Heat	37	0.04
572	Asthma, Influenza, Pneumonia	31	0.03
230	Hearing Loss or Impairment	30	0.03
273	Upper Respiratory Conditions	26	0.03
189	Skin Condition NEC	24	0.03

560	Nervous System Conditions of - NEC	24	0.03
183	Primary Infections of the Skin	23	0.02
184	Other Skin Conditions	22	0.02
159	Other Infective or Parasitic Disease	18	0.02
271	Due to Toxic Materials other than Lead	18	0.02
320	Hemorrhoids	18	0.02
571	Upper Respiratory	13	0.01
154	Conjunctivitis and Ophthalmia	12	0.01
220	Effects of Exposure to Low Temperature	9	0.01
276	Other Diseases of the Gastro-Intestinal	9	0.01
562	Diseases of the Nerves and Peripheral	8	0.01
520	Complications Peculiar to Medical Care	7	0.01
274	Influenza Pneumonia Etc	6	0.01
272	Diseases of the Blood and Blood Forming	5	0.01
287	Other Pneumoconiosis	5	0.01
290	Radiation Effects UNS	5	0.01
283	Asbestosis	--	--
330	Hepatitis Serum and Infective	--	--
561	Diseases of the Central Nervous	--	--
280	Pneumoconiosis	--	--
286	Silicosis	--	--
500	Effects of Changes in Atmospheric	--	--
551	Malignant Tumor	--	--
157	Tuberculosis	--	--
279	Other Toxic Effects of One System Only	--	--
282	Anthraxis	--	--
151	Amebiasis	--	--
152	Anthrax	--	--
153	Brucellosis	--	--
275	Hepatitis Toxic	--	--
550	Neoplasm Tumor UNS	--	--
552	Benign Tumor	--	--
Symptoms, Exposures, or Ill-defined Conditions (ANSI codes 580, 900, 990)		780	0.9
Non-classifiable/missing		7,223	

*Injury/Illness categories based on the American National Standards Institute (ANSI) classification. Dashed line (--) indicates cell count < 5. Ninety-two percent of claims had ANSI codes for nature of injury. ** These categories are discreet ANSI codes, available for selection by claim filers.

Appendix D: Full table of industry groups (4-digit NAICS) in the Manufacturing sector ranked by within sector Prevention Index

Table 3.4 All industry groups in Manufacturing sector ordered by *within sector* Prevention Index (PI)*

All Workers' Compensation (WC) lost wage claims

Private sector, Massachusetts, 2014-2016

4-digit NAICS	Industry Title	WC claims count	WC claim rate**	Within sector			Overall PI Rank
				count rank	rate rank	PI rank	
3121	Beverage mfg.	465	41.4	2	1	1	13
3321 §	Forging and stamping	230	38.2	9	2	2	29
3273	Cement and concrete product mfg.	188	27.8	12	6	3	40
3114	Fruit and vegetable preserving and specialty	134	27.9	21	5	4	44
3115	Dairy product mfg.	168	21.3	16	10	5	47
3323	Architectural and structural metals mfg.	253	17.1	8	18	6	51
3116	Animal slaughtering and processing	148	22.8	18	9	7	49
3118	Bakeries and tortilla mfg.	452	15.5	3	24	8	43
3279	Other nonmetallic mineral products	125	26.3	22	7	9	54
3222	Converted paper product mfg.	292	14.5	6	26	10	61
3261	Plastics product mfg.	490	13.3	1	31	11	50
3117	Seafood product preparation and packaging	135	19.1	20	15	12	70
3364	Aerospace product and parts mfg.	431	12.5	4	33	13	62
3372	Office furniture and fixtures mfg.	107	19.2	24	14	14	74
3326	Spring and wire product mfg.	61	34.0	37	4	15	72
3162	Footwear mfg.	78	19.6	30	13	16	89
3133 §	Textile and fabric finishing mills	96	17.7	27	16	17	85
3328	Coating, engraving, and heat treating metals	180	13.3	13	30	18	80
3262	Rubber product mfg.	72	21.2	33	11	19	84
3119	Other food mfg.	158	13.8	17	27	20	86
3221	Pulp, paper, and paperboard mills	103	16.9	26	19	21	92
3371	Household and institutional furniture mfg.	88	17.2	28	17	22	96
3231	Printing and related support activities	296	8.9	5	41	23	90
3219	Other wood product mfg.	103	16.3	26	21	24	97
3329	Other fabricated metal product mfg.	177	11.2	14	36	25	100
3327	Machine shops and threaded product mfg.	268	8.1	7	45	26	103
3399	Other miscellaneous manufacturing	214	8.0	10	46	27	114
3324	Boiler, tank, and shipping container mfg.	54	16.4	40	20	28	128
3149	Other textile product mills	64	15.0	35	25	29	131
3379	Other furniture related product mfg.	32	20.1	49	12	31	126
3132	Fabric mills	59	16.1	39	23	32	125
3362	Motor vehicle body and trailer mfg.	27	24.7	54	8	33	116
3359	Other electrical equipment and component mfg.	107	8.2	24	44	34	139
3112 §	Grain and oil seed milling	36	16.2	46	22	35	137
3314	Other nonferrous metal production	49	13.3	41	29	36	141
3391	Medical equipment and supplies mfg.	170	4.7	15	56	37	147

3335	Metalworking machinery mfg.	78	8.2	30	43	38	154
3345	Electronic instrument mfg.	211	2.6	11	62	39	157
3113	Sugar and confectionery product mfg.	48	11.9	42	35	40	153
3315 §	Foundries	29	13.7	51	28	41	160
3344	Semiconductor and electronic component mfg.	146	3.1	19	61	42	168
3252	Resin, rubber, and artificial fibers mfg.	59	8.8	39	42	43	164
3272	Glass and glass product mfg.	42	10.8	44	37	44	165
3255	Paint, coating, and adhesive mfg.	45	9.4	43	40	45	172
3339	Other general purpose machinery mfg.	74	5.6	31	52	46	179
3332	Industrial machinery mfg.	68	5.2	34	54	47	188
3322	Cutlery and handtool mfg.	62	5.3	36	53	48	190
3352	Household appliance mfg.	24	12.7	60	32	49	174
3256	Soap, cleaning compound, and toiletry mfg.	27	9.8	54	38	50	180
3241 §	Petroleum and coal products mfg.	27	9.7	54	39	51	183
3141 §	Textile furnishings mills	24	12.2	60	34	52	177
3259	Other chemical product and preparation mfg.	35	7.6	48	47	53	192
3254	Pharmaceutical and medicine manufacturing	73	2.2	32	63	54	200
3334	HVAC and commercial refrigeration equipment	29	7.3	51	48	55	197
3333	Commercial and service industry machinery	38	4.3	45	58	56	205
3353	Electrical equipment mfg.	35	4.6	48	57	57	206
3312	Steel product mfg. from purchased steel	21	6.8	62	49	58	201
3251	Basic chemical mfg.	21	6.5	62	50	59	203
3351	Electric lighting equipment mfg.	25	4.9	58	55	60	208
3363	Motor vehicle parts mfg.	15	5.7	64	51	61	212
3152	Cut and sew apparel mfg.	26	3.6	56	59	62	214
3341	Computer and peripheral equipment mfg.	29	0.7	51	64	63	225
3336 §	Turbine and power transmission equipment mfg.	17	3.6	63	60	64	221
Industry groups not included in top 25 ranked by PI but among the 5 top industry groups ranked by either count or rate							
3211 §	Sawmills and wood preservation	25	35.5	58	3	30	112

* There were 64 industry groups in the Manufacturing sector with 15 or more claims for which PI were computed. ** Rates expressed as WC claims per 1,000 full-time workers. § Relative Margin of Error for ACS estimates used to adjust QCEW counts of employees in this industry is > 30% suggesting the ACS estimates have a larger than acceptable amount of sampling error & may be unreliable.

Appendix E. Number, rate*, rate rank, and prevention index rank of workers' compensation lost wage claims
by city or town of injured worker residence

Private Sector, Massachusetts 2014 – 2016, N= 84,945 **

Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥	Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥
STATEWIDE	84,945	8.2 (8.1 - 8.2)							
ABINGTON	306	11.5 (9.4 - 13.6)	42	36	BOURNE	303	10.1 (8.3 - 11.9)	71	51
ACTON	117	3.2 (2.3 - 4.1)	270	237	BOXBOROUGH	21	2.3 (0.7 - 4.0)	288	294
ACUSHNET	170	10.2 (7.7 - 12.6)	70	84	BOXFORD	31	2.4 (1.0 - 3.8)	284	290
ADAMS	136	10.9 (8.0 - 13.8)	52	85	BOYLSTON	43	5.7 (3.0 - 8.4)	208	247
AGAWAM	363	8.3 (6.9 - 9.6)	130	76	BRAINTREE	488	8.6 (7.4 - 9.8)	119	60
AMESBURY	168	5.9 (4.5 - 7.3)	203	162	BREWSTER	84	6.1 (4.0 - 8.2)	197	206
AMHERST	111	2.0 (1.4 - 2.6)	294	253	BRIDGEWATER	352	8.3 (6.9 - 9.7)	129	77
ANDOVER	148	2.8 (2.1 - 3.5)	278	223	BRIMFIELD	55	8.6 (4.9 - 12.3)	115	179
ARLINGTON	277	3.7 (3.0 - 4.4)	263	168	BROCKTON	2,415	18.2 (17.1 - 19.4)	1	1
ASHBURNHAM	61	6.2 (3.7 - 8.7)	195	229	BROOKFIELD	37	7.1 (3.4 - 10.9)	163	227
ASHBY	36	7.0 (3.3 - 10.8)	170	234	BROOKLINE	195	2.0 (1.6 - 2.4)	293	220
ASHFIELD	15	5.0 (0.7 - 9.2)	239	287	BURLINGTON	206	5.1 (4.0 - 6.2)	230	167
ASHLAND	150	5.0 (3.8 - 6.3)	235	196	CAMBRIDGE	493	2.6 (2.2 - 2.9)	280	154
ATHOL	225	14.6 (11.5 - 17.7)	6	33	CANTON	216	6.3 (5.0 - 7.6)	191	142
ATTLEBORO	740	10.8 (9.5 - 12.0)	55	23	CARVER	203	11.0 (8.5 - 13.5)	49	64
AUBURN	245	9.8 (7.9 - 11.7)	83	72	CHARLTON	179	8.4 (6.4 - 10.4)	125	113
AVON	90	12.2 (8.2 - 16.3)	30	98	CHATHAM	69	8.8 (5.5 - 12.2)	110	157
AYER	115	8.7 (6.1 - 11.3)	114	134	CHELMSFORD	299	5.4 (4.5 - 6.3)	220	141
BARNSTABLE	805	12.1 (10.8 - 13.5)	32	14	CHELSEA	834	14.2 (12.7 - 15.8)	9	8
BARRE	100	11.3 (7.6 - 15.0)	45	100	CHESHIRE	50	10.5 (5.7 - 15.2)	64	148
BECKET	22	7.5 (2.4 - 12.6)	154	241	CHICOPEE	909	11.3 (10.1 - 12.4)	47	17
BEDFORD	62	3.0 (1.8 - 4.1)	276	270	CLINTON	267	11.8 (9.5 - 14.2)	35	41
BELCHERTOWN	153	6.3 (4.7 - 7.9)	190	158	COHASSET	35	3.0 (1.4 - 4.6)	274	285
BELLINGHAM	225	7.5 (6.0 - 9.1)	152	116	COLRAIN	26	9.3 (3.5 - 15.1)	96	197
BELMONT	137	3.5 (2.6 - 4.4)	266	219	CONCORD	57	2.4 (1.4 - 3.3)	286	280
BERKLEY	112	10.1 (7.0 - 13.2)	72	108	DALTON	96	9.2 (6.1 - 12.2)	99	137
BERLIN	32	5.9 (2.6 - 9.2)	202	256	DANVERS	337	7.7 (6.4 - 8.9)	150	94
BERNARDSTON	20	5.6 (1.5 - 9.6)	212	271	DARTMOUTH	429	8.8 (7.5 - 10.1)	111	58
BEVERLY	406	6.1 (5.2 - 7.1)	196	111	DEDHAM	310	7.9 (6.5 - 9.2)	144	93
BILLERICA	573	8.2 (7.2 - 9.2)	132	65	DEERFIELD	69	8.1 (5.0 - 11.3)	136	176
BLACKSTONE	159	10.0 (7.5 - 12.5)	76	92	DENNIS	241	12.8 (10.2 - 15.5)	20	39
BLANDFORD	11	5.3 (-0.1 - 10.6)	222	282	DIGHTON	95	8.2 (5.5 - 10.8)	133	155
BOLTON	19	2.2 (0.6 - 3.8)	292	297	DOUGLAS	140	9.4 (6.8 - 11.9)	91	104
BOSTON	7,495	7.1 (6.8 - 7.3)	168	68	DRACUT	398	7.9 (6.7 - 9.2)	142	81

Appendix E. Number, rate*, rate rank, and prevention index rank of workers' compensation lost wage claims
by city or town of injured worker residence (*continued*)

Private Sector, Massachusetts 2014 – 2016, N= 84,945 **

Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥	Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥
DUDLEY	174	10.0 (7.6 - 12.4)	75	86	HAMILTON	43	3.8 (2.0 - 5.6)	261	277
DUNSTABLE	16	3.0 (0.6 - 5.4)	275	292	HAMPDEN	41	5.0 (2.5 - 7.4)	237	266
DUXBURY	97	4.5 (3.1 - 5.9)	246	236	HANOVER	129	6.1 (4.4 - 7.8)	198	174
EAST BRIDGEWATER	249	10.8 (8.6 - 12.9)	53	53	HANSON	165	9.2 (7.0 - 11.4)	98	103
EAST BROOKFIELD	33	8.8 (3.9 - 13.7)	112	198	HARDWICK	30	7.8 (3.2 - 12.5)	145	224
EAST LONGMEADOW	121	5.0 (3.6 - 6.4)	234	204	HARVARD	15	1.8 (0.2 - 3.3)	297	298
EASTHAM	68	10.5 (6.4 - 14.7)	61	130	HARWICH	163	9.3 (7.0 - 11.6)	95	102
EASTHAMPTON	236	9.0 (7.1 - 10.8)	106	88	HATFIELD	43	7.5 (3.9 - 11.1)	155	215
EASTON	226	6.0 (4.8 - 7.1)	201	144	HAVERHILL	973	10.0 (9.0 - 11.0)	74	25
EDGARTOWN	57	9.8 (5.4 - 14.2)	81	151	HINGHAM	127	4.0 (2.9 - 5.1)	257	218
ERVING	31	10.6 (4.6 - 16.5)	59	161	HINSDALE	41	13.0 (6.5 - 19.6)	17	128
ESSEX	27	4.5 (1.7 - 7.4)	244	281	HOLBROOK	218	12.6 (9.8 - 15.4)	23	42
EVERETT	900	12.6 (11.2 - 13.9)	25	12	HOLDEN	196	6.6 (5.2 - 8.1)	184	145
FAIRHAVEN	273	11.3 (9.2 - 13.4)	46	43	HOLLAND	32	7.8 (3.4 - 12.1)	148	222
FALL RIVER	1,795	15.8 (14.6 - 17.0)	3	3	HOLLISTON	100	4.6 (3.2 - 6.0)	243	230
FALMOUTH	410	9.2 (7.8 - 10.6)	100	56	HOLYOKE	533	10.8 (9.3 - 12.3)	54	27
FITCHBURG	698	12.3 (10.8 - 13.8)	29	15	HOPEDALE	59	6.4 (3.7 - 9.0)	189	225
FOXBOROUGH	218	8.1 (6.4 - 9.8)	137	107	HOPKINTON	82	3.3 (2.2 - 4.4)	269	255
FRAMINGHAM	1,060	9.0 (8.1 - 9.8)	105	40	HUBBARDSTON	59	8.2 (4.8 - 11.5)	134	187
FRANKLIN	282	5.5 (4.5 - 6.4)	216	140	HUDSON	244	7.6 (6.1 - 9.1)	151	110
FREETOWN	134	8.9 (6.6 - 11.3)	107	117	HULL	146	8.4 (6.2 - 10.5)	128	127
GARDNER	356	12.7 (10.6 - 14.8)	21	21	HUNTINGTON	31	9.5 (4.1 - 14.9)	89	182
GEORGETOWN	85	6.0 (4.0 - 8.1)	199	205	IPSWICH	121	5.5 (4.0 - 7.1)	214	194
GLOUCESTER	381	8.5 (7.2 - 9.8)	120	69	KINGSTON	170	8.4 (6.4 - 10.4)	126	115
GRAFTON	203	6.9 (5.4 - 8.4)	174	139	LAKEVILLE	167	9.2 (7.0 - 11.4)	97	101
GRANBY	77	7.1 (4.5 - 9.7)	165	193	LANCASTER	80	7.3 (4.7 - 9.9)	160	186
GRANVILLE	19	7.0 (1.8 - 12.2)	169	249	LANESBOROUGH	38	7.9 (3.8 - 12.0)	143	211
GREAT BARRINGTON	99	9.3 (6.3 - 12.4)	92	129	LAWRENCE	1,580	15.5 (14.2 - 16.7)	4	4
GREENFIELD	214	7.9 (6.3 - 9.6)	141	114	LEE	85	9.4 (6.1 - 12.8)	90	136
GROTON	75	4.4 (2.8 - 6.0)	252	248	LEICESTER	160	8.5 (6.4 - 10.6)	121	118
GROVELAND	87	7.8 (5.1 - 10.5)	146	164	LENOX	51	8.4 (4.5 - 12.2)	127	192
HADLEY	49	5.7 (3.1 - 8.4)	204	243	LEOMINSTER	620	9.8 (8.6 - 11.0)	82	38
HALIFAX	180	14.3 (10.8 - 17.8)	8	47	LEXINGTON	82	1.8 (1.2 - 2.4)	296	268

Appendix E. Number, rate*, rate rank, and prevention index rank of workers' compensation lost wage claims by city or town of injured worker residence (*continued*)

Private Sector, Massachusetts 2014 – 2016, N= 84,945 **

Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥	Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥
LINCOLN	19	2.3 (0.6 - 4.0)	291	296	MONTAGUE	141	11.9 (8.7 - 15.0)	34	71
LITTLETON	61	4.0 (2.4 - 5.6)	258	263	NAHANT	32	5.7 (2.5 - 8.9)	209	260
LONGMEADOW	60	2.6 (1.5 - 3.6)	281	276	NANTUCKET	221	11.6 (9.2 - 14.1)	38	50
LOWELL	1,538	9.7 (9.0 - 10.5)	84	28	NATICK	259	4.4 (3.6 - 5.3)	250	165
LUDLOW	269	8.6 (7.0 - 10.3)	116	87	NEEDHAM	108	2.5 (1.7 - 3.2)	283	245
LUNENBURG	118	6.7 (4.8 - 8.6)	179	166	NEW BEDFORD	2,133	16.8 (15.7 - 17.9)	2	2
LYNN	1,803	13.5 (12.5 - 14.5)	12	7	NEW BRAINTREE	22	13.2 (4.2 - 22.2)	16	146
LYNNFIELD	80	4.1 (2.7 - 5.5)	256	246	NEWBURY	51	4.4 (2.5 - 6.4)	249	267
MALDEN	862	8.8 (7.9 - 9.8)	108	48	NEWBURYPORT	97	3.4 (2.4 - 4.5)	267	244
MANCHESTER	19	2.6 (0.7 - 4.5)	279	293	NEWTON	334	2.5 (2.1 - 2.9)	282	172
MANSFIELD	271	6.9 (5.6 - 8.2)	175	122	NORFOLK	62	4.2 (2.6 - 5.9)	254	261
MARBLEHEAD	115	4.0 (2.8 - 5.1)	259	232	NORTH ADAMS	216	12.6 (9.9 - 15.3)	24	49
MARION	34	5.3 (2.4 - 8.1)	223	264	NORTH ANDOVER	203	4.4 (3.5 - 5.4)	248	185
MARLBOROUGH	596	8.8 (7.7 - 10.0)	109	52	NORTH ATTLEBORO	350	7.4 (6.1 - 8.6)	159	97
MARSHFIELD	329	8.1 (6.7 - 9.4)	138	89	NORTH BROOKFIELD	81	10.7 (6.9 - 14.5)	56	121
MASHPEE	206	10.5 (8.2 - 12.7)	63	70	NORTH READING	125	4.9 (3.5 - 6.2)	240	207
MATTAPOISETT	63	6.8 (4.0 - 9.6)	177	210	NORTHAMPTON	201	4.4 (3.5 - 5.3)	251	190
MAYNARD	74	4.3 (2.7 - 5.8)	253	252	NORTH-BOROUGH	130	5.4 (4.0 - 6.9)	217	189
MEDFIELD	57	3.1 (1.8 - 4.4)	273	273	NORTHBRIDGE	307	11.6 (9.5 - 13.7)	40	35
MEDFORD	644	6.6 (5.8 - 7.4)	185	95	NORTHFIELD	37	7.8 (3.7 - 11.8)	149	216
MEDWAY	129	5.7 (4.1 - 7.2)	206	181	NORTON	310	9.6 (7.9 - 11.2)	87	57
MELROSE	252	5.4 (4.4 - 6.5)	219	149	NORWELL	76	4.9 (3.1 - 6.6)	241	242
MENDON	61	6.2 (3.7 - 8.7)	193	226	NORWOOD	387	8.1 (6.8 - 9.3)	139	80
MERRIMAC	77	7.0 (4.5 - 9.6)	172	199	OAK BLUFFS	45	6.4 (3.2 - 9.6)	188	239
METHUEN	717	9.1 (8.1 - 10.2)	101	46	OAKHAM	28	9.6 (3.9 - 15.4)	86	184
MIDDLE-BOROUGH	418	11.4 (9.7 - 13.2)	44	26	ORANGE	108	11.0 (7.7 - 14.3)	50	99
MIDDLETON	84	6.7 (4.4 - 9.0)	181	200	ORLEANS	55	7.1 (4.1 - 10.1)	166	214
MILFORD	486	10.6 (9.1 - 12.1)	58	31	OXFORD	249	11.7 (9.3 - 14.1)	37	45
MILLBURY	253	11.6 (9.3 - 14.0)	39	44	PALMER	195	10.9 (8.4 - 13.4)	51	66
MILLIS	90	7.2 (4.8 - 9.6)	162	177	PAXTON	40	5.2 (2.6 - 7.8)	229	262
MILLVILLE	58	11.1 (6.6 - 15.7)	48	132	PEABODY	870	10.7 (9.5 - 11.8)	57	22
MILTON	227	5.5 (4.4 - 6.6)	215	150	PEMBROKE	276	9.0 (7.3 - 10.7)	102	75
MONSON	76	5.3 (3.4 - 7.2)	221	235	PEPPERELL	94	5.1 (3.5 - 6.7)	232	228

Appendix E. Number, rate*, rate rank, and prevention index rank of workers' compensation lost wage claims by city or town of injured worker residence (*continued*)

Private Sector, Massachusetts 2014 – 2016, N= 84,945 **

Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥	Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥
PITTSFIELD	826	12.9 (11.5 - 14.3)	18	10	SOUTHAMPTON	55	5.2 (3.0 - 7.4)	227	254
PLAINVILLE	113	7.3 (5.1 - 9.4)	161	159	SOUTH-BOROUGH	55	3.7 (2.1 - 5.2)	265	272
PLYMOUTH	897	9.9 (8.9 - 10.9)	79	30	SOUTHBRIDGE	342	13.9 (11.5 - 16.3)	11	19
PLYMPTON	46	10.3 (5.5 - 15.1)	68	152	SOUTHWICK	102	7.0 (4.8 - 9.2)	171	173
PRINCETON	27	5.0 (1.9 - 8.1)	236	278	SPENCER	198	10.5 (8.1 - 12.9)	62	73
PROVINCETOWN	33	6.9 (3.0 - 10.7)	176	240	SPRINGFIELD	2,160	11.8 (11.0 - 12.6)	36	11
QUINCY	1,154	7.4 (6.8 - 8.1)	158	67	STERLING	97	7.8 (5.3 - 10.3)	147	160
RANDOLPH	690	13.3 (11.7 - 15.0)	15	13	STOCKBRIDGE	22	6.7 (2.1 - 11.2)	183	257
RAYNHAM	217	10.1 (7.9 - 12.3)	73	74	STONEHAM	273	7.4 (6.1 - 8.8)	156	106
READING	158	3.9 (2.9 - 4.8)	260	209	STOUGHTON	455	10.2 (8.7 - 11.7)	69	37
REHOBOTH	107	5.3 (3.7 - 6.8)	224	212	STOW	32	2.9 (1.3 - 4.5)	277	289
REVERE	1,040	12.4 (11.2 - 13.7)	26	9	STURBRIDGE	96	6.8 (4.6 - 8.9)	178	188
ROCHESTER	57	6.7 (3.9 - 9.5)	180	221	SUDBURY	61	2.3 (1.4 - 3.3)	287	279
ROCKLAND	351	12.2 (10.0 - 14.3)	31	24	SUNDERLAND	35	5.0 (2.3 - 7.7)	238	269
ROCKPORT	56	5.2 (3.0 - 7.4)	228	251	SUTTON	109	7.1 (5.0 - 9.3)	164	163
ROWLEY	63	6.5 (3.9 - 9.1)	186	217	SWAMPSCOTT	119	5.4 (3.9 - 7.0)	218	201
ROYALSTON	20	9.5 (2.6 - 16.5)	88	202	SWANSEA	245	9.3 (7.5 - 11.2)	93	78
RUSSELL	22	9.3 (3.0 - 15.7)	94	203	TAUNTON	1,216	14.3 (13.0 - 15.6)	7	6
RUTLAND	118	8.6 (6.1 - 11.1)	118	133	TEMPLETON	121	9.0 (6.3 - 11.6)	103	123
SALEM	602	8.7 (7.6 - 9.8)	113	55	TEWKSBURY	347	7.0 (5.8 - 8.1)	173	105
SALISBURY	118	8.6 (6.1 - 11.1)	117	131	TISBURY	97	15.0 (9.9 - 20.2)	5	79
SANDWICH	265	8.3 (6.7 - 9.8)	131	96	TOPSFIELD	35	3.7 (1.7 - 5.7)	262	283
SAUGUS	459	10.4 (8.9 - 11.9)	66	34	TOWNSEND	114	7.4 (5.3 - 9.6)	157	156
SCITUATE	140	5.2 (3.9 - 6.6)	226	191	TRURO	26	10.4 (3.6 - 17.2)	65	170
SEEKONK	136	5.7 (4.2 - 7.2)	207	178	TYNGSBOROUGH	123	5.7 (4.1 - 7.4)	205	183
SHARON	87	3.1 (2.1 - 4.1)	272	250	UPTON	76	6.2 (4.0 - 8.4)	194	213
SHEFFIELD	24	4.6 (1.5 - 7.7)	242	284	UXBRIDGE	188	8.4 (6.5 - 10.3)	124	109
SHELBURNE	35	12.7 (5.8 - 19.5)	22	135	WAKEFIELD	290	6.4 (5.3 - 7.6)	187	125
SHIRLEY	70	8.0 (4.9 - 11.1)	140	180	WALES	28	10.0 (4.0 - 16.0)	77	175
SHREWSBURY	294	5.1 (4.2 - 6.0)	231	147	WALPOLE	217	5.6 (4.5 - 6.8)	211	153
SOMERSET	268	10.5 (8.5 - 12.6)	60	54	WALTHAM	723	6.7 (5.9 - 7.5)	182	91
SOMERVILLE	651	4.2 (3.7 - 4.7)	255	138	WARE	169	11.9 (9.0 - 14.9)	33	62
SOUTH HADLEY	156	5.7 (4.3 - 7.1)	210	171	WAREHAM	451	12.9 (10.9 - 14.9)	19	16

Appendix E. Number, rate*, rate rank, and prevention index rank of workers' compensation lost wage claims by city or town of injured worker residence (*continued*)

Private Sector, Massachusetts 2014 – 2016, N= 84,945 **

Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥	Massachusetts City or Town	Count of WC Claims	Rate of WC Claims (90% CI)\$	Rate Rank ¥	PI Rank ¥
WARREN	63	8.4 (4.9 - 11.9)	123	169	WESTON	22	1.5 (0.5 - 2.4)	298	295
WATERTOWN	313	5.0 (4.2 - 5.9)	233	143	WESTPORT	188	8.1 (6.3 - 10.0)	135	120
WAYLAND	47	2.3 (1.3 - 3.4)	290	286	WESTWOOD	76	3.3 (2.1 - 4.5)	268	259
WEBSTER	351	14.0 (11.7 - 16.4)	10	18	WEYMOUTH	866	9.8 (8.8 - 10.8)	80	32
WELLESLEY	70	1.9 (1.2 - 2.5)	295	275	WHITMAN	309	12.3 (10.1 - 14.5)	27	29
WELLFLEET	24	5.2 (1.7 - 8.8)	225	274	WILBRAHAM	102	4.5 (3.1 - 5.9)	245	231
WEST BOYLSTON	84	10.3 (6.8 - 13.9)	67	126	WILLIAMSBURG	53	13.4 (7.5 - 19.2)	14	119
WEST BRIDGEWATER	125	11.6 (8.3 - 14.8)	41	82	WILLIAMSTOWN	25	2.3 (0.9 - 3.8)	289	291
WEST BROOKFIELD	66	11.5 (6.9 - 16.0)	43	124	WILMINGTON	275	7.1 (5.8 - 8.4)	167	112
WEST NEWBURY	26	3.7 (1.4 - 6.0)	264	288	WINCHENDON	164	10.0 (7.4 - 12.5)	78	90
WEST SPRINGFIELD	378	9.0 (7.5 - 10.4)	104	59	WINCHESTER	78	2.4 (1.5 - 3.2)	285	265
WEST TISBURY	24	6.3 (2.0 - 10.6)	192	258	WINTHROP	286	9.7 (7.9 - 11.5)	85	63
WESTBOROUGH	131	4.5 (3.3 - 5.7)	247	208	WOBURN	564	8.5 (7.4 - 9.6)	122	61
WESTFIELD	478	7.5 (6.5 - 8.6)	153	83	WORCESTER	3,430	13.5 (12.7 - 14.2)	13	5
WESTFORD	117	3.2 (2.3 - 4.1)	271	238	WRENTHAM	108	6.0 (4.2 - 7.8)	200	195
WESTMINSTER	73	5.5 (3.5 - 7.6)	213	233	YARMOUTH	417	12.3 (10.4 - 14.2)	28	20

* Rate expressed as WC Claims per 1,000 employed residents. Number of employed residents estimated from the American Community Survey - ACS. Rates and PI ranks calculated only for cities/towns with 15 or more claims reported; only Devens, MA did not have an ACS estimate for employed residents and therefore, a rate could not be calculated. ** Ninety-one percent (N = 84,945) of total claims were filed for in-state (MA) residents. § Ninety percent confidence intervals (90% CI) computed for each rate. ¥ Ranks range from the highest priority (1) to the lowest priority (298).

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
492	Couriers & messengers	1,580 (14)	46.4 (1)	1	Overexertion - lifting... (40%)	Other overexertion or bodily reaction (10%)	Fall same level (10%)	Couriers & messengers (62%) Laborers & freight, stock, & material movers (12%) Inspectors, testers, sorters, & weighers (8%)
484	Truck transportation	1,782 (12)	34.2 (3)	2	Overexertion - lifting... (31%)	Fall same level (16%)	Struck by object (11%)	Heavy & tractor-trailer truck drivers (70%) Laborers & freight, stock & material movers (15%) Bus & truck mechanics & diesel engine Specialists (3%)
424	Merchant wholesalers, non-durable goods	3,168 (8)	24.1 (8)	3	Overexertion - lifting... (39%)	Fall same level (13%)	Struck by object (10%)	Driver/sales workers (19%) Light truck or delivery services drivers (16%) Heavy & tractor-trailer Truck drivers (16%)
623	Nursing & residential care facilities	5,506 (3)	19.8 (13)	4	Overexertion - lifting... (38%)	Fall same level (19%)	Violence by person (16%)	Nursing assistants (44%) Personal care aides (8%) Registered nurses (5%)
238	Specialty trade contractors	5,515 (2)	18.8 (16)	5	Overexertion - lifting... (25%)	Struck by object (16%)	Fall lower level (13%)	Construction laborers (18%) Plumbers, pipefitters, & steamfitters (12%) Carpenters (11%)
493	Warehousing & storage	829 (24)	26.6 (5)	6	Overexertion - lifting... (48%)	Struck by object (11%)	Fall same level (10%)	Inspectors, testers, sorters, weighers (33%) Laborers & freight, stock, & material movers (31%) Industrial truck & tractor operators (14%)
481	Air transportation	767 (27)	33.2 (4)	7	Overexertion - lifting... (45%)	Fall same level (12%)	Struck by object (9%)	Flight attendants (43%) Reservation & transportation ticket agents & travel clerks (26%) Customer service representatives (16%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
485	Transit & ground passenger transportation	1,279 (21)	21.8 (10)	8	Roadway incident (38%)	Fall same level (15%)	Overexertion - lifting... (14%)	Bus drivers, transit & intercity (40%) Taxi drivers & chauffeurs (27%) Bus drivers, school or special client (13%)
622	Hospitals	7,720 (1)	13.9 (31)	9	Overexertion - lifting... (41%)	Fall same level (17%)	Violence by person (8%)	Registered nurses (36%) Nursing assistants (14%) Surgical technologists (5%)
444	Building materials & garden supplies	1,362 (18)	19.2 (15)	10	Overexertion - lifting... (37%)	Struck by object (15%)	Fall same level (12%)	Retail salespersons (22%) Light truck or delivery services drivers (18%) Laborers & freight, stock & material movers (9%)
452	General merchandise stores §	1,871 (11)	15.5 (24)	11	--	--	--	Retail salespersons (18%) First-line supervisors of retail sales workers (14%) Stock clerks and order fillers (12%)
445	Food and beverage stores	3,388 (7)	14.5 (28)	12	Overexertion - lifting... (37%)	Fall same level (16%)	Struck by object (14%)	Laborers & freight, stock, & material movers (22%) Stock clerks and order fillers (12%) First-line supervisors of retail sales workers (11%)
562	Waste management & remediation	784 (26)	21 (12)	13	Overexertion - lifting... (30%)	Struck by object (13%)	Fall same level (11%)	Heavy & tractor-trailer truck drivers (49%) Laborers & freight, stock, & material movers (18%) Hazardous materials removal workers (7%)
236	Construction of buildings	1,513 (15)	16.7 (23)	14	Overexertion - lifting... (24%)	Struck by object (17%)	Fall lower level (17%)	Carpenters (39%) Construction laborers (29%) Supervisors of construction trades & extraction workers (7%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
312 ¥	Beverage manufacturing	465 (39)	41.4 (2)	15	--	--	--	Industrial truck & tractor operators (14%) Light truck or delivery services drivers (13%) Driver/sales workers (12%)
311	Food manufacturing	1,280 (20)	17.6 (21)	16	Overexertion - lifting... (24%)	Fall same level (18%)	Struck by object (13%)	Packaging & filling machine operators & tenders (15%) Food processing workers, all other (8%) Laborers & freight, stock & material movers (7%)
561	Administrative & support services	5,255 (4)	11.2 (39)	17	Overexertion - lifting... (22%)	Struck by object (16%)	Fall same level (16%)	Landscaping & grounds keeping workers (15%) Laborers & freight, stock & material movers (12%) Construction laborers (6%)
488	Support activities for transportation	512 (35)	21.3 (11)	18	Overexertion - lifting... (34%)	Fall same level (15%)	Struck by object (13%)	Heavy & tractor-trailer truck drivers (24%) Reservation & transportation ticket agents & travel clerks (21%) Aircraft mechanics & service technicians (6%)
237	Heavy & civil engineering construction	765 (28)	17.9 (19)	19	Overexertion - lifting... (23%)	Struck by object (20%)	Fall same level (13%)	Construction laborers (45%) Supervisors of construction trades & extraction workers (8%) Heavy & tractor-trailer truck drivers (7%)
441	Motor vehicle & parts dealers	1,474 (17)	12.5 (35)	20	Overexertion - lifting... (28%)	Fall same level (16%)	Struck by object (12%)	Automotive service technicians & mechanics (33%) Light truck or delivery services drivers (15%) Tire repairers & changers (12%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
332	Fabricated metal products manufacturing	1,295 (19)	12.8 (34)	21	Overexertion - lifting... (29%)	Struck by object (17%)	Fall same level (11%)	Metal workers, plastic workers, all other (12%) Machinists (11%) Welders, cutters, solderers, & brazers (7%)
721	Accommodation (hotels/motels)	1,278 (22)	12.9 (33)	22	Overexertion - lifting... (28%)	Fall same level (19%)	Struck by object (14%)	Maids & housekeeping cleaners (35%) Cooks, restaurant (9%) Janitors & cleaners, except maids & housekeeping cleaners (8%)
624	Social assistance	2,835 (9)	8.9 (47)	23	Fall same level (22%)	Overexertion - lifting... (21%)	Violence by person (19%)	Preschool teachers, except special education 13%) Personal care aides (10%) Social workers, all other (7%)
621	Ambulatory health care services	3,973 (6)	8.1 (50)	24	Overexertion - lifting... (35%)	Fall same level (20%)	Roadway incident (11%)	Emergency medical technicians & paramedics(21%) Registered nurses (13%) Home health aides (12%)
722	Restaurants and drinking places	4,963 (5)	8.1 (51)	25	Fall same level (22%)	Struck by object (21%)	Overexertion - lifting... (13%)	Cooks, restaurant (23%) Waiters and waitresses (12%) Food service managers (8%)
423	Merchant wholesalers, durable goods	1,678 (13)	9.5 (45)	26	Overexertion - lifting... (33%)	Fall same level (15%)	Struck by object (12%)	Light truck or delivery services drivers (19%) Laborers and freight, stock, and material movers (16%) Heavy and tractor-trailer truck drivers (10%)
327	Nonmetallic mineral product manufacturing	365 (46)	19.7 (14)	27	Overexertion - lifting... (22%)	Struck by object (17%)	Fall same level (10%)	Heavy and tractor-trailer truck drivers (26%) Laborers and freight, stock, and material movers (16%) Production workers, all other (11%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 (Continued)

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
517 ¥	Tele-communications	755 (29)	13.4 (32)	28	--	--	--	--
454	Nonstore retailers	608 (32.5)	14.0 (30)	29	Overexertion - lifting... (30%)	Fall same level (17%)	Slip, trip, no fall (9%)	Maintenance and repair workers, general (18%) Light truck or delivery services drivers (16%) Driver/sales workers (14%)
532	Rental and leasing services	483 (37)	14.8 (26)	30	Overexertion - lifting... (31%)	Fall same level (15%)	Struck by object (8%)	First-line supervisors of non-retail sales workers (13%) Customer service representatives (11%) Laborers and freight, stock, material movers (11%)
326	Plastics and rubber products manufacturing	562 (34)	14.0 (29)	31	Overexertion - lifting... (32%)	Struck by object (13%)	Fall same level (10%)	Metal workers and plastic workers, all other (21%) Production workers, all other (7%) Industrial machinery mechanics (7%)
811	Repair and maintenance	825 (25)	10.3 (40)	32	Overexertion - lifting... (23%)	Struck by object (14%)	Fall same level (13%)	Automotive service technicians & mechanics (22%) Automotive body and related repairers (16%) Heavy and tractor-trailer truck drivers (6%)
531	Real estate	952 (23)	9.8 (43)	33	Overexertion - lifting... (29%)	Fall same level (17%)	Struck by object (12%)	Janitors, cleaners, exc. maids & housekeepers (31%) Maintenance and repair workers, general (22%) Property, real estate, & community assoc managers (8%)
611 ¥	Educational services	2,334 (10)	6.4 (57)	34	Overexertion - lifting... (22%)	Fall same level (21%)	Violence by person (15%)	--

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
322	Paper manufacturing	395 (43)	15.0 (25)	35	Overexertion - lifting... (35%)	Struck by object (11%)	Fall same level (8%)	Production workers, all other (28%) Helpers--production workers (7%) Assemblers and babricators, all other (6%) Laborers and freight, stock, material movers (6%)
112 ¥	Animal production and aquaculture	110 (65)	25.2 (6)	36	--	--	--	Agricultural and food science technicians (62%) Farmworkers, farm, ranch, & aquacultural animals (17%) First-line supervisors of farming, fishing, & forestry workers (6%)
337	Furniture & related product manufacturing	227 (57)	18.5 (17)	37	Overexertion - lifting... (43%)	Struck by object (14%)	Fall same level (10%)	Carpenters (18%) Assemblers and fabricators, all other (12%) Production workers, all other (7%) Laborers and freight, stock, material movers (7%)
336	Transportation equipment manufacturing	489 (36)	12.2 (37)	38	Overexertion - lifting... (44%)	Struck by object (10%)	Fall same level (8%)	Metal workers and plastic workers, all other (13%) Assemblers and fabricators, all other (9%) Machinists (9%)
212	Mining (except oil and gas)	74 (70)	24.4 (7)	39	Overexertion - lifting... (20%)	Fall same level (16%)	Struck by object (13%)	Heavy and tractor-trailer truck drivers (35%) Extraction workers, all other (18%) Rail car repairers (8%)
321	Wood product manufacturing	136 (62)	17.6 (20)	40	Struck by object (31%)	Overexertion - lifting... (21%)	Fall same level (8%)	Production workers, all other (16%) Laborers and freight, stock, material movers (16%) Industrial truck and tractor operators (10%)
313	Textile mills	157 (60)	16.8 (22)	41	Overexertion - lifting... (30%)	Fall same level (14%)	Caught in, compressed (14%)	Sewing machine operators (25%) Laborers and freight, stock, material movers (11%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 (Continued)

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
713	Amusement, gambling, and recreation industries	646 (31)	7.3 (52)	42	Fall same level (23%)	Struck by object (19%)	Overexertion - lifting... (16%)	Landscaping and groundskeeping workers (13%) Amusement and recreation attendants (10%) Cooks, restaurant (8%)
115	Support activities for agriculture and forestry	25 (76)	23.1 (9)	43	Struck by object (24%)	Fall same level (19%)	Overexertion - lifting... (19%)	Farmworkers and laborers, crop, nursery, and greenhouse (24%) Farmers, ranchers, and other agricultural managers (19%)
316	Leather and allied product manufacturing	92 (67)	18.0 (18)	44	Overexertion - lifting... (26%)	Repetitive motion (26%)	Fall same level (10%)	Assemblers and fabricators, all other (40%) Shoe machine operators and tenders (22%) First-line supervisors of production and operating workers (8%) Sewing machine operators (8%)
812	Personal and laundry services	703 (30)	6.7 (55)	45	Overexertion - lifting... (21%)	Fall same level (17%)	Animal insect related (11%)	Laundry and dry-cleaning workers (8%) Hairdressers, hairstylists, and cosmetologists (7%) Landscaping and groundskeeping workers (6%)
711 ¥	Performing arts, spectator sports, and related industries	325 (47.5)	10.0 (41)	46	Struck by object (21%)	Fall same level (15%)	Other overexertion or bodily reaction (12%)	--
453	Miscellaneous store retailers	417 (42)	8.8 (48)	47	Overexertion - lifting... (24%)	Fall same level (19%)	Struck by object (18%)	Retail salespersons (18%) First-line supervisors of retail sales workers (17%) Light truck or delivery services drivers (9%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 (Continued)

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
541	Professional, scientific, and technical services	1,497 (16)	1.6 (74)	48	Fall same level (21%)	Overexertion - lifting... (20%)	Struck by object (9%)	Veterinary technologists and technicians (8%) Laborers and freight, stock, and material movers (4%) Managers, all other (3%)
446	Health and personal care stores	474 (38)	7.1 (53)	49	Fall same level (27%)	Overexertion - lifting... (26%)	Other overexertion or bodily reaction (9%)	First-line supervisors of retail sales workers (39%) Pharmacy technicians (13%) Cashiers (11%)
813	Religious, grant-making, civic, professional, and similar organizations	608 (32.5)	5.8 (59)	50	Overexertion - lifting... (23%)	Struck by object (14%)	Fall same level (13%)	Social and community service managers (12%) Teachers and instructors, all other (9%) Janitors, cleaners, exc. maids & housekeepers (9%)
314	Textile product mills	88 (69)	14.6 (27)	51	Overexertion - lifting... (28%)	Fall same level (16%)	Struck by object (16%)	Sewing machine operators (42%) Production workers, all other (12%) Industrial machinery mechanics (7%)
442	Furniture and home furnishings stores	265 (55)	10.0 (42)	52	Overexertion - lifting... (33%)	Struck by object (17%)	Fall same level (15%)	Retail salespersons (27%) Light truck or delivery services drivers (13%) First-line supervisors of retail sales workers (8%)
323	Printing and related support activities	296 (52)	8.9 (46)	53	Overexertion - lifting... (34%)	Fall same level (10%)	Struck by object (10%)	Printing press operators (34%) Production workers, all other (14%) Print binding and finishing workers (7%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
111	Crop production	129 (63)	12.3 (36)	54	Overexertion - lifting... (21%)	Struck by object (19%)	Fall same level (15%)	Farmworkers and laborers, crop, nursery, and greenhouse (40%) Farmers, ranchers, and other agricultural managers (12%) Agricultural equipment operators (6%)
447	Gasoline stations	299 (51)	8.8 (49)	55	Fall same level (23%)	Overexertion - lifting... (23%)	Struck by object (13%)	Customer service representatives (24%) Cashiers (17%) First-Line supervisors of retail sales workers (16%)
331	Primary metal manufacturing	111 (64)	11.5 (38)	56	Overexertion - lifting... (37%)	Struck by object (16%)	Caught in, compressed (11%)	Metal workers and plastic workers, all other (21%) Extruding and drawing machine setters, operators, and tenders, metal and plastic (12%) Production workers, all other (8%)
425	Wholesale electronic markets and agents and brokers	437 (40)	5.6 (62)	57	Overexertion - lifting... (30%)	Fall same level (19%)	Struck by object (8%)	Light truck or delivery services drivers (19%) Sales representatives, wholesale and manufacturing, exc. technical and scientific products (7%) Maintenance and repair workers, general (7%)
339	Miscellaneous manufacturing	384 (45)	6.1 (58)	58	Overexertion - lifting... (25%)	Fall same level (13%)	Struck by object (12%)	Production workers, all other (22%) Assemblers and fabricators, all other (9%) Machinists (5%)
448	Clothing and clothing accessories stores	388 (44)	5.0 (64)	59	Fall same level (22%)	Overexertion - lifting... (17%)	Struck by object (16%)	Retail salespersons (37%) First-line supervisors of retail sales workers (28%) Shoe machine operators and tenders (4%) Tailors, dressmakers, and custom sewers (4%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 **(Continued)**

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
333	Machinery manufacturing	313 (50)	5.8 (60)	60	Overexertion - lifting... (29%)	Fall same level (14%)	Struck by object (13%)	Assemblers and fabricators, all other (17%) Machinists (15%) Metal workers and plastic workers, all other (9%)
334	Computer and electronic product manufacturing	435 (41)	2.4 (71)	61	Fall same level (23%)	Overexertion - lifting... (20%)	Repetitive motion (12%)	Assemblers and fabricators, all other (15%) Electrical & electronic equipment assemblers (11%) Metal workers and plastic workers, all other (8%)
335	Electrical equipment, appliance, and component manufacturing	335 (59)	6.9 (54)	62	Overexertion - lifting... (36%)	Struck by object (11%)	Fall same level (11%)	Metal workers and plastic workers, all other (23%) Electrical and electronic equipment assemblers (19%) Production workers, all other (5%)
324	Petroleum and coal products manufacturing	27 (74)	9.7 (44)	63	Overexertion - lifting... (35%)	Fall lower level (15%)	Fall same level (10%)	Heavy and tractor-trailer truck drivers (19%) Industrial machinery mechanics (14%) Laborers and freight, stock, material movers (14%)
451 ¥	Sporting goods, hobby, musical instrument, and book stores	192 (58)	5.8 (61)	64	Overexertion - lifting... (30%)	Fall same level (15%)	Struck by object (14%)	--
325	Chemical manufacturing	266 (54)	4.7 (65)	65	Overexertion - lifting... (24%)	Fall same level (16%)	Struck by object (10%)	Production workers, all other (27%) Industrial machinery mechanics (7%) Laborers and freight, stock, material movers (7%)
712	Museums, historical sites, and similar institutions	93 (66)	6.6 (56)	66	Overexertion - lifting... (23%)	Fall same level (22%)	Slip, trip, no fall (10%)	Janitors, cleaners, exc. maids & housekeepers (12%) Maintenance and repair workers, general (12%) Production workers, all other (11%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 (Continued)

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
522 ¥	Credit intermediation and related activities	322 (49)	1.8 (73)	67	Fall same level (33%)	Overexertion - lifting... (16%)	Exposure stressful event (7%)	--
524	Insurance carriers and related activities	325 (47.5)	1.6 (75)	68	Fall same level (26%)	Overexertion - lifting... (11%)	Repetitive motion (11%)	Claims adjusters, examiners, & investigators (12%) Insurance claims and policy processing clerks (12%) Insurance sales agents (11%)
443	Electronics and appliance stores	141 (61)	5.5 (63)	69	Overexertion - lifting... (33%)	Struck by object (16%)	Slip, trip, no fall (8%)	Light truck or delivery services drivers (23%) Home appliance repairers (13%) Retail salespersons (9%)
511	Publishing industries (except internet)	244 (56)	1.9 (72)	70	Overexertion - lifting... (33%)	Fall same level (23%)	Slip, trip, no fall (7%)	Driver/sales workers (28%) Printing press operators (11%) Mail clerks and mail machine operators, exc. postal service (10%)
551	Management of companies and enterprises	286 (53)	1.4 (76)	71	Fall same level (26%)	Overexertion - lifting... (20%)	Slip, trip, no fall (9%)	Managers, all other (11%) Heavy and tractor-trailer truck drivers (8%) Residential advisors (7%)
512	Motion picture and sound recording industries	64 (71)	4.5 (66)	72	Overexertion - lifting... (30%)	Fall same level (16%)	Struck by object (16%)	Laborers and freight, stock, material movers (23%) Heavy and tractor-trailer truck drivers (13%) Carpenters (10%)
515	Broadcasting (except internet)	52 (72)	3.2 (69)	73	Fall same level (22%)	Overexertion - lifting... (22%)	Other overexertion or bodily reaction (15%)	Photographers (37%) Electrical and electronics engineering technicians (23%) Reporters and correspondents (7%)

Appendix F: **Full Table 3.1. All industry subsectors* by Prevention Index (PI), with most common events and occupations, Workers' Compensation (WC) lost wage claims**
Private sector, Massachusetts, 2014-2016 (Continued)

3-digit NAICS	Industry Title	WC Claim Count (rank)	WC Claim Rate (rank)	Subsector PI Rank**	Most Common Events § (%)			Most Common Occupations § (%)
					1	2	3	
315	Apparel manufacturing	26 (75)	3.5 (68)	74	Fall same level (24%)	Overexertion - lifting... (18%)	Repetitive motion (18%)	Sewing machine operators (50%) Retail salespersons (14%)
814	Private households	39 (73)	2.4 (70)	75	Fall same level (30%)	Overexertion - lifting... (30%)	Fall lower level (13%)	Maids and housekeeping cleaners (33%) Childcare workers (24%) Landscaping and groundskeeping workers (12%)
487	Scenic and sightseeing transportation	15 (78)	3.7 (67)	76	Fall same level (46%)	Other overexertion or bodily reaction (15%)		Transportation attendants, exc. flight attendants (23%) Reservation & transportation ticket agents & travel clerks (15%)
523 ¥	Securities, commodity contracts, and other financial investments and related activities	91 (68)	0.6 (77)	77	Fall same level (38%)	Struck by object (12%)	Roadway incident (9%)	--
519 ¥	Other information services	18 (77)	0.6 (78)	78	Roadway incident (25%)	Violence by person (17%)	Fall lower level (17%)	--

*Based on the 78 industry subsectors (3-digit NAICS) with 15 or more WC claims filed during 2014-2016 and for which Prevention Indices (PI) were computed. ** For PI Rank, industry subsectors scoring the lowest (1,2,3...) are prioritized higher. § Event coded according to BLS Occupational Injury and Illness Classification System at 2-digit level. Occupation coded according to the BLS Standard Occupational Classification System at the 6-digit level. Event and occupation percentages computed excluding claim records with missing information. ¥ Event and/or occupation codes were available for less than 60% of the claims within industry subsector; most common events or occupations not included for these industries.
Rates expressed as WC claims per 1,000 full-time workers.

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