Immediate Inpatient Hospitalizations for Work-Related Injury - Washington State, 2014

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SHARP
Safety & Health Assessment & Research for Prevention

Washington State Department of Labor & Industries

Executive Summary

Immediate inpatient hospitalizations resulting from work-related injuries are a small proportion of injuries but indicate a need for intervention to reduce hazards and diminish the risk for future injuries. This report describes the creation of a unique surveillance system designed to identify immediate inpatient hospitalizations in Washington State using a multi-step process linking WA workers' compensation (WC) data with WA hospital discharge data. Employers throughout the United States are required to report work-related immediate inpatient hospitalizations to their state or OSHA regional office. Characterizing these hospitalizations may be valuable both for prevention efforts and for development of surveillance programs in states that are interested in assessing the completeness of employers' reporting hospitalizations to their OSHA programs.

In Washington State in 2014, there were 668 immediate inpatient hospitalizations. Of these, 80% male, and more than half were over 45 years of age; 555 (83%) were covered by the State Fund (SF) and 113 (17%) were Self-Insured (SI). The SF immediate hospitalizations accounted for $35,632,712 dollars (costs at 1 year paid-to-date), 2,561 days spent in the hospital, and 123, 318 days of time loss paid. Among all claims, the most common injury types were 'fracture' and 'fractures and other injuries' (53%). The most common injury event or exposure leading to immediate hospitalization was "Fall from Elevation" (22%). Immediate hospitalizations peak in the third quarter of the calendar year. The highest rates were found in the Construction, and Agriculture, Forestry, Fishing and Hunting industry sectors.

Most immediate inpatient hospitalizations are traumatic injuries which significantly differs from all work-related hospitalizations, which reflect care for musculoskeletal disorders or subsequent hospitalizations occurring after the onset of a claim. The immediate inpatient work-related hospitalization surveillance system provides descriptive data regarding high risk industries, and results can be used to inform prevention efforts, to monitor trends over time and to evaluate employer compliance with reporting regulations.

Introduction

Work-related injuries that result in an immediate inpatient hospitalization are severe, costly, and often disabling injuries. Both Washington State's Division of Occupational Safety and Health[1] (DOSH) and the Federal Occupational Safety and Health Administration[2] (OSHA) require employers to report workplace injuries resulting in immediate inpatient hospitalizations. The WA reporting requirement is for employer reporting within 8 hours of the work-related injury inpatient hospitalization,[3] while the Federal OSHA requirement is employer reporting within 24 hours of the work-related injury inpatient hospitalization.[4]

Despite these state and federal reporting requirements, there is no reliable state or national tracking system to identify and characterize these injuries. Several existing Council of State and Territorial Epidemiologists (CSTE) Occupational Health Indicators (OHI) use hospital discharge data.[5] However, these indicators do not discriminate between immediate and later admissions (for progressive or chronic conditions or follow-up care), as hospital discharge records do not systematically capture the date of injury but instead include only the hospital admission date.

This report describes a unique surveillance system in Washington State created by linking hospital discharge data from the Comprehensive Hospital Abstract Reporting System[6] (CHARS) to workers' compensation (WC) records to identify and characterize immediate inpatient hospitalizations.

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[1] Washington State Division of Occupational Safety & Health: http://inside.lni.wa.gov/WISHA/

[2] Occupational Safety and Health Administration: https://www.osha.gov/

[3] Washington Administrative Code (WAC) 296-27-031 - Reporting fatalities, inpatient hospitalizations, amputations, and losses of an eye as the result of work-related incidents. (1) You must report to DOSH within eight hours of a work-related incident that results in: (a) A fatality; or (b) An inpatient hospitalization of any employee. http://apps.leg.wa.gov/wac/default.aspx?cite=296-27-031.

[4] OSHA Regulations PART 1904 – Recording and Reporting Occupational Injuries and Illness. **1904.39(a)(2)** Within twenty-four (24) hours after the in-patient hospitalization of one or more employees or an employee's amputation or an employee's loss of an eye, as a result of a work-related incident, you must report the in-patient hospitalization, amputation, or loss of an eye to OSHA. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12783.

[5] CSTE Occupational Health Indicators: http://www.cste.org/?OHIndicators

[6] http://www.doh.wa.gov/DataandStatisticalReports/HealthcareinWashington/HospitalandPatientData/HospitalDischargeDataCHARS

Methods

In Washington State, non-federal employers are required to obtain workers' compensation insurance through the Department of Labor and Industries' (L&I) industrial insurance system State Fund (SF), unless they meet specific requirements to self-insure, or are covered by an alternative workers' compensation system (e.g. Longshore and Harbor Workers' Compensation Program). The SF covers approximately two-thirds of Washington's 3.5 million workers. There are approximately 450 self-insured (SI) entities (companies or groups of companies) that are not included in the SF.[7] The information available for (SI) claims is different than for SF claims, therefore, some of the following information (e.g. costs) may be limited to SF claims only. The majority of hospitalized WA workers (555, 83.1%) were SF claims; there were 113 (16.9%) SI claims.[8]

Case Definition & Data Sources

A work-related immediate inpatient hospitalization is defined as a work-related injury that led to an inpatient hospital admission within 1 day of the injury event (based on day, not 24 hours).

Two data sources were used to identify cases: Washington's hospital discharge data called the Comprehensive Hospital Abstract Reporting System (CHARS), and the Washington workers' compensation (WC) data.

Washington hospital discharge data contains coded hospital inpatient information derived from hospital billing systems for individuals 14 years of age or older, including: age, sex, zip code and codes for

[7] For additional information describing the Washington State workers' compensation system, please refer to previous technical report, 64-1-2013, *"Prioritizing Industries for Occupational Injury and Illness Prevention and Research, Washington State Workers' Compensation Claims Data, 2002-2010."* Available at: http://www.lni.wa.gov/safety/research/files/bd_3f.pdf.

[8] Claim information (costs, time loss days, injury information) available to L&I for SI claims is often incomplete, therefore descriptive tables may be limited to SF claims only where noted.

diagnoses and procedures. The hospital discharge data excludes acute inpatient hospitalizations in non-Washington hospitals, and hospitalizations through Veterans' Affairs (VA) and military hospitals. The hospital discharge data elements used for this study include age, date of admission, first name, last name, date of birth (DOB), sex, and worker's zip code.

Workers' compensation claims in Washington State may be categorized in several ways;[9] primarily as accepted or rejected claims; and then, for accepted claims, split into 2 broad categories for discussion purposes– 'medical-only' and 'compensable' claims. 'Compensable' claims are claims resulting in payments of partial wage replacement, disability or death benefits. Washington workers compensation data for this study included all accepted claims for both State Fund (SF) and Self-Insured (SI) claims.

While claims were initially captured for data linkage as accepted claims, over time, claims may change status and data used in this report reflects what the status was at the time of initial case ascertainment. Because of this, while only accepted claims were used to link to hospital data, in the 2014 results there were 4 claims (2 SF, 2 SI) whose status changed and that ended up being rejected (<1%).

Linkage process

A multi-step linking algorithm was used that evaluates worker first and last name, birthdate, sex, and worker's residence zip code (common data elements in the two systems).

1. The first linkage attempt requires exact matches on all five linking variables and a hospital admission date within 1 day of work injury (obtained from the WC claim data).

[9] For further information regarding claim status classification, please refer to previously published descriptions such as the Prioritizing Industries for Occupational Injury and Illness Prevention and Research (2002-2010) report, http://www.lni.wa.gov/safety/research/files/bd_3f.pdf.

2. Subsequent linking attempts allow for matches on four of the five linking variables and a hospital admission date within 1 day of work injury (obtained from the WC claim data).

3. Final linking attempts allow for matches on name where the expected payer is WC and a hospital admission date within 1 day of work injury (obtained from the WC claim data); these potential links are then manually reviewed to confirm the match.

The dataset was limited to one discharge per claim (earliest admission). Unlinked records are excluded.

The WC claims used for linking are all accepted WC claims, including both State Fund (SF) and Self-Insured (SI) claims, with injury dates in the quarter of interest or the three preceding quarters (hospital data is organized by date of discharge and the injury and admission may not have occurred in the same quarter as discharge; e.g. a worker is hospitalized for several months).

After linkage, both the workers' compensation and hospital discharge data were used to characterize the causes and patterns of these injuries. Data elements from the Washington State workers' compensation system used for description included the Occupational Injury and Illness System codes to describe the injury, claimant demographic data, and claim cost and time loss data for State Fund claims. Hospital discharge data were used for capturing data on the length of stay and expected payer.

WC data for SI workers is also often incomplete in regards to claim coding information (nature of injury, source of injury, body part, event or exposure), time loss days paid, and cost data. Data from these SI workers is excluded in analyses of costs and time loss, and they may contribute to the "missing" or uncoded portions of other analyses (as noted).

Injury rates

Two different data sources are used as the denominator to calculate rates throughout this report. For rates by quarter and by industry, the data used are hours reported by the employer (payroll hours) to the

Department of Labor & Industries for WC purposes; these hours can be converted to full-time equivalent workers (FTEs). One FTE is defined as 2,000 hours per year (working 40 hours per week for 50 weeks per year).

For rates by county, age, and gender (information not available in employer reported hours), we used the U.S. Census Bureau Quarterly Workforce Indicators (QWI) Explorer Tool (U.S. Census Bureau. 2017. Quarterly Workforce Indicators Data. Longitudinal- Employer Household Dynamics program; available at: http://lehd.ces.census.gov/data/#qwi).

Results

There were 668 immediate work-related hospitalizations (linked to WC) in Washington State in 2014. The Construction industry had the largest percentage of claims (22%). The most common accident type was 'Falls' (38%), and the most common nature of injury was "fracture" (53%). Hospitalizations (both in count and rate) peaked in the third quarter of the calendar year (Table 1). The observed 2014 immediate hospitalization rate was 27.7 per 100,000 FTE.

Claim Status

Of the 668 claims, at the time of analysis, 664 were accepted (99.4%) and 4 were rejected (<1%). Of the 664 accepted claims, 615 (92.6%) were compensable.

By Quarter

Number & rate of immediate hospitalization for work-related injury varied by quarter, peaking in the third quarter.

Table 1. Immediate inpatient work-related hospitalization by quarter, Washington State, 2014.

Quarter	By Hospital Discharge Date	Quarterly Rate per 100,000 FTE
2014Q1	145	25.5
2014Q2	156	25.6
2014Q3	193	31.4
2014Q4	174	28.1
Year Total	***668***	***27.7***

Expected Payer

The majority of claims (92%) had an expected payer code in the hospital data indicating it would likely be paid for by the Dept. of Labor and Industries as a workers' compensation claim. However, 54 (8%), had other expected payer codes. This represents a unique population of work-related injuries that would otherwise be hard to capture.

Worker Demographics

Age & Gender

Men made up the majority of hospitalizations (Table 2) and higher rates of immediate hospitalization (Table 3, Figure 1). For men, length of stay ranged from 1-66 days (mean 4.6 days, median 2 days). There were 130 women hospitalized, with a range of 1-28 days (mean 3.9 days, median 3 days). There were 2,561 total days spent in hospital.

Table 2. Median days of inpatient stay by age group and gender, immediate work-related hospitalizations in WA, 2014.

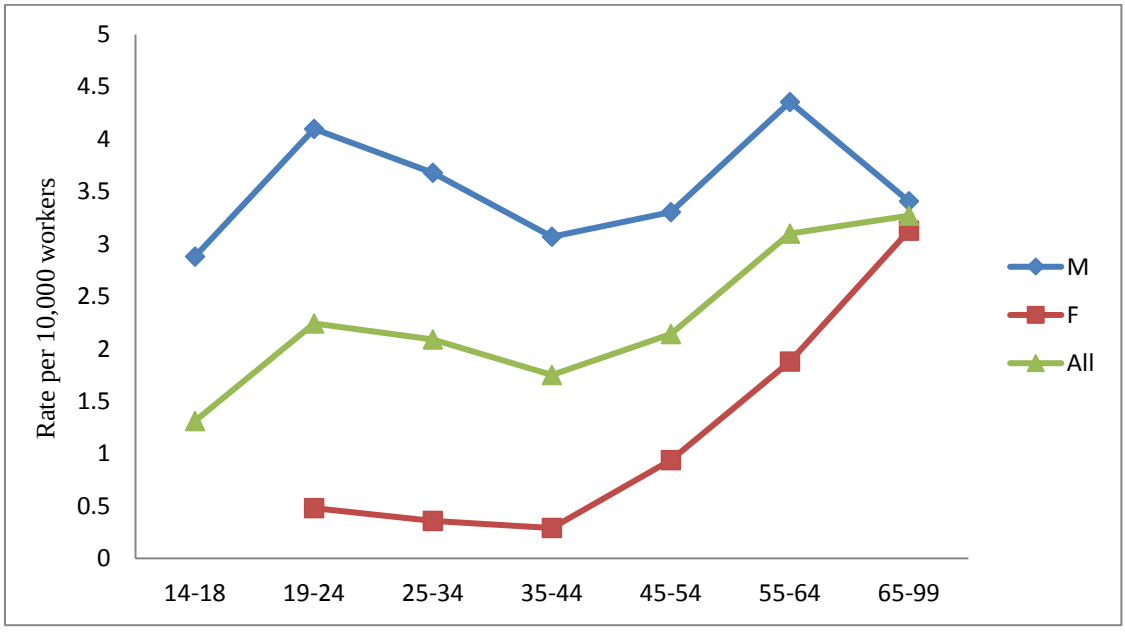
	All Workers			Women			Men		
Age group	n (%)	Median stay (Q1-Q3)		n (%)	Median stay (Q1-Q3)		n (%)	Median stay (Q1-Q3)	
14-18	6 (<1)	1.5	(1-3)	--	--	--	6 (<1)	1.5	(1-3)
19-24	64 (9.5)	2	(1-4)	7 (1)	2	(1-3)	57 (8.5)	2	(1-4)
25-34	134 (20.1)	2	(1-5)	11 (1.7)	2	(1-6)	123 (18.4)	2	(1-5)
35-44	115 (17.2)	2	(1-6)	9 (1.3)	2	(1-5)	106 (15.9)	2	(1-6)
45-54	140 (21)	3	(1-5)	30 (4.5)	3	(2-4)	110 (16.5)	2	(1-5)
55-64	156 (23.4)	3	(1-5)	48 (7.2)	3	(2-5.5)	108 (16.2)	3	(2-5)
65+	53 (7.9)	4	(2-6)	25 (3.7)	4	(3-6)	28 (4.2)	4	(2-6)
All	*668*	*3*	*(2-5)*	*130 (19.5)*	*3*	*(2-5)*	*538 (80.5)*	*2*	*(1-5)*

Table 3. Rate of immediate work-related hospitalization per 10,000 workers, by age and gender, WA, 2014.

Age category	Male	Female	All
14-18	2.88	--	1.31
19-24	4.10	0.48	2.24
25-34	3.68	0.36	2.09
35-44	3.07	0.29	1.75
45-54	3.30	0.94	2.14
55-64	4.36	1.88	3.10
65+	3.41	3.13	3.27
TOTAL	**3.58**	**0.90**	**2.27**

Denominator data (employment by age and gender) obtained using the Quarterly Workforce Indicators (QWI) Explorer Tool. U.S. Census Bureau. 2017. Quarterly Workforce Indicators Data. Longitudinal- Employer Household Dynamics program. http://lehd.ces.census.gov/data/#qwi.

Figure 1. Immediate Inpatient Hospitalizations rate per 10,000 workers, by age and gender, Washington State, 2014.



Denominator data (employment by age and gender) obtained using the Quarterly Workforce Indicators (QWI) Explorer Tool. U.S. Census Bureau. 2017. Quarterly Workforce Indicators Data. Longitudinal-Employer Household Dynamics program. http://lehd.ces.census.gov/data/#qwi.

Language Preference

There were 107 workers who reported preferring a language to communicate with the agency. Of these 107, 88 (82.2%) indicated a preference for communication in Spanish. The other 19 workers indicated preferences including: Vietnamese, Chinese, Korean, Cambodian, Laotian, and Russian.

Table 4. Prefers a language other than English with which to communicate with the agency.

Prefer Other Language	Number (%)
No	561 (84.0)
Yes	107 (16.0)

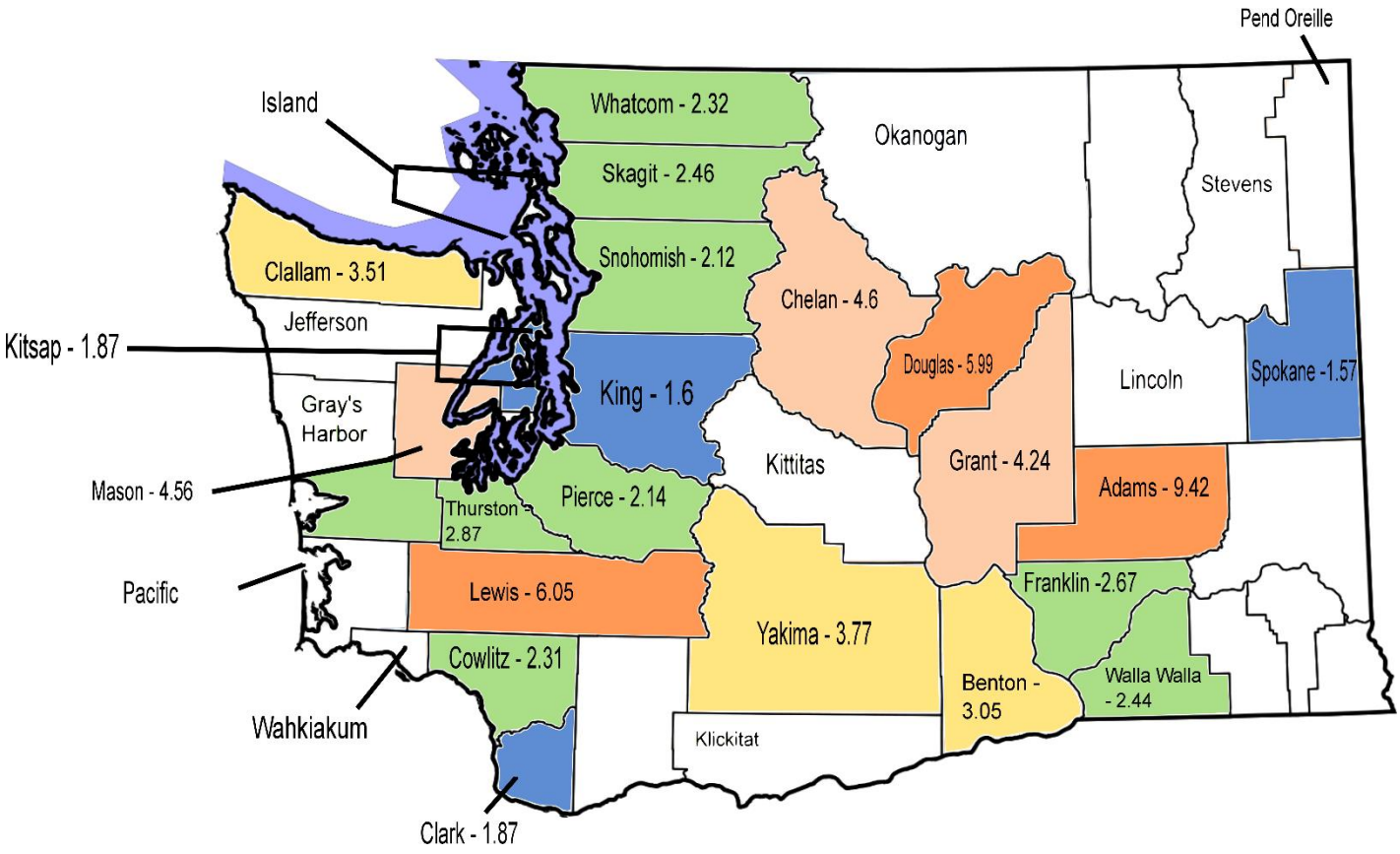
County of Accident

Table 5. Number and rate of immediate hospitalizations for work-related injury per 10,000 workers, by county of accident, Washington State, 2014.

County	Frequency	Percent	Rate / 10,000 workers	County	Frequency	Percent	Rate / 10,000 workers
King	200	29.94	1.60	Adams	7	1.05	9.42
Pierce	57	8.53	2.14	Clallam	7	1.05	3.51
Snohomish	55	8.23	2.12	Douglas	6	<1	5.99
Yakima	38	5.69	3.77	Mason	6	<1	4.56
Spokane	32	4.79	1.57	Walla Walla	6	<1	2.44
Thurston	29	4.34	2.87	Grays Harbor	<5	<1	--
Clark	25	3.74	1.87	Kittitas	<5	<1	--
Benton	24	3.59	3.05	Okanogan	<5	<1	--
Chelan	18	2.69	4.60	Island	<5	<1	--
Whatcom	18	2.69	2.32	Jefferson	<5	<1	--
Grant	15	2.25	4.24	Klickitat	<5	<1	--
Lewis	13	1.95	6.05	Lincoln	<5	<1	--
Kitsap	12	1.80	1.87	Stevens	<5	<1	--
Skagit	11	1.65	2.46	Pacific	<5	<1	--
Cowlitz	8	1.20	2.31	Pend Oreille	<5	<1	--
Franklin	8	1.20	2.67	Wahkiakum	<5	<1	--

Rates suppressed for small numbers (≤5). Denominator data (employment by county) obtained using the Quarterly Workforce Indicators (QWI) Explorer Tool. U.S. Census Bureau. 2017. Quarterly Workforce Indicators Data. Longitudinal-Employer Household Dynamics program. http://lehd.ces.census.gov/data/#qwi.

Figure 2. Immediate hospitalization rate per 10,000 workers, by county of accident and average employment, Washington State, 2014.



Rates for Grays Harbor, Kittitas, Okanogan, Island, Jefferson, Klickitat, Lincoln, Stevens, Pacific, Pend Oreille, and Wahkiakum counties are suppressed due to small numbers; no rates calculated for Asotin, Columbia, Ferry, Garfield, San Juan, Skamania, or Whitman county due to unstable census estimates;16 hospitalizations had out of State zip codes reported, 29 had invalid zip codes reported. Denominator data (employment by county) obtained using the Quarterly Workforce Indicators (QWI) Explorer Tool. U.S. Census Bureau. 2017. Quarterly Workforce Indicators Data. Longitudinal-Employer Household Dynamics program. http://lehd.ces.census.gov/data/#qwi.

There are a high number of immediate inpatient hospitalizations in Washington's most populous counties (Table 5, Figure 2) - King County (which includes the City of Seattle), Snohomish County (Everett), Spokane County (Spokane) and Pierce County (Tacoma) however these counties have relatively low rates of immediate hospitalization for work-related injury due to the large populations of exposed workers. Less dense counties such as Wahkiakum have a much higher rate – but are based on small numbers and are therefore less reliable estimates. Differences in counties with similar employment numbers may be a more valuable tool for identifying risks. Jefferson, Adams, and Klickitat all averaged approximately 7,000 workers in 2014, but Adams had a rate three times higher than the other two counties. The difference in rates by county also likely represents the industry mix across the state, which varies geographically (e.g. agriculture concentrated primarily on the Eastern side of the state).

Claim Costs & Days of Time Loss Paid

All tables in this section present data on SF claims that had cost (Table 6) and time loss (Table 7) data. There were 113 SI claims that were excluded. For cost data (Table 6) there were 3 SF claims that had missing data and were also excluded. For time loss (Table 7), of the 555 SF claims, there were 146 claims that did not have any recorded days of time loss (26.3%). For the 409 SF claims with time loss, days lost ranged from 1-940 days; mean time loss was 293.6 days, median 179 days, mode 8.0 days (Q1-Q3: 59-567 days). There were 123,318 total days of time loss paid for immediate inpatient hospitalizations (SF only) in Washington in 2014.

Table 6. Claim costs at 1-year claim maturity for immediate inpatient work-related hospitalizations, Washington State, 2014.

	@ 1 Year Paid-to-date	@ 1 Year Medical Costs
Mean	$64,552	$48,388
Median	$42,013	$27,608
Range	$265 - $964,766	$265 - $946,813

Table 7. Days of time loss for immediate inpatient work-related hospitalizations, Washington State, 2014.

(SF) Days of time loss paid	Frequency (%)
0 days	146 (26.3)
1 to 6 days	9 (1.6)
7 to 13 days	14 (2.5)
14 to 31 days	34 (6.1)
32 days or more	352 (63.4)

Injury Information

The most common injury type (event or exposure) was 'Fall from Elevation' (22%). Both major types and the top 10 detailed events or exposures are presented in Table 8. The majority of detailed event/exposures that resulted in a work-related acute hospitalization were fall-related.

- In comparison to all workers' compensation claims filed with an injury date in 2014, the distribution by event or exposure, differs from that of all workers' compensation claims filed with an injury date of 2014 as a whole.
- The high proportion of falls from elevation (and other acute traumatic injuries) in immediate inpatient work-related hospitalizations is unique. For accepted claims in the entire insurance pool in 2014, 4.2% of claims filed were for 'fall from elevation,' and 7.4% for 'fall on same level.'

The majority (21.4%) were for 'overexertion and repetitive motion', followed by 'bend, reach, twist, trip, slip' (9.2%).

Table 8. Immediate inpatient work-related hospitalizations, by event or exposure, Washington State, 2014.

Major types of Event or Exposure*	Frequency (%)
Fall from elevation	149 (22.3)
Struck by/against	131 (19.6)
Fall on same level	84 (12.6)
Transportation accidents	61 (9.1)
Caught in/under/between	53 (7.9)
Musculoskeletal disorders	16 (2.4)
Assaults & violent acts	14 (2.0)
Temperature	13 (1.9)
Overexertion	11 (1.6)
Toxics	10 (1.5)
All other types w/<10 ea.	33 (4.9)
Total	668
Top 10 detailed Event or Exposure**	
Fall to floor, walkway, or other surface	76 (11.4)
Fall from ladder	61 (9.1)
Struck by falling object	54 (8.0)
Caught in running equipment or machinery	33 (4.9)
Fall from nonmoving vehicle	24 (3.6)
Contact with objects and equipment, unspecified	20 (3.0)
Fall onto or against objects	20 (3.0)
Fall to lower level, not elsewhere classified	18 (2.7)
Caught in or compressed by equipment or objects, unspecified	14 (2.1)
Struck by slipping handheld object	13 (1.9)
Nonclassifiable	13 (1.9)
All Other	332 (49.7)
Total	668

** Occupational Injury and Illness Classification System, v.1.01 (2007); 93 were blank (10 SF, 83 SI).*

*** Occupational Injury and Illness Classification System, v.1.01 (2007);18 were blank (SI).*

Body Part

Table 9. Immediate inpatient work-related hospitalization, by body part injured, Washington State, 2014.

Part of Body injured (OIICS*)	Frequency (%)
Multiple body parts	152 (22.8)
Lower Extremities	144 (21.6)
Ankles	*33*
Lower Leg(s)	*31*
Knees	*24*
Trunk	140 (20.9)
Hips	*30*
Multiple Trunk Locations	*23*
Chest, except internal…	*15*
Upper Extremities	127 (19.0)
Finger(s), Fingernail(s)	*50*
Hand(s), except finger(s)	*20*
Head	54 (8.1)
Brain	*23*
Body Systems	18 (2.7)
Nonclassifiable	10 (1.5)
Neck	6 (<1%)
Blank	18
Total	**668**

** Occupational Injury and Illness Classification System, v.1.01 (2007).*

Nature of Injury

Of the 668 immediate inpatient work-related hospitalizations in 2014, half (53%) involved 'fractures' or 'fractures and other injuries.' Fracture claims alone accounted for 42% of the total claims costs for all SF immediate inpatient work-related hospitalizations in Washington State in 2014 (Table 10).

- In the industry/occupation groups that had the most claims (Tables 13-14), the leading injury nature within each of the detailed groups presented was fractures, primarily caused by Falls from Elevation.

Table 10. Immediate inpatient work-related hospitalization, by nature of injury, Washington State Fund, 2014.

Nature of Injury*	Frequency (%)	Total Claim Cost @ 1 year ($)	Median Cost ($)
Fractures	241 (43.6)	$15,063,714	$47,677
Fractures and other injuries	97 (17.6)	$7,536,728	$59,629
Cuts, lacerations	23 (4.2)	$838,292	$33,356
Sprains, strains, tears	15 (2.7)	$573,751	$14,144
Heat burns, scalds	14 (2.5)	$304,103	$6,989
Punctures, except bites	13 (2.3)	$351,003	$19,524
Amputations, fingertip	9 (1.6)	$561,507	$59,529
Bruises, contusions	8 (1.4)	$287,402	$20,257
Amputations, except fingertip	7 (1.2)	$816,900	$51,690
Nonclassifiable	5 (<1)	$697,040	$168,076
All Other	120 (21.7)	$8,602,269	$21,414
Total	**552**	**$35,632,711**	**$42,013**

** SF claims only (n=552). Occupational Injury and Illness Classification System, v.1.01 (2007); 3 SF claims were excluded for missing cost data (1 each: amputation, fingertip; fracture; other respiratory system diseases, not elsewhere classified).*

Source

Table 11. Immediate inpatient work-related hospitalization, by leading source of injury, Washington State, 2014.

Source*	Frequency (%)
Ground - outdoors	79 (11.8)
Work surface, unspecified	74 (11.1)
Floor	43 (6.4)
Bodily Motion	28 (4.2)
Unknown / Unidentified	24 (3.6)
Trees / Limb / Snag	20 (3.0)
Structural Metal	14 (2.1)
Person, Other	12 (1.7)
Person, Injured	11 (1.6)
All Other	301 (45.1)
Total	**668**

** Occupational Injury and Illness Classification System, v.1.01 (2007); 18 were blank.*

Industry & Occupation

Industry

- By industry sector, the most immediate work-related hospitalizations occurred in Construction (22%) (Figure 3), followed by Agriculture, Forestry, Fishing, and Hunting (13%).[10] These two sectors also had the highest rates of injury per 10,000 workers (Table 12).
- The leading industries were 'New Single-Family Housing Construction'; 'Roofing Contractors'; 'Landscaping Services', and 'Logging' (Table 13).

Table 12. Number and rate of immediate work-related hospitalization per 10,000 workers, by NAICS Industry Sector, WA, 2014.

North American Industry Classification Sector (2-digit)*	n (%)	Rate per 10,000 FTE
Construction	150 (22.5)	11.2
Agriculture, Forestry, Fishing and Hunting	87 (13.0)	9.8
Transportation and Warehousing	48 (7.2)	6.7
Administrative and Support and Waste Management and Remediation Services	59 (8.8)	4.4
Wholesale Trade	41 (6.1)	3.5
Manufacturing	81 (12.1)	3.0
Public Administration	29 (4.3)	2.2
Other Services (except Public Administration)	20 (3.0)	2.2
Educational Services	30 (4.5)	1.7
Retail Trade	38 (5.7)	1.3
Accommodation and Food Services	18 (2.7)	1.1
Professional, Scientific, and Technical Services	15 (2.2)	1.0
Health Care and Social Assistance	25 (3.7)	0.8
All other Industry Sectors ≤10 each	27 (4.0)	1.0

Denominator date to calculate rates by industry comes from employer reporting of hours to the Department of Labor & Industries. FTE = 2000 hours.

[10] For more detail on immediate inpatient work-related hospitalizations in Crop/Animal Production Agriculture, please see SHARP technical report Technical Report # 96-03-2017: http://www.lni.wa.gov/safety/research/files/agri_hosp_2011_2015.pdf

Table 13. Immediate hospitalization for work-related injury by select detailed industry,* Washington State, 2014.

Industry Sector (NAICS 2-digit) (*italics = detailed industry subtotals)*	Frequency (%)	Most common injury type
Construction (23)	150 (22.5)	
236115 -New Single-Family Housing Construction (exc. Operative Builders)	*19*	*Fall from Elevation (71%)*
236118 - Residential Remodelers	*12*	*Fall from Elevation (75%)*
238130 - Framing Contractors	*16*	*Fall from Elevation (56%)*
238160 - Roofing Contractors	*18*	*Fall from Elevation (72%)*
Agriculture, Forestry, Fishing and Hunting (11)	87 (13.0)	
111331 – Apple Orchards	*13*	*Fall from Elevation (36%)*
113310 - Logging	*17*	*Struck By/Against (53%)*
Administrative and Support and Waste Management and Remediation Services (56)	59 (8.7)	
561320 - Temporary Help Services	*14*	**
561720 - Janitorial Services	*7*	*Fall from Elevation (57%)*
561730 - Landscaping Services	*18*	*Fall from Elevation (44%)*
Transportation & Warehousing (48-49)	48 (7.2)	
484121 – General Freight Trucking, Long-Distance, Truckload	*9*	*Fall from Elevation (44%)*

** North American Industry Classification System (NAICS) assigned to employer account; this table presents detailed industry codes for industry sectors where these industries make up a substantial proportion of the total claims within the sector.*
*** The majority of injury nature information was missing for these claims.*

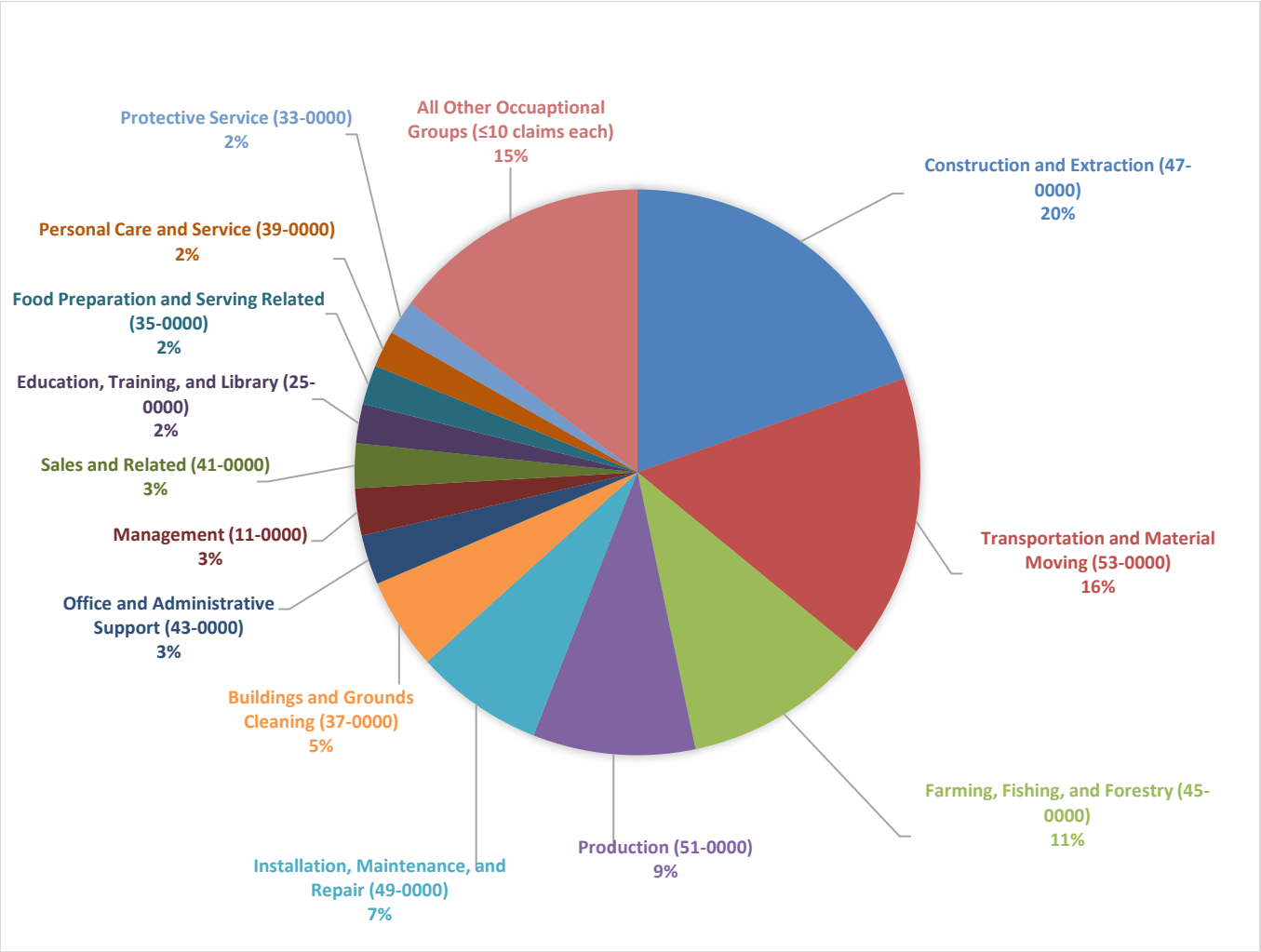
- Fall injuries (both from elevation and on same level), accounted for 34.8% of all immediate work-related hospitalizations. 'Fall from elevation' was the leading injury type in Construction (75% of all injuries in NAICS 236118 Residential Remodelers); Administrative and Support and Waste Management and Remediation Services; Transportation and Warehousing; and Other Services (except Public Administration) (Table 13). 'Fall on Same Level' injuries were the leading cause of injury in Retail Trade; Educational Services; Health Care and Social Assistance; Accommodation and Food Services; and Professional, Scientific and Technical Services (Table 13).

- In Agriculture, Forestry, Fishing and Hunting, 'Struck by/against' injuries were the leading injury type, specifically 'Struck by falling object' (56%), with 'Trees, Logs' being a major source (40%) of 'Struck by/against injuries' (primarily in NAICS 113310 Logging) (Table 13).
- In Manufacturing, the leading injury type was 'Caught in/under/between', of which 61% were 'Caught in Running Equipment or Machinery' and the associated sources included: conveyers, presses, chippers, and band saws, among others (Table 13).

Occupation

- Construction and Extraction (47-0000) and Transportation and Material Moving (53-0000) had the largest proportion of immediate work-related hospitalizations (Figure 4).
- The leading detailed occupations were 'Construction Laborers'; 'Laborers & Freight, Stock, Material Movers, Hand', 'Farmworkers & Laborers, Crop, Nursery, Greenhouse', and 'Truck Drivers, Heavy and Tractor-Trailer' (Table 14).

Figure 3. Immediate hospitalization for work-related injury, by major occupational group,* Washington State, 2014.



**Standard Occupational Classification System, 2000; major groups.*

Table 14. Immediate hospitalization for work-related injury by select detailed occupation group,* and injury type, Washington State, 2014.

Occupation Major Group (SOC 2000*) *Select Detailed Occupation (representing large proportion)*	**Frequency (%)**	**Most common injury type**
Construction and Extraction (47-0000)	131 (19.6)	
47-2061 Construction Laborers	*47*	*Fall from Elevation (43%)*
47-2031 Carpenters	*20*	*Fall from Elevation (55%)*
47-2181 Roofers	*16*	*Fall from Elevation (69%)*
Transportation and Material Moving (53-0000)	109 (16.3)	
53-7062 Laborers & Freight, Stock, Material Movers, Hand	*35*	*Fall Same Level & Struck By/Against (20% ea.)*
53-3032 Truck Drivers, Heavy & Tractor-Trailer	*34*	*Transportation Accidents (26%)*
Farming, Fishing, and Forestry (45-0000)	72 (10.8)	
45-2092 Farmworkers & Laborers, Crop, Nursery, Greenhouse	*35*	*Fall from Elevation (34%)*
Production (51-0000)	62 (9.3)	
51-9199 Production Workers, All Other	*16*	*Fall Same Level (25%)*
Installation, Maintenance, and Repair (49-0000)	49 (7.3)	
49-9099 Installation, Maintenance, & Repair Workers, All Other	*11*	*Caught In & Struck By/Against (27% ea.)*
Buildings and Grounds Cleaning (37-0000)	35 (5.2)	
37-2011 Janitors & Cleaners, exc. Maids/Housekeeping	*16*	*Fall from Elevation (50%)*
37-3011 Landscaping & Groundskeeping Workers	*10*	*Fall from Elevation (40%)*

*Standard Occupational Classification System, 2000; major groups; this table presents detailed occupation codes for major occupational groups where these occupations make up a substantial proportion of the total claims within the group.

Employer Information

There were 603 unique employers associated with these immediate inpatient hospitalizations, as identified by assigned Unified Business Identifier (UBI) number associated with the claim; there were 20 claims where the associated UBIs were unmatched. UBIs are assigned to businesses licensed by the State of Washington (used by several WA agencies) and are used for the identification of businesses/locations and for tax purposes.[11]

[11] http://bls.dor.wa.gov/faqlicense.aspx

- There were 37 businesses (6%) which had more than one immediate work-related hospitalization. Of these, 26 (70%) had 2 hospitalizations, 10 (27%) had 3-5 hospitalizations and 1 business (2%) had 11 hospitalizations in 2014.
- The majority of immediate work-related hospitalizations were workers employed in businesses with 100 or more FTE (Table 16), followed by those employed in businesses with less than 5 FTE. In Washington State as a whole during 2014 (not just those with claims or immediate hospitalizations), the majority of employers (as identified by UBI) reported <5 FTE (73.4%), while those with 100+ FTE accounted for less than 2%.

Table 15. Immediate work-related hospitalization by employer size, Washington State, 2014.

Employer Size (FTE)	# Employers (by UBI)	%
<5	116	19.9
5 - <10	55	9.4
10 - <25	88	15.1
25 - <50	69	11.8
50 - <100	56	9.6
100+	199	34.1
Total	583	

State OSHA Activity in Employer Accounts

Washington is an approved Occupational Safety and Health Administration (OSHA) State Plan state[12], and the Washington State Dept. of Labor and Industries Division of Occupational Safety & Health (DOSH)[13] develops and enforces safety & health rules.

[12] https://www.osha.gov/dcsp/osp/index.html
[13] http://www.lni.wa.gov/SAFETY/TOPICS/ATOZ/ABOUT/DEFAULT.ASP

Of the 603 employers associated with an immediate hospitalization in 2014, 323 employers (53.5%) had at least one DOSH enforcement or consultation activity in the same year[14]. Certain types of incidents (e.g. motor vehicle accidents) are usually not inspected.

Of the 603 employers with an immediate hospitalization in 2014:

- 34.2% of employers had an inspection specifically flagged as being the result of a work-related hospitalization event. *(Caution should be taken when interpreting this result as the field may not be populated for all claims.).*
- 282 (46.7%) had a DOSH activity within 90 days after the hospitalized injury.
- 299 (49.6%) had a DOSH activity within 180 days after the hospitalized injury.
- Of the 603 employers, 137 (22.7%) had some DOSH activity in the 365 days prior to the first injury in 2014 resulting in a work-related hospitalization.

[14] Activities may have occurred at worksites other than the location of the injury.

Discussion

Immediate inpatient hospitalizations for work-related injuries make up a small proportion of claims filed (<1% of claims with an injury date in 2014), but these injuries are costly, disabling, and personally devastating. Information on the leading causes of injuries that result in immediate hospitalization can be used to more efficiently target prevention efforts.

The CSTE Occupational Health Indicators (OHI) are another method to count work-related hospitalizations based on WA hospital discharge data. Using OHI #2 (all work-related hospitalizations), there were 3,707 hospitalizations and a rate of 113.4/per 100,000 employed persons in WA for 2014; OHI #22 (severe traumatic hospitalizations), which focuses on a list of diagnoses codes, yields 408, a rate of 12.5 per 100,000 employed persons in WA for 2014. In comparison, this analysis found 668 immediate inpatient work-related hospitalization, a rate of 27.7 per 100,000 FTE. While the difference in denominator (employed persons vs. FTE) makes direct comparison difficult, using the immediate hospitalization method provides an additional perspective on acute work-related hospitalizations in WA.

This subset of claims linked to immediate inpatient work-related hospitalizations differs from that of all claims filed in that they are composed of higher proportions of acute traumatic injuries, e.g. falls, fracture injuries, as opposed to work-related musculoskeletal disorders, which make up the largest proportion of all Washington workers' compensation claims and non-immediate inpatient hospitalizations.

In comparison to all workers' compensation claims filed with an injury date in 2014, the distribution by nature of injury as well as event or exposure, differs from that of all workers' compensation claims filed with an injury date in 2014 as a whole. In all 2014 claims, <4% were fractures (including 'fractures and other injuries') while the majority (25%) were 'sprains, strains, and tears' – injuries that may arise from chronic exposures. In contrast to the high proportion of immediate hospitalizations related to falls from

elevation or on same level found in this data, in all 2014 claims, only 4.2% of claims filed were for 'fall from elevation,' and 7.4% for 'fall on same level.' The majority of all 2014 claims (21.4%) were for 'overexertion and repetitive motion', followed by 'bend, reach, twist, trip, slip' (9.2%).

The high proportion of traumatic injuries in immediate inpatient hospitalizations exemplifies how this data differs from other measures of work-related injuries including hospitalizations that do not differentiate by immediacy of admission (which often include a large percentage musculoskeletal disorder admissions). The immediate inpatient work-related hospitalization surveillance system provides descriptive data regarding high risk industries, and results can be used to inform prevention efforts, to monitor trends over time and to evaluate employer compliance with reporting regulations.

Limitations

There are some limitations in this study. WA hospital data does not include hospitalizations at out-of-state facilities, Veterans' Affairs (VA), or military hospitals. This limitation may lower rates in counties adjacent to Oregon and Idaho and underestimate the total number of immediate inpatient hospitalizations. Additionally, the hospital data quarterly datasets are usually available more than 6 months after the end of the quarter, and are considered preliminary until the release of the entire calendar year (a dataset including Q1 through Q4), which typically is available in summer (June/July) of the following year. Therefore, the data are not timely and can't be used as a substitute for employer reporting or other reporting mechanisms (e.g. using insurance authorization for hospital admissions), that may capture the data in real-time. WC data for SI workers is also often incomplete in regards to claim coding information (nature of injury, source of injury, body part, event or exposure), time loss days paid, and cost data, however we do not expect SI data to differ from SF hospitalization data..

Strengths

This surveillance system presents unique strengths, in that it uses information from two data sources to capture the population of interest, including those workers in the hospital data that do not have WC as the expected payer. This is a population that would otherwise not be found in existing measures of work-related hospitalizations. Additionally, WC has rich administrative data with which to characterize these claims and identify avenues for prevention, as well as providing the opportunity to examine employer characteristics which may also be inaccessible from other data sources.

The immediate inpatient work-related hospitalization surveillance system provides valuable descriptive data regarding high risk industries, and results can be used to inform prevention efforts, to monitor trends over time and to evaluate employer compliance with reporting regulations.

Focusing on inpatient admission within one day of injury date (without limiting to a prescribed range of diagnoses) allow us to fully characterize the nature and extent of these work-related injuries. Immediate inpatient work-related hospitalizations are preventable. The differences in distribution of event/exposure and nature of injury found in immediate inpatient work-related hospitalizations highlight the need for this type of surveillance system which can identify common injuries and hazards and suggest avenues for injury prevention efforts.

Information for action

- The highest number & rate of immediate hospitalizations occurred in the 3rd quarter of the year (Table 6), reflecting the seasonality of some hazardous tasks (e.g. falls associated with ladders in apple orchards in Agriculture).
- Almost 20% of workers immediately hospitalized for work-related injury preferred communicating in a language other than English (Table 4). Safety training and hazard information should be available in a workers' preferred language.

- Falls represent a large proportion of immediate inpatient hospitalizations across industries; suggesting that strategies to reduce such injury events would greatly the burden of such injuries. Possible strategies include: industry specific education and training programs, focused interventions using evidence based methods to reduce falls.
- In the Manufacturing industry 'Caught in…' injuries are a leading cause of immediate hospitalizations, caused by workers being caught or compressed in running machinery; this demonstrates the continued importance of proper machine guarding and lock-out/tag-out procedures for the prevention of serious injuries.
- The majority of workers were employed with either smaller businesses with less than 5 FTE or with larger employers (100+ FTE), which suggests prevention efforts should be directed in ways that can meet the needs of diverse employers. Previous WA research suggests that for fixed site employers, DOSH consultation & enforcement activities are associated with a substantial decrease in claims rates for the one year following the activity.[15] Washington employers can request a free and confidential L&I Consultation (http://lni.wa.gov/Safety/Consultation/About.asp).

[15] Foley, M. 2016. DOSH Compliance and Consultation Visits and Compensable Claims Rates in Washington State, 2014-2015. SHARP Technical Report #70-7-2016. Available at: http://www.lni.wa.gov/safety/research/files/cnetechreport2016.pdf