

Workers' Compensation Costs in Wholesale and Retail Trade Sectors¹

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Introduction

The wholesale and retail trade (WRT) sector employs nearly 20 million workers. The wholesale trade sector is identified by the Bureau of Labor Statistics' (BLS) North American Industry Classification System (NAICS) code 42, and the retail trade sector is identified by the NAICS codes 44 and 45. According to the Current Population Survey (CPS), wholesale trade sector employment in 2010 was 3.8 million and retail trade sector employment was 15.9 million. About 55 percent of WRT workers were male [BLS 2011a]. In the same year, the WRT sector had 633,500 nonfatal injuries [BLS 2011b] and 502 fatalities [BLS 2012a]. The incidence rate of nonfatal injuries in the wholesale trade sector was 3.3 per 100 full-time equivalent workers, and in the retail trade sector the rate was 4.0 per 100 full-time equivalent workers in 2010. These figures compare to 3.6 per 100 full-time equivalent workers in all private sectors in 2010 [BLS 2012b]. The incidence rate of fatal injuries in the wholesale trade sector was 4.9 per 100,000 full-time equivalent workers, and in the retail trade sector 2.2 per 100,000 full-time equivalent workers. These figures compare to 3.8 per 100,000 full-time equivalent workers in all private sectors in 2010 [http://www.bls.gov/iif/oshwc/foi/foi_revised10.pdf]. The incidence rates for fatality in wholesale trade and nonfatality in retail trade are higher than the average of all private industries. Studies have shown that at the 4- and 5- digit NAICS codes of WRT industries, a wide range of

work activities and physical hazards may cause a substantial risk [NIOSH 2006]. These workplace hazards cause fatal and nonfatal injuries that result in an immense loss to the employers, employees, and the economy. Some of these losses are covered by the Workers' Compensation (WC) system, and the rest are distributed to the employers in the form of lost productivity, to the employees and their family members as pain and suffering, and to society [Safe Work Australia 2012]. This study focuses on the indemnity costs and medical costs of fatal and nonfatal injuries in WRT for the years 2003 through 2007. WC costs are used to estimate the losses in WRT sectors by body parts injured and nature of injury.

Data

Primary data for this study are obtained from BLS and the National Council on Compensation Insurance (NCCI). BLS provides the number of fatal and nonfatal injuries by the nature of injury and body parts injured. The number of fatalities is obtained from Census of Fatal Occupational Injuries (CFOI) research files. WC data on indemnity costs (WC payments for lost wages) and medical costs are obtained from NCCI by the nature of injury and body parts injured. The NCCI data has about 1.4 million claims on WRT for the years 2003 through 2007. The NCCI WC costs utilized are incurred costs and not current paid costs. Incurred costs are forward-looking, that is, the amount that needs to be set aside today to account for current and any future costs [Leigh and Marcin 2012].

¹ Disclaimers: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health. This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

Methods

The medical cost per claim and the indemnity cost per claim obtained from NCCI data are used as the average medical cost and the average indemnity cost. These average medical costs and average indemnity costs are classified by the different body parts injured and the nature of the injury. Total medical costs are obtained from the product of average medical cost from NCCI and number of nonfatal injuries and fatal injuries from BLS. Total indemnity costs are estimated from the product of average indemnity cost from NCCI and number of nonfatal injuries and fatal injuries from BLS. Total WC costs are estimated as the sum of total medical costs and total indemnity costs. The number of fatalities by nature of injury for most categories was too small to report, so that is not included in the study.

Results

Table 1 shows the number of nonfatal injuries, average WC costs in 2010 dollar values (average cost is the sum of average medical cost and average indemnity cost), total WC costs (TWC) and the percentages of injuries by different body parts injured from 2003 through 2007. Both the number of nonfatal injuries and average WC costs decreased over the years (except for the number of arm injuries and the average WC costs of neck injuries). The results show that from the year 2003 through 2007, the WRT sector had a decrease of 8% for “All” nonfatal injuries, a decrease of 34% for “All” average WC (AWC) costs and a decrease of 39% for “All” TWC costs. The frequencies and percentages of back injuries (59,194 and 24% in 2003, and 48,190 and 22% in 2007) are highest among all the different types of body parts injured, followed by multiple body parts and trunk injuries. The AWC costs are highest for the neck injuries (\$36,448 in 2003, and \$37,711 in 2007) followed by the shoulder injuries (\$29,161 in 2003, and \$22,306 in 2007). The TWC costs are highest for back injuries (\$1.5 billion in 2003, and \$0.7 billion in 2007).

Table 2 shows the number of nonfatal injuries, AWC and TWC costs in 2010 dollar values, and percentages of injuries by the different nature of injuries from 2003 through 2007. The results are similar to Table 1, suggesting that the number of nonfatal injuries and AWC costs by different nature of injuries decreased over the years (except for number of amputations and number of fractures). The frequencies and percentages of sprain and strain (108,537 and 45% in 2003, and 89,008 and 40% in 2007) are highest among all the different types of nature of injuries, followed by contusion and concussion. AWC costs are the highest for amputations (\$52,566 in 2003, and \$43,505 in 2007) followed by fractures (\$27,548 in 2003, and \$22,809 in 2007). The TWC costs are highest for sprain and strain (\$2.1 billion in 2003, and \$1.1 billion in 2007).

Table 3 shows the number of fatal injuries, AWC and TWC costs in 2010 dollar values and percentages of the injuries by the different body parts injured from 2003 through 2007. The number of fatal injuries increased from 2003 (545) to 2005 (613) and then decreased to 551 in 2007. AWC costs decreased from \$334,537 in 2003 to \$212,030 in 2004 and then increased to \$280,915 in 2007 for all fatalities. Frequencies and percentages of multiple body parts injured (178 and 33% in 2003, and 232 and 42% in 2007) and head injuries (165 and 30% in 2003, and 122 and 22% in 2007) are the highest among all the body parts injured. The AWC varied a lot during this period for the different body parts injured. AWC costs for neck injuries were the highest for 2007 (\$550,711) while AWC costs for head injuries were the highest for 2003 (\$411,496). The TWC costs are highest for 2003 head injuries (\$68 million) and 2007 multiple body parts injuries (\$68 million).

Table 4 shows the medical costs, indemnity costs, and total costs for fatal and nonfatal injuries separately and together. It also shows the total medical costs and indemnity costs in 2010 dollar values for all injuries and the total estimated WC costs for the years 2003 through 2007. The results suggest that the medical costs

decreased for both fatal (from \$61 million in 2003 to \$10 million in 2007) and nonfatal injuries (from \$1.1 billion in 2003, to \$0.9 billion in 2007), but the indemnity costs increased for fatal injuries (from \$121 million in 2003 to \$145 million in 2007) and decreased for nonfatal injuries (from \$3.7 billion in 2003 to \$2.1 billion in 2007). The estimated total WC costs (sum of medical costs and indemnity costs) for all fatal and nonfatal injuries in the WRT sector decreased from \$4.9 billion in 2003 to \$3.1 billion in 2007, a decrease in 38 percent. Chart 1 shows that the total WC costs, total indemnity costs and total medical costs have dropped similarly in these years. It also shows that total non-fatal WC costs and total fatal WC costs have almost remained the same during these years.

Discussion

Many studies have demonstrated that WC systems do not compensate for all fatal and nonfatal injuries, as there are conditions and incentives that discourage the submission of a WC claim, and the compensation itself is inadequate [Azaroff et al. 2002; Leigh and Robbins 2004; Bonauto et al. 2010]. Previous studies focusing on the WRT sector have concluded that the health burden of occupational injuries and fatalities is substantial for the WRT sector [Anderson et al. 2010]. The value of determining the true economic burden of occupational injuries and illnesses lies in the potential benefit for the employers, employees, and society from reducing the hazards and improving workplace safety. This is the first attempt to estimate the medical costs and indemnity costs of fatal and nonfatal injuries for the WRT sector. Due to the large number of employees in this sector, even a small increase in injury rates can significantly affect the burden for the employers, employees, and society. The outcomes obtained suggest that the estimated total WC costs have decreased from 2003 through 2007, yet they remain high. This decline is due to the drop in the number of nonfatal injuries and average WC costs. A reason behind this decline in WC costs for nonfatal injuries could be increased under-reporting over the years. According to

BLS data [BLS 2004, 2005, 2006, 2007, 2008], disabling injuries (that is, injuries that involve days away from work and cases of job transfer restriction due to injuries) are approximately 55 percent of all injuries. Nondisabling injuries (that is, injuries that do not require days away from work) are approximately 45 percent. Leigh et al. [2000] suggested that about 35% of nondisabling injuries are underreported and 20% of disabling injuries are underreported. Therefore, an average of 28% underreporting can be assumed for all nonfatal injuries; with this assumption, the total costs of nonfatal injuries will be \$6.9 billion in 2003, and \$4.2 billion in 2007 in 2010 dollar values. Another reason for the decline in indemnity costs could be that injured workers are brought back to work earlier and better accommodated while they are on the mend.

Medical costs for fatalities are highly unstable, varying from \$9.54 million (in 2007) to \$61.38 million (in 2003) for fatal injuries. This can be both because of highly variable numbers of fatalities and because of the strong rightward skew of the cost per case distribution (high cost outliers).

The results obtained by body parts injured and nature of injury (data not shown) suggest that the total costs are highest for back injuries, fractures, and sprain and strains. Many of the employers in the WRT sector are small businesses with low profit margins. Therefore, any workplace injury is more detrimental to these employers compared with large corporations. Controlling exposures triggering these injuries will prevent the injuries, improve productivity, and will reduce losses in the economy.

Limitation and Future Research

This study estimates the medical costs and indemnity costs of fatal and nonfatal injuries in WRT. A true economic burden will incorporate indirect costs of fatal and nonfatal injuries accounting for the pain and suffering of the injured workers and the underreporting of occupational injuries that are not included in this study. There is also a difference between the number of WC claims and BLS counts; the BLS capture rate is smaller than the WC

capture rate [Boden et al. 2010], and this study utilized BLS counts with no adjustments for underreporting. There is a need for more research to determine the factors contributing to the most expensive treatments, such as back injuries and head injuries, which have the highest WC average medical costs. Another needed extension is an analysis incorporating all major industries. Work-related injury data are publicly available from BLS, but the WC data are only available from individual WC bureaus, some of which are so expensive it is impractical to conduct comprehensive research studies. Different states have different WC systems, and they cannot be directly linked to BLS injury data. Improved linkage between the WC data and BLS injury data would help researchers predict the true economic burden of workplace injuries and fatalities.

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Table 1. Number, Average WC Costs, Total WC Costs (in 2010 dollar values) and Percentages of Injuries by Body Parts Injured for Nonfatal Injuries

Body Parts	Number/Costs	2003	2004	2005	2006	2007
Arm	Number	9,695	9,216	10,101	9,225	10,064
	Percent	3.99	3.85	4.28	4.20	4.51
	AWC Costs (\$)	19,119	18,421	17,234	16,091	13,853
	TWC Cost (\$ mil.)	185	170	174	148	139
Back	Number	59,194	59,858	53,398	50,338	48,190
	Percent	24.36	24.99	22.63	22.90	21.61
	AWC Costs (\$)	26,280	22,785	20,383	16,411	14,096
	TWC Cost (\$ mil.)	1,556	1,364	1,088	826	679
Head	Number	15,879	14,054	14,921	15,133	15,547
	Percent	6.53	5.87	6.32	6.88	6.97
	AWC Costs (\$)	26,717	27,819	22,027	19,518	18,583
	TWC Cost (\$ mil.)	424	391	329	295	289
Multiple Body Parts	Number	21,446	21,197	20,284	19,105	21,372
	Percent	8.82	8.85	8.60	8.69	9.58
	AWC Costs (\$)	24,864	25,375	25,380	20,983	18,167
	TWC Cost (\$ mil.)	533	538	515	401	388
Neck	Number	3,742	4,285	3,557	3,180	3,345
	Percent	1.54	1.79	1.51	1.45	1.50
	AWC Costs (\$)	36,448	33,173	34,129	28,506	37,711
	TWC Cost (\$ mil.)	136	142	121	91	126
Shoulder	Number	15,916	15,252	15,280	15,133	14,948
	Percent	6.55	6.37	6.48	6.88	6.70
	AWC Costs (\$)	29,161	28,163	26,345	24,111	22,306
	TWC Cost (\$ mil.)	464	430	403	365	333
Trunk	Number	16,782	16,414	17,086	14,773	14,386
	Percent	6.90	6.85	7.24	6.72	6.45
	AWC Costs (\$)	18,753	17,573	16,067	14,359	12,888
	TWC Cost (\$ mil.)	315	288	275	212	185
All	Number	243,045	239,524	235,976	219,802	223,046
	AWC Costs (\$)	19,778	18,341	16,892	14,464	13,079
	TWC Cost (\$ mil.)	4,807	4,393	3,986	3,179	2,917

The percentages do not add up to 100 percent as the 'Other' category is not included in the table.

Table 2. Number, Average WC Costs, Total WC Costs (in 2010 dollar values) and Percentages of Injuries by Nature of Injuries for Nonfatal Injuries

Nature of Injury	Number/ Costs	2003	2004	2005	2006	2007
Amputation	Number	903	1,327	1,263	903	1,005
	Percent	0.37	0.55	0.54	0.41	0.45
	AWC Costs (\$)	52,566	44,392	41,180	42,003	43,505
	TWC Cost (\$ mil.)	47	59	52	38	44
Burns	Number	2,894	3,364	3,428	3,226	2,617
	Percent	1.19	1.40	1.45	1.47	1.17
	AWC Costs (\$)	10,923	12,650	12,181	14,633	8,271
	TWC Cost (\$ mil.)	32	43	42	47	22
Contusion/ Concussion	Number	25,150	24,284	23,538	21,492	21,787
	Percent	10.35	10.14	9.97	9.78	9.77
	AWC Costs (\$)	15,814	14,184	12,728	10,700	9,324
	TWC Cost (\$ mil.)	398	344	300	230	203
Carpal Tunnel Syndrome	Number	3,290	2,682	2,627	2,064	2,193
	Percent	1.35	1.12	1.11	0.94	0.98
	AWC Costs (\$)	25,711	22,441	21,286	21,537	20,228
	TWC Cost (\$ mil.)	85	60	56	44	44
Fracture	Number	15,852	16,663	17,547	16,220	17,815
	Percent	6.52	6.96	7.44	7.38	7.99
	AWC Costs (\$)	27,548	27,288	24,798	24,858	22,809
	TWC Cost (\$ mil.)	437	455	435	403	406
Sprain/ Strain	Number	108,537	106,316	102,979	94,307	89,008
	Percent	44.66	44.39	43.64	42.91	39.91
	AWC Costs (\$)	19,943	18,610	17,241	14,692	12,770
	TWC Cost (\$ mil.)	2,165	1,979	1,775	1,386	1,137
All	Number	243,045	239,524	235,976	219,802	223,046
	AWC Costs (\$)	19,778	18,341	16,892	14,464	13,079
	TWC Cost (\$ mil.)	4,807	4,393	3,986	3,179	2,917

The percentages do not add up to 100 percent as the 'Other' category is not included in the table.

Table 3. Number, Average WC Costs, Total WC Costs and Percentages of Injuries by Body Parts Injured for Fatal Injuries (in 2010 dollar values)

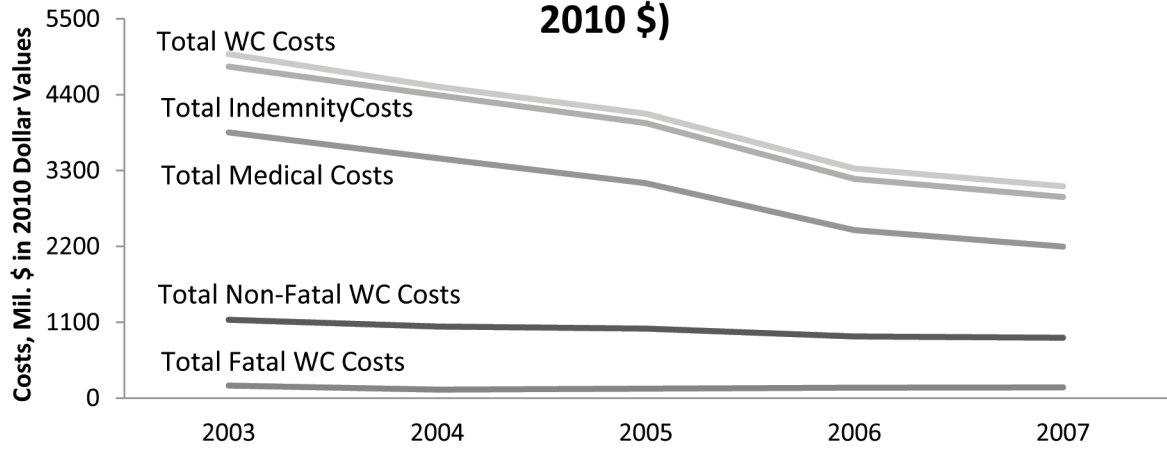
Body Parts	Number/Costs	2003	2004	2005	2006	2007
Back	Number	12	11	15	7	12
	Percent	2.20	1.89	2.45	1.20	2.18
	AWC Costs (\$)	349,538	188,154	132,078	265,965	0
	TWC Cost (\$ mil.)	4	2	2	2	0
Head	Number	165	161	154	159	122
	Percent	30.28	27.66	25.12	27.37	22.14
	AWC Costs (\$)	411,496	251,434	161,830	261,122	222,131
	TWC Cost (\$ mil.)	68	40	25	42	27
Multiple Body Parts	Number	178	213	230	219	232
	Percent	32.66	36.60	37.52	37.69	42.11
	AWC Costs (\$)	309,514	200,479	241,481	259,405	294,167
	TWC Cost (\$ mil.)	55	43	56	57	68
Neck	Number	11	14	13	12	20
	Percent	2.02	2.41	2.12	2.07	3.63
	AWC Costs (\$)	294,107	243,724	81,993	399,984	550,711
	TWC Cost (\$ mil.)	3	3	1	5	11
All	Number	545	582	613	581	551
	AWC Costs (\$)	334,537	212,030	223,114	260,655	280,915
	TWC Cost (\$ mil.)	182	123	137	151	155

The percentages do not add up to 100 percent as the 'Other' category is not included in the table.

Table 4. Medical Costs and Indemnity Costs of Nonfatal and Fatal Injuries (Mil. \$) (in 2010 dollar values)

Year	Nonfatal Injuries			Fatal Injuries			All Injuries		
	Medical (\$)	Indemnity (\$)	Total (\$)	Medical (\$)	Indemnity (\$)	Total (\$)	Medical (\$)	Indemnity (\$)	Total (\$)
2003	1,075	3,732	4,807	61	121	182	1,136	3,853	4,989
2004	1,025	3,368	4,393	13	110	123	1,038	3,478	4,516
2005	985	3,001	3,986	21	116	137	1,007	3,116	4,123
2006	874	2,305	3,179	21	130	151	895	2,435	3,331
2007	865	2,052	2,917	10	145	155	875	2,197	3,072

Chart 1: Medical, Indemnity and Total WC Costs (in 2010 \$)



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