Work-related Musculoskeletal Disorders of the Neck, Back, and Upper Extremity in Washington State, 1997-2005

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REPORT SUMMARY

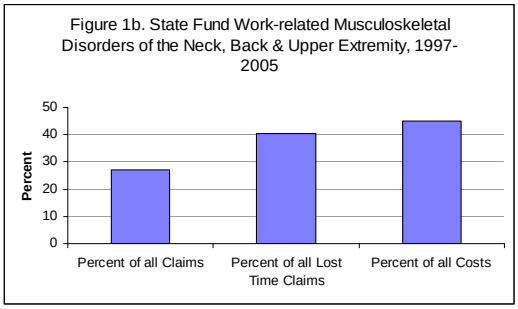
JZ, a 20-year-old man developed rotator cuff problems during his two months of pulling pallets through a cut down saw. Through 18 months of medical treatment and work conditioning, he was able to re-enter the workforce on a regular basis as a light truck driver. He missed 257 days of work, incurred $24,392 in medical and lost time costs.

OBJECTIVES We report the frequency, incidence rate (number of new claims per 10,000 full-time equivalent employees FTEs, CIR), severity rate (number of lost days per 10,000 FTEs, SR), cost, lost time and industry distribution of work-related musculoskeletal disorders (WMSDs) in Washington State in order to monitor and help focus prevention efforts by business, labor and government.

METHODS In the current study we examined State Fund workers' compensation claims for general and selected specific hand/wrist, elbow, shoulder, neck and back disorders in 1997-2005. We examined the Self-Insured closed compensable (four or more lost time days) claims data for general categories because diagnostic codes (ICD-9) were unavailable. We used a prevention index (PI) to rank industries by taking the average rank by incidence rate and rank by number of claims. We used the North American Industrial Classification System (NAICS) codes for industry for national comparison purposes. We used the Washington State Industrial Risk Classes (WIC) to reflect workers' compensation classes.

The focus was on non-traumatic soft tissue musculoskeletal disorders. These musculoskeletal disorders, when caused or aggravated by work activities (for example, exposures to frequent or heavy manual handling, awkward postures, forceful or repetitive exertions) are referred to as Work-related MSDs or WMSDs. The lower extremity is not included in this report. We also included individual characteristics of gender, age and body mass index identified in the claims data to explore potential interactions with industry and WMSDs.

RESULTS Between 1997 and 2005 there were more than 50,000 State Fund and Self-Insured workers' compensation accepted claims for WMSDs per year in Washington State.



There were 336,608 State Fund accepted claims for WMSDs of the neck, back and upper extremity, averaging 37,401 per year, and resulting in:

- $4.1 billion in direct costs
- 27% of all State Fund-accepted claims
- 36% were compensable (four or more timeloss days) versus 24% of all claims
- Average claims incidence rate (CIR) of 258.0 claims and severity rate (SR) of 18,461 days per 10,000 full-time equivalent employees (FTEs)
- Average compensable claims incidence rate of 92.9 per 10,000 FTEs
- Average of 217 timeloss days per compensable WMSD claim
- 51% of claims involved back disorders, 37% involved upper extremity disorders

The average number of State Fund WMSD claims for the neck, back and upper extremity was 37,401 per year and averaged $12,377 per claim.

There was a significant decrease in accepted State Fund CIR for all claims, -5.9% per year over the study period ($p<0.0001$). The CIR for WMSDs decreased -5.6% per year ($p<0.0001$), slightly slower than the -5.9% for all non-WMSD claims. Decreases in rates of neck (-5.5% per year), back (-5.5% per year) and upper extremity (-5.4% per year) WMSDs decreased significantly but not differently than for all other claims. There was no difference in median body mass index (BMI) for all compensable WMSD claims compared to all claims (BMI=27.2). Those with WMSDs tended to be on the job about two months longer than those with other claims (14 versus 12 months).

For the Self-Insured, coded data was available only for compensable closed claims (four or more lost time days). There were 74,361 compensable closed WMSD claims (8,282 per year) resulting in:

- 47% of all Self-Insured compensable closed claims
- Average compensable CIR of 140 per 10,000 FTEs
- 46% were back disorders and 39% were upper extremity disorders
- Claims rate for all compensable claims decreased on average -5% per year, and for WMSDs, -4.7%, not significantly different from - 5.2% for all other claims.

Since approximately 30% of Self Insured claims are compensable, the estimated number of total (medical only + compensable) WMSD claims per year would be approximately 27,600 over the study period.

The CIR for all State Fund compensable claims decreased -4.0% per year ($p<0.0001$) with no difference in decrease between WMSD compensable CIR and all other compensable claims.

We looked at several specific diagnostic codes (ICD-9) for WMSDs in the State Fund and found:

For **sciatica**, there were 7,478 accepted claims (808 per year), with a CIR of 5.7 and a severity rate (SR) of 1,954 days per 10,000 FTEs, they were extremely costly:

- $69,237 per claim on average
- 77.6% were compensable with an average time loss of 554 days
- The CIR for accepted sciatica claims decreased -1.5% per year, compared to -5.9% for all other claims.

For **rotator cuff syndrome**, there were 22,611 accepted claims (2,512 per year) with:

- An average CIR of 17.3 claims and SR of 2,344 days per 10,000 FTEs
- Average cost of $32,169 per claim
- 63% were compensable with an average time loss of 334 days
- The CIR decreased -1.2% per year over the study period ($p<0.0002$), significantly slower than the -5.9% for all other claims ($p<0.02$).

For **epicondylitis**, there were 14,467 accepted claims (1,607 per year) with:

- An average CIR of 11.1 claims and severity rate of 546.6 days per 10,000 FTEs
- Average cost of $12,006 per claim
- 41.8% were compensable with an average time loss of 271 days
- There was a significant decrease in CIR, -2.3% per year, over the study period, not significantly different than other claims ($p<0.09$).

For **carpal tunnel syndrome**, there were 26,685 accepted claims (2,965 per year) with:

- An average CIR of 20.4 claims and SR of 2,478 days per 10,000 FTEs
- Average direct cost of $22,686 per claim
- 65% were compensable

- Average time loss was 258 days
- The CIR decreased significantly (-4.8% per year, p<0.0001), slightly slower than -5.9% for all other claims.

Among State Fund compensable claims, rotator cuff syndrome incidence increased 1.5% per year (p<0.01) while all other claims decreased significantly averaging -4.4 per year (p<0.001) and epicondylitis decreased significantly slower (-1.9% slower) than non cases (-4.0% per year, p<0.05).

For **hand/wrist tendonitis**, there were 19,908 accepted claims (2,212) per year with:

- An average CIR of 15.3 and SR of 1,199 per 10,000 FTEs
- Average cost of $14,045 per claim
- 41% were compensable with an average time loss of 264 days
- The CIR decreased significantly over the study period, -5.4% per year (p<0.0001) but not significantly faster than all other claims. For compensable claims, the decrease -2.6%, slower than the decrease for all other claims (-4.03%). The difference was of was borderline significance (p<0.10).

Gender: In some respects, men and women have the same compensable claims incidence pattern by age group for industries where they are likely to be doing similar types of work such as retail, health care and manufacturing (Figures 2a and 2b). WMSD incidence rates tend to peak in the 35-44 age groups but go down more rapidly for men by the 45-54 age groups. For men in transportation the peak is between 25-34 years, and for women between 35-44 years. Although in construction, rates for both men and women peak between 35-44, the incidence rate for women is about three times higher. This may reflect different tasks. The incidence rate is somewhat higher for men, primarily because they are more concentrated in construction. Mean lost days tend to increase with age for both men and women through 55-64 (Figures 2c and 2d). There are some spikes for women in construction and agriculture in the oldest age group, probably due to the volatility of small numbers of women in these age/industry groups. For both men and women, the longest lost work days are in construction, followed by agriculture.

We used the Prevention Index (PI) to identify industries with the greatest impact of WMSDs. Industries are listed in rank order by the number of claims and by the rate of claims. The PI is the average of the two ranks for each industry. An industry therefore is high on the PI if it has a relatively high number of claims and a relatively high CIR.

In the State Fund, Construction, Health Care and Manufacturing sectors ranked first, second and third on the PI. Among the Self-Insured, Health Care, Public Administration and Transportation and Warehousing were top sectors.

We calculated the PI for industries classified by their 4-digit NAICS codes and also calculated a rate ratio for each industry by comparing the CIR for each industry with the overall state CIR. A rate ratio of 3, for example, means that the rate for that industry is 3 times the overall state rate. The top 12 industries for <u>combined</u> <u>State Fund and Self-Insured</u> compensable WMSDs were:

1. **Couriers** (NAICS 4921) RR=4.3
2. **Scheduled Air Transportation** (NAICS 4811) RR=3.5
3. **Foundation, Structure & Exterior Building Contractors** (NAICS 2381) RR=2.5
4. **Nursing Care Facilities** (NAICS 6231) RR=2.6
5. **General Freight Trucking (**NAICS 4841**)** RR=2.5
6. **Building Finishing Contractors** (NAICS 2383) RR=2.3
7. **Community Care Facilities for Elderly** (NAICS 6233) RR=2.4

8. **Residential Building Construction** (NAICS 2361) RR=2.0
9. **General Medical Surgical Hospitals (NAICS 6221) RR=1.9**
10. **Other Wood Products Manufacturing (NAICS 3219) RR=2.3**
11. **Grocery Stores (**NAICS 4451) RR=1.8
12. **Waste Collection** (NAICS 5621) RR=3.4

We also looked at industry by using the Washington Industrial Classification (WIC) codes. These codes are used for industrial insurance purposes and they code industries by similar processes and exposures. While in general the results are similar to the NAICS analysis, there are some high-risk industries not otherwise identified.

Conclusions Work-related musculoskeletal disorders continue to be a large and costly problem in Washington State. The incidence rates for most WMSDs are decreasing; in some cases, the rate is relatively flat (epicondylitis, sciatica) or increasing (compensable rotator cuff syndrome). Severity rates have increased since last year's report. The highest risks are in industries characterized by manual handling and forceful repetitive exertions. Temporary Agency workers appear to be at particularly high risk.

These estimates of the burden of WMSDs are an underestimate because the lower extremity is not included, there is evidence of under-reporting of these kinds of disorders in the literature, and the indirect costs to the employer, employee and society are not included.

Top 12 Industries for WMSDs by Prevention Index and Washington Industrial Classification (WIC)

Rank	State Fund WIC	Rate Ratio	Self-Insured Compensable WIC	Rate Ratio
1	6108 Nursing Homes	3.8	1101 Parcel Package Delivery	4.4
2	0507 Roofing	4.7	6802 Airlines, Ground Crew	5.0
3	2105 Beer Distributors	4.1	0803 Cities – all other Employees NOC	2.7
4	0510 Wood Frame Bldg Construction	2.7	6904 Fire Fighters	3.3
5	6907 Moving Companies	5.5	1102 Trucking, NOC	2.9
6	0504* Wallboard Installation	5.5	1501 Counties – all other Employees NOC	2.4
7	2903 Wood Products Mfg	2.8	6402 Supermarkets	2.3
8	7201 State Health Care Facilities	3.0	6801 Airlines, Flight Crew	4.2
9	0518 Building Const NOC	2.9	1405 Ambulance Service	7.5
10	7114 Temp Help – Assembly	4.1	6104 Schools, all other Employees	2.3
11	4305 Garbage Collection	3.9	7104 Temporary Help Admin. Staff	19.4
12	7117 Temp Help-Machine Op	6.6	6602 Janitorial Service	3.1

NOC = Not Otherwise Classified, All Other Employees = Grounds keeping, Maintenance, etc.

Temp Help ─ Administrative in Self-Insured also has temporary assembly and machine operator claims.

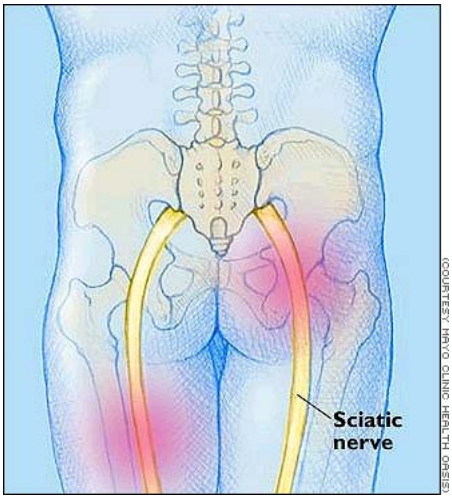
* Consolidated discounted and undiscounted classes

1.0 INTRODUCTION

Someone once said that “every statistic is a dried tear.” That sounds pretty dramatic but with every work-related musculoskeletal disorder claim statistic is a worker in pain. Take for example, HN, a 54-year-old terminal worker who developed sciatica during her six years on the dock. She missed 370 days of work over the 18 months of medical treatment costing $29,780. Incurred cost of her claim was $54,400. She eventually returned to work with her employer of injury.

This study uses workers’ compensation claims data from Washington State to examine the frequency, incidence, cost, and industry distribution of new neck, back and upper extremity (hand/wrist, elbow, and shoulder) disorders, and respectively sciatica, carpal tunnel syndrome (CTS), hand/wrist tendonitis, epicondylitis and rotator cuff syndrome (RCS) as examples of more specific diagnoses within these body region categories.

Sciatic pain is manifested as radiating low back pain that goes below the knee. This very sensitive (95%) indicator of lumbar disc herniation (Deyo, 1992) has been associated with manually handling heavy loads.

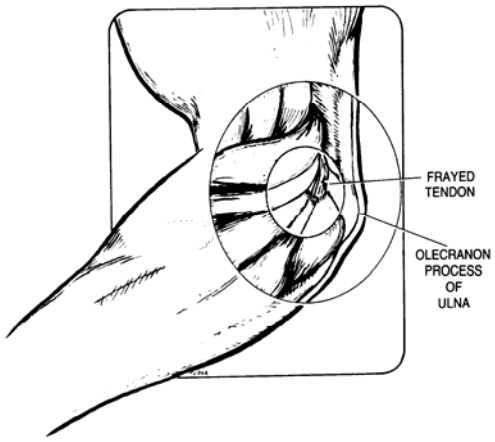


Carpal tunnel syndrome (CTS) is the compression of the median nerve at the wrist, due to ischemia or inflammation.

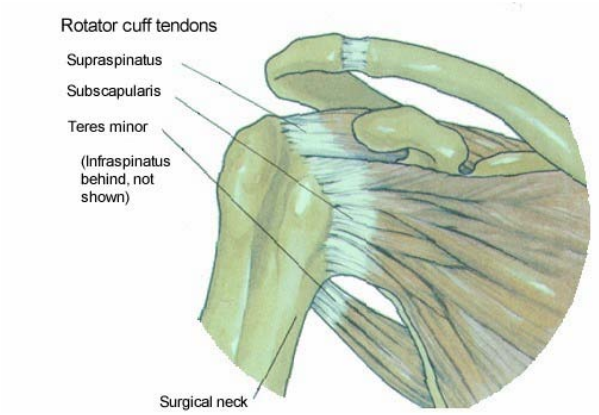
CTS is characterized by numbness, tingling, or pain in the median nerve distribution of the hand (first 3 ½ fingers), frequently worse symptoms at night. Work-related CTS has been associated with high repetition, force, awkward wrist postures and segmental

vibration (Bernard, 1997; Viikari-Juntura and Silverstein, 1999). A recent study by Ettema (2006) suggested that shear forces related to rapid or forceful finger motions cause tendon scarring in the carpal tunnel. Melchior (2006) reported increased risk with wrist flexion of more than two hours per day in women.

Epicondylitis is an inflammation of the tendon at the elbow (lateral epicondylitis or tennis elbow is most common). Epicondylitis is characterized by pain during resisted maneuvers that load the tendons and by tenderness on tendon palpation. Repetitive forceful postures such as twisting or pronation of the forearm combined with extension of the wrist while gripping have been associated with epicondylitis.



Rotator cuff syndrome involves inflammation, degeneration and tear of the tendons around the shoulder (with the supraspinatus tendon most



frequently involved). Pain with certain motions is common, particularly against resistance. Tearing usually results in weakness. Work-related shoulder disorders have generally been attributed to high static or repetitive loads on the shoulder girdle, particularly in combination with abduction, rotation or flexion (Bernard, 1997; Melchior et al, 2006).

Each of these specific conditions has also been associated with an acute traumatic onset (e.g., falls).

The objectives in this study were to estimate the overall and yearly trends in claim incidence rates, lost workdays and costs over the period 1997-2005, for general and specific work-related musculoskeletal disorders. We also wanted to identify industries where there are the highest rates and numbers of claims to focus prevention efforts.

KEY TERMS

Claims incidence rate (CIR): number of new claims per 10,000 full-time equivalent (FTE) workers per year.

Severity rate (SR): number of lost days per 10,000 full-time equivalent (FTE) workers per year.

Relative risk or rate ratio: Incidence rate of specific industry divided by incidence rate for all industries. Relative risk of more than 1 indicates risk in that industry is more than for all industries combined.

WIC: Washington Industrial Classification equals the 4-digit “Risk Class” in the State Fund.

NAICS: North American Industrial Classification System

2.0 METHODS

2.1 Workers' Compensation System

In Washington State, employers (except the self-employed) are required to obtain workers' compensation insurance through the Department of Labor and Industries' (L&I) industrial insurance system unless they are able to self-insure. L&I's State Fund covers approximately two-thirds of the workers in Washington State (the remainder works chiefly for the approximately 400 largest employers and is covered by their self-insured employers). US Department of Energy claims (Hanford) have been included in the Self-Insured section since roughly 2000.

Washington is the only state in which workers contribute monetarily to the medical aid portion of the State Fund.

2.1.1 Claims Management Data Base

Workers' compensation claims data and employment data for the years 1997-2005 were obtained from L&I's files. The L&I claims management database consists of two major data processing systems. The Medical Information and Payment System (MIPS) receives all billing information generated by provider medical bills. This system records such relevant items as dates of service, all associated procedure and treatment (CPT) codes, and physician diagnosis by International Classification of Disease (ICD), version 9, code for each provider visit. The Labor and Industries' Industrial Insurance System (LINIIS) contains all data necessary for the administration of State Fund claims (e.g., claim type and nature, occupation, employer information, status, progress). Only those Self-Insured compensable claims resulting in 4 or more days of lost time are coded in the LINIIS system. Rarely are there ICD9 codes or medical billing information in the MIPS database for the Self-Insured claims. Thus, the Self-Insured data in this report is not comparable to the State Fund data in terms of magnitude or cost.

2.1.2 Definition of Outcome

We used accepted State-Fund claims (for the 1997-2005 period, approximately 9% of the State Fund claims were rejected, Figure 1a). Medical treatment and diagnosis records were extracted from the MIPS database when the claim had either authorized or allowed CPT codes, or both. In addition, we extracted records for wrist or hand conditions (or both) from the LINIIS claim history dataset by using the ANSI z16.2 code for body area.

Similar methods were used to identify claims for general back, elbow and shoulder disorders. The specific disorders were defined as accepted

claims based on claims with ANSI codes and/or CPT procedure codes (see Table 1 for codes).

Since a workers' compensation claim in Washington State may include disorders in more than one body part, only the primary site is assigned a z16.2 code. When specific disorders (like CTS for hand/wrist disorders) were examined in detail to determine type of onset, disorders were required to match the appropriate body area code (since type and nature of disorder are only specified for the primary site of disorder).

Information collected for each claim included: claim status (compensable lost time claim of 4 or more days or medical treatment claim only codes); z16.2 codes for body area; nature and type of disorder; 4-digit Washington Industrial Code (WIC); 6-digit North American Industrial Classification System (NAICS) code; claim identification number; social security number; date of injury; birth date; gender; total cost of claim; lost time days; dollar amount of time loss payments; and dollar amount of medical aid payments. Using first date of injury allows us to estimate claims incidence. For example, if in LINIIS, a first date of injury year is 1996 and recorded for body area of hand/wrist, but the first MIPS allowed bill with a CTS code is in 1998, for purposes of this analysis, this is a 1997 CTS claim.

We categorized non-traumatic and traumatic onset to differentiate *cumulative* trauma exposures from acute exposure, such as falls. A combination of body part and nature and type was required. Non-traumatic onset, type codes (z16.2 code) included: rubbed or abraded, further restricted to disorders caused by leaning, kneeling, or sitting on objects (not vibrating) (081), those caused by objects being handled (not vibrating) (082), those caused by vibrating objects (083), those caused by repetition of pressure (085) and those caused by repetitive motion (086); overexertion (120-124, 129); bodily reaction (100); and unknown (899-999) - primarily strain, muscle soreness, pain with lifting etc.

These type codes were combined with the following nature codes: dislocation or herniation (190 for neck and back only); inflammation or irritation of the joints, tendons or muscles (260), including bursitis, tendonitis, synovitis and tenosynovitis; sprains and strains (310); multiple injuries (400 for upper extremity only); diseases of the nervous system (560), nerves and peripheral ganglia (562); symptoms and ill-defined conditions (580, 995 NOC); and unclassified (999). Disorders not fulfilling

the criteria for non-traumatic onset were considered traumatic (e.g., type was slips, trips, falls, and struck by).

Data were extracted from L&I databases as of July 16, 2007. Claim costs reported here reflect actual totals for closed claims. For State Fund claims that were not closed, costs reflect actual totals to this date *plus* the additional case reserve as estimated by agency staff. Costs are expected to develop further for the most recent years. For example, as of August 2007, approximately 5% of all 2001 carpal tunnel syndrome claims, 11% of 2003, and 23% of 2005 carpal tunnel syndrome claims were still open. For WMSDs, approximately 7% of 2005 claims were still open compared to 4% of all claims (Figure 1a). Lost time days for compensable claims were averaged from 1997-2005.

For Self-Insured compensable closed claims, we abstracted body part, nature, and type. We are less confident about the distinction between non-traumatic and traumatic onset status with the self-insured data because of more incomplete information in these data. Costs and time loss were also incomplete for these data.

Time loss days are paid on a 7-day workweek (20 days of time loss would be reflective of 3 calendar weeks, not 4). While the initial pension reserve is included as part of the total incurred costs, L&I stops counting time loss days as of the date a worker is moved to the pension roles. Lost workdays are not reflected as time loss days when an employee is kept on salary (KOS).

Costs: All bills were adjusted using the Consumer Price Index for Urban Wage Earners and Clerical Workers for Seattle-Tacoma-Bremerton, WA, not seasonally adjusted, annual figures. Bills were adjusted on a simplified basis using the date of injury as the "payment" date for all bills. Time loss payments occur over time and in some case stretch over years. Some open claims have future anticipated expenditures assigned. Incurred Medical costs were adjusted using the Medical Care Series (id CWURA423SAM, CWUSA423SAM), while all other costs were adjusted using All Items except Medical Care Series (id CWURA423SA0L5, CWUSA423SA0L5).

Payroll Hours: By Risk Class (WIC) we are excluding professional athletes (football, hockey, baseball, basketball, jockeys, and car/boat racers).

Using 2000 hours as the FTE basis may present a bias against the very industries we've identified as the

"worst." L&I offers two reporting options: actual hours worked, or a simplified 1920 hours/year, 480/quarter, 160/month…to allow for ease/consistency in payroll, etc. There is no field to indicate whether an employer chose the actual or simplified reporting. Simplified reporting is cost beneficial to those employers who have steady/regular work. It is possible we are underestimating the CIR for those using simplified and overestimating for those using actual hours. It is possible that the actual exposure is 2000 hours even for those reported at 1920.

2.1.3 Validity of Case Codes

For the year 2000 report, numerous medical records abstraction exercises were conducted to evaluate the coding schemes used for both onset type (traumatic or non-traumatic) and specific diagnosis of upper extremity claims. In the first exercise, we took a random sample of 96 Washington State Fund compensable claims coded as CTS (N=56), epicondylitis (N=15) and rotator cuff disorders (N=25). One of the three diagnoses was recorded in each of the medical records.

This exercise demonstrated that the physician's statement on the medical records is fairly accurately translated into the coding system of the L&I claims management database. In an extract of 20 tendonitis claims, 18 (90%) were coded correctly. We also observed that CTS and epicondylitis are often mentioned together in a single claim, and that CTS is usually filed as the main disorder. Thus, the incidence of "elbow" disorders would be underestimated because the epicondylitis case would be identified under "hand/wrist."

Additionally, the cost information for that epicondylitis case would be lost because we required body part be elbow and diagnosis be epicondylitis in order to avoid overestimation of costs for specific conditions.

Electrodiagnostic studies were used to confirm the diagnosis of CTS in 100% of cases.

We also checked whether our definition for a traumatic or non-traumatic onset disorder, based on our selected codes, agreed with information from the medical records, in which it was very clear whether the onset was traumatic or non-traumatic. There was 76% agreement for the hand/wrist, 77% for elbow disorders, and 64% for the shoulder disorders.

The second exercise involved abstracting medical records from 100 random claims from 1995 that were coded *traumatic carpal tunnel syndrome*

and 98 *non-traumatic onset hand/wrist disorders*. The case definition for carpal tunnel syndrome included symptoms in the median nerve distribution, and one of the following: positive electrodiagnostic study, carpal tunnel release surgery, or positive physical examination.

Eighty-one percent of the first group met the case definition for carpal tunnel syndrome and 43% of the second group met the case definition for CTS. All of those coded as non-traumatic onset met the definition of non-traumatic onset. Of those that were coded traumatic onset, 64% were actually non-traumatic onset. This suggests that the incidence rate for non-traumatic onset hand/wrist disorders may be underestimated. For rotator cuff disorders, about 30% of the claims coded as traumatic were non-traumatic.

Of the traumatic onset upper extremity claims, 51% were due to being struck against or struck by, whereas 42% of the traumatic onset back disorders were coded as fall related.

In addition to low back and upper extremity disorders, we reviewed neck and lower extremity disorders. For this purpose, the validity of the codes for nature and type was scrutinized. The purpose was to see whether a distinction could be made between non-traumatic soft tissue disorders and other musculoskeletal disorders.

For the neck disorders, the nature coding was in agreement with the information in the medical files in 86% of the cases. Of the types, 88% of the codes were in agreement. The most common neck disorders were sprain and strain (in 43% of bills), cervicalgia (6%), dislocation (7%), displacement of intervertebral disc (3%), and radicular syndrome or radiculitis (3%). Of these diagnostic groups, radicular syndrome or radiculitis differed from the others in that about half of the cases were non-traumatic, whereas the proportion of non-traumatic cases for the other neck disorders was about 30%. The too small number of cases consistently diagnosed with radiculitis precluded, however, the consideration of this diagnostic group separately in the analysis.

2.2 Washington State Employment by Industry and Region

Employment information is reported to L&I by State Fund employers as the number of hours worked by employees. However, hours by age and gender are not available.

Numbers of employees working per year were calculated assuming that each full-time employee works 2,000

hours per year (40 hours per week for 50 weeks per year). Hours were converted to full time equivalent workers (FTEs) as: Total Hours Reported / 2,000.
In those industries where there are high proportions of part-time workers, the denominator may be an underestimate, making the incidence rate higher than it would be if they were all full-time workers. An industrial classification is a grouping of industries that share similar workplace exposures. Washington Industrial Classifications (WIC) are more specific than the North American Industrial Classification System (NAICS) because employers must sub classify their employees based on type of work. We used converted risk classes for WIC to take into account some sub sectors moving around during the study period.

This year we used claims charged to the account as the primary determinate of the NAICS, secondary determinate was the NAICS code assigned most frequently to the account's business locations by the Department of Labor and Industries, tertiary was NAICS assignment to the Universal Business Identifier by the Department of Employment Security. This year, we consolidated the WIC discounted and undiscounted wallboard classes (current and past) as well as those historical classes that were absorbed by the current into "Wallboard Installation" because there was no difference in the work they performed.

To eliminate unstable rates, only those NAICS codes with an average of 50 FTEs per year or more and those WIC codes with an average of 50 employees per year over the 9-year period were included in the industry analyses.
Self-Insured compensable claims are not received and coded by L&I until they have been closed, thus this long lag time underestimates the number of claims in more recent years.
Because claims data is incomplete for the Self-Insured due to a high proportion of open claims, we used year 2001 claims for the trends analysis.

2.3. Demographic Analysis

L&I does not have denominator data by gender and age. Therefore, in order to estimate rates by age and gender, we used Quarterly Workforce Indicators (QWI) from the U.S. Census Bureau to determine the number of employees rather than FTEs in the denominator.

We included body mass index (BMI) in the demographic data because of some evidence of an association between higher BMI and some WMSDs. Height and weight are self-reported on the initial claim report and were reported for

approximately 72% of State Fund compensable claims. BMI was calculated according to CDC as: [Weight (lbs) / height (in)^2] * 703.

2.4 Statistical Analysis

Descriptive analyses included a summary of claims by year, direct workers' compensation costs, age and gender. Claim incidence rates were calculated by year and industry class, and are expressed as number of claims per 10,000 FTEs.

Each industry code specific rate was compared to the industry-wide rate and a crude incident rate ratio or relative risk was calculated. Test for trend of incidence rates over time was performed using a Poisson regression analysis in SAS Software (SAS Proprietary Software Version 9.1, SAS Institute Inc. Cary, NC, USA 2001). Differences between rates were tested by Poisson regression with an interaction term for the compared rates.
WMSD claims were compared to all claims, excluding WMSDs. The different categories within WMSDs were compared to all claims WMSDs.

To prioritize industries for intervention purposes, frequencies of claims within an industry as well as the relative risk compared to all industries are important considerations. We combined the rank orders of both frequency and relative risk to create a "Prevention Index" (PI).

$$PI = \frac{\text{Frequency Rank} + \text{Incidence Rank}}{2}$$

3.0 RESULTS

3.1 Magnitude of Neck, Back and Upper Extremity Disorders in Washington State

This report describes the distribution of musculoskeletal disorders in Washington State between1997-2005. The focus of the report is on the neck, back and upper extremity (shoulder-fingers) and more specifically for the soft tissue musculoskeletal disorders of non-traumatic origin, referred to as work-related musculoskeletal disorders (WMSDs). The lower extremity was excluded from this report because of inadequate consistency in coding of traumatic and non-traumatic disorders in the claims database.

For the most part, the results will be presented first for the State Fund data (which is more complete) and then the compensable (four or more days of lost time) Self-Insured data, followed by combined State Fund and Self-Insured compensable claims.

Because we had no medical bill data with ICD-9 codes available for specific diagnoses (such as those in Table 1) for the Self-Insured data, direct comparisons between the two are not really possible. Information is presented by North American Industry Classification System (NAICS) codes for national comparisons, but also by Washington Industrial Classification (WIC) because these codes are more specifically related to workplaces with relatively similar processes and exposures.

3.1.1 Overall Incidence and Cost

3.1.1.1 *State Fund*

There were 336,608 State Fund WMSDs (see Tables 1 and 2 for criteria) costing $4.1 billion dollars adjusted to 2005 dollars. While representing 27.1% of all State Fund accepted claims, these claims were responsible for 45% of all costs (Figure 1b).

The average number of State Fund WMSDs was 37,401 per year, averaging $12,379 per claim. The average compensable lost workdays was 217 days compared to 185 for all compensable claims (Table 3). The average claims incidence rate (CIR) was 258.0 per 10,000 FTEs for all WMSDs and 92.95 per 10,000 for compensable claims.

While the incidence rate for WMSDs is decreasing, the severity rate (lost work days) is increasing.

The CIRs for all claims and all WMSDs have decreased significantly ($p<0.0001$) from 1997-2005 (Figure 4). WMSD claims incidence decreased an average of -5.6% per year from 1997-2005,

similar to the -5.9% for of non-WMSD claims.

3.1.1.2 *Self-Insured*

Self-Insured compensable claims represent about 30% of all Self-Insured accepted claims. Additionally, Self-Insured compensable claims data are not available for analysis until the claim has been closed. This may result in substantial underestimates of rates in the more recent years. There were 74,361 (8,262 per year) closed compensable WMSD claims of the neck, back and upper extremity, representing 47.1% of all compensable claims. Unlike the State Fund claims, these numbers are higher than in last year's report. However the average compensable CIR was 140 per 10,000 FTEs (Table 22), the same as in last year's report.

The increase in claim numbers but decrease in incidence rate reflects an increase in employment.

Although the total number (compensable and medical only) of WMSD claims is not available, assuming 36% (State Fund proportion) are compensable, the total number of WMSD claims would be approximately 22,850 per year. The closed compensable WMSDs claims incidence rate decreased significantly from 1997-2005 (-4.7% per year, $p<0.0001$), not significantly different from all other compensable claims (-5.2% per year).

3.2 Age and Gender

Using the U.S. Census Bureau Quarterly Workforce Indicator (CWI) data as our denominator we calculated incidence rates for men and women by age and industry sector groups (Figures 2a-b) for combined State Fund and Self-Insured compensable claims. The Compensable WMSD claim rate for *men* peaked at age 35-44 for nearly all sectors. *Women* also peaked in most sectors at 35-44 with notable exceptions in Manufacturing and Wholesale peaking in the 45-54 age group.

The highest rates were in Transportation. For men, the highest rates were amongst 25-34 year olds, while women's rates were highest throughout the 19-54 year old age groups.

We also estimated the mean lost work days of State Fund claims by age and industry for men and women (figures 2c-d). Men and women differed in WMSD claims lost time experience by age group and industry sector. Men tended to have a steady increase in time loss days with age whereas women appeared to level off at 35-44.

3.3 Magnitude and Cost of Work-related Musculoskeletal Disorders by Body Region

3.3.1 *STATE FUND*

There were 41,182 **Neck** WMSD claims (3.3% of all claims) from 1997-2005 (Table 4):

- Total direct cost of $150.1 million
- 49.8% were compensable
- Average direct claim cost of $15,813
- Average CIR of 31.5 per 10,000 FTEs, decreasing -5.5% per year (p<0.0001). Compensable CIRs decreased -3.9% (p<0.0001) per year. These were not significantly slower decreases than for non-neck claims.
- Average severity rate (SR) of 603 days per 10,000 FTEs
- Average time loss of 279 days.
- Median time on the job was slightly longer and median BMI was slightly less than for all claims.

PH, a 26-year- old female nursing assistant who had worked in an adult family home for 7 years developed back problems lifting and transferring patients. She missed 180 days of work and required $5,200 worth of medical treatment. Incurred costs were $10,350. She moved out of state, her current employment is unknown.

Back WMSDs are the most common, resulting in 174,571 claims (14.1% of all claims) with:

- Direct costs of $1.9 billion
- 38.5% were compensable
- Average direct claim cost of $11,626
- Average CIR of 133.9 claims per 10,000 FTEs, decreasing -5.5% per year on average (p<0.0001), not significantly different than all other claims.

For compensable back claims the -3.9% per year decrease was similar to all other compensable claims -4.1% per year,

- Overall SR of 8,384 days per 10,000 FTEs
- Average time loss of 195 days.

The specific diagnosis of **Sciatica** was identified in 7,478 claims (831 per year), Table 5. These claims, while infrequent (CIR of 5.7 per 10,000 FTEs), were extremely costly:

- Averaging $69,237 per claim
- 554 lost workdays
- 77.6% were compensable.
- Overall SR of 1,954 lost days per 10,000 FTEs

The CIR has significantly changed over the previous nine years, decreasing (-1.5% per year, p<0.03)) compared to non-sciatica cases at -5.9% per year, (p<0.0001), Figure 3c. There was little difference from all claims in months (14 versus 12) on the job or BMI.

There were 127,885 accepted **Upper Extremity** WMSD claims (Table 4), (10.3% of all claims) from 1997-2005 with:

- Direct costs of $1.49 billion
- 36.9% of claims compensable
- Average claim direct cost of $12,481
- Average CIR of 97.9, decreasing –5.4% per year (p<0.0001), similar to all other claims at -6.0% (p<0.0001).
- Overall SR of 7,132 per 10,000 FTEs
- Average lost time of 234 days.

The majority of these **Upper Extremity** WMSDs were in the hand/wrist area (64,396), followed by the shoulder (46,479) and then the elbow/ forearm area (21,986). The **Shoulder** and **hand/wrist** WMSD claims resulted in higher average direct costs ($16,092 and $10,983 respectively) compared to the **elbow/forearm** area WMSDs ($8,317). The shoulder WMSD claims rate decreased -3.6% per year, 2.3% less per year than other claims (p<0.09).

Compensable shoulder claims rate actually increased 0.12% per year compared to a decrease of -4.2% for all other compensable claims, a significant difference (p<0.0000).

The elbow (-5.6%) and hand/wrist (-5.4%) WMSD claims rates decreased about the same as all other claims (-5.9%).

While a greater percentage of **hand/wrist** WMSD claimants were women (51% compared to 37% for shoulder and 40% for elbow/forearm), they were slightly younger (median of 38 ears compared to 39 years for shoulder and 40 years for elbow/forearm). Those with hand/wrist disorders had a longer time on the job (median 24 months versus 17 months for shoulder and 14 months for elbow/forearm), and had slightly higher BMI (27.7).

Specific Conditions. We selected several specific diagnoses for closer examination (Table 5).

There were 22,611 non-traumatic **Rotator Cuff Syndrome** claims from 1997-2005 with:

- Average of 2,512 per year
- Average CIR of 17.3 and SR of 2,345 days per 10,000 FTEs. The CIR decreased -1.2% (p<0.0001), significantly less (p<0.03) than the -5.9% for all other claims.
- Average direct claim cost of $32,169
- 62.5% were compensable
- Average timeloss of 334 days
- Median months on the job was 22 and median BMI was slightly higher (27.4) than for all claims.

For compensable rotator cuff claims, the increase in CIR was 1.4% per year (p<0.0001) compared to a decrease of -4.4% for all other compensable claims.

Non-traumatic **Epicondylitis** was identified in 14,467 claims with:

- Average of 1,607 per year
- Average CIR of 11.1 and SR of 547 days per 10,000 FTEs, decreasing-2.3% per year, p<0.0001) This decrease was somewhat slower (p<0.09) than all other claims (-5.9%, p<0.0001).

Compensable epicondylitis decreased significantly slower (-1.9% per year) than all other compensable claims (-4.0% per year), p<0.05.

- Average direct claim cost of $12,006
- 41.8% were compensable
- Average time loss of 271 days.

There were 19,908 **Hand/wrist Tendonitis/ Tenosynovitis** claims with:

- Average of 2,212 claims per year
- Average CIR of 15.3 and SR of 1,199 days per 10, 000 FTEs. The CIR decreased -5.4% per year (p<0.0001), not significantly different than for all other claims.
- 41.1% were compensable and decreased slower than all other claims (-2.6 per year vs. -4.0, p<0.10)
- Average cost of $14,045 per claim Average time loss of 264 days.

There were 26,685 accepted non-traumatic **Carpal Tunnel Syndrome** (CTS) claims from 1997-2005 with:

- Average of 2,965 per year
- Average CIR of 20.4 claims and SR of 2,478 days per 10,000 FTEs. The CIR decreased -4.8% per year compared to -5.9% for all other claims. The compensable claims rate decreased slightly less at -3.0% per year (p<0.0001), compared to -4.1% for non-CTS claims.
- Average direct cost of $22,686
- 65% were compensable
- Average time loss of 258 days.

The median age for CTS claimants was 41 years compared to 43 years for rotator cuff, and 37 years for tendonitis claimants. CTS claimants had the highest BMI (28.3) and the longest median time on the job (31 months). A much higher percentage of CTS claimants were female (59%) than rotator cuff syndrome (37%) or epicondylitis (47%) claimants. The same was true for hand/wrist tendonitis claimants (57% female).

Although 77% of claimants with one of these diagnoses had single diagnoses, there was a substantial percentage that had more than one diagnosis. of the

sciatica claims, 4% (298) also had one of the upper extremity diagnoses, primarily with carpal tunnel syndrome and rotator cuff syndrome. Among carpal tunnel syndrome cases, 33% overlapped with another diagnosis, primarily hand/wrist tendonitis (20%). Among epicondylitis cases, 30% overlapped, primarily with carpal tunnel syndrome (19%). Among rotator cuff syndrome cases, 14% overlapped, primarily with carpal tunnel syndrome (9%) and epicondylitis (5%). All four upper extremity diagnoses were present during the study period in 101 claimants.

3.3.2 SELF-INSURED

Self Insured compensable WMSD claims rates for the back, neck and shoulder decreased significantly slower than other claims.

There were 1,980 compensable (lost time) **Neck** WMSD disorder claims (1.3% of all claims), (Table 23) with:

- Average of 220 compensable claims per year
- CIR of 3.7 per 10,000 FTEs, decreasing -4.1% per year ($p<0.001$) significantly slower than non-WMSD claims (-6.3%), $p<0.02$.

There were 34,167 closed **Back** compensable WMSD claims (22% of all closed claims) with:

- Average of 3,796 per year
- Average compensable CIR of 64.6 per 10,000 FTEs, decreasing –4.1% per year, 2.4% slower than other claims, $p<0.02$).

There were 29,318 closed compensable **Upper Extremity** WMSD claims from 1997-2005 (18.6% of all claims), with:

- Average of 3,258 closed compensable claims per year
- Average CIR = 55.4 per 10,000 FTEs, decreasing about -4.1% per year ($p<0.01$), 2.4% less rapidly per year than all other claims ($p<0.02$).

Closed compensable **Shoulder** WMSD claims accounted for 6.8% of all claims (n=10,658), averaging 1,184 per year with an average claims rate of 20.1 per 10,000 FTEs. The incidence rate decreased -1.8%p per year. This was 3.5% slower than non-shoulder claims rates ($p<0.06$).

Closed compensable **Elbow/ forearm** WMSDs (n=2,577) accounted for 1.6% of compensable claims with an average of 286 per year. The claims incidence rate was 4.9 per 10,000 FTEs. Over the nine year period the rate decreased -5.9% per year ($p<0.001$), not significantly different from all other claims.

Hand/wrist WMSDs accounted for almost half of the upper extremity

compensable claims (12,465) and 7.9% of all compensable claims, averaging 1,385 claims per year. The average closed compensable claims rate was 23.6 per 10,000 FTEs, decreasing -4.6% per year ($p<0.001$), not significantly different than all other claims which were decreasing -5.0% per year ($p<0.0001$**).**

As with the State Fund claimants, approximately 58% of the hand/wrist WMSD claimants were women, compared to 44% of shoulder, 45% of elbow/forearm, 42% of back and 50% of neck claimants. Self-Insured hand/wrist claimants were about 5 years older (43 years) than the State Fund claimants (38 years).

3.4 Distribution of WMSDs by Industry

Construction, Manufacturing and Health Care continue to be high risk industries

The workers' compensation data were examined by industry sector, the 4-digit NAICS codes to compare with national industry estimates, and by Washington's specific Industrial Classifications (WIC), which are based more on similar risk of injury than on commercial considerations (NAICS). In this year's report, the WIC for wallboard installation is based on the consolidation of discounted and undiscounted types.

The analyses evaluated both the magnitude (number or count) of claims and the risk (incidence) of claims. The ranks of these two components were averaged into a "Prevention Index" (PI) and all tables were rank ordered by this index. For each table, the industry hours, the count of WMSDs, workers' compensation costs, lost workdays, and incidence rate are provided along with the rate ratio (the incidence rate for a particular industry divided by the rate for all industries combined). Additionally, the count rank and rate rank are included. Because the PI is an average of two ranks, it is possible that a very small industry (few hours) might have a very high claims incidence rate and thus would not be in the top 25 industries based on the prevention index. The same could be true with an industry that has a very large population but a low incidence rate. When either of these events occurred, the top three industries by either count or rate are listed below the line (shaded) in the table unless it is already in the body of the table. NAICS codes that had an overall average less than 100,000 hours per year (equivalent to 50 FTEs per year) were excluded from the more detailed analysis of 4-digit NAICS. Similarly, 4-digit WIC classes with an overall average less than 50 FTEs per year were excluded.

The exclusion criteria reflects the tradeoff between precision and stability.

3.4.1 Overall WMSDs by Industry Sector

Table 6 shows that the **State Fund** Construction, and Health Care and Social Assistance sectors are the top two industries of concern based on the prevention index followed by Manufacturing and Retail Trade *(44: non-Department Store*).

*The CIR for Construction (470 per 10,000 FTEs) was 1.8 times that of the overall industry rate, costing more than **$1 billion and 5.5 million lost workdays** over the study period.*

For **Self-Insured** compensable claims, Health Care was followed by Public Administration and Transportation (48: Air, rail, water, truck, transit) and topped the Prevention Index (Table 24). Transportation Warehousing (49: Couriers & Warehouse) had the highest closed compensable CIR, about 3.4 times that of all Self-Insured industry.

Contrary to State Fund Construction which ranked first, Self-Insured Construction was 18th on the PI with an incidence rate (108 per 10,000 FTEs), less than the overall industry rate (140.0 per 10,000 FTEs).

Figures 4a-b shows the State Fund and Self-Insured compensable CIRs from 1997-2005, while 4c shows the combined rates. For the most part, rates are decreasing in most industries except Public Administration. The dramatic decline in the rate for Transportation is primarily among the self-insured couriers. This may be due to changes in industry practices via outsourcing delivery services.

Although a strict comparison between the Self-Insured and State Fund compensable claims rates is not possible because we do not have diagnostic (ICD-9) codes or open claims data for the Self-Insured, the differences in patterns are interesting. In general the Self-Insured rates are similar to or higher than those for the State Fund with the exception of Construction.

The compensable claims rate for Self-Insured Construction is much lower than for the State Fund insured (108 versus 202/10,000 FTEs) and the reverse is true for Transportation (Tables 16, 24).

For example, rates per 10,000 FTEs in NAICS 48 were 359 for the Self-Insured and 182 for the State Fund. In NAICS 49, the rate per 10,000 FTEs was 480 for the Self Insured and 171 for the State Fund. Unfortunately, NAICS

codes were missing for 950 compensable State Fund claims compared to none for Self-Insured.

Figures 4d-f show that WMSDs are a consistent proportion of all compensable claims. In Health Care, WMSDs have been responsible for 55-60% of all compensable claims, whereas for construction, about 35% of their compensable claims have been attributed to WMSDs.

3.4.2 WMSDs by Prevention Index (PI) and 4-Digit NAICS Code

3.4.2.1 State Fund

Nursing Care Facilities (NAICS 6231) continues to be the first industry of concern based on the State Fund Prevention Index (PI), Table 7. It was ranked fourth on claims incidence rate (928.8 per 10,000 FTEs), an increase from last year's report. It ranked 3rd on count rank (8,575 claims), and had 3.6 times the overall industry rate.

There was little change in the top 10 4-digit NAICS industries and their claims rate relative to overall industry other than Beer Wine and Alcoholic Beverages Merchants making the list:

1. Nursing Care Facilities (NAICS 6231) RR=3.6
2. Community Care Facilities for the Elderly (NAICS 6233) RR=3.2
3. Foundation Structure & Building Exterior Contractors (NAICS 2381) RR=2.3
4. Rooming & Boarding Houses (NAICS 7213) RR=2.5
5. Other Wood Products Manufacturing (NAICS 3219) RR=2.4
6. Building Finishing Contractors (NAICS 2383) RR=2.1
7. Residential Building Construction (NAICS 2361) RR=2.0
8. Specialized Freight Trucking (NAICS 4842) RR=2.3
9. Beer, Wine and Distilled Beverage Merchants (SIC 4248) RR=2.4
10. Waste Collection (NAICS 5621) RR=3.4

Table 17 shows the NAICS-4 industries for State Fund compensable WMSD claims, the top 10 industries by prevention index were:

1. Foundation Structure & Building Exterior Contractors (NAICS 2381) RR=2.9
2. Nursing Care Facilities (NAICS 6231) RR=3.0
3. Building Finishing Contractors (NAICS 2383) RR=2.7
4. Community Care Facilities (NAICS 6233) RR=2.8.
5. Residential Building Construction (NAICS 2361) RR=2.4
6. Specialized Freight Trucking (NAICS 4842) RR=2.9
7. Psychiatric & Substance Abuse Hospitals (6222) RR=3.3
8. General Freight Trucking (NAICS 4841) RR=2.5
9. Waste Collection (NAICS 5621) RR=4.0
10. Services to Buildings & Dwellings (NAICS 5617) RR=2.1

The five occupations within each of the top 4-digit NAICS with rates greater than 2.5 times the overall industry rate (RR=2.5) were examined in more detail

in Table 21. More than 50% of the claims occurred in these occupations. In some of these, more than 50% were concentrated in one job such as refuse and recycling collectors in Waste Collection; truck drivers in Couriers and in Specialized Freight; Nursing aides and orderlies in Nursing Care Facilities and Community Care for the Elderly.

Back, Neck and Shoulder WMSDs were concentrated in industries characterized by manual handling activities.

For **Neck** WMSDs (Table 8), Nursing Care Facilities (NAICS 6231) was first on the PI and had a RR of 4.1 times the overall industry CIR. It was followed by Community Care for the Elderly (RR=3.8) and Foundation Structure & Building Exterior Contractors (RR=2.2). These relative risks have increased from last year's report

Back WMSDs had much higher rates but a fairly similar industrial distribution as Neck WMSDs (Table 9). Nursing Care Facilities (RR=4.1) was followed by followed by Community Care for the Elderly (RR=3.8), and Foundation Structure & Building Exterior Contractors (RR=2.6). Similar industries were identified for sciatica, which is much less frequent but much more costly, Table 11.

The distribution of industries at risk for **Upper Extremity** WMSDs differed from back and neck WMSDs (Table 10). Residential Construction was replaced by Household and Institutional Furniture Manufacturing on the top10 industries list:

1. Nursing Care Facilities (NAICS 6231) RR=2.8
2. Other Wood Products Manufacturing (NAICS 3219) RR=2.7
3. Foundation Structure & Building Exterior Contractors (NAICS 2381) RR=2.1
4. Animal Slaughtering & Processing (NAICS 3116) RR=3.7
5. Community Care Facilities for the Elderly (NAICS 6233) RR=2.3
6. Building Finishing Contractors (NAICS 2383) RR=1.9
7. Household& Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371) RR=2.3
8. Plastic Products Manufacturing (NAICS 3261) RR=2.1
9. Grocery Stores (NAICS 4451) RR=17)
10. Waste Collection (NAICS 5621) RR=3.1

Based on the Prevention Index, **Rotator Cuff Syndrome** claims were more likely to be concentrated in manual handling industries similar to back claims with Building Finishing Contractors (NAICS 2383) being first on the PI, followed by Foundation Contractors, Specialized Freight Trucking, Nursing Care Facilities, and Waste Collection, (Table 12). **Epicondylitis** also was primarily concentrated in construction industries, but also manufacturing (Household,

Institutional Furniture and Kitchen Cabinet Manufacturing, Other Wood Products,), and Grocery Stores characterized by both manual handling and repetitive motion activities, Table 13.

Carpal tunnel syndrome and hand/wrist tendonitis were more focused in industries requiring forceful, repetitive hand activities such as in Dentists' Offices.

Carpal Tunnel Syndrome (Table 14) was more focused in those characterized by repetitive work, with Dentists Offices reaching the top 10 list for the first time:

1. Personal Care Services (NAICS 8121) RR=3.5
2. Grocery Stores (NAICS 4451) RR=2.0
3. Animal Slaughtering and Processing (NAICS 3116) RR=4.8
4. Foundation Structure & Building Exterior Contractors (NAICS 2381) RR=1.7
5. Administration of Human Resource Programs (NAICS 9231) RR=2.0
6. Other Wood Products Manufacturing (NAICS 3219) RR=2.1
7. Household & Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371) RR=2.2.
8. Dentists Offices (NAICS 6212) RR=1.7
9. Individual & Family Services (NAICS 6241) RR=1.7
10. Plastic Products Manufacturing (NAICS 3261) RR=1.9

The top 10 NAICS codes for **Hand/wrist Tendonitis**, Table 15, were similar to those for carpal tunnel syndrome but also included, Employment Services (NAICS 5613), Grocery & Related Products Wholesalers (NAICS 4244), Other Misc. Manufacturing (NAICS 3399), Plastic Products Manufacturing (NAICS 3261) and Nursing Care Facilities (NAICS 6231.

State Fund Compensable claims by NAICS had a similar distribution of industries as the accepted claims in Prevention Index order (Tables 17-20). Foundation Contractors, Nursing Care Facilities, Community Care Facilities for the Elderly, Residential Construction, Building Finishing Contractors, General Medical & Surgical Hospitals (NAICS 6222) and Automotive Repair (NAICS 8111) were also in the top 25 rankings for all compensable WMSD claims, and for the back, the neck and the upper extremity.

3.4.2.2 Self-Insured Compensable WMSDs by NAICS

Couriers, Scheduled Air Transportation and General Freight Trucking were in the top 4 based on the PI for all body parts, Tables 25-28.

There was little change in industry PI ranking from last year. Those in **bold** are new to the list. While Aerospace Products and Parts (NAICS 3364) ranked 2nd based on the *number* of

closed WMSD compensable claims, it ranked 63rd based on CIR (Table 25) Based on the Prevention Index for all compensable WMSDs, the following 4-digit NAICS codes were identified:

1. Couriers (NAICS 4921) RR=3.5
2. Scheduled Air Transportation (NAICS 4811) RR=3.0
3. General Freight Trucking (NAICS 4841) RR=2.3
4. School & Employee Bus Transportation (NAICS 4854) RR=3.1
5. **Wood Products (NAICS 3219) RR=2.4**
6. General Medical-Surgical Hospitals (NAICS 6221) RR=1.5
7. **Administration of Environmental Quality Programs (NAICS 9241) RR=4.3**
8. Grocery Stores (NAICS 4451) RR=1.5
9. Grocery & Related Products Wholesalers (NAICS 4244) RR=1.7
10. Nursing Care Facilities (NAICS 6231) RR=1.9

NAICS that had relative risks of compensable claims greater than 2.5, as well as the top 5 occupations in those industries are displayed in Table 29. These occupations represent more than 45% of the occupations of claimants in their industry. For example, Truck drivers in Couriers (NAICS 4921), Emergency Medical Technicians in School & Employee Bus Transportation (NAICS 4854), Laborers & Freight Stockers in Scheduled Air Transportation (NAICS 4811) and Bus Drivers in Interurban & Rural Bus Transportation (NAICS 4852) all had more than 50% of the claims. Administration of Environmental Quality Programs (NAICS 9241) is new. Refuse and Recycling laborers, fire fighters and police are in this high risk category.

Occupational codes were missing for approximately 9% of WMSD claims.

3.4.2.3 Combined State Fund and Self-Insured Compensable WMSDs

The top 12 4-digit NAICS for all combined compensable WMSDs (Table 30) were:

1. Couriers (NAICS 4921) RR=4.3
2. Scheduled Air Transportation (NAICS 4811) RR=3.5
3. Foundation, Structure & Building Exterior Contractors (NAICS 2381) RR=2.5
4. Nursing Care Facilities (NAICS 6231) RR=2.6
5. General Freight Trucking (NAICS 4841) RR=2.5
6. Building Finishing Contractors (NAICS 2383) RR=2.3
7. Community Care Facilities for the Elderly (NAICS 6233) RR=2.4
8. Residential Building Construction (NAICS 2361) RR=2.0
9. General Medical Surgical Hospitals (NAICS 6221) RR=1.9
10. Other Wood Products (NAICS 3219) RR=2.3

Couriers ranked 1st based on CIR. General Medical and Surgical Hospitals ranked 1st based on count.

The top 10 4-digit NAICS for compensable **Neck** WMSDs (Table 31)

were quite similar to all WMSDs except for the inclusion of Psychiatric Hospitals (6222) ranked 7th with a RR=5.5, Rooming and Boarding Houses (NAICS 7213) ranked 5th. The highest incidence rate was found in Residential Mental Retardation, Mental Health and Substance Abuse facilities (NAICS 6232) with a RR of 7.0.

For **Back** WMSDs (Table 32), the top 10 NAICS were also similar to all WMSDs.

With respect to compensable **Upper Extremity** WMSDs (Table 33), the top 10 industries by PI were:

1. Couriers (NAICS 4921) RR=3.3
2. Scheduled Air Transportation (NAICS 4811) RR=3.1
3. Foundation, Structure & Building Exterior Contractors (NAICS 2381) RR=2.1
4. Other Wood Products Manufacturing (NAICS 3219) RR=2.5
5. Grocery Stores (NAICS 4451) RR=2.0
6. Animal Slaughtering & Processing (NAICS 3116) RR=2.8
7. Building Finishing Contractors (NAICS 2383) RR=2.1
8. General Freight Trucking (NAICS 4841) RR=1.9
9. Department Stores (NAICS 4521) RR=1.6
10. Residential Building Construction (NAICS 2361) RR=1.7

3.4.3 WMSDs BY 4-DIGIT WA INDUSTRIAL CLASSIFICATION (WIC) CODE

The **WIC codes** allow a closer look at industries by similar types of processes or exposures for all injuries, not just WMSDs. The utility of this analysis can be seen in the higher rate ratios (RR) than those observed for the NAICS codes. While in general, the results are similar to those based on NAICS codes, there are some high-risk industries that do not show up in the NAICS analysis.

Some Temporary Help categories show up as high risk using WICs.

3.4.3.1 State Fund

Based on the Prevention Index (PI) for all WMSDs (Table 34), the top 10 State Fund industries were identified by WIC:

1. Nursing Homes (WIC 6108) RR=3.8
2. Roofing (WIC 0507) RR=4.7
3. Beer Distributors (WIC2105) RR=4.1
4. Wood Frame Bldg Construction (WIC 0510) RR=2.7
5. Moving Companies (WIC 6907) RR=5.5
6. Wallboard Installation (0540*) RR=5.5
7. Wood Products Manufacturing (WIC 2903) RR=2.8
8. State Health Care Facilities (WIC 7201) RR=3.0
9. Building Construction NOC (WIC0518) RR=2.9
10. Temporary Help-Assembly (WIC 7114) RR=4.1

Based on CIR, Temporary Help-Machine Operators had the highest rate (RR=6.6) and Restaurants had the highest count.

For **Neck** WMSDs (Table 35), additional industries identified include Home Health Care Nursing (WIC 6110) with a

RR=4.1, Boarding Homes (WIC 6509) with a RR =2.7, and Trucking NOC (WIC 1102) with a RR of 2.5. Based on CIR, Wallboard Installation (WIC 0540*) RR=6.4, had the highest rate.

For **Back** WMSDs (Table 36), Nursing Homes was first on the Prevention Index, followed by Beer Distributors, Roofing, Wood Frame Building Construction and Moving companies (RR=6.4).

For **Upper Extremity** WMSDs (Table 37), additions to the top 10 list based on the PI include Meat Dealers Wholesale (WIC 3304) with a RR=3.2, Wallboard Installation (WIC 0540*) with a RR=5.8, Sawmills (WIC 1002) with a RR=3.4, joined the top 10 list. Based on CIR, Temporary Help-Machine Operation (WIC 7117) RR=7.6, had the highest rate, while Restaurants (WIC 3905) had the highest count. Temporary Help-Assembly ranked 3rd with a RR=4.5.

3.4.3.2 Self-Insured

Based on the Prevention Index for compensable WMSDs (Table 39), the top 10 industries by WIC include:

1. Parcel Package Delivery (WIC 1101) RR=4.4
2. Airlines, Ground Crew (WIC 6802) RR=5.0
3. Cities-All Other Employees NOC (WIC 0803) RR=2.7
4. Fire Fighters (WIC 6904) RR=3.3
5. Trucking NOC (WIC 1102) RR=2.9
6. Counties-All Other Employees NOC (WIC 1501) RR=2.4
7. Supermarkets (WIC 6402) RR=2.3
8. Airlines, Fight Crew (WIC 6801) RR=4.2
9. Ambulance Service (WIC 1403) RR=7.5
10. Schools-all other employees (WIC 6104) RR=2.3

Based on CIR, Temporary Help-Administrative staff (WIC 7104) with a RR of 19.4 was first, whereas Hospitals (WIC 6105) was 1st based on number of claims (RR=1.4). Other high risk industries included Beer Distributors (WIC 2105), RR=7.7, Building Construction NOC (WIC 0505), with a RR=9.5 and Ambulance Service (WIC 1405) with a RR=7.5.

For compensable **Neck** WMSDs (Table 40) based on the PI, Counties-all other employees NOC RR=3.2, Airline Flight Crew (WIC 6801) RR=8.4, Parcel Package Delivery (WIC 1101), RR=4.8, were the top three. Other industries that fell in the top 10 were Airlines, Ground Crew (RR=5.2), Schools All Other Employees (RR=2.2), Cities-All Other Employees (RR=2.6), Fire Fighters (RR=5.1), Hospitals (RR=1.5), Trucking NOC (RR=2.6) . Hospitals were first in frequency while Airline Flight Crew followed by and Ambulance Services (WIC 1405) were highest by incidence rate (RR8.4 and 7.0 respectively).

Workers in Self-Insured Ambulance Services have 10 times the back WMSD claims incidence rate as all self-insured industry.

For **Back** WMSDs (Table 41), Parcel Package Delivery (WIC 1101) was 1st on the PI with a RR=5.5, followed by Airlines, Ground Crew (RR=5.6), Fire Fighters (RR=4.4) and Ambulance Services (RR=10.2). Others in the top 10 included Cities-All other employees, NOC, Schools-All other employees , Trucking NOC, Counties-All other employees, Temporary Help-administrative staff, and Supermarkets. The highest CIR was in Temporary Help Administrative Staff (WIC 7104) with RR=18.6, and the highest number of claims was in Hospitals (WIC 6105), with RR=1.6.

Temporary Help-Administrative staff and Building Construction (NOC) have more than 10 times the upper extremity incidence rate of all industry.

For **Upper Extremity** WMSDs, Airlines Ground Crew (WIC 6802), RR=4.4 followed by Parcel Package Delivery (WIC 1101), RR=3.4 (Table 42). Additional top 10 industries were Supermarkets with RR=2.7, Counties-all other employees NOC, RR=2.5, Airline Flight Crew (WIC 6801) with RR=3.4. The highest CIR was in Temporary Help Administrative Staff (WIC 7104) with RR=21.5, followed by Building Construction NOC (WIC 0505) with RR=13.8, and Wood Frame Building Construction (WIC 0510) with RR=7.8. The largest numbers were in Aircraft Manufacturing (RR=1.3), Hospitals (RR=1.2), and Supermarkets (RR=2.6).

3.4.4 TEMPORARY HELP WORK

The overall hours worked in State Fund temporary service agencies increased by 34 million hours since the 2006 report, whereas they have been mixed among the Self-Insured.

Although there are different kinds of temporary workers, we are able to identify temporary workers in the workers' compensation system only if they work in temporary help agencies. The numbers of workers working for temporary help agencies has been increasing over the years for State Fund employers (34 million more hours reported among State Fund Temporary Help employers for this report than the 2006 report) Incidence rates were decreasing slightly in almost all of the 16 WICs (Table 38), except Administrative staff, Office, Store and Food Services.

Self Insured (Table 43) Temporary Help Agencies' hours have largely declined since last year's report. Incidence rates increased in 6 categories and

decreased in six. The biggest decline in rates was in Food Processing which had a large increase in hours. On the contrary, Food services hours decreased considerably while the incidence rates increased. Temporary workers who were not included were those not working for a temporary help agency.

3.4.5 Geographic Distribution

Figure 5 presents the average number of WMSD claims per county based on county on the report of injury/illness form. In general, the number of claims is proportional to county population, with King County averaging more than 12,000 per year, followed by Pierce, Snohomish and Spokane counties. The percent of compensable claims that were due to WMSDs differed dramatically between counties. Forty percent or more were reported in all Western Washington counties except, Wahkiakum, Lewis and Clark. There were only two eastern Washington counties with 40% or more: Spokane and Asotin, (Figure 5). It is unclear whether this reflects differences in industry distribution, or recognition, or unemployment patterns. Further exploration may be useful.

4.0 DISCUSSION

In the current study we looked at musculoskeletal disorder (MSD) claims for general and selected specific hand/ wrist, elbow, shoulder and back disorders. These MSDs, when caused or aggravated by work activities (for example, exposures to frequent or heavy manual handling, awkward postures, forceful or repetitive exertions) are referred to as Work-related MSDs (WMSDs).

The major findings of this report are:

1. WMSDs continue to be a large and costly problem for workers and companies, costing more than $4 billion for State Fund claims alone over the study period.
2. While claims incidence rates for some but not all WMSDs are decreasing, compensable claims rates are generally decreasing less rapidly than non-WMSD claims rates.
3. While claims rates are decreasing, severity rates are increasing.
4. Construction, transportation and health care have the highest rates and numbers of WMSD claims.
5. Household and Institutional Furniture Manufacturing has replaced Residential Construction on the top 10 list for Upper Extremity Disorders in the State Fund.
5. Some WIC groups have WMSD rates more than 5 times as high as other groups combined, including:

State Fund:

- Temporary help — machine operators
- Temporary help — Vehicle operation
- Moving companies
- Ambulance services
- State health care facilities
- Building construction NOC
- Wallboard installation
- Roofing
- Beer distributors

Self-Insured

- Temporary help — Admin staff
- Airline ground crew
- Ambulance service
- Beer distributors
- Airline flight crews
- Parcel package delivery
- Building construction NOC

4.1 Magnitudes and Cost

On average, there were at least 50,000 WMSDs of the neck, back and upper extremity every year (37,401 accepted State Fund and 8,262 Self-Insured closed compensable claims, with an estimate of 14,600 Self-Insured medical only claims based on State Fund distribution).

4.1.1 STATE FUND

Neck, back and upper extremity musculoskeletal disorders represent a significant cause of morbidity in the working population. WMSDs account for 27.1% of all State Fund claims. Among all claims, 24.2% were compensable whereas among WMSD cases, 36.1% were compensable claims. Overall, these WMSD claims for neck, back and upper extremity WMSDs in the State Fund had direct costs of $4.1 billion over the 9-year period, an average annual direct cost of $453 million per year.

The overall accepted claims rate has decreased -5.9% per year over the study period. The WMSD claims incidence rate decreased slightly less than for non-WMSD claims. There was an **increase** in compensable rotator cuff syndrome rate (+1.5% per year, $p<0.01$, compared to -4.4% decrease in non-rotator cuff CIRs, $p<0.0001$).

We looked at self-reported duration of time on the job before claim reporting (65% reported in compensable claims) and body mass index (height and weight self reported in 76% of compensable claims). The median time on the job was 12 months for all compensable claims and 14 months for compensable WMSD claims. The longest average duration was 31 months for carpal tunnel syndrome claimants, It is unknown whether this reflects a longer time to develop CTS or an administrative or treatment issue.

Median body mass index (BMI) for all those with State Fund compensable claims was increased from 27.1 in last year's report to 27.2 in this report. This may reflect the overall population trend toward overweight and not be specific to claimants. However, the median BMI for compensable carpal tunnel syndrome claimants was 28.3, at least one full point above the other specific conditions. We do not have underlying population data (non-injured workers). However, in a number of epidemiological studies of carpal tunnel syndrome, BMI has been a risk factor for CTS. While Melchoir (2006) found an increased risk for upper extremity WMSDs, he did not find a significant increased risk for CTS due to elevated BMI. Arena (2006) found increasing BMI was a predictor for short-term disability among white collar workers in the workplace.

4.1.2 SELF-INSURED

Approximately 30% of Self-Insured claims are compensable lost time claims. There were 74,361 *closed* compensable neck, back and upper extremity WMSD musculoskeletal disorder claims. It is unfortunate that we

have no ICD-9 diagnostic codes for the Self-Insured claims, and the data on costs and lost time are incomplete. Thus, the CIR of 140.0 per 10,000 FTEs is probably a considerable underestimate of the claims incidence rate for the Self-Insured. An additional reason for underestimation is due to large numbers of Self-Insured claims not having sufficient information to categorize them.

4.2 Comparisons with Other Studies

Although the US Bureau of Labor Statistics (BLS) has a somewhat different definition of WMSDs, some comparison is reasonable. For 2005 BLS reported that the national rate for all cases resulting in days away from work was 135.7 per 10,000 FTEs and in Washington State it was 203.7 per 10,000. The BLS national rate for MSDs was 41.3 per 10,000 FTEs and for Washington State it was 79.3 per 10,000. National figures do not include government whereas BLS data for Washington State does include government. The Washington State combined State Fund & Self-Insured workers' compensation rate for all compensable claims was 203.7 per 10,000 FTEs and for compensable WMSDs; the rate was 83.2 per 10,000 FTEs. Washington State's total compensable claims rates are the same as the BLS rates for Washington. Compensable WMSDs represent 40.8% of all compensable claims compared to the BLS report of 36.3% for Washington State. Both identify the highest rate of WMSDs as being in Transportation and Warehousing followed by Construction. It is unlikely that the distribution would be different than the overall BLS distribution. There has been considerable debate about why Washington State's BLS rates are generally higher than the national average. In a recent state comparison report by Zugel et al (January 2006), statistically significant predictors of higher BLS rates such as in Washington State, include lower percent of non-white workforce, higher unionization and higher percentage of "adequacy of workers' compensation system" based on a report by the National Commission on State Workmen's Compensation Laws and these all represent a reporting bias rather than differences in true underlying injury rates, thus state comparisons may not be as meaningful as one might hope. The incidence of work-related CTS found in this study was 20.4 per 10,000 FTEs over the years 1997-2005, while Franklin et al who also used Washington State workers' compensation data reported a claim rate of 17.4 per 10,000 FTEs for carpal tunnel syndrome over the period 1984-1988. The recent decline in CTS incidence rate has not descended to the

rate of the late 1980's and early 1990's, it is continuing to decrease significantly but not differently than all other claims. BLS reported a 30% decrease in CTS incidence between 1992 and 2001, from 4.3 to 3.0 per 100 FTEs, (http://www.bls.gov/iif/oshcdnew.htm). From 1997 through 2005, the accepted CTS claims rate in the State Fund decreased 43% whereas for all claims, the non-CTS overall decrease was 53%. Surgical incidence of CTS in the Montreal adult population was 9 per 10,000, 19 per 10,000 for male manual workers and 18 per 10,000 for female manual workers, with 75% and 55% of all surgical CTS attributable to work respectively. In the Washington State Fund, there were 13,643 cases of Carpal Tunnel Release identified by either CPT procedure code 64721 (Neuroplasty of the median nerve at carpal tunnel) or ICD 9 procedure 04.43 (carpal tunnel release). This represents 51% of allowed CTS claims for a CTS release rate of 10.4 per 10,000 FTEs. Atroshi et al estimated a prevalence of 2.7% of a general adult population in Sweden had CTS symptoms with clinical or electrodiagnostically positive findings (2.1% for men and 3.0% for women). Using excessive hand force or wrist flexion/extension or using vibratory tools for more than one hour per day was associated with significantly increased prevalence of CTS in this study. Roquelaure et al (2006) found high prevalence of upper extremity WMSDs in a working population using standardized methods by 80 physicians, 13% had at least one upper extremity WMSD. More than half were exposed to at least two workplace risk factors. Prevalence of rotator cuff syndrome was 6.8% in men and 9.0% in women. Lateral epicondylitis was 2.2% and 2.7% respectively and carpal tunnel syndrome prevalence was 2.3% and 4.0% respectively for men and women. Prevalence of exposure to at least two risk factors by body area ranged from 43% for the neck to 59% for the wrist, and was particularly high in construction, farming, manufacturing and services. These findings are similar to what was found in the Washington State workers' compensation data, although the French prevalence estimates are higher, suggesting the workers' compensation data may underestimate true prevalence.

There are other reasons to believe that the workers' compensation claims estimates of the magnitude and costs are underestimates. For example, Morse et al, in a survey of the Connecticut working population, found that only 10.6% of those with work-related upper extremity disorders went through the workers' compensation system and only 21% of those who had

medical visits or procedures reported having them paid for by workers' compensation. In a capture-recapture analysis of workers' compensation data versus physician reporting, Morse et al (2005), found very little overlap in cases from these two surveillance systems (6.7% of WC cases or 8% of physician reports) suggesting under-reporting to be about 11 actual cases to: 1 workers' compensation case. In addition, in the 2002 Oregon Population Survey approximately 47% of those who believed they had a work-related injury/illness had not filed a workers' compensation claim. Fan et al (2006) identified underreporting of work-related injuries to workers' compensation in Washington State using state BRFSS data. Additionally, the Massachusetts SENSOR program (Davis, 2001) found that only 6% of work-related CTS was reported from both workers' compensation records and physician reporting, with physician reporting identifying a higher proportion of males in manufacturing than the workers' compensation data. In a capture-recapture analysis, Morse et al estimated an upper extremity WMSD rate of 133 per 10,000, far above the BLS rates.

None of these figures take into account the indirect costs to the employer in lost productivity, quality, training replacement workers, recruitment and other administrative costs. Foley et al (2007) followed Washington State CTS claimants compared to fracture and dermatitis claimants for six years after claim filing and found that CTS claimant earnings **losses** were substantially greater than for fractures. They were able to recover to approximately half of their pre-injury earnings at six years compared to those with fractures and had three times the time loss duration. Nor do these figures take into account the quantitative and qualitative costs to the claimant and family (e.g., loss in home production), as well as those workers who never file a workers' compensation claim but suffer from work-related back or upper extremity disorders. The economic losses estimated for those with WMSDs by Biddle and Roberts (2004) substantiate the work of Foley et al. on lost earnings. Morse et al (1998) reported the cases in their survey had much higher difficulties with daily tasks (bathing, child care), having lost their homes, had divorces, etc., than non-cases.

4.3 High Risk Industries

The focus of this study has been identifying high-risk industries for both research and prevention purposes. It should be noted that there are high-risk jobs in low risk industries. However, we

did not have adequate denominator data to determine incidence rates by occupation in this study.

We used three different approaches to identify high-risk industries: frequency count, relative risk or rate ratio, and prevention index. Each has advantages and disadvantages depending on the goals.

If we were interested in, for example, reducing the overall number of claims by 10%, we would look for the industries where the most claims are occurring and perhaps focus educational campaigns in those industries. It is likely that the reason why there are so many claims is because these are large industries with many employees, even if the relative risk is low.

An example of this can be seen with Building Equipment Contractors which ranked 2nd on count and 91st on rate in Table 14. This suggests that any specific contractor may not have a high concentration of risk factors present. The relative risk or rate ratio is used to identify those industries at highest risk. We would expect to find a higher concentration of risk factors present in most workplaces in these industries.

This might be important in focusing inspection activities or research where contrasts in claims incidence rates may be important. However, if the highest risk industry has few employees, the overall industry impact of intervention activities might be small unless control measures have widespread utility.

The prevention index was developed as a way to obtain the most impact in high-risk industries. It treats frequency and relative risk as equally important. Depending on the type of intervention, education or research focus contemplated, weighting relative risk or incidence rate more heavily than frequency should be considered. Based on State Fund compensable claims data, the Construction Sector has the highest rate but based on Self-Insured data, Transportation (Couriers and Warehousing) and Public Administration have higher overall rates (Table 24, Figure 4b). It is likely that the larger Self-Insured construction companies have initiated prevention activities, whereas the small contractor in the State Fund has not used the same strategy. It may be that the joint apprenticeship programs (e.g., carpenter's apprenticeship program) have focused more on using ergonomics principles, and workers from these apprenticeships tend to work for the larger Self-Insured employers.

Although tasks in the construction industries are quite varied, they are characterized by manual handling of heavy materials, high peak hand force with periodic repetitive motions (sometimes with segmental vibration as in sawing and drilling), combined with awkward postures.

Compensable WMSD rates for Transportation (NAICS 48 and 49) among the Self-Insured decreased substantially but have not decreased to the rate of State Fund employers (Figure 4). Changes in industry sector business practices, such as out-sourcing delivery and acquiring pack and ship stores, may have shifted risk.

Based on the State Fund Prevention Index and 4-digit NAICS code for compensable back, neck and upper extremity WMSDs, the 4-digit NAICS code industries involving heavy manual handling are of note: Nursing Care Facilities, Foundation Contractors, Residential Building Construction, and Specialized Freight Trucking.

These industries are characterized by heavy manual handling tasks and should be the focus of prevention activities. Within the industries at highest risk (RR≥2.5), occupations such as refuse collectors, laborers and freight stockers, and nursing aides, accounted for the majority of claims (Table 21).

For upper extremity compensable WMSDs, additional industries to include are Animal Slaughtering and Processing, Plastics Product Manufacturing, Personal Care Services (hair salons) and Grocery Stores.

Based on the Self-Insured Prevention Index, the 4-digit NAICS code industries requiring the most prevention attention include Couriers, Scheduled Air Transportation, General Freight Trucking, School & Employee Bus Transportation, Other Wood Products Manufacturing and General Medical and Surgical Hospitals. As shown in Table 29, NAICS codes with rate ratios greater than 2.5 had the largest percentage of claims among occupations such as truck drivers, emergency medical technicians, laborers & freight stockers, flight attendants, bus drivers and refuse collectors.

In general, the State Fund WIC codes continue to provide more specific information on industries requiring attention (Tables 34-37), however they are closer to the 4-digit NAICS codes than the 3-digit SIC codes previously used. While there is substantial overlap between industries at high risk for back and upper extremity WMSDs, there are

also some important differences. For example, Nursing Homes, Beer Distributors, Roofing, Wood Frame Construction, and Moving Companies were the top five industries for back disorders based on the prevention index (Table 36) whereas, Nursing Homes, Wood Products Manufacturing Temporary Help-Assembly, Wallboard Installation and Wholesale Meat Dealers were the top five for upper extremity disorders (Table 37). Prevention activities for the upper extremity should focus on these industries.

For the Self-Insured employers, WIC code industries with the highest PIs for back WMSDs (Table 41) include Parcel Package Delivery, Airline Ground Crew, Ambulance Service, Fire Fighters. Temporary Help Administrative Staff had an extremely high rate ratio (more than 19) but a relatively small number of cases (n=187) . WIC codes for Self-Insured employers may not be as precise as for State Fund employers because they may have multiple types of businesses under the same codes.

In addition to Airline Ground Crew, Parcel Package Delivery, Supermarkets, Public Administration (Cities, Counties, Schools), Temporary Help – Administrative, and Airlines- Flight Crew, Newspaper Publishing, Janitorial Service and Aluminum Products Manufacturing were also associated with upper extremity disorders (Table 42). These industries should also be the focus of research and prevention activities.

4.4 Female Workers

In 2005, 49% of the Washington employed workforce was female (QWI) and 48.3% of the national employed workforce was female (U.S. Census, Current Employment Statistics, tables B12 & B13). There has been only a slight increase in the female portion of the workforce in Washington State over the study period. Between 1997 and 2005, the percent of all claimants and those with WMSDs who were female was 32.7 and 37.4% respectively for the State Fund and 44.3% and 48.4% for the Self-Insured. By body area, the only location where females represented more than 50% of claimants was with Hand/wrist WMSDs. More specifically, for the specific diagnostic entities in the State Fund, females were 57.2% of hand/wrist tendonitis claimants and 58.8% of the CTS claimants. This may reflect differences in job demands (females still tend to be in more hand intensive jobs and males in higher force/manual handling jobs (with the exception of health care)). Women also tend to have lower maximum grip and pinch strength then men so they may be working closer to capacity. Sciatica and

rotator cuff syndrome claimants tended to be more men (66.4% and 62.8% respectively).
McDiarmid et al (2000) used BLS occupational data to demonstrate equal risk between genders when the tasks are truly similar.

4.5 Temporary Workers

Although there are a variety of temporary work situations (temporary agencies, leasing, independent contractor, etc.), we were only able to identify claims associated with temporary service agencies (Tables 38 and 43). Because of the increase in temporary service agency employment over the study period (+17.4 million hours more than in last year's report), summary tables may still underestimate the current rank order of frequency and incidence of musculoskeletal disorders in segments of this industry. Among the Self-Insured (Table 43), Temporary Help – Administrative Staff was at high risk for both upper extremity and back disorders based on the prevention index. For the State Fund, this WIC had a relatively low incidence rate (Table 38). This WIC actually included claimants who were temporary help workers in assembly, machine operators, etc. This most likely explains the extremely high rate identified among the self-insured.

Because L&I does not manage the self-insured claims like the State Fund, there may be less oversight on the quality of the Self-Insured data provided to L&I by the Self-Insured employers.

Among the State Fund temporary services WICs, temporary help in assembly, machine operation, construction, and vehicle operations had extremely high claims incidence rates, in excess of 10 per 100 FTEs (Table 38).

Given the likely continued increase in temporary service employment due to many companies shifting high-risk low skill work away from permanent employees, we can expect to see these temporary service WICs at the top of the Prevention Index in the future. This change in the labor market presents a major challenge for developing effective prevention strategies.

4.6 Limitations and Strengths of Using Workers' Compensation Data

There were a number of limitations in this study. Potential misclassification of the outcome measures is an important consideration. Underestimation of non-traumatic onset was identified in the records review. This was particularly evident in the Self-Insured data.
The use of broad industrial categories as surrogates for exposure may mask high risk jobs in heterogeneously exposed industries. However, mis-

classification of exposure is believed to be less for WIC than for NAICS because WICs are more closely related to exposure (e.g., clerical workers in a factory have a different WIC than the factory workers), whereas NAICS is related to commerce. The only major exception to this is Self-Insured Temporary Help employers who may be misclassifying the claimants using the central office WIC rather than their actual employment.

The use of ANSI z16.2 codes of nature and type is cumbersome. This coding scheme will be replaced with the Occupational Injury and Illness Classification System (OIICS) used by BLS. This transition is beginning and should be reported next year.

Secondly, this study includes very limited data for the largest employers in the state who employ one-third of the workforce (including large aerospace, health care and forest products which are known to involve jobs with work-related risk factors for these musculo-skeletal disorders).

In some respects, because smaller employers are more represented in the State Fund, costs may be overestimated due to the greater capacity of large em-ployers to return employees to work, even in light duty jobs, thereby reducing lost time days and costs.

Differences may also involve higher caseloads for workers' compensation adjudicators for the State Fund compared to the Self-Insured, thus delaying the attention needed to address claims once they have been opened. The incomplete direct cost data (indemnity and medical) for the Self-Insured leads to an underestimate of the total direct cost to Washington State.

A third limitation is the inherent bias in reporting. The traumatic onset disorders tend to gain more ready acceptance in the workers' compensation system than the more gradual or non-traumatic onset disorders.

The medical records review indicated that the State Fund databases were useful for correctly identifying carpal tunnel syndrome, epicondylitis, rotator cuff syndrome and that our coding scheme for determining non-traumatic soft tissue disorders was good for the neck, back and upper extremity but poor for the lower extremity.

For example, a random records review of knee and ankle disorders indicated that the vast majority is of traumatic origin.

In this study we were able to define specific disorders with non-traumatic onset using State Fund data. Among CTS and hand/wrist tendonitis cases, 86% were non-traumatic claims.

We were also able to identify some emerging trends among workers in temporary service agencies. Hopefully, this finding will generate a closer look at health and safety issues affecting contingent workers.

The claims incidence rate of rotator cuff syndrome is 84% of the CTS claims incidence rate (17.3 versus 20.4) but more costly, $32,169 versus $22,868 (Table 5).

Epicondylitis has approximately half of the claims incidence and cost of CTS per claim but still presents a major lost time problem.

Sciatica appears to be a relatively rare diagnosis (incidence rate of 5.7 per 10,000 FTEs) compared to non-traumatic back disorders (incidence rate of 133.9 per 10,000 FTEs), however the costs are extremely expensive ($69,237 on average). Sciatica claims may be viewed as “sentinel events” indicating workplaces where there may be high physical loads requiring improvements.

Research and prevention activities focused in industries with high demands for manual handling and repetitive work should contribute to the reduction of these work-related disorders.

The biggest prevention impact for upper extremity disorders can be achieved by reducing the duration or frequency of exposure to high forces. For the back, the biggest prevention impact can be achieved by redesigning to eliminate awkward or heavy manual handling tasks. Ideas on how to reduce specific hazards in different industries can be found in the Department of Labor & Industries Ergonomics Ideas Bank:

http://www.ErgoIdeas.LNI.wa.gov

In this report, we were able to report severity rates (number of lost workdays per 10,000 FTEs) for State Fund employers. This is an important indicator of severity that cannot be captured with claims incidence or rate ratios alone. While WMSDs represent 27% of all claims, they account for more than 47.4% of all lost work days.

Finally, the use of the Prevention Index has been shown to be relatively stable from year to year. The top 12 industries in need of focused research and prevention efforts, based on the Prevention Index for WMSDs, using

combined State Fund and Self-Insured compensable claims (Table 30), are:

1. Couriers
2. Scheduled Air Transportation
3. Foundation/Structure/Building Exterior Contractors
4. Nursing Care Facilities
5. General Freight Trucking
6. Building Finishing Contractors
7. Community Care Facilities for the Elderly
8. Residential Building Construction
9. General Medical Surgical Hospitals
10. Other Wood Products Manufacturing
11. Grocery Stores
12. Waste Collection

By focusing prevention efforts in these industries, the biggest impact on claims rates, severity and costs due to WMSDs can be achieved because they are big industries and high risk industries.

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Table 1. WA State Fund ICD-9 and Procedure Codes (CPT) Used to Extract Claims with Specific Diagnoses

Condition	ICD9	Diagnosis Description	CPT	Procedure Description
Rotator Cuff	726.1	Rotator Cuff Syndrome	23410	Repair Ruptured Rotator Cuff-Acute
	726.10	Rotator Cuff, Supraspinatus Syndrome	23412	Repair Ruptured Rotator Cuff-Chronic
	727.61	Complete Rupture of Rotator Cuff	23415	Coracoacromial Ligament Release-Chronic Ruptured Rotator Cuff
	840.4	Sprains and Strains of Rotator Cuff Capsule	23420	Repair of Complete Rotator Cuff Avulsion, Chronic
Epicondylitis	726.31	Medial Epicondylitis	24350	Lateral or Medial Fasciotomy
	726.32	Lateral Epicondylitis		
Tenosynovitis/Tendinitis (Hand/Wrist)	727.03	Trigger Finger		
	727.04	DeQuervain's Disease		
	727.05	Other Tenosynovitis of Hand and Wrist		
	727.4	Ganglion & Cyst of Synovium, Bursa, Tendon		
	727.42	Ganglion of the Tendon Sheath		
Carpal Tunnel Syndrome	354.0	Carpal Tunnel Syndrome	64721	Median Nerve Decompression at Carpal Tunnel
Neck Diagnoses	722.0	Neuritis or radiculitis due to displacement of cervical disc		
	722.71	Intervertebral disc disorder with myelopathy		
	723	Other disorders of cervical region		
	723.1	Cervicalgia (pain in neck)		
	723.4	Cervical radiculitis, radicular syndrome		
	723.3	Cervicabrachial syndrome		
	723.5	Torticollis		
	847.0	Sprain and strain of neck		
Back Diagnoses	722.10	Lumbago or sciatica due to displacement of intervertebral disc		
	722.73	Intervertebral disc disorder with myelopathy		
	724	Other disorders of back		
	724.2	Lumbago, lumbalgia, low back pain		
	724.3	Sciatica		
	724.5	Backache, unspecified		

Table 2. Coding Scheme for Work-related Musculoskeletal Disorders of the Neck, Back and Upper Extremity

Soft Tissue Nature Code and Description

190	Dislocation or herniation of discs (back and neck only)
260	Inflammation or irritation of joints, tendons or muscles
310	Strains & sprains
400	Multiple injuries (upper extremity only)
560	Nervous system
562	Bell's Palsy and other diseases of the nerves and peripheral ganglia (carpal tunnel syndrome)
580	Symptoms and ill-defined conditions
995	Other injury, not elsewhere classified
999	Unclassified

NOTE: INJURY NATURE HAS TO BE COMBINED WITH INJURY TYPE AND BODYPART

Types of Non-Traumatic Soft Tissue Disorders.

Code	Type
Rubbed or abraded by:	
81	leaning, kneeling, or sitting on objects (not vibrating)
82	objects being handled (not vibrating)
83	vibrating objects
85	repetition of pressure
86	repetitive motion
100	Bodily reaction (strain, sprain, rupture or other internal injuries resulting from assumption of unnatural position or involuntary motion such as efforts to recover balance from slip)
120	Overexertion
121	in lifting objects
122	in pulling or pushing objects
123	in wielding or throwing objects
124	in carrying objects
129	Overexertion, not elsewhere classified
899-999	Unknown (primarily strain, muscle soreness, pain with lifting etc)

Table 3. WA State Fund Workers' Compensation Claims. All Claims, MSDs and Non-Traumatic Soft Tissue Disorders (WMSDs) in the Neck, Back & Upper Extremity 1997-2005.

	All Claims	Neck, Back and Upper Extremity	
		All MSDs	Non-Traumatic Soft-Tissue Disorders (WMSDs)
Total claims 1997-2005	1,239,844	592,562	336,608
% of all claims	100.0%	47.8%	27.1%
Total direct cost 1997-2005	$9,573,199,129	$6,822,256,361	$4,077,158,376
Average total no. claims/year	137,760	65,840	37,401
Average total no. individuals/year	85,708	48,476	29,781
% female	32.7%	36.4%	37.4%
Median age	35	37	37
Compensable claims median BMI*	27.2	27.1	27.2
Compensable claims median months on the job*	12	12	14
Average yearly claim rate per 10,000 FTEs	950.3	454.1	258.0
Overall yearly claim rate per 10,000 FTEs	946.6	452.4	257.0
Overall severity rate (lost days) per 10,000 FTEs	38027.2	28845.4	18461.3
Total compensable claims	300,298	198,082	121,671
% of total claims	24.2%	33.4%	36.1%
Overall yearly compensable claims rate per 10,000 FTEs	229.3	151.2	92.9
Average time loss days	185.3	214.5	217.1
Median time loss days	34	42	42
Average total direct cost/claim**	$7,813	$11,903	$12,377
Median total direct cost/claim**	$446	$776	$939

BMI=weight in kilograms/height in meters^2

* 35.3% of compensable claims do not indicate length of employment

* 20.6% of compensable claims do not indicate height/weight

** adjusted to 2005 dollars (medical CPI+ general CPI for wages)

Table 4. WA State Fund Workers' Compensation Claims. Work-related Musculoskeletal Disorders (WMSDs) by Body Area, 1997-2005.

	Neck	Back	Upper Extremity	Shoulder	Elbow Forearm	Hand Wrist
Total claims 1997-2005	41,182	174,571	127,885	46,479	21,986	64,396
% of all claims	3.3%	14.1%	10.3%	3.7%	1.8%	5.2%
Total direct cost 1997-2005	$150,109,235	$1,899,781,170	$1,493,722,885	$644,519,340	$131,000,214	$602,423,649
Average total no. claims/year	4,576	19,397	14,209	5,164	2,443	7,155
Average total no. individuals/year	4,260	16,613	12,602	4,813	2,308	6,580
% female	46.1%	31.1%	43.2%	36.8%	40.3%	50.6%
Median age	39	36	38	39	40	38
Compensable claims median BMI*	26.6	27.1	27.4	27.3	26.6	27.7
Compensable claims median months on the job*	16	12	18	17	14	24
Average yearly claim rate per 10,000 FTEs	31.5	133.9	97.9	35.5	16.8	49.4
Overall yearly claim rate per 10,000 FTEs	31.4	133.3	97.6	35.5	16.8	49.2
Overall severity rate (lost days) per 10,000 FTEs	602.9	8,383.8	7,132.2	2,835.2	693.8	3,083.6
Total compensable claims	20,514	67,268	47,198	19,743	7,584	25,068
% of accepted claims	49.8%	38.5%	36.9%	42.5%	34.5%	38.9%
Overall yearly compensable claims rate per 10,000 FTE	15.7	51.4	36.0	15.1	5.8	19.1
Average time loss days	279	195	234	258	222	216
Median time loss days	53	24	74	83	64	69
Average total direct cost/claim**	$15,813	$11,626	$12,481	$16,092	$8,317	$10,983
Median total direct cost/claim**	$950	$834	$948	$1,111	$672	$939

BMI=weight in kilograms/height in meters^2

* 35.3% of compensable claims do not indicate length of employment

* 20.6% of compensable claims do not indicate height/weight

** adjusted to 2005 dollars (medical CPI+ general CPI for wages)

Table 5. WA State Fund Workers Compensation Claims. Selected ICD-9 Examples of WMSDs in the Back and Upper Extremity, 1997-2005.

	Sciatica	Rotator Cuff Syndrome	Epicondylitis	Hand wrist Tendonitis	Carpal Tunnel Syndrome
Total claims1997-2005	7,478	22,611	14,467	19,908	26,685
% of all claims	0.6%	1.8%	1.2%	1.6%	2.2%
Total direct cost 1997-2005	$429,964,605	$531,467,422	$100,848,181	$219,854,854	$476,360,152
Average total no. claims/year	831	2,512	1,607	2,212	2,965
Average total no. individuals/year	811	2,368	1,509	2,102	2,733
% female	33.6%	37.2%	46.6%	57.2%	58.8%
Median age	40	43	42	37	41
Compensable claims median BMI*	27.3	27.4	26.6	27.1	28.3
Compensable claims median months on the job*	14	22	18	18	31
Average yearly claim rate per 10,000 FTEs	5.7	17.3	11.1	15.3	20.4
Overall yearly claim rate per 10,000 FTEs	5.7	17.3	11.0	15.2	20.4
Overall severity rate (lost days) per 10,000 FTEs	1,953.7	2,344.5	546.6	1,199.0	2,478.2
Total compensable claims	5,804	14,142	6,043	8,184	17,309
% of accepted claims	77.6%	62.5%	41.8%	41.1%	64.9%
Overall yearly compensable claims rate per 10,000 FTEs	4.4	10.8	4.6	6.2	13.2
Average time loss days	554	334	271	264	258
Median time loss days	260	142	92	80	93
Average total direct cost/claim**	$69,237	$32,169	$12,006	$14,045	$22,686
Median total direct cost/claim**	$22,768	$7,589	$1,238	$1,483	$7,225

BMI=weight in kilograms/height in meters^2

* 35.3% of compensable claims do not indicate length of employment

* 20.6% of compensable claims do not indicate height/weight

** adjusted to 2005 dollars (medical CPI+ general CPI for wages)

Table 6. WA State Fund WMSDS in the Neck, Back and Upper Extremity, 1997-2005. Industry Sector by Prevention Index. Accepted Claims Incidence Rates per 10,000 FTEs, Costs, and Time Loss Days

NAICS DESCRIPTION	Hours	Count	Cost	Lost Work Days	Rate	Rate Ratio	Rate Rank	Count Rank
23 Construction	2,197,667,658	51,650	$1,064,513,672	5,499,874	470.0	1.8	1	1
62 Health Care and Social Assistance	2,386,347,099	36,365	$340,823,514	2,186,698	304.8	1.2	8	2
32 Manufacturing (Paper, Printing, Energy, Chemicals)	685,556,764	14,667	$154,501,401	919,846	427.9	1.7	3	9
33 Manufacturing (Metals, Machinery, Transport, Furniture)	1,199,968,351	20,273	$241,423,321	1,425,320	337.9	1.3	6	7
44 Retail Trade (Non-Department Store)	2,182,094,445	30,861	$315,697,660	1,924,809	282.9	1.1	12	3
48 Transportation and Warehousing (Air, Rail, Water, Truck, Transit)	589,692,597	12,458	$165,132,657	935,711	422.5	1.6	4	11
56 Administrative and Support and Waste Management and Remediation Services	1,368,498,921	20,389	$211,053,397	1,455,230	298.0	1.2	10	6
42 Wholesale Trade	1,677,743,679	24,350	$247,308,636	1,412,906	290.3	1.1	11	5
72 Accommodation and Food Services	2,064,501,351	26,084	$204,781,820	1,560,245	252.7	1.0	13	4
31 Manufacturing (Food, Beverage, Textile, Apparel)	421,784,388	8,414	$85,306,470	589,374	399.0	1.6	5	15
92 Public Administration	1,195,637,896	14,942	$154,762,622	687,747	249.9	1.0	14	8
49 Transportation and Warehousing (Courier, Warehouse)	110,271,590	2,506	$23,503,500	157,322	454.5	1.8	2	21
81 Other Services (Except Public Administration)	1,314,763,663	14,663	$204,351,701	1,276,980	223.1	0.9	18	10
45 Retail Trade (General, Miscellaneous Retailers)	792,907,909	9,672	$86,403,306	602,045	244.0	0.9	15	13
11 Agriculture, Forestry, Fishing and Hunting	1,019,621,489	11,422	$136,296,482	862,692	224.0	0.9	17	12
21 Mining	51,053,828	815	$15,021,033	74,157	319.3	1.2	7	24
22 Utilities	80,216,557	1,210	$16,733,889	62,489	301.7	1.2	9	23
61 Educational Services	1,353,420,034	8,606	$77,586,565	433,548	127.2	0.5	22	14
53 Real Estate and Rental and Leasing	806,897,650	7,501	$83,530,114	525,801	185.9	0.7	20	17
71 Arts, Entertainment, and Recreation	327,690,533	3,379	$29,784,897	196,333	206.2	0.8	19	20
54 Professional, Scientific, and Technical Services	1,876,153,936	7,611	$92,522,804	504,625	81.1	0.3	24	16
99 Unclassified Establishments	19,054,932	218	$2,720,298	23,739	228.8	0.9	16	25
51 Information	612,345,246	3,439	$32,318,360	179,896	112.3	0.4	23	19
52 Finance and Insurance	1,168,750,643	3,785	$39,261,216	219,314	64.8	0.3	25	18
55 Management of Companies and Enterprises	10,389,614	81	$2,216,095	10,981	155.9	0.6	21	26

1465 cases missing NAICS code

Cost adjusted to 2005 using medical cpi for medical costs and overall CPI for wage replacement costs.

Table 7. WA State Fund WMSDs in the Neck, Back & Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6231 Nursing Care Facilities	184,639,603	8,575	391,323	928.8	3.6	42,387.8	4	3
6233 Community Care Facilities For The Elderly	186,313,941	7,646	409,459	820.8	3.2	43,953.7	6	7
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	12,675	1,468,284	601.8	2.3	69,713.5	25	1
7213 Rooming and Boarding Houses	132,108,217	4,183	256,003	633.3	2.5	38,756.6	18	18
3219 Other Wood Product Manufacturing	124,141,723	3,776	255,247	608.3	2.4	41,121.9	23	21
2383 Building Finishing Contractors	243,223,835	6,487	782,590	533.4	2.1	64,351.4	34	10
2361 Residential Building Construction	316,273,154	7,948	843,145	502.6	2.0	53,317.5	40	6
4842 Specialized Freight Trucking	97,804,802	2,858	263,762	584.4	2.3	53,936.4	26	27
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	69,558,392	2,170	87,085	623.9	2.4	25,039.4	20	34
5621 Waste Collection	38,736,024	1,673	101,066	863.8	3.4	52,181.9	5	49
3116 Animal Slaughtering and Processing	50,481,797	1,761	104,911	697.7	2.7	41,563.9	12	48
4841 General Freight Trucking	162,408,304	4,031	343,889	496.4	1.9	42,348.7	42	19
5617 Services to Buildings and Dwellings	304,828,711	6,859	554,930	450.0	1.8	36,409.3	56	9
3315 Foundries	43,693,936	1,492	95,135	682.9	2.7	43,546.1	13	54
4441 Building Material and Supplies Dealers	282,110,498	6,263	330,166	444.0	1.7	23,406.9	58	11
4533 Used Merchandise Stores	64,577,475	1,803	90,175	558.4	2.2	27,927.7	30	45
2382 Building Equipment Contractors	614,316,214	12,481	964,668	406.3	1.6	31,406.2	75	2
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	2,017	130,834	513.7	2.0	33,322.6	38	40
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	1,402	89,934	671.5	2.6	43,076.5	15	65
4451 Grocery Stores	285,849,013	5,908	346,580	413.4	1.6	24,249.2	73	12
2389 Other Specialty Trade Contractors	152,421,290	3,367	401,492	441.8	1.7	52,681.9	61	25
3261 Plastics Product Manufacturing	104,754,172	2,379	139,553	454.2	1.8	26,643.9	54	32
3323 Architectural and Structural Metals Manufacturing	90,887,116	2,072	167,625	456.0	1.8	36,886.4	52	38
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	1,436	101,138	559.7	2.2	39,421.3	29	61
2362 Nonresidential Building Construction	168,705,828	3,592	378,405	425.8	1.7	44,859.7	67	24
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
1132 Forest Nurseries and Gathering of Forest Products	1,171,857	67	637	1,143.5	4.4	10,871.6	1	273
3311 Iron and Steel Mills and Ferroalloy Manufacturing	1,324,455	74	2,207	1,117.4	4.3	33,326.9	2	269
1131 Timber Tract Operations	1,124,650	53	347	942.5	3.7	6,170.8	3	284

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

1465 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 8. WA State Fund WMSDs in the Neck, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6231 Nursing Care Facilities	184,639,603	1,198	8,055	129.8	4.1	872.5	2	3
6233 Community Care Facilities For The Elderly	186,313,941	1,118	8,493	120.0	3.8	911.7	4	4
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	1,455	31,376	69.1	2.2	1,489.7	23	1
7213 Rooming and Boarding Houses	132,108,217	609	6,644	92.2	2.9	1,005.8	9	17
2383 Building Finishing Contractors	243,223,835	861	26,539	70.8	2.3	2,182.3	20	8
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	276	5,544	107.6	3.4	2,160.9	7	33
4841 General Freight Trucking	162,408,304	559	14,793	68.8	2.2	1,821.7	24	18
2361 Residential Building Construction	316,273,154	906	27,507	57.3	1.8	1,739.4	38	7
4842 Specialized Freight Trucking	97,804,802	377	9,080	77.1	2.5	1,856.8	16	29
6239 Other Residential Care Facilities	73,939,973	272	3,485	73.6	2.3	942.7	18	34
3219 Other Wood Product Manufacturing	124,141,723	382	9,489	61.5	2.0	1,528.7	32	26
6232 Residential Mental Retardation, Mental Health and Substance Abuse Facilities	24,178,132	186	1,826	153.9	4.9	1,510.5	1	58
5621 Waste Collection	38,736,024	190	1,844	98.1	3.1	952.1	8	57
5617 Services to Buildings and Dwellings	304,828,711	766	12,552	50.3	1.6	823.5	57	9
6216 Home Health Care Services	110,031,200	324	6,873	58.9	1.9	1,249.3	36	30
4533 Used Merchandise Stores	64,577,475	211	3,283	65.3	2.1	1,016.8	27	49
1133 Logging	64,739,165	207	6,321	63.9	2.0	1,952.8	28	50
4451 Grocery Stores	285,849,013	672	10,344	47.0	1.5	723.7	72	11
4421 Furniture Stores	64,898,193	202	1,396	62.3	2.0	430.2	31	54
2382 Building Equipment Contractors	614,316,214	1,349	28,904	43.9	1.4	941.0	84	2
4811 Scheduled Air Transportation	36,707,254	154	694	83.9	2.7	378.1	11	75
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	219	4,910	55.8	1.8	1,250.5	43	45
2389 Other Specialty Trade Contractors	152,421,290	379	12,289	49.7	1.6	1,612.5	61	27.5
2362 Nonresidential Building Construction	168,705,828	408	3,113	48.4	1.5	369.0	66	24
9231 Administration of Human Resource Programs	155,975,582	379	2,557	48.6	1.5	327.9	65	27.5
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
4859 Other Transit and Ground Passenger Transportation	10,127,292	64	2,319	126.4	4.0	4,579.7	3	148

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

158 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 9. WA State Fund WMSDs of the Back, 1997-2005. Top 25 4-digit NAICS Codes by Prevention Index. Accepted Claims Incidence & Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6231 Nursing Care Facilities	184,639,603	5,077	218,119	549.9	4.1	23,626.5	2	3
6233 Community Care Facilities For The Elderly	186,313,941	4,679	245,302	502.3	3.8	26,332.1	4	4
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	7,307	768,645	346.9	2.6	36,494.9	18	1
7213 Rooming and Boarding Houses	132,108,217	2,539	150,152	384.4	2.9	22,731.7	11	16
2361 Residential Building Construction	316,273,154	4,666	432,388	295.1	2.2	27,342.7	26	5
2383 Building Finishing Contractors	243,223,835	3,555	369,042	292.3	2.2	30,345.9	27	10
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	69,558,392	1,429	45,893	410.9	3.1	13,195.5	10	30
5621 Waste Collection	38,736,024	894	48,097	461.6	3.5	24,833.2	5	45
4842 Specialized Freight Trucking	97,804,802	1,577	130,667	322.5	2.4	26,720.0	22	28
5617 Services to Buildings and Dwellings	304,828,711	3,956	290,072	259.6	1.9	19,031.8	45	7
3219 Other Wood Product Manufacturing	124,141,723	1,798	104,948	289.7	2.2	16,907.8	30	24
4841 General Freight Trucking	162,408,304	2,237	171,551	275.5	2.1	21,125.9	41	19
4441 Building Material and Supplies Dealers	282,110,498	3,498	171,276	248.0	1.9	12,142.5	50	11
3315 Foundries	43,693,936	831	39,453	380.4	2.9	18,058.8	12	51
2382 Building Equipment Contractors	614,316,214	6,842	497,713	222.8	1.7	16,203.8	65	2
2389 Other Specialty Trade Contractors	152,421,290	1,924	221,747	252.5	1.9	29,096.6	47	23
4421 Furniture Stores	64,898,193	940	46,663	289.7	2.2	14,380.4	29	43
4533 Used Merchandise Stores	64,577,475	929	43,167	287.7	2.2	13,369.1	32	44
4811 Scheduled Air Transportation	36,707,254	698	21,965	380.3	2.9	11,967.7	13	65
2362 Nonresidential Building Construction	168,705,828	1,983	210,776	235.1	1.8	24,987.4	57	22
3273 Cement and Concrete Product Manufacturing	53,008,912	770	50,319	290.5	2.2	18,985.1	28	54
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	702	34,786	336.2	2.5	16,661.8	19	63
4451 Grocery Stores	285,849,013	2,952	149,930	206.5	1.5	10,490.2	78	12
3323 Architectural and Structural Metals Manufacturing	90,887,116	1,083	80,251	238.3	1.8	17,659.5	53	38
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	982	58,686	250.1	1.9	14,947.0	49	42
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
1131 Timber Tract Operations	1,124,650	32	285	569.1	4.3	5,068.2	1	268
1132 Forest Nurseries and Gathering of Forest Products	1,171,857	31	295	529.1	4.0	5,034.7	3	270

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

183 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 10. WA State Fund WMSDs of the Upper Extremity, 1997-2005. Top 25 4-digit NAICS Codes by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6231 Nursing Care Facilities	184,639,603	2,533	102,911	274.4	2.8	11,147.2	14	7
3219 Other Wood Product Manufacturing	124,141,723	1,639	113,063	264.1	2.7	18,215.1	15	17
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	4,227	479,549	200.7	2.1	22,768.8	35	2
3116 Animal Slaughtering and Processing	50,481,797	904	62,432	358.1	3.7	24,734.5	3	35
6233 Community Care Facilities For The Elderly	186,313,941	2,056	83,918	220.7	2.3	9,008.2	24	15
2383 Building Finishing Contractors	243,223,835	2,204	291,402	181.2	1.9	23,961.6	45	10
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	867	49,077	220.8	2.3	12,499.6	23	36
3261 Plastics Product Manufacturing	104,754,172	1,061	70,213	202.6	2.1	13,405.3	33	30
4451 Grocery Stores	285,849,013	2,402	150,008	168.1	1.7	10,495.6	58	8
5621 Waste Collection	38,736,024	581	32,350	300.0	3.1	16,702.8	9	59
2361 Residential Building Construction	316,273,154	2,581	262,946	163.2	1.7	16,627.8	65	6
4842 Specialized Freight Trucking	97,804,802	951	100,151	194.5	2.0	20,479.8	39	34
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	578	37,615	276.9	2.8	18,016.8	13	60
3315 Foundries	43,693,936	566	47,177	259.1	2.7	21,594.3	16	63
7213 Rooming and Boarding Houses	132,108,217	1,136	63,954	172.0	1.8	9,682.1	52	28
4533 Used Merchandise Stores	64,577,475	674	36,617	208.7	2.1	11,340.5	30	52
8121 Personal Care Services	108,277,218	953	105,741	176.0	1.8	19,531.5	49	33
3211 Sawmills and Wood Preservation	43,392,605	548	34,548	252.6	2.6	15,923.5	17	66
4841 General Freight Trucking	162,408,304	1,342	105,494	165.3	1.7	12,991.2	63	20
2382 Building Equipment Contractors	614,316,214	4,485	334,144	146.0	1.5	10,878.6	85	1
4441 Building Material and Supplies Dealers	282,110,498	2,144	107,039	152.0	1.6	7,588.4	76	13
3323 Architectural and Structural Metals Manufacturing	90,887,116	802	65,765	176.5	1.8	14,471.8	48	41
4244 Grocery and Related Product Wholesalers	284,242,746	2,119	138,462	149.1	1.5	9,742.5	80	14
2362 Nonresidential Building Construction	168,705,828	1,317	117,105	156.1	1.6	13,882.7	71	23
3329 Other Fabricated Metal Product Manufacturing	61,191,778	592	46,509	193.5	2.0	15,201.1	40	57
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
3311 Iron and Steel Mills and Ferroalloy Manufacturing	1,324,455	43	1,138	649.3	6.7	17,184.4	1	252
1132 Forest Nurseries and Gathering of Forest Products	1,171,857	29	268	494.9	5.1	4,573.9	2	276
5613 Employment Services	494,529,291	3,514	202,093	142.1	1.5	8,173.1	97	3

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

1271 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 11. WA State Fund Non-Traumatic Sciatica, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6231 Nursing Care Facilities	184,639,603	213	59,431	23.1	4.0	6,437.5	1	3
6233 Community Care Facilities For The Elderly	186,313,941	191	47,690	20.5	3.6	5,119.3	2	5
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	359	171,263	17.0	3.0	8,131.5	7	1
7213 Rooming and Boarding Houses	132,108,217	127	39,867	19.2	3.4	6,035.5	3	13
2361 Residential Building Construction	316,273,154	198	96,605	12.5	2.2	6,109.0	24	4
2383 Building Finishing Contractors	243,223,835	159	74,366	13.1	2.3	6,115.0	21	7
4841 General Freight Trucking	162,408,304	107	32,573	13.2	2.3	4,011.2	18	19
2362 Nonresidential Building Construction	168,705,828	110	63,685	13.0	2.3	7,549.8	22	18
5617 Services to Buildings and Dwellings	304,828,711	175	76,788	11.5	2.0	5,038.1	35	6
2382 Building Equipment Contractors	614,316,214	309	115,300	10.1	1.8	3,753.8	42	2
4842 Specialized Freight Trucking	97,804,802	65	29,921	13.3	2.3	6,118.5	17	29
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	69,558,392	51	6,693	14.7	2.6	1,924.4	13	34
2389 Other Specialty Trade Contractors	152,421,290	95	34,241	12.5	2.2	4,492.9	25	22
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	43	10,453	16.8	2.9	4,074.3	9	42
6239 Other Residential Care Facilities	73,939,973	50	19,042	13.5	2.4	5,150.7	16	35
6216 Home Health Care Services	110,031,200	66	23,921	12.0	2.1	4,348.0	27	28
8111 Automotive Repair and Maintenance	282,313,263	135	65,944	9.6	1.7	4,671.7	49	11
4529 Other General Merchandise Stores	63,987,389	42	16,265	13.1	2.3	5,083.8	19	43
3219 Other Wood Product Manufacturing	124,141,723	69	30,164	11.1	1.9	4,859.6	37	26
5621 Waste Collection	38,736,024	33	9,290	17.0	3.0	4,796.6	8	57
3273 Cement and Concrete Product Manufacturing	53,008,912	36	14,861	13.6	2.4	5,607.0	15	50
5311 Lessors of Real Estate	244,057,809	112	37,296	9.2	1.6	3,056.3	51	15
4413 Automotive Parts, Accessories, and Tire Stores	128,828,311	67	23,209	10.4	1.8	3,603.1	39	27
1133 Logging	64,739,165	41	18,777	12.7	2.2	5,800.8	23	45
4244 Grocery and Related Product Wholesalers	284,242,746	115	22,455	8.1	1.4	1,580.0	58	14

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

14 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 12. WA State Fund Non-Traumatic Rotator Cuff Syndrome, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
2383 Building Finishing Contractors	243,223,835	548	134,492	45.1	2.6	11,059.1	16	3
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	882	176,478	41.9	2.4	8,379.1	25	2
6231 Nursing Care Facilities	184,639,603	403	38,182	43.7	2.5	4,135.8	20	9
4842 Specialized Freight Trucking	97,804,802	257	53,841	52.6	3.0	11,009.9	8	25
5621 Waste Collection	38,736,024	149	19,281	76.9	4.5	9,955.1	2	34
4841 General Freight Trucking	162,408,304	350	47,037	43.1	2.5	5,792.4	21	17
3211 Sawmills and Wood Preservation	43,392,605	123	10,769	56.7	3.3	4,963.5	4	44
3219 Other Wood Product Manufacturing	124,141,723	259	40,169	41.7	2.4	6,471.5	26	22
2361 Residential Building Construction	316,273,154	521	104,263	32.9	1.9	6,593.2	45	4
6233 Community Care Facilities For The Elderly	186,313,941	350	35,894	37.6	2.2	3,853.1	33	17
1133 Logging	64,739,165	147	33,385	45.4	2.6	10,313.7	15	36
4441 Building Material and Supplies Dealers	282,110,498	456	42,653	32.3	1.9	3,023.9	51	6
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	122	13,590	47.6	2.8	5,297.1	13	45
2389 Other Specialty Trade Contractors	152,421,290	266	51,491	34.9	2.0	6,756.4	39	20
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	106	15,117	50.8	2.9	7,240.7	9	56
2362 Nonresidential Building Construction	168,705,828	277	53,529	32.8	1.9	6,345.8	46	19
2382 Building Equipment Contractors	614,316,214	905	145,954	29.5	1.7	4,751.8	65	1
3116 Animal Slaughtering and Processing	50,481,797	112	12,117	44.4	2.6	4,800.5	18	50
2373 Highway, Street, and Bridge Construction	77,083,026	146	30,356	37.9	2.2	7,876.2	32	37
4451 Grocery Stores	285,849,013	424	43,311	29.7	1.7	3,030.3	64	8
8121 Personal Care Services	108,277,218	179	25,957	33.1	1.9	4,794.5	44	31
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	141	13,827	35.9	2.1	3,521.6	35	42
9221 Justice, Public Order, and Safety Activities	275,073,659	396	24,111	28.8	1.7	1,753.1	68	11
3315 Foundries	43,693,936	98	26,970	44.9	2.6	12,345.0	17	64
4453 Beer, Wine, and Liquor Stores	20,086,979	74	8,678	73.7	4.3	8,640.4	3	85
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
3115 Dairy Product Manufacturing	8,342,431	38	9,308	91.1	5.3	22,314.8	1	139

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

98 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 13. WA State Fund Non-Traumatic Epicondylitis, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	560	54,752	26.6	2.4	2,599.6	20	1
2383 Building Finishing Contractors	243,223,835	302	31,723	24.8	2.2	2,608.5	23	5
2361 Residential Building Construction	316,273,154	349	23,223	22.1	2.0	1,468.5	29	3
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	124	7,747	31.6	2.9	1,973.1	8	32
4451 Grocery Stores	285,849,013	298	11,039	20.9	1.9	772.4	35	6
3219 Other Wood Product Manufacturing	124,141,723	152	6,312	24.5	2.2	1,016.9	24	21
3261 Plastics Product Manufacturing	104,754,172	127	5,338	24.2	2.2	1,019.1	25	30
9231 Administration of Human Resource Programs	155,975,582	159	1,068	20.4	1.8	136.9	39	20
2382 Building Equipment Contractors	614,316,214	522	27,685	17.0	1.5	901.3	58	2
2362 Nonresidential Building Construction	168,705,828	164	9,409	19.4	1.8	1,115.4	44	17
3116 Animal Slaughtering and Processing	50,481,797	74	2,655	29.3	2.7	1,051.9	12	56
3222 Converted Paper Product Manufacturing	41,745,947	67	2,899	32.1	2.9	1,388.9	7	62
8121 Personal Care Services	108,277,218	114	5,424	21.1	1.9	1,001.9	34	36
3315 Foundries	43,693,936	68	1,144	31.1	2.8	523.6	9	61
8111 Automotive Repair and Maintenance	282,313,263	232	21,034	16.4	1.5	1,490.1	61	10
2389 Other Specialty Trade Contractors	152,421,290	141	12,619	18.5	1.7	1,655.8	48	25
3323 Architectural and Structural Metals Manufacturing	90,887,116	96	2,294	21.1	1.9	504.8	33	40
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	63	5,906	30.2	2.7	2,828.9	11	64
3329 Other Fabricated Metal Product Manufacturing	61,191,778	77	2,210	25.2	2.3	722.3	22	54
3364 Aerospace Product and Parts Manufacturing	104,053,918	107	2,324	20.6	1.9	446.7	38	39
3211 Sawmills and Wood Preservation	43,392,605	61	3,308	28.1	2.5	1,524.7	13	68
7223 Special Food Services	82,082,647	85	2,779	20.7	1.9	677.1	36	48
4841 General Freight Trucking	162,408,304	139	6,253	17.1	1.5	770.0	57	27
4842 Specialized Freight Trucking	97,804,802	95	6,325	19.4	1.8	1,293.4	45	41
4441 Building Material and Supplies Dealers	282,110,498	210	6,913	14.9	1.3	490.1	75	13
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
3334 Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	13,509,176	29	2,559	42.9	3.9	3,788.5	1	124
4453 Beer, Wine, and Liquor Stores	20,086,979	42	3,159	41.8	3.8	3,145.3	2	103
3115 Dairy Product Manufacturing	8,342,431	16	3,638	38.4	3.5	8,721.7	3	172

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

155 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 14. WA State Fund Non-Traumatic Carpal Tunnel Syndrome, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
8121 Personal Care Services	108,277,218	385	45,155	71.1	3.5	8,340.6	4	16
4451 Grocery Stores	285,849,013	589	62,210	41.2	2.0	4,352.6	24	5
3116 Animal Slaughtering and Processing	50,481,797	248	29,045	98.3	4.8	11,507.1	1	28
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	738	139,058	35.0	1.7	6,602.4	41	3
9231 Administration of Human Resource Programs	155,975,582	317	9,848	40.6	2.0	1,262.8	25	20
3219 Other Wood Product Manufacturing	124,141,723	262	33,889	42.2	2.1	5,459.7	21	26
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	173	16,646	44.1	2.2	4,239.6	16	42
6212 Offices of Dentists	210,080,312	365	51,120	34.7	1.7	4,866.7	44	17
6241 Individual and Family Services	309,731,759	521	40,540	33.6	1.7	2,617.7	53	8
3261 Plastics Product Manufacturing	104,754,172	205	31,252	39.1	1.9	5,966.7	27	38
2383 Building Finishing Contractors	243,223,835	410	66,877	33.7	1.7	5,499.2	52	14
3399 Other Miscellaneous Manufacturing	99,330,288	188	29,069	37.9	1.9	5,853.0	30	39
3323 Architectural and Structural Metals Manufacturing	90,887,116	174	29,533	38.3	1.9	6,498.8	29	41
8111 Automotive Repair and Maintenance	282,313,263	448	72,805	31.7	1.6	5,157.7	63	12
3329 Other Fabricated Metal Product Manufacturing	61,191,778	132	19,493	43.1	2.1	6,371.1	18	57
3315 Foundries	43,693,936	111	10,869	50.8	2.5	4,975.1	8	68
1133 Logging	64,739,165	134	22,631	41.4	2.0	6,991.4	23	56
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	114	12,166	44.4	2.2	4,742.0	14	65
7223 Special Food Services	82,082,647	148	25,538	36.1	1.8	6,222.5	34	46
9261 Administration of Economic Programs	151,689,998	254	19,866	33.5	1.6	2,619.3	55	27
3222 Converted Paper Product Manufacturing	41,745,947	102	11,263	48.9	2.4	5,396.0	11	72
2361 Residential Building Construction	316,273,154	470	71,104	29.7	1.5	4,496.4	75	9
3211 Sawmills and Wood Preservation	43,392,605	100	12,890	46.1	2.3	5,941.1	12	74
2382 Building Equipment Contractors	614,316,214	816	82,693	26.6	1.3	2,692.2	91	2
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	92	8,534	44.1	2.2	4,087.6	15	82
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
1125 Animal Aquaculture	4,295,228	18	3,954	83.8	4.1	18,411.1	2	210
3162 Footwear Manufacturing	3,485,372	13	1,230	74.6	3.7	7,058.1	3	235

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

927 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 15. WA State Fund Non-Traumatic Hand-Wrist Tendonitis, 1997-2005. Top 25 4-digit NAICS by Prevention Index. Accepted Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
8121 Personal Care Services	108,277,218	295	26,375	54.5	3.6	4,871.8	10	13
3116 Animal Slaughtering and Processing	50,481,797	226	16,089	89.5	5.9	6,374.2	3	21
3219 Other Wood Product Manufacturing	124,141,723	290	15,223	46.7	3.1	2,452.5	12	14
5613 Employment Services	494,529,291	764	37,856	30.9	2.0	1,531.0	36	1
4244 Grocery and Related Product Wholesalers	284,242,746	398	24,279	28.0	1.8	1,708.3	43	6
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	555	56,614	26.4	1.7	2,688.0	50	2
4451 Grocery Stores	285,849,013	370	23,608	25.9	1.7	1,651.8	53	7
3399 Other Miscellaneous Manufacturing	99,330,288	172	15,351	34.6	2.3	3,090.9	30	33
3261 Plastics Product Manufacturing	104,754,172	177	12,762	33.8	2.2	2,436.6	32	32
6231 Nursing Care Facilities	184,639,603	250	17,531	27.1	1.8	1,898.9	48	18
1151 Support Activities For Crop Production	124,003,523	182	9,516	29.4	1.9	1,534.8	39	28
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	139	6,131	35.4	2.3	1,561.5	29	39
3117 Seafood Product Preparation and Packaging	60,490,410	123	10,623	40.7	2.7	3,512.3	23	47
6233 Community Care Facilities For The Elderly	186,313,941	229	13,877	24.6	1.6	1,489.6	56	20
3329 Other Fabricated Metal Product Manufacturing	61,191,778	115	11,073	37.6	2.5	3,619.1	27	50
3211 Sawmills and Wood Preservation	43,392,605	90	2,466	41.5	2.7	1,136.6	18	63
5617 Services to Buildings and Dwellings	304,828,711	308	36,305	20.2	1.3	2,382.0	74	9
3323 Architectural and Structural Metals Manufacturing	90,887,116	131	16,689	28.8	1.9	3,672.5	41	43
3222 Converted Paper Product Manufacturing	41,745,947	87	6,914	41.7	2.7	3,312.4	16	69
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	87	1,339	41.7	2.7	641.4	17	69
3315 Foundries	43,693,936	89	5,299	40.7	2.7	2,425.5	22	64
5111 Newspaper, Periodical, Book, and Directory Publishers	115,460,739	148	9,167	25.6	1.7	1,587.9	55	34
2361 Residential Building Construction	316,273,154	307	30,855	19.4	1.3	1,951.2	81	11
9231 Administration of Human Resource Programs	155,975,582	179	4,888	23.0	1.5	626.8	62	30
8123 Dry cleaning and Laundry Services	60,313,039	93	11,561	30.8	2.0	3,833.7	37	59
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
1132 Forest Nurseries and Gathering of Forest Products	1,171,857	12	13	204.8	13.5	221.9	1	226
3311 Iron and Steel Mills and Ferroalloy Manufacturing	1,324,455	13	360	196.3	12.9	5,436.2	2	219
7221 Full-Service Restaurants	782,184,045	545	52,212	13.9	0.9	1,335.0	139	3

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

229 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 16. WA State Fund WMSDs in the Neck, Back and Upper Extremity, 1997-2005. 2-Digit NAICS Industry Sector by Prevention Index. *Compensable* (lost-time) Claims Incidence Rates per 10,000 FTEs, Costs, and Time Loss Days

NAICS DESCRIPTION	Hours	Count	Cost	Lost Work Days	Rate	Rate Ratio	Rate Rank	Count Rank
23 Construction	2,197,667,658	22,154	$1,031,752,111	5,498,744	201.6	2.2	1	1
62 Health Care and Social Assistance	2,386,347,099	12,436	$311,408,146	2,186,108	104.2	1.1	10	2
48 Transportation and Warehousing	589,692,597	5,350	$157,507,297	935,422	181.5	2.0	2	10
56 Administrative and Support and Waste Management and Remediation Services	1,368,498,921	7,939	$199,380,320	1,454,940	116.0	1.2	7	6
44 Retail Trade	2,182,094,445	10,617	$293,062,265	1,924,218	97.3	1.0	11	3
33 Manufacturing	1,199,968,351	6,709	$226,378,439	1,425,145	111.8	1.2	8	7
32 Manufacturing	685,556,764	4,983	$144,423,318	919,524	145.4	1.6	4	11
42 Wholesale Trade	1,677,743,679	8,141	$229,256,037	1,412,756	97.0	1.0	12	5
72 Accommodation and Food Services	2,064,501,351	8,664	$186,066,662	1,559,979	83.9	0.9	15	4
31 Manufacturing	421,784,388	2,977	$79,365,989	589,119	141.2	1.5	5	14
92 Public Administration	1,195,637,896	5,423	$142,437,299	687,647	90.7	1.0	13	8
49 Transportation and Warehousing	110,271,590	944	$21,872,966	157,319	171.2	1.8	3	21
81 Other Services (Except Public Administration)	1,314,763,663	5,404	$192,381,254	1,276,784	82.2	0.9	16	9
45 Retail Trade	792,907,909	3,127	$78,651,496	601,851	78.9	0.8	17	13
21 Mining	51,053,828	346	$14,498,950	74,156	135.5	1.5	6	24
11 Agriculture, Forestry, Fishing and Hunting	1,019,621,489	3,877	$128,846,496	862,489	76.0	0.8	18	12
22 Utilities	80,216,557	435	$15,710,452	62,489	108.5	1.2	9	23
53 Real Estate and Rental and Leasing	806,897,650	2,627	$77,679,432	525,738	65.1	0.7	19	16
61 Educational Services	1,353,420,034	2,829	$70,006,121	433,490	41.8	0.5	22	15
71 Arts, Entertainment, and Recreation	327,690,533	1,061	$26,868,624	196,318	64.8	0.7	20	19
99 Unclassified Establishments	19,054,932	85	$2,571,831	23,739	89.2	1.0	14	25
54 Professional, Scientific, and Technical Services	1,876,153,936	2,407	$85,174,402	504,499	25.7	0.3	24	17
51 Information	612,345,246	1,042	$29,272,592	179,877	34.0	0.4	23	20
52 Finance and Insurance	1,168,750,643	1,201	$35,021,777	219,127	20.6	0.2	26	18
55 Management of Companies and Enterprises	10,389,614	28	$2,177,933	10,981	53.9	0.6	21	26

950 cases missing NAICS code

Cost adjusted to 2005 using medical cpi for medical costs and overall CPI for wage replacement costs.

Table 17. WA State Fund WMSDs of the Neck, Back & Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence & Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	5,742	1,467,954	272.6	2.9	69,697.8	10	1
6231 Nursing Care Facilities	184,639,603	2,540	391,193	275.1	3.0	42,373.7	9	8
2383 Building Finishing Contractors	243,223,835	3,046	782,549	250.5	2.7	64,348.1	20	4
6233 Community Care Facilities For The Elderly	186,313,941	2,419	409,320	259.7	2.8	43,938.7	17	9
2361 Residential Building Construction	316,273,154	3,460	843,078	218.8	2.4	53,313.3	28	3
4842 Specialized Freight Trucking	97,804,802	1,299	263,754	265.6	2.9	53,934.8	13	25
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	796	101,131	310.3	3.3	39,418.5	7	32
4841 General Freight Trucking	162,408,304	1,895	343,648	233.4	2.5	42,319.0	24	16
5621 Waste Collection	38,736,024	723	101,065	373.3	4.0	52,181.4	3	41
5617 Services to Buildings and Dwellings	304,828,711	2,946	554,802	193.3	2.1	36,400.9	40	5
2389 Other Specialty Trade Contractors	152,421,290	1,505	401,355	197.5	2.1	52,663.9	38	19
7213 Rooming and Boarding Houses	132,108,217	1,372	255,977	207.7	2.2	38,752.6	34	23
3219 Other Wood Product Manufacturing	124,141,723	1,282	255,196	206.5	2.2	41,113.7	35	26
3116 Animal Slaughtering and Processing	50,481,797	665	104,908	263.5	2.8	41,562.7	16	48
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	69,558,392	767	87,082	220.5	2.4	25,038.5	27	37
2382 Building Equipment Contractors	614,316,214	4,633	964,389	150.8	1.6	31,397.2	66	2
4451 Grocery Stores	285,849,013	2,253	346,522	157.6	1.7	24,245.1	61	10
2362 Nonresidential Building Construction	168,705,828	1,439	378,374	170.6	1.8	44,856.1	52	20
1133 Logging	64,739,165	702	203,249	216.9	2.3	62,790.1	32	43
8111 Automotive Repair and Maintenance	282,313,263	2,038	521,557	144.4	1.6	36,948.8	76	11
6239 Other Residential Care Facilities	73,939,973	689	112,802	186.4	2.0	30,511.8	43	45
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	484	89,922	231.8	2.5	43,070.8	26	63
6232 Residential Mental Retardation, Mental Health and Substance Abuse Facilities	24,178,132	395	43,502	326.7	3.5	35,984.6	4	86
2373 Highway, Street, and Bridge Construction	77,083,026	694	215,828	180.1	1.9	55,998.8	46	44
3315 Foundries	43,693,936	475	95,122	217.4	2.3	43,540.1	30	65
Listed below industries in the top three by rate or count but not in the top 25 by prevention index.								
3115 Dairy Product Manufacturing	8,342,431	170	33,482.0	407.6	4.4	80,269.2	1	152
1132 Forest Nurseries and Gathering of Forest Products	1,171,857	22	637.0	375.5	4.0	10,871.6	2	271

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

950 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 18. WA State Fund WMSDs in the Neck, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence and Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
6233 Community Care Facilities For The Elderly	186,313,941	516	8,493	55.4	3.5	911.7	7	3
6231 Nursing Care Facilities	184,639,603	491	8,055	53.2	3.4	872.5	8	7
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	918	31,360	43.6	2.8	1,489.0	15	1
2383 Building Finishing Contractors	243,223,835	495	26,539	40.7	2.6	2,182.3	20	6
7213 Rooming and Boarding Houses	132,108,217	293	6,644	44.4	2.8	1,005.8	14	15
4841 General Freight Trucking	162,408,304	320	14,793	39.4	2.5	1,821.7	21	13
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	173	5,544	67.4	4.3	2,160.9	4	30
2361 Residential Building Construction	316,273,154	515	27,501	32.6	2.1	1,739.1	34	4
4842 Specialized Freight Trucking	97,804,802	211	9,080	43.1	2.8	1,856.8	17	26
5617 Services to Buildings and Dwellings	304,828,711	467	12,552	30.6	2.0	823.5	41	8
6232 Residential Mental Retardation, Mental Health and Substance Abuse Facilities	24,178,132	104	1,826	86.0	5.5	1,510.5	1	51
5621 Waste Collection	38,736,024	108	1,844	55.8	3.6	952.1	6	48
1133 Logging	64,739,165	133	6,321	41.1	2.6	1,952.8	19	37
6216 Home Health Care Services	110,031,200	188	6,873	34.2	2.2	1,249.3	31	28
6239 Other Residential Care Facilities	73,939,973	140	3,485	37.9	2.4	942.7	26	34
8111 Automotive Repair and Maintenance	282,313,263	351	16,307	24.9	1.6	1,155.2	61	10
2389 Other Specialty Trade Contractors	152,421,290	217	12,289	28.5	1.8	1,612.5	48	24
3219 Other Wood Product Manufacturing	124,141,723	183	9,489	29.5	1.9	1,528.7	45	29
2382 Building Equipment Contractors	614,316,214	685	28,904	22.3	1.4	941.0	73	2
4451 Grocery Stores	285,849,013	348	10,307	24.3	1.6	721.1	65	11
2362 Nonresidential Building Construction	168,705,828	229	3,113	27.1	1.7	369.0	55	23
8121 Personal Care Services	108,277,218	146	9,910	27.0	1.7	1,830.5	56	32
2373 Highway, Street, and Bridge Construction	77,083,026	115	7,113	29.8	1.9	1,845.5	44	44
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	81	6,319	38.8	2.5	3,026.7	22	66
4421 Furniture Stores	64,898,193	103	1,396	31.7	2.0	430.2	37	52
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
3115 Dairy Product Manufacturing	8,342,431	34	1,431	81.5	5.2	3,430.7	2	143
4859 Other Transit and Ground Passenger Transportation	10,127,292	38	2,319	75.0	4.8	4,579.7	3	132

NAICS groups with less than 100,000 hours per year were excluded from the analysis

117 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 19. WA State Fund WMSDs in the Back, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence & Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	3,530	768,489	167.6	3.3	36,487.5	9	1
6231 Nursing Care Facilities	184,639,603	1,659	218,090	179.7	3.5	23,623.3	6	6
6233 Community Care Facilities For The Elderly	186,313,941	1,609	245,232	172.7	3.4	26,324.6	7	7
2383 Building Finishing Contractors	243,223,835	1,772	369,029	145.7	2.8	30,344.8	17	5
2361 Residential Building Construction	316,273,154	2,183	432,347	138.0	2.7	27,340.1	23	3
4841 General Freight Trucking	162,408,304	1,138	171,337	140.1	2.7	21,099.5	19	12
5617 Services to Buildings and Dwellings	304,828,711	1,841	290,056	120.8	2.4	19,030.8	29	4
5621 Waste Collection	38,736,024	415	48,096	214.3	4.2	24,832.7	1	35
4842 Specialized Freight Trucking	97,804,802	747	130,662	152.8	3.0	26,718.9	14	24
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	69,558,392	536	45,890	154.1	3.0	13,194.7	11	29
7213 Rooming and Boarding Houses	132,108,217	901	150,141	136.4	2.7	22,730.0	24	20
2389 Other Specialty Trade Contractors	152,421,290	904	221,718	118.6	2.3	29,092.8	31	19
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	402	39,704	156.7	3.1	15,475.7	10	42
2382 Building Equipment Contractors	614,316,214	2,707	497,665	88.1	1.7	16,202.2	58	2
2362 Nonresidential Building Construction	168,705,828	864	210,764	102.4	2.0	24,986.0	43	21
6239 Other Residential Care Facilities	73,939,973	412	57,425	111.4	2.2	15,532.9	35	36
3219 Other Wood Product Manufacturing	124,141,723	632	104,934	101.8	2.0	16,905.5	45	26
6232 Residential Mental Retardation, Mental Health and Substance Abuse Facilities	24,178,132	229	22,309	189.4	3.7	18,453.9	4	75
1133 Logging	64,739,165	366	80,743	113.1	2.2	24,944.1	34	45
2373 Highway, Street, and Bridge Construction	77,083,026	403	102,322	104.6	2.0	26,548.5	39	41
4441 Building Material and Supplies Dealers	282,110,498	1,166	171,152	82.7	1.6	12,133.7	70	11
4451 Grocery Stores	285,849,013	1,169	149,909	81.8	1.6	10,488.7	73	10
4421 Furniture Stores	64,898,193	351	46,651	108.2	2.1	14,376.7	37	47
4811 Scheduled Air Transportation	36,707,254	255	21,962	138.9	2.7	11,966.0	22	66
8111 Automotive Repair and Maintenance	282,313,263	1,106	246,455	78.4	1.5	17,459.7	79	13
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
4852 Interurban and Rural Bus Transportation	9,159,548	97	11,155	211.8	4.1	24,357.1	2	147
3115 Dairy Product Manufacturing	8,342,431	81	12,466	194.2	3.8	29,885.8	3	157

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

98 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 20. WA State Fund WMSDs in the Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence & Severity Rates per 10,000 FTEs

NAICS Description	Hours	Count	Lost Days	Rate	Rate Ratio	Severity Rate	Rate Rank	Count Rank
2381 Foundation, Structure, and Building Exterior Contractors	421,233,892	1,900	479,399	90.2	2.5	22,761.7	18	1
2383 Building Finishing Contractors	243,223,835	1,065	291,382	87.6	2.4	23,960.0	22	6
3116 Animal Slaughtering and Processing	50,481,797	379	62,432	150.2	4.2	24,734.5	3	31
3219 Other Wood Product Manufacturing	124,141,723	581	113,026	93.6	2.6	18,209.2	15	19
4842 Specialized Freight Trucking	97,804,802	465	100,150	95.1	2.6	20,479.6	12	27
2361 Residential Building Construction	316,273,154	1,123	262,936	71.0	2.0	16,627.1	37	4
8121 Personal Care Services	108,277,218	485	105,741	89.6	2.5	19,531.5	19	26
4451 Grocery Stores	285,849,013	977	150,008	68.4	1.9	10,495.6	42	7
6231 Nursing Care Facilities	184,639,603	699	102,814	75.7	2.1	11,136.7	34	15
4841 General Freight Trucking	162,408,304	616	105,467	75.9	2.1	12,987.9	33	17
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	289	36,087	112.6	3.1	14,065.9	9	42
5621 Waste Collection	38,736,024	249	32,350	128.6	3.6	16,702.8	6	49
1133 Logging	64,739,165	299	79,324	92.4	2.6	24,505.7	17	39
2389 Other Specialty Trade Contractors	152,421,290	521	123,320	68.4	1.9	16,181.5	41	22
3211 Sawmills and Wood Preservation	43,392,605	213	34,508	98.2	2.7	15,905.0	11	59
5617 Services to Buildings and Dwellings	304,828,711	900	185,245	59.0	1.6	12,154.0	62	8
6233 Community Care Facilities For The Elderly	186,313,941	592	83,914	63.5	1.8	9,007.8	52	18
3222 Converted Paper Product Manufacturing	41,745,947	207	37,590	99.2	2.8	18,008.9	10	62
8111 Automotive Repair and Maintenance	282,313,263	815	197,861	57.7	1.6	14,017.1	67	11
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing	78,525,701	286	49,026	72.8	2.0	12,486.6	35	43
2382 Building Equipment Contractors	614,316,214	1,688	333,894	55.0	1.5	10,870.4	77	2
3315 Foundries	43,693,936	204	47,164	93.4	2.6	21,588.4	16	63
2362 Nonresidential Building Construction	168,705,828	515	117,086	61.1	1.7	13,880.5	56	24
3261 Plastics Product Manufacturing	104,754,172	354	70,172	67.6	1.9	13,397.5	45	35
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	41,755,438	196	37,609	93.9	2.6	18,013.9	14	66
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.								
3115 Dairy Product Manufacturing	8,342,431	76	18,010	182.2	5.1	43,176.9	1	142
3379 Other Furniture Related Product Manufacturing	8,308,074	63	19,837	151.7	4.2	47,753.5	2	154
5613 Employment Services	494,529,291	1,214	201,989	49.1	1.4	8,168.9	100	3

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

870 cases missing NAICS code

Severity rate=timeloss days per 10,000 FTEs

Table 21. WA State Fund Compensable WMSD Claims. Top 5 Occupations for 4-digit NAICS Codes with Rate Ratios of Greater than 2.5 1997-2005

NAICS Description	Occupation	Count	Number Claims	Percent
3115 Dairy Product Manufacturing	537062 Laborers & Freight, Stockers	31		
	519199 Production workers	26		
	533032-3 Truck Drivers Heavy & Light	17		
	537064 Packers & Packagers, Handlers	13		
	451011 First-Line Supervisors	5		
	Total	92	170	54.1%
5621 Waste Collection	537081 Refuse & Recycled Materials Collectors	370		
	533032-3 Truck Drivers Heavy & Light	143		
	537062 Laborers	26		
	493031 Bus & Truck Mechanics	17		
	514121 Welders & Cutters	12		
	Total	568	723	78.6%
6232 Residential Mental Health & Substance Abuse Facilities	311012 Nursing Aides & Orderlies	63		
	311011 Home Health Aides	54		
	211019 Counselors	53		
	211099 Community and Social Service Specialists	23		
	537062 Laborers	22		
	Total	215	395	54.4%
4852 Interurban & Rural Bus Transportation	292041 Emergency Medical Technician	62		
	533021 Bus Drivers	35		
	Total	97	147	66.0%
6222 Psychiatric and Substance Abuse Hospitals	292053 Psychiatric Technicians	133		
	291111 Registered Nurses	104		
	292061 Licensed Practical Nurses	89		
	372011 Janitors and Cleaners	54		
	359099 Food Preparation and Service	33		
	Total	413	796	52.1%

Table 21. (continued)

NAICS Description	Occupation	Count	Number Claims	Percent
6231 Nursing Care Facilities	311012 Nursing Aides & Orderlies	1590		
	291111 Registered Nurses	102		
	292061 Licensed Practical Nurses	86		
	372012 Maids and Housekeeping Cleaners	68		
	311011 Home Health Aids	55		
	Total	1,901	2,540	52.1%
3116 Animal Slaughtering & Butchering	537062 Laborers & Freight, Stockers	128		
	513021-2 Butchers & Meat cutters	100		
	513023 Slaughterers & Meatpackers	70		
	519199 Production Workers, All Others	45		
	452093 Farmworkers	28		
	Total	371	665	55.8%
2381 Foundation Structure & Bldg Exterior Contractors	472031 Carpenters	1211		
	472061 Construction Craft Laborers	759		
	472181 Roofers	681		
	471011 Construction Supervisors	478		
	47051 Concrete Finishers	259		
	Total	3,388	5,742	59.0%
4842 Specialized Freight Trucking	533032-3 Truck Drivers Heavy & Light	692		
	537062 Laborers & Freight, Stockers	290		
	Total	982	1,299	75.6%
4921Couriers	533032-3 Truck Drivers Heavy & Light	109		
	435021 Couriers & Messengers	51		
	537062 Laborers & Freight, Stockers	28		
	Total	188	236	79.7%

Table 21. (continued)

NAICS Description	Occupation	Count	Number Claims	Percent
6233 Community Care Facilities for the Elderly	311012 Nursing Aides & Orderlies	1267		
	311011 Home Health Aides	197		
	372012 Maids & Housekeeping Cleaners	100		
	292061 Licensed Practical Nurses	79		
	291111 Registered Nurses	64		
	Total	1,707	2,419	70.6%
5622 Waste Treatment and Disposal	537081 Refuse & Recycled Materials Collectors	67		
	533032-3 Truck Drivers Heavy & Light	27		
	537062 Laborers	11		
	Total	105	154	68.2%
2383 Building Finishing Contractors	472081 Drywall & Ceiling Tile Installers	786		
	472141 Painters, Construction & Maintenance	441		
	472031 Carpenters	335		
	471011 Construction Supervisors	207		
	472131 Insulation Workers	147		
	Total	1,916	3,046	62.9%
4884 Support Activities for Road Transportation	533032-3 Truck Drivers Heavy & Light	133		
	Total	133	186	71.5%
4841 General Freight Trucking	533032-3 Truck Drivers Heavy & Light	1296		
	537062 Laborers & Freight, Stockers	229		
	Total	1,525	1,895	80.5%

Table 22. WA Self-Insured Workers Compensation *Compensable* (lost-time) Claims. All Claims, MSDs and WMSDs in the Neck, Back & Upper Extremity 1997-2005.

	All Claims	Neck Back and Upper Extremity	
		All MSDs	Non-Traumatic Soft-Tissue Disorders
Total compensable claims	157,824	102,268	74,361
% of all compensable claims	100.0%	64.8%	47.1%
Average total no. claims/year	17,536	11,363	8,262
Average total no. individuals/year	13,319	9,171	6,881
% female	44.3%	47.7%	48.4%
Median age	42	42	42
Average yearly claim rate per 10,000 FTEs	298	193	140
Overall yearly claim rate per 10,000 FTEs	298.2	193.2	140.5

Table 23. WA Self-Insured *Compensable* Workers Compensation Claims. WMSDs by Body Area, 1997-2005.

	Neck	Back	Upper Extremity	Shoulder	Elbow Forearm	Hand Wrist
Total compensable claims	1,980	34,167	29,318	10,658	2,577	12,465
% of all compensable claims	1.3%	21.7%	18.6%	6.8%	1.6%	7.9%
Average total no. claims/year	220	3,796	3,258	1,184	286	1,385
Average total no. individuals/year	214	3,335	2,952	1,113	277	1,306
% female	49.8%	41.8%	52.1%	43.9%	45.1%	58.2%
Median age	41	40	43	43	42	43
	4	65	55	20	5	24
Average yearly claim rate per 10,000 FTEs	3.7	64.6	55.4	20.1	4.9	23.6
Overall yearly claim rate per 10,000 FTEs	3.7	64.6	55.4	20.1	4.9	23.6

Table 24. WA Self-Insured WMSDs in the Neck, Back and Upper Extremity, 1997-2005. Industry Sector by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
62 Health Care and Social Assistance	1,280,578,385	11,589	181.0	1.3	4	1
92 Public Administration	861,426,032	7,420	172.3	1.2	5	3
48 Transportation and Warehousing	309,020,274	5,549	359.1	2.6	2	7
49 Transportation and Warehousing	117,719,654	2,826	480.1	3.4	1	9
45 Retail Trade	801,560,544	6,781	169.2	1.2	6	5
44 Retail Trade	986,436,997	7,364	149.3	1.1	9	4
33 Manufacturing	1,739,543,700	11,286	129.8	0.9	12	2
32 Manufacturing	391,407,222	3,176	162.3	1.2	8	8
56 Administrative and Support and Waste Management and Remediation Services	133,620,802	1,470	220.0	1.6	3	13
31 Manufacturing	333,638,012	2,775	166.3	1.2	7	10
61 Educational Services	1,452,453,370	5,800	79.9	0.6	19	6
42 Wholesale Trade	240,269,313	1,546	128.7	0.9	13	12
21 Mining	20,326,103	149	146.6	1.0	10	20
23 Construction	171,154,987	924	108.0	0.8	17	14
72 Accommodation and Food Services	158,958,188	891	112.1	0.8	15	16
51 Information	731,797,490	1,829	50.0	0.4	20	11
22 Utilities	125,484,105	772	123.0	0.9	14	18
53 Real Estate and Rental and Leasing	5,550,130	37	133.3	0.9	11	21
11 Agriculture, Forestry, Fishing and Hunting	217,313,814	901	82.9	0.6	18	15
81 Other Services (Except Public Administration)	147,402,901	800	108.5	0.8	16	17
52 Finance and Insurance	349,080,232	458	26.2	0.2	22	19
71 Arts, Entertainment, and Recreation	9,931,509	16	32.2	0.2	21	22

Table 25. WA State Self-Insured WMSDs in the Neck, Back and Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4921 Couriers	115,783,369	2,819	486.9	3.5	2	7
4811 Scheduled Air Transportation	133,774,531	2,774	414.7	3.0	5	8
4841 General Freight Trucking	78,829,816	1,297	329.1	2.3	12	9
4854 School and Employee Bus Transportation	29,720,239	675	454.2	3.2	3	20
3219 Other Wood Product Manufacturing	50,296,077	833	331.2	2.4	11	16
6221 General Medical and Surgical Hospitals	915,760,585	9,360	204.4	1.5	28	1
9241 Administration of Environmental Quality Programs	14,318,515	432	603.4	4.3	1	30
4451 Grocery Stores	445,524,167	4,830	216.8	1.5	25	6
4244 Grocery and Related Product Wholesalers	81,935,154	979	239.0	1.7	20	13
6231 Nursing Care Facilities	55,937,331	738	263.9	1.9	15	18
5191 Other Information Services	55,947,142	676	241.7	1.7	19	19
3121 Beverage Manufacturing	39,818,592	531	266.7	1.9	13	25
5621 Waste Collection	24,421,699	429	351.3	2.5	7	31
4521 Department Stores	615,903,097	5,465	177.5	1.3	38	5
9211 Executive, Legislative, and Other General Government Support	847,107,517	6,988	165.0	1.2	41	3
5613 Employment Services	37,028,086	458	247.4	1.8	17	28
3221 Pulp, Paper, and Paperboard Mills	114,244,704	1,030	180.3	1.3	35	11
5617 Services to Buildings and Dwellings	51,615,652	542	210.0	1.5	27	24
4851 Urban Transit Systems	20,119,872	335	333.0	2.4	10	41
3313 Alumina and Aluminum Production and Processing	70,431,812	660	187.4	1.3	32	21
4852 Interurban and Rural Bus Transportation	7,786,911	176	452.0	3.2	4	52
3364 Aerospace Product and Parts Manufacturing	1,304,712,277	8,879	136.1	1.0	57	2
4441 Building Material and Supplies Dealers	115,902,098	881	152.0	1.1	46	14
3115 Dairy Product Manufacturing	21,285,889	267	250.9	1.8	16	44
4529 Other General Merchandise Stores	133,442,939	1,004	150.5	1.1	50	12

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

Table 26. WA State Self-Insured WMSDs in the Neck, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4811 Scheduled Air Transportation	133,774,531	91	13.6	3.6	3	6
4921 Couriers	115,783,369	75	13.0	3.5	5	8
4841 General Freight Trucking	78,829,816	40	10.1	2.7	6	9
6221 General Medical and Surgical Hospitals	915,760,585	259	5.7	1.5	13	2
9211 Executive, Legislative, and Other General Government Support	847,107,517	248	5.9	1.6	12	3
3364 Aerospace Product and Parts Manufacturing	1,304,712,277	285	4.4	1.2	19	1
4851 Urban Transit Systems	20,119,872	18	17.9	4.8	1	19
4854 School and Employee Bus Transportation	29,720,239	20	13.5	3.6	4	17
6231 Nursing Care Facilities	55,937,331	21	7.5	2.0	8	14
4521 Department Stores	615,903,097	140	4.5	1.2	18	5
3219 Other Wood Product Manufacturing	50,296,077	20	8.0	2.1	7	17
3313 Alumina and Aluminum Production and Processing	70,431,812	21	6.0	1.6	11	14
4451 Grocery Stores	445,524,167	89	4.0	1.1	20	7
4461 Health and Personal Care Stores	94,719,847	24	5.1	1.4	17	11
4244 Grocery and Related Product Wholesalers	81,935,154	21	5.1	1.4	16	14
9241 Administration of Environmental Quality Programs	14,318,515	11	15.4	4.1	2	29
6111 Elementary and Secondary Schools	1,437,843,683	153	2.1	0.6	30	4
5613 Employment Services	37,028,086	12	6.5	1.7	9	26
4529 Other General Merchandise Stores	133,442,939	23	3.4	0.9	23	12
3339 Other General Purpose Machinery Manufacturing	39,769,152	12	6.0	1.6	10	26
2373 Highway, Street, and Bridge Construction	60,685,904	16	5.3	1.4	15	22
5191 Other Information Services	55,947,142	15	5.4	1.4	14	23
6211 Offices of Physicians	264,089,717	29	2.2	0.6	28	10
4441 Building Material and Supplies Dealers	115,902,098	19	3.3	0.9	24	18
3221 Pulp, Paper, and Paperboard Mills	114,244,704	17	3.0	0.8	25	20

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

Table 27. WA State Self-Insured WMSDs in the Back, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4921 Couriers	115,783,369	1,635	282.4	4.4	3	7
4811 Scheduled Air Transportation	133,774,531	1,290	192.9	3.0	7	8
4854 School and Employee Bus Transportation	29,720,239	421	283.3	4.4	2	15
4841 General Freight Trucking	78,829,816	687	174.3	2.7	10	9
6231 Nursing Care Facilities	55,937,331	445	159.1	2.5	12	14
4244 Grocery and Related Product Wholesalers	81,935,154	522	127.4	2.0	17	10
9241 Administration of Environmental Quality Programs	14,318,515	228	318.5	4.9	1	27
3219 Other Wood Product Manufacturing	50,296,077	404	160.6	2.5	11	17
6221 General Medical and Surgical Hospitals	915,760,585	4,806	105.0	1.6	29	1
3121 Beverage Manufacturing	39,818,592	305	153.2	2.4	13	21
5621 Waste Collection	24,421,699	225	184.3	2.9	8	29
4451 Grocery Stores	445,524,167	2,154	96.7	1.5	33	6
4521 Department Stores	615,903,097	2,575	83.6	1.3	39	5
5191 Other Information Services	55,947,142	311	111.2	1.7	24	20
9211 Executive, Legislative, and Other General Government Support	847,107,517	3,190	75.3	1.2	45	2
5617 Services to Buildings and Dwellings	51,615,652	276	106.9	1.7	27	22
4441 Building Material and Supplies Dealers	115,902,098	496	85.6	1.3	37	13
4529 Other General Merchandise Stores	133,442,939	514	77.0	1.2	42	11
4852 Interurban and Rural Bus Transportation	7,786,911	81	208.0	3.2	5	49
5613 Employment Services	37,028,086	199	107.5	1.7	26	33
4413 Automotive Parts, Accessories, and Tire Stores	54,129,360	236	87.2	1.4	36	26
4851 Urban Transit Systems	20,119,872	123	122.3	1.9	19	43
3221 Pulp, Paper, and Paperboard Mills	114,244,704	420	73.5	1.1	47	16
3115 Dairy Product Manufacturing	21,285,889	125	117.4	1.8	22	42
3117 Seafood Product Preparation and Packaging	10,867,318	75	138.0	2.1	15	53
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
3364 Aerospace Product and Parts Manufacturing	1,304,712,277	3,183	48.8	0.8	68	3

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

Table 28. WA State Self-Insured WMSDs in the Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4921 Couriers	115,783,369	859	148.4	2.7	4	8
4811 Scheduled Air Transportation	133,774,531	957	143.1	2.6	5	7
4451 Grocery Stores	445,524,167	2,152	96.6	1.7	15	4
4841 General Freight Trucking	78,829,816	424	107.6	1.9	11	11
3219 Other Wood Product Manufacturing	50,296,077	326	129.6	2.3	7	16
3221 Pulp, Paper, and Paperboard Mills	114,244,704	478	83.7	1.5	24	10
5613 Employment Services	37,028,086	202	109.1	2.0	10	25
9241 Administration of Environmental Quality Programs	14,318,515	163	227.7	4.1	1	35
4244 Grocery and Related Product Wholesalers	81,935,154	354	86.4	1.6	22	14
3313 Alumina and Aluminum Production and Processing	70,431,812	317	90.0	1.6	20	17
5191 Other Information Services	55,947,142	266	95.1	1.7	16	21
4521 Department Stores	615,903,097	2,125	69.0	1.2	35	5
6221 General Medical and Surgical Hospitals	915,760,585	3,059	66.8	1.2	39	2
3364 Aerospace Product and Parts Manufacturing	1,304,712,277	4,250	65.1	1.2	41	1
3118 Bakeries and Tortilla Manufacturing	44,078,360	206	93.5	1.7	18	24
9211 Executive, Legislative, and Other General Government Support	847,107,517	2,662	62.8	1.1	42	3
4851 Urban Transit Systems	20,119,872	138	137.2	2.5	6	40
3116 Animal Slaughtering and Processing	51,788,072	216	83.4	1.5	25	23
4854 School and Employee Bus Transportation	29,720,239	159	107.0	1.9	12	36
5621 Waste Collection	24,421,699	138	113.0	2.0	9	40
3121 Beverage Manufacturing	39,818,592	172	86.4	1.6	23	31
4852 Interurban and Rural Bus Transportation	7,786,911	70	179.8	3.2	2	55
3115 Dairy Product Manufacturing	21,285,889	107	100.5	1.8	14	44
4529 Other General Merchandise Stores	133,442,939	374	56.1	1.0	49	12
5617 Services to Buildings and Dwellings	51,615,652	190	73.6	1.3	33	28
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
4237 Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	4,520,083	38	168.1	3.0	3	73

NAICS Groups Averaging Less Than 100,000 Hours Per Year Were Excluded From The Analysis

Table 29. WA Self-Insured *Compensable* WMSD Claims. Top 5 Occupations for 4-digit NAICS Codes with Rate Ratios of Greater than 2.5 1997-2005

NAICS Description	Occupation		Count	Number of Claims in NAICS	Percent
9241 Administration of Environmental Quality Programs	537062	Laborers and Freight, Stock	63		
	537081	Refuse and Recyclable Mate	44		
	332011	Fire Fighters	43		
	333051	Police and Sheriff's Patrol	24		
	331021	First-Line Supervisors/Man	21		
	Total		195	432	45.1%
4921Couriers	533032-3	Truck Drivers Heavy & Light	1,291		
	537062	Laborers & Freight, Stockers	809		
	435021	Couriers & Messengers	273		
	519061	Inspectors, Testers, Sorters	58		
	Total		2,431	2,819	86.2%
4854 School & Employee Bus Transportation	292041	Emergency Medical Technician	415		
	533021-2	Bus Drivers	143		
	291070	Physicians Assistants	39		
	291111	Registered Nurses	18		
	493031	Bus & Truck Mechanics	13		
	Total		628	675	93.0%
4852 Interurban & Rural Bus Transportation	533021	Bus Drivers	96		
	493031	Bus & Truck Mechanics	28		
	Total		124	176	70.5%
4811 Scheduled Air Transportation	537062	Laborers & Freight, Stockers	899		
	396031	Flight Attendants	658		
	434181	Reservation & Transportation Agents	178		
	493011	Aircraft Mechanics & Service	108		
	434051	Customer Service Representative	104		
	Total		1,947	2,774	70.2%
5621 Waste Collection	537081	Refuse Collectors	219		
	533032-3	Truck Drivers Heavy & Light	135		
	Total		354	429	82.5%

Table 30. Combined WA State Fund & Self-Insured WMSDs in the Neck, Back & Upper Extremity, 1997-2005. Top 25 4-digit NAICS by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4921 Couriers	133,672,227	3,055	457.1	4.3	1	17
4811 Scheduled Air Transportation	170,481,785	3,200	375.4	3.5	5	13
2381 Foundation, Structure, and Building Exterior Contractors	431,301,817	5,742	266.3	2.5	13	6
6231 Nursing Care Facilities	240,576,934	3,278	272.5	2.6	12	12
4841 General Freight Trucking	241,238,120	3,192	264.6	2.5	16	14
2383 Building Finishing Contractors	251,927,427	3,103	246.3	2.3	20	16
6233 Community Care Facilities For The Elderly	200,207,939	2,539	253.6	2.4	18	20
2361 Residential Building Construction	325,652,522	3,495	214.6	2.0	29	9
6221 General Medical and Surgical Hospitals	960,417,689	9,629	200.5	1.9	37	1
3219 Other Wood Product Manufacturing	174,437,800	2,115	242.5	2.3	22	22
4451 Grocery Stores	731,373,180	7,083	193.7	1.8	40	4
5621 Waste Collection	63,157,723	1,152	364.8	3.4	6	38
5617 Services to Buildings and Dwellings	356,444,363	3,488	195.7	1.8	39	10
4842 Specialized Freight Trucking	97,804,802	1,299	265.6	2.5	14	35
4521 Department Stores	648,505,872	5,703	175.9	1.6	51	7
7213 Rooming and Boarding Houses	132,108,217	1,372	207.7	1.9	33	32
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	796	310.3	2.9	9	57
4854 School and Employee Bus Transportation	34,611,181	695	401.6	3.8	2	66
2389 Other Specialty Trade Contractors	157,248,652	1,518	193.1	1.8	42	28
3116 Animal Slaughtering and Processing	102,269,869	1,056	206.5	1.9	34	42
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	70,982,789	791	222.9	2.1	25	58
2382 Building Equipment Contractors	643,619,648	4,742	147.4	1.4	76	8
4244 Grocery and Related Product Wholesalers	366,177,900	2,922	159.6	1.5	68	18
3121 Beverage Manufacturing	78,543,350	827	210.6	2.0	32	54
2362 Nonresidential Building Construction	214,610,727	1,713	159.6	1.5	67	27
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
4852 Interurban and Rural Bus Transportation	16,946,459	323	381.2	3.6	3	126
3364 Aerospace Product and Parts Manufacturing	1,408,766,195	9,345	132.7	1.2	101	2
9211 Executive, Legislative, and Other General Government Support	1,308,787,000	8,930	136.5	1.3	97	3

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

924 cases missing NAICS code

Table 31. Combined WA State Fund & Self-Insured WMSDs of the Neck, 1997-2005. Top 25 4 digit 4-digit NAICS Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
6233 Community Care Facilities For The Elderly	200,207,939	518	51.7	4.2	5	3
2381 Foundation, Structure, and Building Exterior Contractors	431,301,817	918	42.6	3.5	11	1
6231 Nursing Care Facilities	240,576,934	512	42.6	3.5	12	5
2383 Building Finishing Contractors	251,927,427	496	39.4	3.2	14	8
7213 Rooming and Boarding Houses	132,108,217	293	44.4	3.6	8	19
2361 Residential Building Construction	325,652,522	515	31.6	2.6	25	4
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	173	67.4	5.5	2	34
4842 Specialized Freight Trucking	97,804,802	211	43.1	3.5	10	29
4841 General Freight Trucking	241,238,120	360	29.8	2.4	32	12
5617 Services to Buildings and Dwellings	356,444,363	477	26.8	2.2	40	9
6232 Residential Mental Retardation, Mental Health and Substance Abuse Facilities	24,178,132	104	86.0	7.0	1	57
6239 Other Residential Care Facilities	73,939,973	140	37.9	3.1	18	40.5
8111 Automotive Repair and Maintenance	282,313,263	351	24.9	2.0	45	14
6216 Home Health Care Services	123,706,776	188	30.4	2.5	29	32
2382 Building Equipment Contractors	643,619,648	687	21.3	1.7	60	2
2389 Other Specialty Trade Contractors	157,248,652	218	27.7	2.3	36	27
5621 Waste Collection	63,157,723	117	37.1	3.0	19	50
5613 Employment Services	531,557,377	508	19.1	1.6	67	6
8121 Personal Care Services	108,277,218	146	27.0	2.2	39	38
9231 Administration of Human Resource Programs	155,975,582	189	24.2	2.0	49	31
3219 Other Wood Product Manufacturing	174,437,800	203	23.3	1.9	53	30
2362 Nonresidential Building Construction	214,610,727	236	22.0	1.8	59	25
4421 Furniture Stores	68,128,505	104	30.5	2.5	28	57
5311 Lessors of Real Estate	245,317,370	252	20.5	1.7	63	23
4533 Used Merchandise Stores	75,021,718	106	28.3	2.3	35	54.5
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
4859 Other Transit and Ground Passenger Transportation	14,418,710	38	52.7	4.3	3	136

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis
110 cases missing NAICS code

Table 32. Combined WA State Fund & Self-Insured WMSDs of the Back, 1997-2005. Top 25 4-digit NAICS Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
2381 Foundation, Structure, and Building Exterior Contractors	431,301,817	3,530	163.7	3.0	10	3
4921 Couriers	133,672,227	1,789	267.7	4.9	1	14
6231 Nursing Care Facilities	240,576,934	2,104	174.9	3.2	8	11
6233 Community Care Facilities For The Elderly	200,207,939	1,672	167.0	3.0	9	15
4841 General Freight Trucking	241,238,120	1,825	151.3	2.7	15	12
4811 Scheduled Air Transportation	170,481,785	1,545	181.3	3.3	7	20
2383 Building Finishing Contractors	251,927,427	1,803	143.1	2.6	18	13
2361 Residential Building Construction	325,652,522	2,197	134.9	2.4	23	9
5617 Services to Buildings and Dwellings	356,444,363	2,117	118.8	2.2	28	10
5621 Waste Collection	63,157,723	640	202.7	3.7	4	36
6221 General Medical and Surgical Hospitals	960,417,689	4,957	103.2	1.9	42	1
4842 Specialized Freight Trucking	97,804,802	747	152.8	2.8	14	33
7213 Rooming and Boarding Houses	132,108,217	901	136.4	2.5	22	28
3219 Other Wood Product Manufacturing	174,437,800	1,036	118.8	2.2	29	24
4248 Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	70,982,789	551	155.2	2.8	12	41
4854 School and Employee Bus Transportation	34,611,181	429	247.9	4.5	2	52
2389 Other Specialty Trade Contractors	157,248,652	909	115.6	2.1	31	27
4451 Grocery Stores	731,373,180	3,323	90.9	1.6	55	5
2382 Building Equipment Contractors	643,619,648	2,749	85.4	1.5	63	7
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	402	156.7	2.8	11	60
3121 Beverage Manufacturing	78,543,350	495	126.0	2.3	26	46
4244 Grocery and Related Product Wholesalers	366,177,900	1,592	87.0	1.6	58	19
4521 Department Stores	648,505,872	2,702	83.3	1.5	70	8
2362 Nonresidential Building Construction	214,610,727	993	92.5	1.7	53	25
4441 Building Material and Supplies Dealers	398,012,596	1,662	83.5	1.5	68	16
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
4852 Interurban and Rural Bus Transportation	16,946,459	178	210.1	3.8	3	117
9211 Executive, Legislative, and Other General Government Support	1,308,787,000	4,225	64.6	1.2	111	2

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis

93 cases missing NAICS code

Table 33. Combined WA State Fund & Self-Insured WMSDs of the Upper Extremity, 1997-2005. Top 25 4 digit 4-digit NAICS Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

NAICS Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
4921 Couriers	133,672,227	907	135.7	3.3	2	19
4811 Scheduled Air Transportation	170,481,785	1,082	126.9	3.1	6	15
2381 Foundation, Structure, and Building Exterior Contractors	431,301,817	1,900	88.1	2.1	23	7
3219 Other Wood Product Manufacturing	174,437,800	907	104.0	2.5	12	19
4451 Grocery Stores	731,373,180	3,129	85.6	2.1	29	4
3116 Animal Slaughtering and Processing	102,269,869	595	116.4	2.8	9	30
2383 Building Finishing Contractors	251,927,427	1,086	86.2	2.1	27	14
4841 General Freight Trucking	241,238,120	1,040	86.2	2.1	26	16
4521 Department Stores	648,505,872	2,224	68.6	1.6	47	6
2361 Residential Building Construction	325,652,522	1,142	70.1	1.7	45	11
4842 Specialized Freight Trucking	97,804,802	465	95.1	2.3	16	41
5621 Waste Collection	63,157,723	387	122.6	2.9	8	49
6221 General Medical and Surgical Hospitals	960,417,689	3,157	65.7	1.6	55	3
8121 Personal Care Services	108,277,218	485	89.6	2.2	20	39
6231 Nursing Care Facilities	240,576,934	864	71.8	1.7	41	22
3364 Aerospace Product and Parts Manufacturing	1,408,766,195	4,481	63.6	1.5	62	1
3221 Pulp, Paper, and Paperboard Mills	126,862,578	511	80.6	1.9	35	36
6222 Psychiatric and Substance Abuse Hospitals	51,311,384	289	112.6	2.7	11	67
3313 Alumina and Aluminum Production and Processing	78,991,925	342	86.6	2.1	25	55
2389 Other Specialty Trade Contractors	157,248,652	527	67.0	1.6	52	32
4244 Grocery and Related Product Wholesalers	366,177,900	1,119	61.1	1.5	73	12
5617 Services to Buildings and Dwellings	356,444,363	1,090	61.2	1.5	72	13
6233 Community Care Facilities For The Elderly	200,207,939	629	62.8	1.5	67	29
3261 Plastics Product Manufacturing	122,264,145	413	67.6	1.6	50	47
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing	51,503,346	232	90.1	2.2	19	79
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
3379 Other Furniture Related Product Manufacturing	8,308,074	63	151.7	3.6	1	172
1125 Animal Aquaculture	4,295,228	28	130.4	3.1	3	227

NAICS groups averaging less than 100,000 hours per year were excluded from the analysis
850 cases missing NAICS code

Table 34. WA State Fund Accepted WMSDs of the Neck, Back & Upper Extremity 1997-2005. Top 25 4 digit WIC Codes by Prevention Index. Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
6108 Nursing Homes	304,118,471	14,993	986.0	3.8	19	2
0507 Roofing	39,885,912	2,396	1,201.4	4.7	7	40
2105 Beer Distributors	45,716,835	2,388	1,044.7	4.1	12	41
0510 Wood Frame Bldg. Const.	205,297,579	7,237	705.0	2.7	48	5
6907 Moving Companies	27,424,573	1,927	1,405.3	5.5	3	52
0540* Wallboard Installation	25,027,444	1,760	1,406.5	5.5	2	59
2903 Wood Products Mfg.	120,868,614	4,295	710.7	2.8	46	18
7201 State Health Care Facilities	75,663,044	2,915	770.5	3.0	35	30
0518 Building Const. Noc	97,691,062	3,576	732.1	2.9	38	27
7114 Temporary Help-Assembly	36,851,721	1,919	1,041.5	4.1	13	53
4305 Garbage Collection	35,934,499	1,820	1,013.0	3.9	17	56
7117 Temporary Help-Machine Operation	15,069,927	1,273	1,689.5	6.6	1	76
1101 Parcel Package Delivery	159,606,402	4,888	612.5	2.4	75	10
0306 Plumbing	110,241,149	3,588	650.9	2.5	62	26
6802 Airlines, Ground Crew	25,572,428	1,303	1,019.1	4.0	16	73
0516 Carpentry, Noc	81,763,109	2,703	661.2	2.6	56	33
2009 Bldg. and Home Impr. Centers	144,179,605	4,422	613.4	2.4	74	15
1002 Sawmills	51,474,738	1,880	730.5	2.8	39	55
0307 HVAC Systems	97,461,454	3,119	640.1	2.5	67	28
6509 Boarding Homes	291,925,786	7,840	537.1	2.1	92	4
0217 Concrete Work - Foundations and Sidewalks	65,922,975	2,205	669.0	2.6	53	44
0511 Glass Installation	20,899,655	1,070	1,023.9	4.0	14	85
5103 Foundries, Noc	25,010,531	1,150	919.6	3.6	20	82
0302 Masonry Construction	25,833,345	1,159	897.3	3.5	21	81
0502 Floor Covering Installation	25,532,644	1,135	889.1	3.5	22	83
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
3905 Restaurants	1,786,596,469	17,822	199.5	0.8	224	1
4904 Clerical Office, Noc	3,738,123,142	8,517	45.6	0.2	275	3

WIC groups averaging less than 100,000 hours per year were excluded from the analysis

*Wallboard classes for discounted and undiscounted were consolidated

Table 35. WA State Fund Accepted WMSDs of the Neck, 1997-2005. Top 25 4 digit WIC Codes by Prevention Index. Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Incidence Rate	Rate Ratio	Rate Rank	Frequency Rank
6108 Nursing Homes	304,118,471	2,043	134.4	4.3	9	2
7201 State Health Care Facilities	75,663,044	634	167.6	5.3	3	10
6509 Boarding Homes	291,925,786	1,244	85.2	2.7	37	3
0540* Wallboard Installation	25,027,444	250	199.8	6.4	1	46
6110 Home Health Care, Nursing	42,837,650	278	129.8	4.1	11	39
0510 Wood Frame Bldg. Const.	205,297,579	805	78.4	2.5	48	6
6907 Moving Companies	27,424,573	225	164.1	5.2	4	52
0507 Roofing	39,885,912	253	126.9	4.0	15	45
1102 Trucking, Noc	161,756,465	632	78.1	2.5	50	11
0516 Carpentry, Noc	81,763,109	361	88.3	2.8	35	31
1101 Parcel Package Delivery	159,606,402	591	74.1	2.4	53	13
4305 Garbage Collection	35,934,499	219	121.9	3.9	17	53
0518 Building Const. Noc	97,691,062	383	78.4	2.5	49	27
7117 Temporary Help-Machine Operation	15,069,927	146	193.8	6.2	2	76
7114 Temporary Help-Assembly	36,851,721	196	106.4	3.4	23	62
6802 Airlines, Ground Crew	25,572,428	162	126.7	4.0	16	70
0302 Masonry Construction	25,833,345	148	114.6	3.6	20	73
0306 Plumbing	110,241,149	380	68.9	2.2	66	28
2105 Beer Distributors	45,716,835	202	88.4	2.8	34	61
0511 Glass Installation	20,899,655	134	128.2	4.1	13	83
3708 Textile Mfg.	30,608,660	159	103.9	3.3	26	71
2903 Wood Products Mfg.	120,868,614	403	66.7	2.1	72	26
0502 Floor Covering Installation	25,532,644	142	111.2	3.5	21	78
2002 Freight Handlers	30,615,398	153	100.0	3.2	28	72
0217 Concrete Work - Foundations and Sidewalks	65,922,975	243	73.7	2.3	54	48
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
3905 Restaurants	1,786,596,469	2,075	23.2	0.7	206	1

WIC groups with less than 100,000 hours per year were excluded from the analysis

*Wallboard classes for discounted and undiscounted were consolidated

Table 36. WA State Fund Accepted WMSDs of the Back 1997-2005. Top 25 4 digit WIC Codes by Prevention Index. Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
6108 Nursing Homes	304,118,471	8,925	586.9	4.4	13	2
2105 Beer Distributors	45,716,835	1,602	700.8	5.3	5	28
0507 Roofing	39,885,912	1,399	701.5	5.3	4	36
0510 Wood Frame Bldg. Const.	205,297,579	4,224	411.5	3.1	36	4
6907 Moving Companies	27,424,573	1,177	858.4	6.4	1	42
0518 Building Const. Noc	97,691,062	1,978	405.0	3.0	38	23
1101 Parcel Package Delivery	159,606,402	2,894	362.6	2.7	59	6
0540* Wallboard Installation	25,027,444	864	690.4	5.2	6	60
4305 Garbage Collection	35,934,499	966	537.6	4.0	19	54
6509 Boarding Homes	291,925,786	4,803	329.1	2.5	70	3
2009 Bldg. and Home Impr. Centers	144,179,605	2,508	347.9	2.6	64	12
7114 Temporary Help-Assembly	36,851,721	943	511.8	3.8	22	55
0217 Concrete Work - Foundations and Sidewalks	65,922,975	1,310	397.4	3.0	41	37
0306 Plumbing	110,241,149	2,005	363.7	2.7	58	22
2903 Wood Products Mfg.	120,868,614	2,168	358.7	2.7	62	18
7117 Temporary Help-Machine Operation	15,069,927	596	791.0	5.9	2	82
6802 Airlines, Ground Crew	25,572,428	727	568.6	4.3	16	69
0516 Carpentry, Noc	81,763,109	1,519	371.6	2.8	54	31
0502 Floor Covering Installation	25,532,644	703	550.7	4.1	17	71
7201 State Health Care Facilities	75,663,044	1,400	370.1	2.8	55	35
0307 HVAC Systems	97,461,454	1,715	351.9	2.6	63	27
6110 Home Health Care, Nursing	42,837,650	894	417.4	3.1	34	58
2002 Freight Handlers	30,615,398	727	474.9	3.6	25	69
2102 Warehouses, Noc	61,062,831	1,143	374.4	2.8	52	44
5103 Foundries, Noc	25,010,531	666	532.6	4.0	20	76
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
1405 Ambulance Service	7,435,040	276	742.4	5.6	3	143
3905 Restaurants	1,786,596,469	9,151	102.4	0.8	226	1

WIC groups with less than 100,000 hours per year were excluded from the analysis

*Wallboard classes for discounted and undiscounted were consolidated

Table 37. WA State Fund WMSDs in the Upper Extremity, 1997-2005. Top 25 4-digit WIC Codes by Prevention Index. Accepted Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Rate	Rate Ratio	Rate Rank	Count Rank
6108 Nursing Homes	304,118,471	4,430	291.3	3.0	33	3
2903 Wood Products Mfg.	120,868,614	1,799	297.7	3.1	30	14
7114 Temporary Help-Assembly	36,851,721	804	436.3	4.5	10	45
0540* Wallboard Installation	25,027,444	702	561.0	5.8	3	53
3304 Meat Dealers Wholesale	83,163,682	1,300	312.6	3.2	29	27
0507 Roofing	39,885,912	775	388.6	4.0	12	47
0518 Building Const. Noc	97,691,062	1,356	277.6	2.8	37	25
7117 Temporary Help-Machine Operation	15,069,927	561	744.5	7.6	1	64
1002 Sawmills	51,474,738	852	331.0	3.4	25	43
0510 Wood Frame Bldg. Const.	205,297,579	2,357	229.6	2.4	62	7
3510 Plastic Products Manufacturing	122,923,365	1,459	237.4	2.4	55	21
3404 Aluminum Product Mfg.	132,138,691	1,543	233.5	2.4	60	18
4305 Garbage Collection	35,934,499	628	349.5	3.6	19	60
6907 Moving Companies	27,424,573	507	369.7	3.8	16	69
2907 Cabinet/Countertop Mfg.	70,393,463	910	258.6	2.7	44	41
7201 State Health Care Facilities	75,663,044	966	255.3	2.6	48	37
3708 Textile Mfg.	30,608,660	530	346.3	3.6	20	67
0307 HVAC Systems	97,461,454	1,121	230.0	2.4	61	31
0306 Plumbing	110,241,149	1,265	229.5	2.4	64	29
0516 Carpentry, Noc	81,763,109	965	236.1	2.4	57	38
2009 Bldg. and Home Impr. Centers	144,179,605	1,493	207.1	2.1	81	19
4301 Meat Products Mfg.	23,066,909	414	359.0	3.7	18	84
6402 Supermarkets	191,644,606	1,909	199.2	2.0	91	11
0511 Glass Installation	20,899,655	396	379.0	3.9	14	89
6802 Airlines, Ground Crew	25,572,428	428	334.7	3.4	24	81
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
7119 Temporary Help-Vehicle Operation	3,837,751	108	562.8	5.8	2	179
3905 Restaurants	1,786,596,469	6,718	75.2	0.8	222	1
4904 Clerical Office, Noc	3,738,123,142	5,435	29.1	0.3	260	2

WIC groups with less than 100,000 hours per year were excluded from the analysis

*Wallboard classes for discounted and undiscounted were consolidated

Table 38. WA State Fund Temporary Services Risk Classes (WIC Codes) Accepted WMSDs, 1997-2005. Accepted Claims Incidence Rates per 10,000 FTEs

		All		Neck		Back		Upper Extremity	
WIC Description	**Hours**	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate**
7104 Temporary Help Admin. Staff	49,957,934	87	34.8	18	7.2	29	11.6	38	15.2
7105 Temporary Help-Office Services	259,248,035	677	52.2	94	7.3	223	17.2	369	28.5
7106 Temporary Help-Store Services	9,977,251	113	226.5	20	40.1	66	132.3	38	76.2
7107 Temporary Help-Food Services	4,180,965	96	459.2	8	38.3	44	210.5	48	229.6
7108 Temporary Help-Warehousing	46,708,295	964	412.8	112	48.0	407	174.3	470	201.3
7109 Temporary Help-Tech. Services	37,333,117	521	279.1	56	30.0	182	97.5	304	162.9
7110 Temporary Help-Field Services	11,218,125	138	246.0	16	28.5	81	144.4	45	80.2
7111 Temporary Help-Health Care	35,334,290	735	416.0	122	69.1	466	263.8	186	105.3
7112 Temporary Help-Agricultural Services	1,277,719	53	829.6	7	109.6	18	281.8	31	485.2
7113 Temporary Help-Maintenance	15,658,784	316	403.6	34	43.4	157	200.5	137	175.0
7114 Temporary Help-Assembly	36,851,721	1,919	1,041.5	196	106.4	943	511.8	804	436.3
7115 Temporary Help-Food Processing	8,863,507	373	841.7	26	58.7	166	374.6	190	428.7
7116 Temporary Help-Utility Work	5,022,354	81	322.6	13	51.8	40	159.3	35	139.4
7117 Temporary Help-Machine Operation	15,069,927	1,273	1,689.5	146	193.8	596	791.0	561	744.5
7118 Temporary Help-Construction	11,634,572	687	1,181.0	75	128.9	357	613.7	263	452.1
7119 Temporary Help-Vehicle Operation	3,837,751	256	1,334.1	31	161.6	131	682.7	108	562.8

note: overall increase in hours: 16,070,728 vs 2006 report
decreased hours in Temp help Tech Services (-1.4 million)
decreased hours in Temp help Utility work (-12,421)

Table 39. WA Self-Insured WMSDs in the Neck, Back and Upper Extremity, 1997-2005. Top 25 4-digit WIC Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Incidence Rate	Rate Ratio	Rate Rank	Frequency Rank
1101 Parcel Package Delivery	108,482,920	3,344	616.5	4.4	9	5
6802 Airlines, Ground Crew	51,629,966	1,830	708.9	5.0	7	10
0803 Cities-All Other Empl. Noc	127,355,464	2,408	378.2	2.7	20	8
6904 Fire Fighters	51,501,420	1,187	461.0	3.3	15	14
1102 Trucking, Noc	75,604,183	1,520	402.1	2.9	18	12
1501 Counties-All Other Empl. Noc	189,509,245	3,213	339.1	2.4	25	6
6402 Supermarkets	378,424,737	6,094	322.1	2.3	28	3
6801 Airlines, Flight Crew	25,511,351	745	584.1	4.2	10	22
1405 Ambulance Service	9,217,881	483	1,048.0	7.5	5	28
6104 Schools, All Other Empl.	271,908,052	4,369	321.4	2.3	29	4
7104 Temporary Help Admin. Staff	3,122,468	425	2,722.2	19.4	1	33
6602 Janitorial Service	20,520,643	443	431.8	3.1	16	31
1301 Electric Power Plants	67,263,104	921	273.8	1.9	33	16
6407 Wholesale Stores, Noc	71,232,546	904	253.8	1.8	36	17
2105 Beer Distributors	3,972,193	216	1,087.6	7.7	3	51
4103 Newspaper Publishing	12,238,871	299	488.6	3.5	13	41
4305 Garbage Collection	16,719,060	355	424.7	3.0	17	37
6105 Hospitals	1,008,965,902	10,229	202.8	1.4	54	1
2102 Warehouses, Noc	188,453,923	2,081	220.8	1.6	49	9
3702 Breweries	16,040,139	289	360.3	2.6	23	42
3404 Aluminum Product Mfg.	63,089,700	739	234.3	1.7	42	23
1002 Sawmills	77,343,323	857	221.6	1.6	48	18
6108 Nursing Homes	91,838,984	995	216.7	1.5	51	15
0101 Road Construction	16,333,870	266	325.7	2.3	26	45
1802 Aluminum Smelting	52,569,622	592	225.2	1.6	45	26
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
0505 Building Construction, Noc	968,844	65	1,341.8	9.5	2	79
3403 Aircraft Mfg.	1,189,820,847	8,613	144.8	1.0	80	2

WIC groups averaging less than 100,000 hours per year were excluded from the analysis

Table 40. WA Self-Insured WMSDs in the Neck, 1997-2005. Top 25 4-digit WIC Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Incidence Rate	Rate Ratio	Rate Rank	Frequency Rank
1501 Counties-All Other Empl. Noc	189,509,245	115	12.1	3.2	7	3
1101 Parcel Package Delivery	108,482,920	97	17.9	4.8	5	6
6802 Airlines, Ground Crew	51,629,966	50	19.4	5.2	3	10
6801 Airlines, Flight Crew	25,511,351	40	31.4	8.4	1	13
6904 Fire Fighters	51,501,420	49	19.0	5.1	4	11
6104 Schools, All Other Empl.	271,908,052	110	8.1	2.2	11	4
0803 Cities-All Other Empl. Noc	127,355,464	62	9.7	2.6	8	8
6105 Hospitals	1,008,965,902	284	5.6	1.5	17	1
1102 Trucking, Noc	75,604,183	36	9.5	2.6	9	14
6402 Supermarkets	378,424,737	105	5.6	1.5	19	5
3403 Aircraft Mfg.	1,189,820,847	279	4.7	1.3	22	2
2102 Warehouses, Noc	188,453,923	55	5.8	1.6	16	9
1404 Bus Companies	42,052,725	19	9.0	2.4	10	20
3404 Aluminum Product Mfg.	63,089,700	22	7.0	1.9	13	17
6905 Law Enforcement Officers	95,524,087	28	5.9	1.6	15	15
6304 Department Stores	372,621,261	84	4.5	1.2	23	7
1405 Ambulance Service	9,217,881	12	26.0	7.0	2	30
1802 Aluminum Smelting	52,569,622	19	7.2	1.9	12	20
6407 Wholesale Stores, Noc	71,232,546	20	5.6	1.5	18	18
6108 Nursing Homes	91,838,984	25	5.4	1.5	20	16
0101 Road Construction	16,333,870	11	13.5	3.6	6	31
3906 Bakeries Wholesale Noc	39,229,396	13	6.6	1.8	14	28
6103 Schools, Professional Staff	1,219,768,988	48	0.8	0.2	32	12
1301 Electric Power Plants	67,263,104	16	4.8	1.3	21	24
2401 Pulp Or Paper Mfg.	139,794,435	19	2.7	0.7	26	20

WIC groups averaging less than 100,000 hours per year were excluded from the analysis

Table 41. WA Self-Insured WMSDs in the Back, 1997-2005. Top 25 4-digit WIC Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs.

WIC Description	Hours	Count	Incidence Rate	Rate Ratio	Rate Rank	Frequency Rank
1101 Parcel Package Delivery	108,482,920	1,922	354.3	5.5	7	5
6802 Airlines, Ground Crew	51,629,966	925	358.3	5.6	6	10
1405 Ambulance Service	9,217,881	332	720.3	11.2	2	21
6904 Fire Fighters	51,501,420	736	285.8	4.4	10	13
1102 Trucking, Noc	75,604,183	833	220.4	3.4	17	11
0803 Cities-All Other Empl. Noc	127,355,464	1,193	187.4	2.9	21	8
6104 Schools, All Other Empl.	271,908,052	2,063	151.7	2.4	25	4
7104 Temporary Help Admin. Staff	3,122,468	187	1,197.8	18.6	1	32
1501 Counties-All Other Empl. Noc	189,509,245	1,370	144.6	2.2	26	7
6402 Supermarkets	378,424,737	2,550	134.8	2.1	32	3
6801 Airlines, Flight Crew	25,511,351	291	228.1	3.5	13	25
6602 Janitorial Service	20,520,643	231	225.1	3.5	14	28
6105 Hospitals	1,008,965,902	5,153	102.1	1.6	42	1
2105 Beer Distributors	3,972,193	125	629.4	9.8	3	41
2102 Warehouses, Noc	188,453,923	1,164	123.5	1.9	37	9
1301 Electric Power Plants	67,263,104	461	137.1	2.1	30	17
6108 Nursing Homes	91,838,984	609	132.6	2.1	33	14
6407 Wholesale Stores, Noc	71,232,546	462	129.7	2.0	34	16
4305 Garbage Collection	16,719,060	175	209.3	3.2	19	34
4103 Newspaper Publishing	12,238,871	137	223.9	3.5	15	39
3702 Breweries	16,040,139	168	209.5	3.2	18	36
3404 Aluminum Product Mfg.	63,089,700	323	102.4	1.6	41	22
6405 Tire Sales & Service	32,301,248	188	116.4	1.8	39	31
1002 Sawmills	77,343,323	333	86.1	1.3	54	20
2009 Bldg. And Home Impr. Centers	95,921,465	409	85.3	1.3	56	18
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
3403 Aircraft Mfg.	1,189,820,847	3,084	51.8	0.8	80	2

WIC groups averaging less than 100,000 hours per year were excluded from the analysis

Table 42. WA Self-Insured WMSDs in the Upper Extremity, 1997-2005. Top 25 4-digit WIC Codes by Prevention Index. *Compensable* Claims Incidence Rates per 10,000 FTEs

WIC Description	Hours	Count	Incidence Rate	Rate Ratio	Rate Rank	Frequency Rank
6802 Airlines, Ground Crew	51,629,966	622	241.0	4.4	8	10
1101 Parcel Package Delivery	108,482,920	1,028	189.5	3.4	12	6
6402 Supermarkets	378,424,737	2,845	150.4	2.7	18	3
1501 Counties-All Other Empl. Noc	189,509,245	1,306	137.8	2.5	20	5
0803 Cities-All Other Empl. Noc	127,355,464	850	133.5	2.4	22	8
6104 Schools, All Other Empl.	271,908,052	1,592	117.1	2.1	28	4
7104 Temporary Help Admin. Staff	3,122,468	186	1,191.4	21.5	1	33
1102 Trucking, Noc	75,604,183	477	126.2	2.3	23	13
6801 Airlines, Flight Crew	25,511,351	239	187.4	3.4	13	25
4103 Newspaper Publishing	12,238,871	137	223.9	4.0	9	40
6904 Fire Fighters	51,501,420	301	116.9	2.1	29	20
1002 Sawmills	77,343,323	412	106.5	1.9	34	15
6602 Janitorial Service	20,520,643	155	151.1	2.7	17	34
3404 Aluminum Product Mfg.	63,089,700	336	106.5	1.9	35	19
1301 Electric Power Plants	67,263,104	354	105.3	1.9	38	17
4305 Garbage Collection	16,719,060	133	159.1	2.9	15	44
1405 Ambulance Service	9,217,881	93	201.8	3.6	10	50
6407 Wholesale Stores, Noc	71,232,546	341	95.7	1.7	43	18
1802 Aluminum Smelting	52,569,622	270	102.7	1.9	39	23
0101 Road Construction	16,333,870	118	144.5	2.6	19	45
2105 Beer Distributors	3,972,193	63	317.2	5.7	6	59
3402 Machine Shops	22,621,632	136	120.2	2.2	24	42
2401 Pulp Or Paper Mfg.	139,794,435	568	81.3	1.5	55	11
3403 Aircraft Mfg.	1,189,820,847	4,110	69.1	1.3	67	1
1407 Bus Companies - Private	6,276,042	60	191.2	3.5	11	60
Listed below are industries in the top three by rate or count but not in the top 25 by prevention index.						
0505 Building Construction, Noc	968,844	37	763.8	13.8	2	74
0510 Wood Frame Bldg. Const.	1,346,538	29	430.7	7.8	3	80
6105 Hospitals	1,008,965,902	3,432	68.0	1.2	69	2

WIC groups averaging less than 100,000 hours per year were excluded from the analysis

Table 43. WA Self-Insured Temporary Services Risk Classes (WIC Codes) WMSDs, 1997-2005. *Compensable* Claims Incidence Rates per 10,000 FTEs.

		All		Neck		Back		Upper Extremity	
WIC DESCRIPTION	**Hours**	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate**
7104 Temporary Help Admin. Staff	3,122,468	425	2,722.2	6	38.4	187	1,197.8	186	1,191.4
7105 Temporary Help-Office Services	37,991,892	58	30.5	1	0.5	31	16.3	21	11.1
7106 Temporary Help-Store Services	5,113,589	7	27.4	1	3.9	1	3.9	5	19.6
7107 Temporary Help-Food Services	199,861	15	1,501.1	0	0.0	5	500.4	9	900.6
7108 Temporary Help-Warehousing	14,585,823	59	80.9	4	5.5	21	28.8	27	37.0
7109 Temporary Help-Tech. Services	7,251,061	19	52.4	0	0.0	6	16.6	10	27.6
7110 Temporary Help-Field Services	400,958	0	0.0	0	0.0	0	0.0	0	0.0
7111 Temporary Help-Health Care	3,576,542	13	72.7	0	0.0	4	22.4	3	16.8
7112 Temporary Help-Agricultural Services	21,212	0	0.0	0	0.0	0	0.0	0	0.0
7113 Temporary Help-Maintenance	676,460	6	177.4	0	0.0	3	88.7	1	29.6
7114 Temporary Help-Assembly	3,961,418	44	222.1	2	10.1	17	85.8	21	106.0
7115 Temporary Help-Food Processing	1,983,551	4	40.3	0	0.0	0	0.0	4	40.3
7116 Temporary Help-Utility Work	191,685	1	104.3	0	0.0	1	104.3	0	0.0
7117 Temporary Help-Machine Operation	2,360,913	4	33.9	0	0.0	1	8.5	3	25.4
7118 Temporary Help-Construction	324,809	0	0.0	0	0.0	0	0.0	0	0.0
7119 Temporary Help-Vehicle Operation	2,725,808	1	7.3	0	0.0	0	0.0	1	7.3

note: overall increase in hours: 1,348,773 vs 2006 report

Decreased hours: admin staff, Office Services, Food Services, Health care, machine operation

Biggest increase: Food processing +1,385,649

Figure 1a. State Fund Claims. Percent Rejected and Still Open by Year

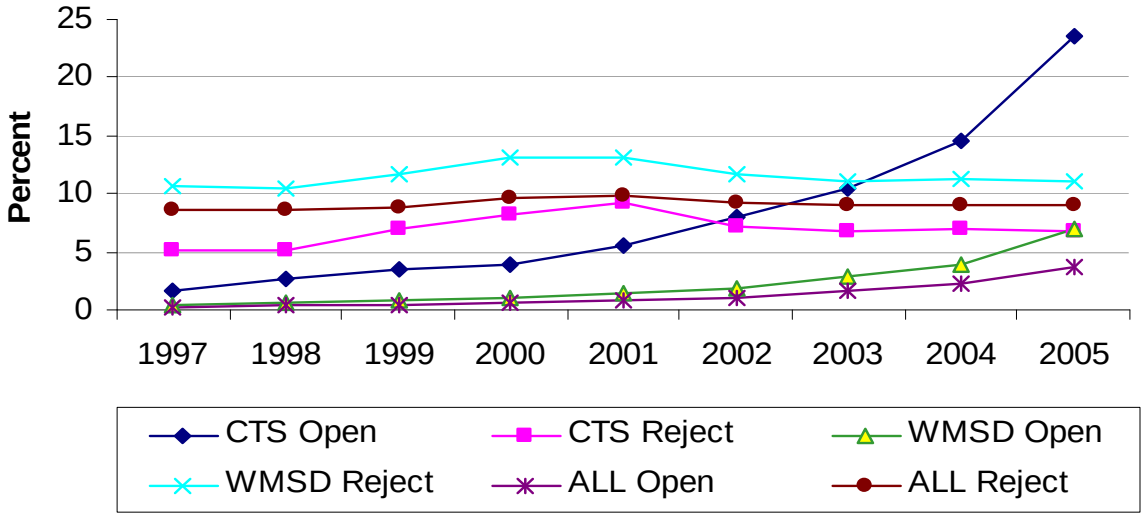


Figure 1b. State Fund Work-related Musculoskeletal Disorders of the Neck, Back & Upper Extremity, 1997-2005

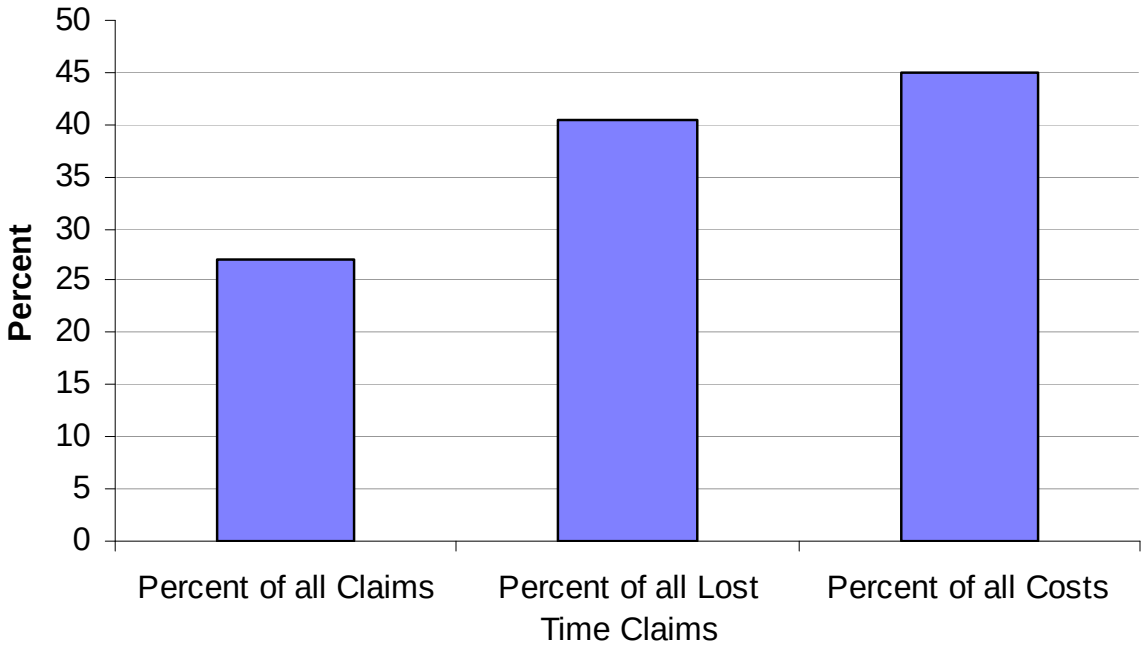


Figure 2a. Incidence of Compensable WMSDs in the Neck, Back & Upper Extremity, 1997-2005 by Age: Males

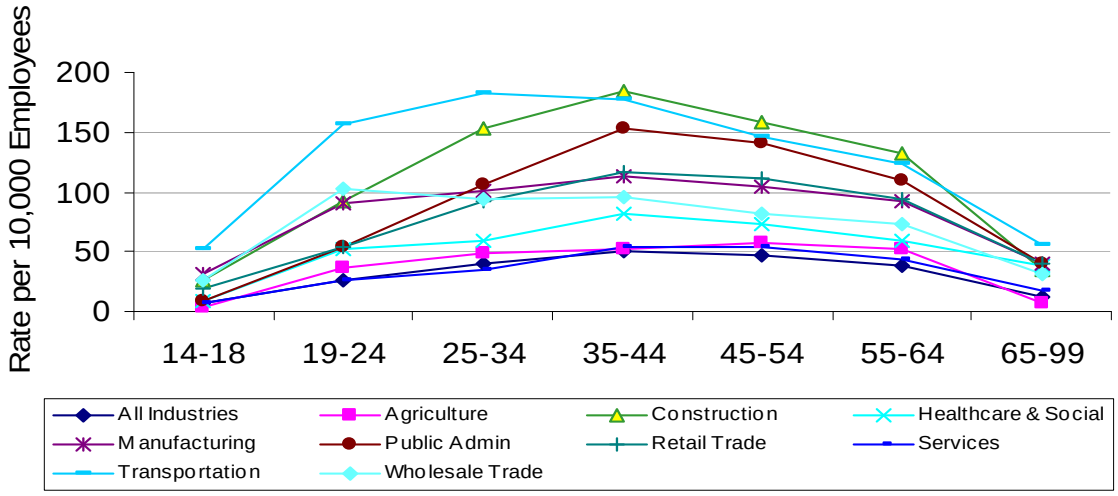


Figure 2b. Incidence of Compensable WMSDs in the Neck, Back & Upper Extremity, 1997-2005 by Age: Females

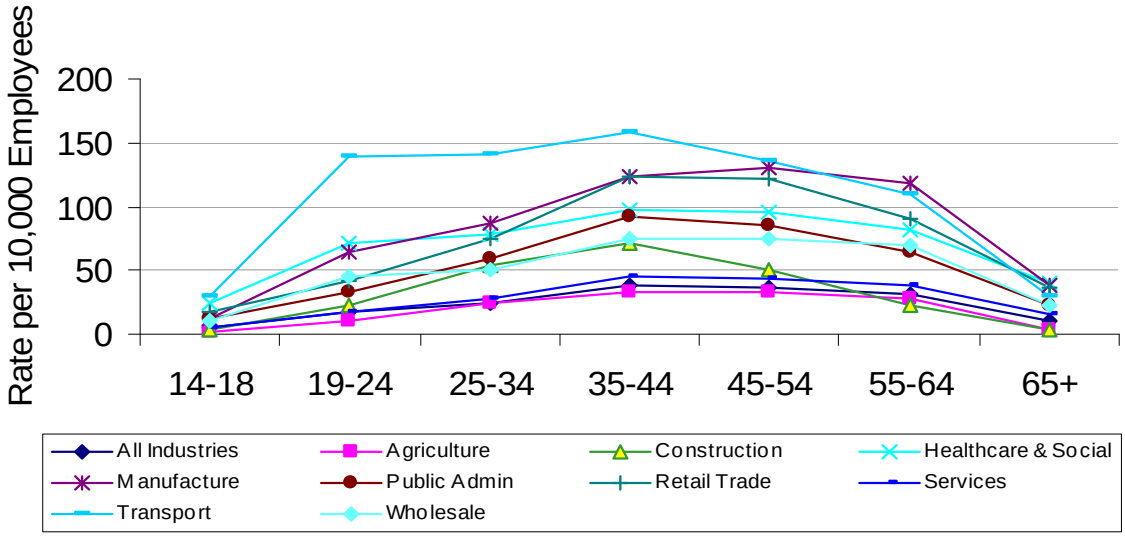


Figure 2c. State Fund Compensable WMSDs, 1997-2005. Mean Lost Work Days by Age & Sector: Males

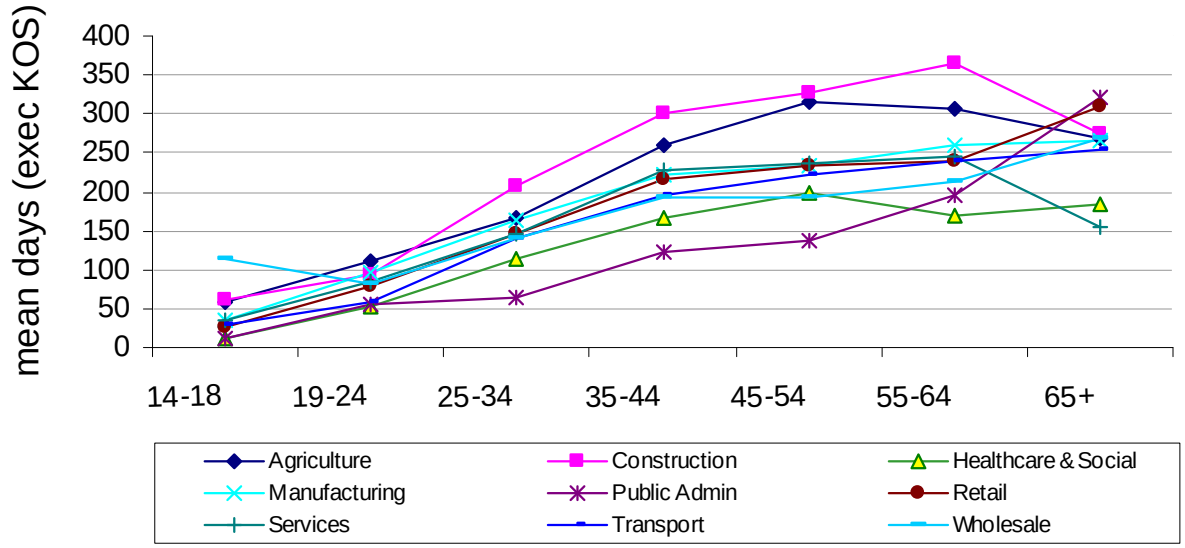


Figure 2d. State Fund Compensable WMSDs, 1997-2005. Mean Lost Work Days by Age & Sector: Females

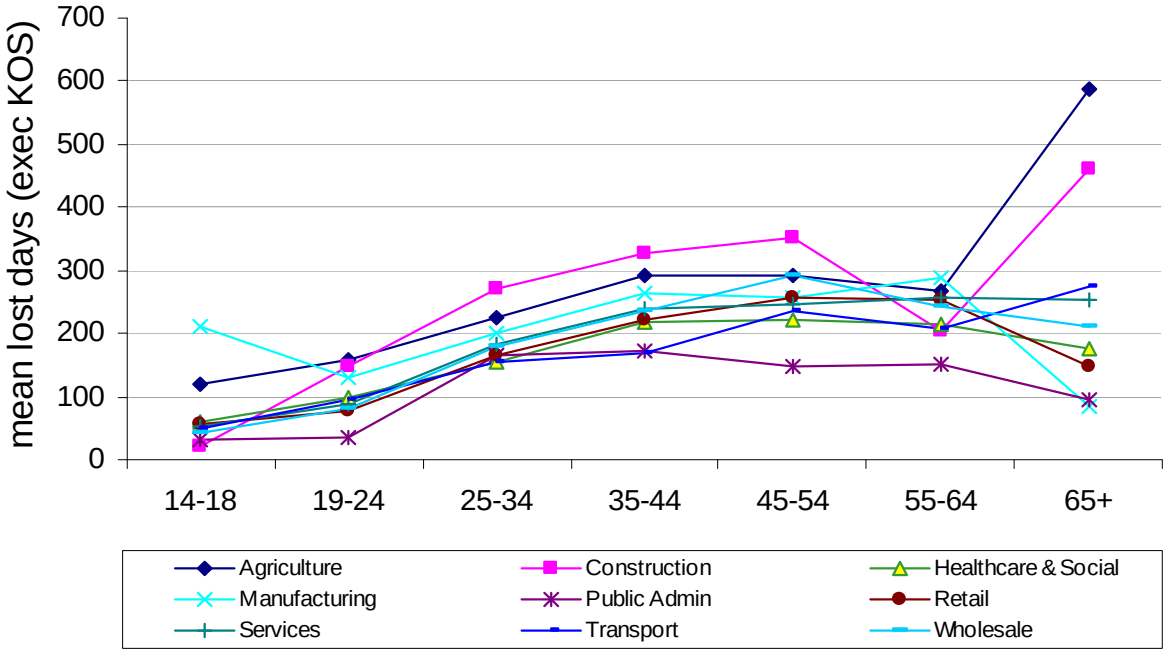


Figure 3a. State Fund & Self-Insured Compensable Claims Rates by Year: All, WMSDs

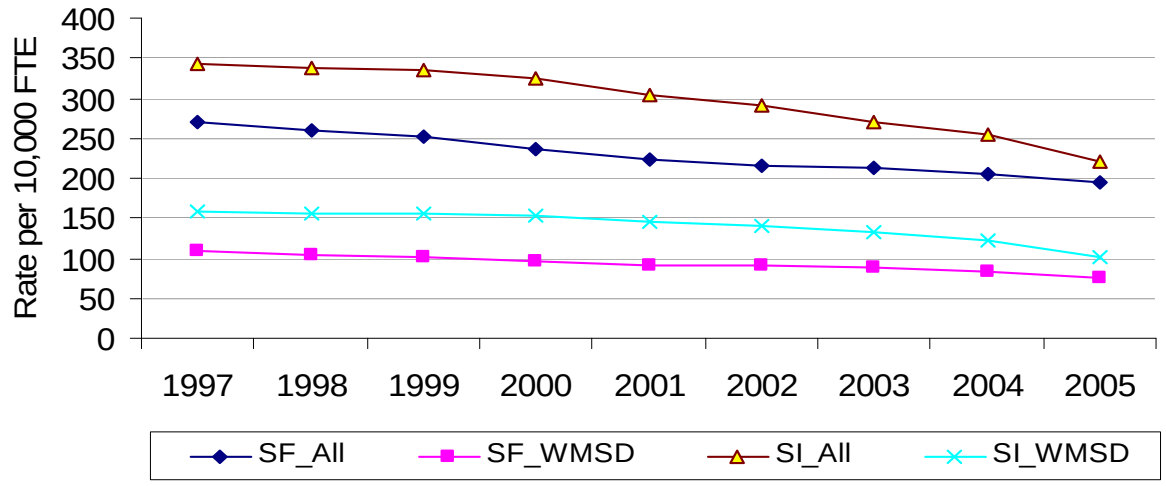


Figure 3b. State Fund & Self-Insured Compensable Claims Rates by Year: Non-Traumatic Neck, Back and Upper Extremity

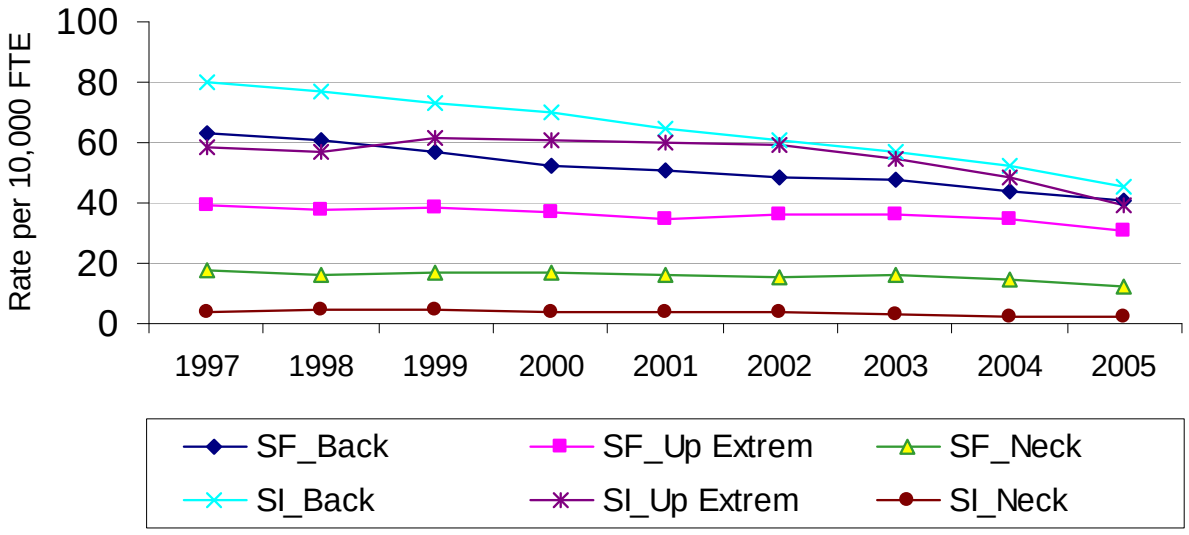


Figure 3c. State Fund Compensable Claims by Specific Non-Traumatic Condition by Year

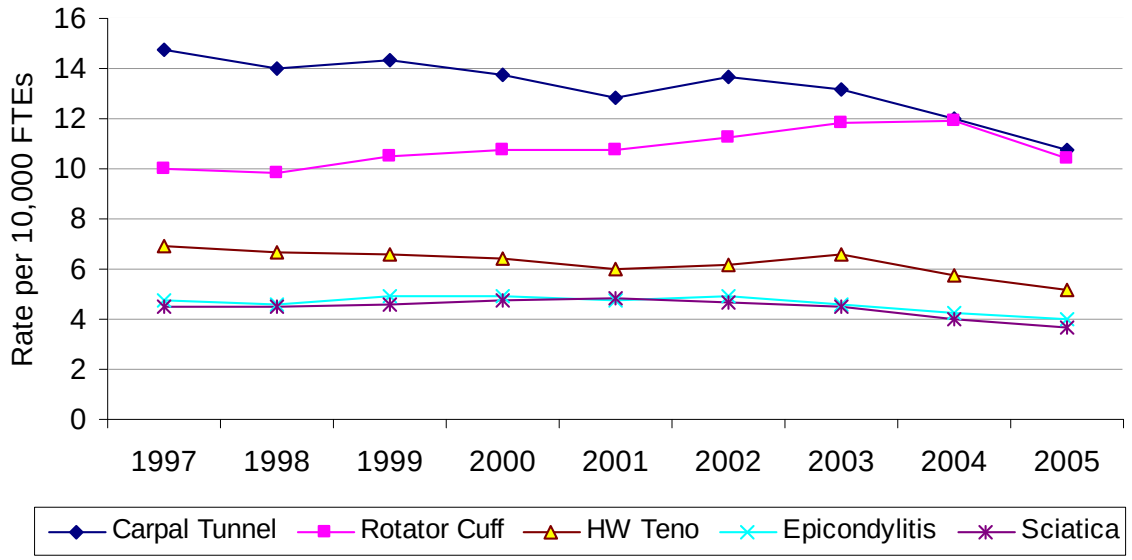


Figure 4a. State Fund Compensable WMSD Claims Rates by Industry Sector & Year

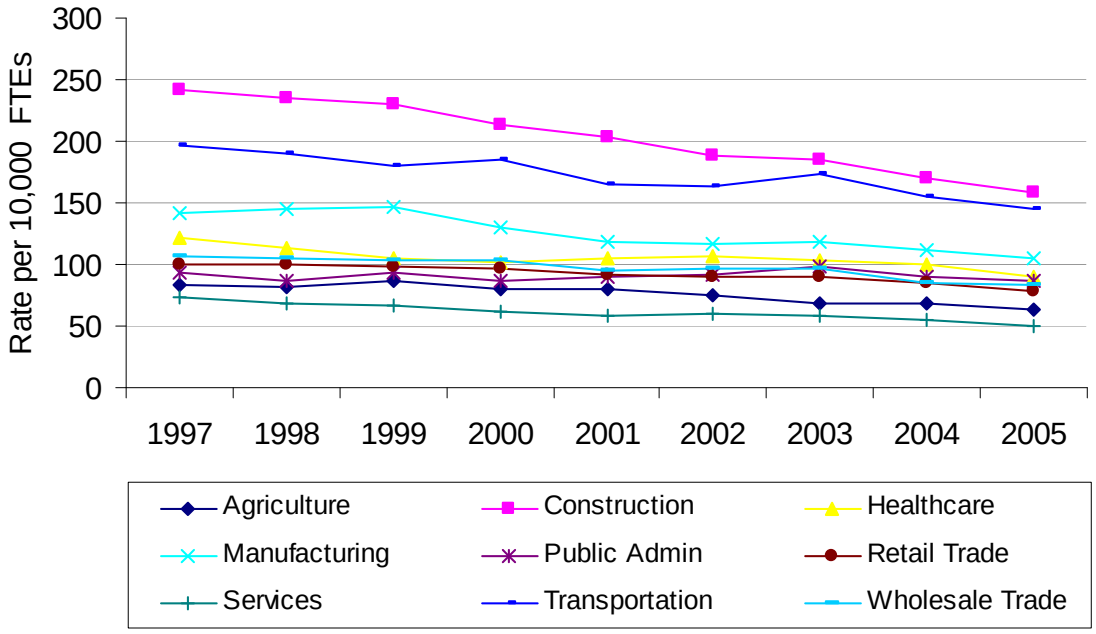


Figure 4b. Self-Insured Compensable WMSD Claims Rates by Industry Sector & Year

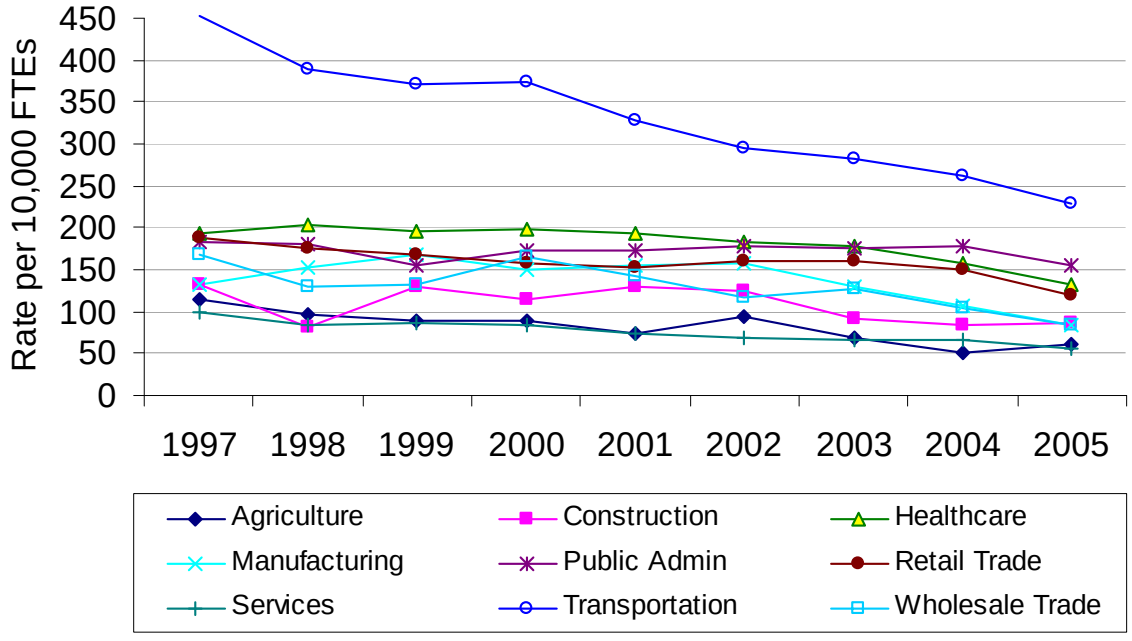


Figure 4c. Combined State Fund & Self-Insured Compensable WMSD Claims Rates by Sector & Year

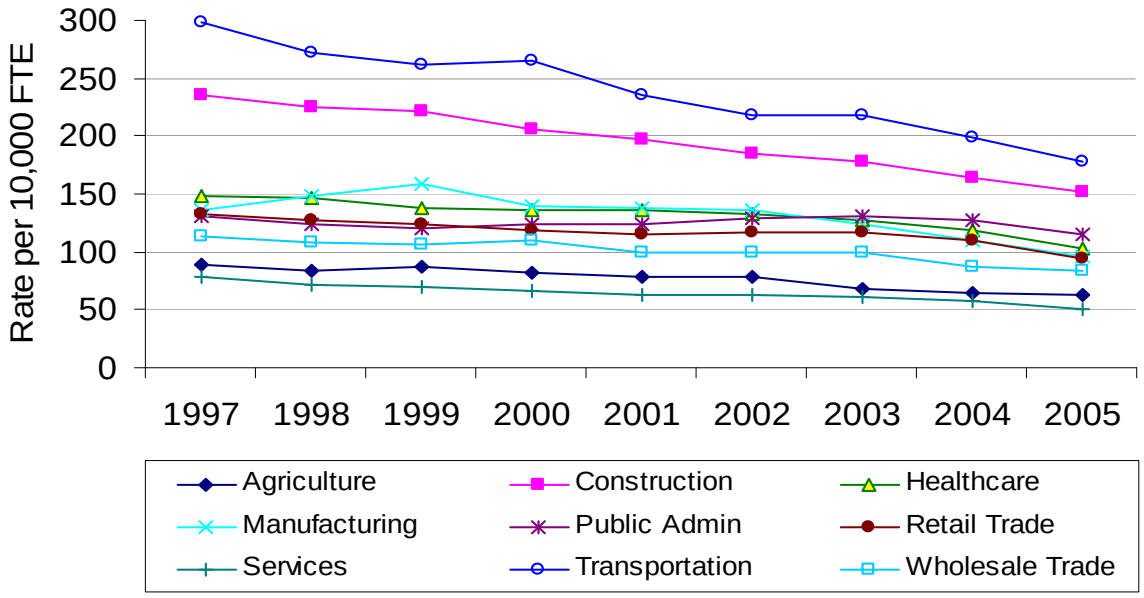


Figure 4d. State Fund Percent of Compensable Claims Due to WMSDs by Sector & Year

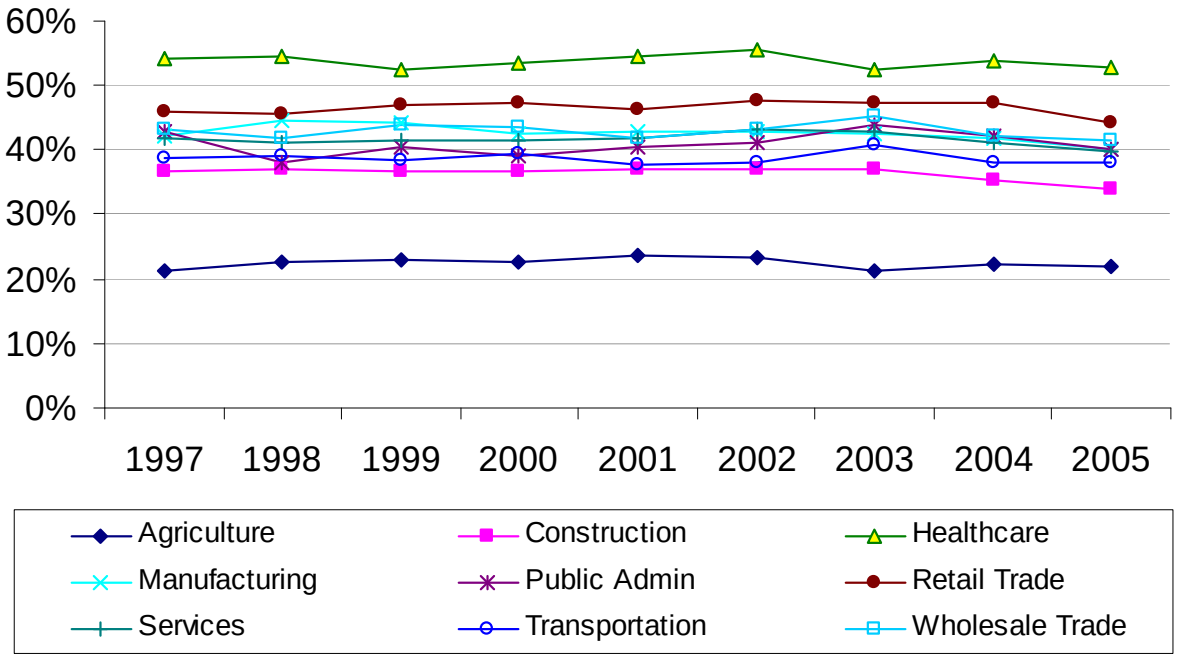


Figure 4e. Self-Insured Percent of Compensable Claims Due to WMSDs by Sector & Year

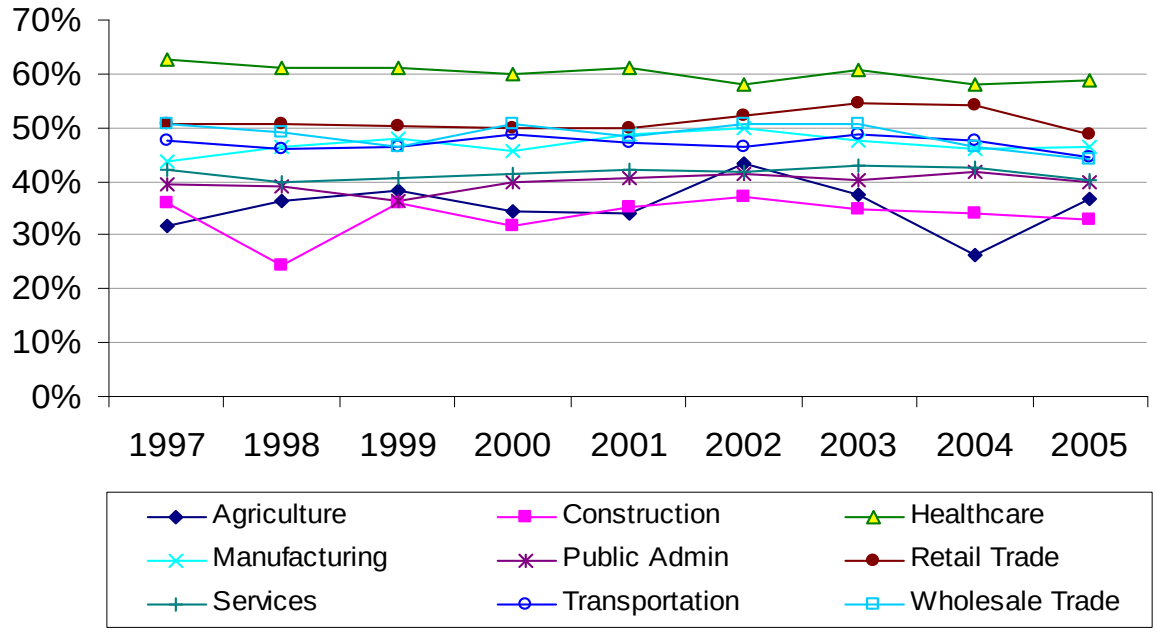
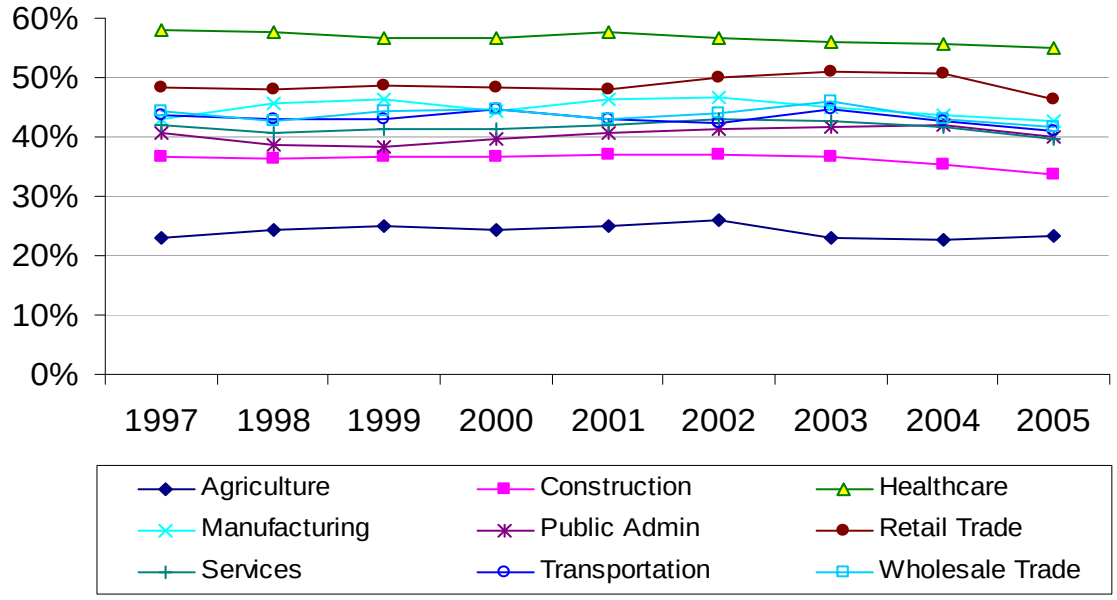


Figure 4f. Combined State Fund & Self-Insured Percent of Compensable Claims Due to WMSDs by Sector & Year



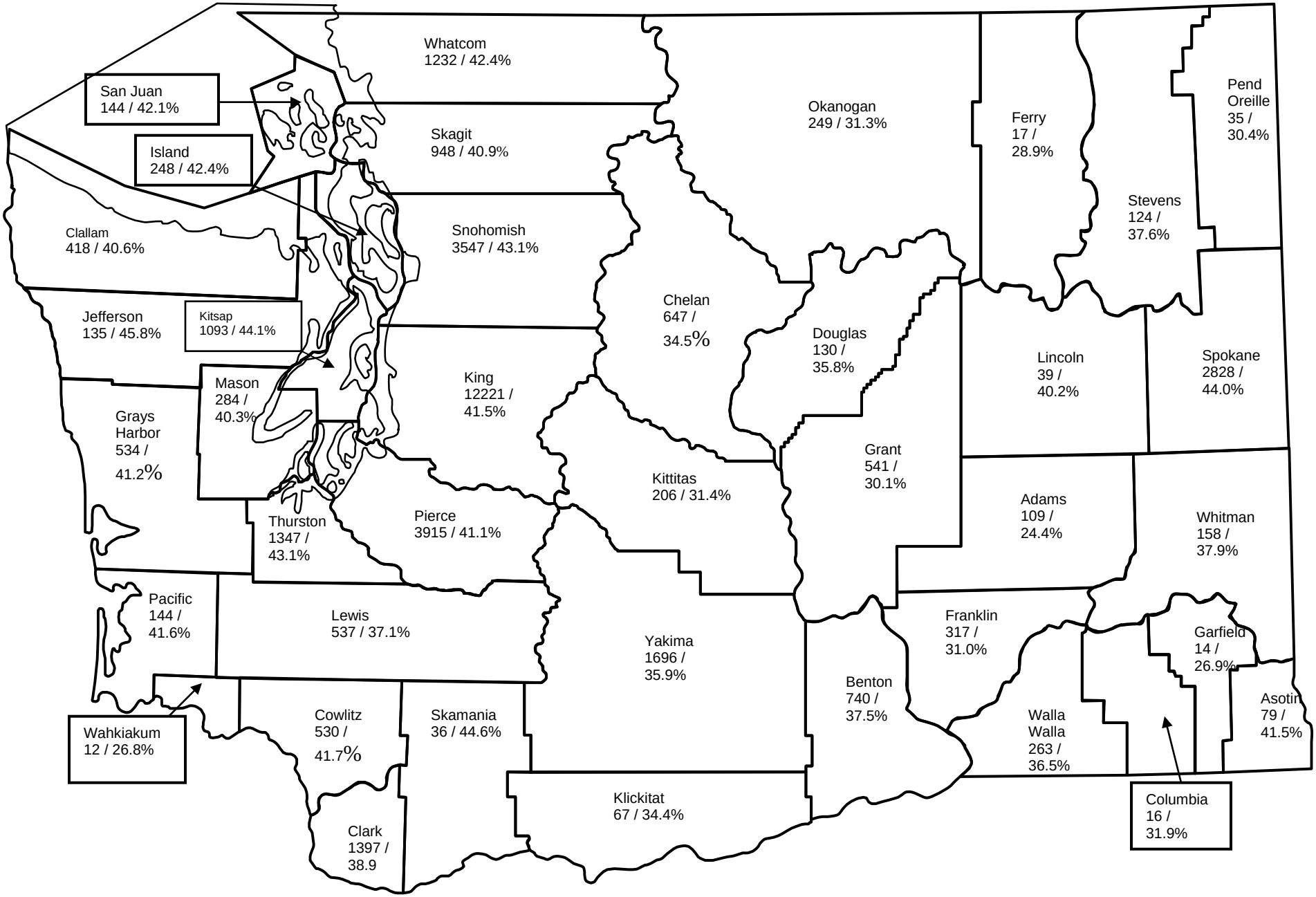


Figure 5. WA State Fund Workers' Compensation Claims for Non-Traumatic Soft Tissue Disorders. Average Number of Accepted Claims per year Average Percentage of Compensable Claims within the County attributable to WMSDs, by county 1997-2005