

A Quantification and Risk Analysis of Occupational Burns:
Oregon Workers' Compensation Claims 1990-1997

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Abstract

This study examined all accepted Oregon workers' compensation claims for occupational burn injuries over 1990-1997 (n = 3,158). The Current Population Survey (CPS) was used to derive employee population baselines for establishing rate estimates. It was estimated that the average occupational burn claim rate was 2.89 per 10,000 workers (95% C.I. = 2.76-3.02). The majority of claimants (71.7%) were males, the largest proportion (32.6%) were aged 25 years or under, and almost half (48.7%) had less than 1 year of job tenure. Costs averaged over \$1.6 million annually. The average indemnity period was 16 days. Higher relative risks were found for evening workers (2.97, 95% CI = 2.96-2.98) and night workers (2.13, 95% CI = 2.12-2.13) compared to day shift workers. Kitchen workers had the highest burn rate of all occupations with 62.5 per 10,000.

Introduction

Quantifying and analyzing work-related burns is an important precursor to establishing safety interventions to address any potential problems. A large proportion of previous research on occupational burns has reported data based on admission and medical records of burn centers and clinics.¹⁻⁹ This line of research has compiled information on the type, causes and severity of burn injuries associated with workplace accidents. However, because such information is collected at burn or trauma centers, the injuries observed may not be representative of all workplace burn injuries, many of which may not be treated in such facilities, and hence, such data may be inappropriate for assessing workplace risks or accident rate prevalence. Other studies have used population-based approaches for studying occupational burns to provide broader information on general accident rates, worker demographics and occupations, and sources of injury.¹⁰⁻¹⁶ Nevertheless, investigation on occupational burns is still needed, especially with respect to causal factors affecting workplace dangers, assessments of occupational risks, and employees most likely to experience burn injury, hence leading burn scholars to advocate the continued use of population-based research designs.¹⁶

This study contributes to the literature by analyzing all Oregon workers' compensation claims resulting from burn accidents during the time period of 1990-1997. In doing so, detailed claimant demographic information such as age, gender, occupation, and job tenure are examined as well as details on injury type, shift, indemnity duration, and costs associated with the claims. Additionally, this study uses data from the U.S. Census' Current Population Survey (CPS) on the

size and composition of Oregon's workforce to estimate burn rates for different groups of Oregon workers over the years 1990-1997. Through this method, this study is able to provide a longitudinal analysis of burn claim rate trends among all Oregon workers, as well as compare burn claim rates across occupations.

Methods

This study used workers' compensation claim data that were provided by the Oregon Department of Consumer and Business Information and Management Division for the period 1990 – 1997. Records were kept for all claims that were disabling or potentially disabling (i.e. those that involved either potential or actual lost work time), although the records were available for some claims that did not actually result in disability. For this study only accepted claims that reported that the nature of the injury was a chemical burn (code 051), electrical burn (052), heat burn or scald (053), multiple burns (058), burns- unspecified (050) or burns-not elsewhere classified (059) were analyzed.

The data set included information on claimant occupation and industry, claimant demographics (e.g. age, gender), claimant work schedules, nature of reported injury, body part affected, compensated days of lost work by claimant and claimant cost. Claims costs were tracked through 1999 and the cost data reflect accumulated claim costs through this time. By the end of the observation period 97.3% of all accepted claims used in this study were closed and for these claims the cost data was complete.

Data from the U.S. Bureau of the Census' Current Population Survey (CPS) was used to estimate Oregon employment levels for different demographic categories and time periods. The CPS is a monthly survey of approximately 50,000 households that is used by the United States government to assess, among other things, monthly unemployment rates. The CPS is a rotating

survey with households first surveyed for the first four months, not surveyed for the next eight months, and then surveyed for an additional four months before permanently leaving the survey. Most of our employment estimates are based on the monthly outgoing rotation group (MORG) files for 1990 through 1997. These files contain data for all individuals participating in their fourth or eighth monthly survey. For individuals in MORG, additional questions pertaining to an individual's employment are asked.

In order to investigate differences in burn injury rates by shift of work, we used information contained in the injury claim data on work start times. For purposes of this study, an individual was classified as working the day shift if they started work between 4 a.m. and 11 a.m., the evening shift if they started work between 12 p.m. and 7 p.m., and the night shift if they started work between 8 p.m. and 3 a.m. To estimate Oregon employment rates by shift and day of week, data from the May 1991 and May 1997 CPS Work Schedule Supplement Surveys was used. These surveys contain supplemental questions pertaining to an individual's work schedule in addition to the usual monthly survey questions. We further restricted our samples to those individuals who reported residing in Oregon at the time of the interview.

The burn injury rate for a particular employment category was calculated by dividing the reported number of injuries in the employment category by the number of individuals employed. Data for the numerator was obtained from the Oregon workers' compensation administrative data while the denominator was estimated using CPS sample data for Oregon workers. The employment estimates incorporate the sampling weights used by the CPS. The burn injury rates were converted to injuries per 10,000 workers by multiplying the rate by

10,000. Since estimates were employed in calculating the injury rates, 95% confidence interval estimates are presented.

In some cases injury rates were reported in relation to a baseline employment category. The relative rates were computed by forming the ratio of the injury rate of the particular employment category and the injury rate of the baseline employment category. A ratio greater than one indicates that the particular employment category has a higher injury rate than the baseline category. Since both the numerator and denominator of this ratio are based on estimates, 95% confidence intervals (95 % CI) were calculated using the delta method. All calculations reported in this paper were made using Stata release 7 software.¹⁷

Results

Between 1990-1997 there were a total of 3,218 Oregon workers' compensation claims citing burn as injury experienced on the job. Of those, only 60 (1.9%) rejected in the adjudication process and a total of 3,158 (98.1%) were accepted as valid. In general, the number of burn claims per year over the period examined declined steadily. There were a total of 500 accepted burn claims in 1990, 434 in 1991, 379 in 1992, 387 in 1993, 386 in 1994, 363 in 1995, 363 in 1996, and 346 in 1997. Using the CPS to calculate an estimate of the number of total employees in Oregon for the years examined, we derived an overall average annual burn claim rate of 2.89 per 10,000 workers, with a 95% CI of 2.76-3.02. A breakdown of the estimated burn claim rate for each year is presented in Figure 1.

For all accepted claims, 2,263 (71.7%) were by males and 895 (28.3%) were by females, with 1,028 (32.6%) of the claims filed by workers 25 years of age or younger, 936 (29.6%) filed by workers aged between 26-35 years of age, 703 (22.3%) claims filed by workers between 36-45 years of age, 331 (10.5%) claims filed by workers between 46-55 years of age, 140 (4.4%) claims filed by workers between 56-65 years of age, and 20 (0.6%) claims filed by workers over 65 years of age. Using CPS MORG data for Oregon over the same time period, 52.7% of workers were male and 18.0% of workers were 25 years of age or younger, 26.3% between 26-35 years of age, 29.0% between 36-45 years of age, 18.1% between 46-55 years of age, 6.1% between 56-65 years of age, and 1.3% aged 65 years and older. Thus, burn claims are over-represented by male and younger workers.

An examination of claimant tenure at the time of injury reveals that the large majority of the individuals with accepted claims, totaling 2,317 (73.4%), had 5 years of tenure or less at their time of injury, of which 1,537 had less than 1 year of job tenure. Of the remaining claimants, 232 (7.4%) had between 6-10 years of tenure, 122 (3.9%) had between 11-15 years of tenure, 68 (2.2%) had 16-20 years of tenure, and 417 (13.2%) had over 20 years of tenure at the time of injury.

An analysis of the accepted cases found that 2,490 (78.9%) of burn claims were heat burns/scalds, 608 (19.3%) were chemical burns, 26 (0.8%) were electrical burns, and 5 (0.2%) were multiple burns. There were 29 claims (0.9%) in which the type of burn was not classified. The most common events leading to injury were “contact with hot objects of substances” as noted in 2,310 (73.2%) of the claims, “contact with skin or other exposed tissue” in 551 (17.5%) of the claims, “explosion” in 96 (3.0%) of the claims, and “contact with electrical current” in 68 (2.2%) of the claims. Various other events, each with less than 20 claims were recorded as cause of injury for the remaining 4.1% of the cases. It should be noted that as there were more claims which specified contact with electrical current as event leading to injury than those citing electrical burns as burn type. This occurs because many of the claims that resulted from contact with electrical current are classified as a heat burn or scald when the first injury report is filed.

Additional analyses were performed to examine whether there were differences in burn injury by work shift, day of week, and month over the 8-year period examined. We found that 2,024 (64.1%) of the burn injuries occurred on the day shift, while 903 (28.6%) occurred during the

evening shift and 231 (7.3%) happened on the night shift. In general, there was little variation between the percentage of total claims made during each of the weekdays (range 15.1%-17.0%). However, the reported burn injury claims occurring on weekends were much lower with 10.4% of all claims occurring on Saturdays and 8.0% on Sundays.

The lower number of burn claims on evening and night shifts and weekends is not surprising since employment levels are substantially lower at these times. After adjusting for these employment levels using data on Oregon work schedules derived from the 1991 and 1997 CPS Work Schedule Supplements we found that a disproportionately higher rate of burn injuries occur on evening and night shifts and on weekends. The relative risk of a burn injury occurring during the evening shift as compared to the day shift was 2.97 (95% CI 2.96 – 2.98) while the relative risk of a burn occurring on the night shift relative to the day shift was 2.13 (95% CI 2.12-2.13). The relative risk of a burn injury on Saturday as compared to Tuesday was 2.17 (95% CI 2.15 – 2.19) while the relative risk of a burn injury occurring on Sunday relative to Tuesday was 3.23 (95% CI 3.22 – 3.24).

We also found differences in burn claims between months of the year. Whereas the months of September through June each had a percentage of claims varying between 6.4% (December) and 8.7% (September and October), there was a dramatic jump in claim percentages to 10.3% and 10.9% for the months of July and August respectively. These differences persisted after accounting for the potential increase in workers during the summer months, using the CPS MORG data to derive monthly employment rates for Oregon. The rate of burn injuries for July

and August were found to equal 0.31 claims per 10,000 workers compared to 0.25 for the next highest months, and a monthly average of 0.24 per 10,000 workers.

In total, \$13,506,039 was paid out for all accepted burn claims during 1990-1997, representing a mean expenditure of \$1,688,254 per year. The associated costs averaged \$4,276 per claim, with \$758 for total temporary disability (TTD) payments, \$722 for permanent partial disability (PPD) payments, \$2,758 in medical payments, and \$38 for vocational rehabilitation payments. On average, the duration of indemnity per claim was 16 days. The average cost of burn claim for male workers was \$5,284, which was substantially higher than the cost of female claims that averaged \$1,720. Electrical burns were associated with the highest costs among all burn injury types averaging \$27,045 per claim, and followed by \$9,324 for unclassified/unspecified burns, \$7,507 for multiple burns, \$4,479 for heat/scald burns, and \$2,196 for chemical burns. The average total cost per claim, and breakdown expense type, was calculated by Census detailed industrial classification and is shown on Table 1. The average total cost per claim was also calculated by Census detailed occupational category for occupations in which 30 or more accepted claims was recorded, and is presented in Table 2.

The average time that burn claimants received indemnity payments was 16.0 days. However, the average time that indemnity payments were received was considerably longer for older individuals who filed claims. For claimants who were aged 25 and under, the average TTD indemnity period per claim was 11.8 days, while claimants between 26-35 averaged 15.4 days, claimants between 36-45 averaged 17.5 days, claimants between 46-55 averaged 21.7 days, claimants between 56-65 averaged 25.0 days, and claimants over 65 averaged 52.0 days. Male

claimants on average received TTD benefits for 17.1 days, which was slightly longer than the average 13.4 days for female claimants. Claimants reporting electrical burns received TTD indemnity payments longer than other burn types with an average TTD duration of 48.2 days, as compared to multiple burn claimants who averaged 18.0 days, heat/scald burn claimants who averaged 16.2 days, unclassified/unspecified burn claimants who averaged 14.2 days, and chemical burn claimants who averaged 14.1 days. There were 6 fatalities reported among all burn claimants in Oregon during the eight-year period examined in this investigation. The average durations of receipt of TTD indemnity payments by detailed occupational categories in which 30 or more burn claims were reported are presented in Figure 2.

Burn claims were further analyzed with respect to frequency, TTD indemnification and average total cost by body part injured. The most common injury type of burn injury reported was to the hands with 846 (26.8%) claims, followed by multiple body parts with 595 (18.8%) claims, and foot/feet with 376 (11.9%) claims. The claims with the longest indemnity time was for those associated with trunk burns averaging 48.1 days, multiple body parts with 30.7 days, and legs with 23.4 days. The highest costs were associated with claims of injury to multiple body parts averaging \$13,545 per claim, hips averaging \$7,089 per claim, and legs averaging \$7,019.35 per claim. A full breakdown of claim analysis by body part injured is provided in Table 3.

For detailed Census occupation classifications, employees in food service occupations made 1,051 claims over the 1990-1997 period, constituting about 33.3% of all burn claims. Machine operators and tenders comprised 383 or 12.1 % of all claims, followed by handlers/equipment

cleaners with 337 or 10.7% of claims, and mechanics/repairers with 278 or 8.8% of the claims. Using the narrower three-digit Census occupation classifications, cooks (except short-order) had the largest number of burn claims with 518 (16.4%), followed by laborers (except construction) with 167 (5.2%), kitchen workers/food preparers with 158 (5.0%), miscellaneous food preparation occupations with 118 (3.7%), welders and cutters with 95 (3.0%), and food counter occupations with 93 (2.9%). The CPS MORG data on the Oregon employment population by occupation was used in conjunction with the claim data to derive burn rate estimates. These estimates along with the 95% confidence interval estimates are presented in Table 4 for three-digit occupational categories in which 30 or more claims were filed during the 1990-1997 period.

Discussion

One of the most prominent findings of this study was that almost 50% of all burn claimants had less than 1 year of job tenure, and over 70% had less than 5 years. While both the CPS MORG and May Work Schedule supplement data lack information on job tenure, thus preventing us from calculating population job tenure frequencies, a recent study found that the fraction of U.S. workers with less than one year of tenure in their current job was below 25%.¹⁸ Thus, this finding suggests workers with little training and job experience were at higher risks for workplace accidents that result in occupational burns. We also found that workers under the age of 25 were disproportionately more likely to file burn injury claims. Some of this effect can be explained by the fact that younger workers are concentrated in occupations that exhibit higher burn injury rates. For example, the claim rate of cooks is 24.3 per 10,000 workers as compared to 2.89 per 10,000 overall. The average of cooks, however, is 30.4 years as compared to an average age of 37.5 for all Oregon workers.

The majority of those found injured in this study were male, which is in line with many previous investigations.^{1,4,7,14,16} A breakdown of the aetiology of burns in the workers' compensation claim data found that heat/scalds were the most frequently cited, which is also consistent with the findings of several past studies.^{5,14} However, as we mentioned earlier, a small percentage of injuries categorized as heat/scalds may be due to claims in which electrical current was listed as event. But even if all of these questionable heat/scald claims are assigned to the electrical burn category. Heat/scalds remain the most prevalent type of burn injury.

Our analysis also discovered a statistically significant difference in burn injuries rates by shift, with the relative risk of injury higher for employees on the evening and night shifts as compared to those on the day shift. This finding held after adjusting for varying levels of employment between the shifts. While in the past, research has found that working late shifts were related to decreases in cognitive functioning¹⁹⁻²⁰ and psychomotor skills²¹, and increases in both task errors²² and occupational accidents²³⁻²⁴, we believe that this is the first study to specifically link night shiftwork to higher incidents of occupational burns. We feel this finding is particularly important as it highlights an important risk factor that employers can and should address as a means to improving the safety of their workforce where the potential for burn injury exists. Additionally, we feel our discovery of increased risk of burn injury on weekends after controlling for staffing levels is of value to workplace burn prevention, though the reasons behind this phenomenon are not as intuitively apparent as with shiftwork, nor as well documented in the medical literature. One possible explanation may be that higher workloads and job demands for employees in establishments that receive greater business over the weekends (such as restaurants) may increase burn accident risk, though more research is needed before such a conclusion is drawn.

It was found that on average, over 1.6 million dollars was paid out annually in workers' compensation claims in the state of Oregon, with the mean amount per claim costing over 4 thousand dollars. Claims made by males were over three times as high on average as those by females. While some of this difference may be due to gender differences in wages that lead to higher daily TTD compensation rates for injured men than women, men receive almost 4 days

more of TTD benefits than women. Moreover, medical costs paid for burn injuries are over three times higher for men than women.

The most expensive claims by type were for electrical burns, and the least expensive with chemical burns, while the most expensive claims by body part injured was those associated with multiple body parts and least expensive with those to the forearm. On average, the average TTD time taken off work for burn injuries was 16 days, with those claiming injury to the trunk averaging the longest TTD of almost 7 weeks. We also found that these lost days increased with age. Thus, while younger workers are more likely to suffer a burn injury at work, older workers suffer more severe burn injuries or require longer recovery times.

Burn rate estimates for occupations derived using the CPS, found that kitchen workers/food preparers had an average rate of 62.5 claims per 10,000. Roofers had the second highest burn claim rate of 45.1 per 10,000, followed by furnace/kiln operators with 35.6, and non-short order cooks with 24.3. These rates demonstrate a particularly high risk of burns associated with these occupations when their rates are compared with the average burn rate found of 2.89 per 10,000. Given these extremely high rates, we believe it to be of the utmost importance that special attention by employers of workers in these occupations be focused on assessing particular sources of potential burn injuries in these job sites, and take steps to effectively reduce the risks.

This study has several limitations that should be considered. First, because this study reports workers' compensation data, burns sustained on-the-job but not serious enough to result in disability may have gone unreported. To this extent, this study likely underreports the actual

number of incidents of workplace burn events that occurred in Oregon workplaces during the period examined. Second, as there are costs that occur with such injuries that are not recorded in workers' compensation records, such as lowered productivity and accommodation expenses, this study cannot fully capture the amounts associated with occupational burns. Third, as was demonstrated in the case of electrical burns, workers' compensation records are inherently subject to some error in the recording process. In the specific case of fatalities, almost 40% of those which occurred in Oregon during the period examined were recorded as "multiple traumatic injuries," and thus while we reported 6 fatalities due to burns, it is possible that this total is an underestimate of burn fatalities, as some could have been coded in the more general category. However, in spite of these limitations, the information contained in this workers' compensation analysis provides a wealth of data on claims serious enough to result in disability, cost information on specific areas that constitute a large portion of the expenses associated with burn injury, and extremely valuable detail on the scope and trends associated with occupational burns across large employee populations over time. In addition, we believe that incorporating the use of census data to estimate claim rates, is an important addition to the methodology used in determining and comparing burn risks of varying occupations.

It should also be noted that not all the findings of this study are in agreement with some reported in past research endeavors. For example, some investigators have found that older workers had a higher distribution of occupational burn injuries than younger workers¹⁶, and other studies have found chemical burns¹ or electrical burns⁴ to be more common than those from heat/scalds. There are, of course, many possible explanations for such discrepancies in the findings, including but not limited to, differences in the geographic or occupational compositions

of the populations studied. These differences only highlight the need for continued occupational burn research using population-based data in the future.

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Table 1:**Average Cost of Burn Claims by Industry**

<u>Industry</u>	<u>TTD</u>	<u>PPD</u>	<u>Medical</u>	<u>Vocat. Rehab</u>	<u>Total</u>
Agriculture	\$1197.87	\$906.82	\$20,083.54	\$0.00	\$22,188.24
Auto & Repair	\$537.77	\$347.39	\$1,454.74	\$0.00	\$2,339.91
Communications	\$1,009.00	\$454.50	\$2,381.25	\$0.00	\$3,844.75
Construction	\$1,439.40	\$1,655.85	\$6,720.71	\$49.97	\$9,865.93
Education Services	\$615.00	\$800.74	\$2,160.72	\$510.38	\$4,086.83
Finance/Insurance/Real Estate	\$365.50	\$532.60	\$417.38	\$0.00	\$1,315.50
Forestry & Fisheries	\$1,633.17	\$3,465.00	\$1,353.33	\$0.00	\$6,451.50
Entertainment & Recreation	\$285.67	\$464.67	\$915.10	\$0.00	\$1,665.43
Hospitals	\$466.48	\$461.48	\$982.57	\$0.00	\$1,910.54
Manufacturing (Durable goods)	\$1,284.11	\$1,351.52	\$4,330.88	\$53.91	\$7,020.42
Manufacturing (Non-Durable)	\$1,013.82	\$553.75	\$1,774.62	\$49.86	\$3,392.05
Med. Services (except hospitals)	\$249.91	\$221.91	\$695.78	\$0.00	\$1,167.59
Mining	\$804.25	\$1,023.75	\$5,346.25	\$0.00	\$7,174.25
Other Professional Services	\$252.57	\$156.05	\$640.67	\$0.00	\$1,039.29
Personal Services	\$305.28	\$842.81	\$1,027.73	\$21.52	\$2,197.34
Public Administration	\$1,125.00	\$967.55	\$3,429.75	\$0.00	\$5,522.30
Retail Trade	\$360.38	\$314.83	\$908.61	\$8.01	\$1,591.83
Social Services	\$341.00	\$305.08	\$747.95	\$0.00	\$1,394.03
Transportation	\$666.82	\$459.27	\$2,008.13	\$0.00	\$3,134.22
Utilities/Sanitary Services	\$1,482.90	\$1,546.50	\$6,692.03	\$0.00	\$9,721.43
Wholesale Trade	\$876.37	\$675.28	\$2,557.47	\$121.51	\$4,230.63
Overall Industry Average:	\$758.08	\$721.99	\$2,758.45	\$38.24	\$4276.77

Table 2:**Average Cost of Burn Claims by Occupational Category***

<u>Occupation Category</u>	<u>TTD</u>	<u>PPD</u>	<u>Medical</u>	<u>Vocat. Rehab</u>	<u>Total</u>
Administrators & Officials	\$1,012.74	\$1,014.68	\$2,399.19	\$13.81	\$4,467.42
Cleaning & Building Service	\$403.35	\$283.86	\$1,067.04	\$0.00	\$1,754.25
Construction Laborers	\$941.83	\$286.54	\$1,414.80	\$0.00	\$2,643.17
Construction Trades	\$1,591.81	\$2,354.28	\$9,318.05	\$39.22	\$13,303.36
Engineers	\$1,686.00	\$0.00	\$16,611.00	\$0.00	\$18,297.00
Engineering & Science Techs	\$880.06	\$1,916.31	\$2,916.75	\$0.00	\$5,713.13
Fabricators/Assemblers/Inspectors	\$508.82	\$222.84	\$1,095.72	\$47.87	\$1,875.26
Farm Operators/Managers	\$550.00	\$0.00	\$14,226.00	\$0.00	\$14,776.00
Farm Workers/Related Occupations	\$387.27	\$386.27	\$987.02	\$0.00	\$1,751.55
Financial Records/Processing	\$571.50	\$0.00	\$699.50	\$0.00	\$1,271.00
Food Service Occupations	\$267.81	\$260.46	\$644.43	\$34.96	\$1,207.66
Forestry & Fishing Occupations	\$1,256.00	\$0.00	\$123.33	\$0.00	\$1,379.33
Freight/Stock/Material Handlers	\$1,272.50	\$1,942.33	\$3,316.61	\$26.06	\$6,557.50
Health Assessment & Treatment	\$699.25	\$1,601.25	\$4,798.50	\$0.00	\$7,069.00
Health Service Occupations	\$214.15	\$273.12	\$214.15	\$0.00	\$859.88
Health Technologists/Technicians	\$143.50	\$0.00	\$203.00	\$0.00	\$346.50
Machine Operators & Tenders	\$1,196.94	\$1,316.41	\$3,428.66	\$49.82	\$5,991.83
Mail/Message Distribution	\$338.00	\$0.00	\$158.00	\$0.00	\$496.00
Mechanics & Repairers	\$1,331.63	\$1,075.41	\$7,810.75	\$92.21	\$10,310.00
Motor Vehicle Operators	\$859.33	\$855.82	\$2,661.88	\$0.00	\$4,377.03
Natural Scientists	\$1,195.00	\$238.50	\$1,967.50	\$238.50	\$3,401.00
Other Administrative Support	\$1,111.08	\$301.75	\$3,050.21	\$0.00	\$4,463.04
Other Executive/Administrators	\$243.74	\$35.29	\$734.46	\$0.00	\$1,013.49
Other Handlers/ Equipt. Cleaners	\$676.42	\$381.90	\$1,720.69	\$51.43	\$2,830.44
Other Precision Production	\$986.46	\$804.36	\$3,198.52	\$24.93	\$5,014.26
Other Professional Specialty	\$305.00	\$0.00	\$1,970.50	\$0.00	\$2,275.50
Other Transportation Occupations	\$1,487.10	\$423.43	\$2,807.45	\$46.13	\$4,764.10
Personal Service Occupations	\$189.58	\$0.00	\$277.42	\$0.00	\$467.00
Private Household Services	\$174.00	\$0.00	\$270.00	\$0.00	\$444.00
Protective Service Occupations	\$1,159.57	\$1,102.90	\$2,213.10	\$0.00	\$4,475.57
Sales Representatives	\$1,613.00	\$0.00	\$1,131.00	\$0.00	\$2,744.00
Sales Workers - Retail & Personal	\$401.46	\$218.08	\$869.33	\$0.00	\$1,448.87
Secretaries/Stenographers	\$90.50	\$0.00	\$228.50	\$0.00	\$319.00
Supervisors/Proprietors	\$4,191.00	\$2,877.20	\$10,960.00	\$0.00	\$17,758.20
Teachers – Colleges/Universities	\$7,797.00	\$16,810.00	\$60,191.00	\$0.00	\$84,789.00
Teachers (except colleges)	\$371.83	\$218.33	\$417.83	\$0.00	\$1,008.00
Technician (non-health & engineers)	\$1,098.88	\$1,731.00	\$1,114.00	\$0.00	\$3,943.88
Unreported Occupations	\$1,012.74	\$1,041.68	\$2,399.19	\$13.81	\$4,467.42

*Occupational categories with 30 or more accepted burn claims

Table 3:
Analysis of Body Part Injured

Body Part Injured*	No. of Claims	Av. Days TTD	Av. Total Cost
Hands (033,034,381,382,383)	846	9.4	\$1,421.60
Multiple Body Parts (08)	595	30.7	\$13,544.99
Foot/Feet (44,430,438,439,481,482,483,4322,4323)	390	16.2	\$1,985.45
Eyes (032)	272	7.2	\$1,625.45
Upper Extremities (030,039,380,389)	200	13.3	\$2,368.68
Forearms (313)	134	6.4	\$679.29
Arms (310,311,318)	122	17.9	\$2,588.33
Multiple Lower Extremities (480)	95	17.5	\$2,381.13
Legs (410,418,419)	81	23.4	\$7,019.35
Ankles (042)	75	17.2	\$2,346.71
Lower Leg (413)	58	18.1	\$3,115.64
Face/Head (008, 010,012,038,039,0330,0360)	58	9.2	\$1,993.31
Wrists (032)	39	21.0	\$2,209.85
Ears (002)	38	9.7	\$2,209.85
Thighs (441)	28	21.8	\$6,242.21
Trunk (020,028,029)	27	48.1	\$6,655.26
Elbows (312)	17	11.2	\$1,556.29
Knees (412)	16	3.2	\$812.88
Back (230)	15	11.2	\$2,059.07
Chest (220)	14	5.6	\$1,011.38
Abdomen (240)	12	14.2	\$2,416.25
Shoulder (021)	6	5.8	\$856.17
Pelvic Area (250)	6	8.5	\$710.17
Non-classifiable (9999)	8	12.5	\$1,306.00
Neck (10)	4	4.8	\$4,466.25
Hips (251)	2	10.5	\$7,089.00

*Injury code in parenthesis

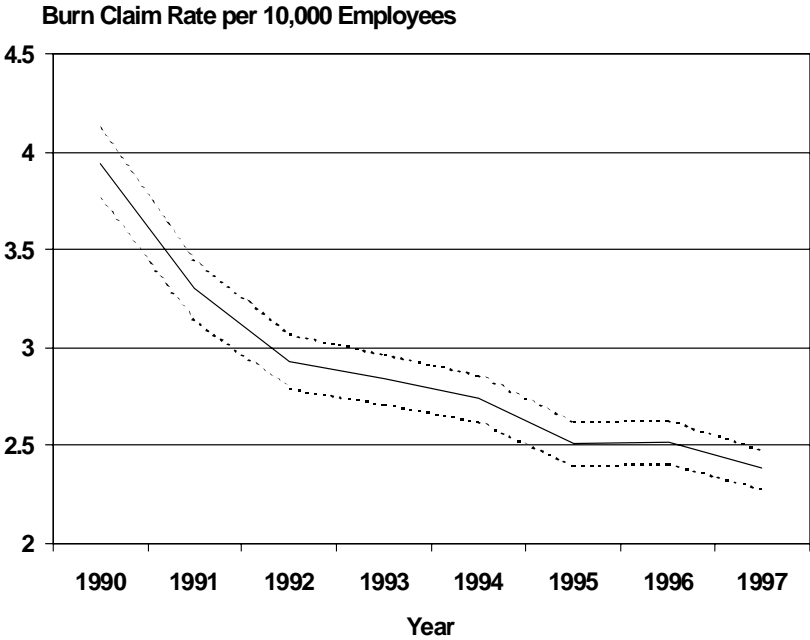
Table 4:**Estimated Burn Claim Rate by Detailed Occupations***

<u>Occupation</u>	<u>Number of Claims</u>	<u>Claim Rate per 10,000</u>	<u>95% CI</u>
Cooks (except short order)	518	24.3	21.4 - 27.2
Laborers (non-construction)	167	9.7	8.4 - 11.0
Kitchen Workers/Food Preps	158	62.5	40.5 - 84.6
Misc. Food Preps	118	17.7	13.9 - 21.6
Welders & Cutters	95	12.4	9.9 - 14.9
Food Counter/Fountain Workers	93	18.3	13.7 - 22.9
Waiters/Waitresses	90	5.9	5.1 - 6.8
Construction Laborers	65	8.8	7.0 - 10.6
Miscellaneous Machine Operators	64	8.0	6.4 - 9.6
Janitors & Cleaners	62	3.4	3.0 - 3.8
Machine Operators (unspecified)	60	11.9	8.9 - 14.9
Garage/Service Station Workers	55	11.6	8.6 - 14.6
Auto Mechanics	53	9.6	7.3 - 11.9
Furnace/Kiln Operators (non-food)	50	35.6	18.7 - 52.5
Electricians	49	6.8	5.4 - 8.2
Roofers	49	45.1	20.8 - 69.4
Truck Drivers	46	2.0	1.8 - 2.2
Millwrights	42	14.9	19.9 - 9.9
Farm Workers (non-supervisory)	39	2.7	2.3 - 3.1
Bus/Truck/Stationary Mechanic	34	7.8	5.7 - 9.9
Supervisors – Production	30	2.3	1.9 - 2.7

*Occupations with 30 or more accepted burn claims

Figure 1

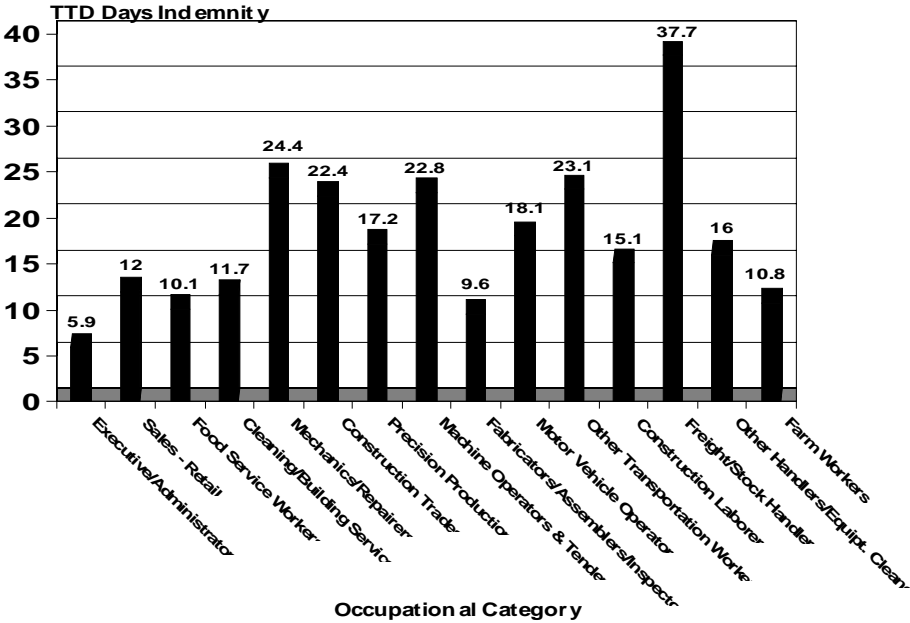
Estimated Oregon Burn Claim Rates: 1990-1997*



* Dashed lines show 95% upper and lower confidence limits

Figure 2

Average Total Temporary Disability (TTD) in Days for Burn Injuries by Occupational Category*



*Occupatio ns w ith 30 bur n c laims or greater