

## A RETROSPECTIVE STUDY OF OCCUPATIONAL SLIPS, TRIPS AND FALLS ACROSS INDUSTRIES

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This paper investigates the significance of occupational injuries related to slips and falls on the same level and from elevation based on claims data collected over a six-year period by a major U.S. workers' compensation insurer. The relative percent of claims and claim costs associated with slips and falls varies by industry sector. Construction industry proportions of claims and claim costs associated with falls from elevation ranked first compared with all other industries examined. The claim and claim costs proportions associated with falls on the same level were highest in the retail industry. Despite the significance of the problem, there has been no significant change in the proportion of fall related claims (either on the same level or from elevation) compared to all reported claims by industry type from 1993 to 1998. Results suggest the need for increased research activity to explore the causes and identify interventions which can reduce the sizable losses in industry.

### INTRODUCTION

Slips, trips, and falls (STF) accounted for approximately 19% of all U.S. non-fatal occupational injuries and illnesses involving days away from work in 1997 (U.S. BLS, 1999). The median days away from work (DAW) associated with STF ranged from 6 for slips and trips without falls to 12 for falls from elevation, and exceeded the national median for all injuries and illnesses. The National Safety Council (1999) reported that falls from elevation were the third leading cause of death for all industries, following highway accidents and workplace assaults/violent acts, and the first cause of death in the construction sector. The service sector had the highest proportion of disabling injuries resulting from falls on the same level compared with all other industries.

Occupational STF are also a significant source of workers' compensation claims and costs in industry. Leamon and Murphy (1995) reported that STF were the most frequent type of claim for clerical workers and second most frequent for trucking and restaurant workers based on claims filed in 1989 and 1990. Further, the claim costs associated with falls were the highest for construction, restaurant, and clerical workers.

This study examined the frequency and severity of STF-related claims across eight industries using worker's compensation claims data from 1993 through 1998. The purpose of the study was to determine what, if any, changes had occurred in the distribution of STF

claims over time and to what extent the experience differed by industry and antecedent event type.

### METHODS

The worker's compensation claims population sampled for the analysis included over 2.4 million claims and over 5 billion dollars in associated direct costs from a major U.S. based insurer. STF-related worker's compensation claims filed between January 1, 1993 and December 31, 1998 were included in the analysis ( $n = 418,572$ ). Only closed cases were included in this analysis to ensure stable cost estimates.

Claims were categorized into one of two antecedent groups: "falls on same level" and "falls from elevation". Claims coded as falls on the same level included all STF that did not involve a change in height. Falls from elevation typically involved stairs, ladders, scaffolding, other elevated work areas, floor openings, and vehicles. To examine industry differences those claims within each of eight previously defined industry groups were then selected. Claims were assigned to groups approximating two-digit standard industrial classes based on the four-digit manual class code associated with each claim (Murphy and Courtney, in press). The industry groups were construction, durable manufacturing, non-durable manufacturing, retail (including restaurant and hospitality workers), services (including clerical and office workers), health services (including healthcare workers), wholesale (including wholesale distributors), and trucking. These industry groups contained the majority of STF claims.

**RESULTS**

**Falls From Elevation Versus on Same Level**

On average falls from elevation comprised 5.2% (S.D.= 0.21%) of all reported claims and 10% (S.D.= 0.48%) of claim costs in the eight industry groups over the 6-year period. The percent distribution of claims and claim costs remained consistent over this period as shown in Figure 1. Falls on same level represented 11.9% (S.D.= 0.18%) of claims and 14.4% (S.D.= 0.60%) of claim costs on average over the period (See Figure 2).

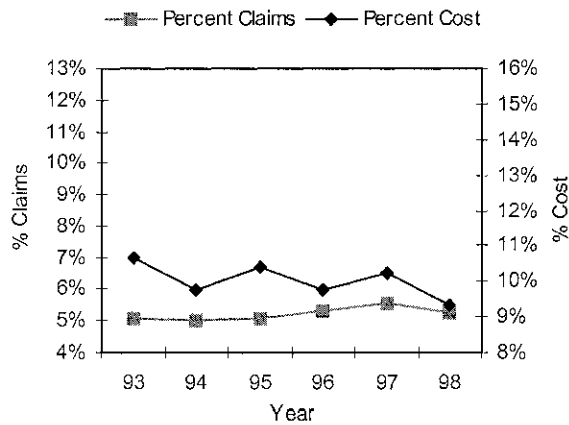


Figure 1. Percent of claims and cost for claims involving falls from elevation, 1993-1998

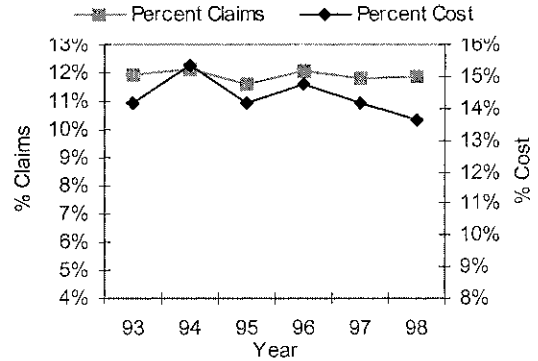


Figure 2 Percent of claims and cost for all claims involving falls on the same level, 1993-1998

**Industry Comparisons- Elevation**

Figures 3 and 4 (see legend, figure 3) present the percent of claims and claim costs involving falls from elevation across the eight industry groups. The construction industry had the highest proportion of claims and claim costs related to falls from elevation. Construction industry falls from elevation represented 9.1% of claims and 21.8% of cost.

**Industry Comparisons- Same Level**

Figures 5 and 6 (see legend, figure 3) present the percent of claims and claim costs involving falls on same level by industry group. In this case the retail industry had the highest proportion of claims and claim costs. Retail industry falls on the same level represented 17.1% of claims and 22.4% of costs. In general, the percent claims and claim costs associated with same level falls remained stable across the entire time period analyzed.

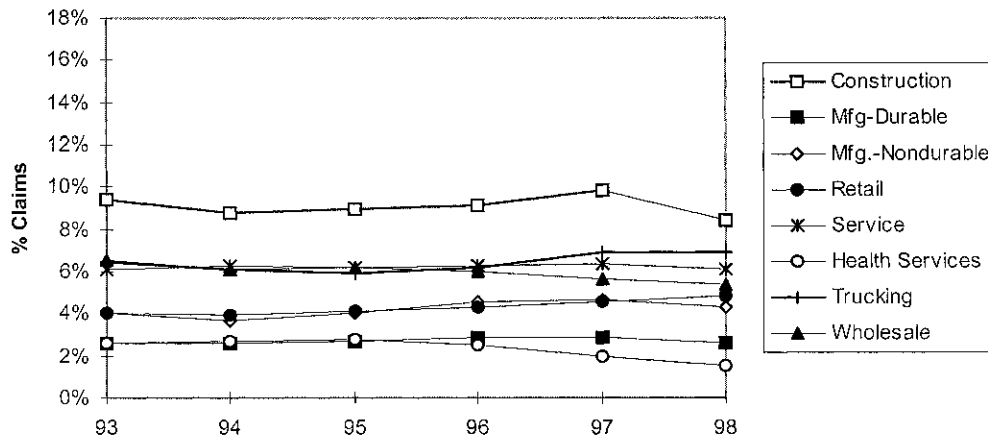


Figure 3. Percent of claims involving falls from elevation across eight industries.

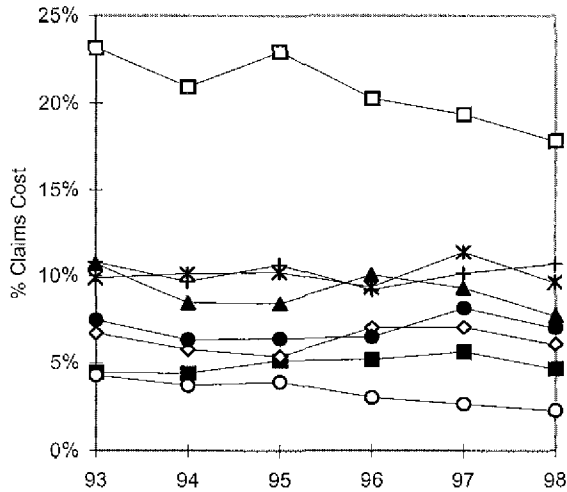


Figure 4. Percent of claim costs involving falls from elevation across eight industries

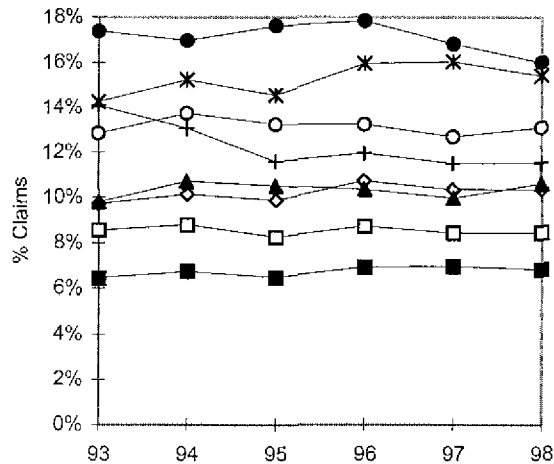


Figure 5. Percent of claims involving falls on same level across industries

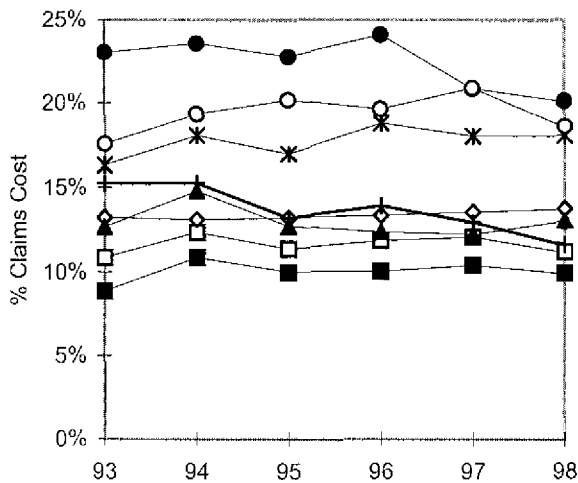


Figure 6. Percent of claim costs involving falls on same level across eight industries

## DISCUSSION

Combining the average percent of claims and claim costs from 1993 to 1998, overall STF accounted for 17.1% of claims and 24.4% of claim costs in these eight industries. This was comparable to the results of Leamon and Murphy (1995) who reported 16% of claims and 24% of claim costs for 1989 and 1990. The total cost of falls from elevation range from 25 to 36% less than the total cost of falls on the same level across this six year period. Therefore, there are higher total costs associated with falls from same level for all eight industries combined.

The construction claim costs related to falls from elevation were disproportionate to their frequency. The ratio of costs to claims was 2.4. This differential may have been due to the severity of the injuries sustained (related to the initial height and distance of the fall as well as the landing surface or object), barriers to return to work (limited modified duty opportunities) or both. This finding is consistent with those of Leamon and Murphy (1995) showing construction industry falls from elevation with the highest claim costs and costs per capita in industry. At the other end of the spectrum, health services had the lowest falls from elevation frequency and cost proportions.

The retail sector led all other sector with 17.1% of claims and 22.4% of claim costs associated with falls on the same level. Retail was followed by service, health services, and trucking. Surprisingly construction, which occupied the first place for falls from elevation, ranked much lower (almost last) for same level falls. These results were again similar to those reported by Leamon and Murphy (1995). Observed proportions of claim costs were higher for the retail, health services, and service sectors and generally lower for the other sectors.

There are a number of plausible explanations for the differences in proportions of claim frequency and cost by industry. Certain sectors may have particular differences based on the ability to control the work environment. For example, construction workplaces are generally much more variable and difficult to control in terms of working and walking surface conditions than manufacturing sites. In addition construction has a greater exposure to less controlled, elevated exposures. Some sectors (e.g., retail and especially restaurants) may also have increased exposure to contaminants on walking surfaces which influence the probability of STF. Differences in the proportions reported here may also reflect the presence or absence of "competing" risks in a particular sector. In manufacturing there are numerous other risks related to material handling, machine guarding, and struck-by-against exposures.

The retail sector may not have as many risks to compete with STF allowing STF to emerge as the major injury problem in that sector.

A potential limitation of this study was the restriction to closed claims. The percentage of open claims varied by year. There were 7.3% of all claims open for 1998 compared with 3.6% for 1997, 2.1% for 1996, 1.3% for 1995, 0.9% for 1994 and 0.7% for 1993. These open claims typically represent more severe and costly claims that could affect the calculated ratio's (e.g., cost associated with open claims involving falls may be higher than the cost associated with open claims from all other cause group categories). The likely effect of this situation would be an artificial reduction in cost proportions for more recent years which may explain some of the small reductions in proportions of claim costs in several instances.

These accident statistics show that falls on same level and from an elevation represent a major problem for all industries examined. In addition the distribution of STF losses has not changed appreciably over time. More work in the area of STF research is still needed to help us better understand why these types of accidents occur and which types of intervention programs are

most effective for reducing future injuries and related disability.

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