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Accident/Injury Analysis of Workers' Compensation Claims in the Oil and Gas Extraction Industry in Texas in 2010-2014

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Abstract: This paper presents an analysis of Workers' Compensation claims, by causes of injury and illness, in the oil and gas extraction industry in Texas in the period 2010-2014. The raw data was published by the Texas Department of Insurance from 2010. The data relates to only lost workday claims (at least one full day of work was missed), and does not provide information on 'medical only' or other types of claims. The data were analyzed in terms of (1) trend in the claims for injury/illness categories that account for a large percent of claims, and (2) mean medical associated costs, and (3) mean income cost for these causes. The number of claims per category of injury don't have a common trend. Mean medical and income costs were also without a common trend. The five major categories (or causes) of injury/illness were: (i) caught in or between, (ii) fall of slip, (ii) strain, (iv) struck by, and (v) miscellaneous. These categories accounted for 86 % of the claims in 2010, 78 % in 2011, 80 % in 2012, 82 % in 2013, and 84 % in 2014. Injuries from motor vehicles are the most frequent over the 2010-2014 period. The reasons for the variation in the numbers are difficult to determine from the published information, but the reasons for the large number of claims are clearly due to the extreme physical demands of the jobs and long shifts (roughnecks often work 72 hours) in a dangerous work environment.

Keywords: workers compensation; injuries; oil and gas extraction

1. Introduction

The growth in the oil and gas extraction has been rapid and fraught with danger to the health of the worker. The fatality rate is 2.5 times higher than in the construction industry and 7 times that of general industry (Witter et al., 2014). The injury recordable rate is 3-fold lower than in construction industry but this is believed to be due to underreporting (Witter et al., 2014). Work related injuries, in general, are due to the relatively high levels of hazards in the work environment, taking into account the type of equipment and the nature of the work. Texas oil and gas drilling and extraction has been booming over the last several years. Employment is rising concomitantly; and accident and injury rates, which have always been high, are always of concern. An increasing number of rigs bring in an increasing number of unskilled, inexperienced, workers who are unfamiliar with the inherent hazards of the industry. The jobs are physically demanding and require great endurance (roughnecks often work 72 hour shifts).

Workers Compensation (WC) to injured workers by employers was instituted by states to (i) compensate injured workers for lost income, (ii) provide rehabilitation of the injured worker so that he or she would be able to return to work, (iii) promote accident prevention programs in the workplace, and (iv) spread the cost of WC over industries with different levels of risk (Goetsch, 2005). Workers often seek compensation for injuries via WC. Thus WC data may be a good source to determine certain characteristics of injuries in the workplace. These include the trend over the years for a specific injury, the type of injury associated with a particular industry, and the relative cost of injuries. The objective of this paper is to determine trends in the Workers Compensation (WC) claims in the Oil and Gas Extraction industry for the most recent 5 year period, 2010-2014, in Texas.

2. Methods

The raw data for this paper was taken from the available data in the Texas Department of Insurance website. (https://wwwapps.tdi.state.tx.us). Data before 2010 was not accessible. Using specific queries, data were obtained on five major categories of WC claims: occurrence, mean medical costs per category (cause), and the mean income cost. The data pertained to lost work days claims only; that is, claims reported by employers to WC insurers that involve the worker missing

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at least one day of work. It does not provide information for 'medical only' or other types of claims. Cases where there were fewer than 5 claims were called 'other' or 'unknown.'

3. Results and Discussion

The claims from 2010-2014 show a decreasing-increasing trend with 2012 having the least number of claims (599, 560, 496, 503, and 557 claims, respectively).

Number of claims: The five major categories (or causes) of injury/illness were: (i) caught in or between, (ii) fall of slip, (ii) strain, (iv) struck by, and (v) miscellaneous. These resulted in a total of 78-86% of the claims in a year, over the 2010-2014 period. The change in the number of claims from one year to the other did not follow the same trend for all categories of injury (Figure 1). 'Strain' and 'fall or slip' showed a definite decreasing-increasing trend from 2010-2014, whereas the three other categories showed an irregular pattern with an overall gradual decrease. In other words, 'strain' and 'fall or slip' were on the rise in the latter two years. A Chi-square test of independence between variables 'year' and 'category of injury' confirmed that the change in the number of claims of injury/illness across time periods was associated with the category of injury ($p=0.04$).

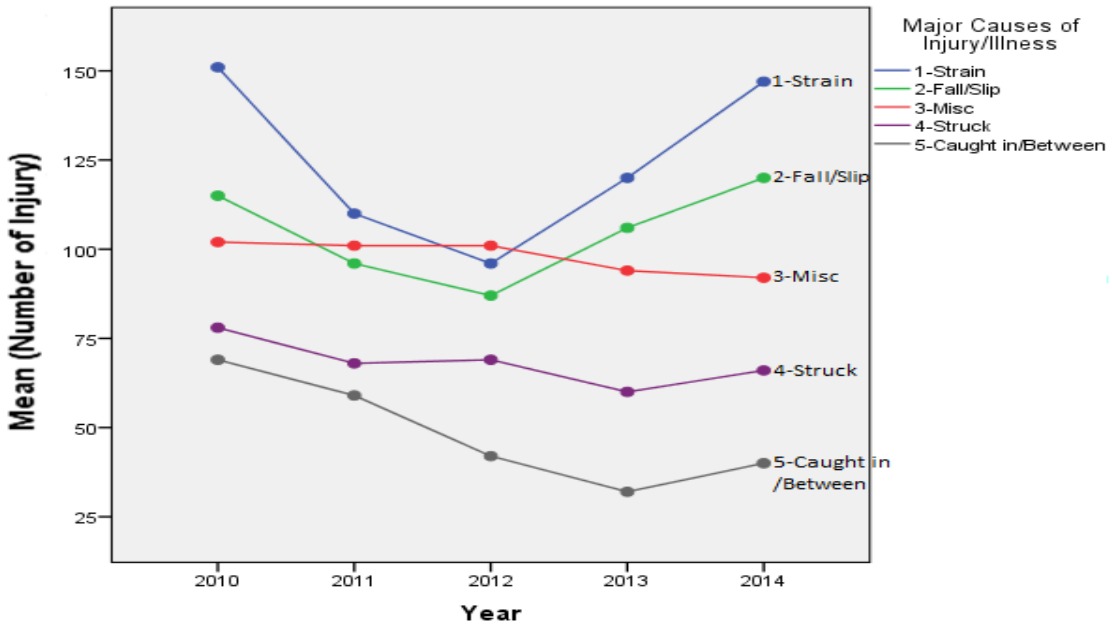

Figure 1. Number of claims for the five major categories (causes) of injury from 2010-2014.

Mean medical cost: Medical costs were highest for the following categories: burn or scald-heat or cold exposure; caught in or between; cut, puncture, scrape; fall or slip or fall; motor vehicle; strain; against or stepping on; struck or injured by; rubbed or abraded by; and miscellaneous. In 2010, the highest mean was for 'burn or scald or heat exposure' at $23,954 and the lowest at 'rubbed or abraded by' at $2,376. In general, these costs changed over the ensuing years with no clear pattern. For some categories there were increases, and for others, decreases. 'Burn or scald-heat exposure' showed a steady decrease; 'motor vehicle' showed a sharp but irregular increase; and the others showed comparatively milder and irregular increases or decreases from 2010 to 2014 (Figure 2). A Chi-square tePst of independence, between variables 'mean cost' and 'year' confirmed that the change in 'mean cost of injury/illness' from year to year was not the same for all categories; the change was associated with the category of the injury/illness ($p<0.0001$). Among the greatest increases in cost from one year to the next (Table 1) are:

- Motor vehicle: 264 % from 2100-2013.
- Striking against or stepping on: 183 % from 2010-2011.
- Rubbed or abraded by: 193 % from 2011-2012.

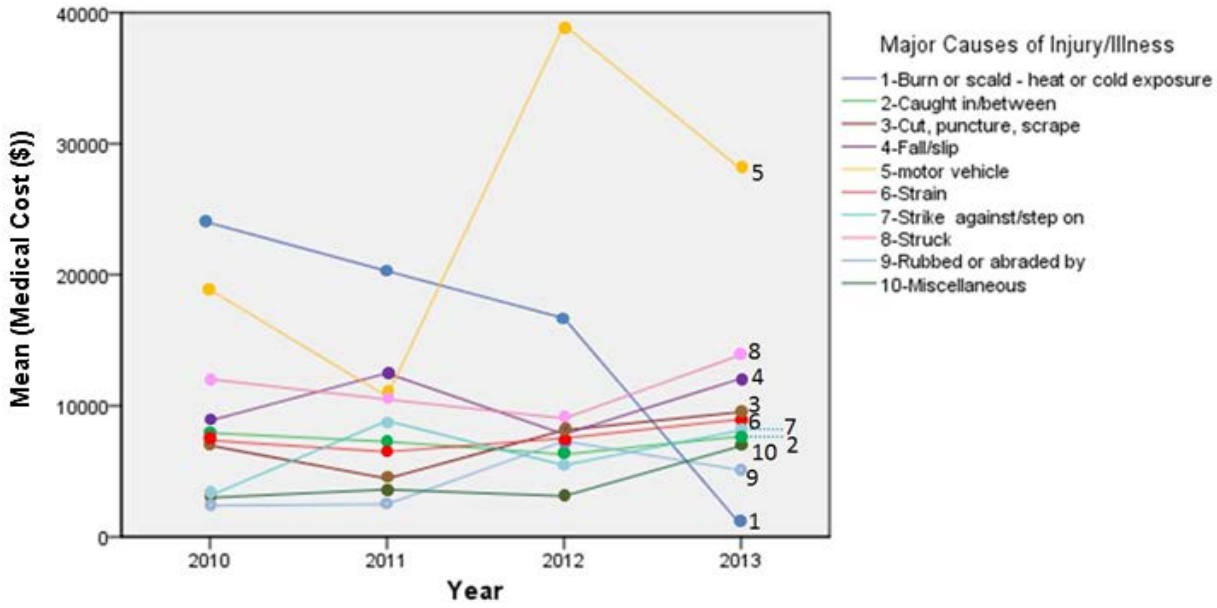

Figure 2. Mean cost per claim for various categories of injury in 2101-2014

Table 1. Percentage Change in Mean Medical Cost, by Category (cause), Across Time Period*.

Cause of Injury/Illness	2010 to 2011	2011 to 2012	2012 to 2013
Burn or scald –heat or cold exposure	-15.3	-17.7	-94.7
Caught in or between	-8.6	-13.2	21.8
Cut, puncture, scrape, injured by	-36.3	83.2	14.7
Fall or slip	40.8	-37.3	54.3
Motor vehicle	42.6	264.7	28.2
Strain or injured by	11.7	13.7	19.2
Striking against or stepping on	182.5	-38.2	48.7
Struck or Injured by	12.8	-13.9	53.7
Rubbed or abraded by	4.8	193.4	-30.6
Miscellaneous	21.0	-13.9	123.4

*Negative values indicates decrease; positive values indicates increase

The three categories of injury with the highest mean costs were 'motor vehicle,' 'burn or scald-heat or cold exposure, ' and 'fall or slip. ' It is worth noting which sub-categories within the above listed categories were responsible for costs above the mean for the category. These are listed below.

2010:

- for 'motor vehicle' – collision or sideswipe with another vehicle
- for 'fall or slip' - fall from ladder of scaffolding; and fall from liquid or grease spill

2011:

- for 'motor vehicle' – not otherwise classified/unknown
- for 'fall or slip' - fall from different levels or elevation (off catwalk, bridge, etc.); on the same level, on ice, or on snow
- for 'burn or scald-heat or cold exposure' - chemicals

2012:

- for 'motor vehicle' – collision or sideswipe with another vehicle
- for 'fall or slip' - fall from different levels or elevation (off catwalk, bridge, etc.); on the same level; on ice; and on snow
- for 'burn or scald-heat or cold exposure' – chemicals

2013:

- for 'motor vehicle' – collision or sideswipe with another vehicle
- for 'fall or slip' - from different elevations; trip and not otherwise classified; and on snow

4. Conclusions

The rapidly expanding oil and gas extraction industry is fraught with danger to workers' health and safety. Workers Compensation data can provide us with information for making valid comparisons of levels of hazards of various categories, and relative dollar costs among these categories. Five categories of injuries account for 78- 86 % of WC claims, but the number of claims and the mean cost per claim did not follow easily predictable patterns over the period 2010-2014. A longer time period is required to establish clear patterns, or refute the existence of clear patterns.

5. References

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