Making the meat industry a safer place

Identifying the drivers of high Workers' Compensation premium rates in the Meat Industry

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1. Executive Summary

Review of existing literature (Section 2, below) confirmed that the rate of injury in the meat industry remains higher than for other industries, and that a range of workplace safety initiatives have been trialled and shown to have some benefit in increasing workplace safety. Even so, rate of injury remains a concern, and evaluation of the broader literature suggests several gaps in the way these injury claims data have been assessed. First, there is large variability in the duration of time off work due to injury, and this has not been extensively accounted for in analyses. Understanding the company and individual level predictors of time off work may help to better utilize prevention strategies by targeting at risk groups before injury occurs. Second, as the statistics on injury are typically reported at the level of industry, differences across companies within the same injury that may account for differences in injury rates and duration of claims have been largely neglected. Third, Further evaluation of the types of workplace safety initiatives that are implemented and fidelity to these procedures is needed to help identify what safety training is needed and where gaps at the organisational level may exist.

Thus, the overarching aims of the current project were to: (1) develop an up-to-date, detailed, and accurate picture of the work compensation claims in the meat industry, by analyzing existing state and territory database records for workplace injury claims, as well as interviews and site visits at meat industry sites around Australia to determine safety practices (see Section 3 for more details of Method); and (2) utilise the information to provide a series of recommendations, activities, and resources for prevention and intervention strategies to further reduce incidence and severity of injury claims in the meat industry.

Overall, there were 2575 work compensation claims across 37 organisations within Australia included in analyses, as well as interview data from each of these organisations on safety initiatives and practice. As covered in Section 4, descriptive statistics from the claims data showed that the most common injury types were traumatic joint/ligament and muscle/tendon injury, followed by wounds, lacerations, amputations and internal organ damage for the sample overall, and that the pattern was reasonably consistent across gender. Specifically, it was found that traumatic injuries accounted for ~50% of claims and 36% of overall claims costs. Lacerations accounted for 29% of claims and 21% of costs overall. These findings suggest clear targets for intervention.

Although less common occurrences, fractures and burns accounted for a larger proportion of total claims costs relative to their proportion of all incidents. Body stressing and being hit by moving objects were the most common mechanisms for injury, though body stressing was more common for women and hit by moving objects was more common for men. Vehicle incidents and heat, electricity, and other environmental factors were the most costly mechanisms of injury. Analyses of these individual-level data showed that days compensated, delay in claims lodgement and repeat claimant were all unique contributors to total cost of a given claim at the individual level. Significant organisation-level predictors of claim costs were claims management, compliance, health and wellbeing, OH&S, and recruitment processes, although it is noted that in some cases, the organisational predictors may reflect subsequent changes to workplace culture in light of recent injuries.

In conclusion, as much as safety must always be a focus for every organisation, the significant focus on this in the past 30 years led to a current phase in safety where only incremental reduction is possible through current safety strategies. As a result, significant reductions in Workers' Compensation Premiums are unlikely to be achieved through this focus.

In contrast to the period of significant improvement in safety, as a Nation we have failed to make improvements in our approaches to Return to Work. This has resulted in increasing claim durations and costs across a 15 year period. This failure to innovate in the Return to Work (RTW) space continues in the meat industry, with the associated lost time and claims costs driving the significant premium rates across the country.

The meat industry must look at innovations in the RTW and engage as an industry in sharing and implementing these innovations if they are going to achieve notable reductions in Industry Workers' Compensation rates.

2. Review of the workplace safety literature

The rate of injury specific to the meat industry is hard to quantify accurately from publicly available reports. However, several lines of evidence suggest that rate of injury for workers in this industry may be higher than all industry rates, and for many other high-risk occupations. WorkCover WA's (2016) recent workers' compensation scheme trends analysis show that for 2014/2015 data, the agriculture, forestry, and fishing industry has the highest frequency rate of injury claims (16.9%), which is considerably higher than the all industry average (7.7%). Injury data reported by the Queensland Office of Industrial Relations drills down further to show that in 2013-2014 there were 40.7 serious injury claims per 1,000 employees in the meat and meat manufacturing sector, which far exceeds the manufacturing serious injury claim rate (18.1) and all industry claim rate (12.6) for the same period. Although this latter document reports declining serious injury claim rates over time (58.5 per 1,000 in the prior period of 2012-2013), the numbers show that rate of injury is still far higher in the meat industry than for other industries, and remains at worryingly high levels both from employee safety and economic perspectives. Finally, Safework Australia data for the period 2013-2016 indicate that in 2015-2016, the three occupations within the meat industry with the highest serious injury claim rates were meat processing (720 out of 1465), fresh meat, fish, and poultry retailing (160), and poultry processing (105). Although the numbers have decreased since 2013-2014 (1810 for the industry overall in 2013-14 to 1465 in 2015-2016), the ranking of these occupations remains stable in terms of risk. In 2015-2016, many of these claims were due to laceration or open wound (395), and affected body areas were most often upper limb (205) and fingers (130). The variability across occupation types highlights that focusing on data at the industry-wide level may miss subgroups of particularly high risk.

Nevertheless, this high rate of injury risk in the meat industry is reflected in the Workers' Compensation industry rates for claims from post-farm-gate industries, which are amongst the highest nationally, reflecting a need for assistance in addressing both occupational health and safety (OHS) and Workers' Compensation for employers in this area and the industry as a whole. For instance, in Victoria, the industry rate for C11110 Meat Processing is 4.869%, which is more than double that of companies engaged in logging (2.395%), almost double that of companies engaged in aged care (2.643%), almost as high as companies engaged in brick laying (5.589%), and higher than companies engaged in the manufacture of explosives (4.154%). It is therefore important to understand the drivers of these injuries in order to devise effective intervention strategies to reduce their incidence.

In recent years, safety initiatives (such as OH&S advertising campaigns, site visits, audits of workplace climate, and psycho-education programs educating workers about risks of workplace injury) have been rolled out state- or country-wide (Australian Institute for Social Research, 2010; Correll & Andrewartha, 2000; Franche et al., 2004; Safework Australia, 2013). While the incidence of serious injury claims[1] has reduced by as much as 28% (disregarding industry level differences) since the introduction of these initiatives, the 40% reduction target set in the National Occupational Health and Safety 2002-2012 Strategic Plan (Safework Australia, 2002) was not achieved.

Incidence of serious claims may not be the most appropriate indicator of success in combating workplace injury. Examination of time off from work shows sizable variability in the duration of leave (Mean = 85.6 days, Standard Deviation = 257.1 days; Ruseckaite & Collie, 2013), indicating considerable heterogeneity in the experiences and nature of claims for those who are injured at work. When a stricter cut-point is used to demarcate serious injury, the apparent improvement in workplace safety disappears.

Worksafe Western Australia (2012) showed that the number of cases of 60+ days lost to injury claims continues to increase, and now accounts for almost one-third of all LTI/Ds. Stability or upward trajectories for number of cases of 60+ LTI/Ds over time have been reported in other states (e.g., WorkCover Tasmania, 2011). Age breakdowns show that younger employees account for the greatest share of LTI/Ds (e.g., Worksafe Western Australia, 2012).

Another concern is that serious injury claims are typically analysed as discrete events, without due consideration for whether this is an isolated (one-off) or recurrent injury. Recent evidence, however, strongly suggests against the practice of combining - for the purpose of risk modeling - claims that are one-off versus repeat claims. Ruseckaite and Collie (2013) showed that between 1995 and 2008, more than half (53.4%) of claims were filed for a recurrent injury or disease. The majority of time lost from work was accounted for by recurrent claims, signaling the need to not only identify those at risk of a single claim, but also those who are at-risk of re-injury.

[1] A 'serious claim' is defined as claims involving death, permanent incapacity or a temporary incapacity requiring an absence of at least one full week of work.

Ruseckaite and Collie (2011) showed that while the initial claims of recurrent claimants are 52.6% the size of one-off claims, the subsequent claims are 149.1% greater than the initial, and equate to 131% of the claim size for one-off claimants. Thus, when claims history is considered, there are a sizable number of repeat claimants, and their total time away from work (plus expenses) easily exceeds one-off claims. Importantly, repeat claims are particularly frequent in manual labour positions, such as is common in the meat industry.

Collectively, these findings suggest that lumping all injury claims together may skew perceptions of safety figures, and highlight the need to identify important differences in injury incidence, duration, and cost across subgroups of workers (e.g., differences across age groups, gender, level of work experience, field of work, labour hire workers, etc). Indeed, just as differences in claim rates are observed across industry, differences have also been identified based on age of employee (e.g., Worksafe Western Australia, 2012).

It is likely that the type of tasks engaged in at work may predispose some individuals to greater risk of injury, and up-to-date statistics on the association between task and injury prevalence would help identify those groups most in need of intervention. Similarly, modeling of the claims data should include consideration of the physical location of injury (e.g., hands, back, shoulders, etc.) as this may also predict the duration of time lost due to injury.

In reviewing the literature, it is also clear that organisation-level differences in rate of injury and workplace safety culture have not been taken into consideration in predicting nature of workplace injury claims. This is understandable as the bulk of past research has focused on claims databases that do not collect this sort of information. However, through purposeful sampling of representative organisations, it is possible to obtain a sense of these organisation-level influences. Such influences are important to model because it helps contextualize the nature of injuries to the individual. That is, it may enable distinctions to be drawn between injury claims in a generally safe working environment from many claims made in an organisation that may have a history of claims.

This fine-grained analysis of the drivers of injury (at both employee- and organisation-levels) is necessary in order to inform tailored, targeted prevention and intervention strategies that reduce the occurrence of workplace injury into the future.

In summary, the existing literature indicates that:

1. Rate of injury in the meat industry is higher than in other sectors;
2. Efforts to reduce incidence and severity of injury in the meat industry have had some success, but injury rates still remain a concern;
3. Modelling of injury claim databases show considerable variability in the nature of claims;
4. One likely reason for the variability in claims data is lumping together one-off injuries with repeat claims, thus treating the two conditions as if they were the same; and
5. Other predictors of variability in claims are likely to include organisation-level factors (such as rate of injury claims in the organisation, workplace safety initiatives that exist in the organisation, and fidelity to these safety practices), employee-level factors (age, gender, years on the job, etc.), and injury-related factors (repeat or one-off claim, physical location of injury, etc.).

Despite accumulated literature suggesting a wide range of contributors to workplace injury, sophisticated models that attempt to incorporate all (or most) of these proposed predictors have yet to be undertaken. Evaluating these predictors separately, in isolation, can give misleading results as some of these risk factors are likely to overlap, hence leading to over-estimates of influence if researchers do not control for these multiple risk factors in the same analysis. Section 3 of this report provides details of the method of a project conducted to address these limitations in existing literature. Section 4 provides a breakdown of results from this data collection.

3. Method

Procedure:

74 organisations who were members of the Australian Meat Industry Council (AMIC) were approached to participate in this study via email and phone calls. Of these, 40 organisations across 6 states and territories in Australia agreed to participate in this study. This number of organisations and spread across Australia was designed to facilitate meaningful evaluations of organisation- and state-level differences in injury rates, whilst ensuring that the number of organisations we collect data from is feasible to allow for site visits to collect in-depth qualitative data about safety practices that was not immediately available from injury databases.

Participating organisations provided work cover claims data for the period 2014 to 2018 (inclusive) for analysis, and also agreed to an on-site interview. The on-site interview included a pre-specified list of questions pertaining to knowledge and practice of workplace safety standards, as well as inspection of relevant workplace safety documentation and resources by project investigators. It was important to conduct these on-site visits as claims data alone do not provide environmental context that may help account for differences in rates of injury from one site to another.

Claims data

Data were obtained from each of the participating organisations, and included all claims – successful and unsuccessful – over the period 2014 to 2018. These claims data included information about age, gender, state, and organisation of the individual, nature of the injury (injury type, injury location, and mechanism of injury), claim status, whether the claimant has claimed before, and compensation paid (both amount and days of compensation paid). Although initially entered as text, mechanism of injury and bodily location of injury were coded using the Australian standard Type of Occurrence Classification System (TOOCS, 3rd edition) for workplace injury and disease recording.

Site visit data

A semi-structured interview approach was used to guide data extraction from site visits. This entailed a series of set questions asked of all organisations, with opportunity for flexibility for follow up information where necessary. The set questions asked about seven key areas of interest: (1) compliance with state-level workplace safety laws; (2) occupational health and safety practices; (3) focus on safety during recruitment processes; (4) employee management role in fostering a safe working environment; (5) claims management process; (6) whether a return to work coordinator is available on-site, and the scope of their role; and (7) organisational focus on employee health and wellbeing.

Analytic approach

Initial analyses consisted of descriptive statistics to provide a breakdown of claims on the basis of: (1) successful vs unsuccessful; (2) state representation; (3) average amount paid per claim; and (4) most common injury types, mechanisms, and locations. Injury types, locations, and mechanisms were further broken down by gender to determine whether the most commonly occurring types of injuries differed for male and female employees. Costs of claim by injury type, location, and mechanism were calculated both as the average cost per injury type, and as the percentages of overall paid and overall number of claims.
Finally, a series of regression analyses were conducted to evaluate organisation- and employee- level predictors of claim costs. At the individual level, claims were predicted by claimant gender, age, nature of the injury, and whether there was a reporting delay for the claim. Each predictor was entered individually initially to observe the total effect of these predictors (unadjusted model). Subsequently, all predictors were entered together (adjusted model) to control for inter-relationships among these predictors, and in turn to provide more accurate estimates of their unique contributions for prediction of claim amount. These individual level models were adjusted for clustering due to repeated claims within organisations using multilevel modelling.

At the organisational level, regression analyses were conducted to predict total claims paid on the basis of the seven topic areas of the on-site interview (claims management, compliance, employee management, health and wellbeing, OH&S, recruitment, and return to work coordinator) as well as organisation size. Organisation size was converted into a categorical variable, dummy coded to compare organisations of 1-50 employees against organisations with 51-200 employees (dummy variable 1) and >200 employees (dummy variable 2). As with the individual-level analyses, predictors were tested individually (unadjusted model) and then entered together in a full model (adjusted model). Organisation level analyses were also conducted using multilevel modeling to adjust for clustering.

4. Results

Overview of sample characteristics

Number of claims overall

Overall, there were 2575 claims across 37 policies, of which 27 site surveys were conducted. Of these claims, 107 were accepted and remained active, 2150 were accepted but finalised, and 318 cases were rejected. As the final amount of payment will likely deviate from current amount paid in open cases, and since the discrepancy between current and final amount paid is likely to depend on how far into the claim the case is, subsequent analyses reported below are for accepted but finalised cases (n = 2150).

State representation of claims

In total, six states and territories were included in the present evaluation. These differed in the number of claims they accounted for in the overall datafile: (1) New South Wales (n = 971, 45.2%), (2) Queensland (n = 728, 33.9%), (3) Western Australia (n = 260, 12.1%), (4) Victoria (n = 127, 5.95%), (5) South Australia (n = 35, 1.6%), and Northern Territory (n = 29, 1.3%).

Amount paid for claims

On average, the total amount paid per claim was $5,389.04. There was considerable variation in claim size (standard deviation, SD = $26,806.39), ranging from $0 to $803,363.08. The total paid amount was roughly equally split between compensation paid (Mean = $1,728.13), medical paid (Mean = $1,539.24), and payment for other reasons (Mean = $2,009.46).

Nature of injury claims

The nature of injury for these claims are reported in Tables 1a-3b. As shown in Table 1a, the most common injury type for the sample overall is traumatic joint/ligament and muscle/tendon injury (n = 1083 claims, 50.4%), followed by wounds, lacerations, amputations and internal organ damage (n = 618, 28.7%). In most cases, the proportion of injury type was comparable across gender, with two main exceptions. Musculoskeletal and connective tissue diseases were more common for women than men (16.3% vs 5.9%), whereas wounds, lacerations, amputations, and internal organ damage was more common for men than women (30.5% vs 15.5%). Table 1b shows that, although these were less common occurrences, intracranial injury and injury to nerves or spinal cord were (on average) the most costly claims. Fractures and burns also accounted for a greater percentage of claim payments

(more than double) than anticipated by the proportion of overall claims they contribute. For example, burns accounted for 8.29% of overall payment on claims but were only 3.1% of the number of claims.

Table 1a. *Injury type frequency (and percentage)*

Injury Type	Overall	Men	Women
Traumatic joint/ligament and muscle/tendon injury	1083 (50.4%)	929 (49.9%)	140 (54.3%)
Musculoskeletal and connective tissue diseases	153 (7.1%)	110 (5.9%)	42 (16.3%)
Wounds, lacerations, amputations and internal organ damage	618 (28.7%)	567 (30.5%)	40 (15.5%)
Fractures	63 (2.9%)	57 (3.1%)	5 (1.9%)
Burn	67 (3.1%)	57 (3.1%)	10 (3.9%)
Intracranial injuries	14 (0.7%)	10 (0.5%)	2 (0.8%)
Injury to nerves and spinal cord	31 (1.4%)	25 (1.3%)	6 (2.3%)
Mental disorders	14 (0.7%)	11 (0.6%)	3 (1.2%)
Digestive system diseases	1 (~0%)	1 (0.1%)	0 (0%)
Nervous system and sense organ diseases	11 (0.5%)	11 (0.6%)	0 (0%)
Skin and subcutaneous tissue disease	14 (0.7%)	12 (0.6%)	1 (0.4%)
Infectious and parasitic diseases	34 (1.6%)	29 (1.6%)	4 (0.4%)
Respiratory system diseases	1 (~0%)	0 (0%)	1 (0.4%)
Circulatory system diseases	3 (0.1%)	3 (0.2%)	0 (0%)
Other/unspecified	43 (2.0%)	39 (2.1%)	4 (1.6%)

Table 1b. *Cost of claim by injury type*

Injury Type	Average cost (SD)	% overall paid	% n overall
Traumatic joint/ligament and muscle/tendon injury	$3,900.23 ($18,494.76)	36.46%	50.4%
Musculoskeletal and connective tissue diseases	$7,566.46 ($19,864.61)	9.99%	7.1%
Wounds, lacerations, amputations and internal organ damage	$3,950.00 ($15,040.99)	21.07%	28.7%
Fractures	$12,386.04 ($31,873.74)	6.73%	2.9%
Burn	$14,344.41 ($97,977.71)	8.29%	3.1%
Intracranial injuries	$37,305.93 ($83,460.97)	4.51%	0.7%
Injury to nerves and spinal cord	$36,280.21 ($63,575.29)	9.71%	1.4%
Mental disorders	$10,827.28 ($17,759.89)	1.31%	0.7%
Digestive system diseases	$1,889.07 ($0.00)	0.02%	~0%
Nervous system and sense organ diseases	$7,566.20 ($11,473.54)	0.72%	0.5%
Skin and subcutaneous tissue disease	$2,201.32 ($6,172.57)	0.27%	0.7%
Infectious and parasitic diseases	$819.64 ($2,431.55)	0.24%	1.6%
Respiratory system diseases	$319.00 ($0.00)	0.01%	~0%
Circulatory system diseases	$0.00 ($0.00)	0.00%	0.1%
Other/unspecified	$1,852.15 ($5,766.44)	0.69%	2.0%

Hand, fingers, or wrists (*n* = 750, 34.9%) were most commonly reported location of injury for the sample overall, followed by back (*n* = 280, 13%) and upper arms and shoulders (*n* = 248, 11.5%). Further breakdown of injury location showed these proportions were roughly comparable across gender (percentage difference <10% for all locations). Table 2b provides breakdown of cost by injury location, both as average cost and as proportion of overall claims payment amount made. Injuries to skin were the most costly, but some caution is needed in interpretation as this is based on a total of 4 claims. Mental health claims and Injuries to head/face, elbow, neck, or back were next most costly on average. Using a ratio of >2 (proportion of costs/proportion of claims), costs associated with claims for skin, head/face, and elbows were considerably higher than their number of claims.

Table 1c re-evaluates the pattern of injury types and costs specifically for serious claims. As shown below, average costs are much higher for serious claims (as may be expected). The key injury types though remain the same – traumatic injury and lacerations remain the top two claim types both in terms of cost and number of overall claims.

Table 1c. *Cost of claim by injury type for serious claims*

Injury Type	Average cost (SD)	% overall paid	% n overall
Traumatic joint/ligament and muscle/tendon injury	$11,700.73 (25,932.68)	34.00%	38.66%
Musculoskeletal and connective tissue diseases	$11,608.43 ($22,584.76)	10.43%	11.95%
Wounds, lacerations, amputations and internal organ damage	$9,998.40 ($23,753.59)	22.60%	30.07%
Fractures	$14,794.47 ($33,400.04)	5.82%	5.23%
Burn	$29,545.39 (141,353.98)	9.54%	4.30%
Intracranial injuries	$65,045.28 ($104,328.01)	5.25%	1.07%
Injury to nerves and spinal cord	$36,886.60 ($60,703.19)	9.31%	3.36%
Mental disorders	$12,612.16 ($18,666.37)	1.53%	1.61%
Digestive system diseases	$1,889.07 ($0.00)	0.02%	0.13%
Nervous system and sense organ diseases	$23,991.13 ($0.00)	0.24%	0.13%
Skin and subcutaneous tissue disease	$9,647.72 ($11,900.74)	0.29%	0.40%
Infectious and parasitic diseases	$3,756.16 ($5,047.14)	0.23%	0.81%
Respiratory system diseases	-	0.00%	0.00%
Circulatory system diseases	-	0.00%	0.00%
Other/unspecified	$4,322.39 ($8,742.97)	0.74%	2.28%

Table 2a. *Injury location*

Injury Location	Overall	Men	Women
Skin	4 (0.2%)	4 (0.2%)	0 (0.0%)
Abdomen/pelvic region	70 (3.3%)	66 (3.5%)	4 (1.6%)
Ankles/feet	116 (5.4%)	97 (5.2%)	19 (7.4%)
Mental health	14 (0.7%)	11 (0.6%)	3 (1.2%)
Back	280 (13.0%)	242 (13.0%)	35 (13.6%)
Upper arms/shoulder	248 (11.5%)	198 (10.6%)	46 (17.8%)
Head/face	78 (3.6%)	68 (3.7%)	5 (1.9%)
Chest/ribs	37 (1.7%)	34 (1.8%)	2 (0.8%)
Internal organs	6 (0.3%)	5 (0.3%)	1 (0.4%)
Ears	13 (0.6%)	13 (0.7%)	0 (0.0%)
Elbow	80 (3.7%)	65 (3.5%)	14 (5.4%)
Eye	42 (2.0%)	38 (2.0%)	3 (1.2%)
Hand/fingers/wrist	750 (34.9%)	657 (35.3%)	80 (31.0%)
Forearm	142 (6.6%)	124 (6.7%)	17 (6.6%)
Knees	110 (5.1%)	99 (5.3%)	10 (3.9%)
Legs	64 (3.0%)	56 (3.0%)	8 (3.1%)
Neck	41 (1.9%)	33 (1.8%)	8 (3.1%)
Unspecified	54 (2.5%)	51 (2.7%)	3 (1.2%)

Table 2b. *Cost of claim by injury location*

Injury Location	Average cost (SD)	% overall paid	% n overall
Skin	$209,861.27 ($395,755.95)	7.25%	0.20%
Abdomen/pelvic region	$4,429.56 ($8,357.07)	2.68%	3.30%
Ankles/feet	$2,977.06 ($12,236.97)	2.98%	5.40%
Mental health	$10,827.28 ($17,759.89)	1.31%	0.70%
Back	$6,568.93 ($26,870.11)	15.87%	13.00%
Upper arms/shoulder	$4,539.85 ($14,366.86)	9.72%	11.50%
Head/face	$12,362.95 ($44,565.16)	8.32%	3.60%
Chest/ribs	$3,155.14 ($12,634.53)	1.01%	1.70%
Internal organs	$368.01 ($756.01)	0.02%	0.30%
Ears	$6,538.25 ($10,776.28)	0.73%	0.60%
Elbow	$10,550.92 ($33,008.08)	7.29%	3.70%
Eye	$965.71 ($2,905.58)	0.35%	2.00%
Hand/fingers/wrist	$3,333.93 ($10,496.06)	21.58%	34.90%
Forearm	$8,047.50 ($37,205.59)	9.86%	6.60%
Knees	$4,734.31 ($13,309.32)	4.49%	5.10%
Legs	$2,176.47 ($8,358.66)	1.20%	3.00%
Neck	$9,939.76 ($39,340.36)	3.52%	1.90%
Unspecified	$3,838.78 ($8,699.49)	1.82%	2.60%

As shown in Table 3a, body stressing (n = 894, 41.6%) and being hit by moving objects (n = 751, 34.9%) were the most common mechanisms of injury for the sample overall. Gender differences were evident though for body stressing and being hit by moving objects. Women were more likely to have claims based on body stressing (57% vs 39.7%), whereas men were more likely to be hit by moving objects (36.7% vs 20.2%).

Table 3b shows that vehicle incidents (mean = $38,151.93) and heat, electricity, and other environmental factors (mean = $14,335.08) were the most costly categories of mechanism of injury. Proportionally, costs of claims for these mechanisms of injury account were high relative to their number of claims.

Table 3a. *Mechanism of injury*

Mechanism of Injury	Overall	Men	Women
Body stressing	894 (41.6%)	739 (39.7%)	147 (57.0%)
Falls, trips, and slips of a person	178 (8.3%)	154 (8.3%)	24 (9.3%)
Being hit by moving objects	751 (34.9%)	683 (36.7%)	52 (20.2%)
Hitting objects with a part of the body	109 (5.1%)	95 (5.1%)	11 (4.3%)
Vehicle incidents	15 (0.7%)	13 (0.7%)	2 (0.8%)
Heat, electricity, and other environmental factors	66 (3.1%)	56 (3.0%)	10 (3.9%)
Chemicals and other substances	31 (1.4%)	26 (1.4%)	5 (1.9%)
Biological factors	30 (1.4%)	27 (1.5%)	3 (1.2%)
Sound and pressure	11 (0.5%)	11 (0.6%)	0 (0.0%)
Unspecified	65 (3.0%)	57 (3.1%)	4 (1.6%)

Table 3b. *Cost of claim by mechanism of injury*

Mechanism of Injury	Average cost (SD)	% overall paid	% n overall
Body stressing	$5,861.99 ($21,000.69)	45.23%	41.60%
Falls, trips, and slips of a person	$7,850.38 ($25,280.74)	12.06%	8.30%
Being hit by moving objects	$3,223.27 ($13,437.18)	20.89%	34.90%
Hitting objects with a part of the body	$5,759.08 ($35,760.48)	5.42%	5.10%
Vehicle incidents	$38,151.93 ($83,218.33)	4.94%	0.70%
Heat, electricity, and other environmental factors	$14,335.08 ($98,721.73)	8.17%	3.10%
Chemicals and other substances	$925.92 ($1,848.72)	0.25%	1.40%
Biological factors	$786.78 ($2,558.59)	0.20%	1.40%
Sound and pressure	$7,566.20 ($11,473.54)	0.72%	0.50%
Unspecified	$3,786.22 ($7,924.42)	2.12%	3.00%

785 claims included information about whether this was the first or a repeat claim. Of these cases, 367 (46.8%) were repeat incidents, and 418 (53.2%) were not. The total amount paid for claims of repeat claimants was higher (Mean = $11,095, *SD* = $33,086.38) than for non-repeat claimants (Mean = $7,266.50, *SD* = $43,109.28). Given the considerable variability in claim payments for both groups, this difference was non-significant ($t = 0.78$, $p = .438$). The two groups also did not differ in the number of days compensation was paid for: Mean = 18.11 days, SD = 86.35 days for non-repeat claimants vs Mean = 18.29 days, SD = 42.97 days for repeat claimants ($t = .037$, $p = .970$).

Analysis of descriptive statistics by age group

In addition to exploring the nature of claims for the sample overall (and broken down by gender), we further explored for different age groups. This was premised on the notion that different age groups may be particularly vulnerable to specific injury types, and such information may further enable targeted intervention.

Table 4a below shows (at the level of injury and musculoskeletal claims, disease claims, and all claims) that the highest claim percentage falls within the age range of 20-34 years. However, as shown in Figures 1 and 2, median time lost and claim costs are higher for older employees who get injured.

Table 4a. *Breakdown of injury claim type by age and gender*.

	Injury and musculoskeletal disorder claims			Disease claims			All claims		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total
<20 years	19 (3.3%)	7 (6.8%)	27 (3.8%)	0 (0%)	0 (0%)	0 (0%)	19 (3.1%)	7 (6.6%)	27 (3.7%)
20-24 years	65 (11.2%)	17 (16.5%)	84 (12.0%)	3 (12.5%)	1 (33.3%)	4 (14.3%)	68 (11.3%)	18 (17.0%)	88 (12.1%)
25-29 years	93 (16.0%)	15 (14.6%)	110 (15.7%)	3 (12.5%)	0 (0%)	3 (10.7%)	96 (15.9%)	15 (14.2%)	113 (15.5%)
30-34 years	85 (14.7%)	9 (8.7%)	103 (14.7%)	5 (20.8%)	0 (0%)	5 (17.9%)	90 (14.9%)	9 (8.5%)	108 (14.8%)
35-39 years	69 (11.9%)	5 (4.9%)	74 (10.5%)	2 (8.3%)	0 (0%)	2 (7.1%)	71 (11.8%)	5 (4.7%)	76 (10.4%)
40-44 years	73 (12.6%)	8 (7.8%)	81 (11.5%)	4 (16.7%)	0 (0%)	4 (14.3%)	77 (12.7%)	8 (7.5%)	85 (11.6%)
45-49 years	55 (9.5%)	10 (9.7%)	68 (9.7%)	3 (12.5%)	2 (66.7%)	5 (17.9%)	58 (9.6%)	12 (11.3%)	73 (10.0%)
50-54 years	52 (9.0%)	15 (14.6%)	67 (9.5%)	2 (8.3%)	0 (0%)	2 (7.1%)	54 (8.9%)	15 (14.2%)	69 (9.5%)
55-59 years	33 (5.7%)	11 (10.7%)	46 (6.6%)	1 (4.2%)	0 (0%)	2 (7.1%)	34 (5.6%)	11 (10.4%)	48 (6.6%)
60+ years	36 (6.2%)	6 (5.8%)	42 (6.0%)	1 (4.2%)	0 (0%)	1 (3.6%)	37 (6.1%)	6 (5.7%)	43 (5.9%)
Total	580	103	702	24	3	28	604	106	730

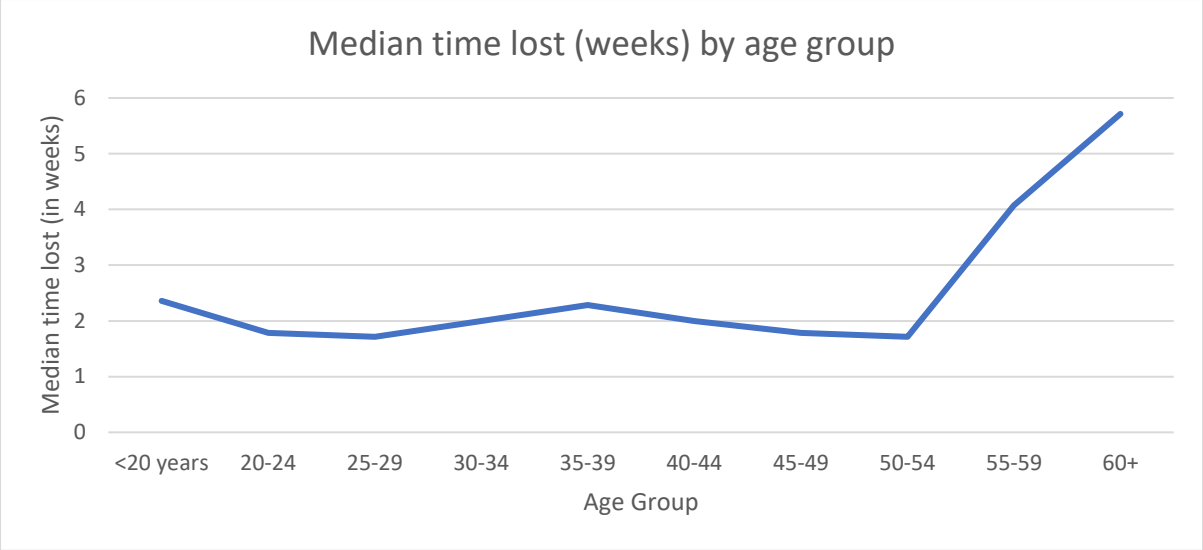

Figure 1. *Median time lost across age groupings*

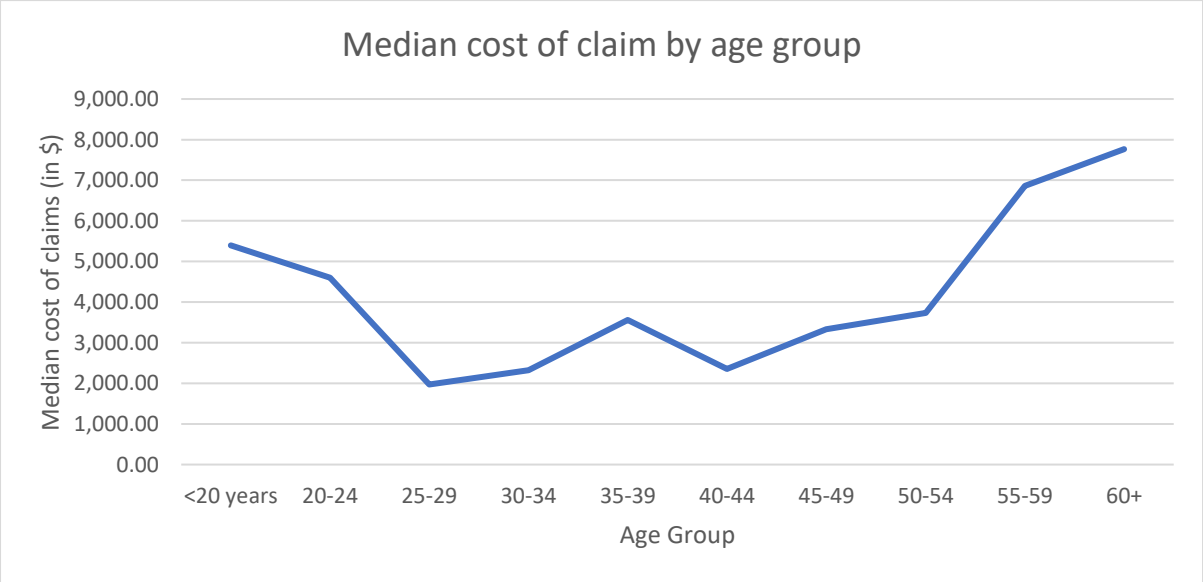

Figure 2. *Median claim cost across age groupings*

Table 4b evaluates nature of injury by age group more extensively than Table 4a. Findings are broadly consistent in the types of injuries that are most common across the age groups, with one key exception. Laceration injuries are most common for employees <20 years and 20-24 year olds, whereas this category is typically second most common for a majority of the other age groupings. Even so, the pattern of findings broadly supports the notion that traumatic injuries and lacerations are the most common injuries, and hence should be prioritized in prevention efforts.

Table 4b. *Nature of injury by age group.*

Nature of injury/disease	<20 years	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+
Traumatic joint/ligament and muscle/tendon injury	7 (25.9%)	22 (25.05%)	51 (45.1%)	36 (33.3%)	31 (40.8%)	34 (40.0%)	26 (35.6%)	31 (44.9%)	24 (50.0%)	22 (51.2%)
Wounds, lacerations, amputations and internal organ damage	16 (59.3%)	36 (40.9%)	34 (30.1%)	34 (31.5%)	24 (31.6%)	25 (29.4%)	20 (27.4%)	15 (21.7%)	8 (16.7%)	5 (11.6%)
Musculoskeletal and connective tissue diseases	0 (0%)	10 (11.4%)	14 (12.4%)	11 (10.2%)	9 (11.8%)	11 (12.9%)	13 (17.8%)	9 (13.0%)	7 (14.6%)	5 (11.6%)
Fractures	0 (0.0%)	8 (9.1%)	5 (4.4%)	10 (9.3%)	4 (5.3%)	2 (2.4%)	2 (2.7%)	2 (2.9%)	3 (6.3%)	3 (7.0%)
Burn	1 (3.7%)	1 (1.1%)	5 (4.4%)	5 (4.6%)	4 (5.3%)	3 (3.5%)	4 (5.5%)	4 (5.8%)	0 (0.0%)	2 (4.7%)
Intracranial injuries	1 (3.7%)	1 (1.1%)	0 (0.0%)	2 (1.9%)	0 (0.0%)	1 (1.2%)	0 (0.0%)	1 (1.4%)	1 (2.1%)	0 (0.0%)
Injury to nerves and spinal cord	2 (7.4%)	4 (4.5%)	1 (0.9%)	3 (2.8%)	2 (2.6%)	4 (4.7%)	2 (2.7%)	3 (4.3%)	2 (4.2%)	2 (4.7%)
Mental disorders	0 (0.0%)	2 (2.3%)	0 (0.0%)	2 (1.9%)	0 (0.0%)	1 (1.2%)	1 (1.4%)	2 (2.9%)	1 (2.1%)	3 (7.0%)
Digestive system diseases	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Nervous system and sense organ diseases	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Skin and subcutaneous tissue diseases	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.9%)	0 (0.0%)	1 (1.2%)	0 (0.0%)	0 (0.0%)	1 (2.1%)	0 (0.0%)
Infectious and parasitic diseases	0 (0.0%)	2 (2.3%)	0 (0.0%)	0 (0.0%)	1 (1.3%)	0 (0.0%)	1 (1.4%)	1 (1.4%)	0 (0.0%)	1 (2.3%)

Respiratory system diseases	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Circulatory system diseases	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Neoplasms (cancer)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other diseases	0 (0.0%)	2 (2.3%)	3 (2.7%)	4 (3.7%)	1 (1.3%)	1 (1.2%)	4 (5.5%)	1 (1.4%)	1 (2.1%)	0 (0.0%)

Predictors of total claim paid

Predictors of total claim paid were explored at the level of individual claims and also at the organisational level. At the individual level, claims included information about claimant gender, age, nature of the injury, and whether there was a reporting delay for the claim. At the organisational level, interviews were used to collect information about the size of the organisation (1-50 employees, 51-200 employees, >200 employees), whether the organisation followed its state's compliance regulations (scored as 1 for compliance with all rules or else 0), OHS policies, recruitment processes, employee management, claims management, presence and experience of a return to work coordinator, and focus on health and wellbeing of employees.

Individual level predictors (derived from claims data)

As shown in Table 5, age and days compensated were significantly related to amount paid, when modelled individually (i.e., without other predictors in the model; unadjusted model). The b weight for age indicates that claims were $112 greater for every additional year older the claimant was. For every additional day of compensation, the total paid amount was $204 more expensive, on average. Although non-significant, the negative b weight for gender indicates that male claimants received more total payment than female claimants, on average by $628. This difference was non-significant, and likely reflects the considerable variation in claim size for both male and female claimants.

When the predictors were included together in the same model (adjusted model), days compensated, delay in claims, and repeat claimant were all significantly related to amount paid. The emergence of significant results for several of these predictors (repeat claimant and delay in claims) where they were non-significant initially is likely to due to removal of confounding influences by controlling for other variables in the model. In this full, adjusted model, it is clear that longer delays in claims being lodged with the insurer/regulator were associated with higher total claims cost, and that repeat claimants received more than non-repeat claimants.

Gender remained unrelated to paid claim amount, and age became non-significant in the context of more important predictors in the model. It should be noted though that although there were no gender differences in the amount awarded for claims, men (87.8%) were more

heavily represented in the claim data than women (12.2 %). The average age of claimants was 37.18 years (SD = 12.71 years).

Table 5. *Individual-level predictors of total claim amount paid (in units of $1,000)*

	Unadjusted model		Adjusted model	
Predictor	b weight	p-value	b weight	p-value
Age	0.112	.009*	-0.065	.079
Days compensated	0.204	.004*	0.429	<.001*
Delay in claims	0.007	.546	0.140	<.001*
Gender	-0.628	.698	-0.032	.966
Repeat claimant	2.780	.438	1.344	.002*

Notes.

b weights = a numeric representation of the relationship between a predictor and outcome variable. As the outcome is amount paid (measured in $1000 increments), a b weight of 1 indicates that for a one-unit increase in the predictor, there is a $1000 increase in payment. A b weight value of -1 would reflect a reduction in payment of $1000.

It is important to note that a bigger b weight does not always accord with a more reliable and significant effect. It could be that on average, the b weight is big, but there is huge variability around this value. In such a case, the b weight isn't particularly reliable or reflective of the sample as a whole, and is likely to be non-significant.

p-value = probability level for significance testing (p <.05 is typically used to indicate a significant result). Significant results are denoted by an asterisk. Unadjusted model = the predictor is modelled by itself without controlling for other predictors. Adjusted model = the predictor is modelled, controlling for all other predictors listed in the table. All models adjust for clustering of claims by organisation.

Organisation-level predictors (derived from site visits)

The relationships between the predictors (entered individually and together in a single, adjusted model) and total claim amount paid are shown in Table 6, below. When modelled individually, compliance (b = -13.087, p = .027) and return to work coordinator (b = -4.261, p = .026) were significantly related to claim amount awarded. These results suggest that claims were smaller in organisations that met the compliance regulations for their state, and/or had a return to work coordinator with more experience. There was a trend for claims to be larger as the size of the organisation increased, but this was non-significant.

When modelled together, the shared variance among these predictors clarified the unique predictive value of each of these organisational elements for amount paid to claimants. Perhaps counter-intuitively, claims were higher within organisations with more robust claims management process and stronger communication to employees of OH&S policy, potentially reflecting greater identification of potential claims and/or stronger importance placed on ensuring safe return to work. It is also possible that adherence to OH&S and stronger claims management process are in response to recent volume of claims within these organisations visited in the present study. Claims costs were also higher within organisations that had more sophisticated recruitment process, such as pre-employment medicals. Again, this may reflect a general attentiveness to workplace safety, and attempts to rectify in instances where an employee is injured.

However, not all organisational characteristics were associated with higher claims. Claims were considerably lower in organisations that observed compliance regulations ($22,538 smaller claims on average), and among organisations with stronger focus on health and wellbeing of employees ($3,123 smaller claims per unit increase in health and wellbeing focus).

Size of organisation was not reliably associated with costs, although there was a trend in the unadjusted models for larger organisations to have higher claims: $3,376 more for organisations of 51-200 employees relative to organisations with 1-50 employees, and $8,897 more for organisations of >200 employees relative to organisations with 1-50 employees.

Table 6. *Organisation-level predictors of total claim amount paid (in units of $1,000)*

	Unadjusted model		Adjusted model	
Predictor	b weight	p-value	b weight	p-value
Claims Management	0.383	.646	2.645	.028*
Compliance	-13.087	.027*	-22.538	<.001*
Employee Management	1.020	.271	0.433	.839
Health and wellbeing	-0.153	.912	-3.123	.015*
OH&S	0.658	.829	8.006	.007*
Recruitment	1.397	.194	4.217	.007*
Return to work coordinator	-4.261	.026*	-1.205	.777
Size of organisation				
1-50 vs 51-200	3.376	.135	-0.456	.959
1-50 vs >200	8.897	.146	-1.271	.911

5. Discussion

Despite the improvement in rates that have been seen in the past decade, organisations in the meat industry are still paying substantially higher rates for Workers' Compensation insurance than most other industries. There is currently a lack of industry collaboration in relation to the areas of both Health and Safety and Return to Work, with innovations by organisations in these areas being kept in house and not shared with those that they see as their competitors.

Injuries associated with sprains & strains and lacerations make up the majority of both claim numbers and costs. Combined these injuries relate to almost 80% of claim numbers and 60% of claim costs. Based on these figures, these areas must form a significant part of any initiatives to improve Workers' Compensation rates in the industry.

Given the physical nature of the industry, the figures relating to manual handling related injuries are not surprising. However, with the abundance of Personal Protective Equipment (PPE) designed specifically to stop/reduce lacerations in this industry, the frequency and severity of claims in this space is concerning. A reluctance of many employers to enforce the use of PPE along with the use of inadequate PPE were identified by the industry as potential issues driving claims in this area.

The majority of injuries for workers under 25 relate to lacerations. Representatives from the industry have identified that younger workers, as well as being less experienced, appear to underestimate the significant risks relating to working with knives in this industry. Many organisation employ a buddy system to train new workers in knife work. Given the figures identified in this study, this practice, in isolation, appears to be insufficient in containing injuries of this nature.

The costs of claims for workers in this age group was higher than all other age groups except the 55 and above group. Given that lacerations are the major injury type in this age group, and that the average time lost for workers in this age group was commensurate with all age groups except the 55 and above, this increase in cost is most likely due to the costs associated with treating injuries associated with lacerations, which often require specialist surgical intervention.

The majority of injuries for workers aged 55 and above related to sprains and strains. In addition, workers in this age group also had significantly more time of work and substantially higher costs per claim than any other age group.

The increase time lost and claims costs in this age group is most likely associated with the nature of injuries they are having and the fact that older workers, due to impact of ageing, often take longer to recover from these injuries (Chandler Macleod, 2014).

Organisations in Western Australia were more likely to engage an insurance broker or consultant to assist them in the management of their Workers' Compensation program. Western Australia also had the lowest gazette rate across the 5 states involved in the interview component of the study. Whether the lower rate is related to the provision of expert advice or the fact that Western Australia was the only privately underwritten state involved in the study is not known.

Though most of the organisations who participated in the survey could articulate what they believed to be the major hazards in their workplaces, very few organisation could provide documented evidence of formal hazard assessments or documentation outlining how these hazards were being addressed.

The survey identified that the majority of Return to Work Coordinators (RTWCs) had come from the meat industry, with no formal qualifications and had learnt on the job. Many had not undertaken any formal training in Workers' Compensation and those that had, had not updated their skills in over 3 years. A substantial number of the RTWCs lacked basic knowledge relating to the Workers' Compensation system, injury management and the RTW process.

For many of the RTWCs, Workers' Compensation was not their primary role, with their main responsibilities often being, Payroll, Human Resources, Operations or Management. RTWC in this situation identified that their primary responsibilities often impacted on their ability to focus effectively on Workers' Compensation issues.

No organisation had formal, clear and measureable KPI's for their RTWC's and no organisation had a process in place to audit the RTWC files or outcomes. The majority of organisations had no formal structure behind their injury management files and often claim information was not kept in a separate file but kept in the worker's employment file. File notes relating to claims were often nonexistent or, where made, were often not kept in the injury management file.

A study of safety trends across the 30 years of WorkSafe Victoria (OHSIntros 2015) between its inception in 1985 and 2015 showed significant improvement in safety. This has been reflected in a significant reduction in claim numbers in the state. With the increase in regulation in all states across this period, a similar trend would be expected nationally. As a result of the improvements in this space, the study has suggested that we can now only make incremental improvements in safety with current safety strategies.

The latest data from Safe Work Australia (2015) show that as a Nation between 2000/2001 and 2014/2015 time lost for serious injuries has increased by 33% and the cost of serious claims has increased by 30%. Despite these increasing costs and apparent increase in awareness in the return to work space, Alex Collie (2013) has identified that as a nation we have failed to make any radical changes to the way we operate, with our practices and policies remaining broadly the same today as they were more than 15 years ago, concluding that "we have failed to innovate" in the return to work space.

It is essential that those organisation in the meat industry understand that they do not compete in relation to safety and return to work, as only an industry wide focus in these areas will provide the improvement required to drive down the Industries Workers Compensation rates.

Put simply, whilst organisations must always retain a focus on safety, the greatest driver of a company's Workers' Compensation premium, is not the number of claims they have, but the lost time and associated weekly benefits associated with these claims. A failure of the industry to invest in innovation in the return to work space, combined with an ongoing reluctance to share these innovations and develop an industry approach to best practice, will see Workers' Compensation premiums and associated costs remain a significant bottom line expense, with direct and critical impacts on company profitability and viability.

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