

Australian Wool Innovation

Project WP197

Wool Harvesting OH&S Injury and Cost Evaluation Review

2005-06 Analysis & Update of 5 Year Analysis

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1. **Executive Summary**

1.1 Introduction

This review, analysis and report is now based on a rolling five year period to provide the industry with a more robust picture of the injury risk, costs and causes.

This review of shearer injury claims for the period 2001-02 to 2005-06 follows the previous analysis and report of five years (1999-00 to 2003-04) shearing injury and cost produced in 2005, and subsequent review and report of 2004-05 data.

Analysis of injuries and costs is based on available evidence provided by workers compensation authorities throughout Australia. This data has been used to examine causal factors of injury and associated cost – particularly Animal Handling and Handpiece injuries. Evidence of under-reporting and the causes of these under-reported injuries are examined in detail in the 2005 report.

A new method of analysing and reporting injury information was developed for this project, based on careful examination of injury reports and the industry activity or technology type causing the injury. We believe this method is leading occupational health and safety practice and provides the most useful information for the industry. Workers Accident Compensation Authorities change recording and calculation methods therefore this method of analysis will need matching development and updating.

1.2 Sheep Shearer Injuries & Cost

1.2.1 Injuries

- During 2005-06^a, a total of 420 (Table 1, p. 12) sheep shearer injuries were reported to workers compensation authorities in the 5 major wool-growing states of Australia. Over the 5 years to 2005-06, a total of 2493 injuries (499 average per annum) were reported (Table 2, p. 13).

^a The 2005 report included Qld data in the background reported data but not in the detailed analysis due to Qld reduction in sheep numbers. There were 5 shearer injury claims in 2003-04. Qld data was not provided for this review report.

Occupation/Industry	Incidence Rate (injuries per thousand workers per year)	Ratio: Shearer Rate to Other Industry	Frequency Rate (injuries per million hours worked per year)	Ratio: Shearer Rate to Other Industry
Occupation Shearer 2005-06	82.5	NA	89.5	NA
Occupation Shearer Annual Average 2001-02 to 2005-06	112.8	NA	100.1	NA
Occupation Shearer Annual Average 2000-01 to 2004-05	115.0	NA	105.8	NA
Three Highest Risk Occupations*	Sheet Metal 171 Meat 69 Cement 66		Labourers 33 Prod'n & Trans 19 Tradesman 15	
Five Highest Risk Industries*	Ag, Forestry & Fishing 27 Transport & Storage 30 Construction 27 Manufacturing 32 Mining 26		Ag, Forestry & Fishing 14 Transport & Storage 15 Construction 14 Manufacturing 17 Mining 11	
All Australian Industries Average*	17		10	
* Australian Safety and Compensation Council 2007 Compendium of Workers' Compensation Statistics Australia 2004-05.				

- The associated shearer injury incidence and frequency rates^b over both the five year rolling periods (2000-01 to 2004-05 and 2001-02 to 2005-06) and the one year 2005-06 review period are compared to other Australian industries and occupations in the table above. The five year period provides a more reliable indication of the true comparison due to the greater numbers involved. Therefore the incidence and frequency rates for a five year "rolling period" are also shown for the period 2001-02 to 2005-06.
- The shearing occupation is compared to Agriculture, Forestry and Fishing and to the other four highest risk industries as well as All Australian Industries in the table above.
- The shearing industry is also compared to the three highest risk occupations by incidence rate (injury claims per thousand workers) and by frequency rate (injury claims per million hours worked).
- Frequency rates are the most real comparison for a casual and seasonal workforce.

^b **Incidence Rate** is the number of occurrences expressed as a rate per 1,000 wage and salary earners employed, calculated as: (number of occupational injuries and diseases x 1000) / number of wage and salary earners. **Frequency Rate** is the number of occurrences expressed as a rate per 1,000,000 hours worked by wage and salary earners, calculated as: (number of occupational injuries and diseases x 1,000,000) / number of hours worked by shearers.

- The figures speak for themselves; the shearing occupation has three times more injury claims than the second highest risk occupation and five times that of the third highest risk occupation.
- Shearers have seven times more injury claims than agriculture, forestry and fishing and ten times more than the Australian average.
- The incidence rate remained substantially unchanged between the 2000-01 to 2004-05 and 2001-02 to 2005-06 five year rolling averages reducing slightly from 115.0 to 112.8 injury claims per 1,000 shearers per year (Table 3, p. 22).
- The frequency rate is based on number of injuries per total shearer hours worked. The frequency rate fell from 105.8 (five year annual average) injuries per million hours worked during the period 2000-01 to 2004-05 to 100.1 injuries per million hours of shearing for the period 2001-02 to 2005-06 (Table 3, p. 22).
- Therefore there are fewer injuries per hours worked and therefore fewer injuries overall.
- However when reviewing the findings of this and the two previous reports, and therefore looking at the period 1999-00 to 2005-06, the trend has been for fewer injuries in total but concentrated on fewer shearers.
- A possible contributor to this picture of less overall injuries with more injuries per individual shearer may be that those remaining in shearing at present are the more experienced and skilled shearers who are shearing for more hours per annum than the average shearer in the 1990s.
- The higher rate of injuries to individual shearers may not be sustainable.

1.2.2 Cost

- The 420 injury claims in 2005-06 bear an estimated total direct cost to the workers compensation authorities in the five states other than Qld (including income compensation, medical and related expenses) of \$9.6 million. Over the five years to 2005-06, costs of sheep shearer injuries totalling \$58.5 million (\$11.7 million average per annum) were reported (Table 1, p. 12 and Table 4, p. 23).
- These 420 injuries have resulted in at least 20,259 days lost from work for injuries incurred in 2005-06. This contrasts with the previous 5-year period averaging 27,060 days lost from work per year. These figures are conservative and do not include employer-paid days, permanent disabilities in NSW, or unreported (no workers compensation claim made) injuries (Table 4, p. 23).
- A conservative calculation of total injury costs to the industry, which is based on the workers compensation claim numbers and costs only (i.e. does not include unreported injuries), uses a multiplier factor of 2:1 and results in a \$19 million (down approx \$4 million from 2004-05) injury cost for shearer injuries incurred in 2005-06 and \$23.4 million for the five year average. (\$34.8 million and \$44 million for the two previous rolling five year periods i.e. 2000-01 to 2004-05 and 1999-00 to 2003-04 respectively). This drop needs to be treated with caution due to the 67% drop in Victoria from the previous (2001-02 to 2004-05) five year annual average of \$4.6 million to a 2005-06 annual total of \$1.5 million direct total claims costs.

- Vic and SA costs were slightly down, WA and Tas costs slightly up and NSW costs significantly down. Sheep numbers changed only marginally reducing from 106.8 million in 2004-05 to 106.5 million in 2005-06.

1.3 Improvements to Data Analysis from Previous OH&S Reports

- Analysing by workers compensation categories alone has been found to be prone to errors and inaccuracy in attributing cause of injury; therefore, the text accompanying each claim in Vic and SA was examined to attribute cause and extrapolated nationally. This method will be used and developed as needed for ongoing data capture and analysis (see Appendix One, p. 34 for further explanation of the extrapolation methods used for this report).
- Injury numbers and costs are categorised by industry injury causal factors (Animal Handling; Animal Handling & Handpiece Combined; and Handpiece). This method has been developed to enable better targeting and evaluation of occupational health and safety improvement measures and return on injury prevention investment by the industry.
- The case study data analysis and figures (Figure 1, p. 24; Figure 2, p. 28, Figure 3, p. 29; Figure 4, p. 30) are now based on five years of data (updated annually) to provide a more robust and reliable indication of shearing injury causal factors.
- In this analysis, an increased proportion of injury was attributed to causal factors (93% of the 2005-06 data) compared to 69% (of the 2004-05 data) in the previous report (Table 1, p. 12).
- No further back or upper limb injuries could be categorised beyond those already allocated into the causal factor categories with a high degree of certainty. Vic and SA 2004-05 claims data had no back or upper limb injury claims not already attributed to the following Causal Factor Categories: Animal Handling, Animal Handling/Handpiece Combination or Handpiece which could be attributed to the “Lower Certainty of Cause” categories following a careful analysis of individual injury claim data. Detailed data analysis of these injury claims showed either that the causal factors were rightly “Other” e.g. “hand infection” or insufficient information was available attribute any causal factor.
- The (previously reported, AWI 2005) reduction in total injury numbers and cost from ~\$70 million in 1993 to ~\$44 million per annum for the period 1999-00 to 2003-04 is believed to be due to the same proportional drop in national sheep flock numbers over the same period (from ~ 160 million to ~100 million). The further 50% reduction in costs to \$23 million in 2004-05 was a continuation of a downward trend as well as factors such as the 70% reduction in Victorian fully developed cost for shearer injury claims between 2003-04 and 2004-05.
- The previously reported reduction in incidence rates (i.e. from ~151 injuries per thousand shearers per year in 1995 to ~103 injuries per thousand shearers per year during the 1999-00 to 2003-04 period noted in the 2005 report to AWI) was likely to be due to a more conservative approach taken in calculating shearer numbers by including ABS figures for part time shearers.
- These incidence and frequency rates are now reviewed and reported on a five year average basis to provide increased validity to the figures.

1.4 Animal Handling Injuries & Cost

- The Animal Handling injury category includes both sudden and traumatic onset injuries as well as gradual onset injuries sustained during catching, tipping and dragging or wool removal, as well as injuries caused by a sheep running into or hitting a shearer. This category also includes injuries caused by wool fibres, thistles, burrs and other plant material entering the shearer's skin.
- Based on a nationally extrapolated case study of shearer injuries in Vic (and SA), animal handling activities accounted for at least 40% of injury claims and 61% of total estimated claims costs of all shearing injuries incurred in the five year period 2001-02 to 2005-06 (Table 2, p. 13).
- Extrapolating these proportions to all injuries in the 5 states excluding Qld^c provides an estimate that animal handling activities account for approximately 220 injuries in 2005-06 (five year annual average = 201) (Table 2, p. 13). These injuries bear an estimated total cost to the workers compensation authorities (including income compensation, medical and related expenses) of \$7.5 million (five year annual average = \$7.1 million) (Table 2, p. 13).
- A significant proportion of animal handling injuries fall into the two categories "Catch, Tip, and Drag" and "Wool Removal". In Victoria, these two injury causal factors represented 19% of injury claims and 31% of the total estimated injury claims costs). Attempts to address these two major activities involved in shearing is therefore likely to lead to a significantly reduced number of animal handling injuries and reduced total cost of injuries (Figure 3, p. 29).

1.5 Animal Handling/Handpiece Combination Injuries & Cost

- The Animal Handling/Handpiece Combination injury category includes both sudden and traumatic onset injuries and gradual onset injuries where both the handpiece and animal handling are implicated. Traumatic injuries in this category include handpiece lock-ups and "free and running" events caused by the movement or kicking of a sheep. It was not possible in many cases to identify instances where the handpiece was kicked free and running based on the available data in many cases where this may have been the cause of injury. An example of a gradual onset injury in this Animal Handling/Handpiece Combination injury category would be tendonitis to both upper limbs.
- Based on a nationally extrapolated case study of shearer injuries in Vic (and SA), a combination of animal handling and the shearing handpiece accounted for at least 13% of all shearing injuries and at least 5% of total estimated costs in the five year period 2001-02 to 2005-06 (Table 2, p. 13).
- Extrapolating these proportions to all injuries in the 5 states excluding Qld^d provides an estimate that the combination of animal handling and the shearing handpiece accounts for approximately 62 injuries (five year annual average) (Table 2, p. 13). These injuries bear an estimated total cost to the workers compensation authorities (including income compensation, medical and related expenses) of \$0.5 million (five year annual average) (Table 2, p. 13).

^c Qld has been excluded from analysis as the sheep population in that state has fluctuated significantly over the past 5 years and is therefore unrepresentative of national trends.

^d Qld has been excluded from analysis as the sheep population in that state has fluctuated significantly over the past 5 years and is therefore unrepresentative of national trends.

1.6 Handpiece Injuries & Cost

- The Handpiece injury category includes both sudden/traumatic onset injuries and gradual onset injuries where only the handpiece is implicated (and not animal handling). Traumatic injuries in this category include handpiece lock-ups and “free and running” events as well as gradual onset injuries such as tendonitis in only the right arm.
- Based on a nationally extrapolated case study of shearers injuries in Vic (and SA), the shearing handpiece alone accounts for approximately 26% of all shearing injuries and at least 10% of total estimated costs the five year period 2001-02 to 2005-06 (Table 2, p. 13).
- Extrapolating these proportions to all injuries in the 5 states excluding Qld^e provides an estimate that the shearing handpiece alone accounts for at least 130 injuries per annum (five year annual average) (Table 2, p. 13). These injuries bear an estimated total cost to the workers compensation authorities (including income compensation, medical and related expenses) of \$1.1 million per annum (five year annual average) (Table 2, p. 13).

1.7 Other (non-categorised) Injury Types

- In the 2005-06 data, other injuries with unidentified or other causal factors outside the three major industry cause categories accounted for 7% of injuries and 4% of cost for 2005-06 (Table 1, p. 12).
- In the 2005-06 data, no further injuries could be categorised with any degree of confidence to the three causal factor categories they are therefore included in the Other category for 2005-06 (Table 1, p. 12) and make up the difference between the “analysed” and “all “ injuries in Table 2 (p. 13) which displays the rolling five year analysis.

1.8 Unreported Injuries

- A detailed analysis of shearer injury underreporting is included in the 2005 report. This found that a reasonable conclusion was that at least 50% of all shearer injuries are not reported to workers compensation authorities.
- While these injuries may not incur a workers compensation cost, they do present a real cost to the industry in terms of time, quality, productivity, skills and training losses.

1.9 Cost Benefit

Injuries that can be directly impacted by technology and/or training initiatives that address occupational health & safety can be categorised as the following.

- Animal Handling injuries account for approximately 40% of shearer injuries and 61% of injury costs.

^e Qld has been excluded from analysis as the sheep population in that state has fluctuated significantly over the past 5 years and is therefore unrepresentative of national trends.

- A significant proportion of animal handling injuries in the case studies of Victoria (and South Australia) continue to fall into the subcategories of “Catch, Tip and Drag” and “Wool Removal”. Injuries in these two subcategories made up a total of 19% of all shearer injuries in the 5-year period 2001-02 to 2005-06. These injuries bear an estimated 31% of the estimated total cost of all shearer injuries. The five year annual average figures are a more robust indicator of the risk level than the previously reported annual figures. Addressing these two major activities should have significant impacts on occupational health and safety and the costs associated with shearer injuries. For further information refer to Figure 3 (p. 29).
- Handpiece injuries, both from the handpiece alone and from incidents involving both animal handling and the handpiece, make up a total of 39% of all reported shearer injuries and 15% of the total estimated cost of all shearer injuries (Table 2, p. 13). It is likely that the development of ergonomic improvements and additional safety measures to cut power to any handpiece freed from the shearers hand could see significant reductions in both numbers and costs of handpiece injuries.
- Applying a 20% animal-handling injury cost improvement and 50% handpiece-related injury cost improvement provides a benefit per annum of \$2.3 million per annum in workers compensation claims cost savings. These 20% and 50% estimations are on based on the injury cause, planned improvements and clinical recovery pathways typical for these type of injuries. Based on the calculation that total injury costs to the industry are at least double the workers compensation claims costs, a more realistic benefit estimate is \$4.5 million per annum.

Animal Handling injury cost % reductions per annum (Workcover fully developed claims costs only)		Handpiece injury cost % reductions per annum (Workcover fully developed claims costs only)			
		20%	30%	40%	50%
	20%	\$1,760,877	\$1,928,174	\$1,171,079	\$2,262,768
	35%	\$2,830,589	\$2,997,886	\$3,165,183	\$3,332,480
	50%	\$3,900,301	\$4,067,598	\$4,234,895	\$4,402,192
	65%	\$4,970,012	\$5,137,309	\$5,304,606	\$5,471,903

Table 1. One year data (2005-06) estimated average figures for sheep shearer injuries in the 5 major wool-growing states of Australia; NSW, WA, Vic, SA, and Tas.

Figures are based on one year of data (2005-06) with total numbers and costs extrapolated to other states based on a case study of Vic and SA.

Numbers in the first section are those where clear evidence is available to attribute the injuries to a specific cause. Figures in subsequent sections are based on reasonable and conservative assumptions of injury cause. Percentage figures indicate the proportion of total shearer injuries or proportion of total estimated cost for all shearer injuries reported to workers compensation authorities in the 5 major wool-growing states.

		Animal Handling Injuries	Animal Handling / Handpiece Combination Injuries	Handpiece Injuries	Other Injuries	Total
Results from Investigation of Workers Compensation Claims Data, All Bodily Locations	Number of Injuries	220 52.5%	50 11.9%	121 28.7%	29 6.9%	420
	Total Estimated Cost	\$7,544,082 78.6%	\$855,972 8.9%	\$811,430 8.4%	\$390,846 4.1%	\$9,602,331
Workers Compensation Back Injury Claims With Lower Certainty of Cause*	Number of Injuries	*				
	Total Estimated Cost					
Workers Compensation Upper Limb Injury Claims with Lower Certainty of Cause*	Number of Injuries					
	Total Estimated Cost					
Total: Workers Compensation Claims	Number of Injuries	220 52.5%	50 11.9%	121 28.7%	29 6.9%	420 100%
	Total Estimated Cost	\$7,544,082 78.6%	\$855,972 8.9%	\$811,430 8.4%	\$390,846 4.1%	\$9,602,331 100%

*Neither the 2004-05 nor the 2005-06 Vic and SA claims data had back or upper limb injury claims not already attributed to the following Causal Factor Categories: Animal Handling, Animal Handling/Handpiece Combination or Handpiece which could be attributed to the "Lower Certainty of Cause" categories following a careful analysis of individual injury claim data.

Detailed data analysis of these injury claims showed either that the causal factors were rightly "Other" e.g. "hand infection" or insufficient information was available to attribute any causal factor. Therefore this contrasts with the analysis of the 1999-00 to 2003-04 data when an estimated annual average of 53 "non-categorised" back injuries (across the 5 major wool-growing states) were attributed to Animal Handling with a lower degree of certainty, and; an estimated annual average of 63 "non-categorised" upper limb injuries (across the 5 major wool-growing states) were divided into the three major cause categories (with a lower degree of certainty) using the representative case study proportions for each category.

Table 2. Five year estimated average figures for sheep shearing injuries by the three major causal factors in the 5 major wool-growing states of Australia; NSW, WA, Vic, SA and Tas (for all injuries see Tables 3 & 4 pp. 22 – 23).

Figures are based on 5 years of data from 2001-02 to 2005-06 with total numbers and costs extrapolated to other states based on a case study of Vic and SA. Percentage figures indicate the proportion of total shearer injuries or proportion of total estimated cost for all shearer injuries reported to workers compensation authorities in the 5 major wool-growing states that can be attributed to the three causal factor categories.

							2001-02 to 2005-06		
Animal Handling Only - National	2001-02	2002-03	2003-04*	2004-05	2005-06	5 year total	5 year Avg.	% of total	
Est Total Costs	\$7,319,975	\$5,684,910	\$7,486,525	\$7,621,574	\$7,544,082	\$35,657,066	\$7,131,413	61%	
Days Compensated	15,065	14,058	10,141	10,853	11,650	61,767	12,353		
Number of Injuries	213	182	188	201	220	1,004	201	40%	
IR	44.4	39.5	38.2	53.2	38.1		42.7		
FR	40.0	36.7	36.7	37.9	41.3		38.5		
Animal handling with Handpiece - National									
Animal handling with Handpiece - National	2001-02	2002-03	2003-04*	2004-05	2005-06	5 year total	5 year Avg.	% of total	
Est Total Costs	\$302,678	\$459,571	\$509,261	\$574,982	\$855,972	\$2,702,464	\$540,493	5%	
Days Compensated	373	1,015	728	2,701	1,646	\$6,463	1,293		
Number of Injuries	65	63	67	67	50	312	62	13%	
IR	13.5	13.7	13.6	17.7	8.7		13.4		
FR	12.2	12.7	13.1	12.6	9.4		12.0		
Handpiece Only - National									
Handpiece Only - National	2001-02	2002-03	2003-04*	2004-05	2005-06	5 year total	5 year Avg.	% of total	
Est Total Costs	\$1,853,721	\$1,308,571	\$1,060,093	\$628,566	\$811,430	\$5,662,381	\$1,132,476	10%	
Days Compensated	2,310	3,249	2,406	6,783	4,741	19,489	3,898		
Number of Injuries	141	132	128	126	121	648	130	26%	
IR	29.4	28.7	26.0	33.4	21.0		27.7		
FR	26.5	26.6	25.0	23.8	22.7		24.9		
Total - National									
Total - National	2001-02	2002-03	2003-04*	2004-05	2005-06	5 year total	5 year Avg.	% of total	
Est Total Costs Analysed	\$9,476,374	\$7,453,052	\$9,055,879	\$8,825,122	\$9,211,484	\$44,021,991	\$8,804,382	75%	
Est Total Costs (all)				\$11,405,522	\$9,602,331	\$58,493,360	\$11,698,672		
Days Compensated	17,748	18,322	13,275	20,337	18,037	87,719	17,544		
Number of Injuries Analysed	419	377	383	394	391	1,964	393	79%	
Number of Injuries (all)				503	420	2,493	499		

* NSW data for the 2003-04 year calculated using an average of 2002/03 and 2004/05 data.

2. Purpose and Scope of Report

The purpose of this report is to provide Australian Wool Innovation (AWI) with an up-to-date picture of sheep shearer injuries and costs. This report produced in 2007 reviews the shearer injury claims data for the five years up to and including the 2005-06 financial year. The information derived from analysing and reporting this data is to be viewed against the background of the analysis of five years of data (1999-00 to 2003-04) the report of which was produced for AWI in 2005 and the 2004-05 Update and Five Year Analysis produced in 2006. Both these reports are available on the AWI website www.wool.com.au.

The figures have been compiled based on data obtained from workers compensation authorities in the major wool-growing states. The states included in the study, listed in order of sheep population (greatest to smallest) are New South Wales (NSW), Western Australia (WA), Victoria (Vic), South Australia (SA), and Tasmania (Tas). Queensland (Qld) was included in the background information in the 1999-00 to 2003-04 analysis but excluded from in-depth injury analysis of injuries as the sheep population in that state has fluctuated significantly over the past seven years and is therefore unrepresentative of national trends. Queensland data was not made available to either this or the previous 2004-05 data review and if available would have been of limited significance. Shearer injury claims in Queensland fell from 45 in 1999-00 to 5 in 2003-04 reflecting the drop in sheep numbers.

This project examines injury types, causal factors, contributing factors and reports the corresponding costs and number of injuries. Injury numbers and costs are categorised by industry injury causal factors – particularly Animal Handling, Animal Handling and Handpiece Combined, and Handpiece. This method has been developed by this project to enable better targeting and evaluation of occupational health and safety improvement measures and return on injury prevention investment by the industry

The statistics and cost figures in this report do not cover all injury/disease occurrences and do not reflect the full costs of shearer injuries. They underestimate the full extent of the problem due to widespread under-reporting of injuries and due to the hidden, non-workers-compensation costs associated with injuries.

3. Explanatory Notes

3.1 Incidence and Frequency Rates

When investigating occupational injuries and diseases, incidence rates and frequency rates are used to give more meaning to injury/disease occurrence figures. Incidence rates are calculated to reflect the number of workers engaged in the work. Frequency rates reflect the number of hours worked. The formulae used to calculate each of these rates are detailed in the boxes below.

Incidence Rate is the number of occurrences expressed as a rate per 1,000 wage and salary earners employed, calculated using the formula:

$$\frac{\text{number of occupational injuries and diseases} \times 1,000}{\text{number of wage and salary earners}}$$

Frequency Rate is the number of occurrences expressed as a rate per 1,000,000 hours worked by wage and salary earners, calculated using the formula:

$$\frac{\text{number of occupational injuries and diseases} \times 1,000,000}{\text{number of hours worked}}$$

Source: Worksafe Australia December 1995: Occupational Health and Safety Performance Overviews, Selected Industries; Issue No. 9 – Agriculture and Services to Agriculture Industries.

Denominator data for incidence rates throughout this report was sourced from the Australian Bureau of Statistics (ABS) Labour Force Survey unless otherwise stated. The ABS figures for full and part time shearer numbers appear credible when cross checked with Australian Tax Office number of shearer tax returns.

However, ABS figures for shearer hours worked appear to be about double what can reasonably be calculated based on flock numbers, shearer numbers and tallies. The calculation of shearer hours worked which was used for injury frequency rates and cost modelling is calculated by dividing a typical professional tally per hour into the national flock, e.g. 100 million divided by 20 sheep per hour equals 5 million hours shearing per year.

3.2 Injury Definition

Throughout the report, the term “injury” can be understood as including occupational injuries and diseases.

3.3 Symbols Used

- ASCO Australian Standard Classification for Occupations
- na not available
- ABS Australian Bureau of Statistics
- ANZSIC Australian and New Zealand Standard Industrial Classification

4. Data Quality and Limitations

When interpreting the results of this review of shearer injuries and costs it is important to take into account that the five year annual average figures are a more robust indicator of risk than the data from one year.

Data for this report was obtained from the workers compensation authorities in the states holding the majority of Australia's sheep population. Queensland was excluded from the initial analysis of five years data (but included in background information) and from this review because the sheep population (and subsequently, the amount of shearing) has diminished significantly over the 5 years to 2005 and this state of flux is not representative of the rest of the nation. The states included in the investigation, listed in order of current sheep population (largest to smallest), are New South Wales (NSW), Western Australia (WA), Victoria (Vic), South Australia (SA), and Tasmania (Tas). It is important to note that NSW was not able to provide data for the 2003-04 year (See 4.1).

To extract claims data for injuries involving sheep shearing, the Australian Standard Classification of Occupations (Second Edition) (ASCO2) code 4612 ("Shearer") was used. Using occupation rather than industry as a database search criteria ensured that claims were included regardless of the industry in which an injured shearer was categorised. In this way, we believe we have found the majority of all sheep shearer claims reported up to and including 2005-06 (commencing from 1999-00) and that we are looking only at injuries incurred by shearers.

The assumption introduced into the review of the 2004-05 data regarding data leakage between categories to improve the capture and quantification of risk has been retained for this review of the 2005-06 data. This assumption is that due to reviews of workers compensation injury claims data in any occupation or industry category containing a small percentage of occupations or industry descriptions which do not fit or appear miss categorised the working assumption has been made that leakage in and out of categories is similar across the workers compensation data. Therefore all injuries with the occupation shearer have been included in this review. The risk management based reasoning being that it is better to identify a probable risk than ignore a threat about which there is some doubt.

The following claim-level (or unit-level) information was requested from each of the 5 states for each injury with a "shearer" occupation code:

- ANZSIC code (Australia and New Zealand Standard Industrial Classification) – industry in which the worker is categorised;
- Bodily location – what part of the body was injured;
- Nature of injury – what sort of injury (i.e. sprain, contusion, fracture);
- Mechanism of injury – the action, exposure or event which is the direct cause of the most serious injury or disease experienced;
- Agency of injury – the object, substance or circumstance involved in the first event leading to the injury/disease;
- Text descriptions by the injured worker and/or the employee;
- Compensation costs; and
- Time lost from work.

Data is stored based on the date an injury was reported to the relevant workers compensation authority, rather than the date the injury was sustained. This means that some injuries may have occurred some time before the year in which they were reported.

For the purposes of our study, all injuries reported in the given financial years are included regardless of the year they occurred.

Each state's database has its own particular limitations. Because each jurisdiction has a unique procedure for collecting and reporting injury data, comparison between states must be made with extreme caution. Results from the five major wool-growing states are displayed together in tables throughout this report to give some idea of the injury picture nation-wide, but the limitations and missing information must be kept in mind when reviewing these results.

The data provided by each state and the particular nuances and limitations of each state's data are discussed below.

4.1 New South Wales

Data was not available for NSW from the financial year 2003-04 to update the rolling five year annual average information. Therefore the following assumption was made to enable an estimated five year average of injuries and costs. As NSW 2003-04 data was not available it was averaged based on 2002-03 and 2003-05 data, based on the assumption that injury numbers in NSW had plateaued. Thus the tabulated figure is based on an average "Absolute Number" of injuries using 2002-03 and 2004-05 data.

Costs reported by WorkCover NSW included a figure for "total payments" and a figure for "gross incurred cost". The former describes the total paid in compensation for the injury to the publication of the bulletin (roughly the end of the financial year). The latter includes the costs paid to date plus an estimate of future costs. This estimate is provided by the insurer.

One of the major limitations of the NSW data is in the "days lost" figure. Days lost was only reported where the injury involved a temporary disability, and it includes both time already lost plus an estimate of days to be lost in the future. There was no days lost figure where the injury resulted in a permanent disability. Therefore, NSW may appear to have fewer days lost as a result of injury compared to other states.

The NSW workers compensation system requires the employer to pay the first amount (\$500 for policies commencing prior to 31st December 2005) of weekly compensation costs. For policies commencing on or after 31st December 2005 the excess is the 1st week of weekly compensation i.e. the excess is only the 1st week of weekly compensation. No excess is payable on medical or other expenses. This must be taken into account when reflecting on the true extent of costs of shearer injuries.

For further information on extrapolation methods used for NSW data please see Appendix One (p. 35).

4.2 Western Australia

Costs reported by WorkCover WA included a figure for "total cost". For finalised claims, this is the actual total of payments made. For open claims, this figure includes an estimate, provided by the insurer, for the total payments likely to be made over the life of the claim.

The "days lost" figure reported by WA similarly reflects the total days lost for finalised claims and the insurer's estimate of days likely to be lost over the life of the claims. For this reason, WA may appear to have more days lost as a result of injury compared to other states.

There is no employer-paid threshold applied to claim payments in WA, so the costs reported by WorkCover may seem higher per injury than other states.

For further information on extrapolation methods used for WA data please see Appendix One (p. 35).

4.3 Victoria

Victoria was one of the two states able to provide the “free text” fields as part of the claim-level or unit-level data. This enabled detailed categorization of the injuries which served as a “case study” to obtain proportions which were applied to totals in other states. This process is discussed in detail later in the report.

Victoria’s system for reporting claims differs significantly from other states. In Victoria, claims are considered “minor” if the cost for medical and like expenses falls below a particular threshold (indexed annually ~\$517 in 2005-06) and the time lost from work is no more than 10 days. In addition, the employer is responsible for income maintenance for the days lost from work before a claim reaches the thresholds.

Data for minor claims does not include a modelled “fully developed” cost and the only cost recorded for these claims is the cost stated by the employer when reporting the injury. This is not checked or updated at any point unless the claim becomes standardised. Therefore, costs and time lost figures for minor claims is an unknown and can only be estimated based on the figures provided.

Other claims where the expense and/or time lost thresholds are surpassed are considered “standardised”, and data for these claims are maintained and updated regularly. For standardised claims, a “cost paid to date” figure is provided and a “fully developed” cost is modelled to reflect the full extent of costs over the life of the claim. This fully developed cost figure is usually greater than the total estimated cost for similar injuries in other states. This discrepancy could come about because the model used in Victoria is based on very large numbers of claims and is not designed to be used on a per-claim basis. While the fully developed cost model may seem to overestimate costs in comparison to other states, the model may well provide a more accurate reflection of true costs of an injury.

The “days lost” figure reported by Victoria for standardised claims can be misleading as the worker could have missed anywhere from 1 to 10 days of work before the claim became standardised (those days being compensated by the employer).

4.4 South Australia

Like Victoria, South Australia was able to provide the “free text” fields as part of their unit-level data, and the SA was therefore combined with the Vic data as a “case study”, as discussed later in the report.

Costs reported by WorkCover SA include only the total cost paid to the date of data extraction (March 2007). SA does not model a fully developed cost or provide any other estimate for total cost over the life of a claim. For this reason, it is difficult to compare the costs in SA to the total estimated costs in other states. Likewise, expenditure in SA cannot be compared across injury years but only between categories within a particular injury year. Where necessary, we have used the ratio of paid-to-date costs to fully developed costs in Victoria to extrapolate an estimate of total costs in SA.

Employers in SA are not responsible for any medical and like expenses, but they are required to pay the first 2 weeks of income maintenance when an injury occurs. Depending on whether an employee is full-time or part-time, these “2 weeks” could mean anywhere from 1 – 10 working days. These days (and the cost) compensated by the employer are not reported in the data.

For further information on extrapolation methods used for SA data please see Appendix One (p. 35).

4.5 Tasmania

Costs reported by WorkCover Tasmania included figures for both cost paid and total estimated cost. For finalised claims, the total cost is the actual total of payments made. For open claims, this figure includes an estimate, provided by the insurer, for the total payments likely to be made over the life of the claim.

The “days lost” figure reported by Tasmania reflects the total days lost for finalised claims but only reflects the days lost so far for open claims (unlike WA).

Employers in Tasmania are required to meet the costs of income maintenance for the first week and the first (\$200 for 2005-06) of other expenses.

For further information on extrapolation methods used for Tas data please see Appendix One (p. 35).

5. Sheep Shearer Injuries: Background

Table 3 (p. 22) displays total shearer injury numbers and incidence/frequency rates for 2005-06 as well as the previous and current five year rolling annual averages. Table 4 (p. 23) displays the costs and time lost from work for these injuries. Queensland has been included in this background information but the Qld. portion of the injuries and costs should not be used to forecast into the future because this state is unrepresentative of national trends over the time periods studied.

In the 2005-06 period 420 sheep shearer injuries were reported to workers compensation authorities in the 5 major wool-growing states of Australia. Over the 5 years to 2005-06, a total of 2493 injuries (499 average per annum) were reported (Table 2, p. 13). The associated incidence rate of shearer injuries over these 5 states in 2005-06 is 82.5 injuries per thousand shearers and the associated frequency rate is 89.5 injuries per million hours worked by shearers Table 3 (p. 22).

These 420 injuries carried an estimated total cost to the workers compensation authorities (including income compensation, medical and related expenses) of \$9.6 million (Table 4, p. 23).

These 420 injuries have resulted in at least 20,259 days lost from work for injuries incurred in 2005-06. This contrasts with the previous 5-year period averaging 27,060 days lost from work per year. These figures are conservative and do not include employer-paid days, permanent disabilities in NSW, or unreported (no workers compensation claim made) injuries (Table 4, p. 23).

The reduction in incidence rates previously reported to AWI in 2005 (from ~151 injuries per thousand shearers per year in 1995 to ~103 injuries per thousand shearers per year during the 1999-00 to 2003-04 period) was likely to be due to a more conservative approach taken in calculating shearer numbers by including ABS figures for part time shearers than was used prior to the 2005 analysis.

The incidence rate decreased slightly from a five year annual average (2000-01 to 2004-05) of 115 to an incidence of 112.8 (for the period 2001-02 to 2005-06). This follows a spike in the incidence rate to 137 injuries per thousand shearers per year during 2004-05 (Table 3, p. 22).

The frequency rate is based on number of injuries per million shearer hours worked. The frequency rate fell from 106 (five year annual average) injuries per million hours worked during the period 1999-00 to 2003-04 to 100 injuries per million hours of shearing in 2001-02 to 2005-06 (Table 3, p. 22).

Therefore there were both fewer injury claims per hours worked (and therefore fewer injury claims overall) and fewer injury claims per shearer. This contrasts with the 2004-05 claims data which showed fewer injuries overall by a marked increase in injury claims per shearer. The fall in incidence rate from 137 in 2004-05 to 82.5 in 2005-06 is even more dramatic. It demonstrates the difficulty in dealing with relatively small numbers over a one year period and the good sense in using the five year rolling average figures as a more robust guide for the industry.

Denominator data for incidence rates throughout this report was sourced from the Australian Bureau of Statistics (ABS) Labour Force Survey unless otherwise stated. The ABS figures for full and part time shearer numbers appear credible when cross checked with Australian Tax Office number of shearer tax returns.

However, ABS figures for shearer hours worked appear to be about double what can reasonably be calculated based on flock numbers, shearer numbers and tallies. The calculation of shearer hours worked which was used for injury frequency rates and cost

modelling is calculated by dividing a typical professional tally per hour into the national flock, e.g. 100 million divided by 20 sheep per hour equals 5 million hours shearing per year.

Table 3. Sheep Shearer Injuries. Absolute Numbers (N), Incidence Rates (IR), and Frequency Rates (FR) of sheep shearer injuries reported to Worker's Compensation Authorities in the Major Wool-growing States of Australia over 5 years. Incidence rates have been calculated using denominator data (number of shearers) supplied by the Australian Bureau of Statistics Labour Force Survey. Frequency rates have been calculated by estimating the number of hours worked based on the annual average size of the sheep flock, annual average number of shearers, and an assumption that each shearer works an 8-hour day to shear 160 sheep per day.

YEAR		2001-02	2002-03	2003-04 ^f	2004-05	2005-06 ^g	Previous 5-Year Total 2000-01 to 2004-05	Previous Annual Average 2000-01 to 2004-05 ^h	5-Year Total 2001-02 to 2005-06 ^a	Annual Average 2001-02 to 2005-06 ^c
NSW	N	289	200	198	196	161	1239	247.8	1044	208.8
	IR	218.1	73.4	108.5	132.8	78.5		125.2		122.3
	FR				94.6	85.2				
WA	N	91	148	165	174	142	707	141.4	720	144.0
	IR	61.7	219.3	115.8	232	81.1		145.6		142.0
	FR				165.2	88				
Vic	N	93	84	57	58	41	371	74.2	333	66.6
	IR	82.7	101.8	49.6	68.2	34.9		78.5		67.4
	FR				48.6	37.8				
SA	N	77	61	56	62	60	322	64.4	316	63.2
	IR	123.2	187.7	117.9	145.9	160		137.9		146.9
	FR				103.9	173.5				
Qld	N	21	14	5	NA	NA	78	19.5	NA	NA
	IR	38.0	69.0	22.4	NA	NA		50.1	NA	NA
	FR				NA	NA			NA	NA
Tas	N	17	17	17	13	16	81	16.2	80	16.0
	IR	68.0	340.0	340.0	104	58.2		189.8		182.0
	FR				74.1	63.1				
Totals	N	588	524	498	503	420	2798	563.5	2493	499 <i>(column sum)</i>
	IR	109.8	109.1	125.7	136.6	82.5		115.0		112.8 <i>(row avg.)</i>
	FR	110.5	105.8	97.3	97.3	89.5		105.8		100.1 <i>(row avg.)</i>

^f NSW data for 2003-04 was not available. Based on the 2002-03 and 2004-05 data, it was assumed injury numbers in NSW had plateaued. Thus the tabulated figure is based on an average 'Absolute Number' of injuries using 2002-03 and 2004-05 data.

^g NSW data not available until after August 2007. These figures are modelled on available data for this interim report.

^h Average number of claims is the total over 5 years divided by 5. Average rates are calculated using the average number of claims over 5 years in the numerator and average number of shearers ('000s) in the denominator (for IR) or estimated hours worked ('000,000s) in the denominator (for FR) over the same period.

Table 4. Sheep Shearer Injuries. Days Compensated, Paid-to-Date Compensation Costs (to date of data extraction) and Estimated Total Compensation Costs of sheep shearer injuries reported to Worker's Compensation Authorities in the Major Wool-growing States of Australia for 2005/06

NA indicates that data was unavailable.

YEAR		2005-06	Previous 5 Year Total (2000-01 to 2004-05) ^e	Previous 5 Year Annual Average (2000-01 to 2004-05) ^e	Current 5 Year Total (2001-02 to 2005-06) ^e	Current 5 Year Annual Average (2001-02 to 2005-06) ^e
NSW	Paid-to-Date Costs	\$1,312,360	NA	NA		
	Est. Total Costs	\$3,307,145	\$35,206,782	\$7,041,356	\$29,192,190	\$5,838,438
	Days Compensated ^b	6035	35,039	8,760	38,234	7,647
WA	Paid-to-Date Costs	\$585,478	\$1,137,827	\$1,137,827	\$2,071,904	\$414,381
	Est. Total Costs ^d	\$2,359,846	\$7,512,853	\$1,502,571	\$8,298,461	\$1,659,692
	Days Compensated	9,187	33,568	6,714	34,287	6,857
Vic	Paid-to-Date Costs	\$408,950	\$6,775,393	\$1,355,079	\$4,780,044	\$956,009
	Est. Total Costs	\$1,500,631	\$22,780,407	\$4,556,081	\$19,145,200	\$3,829,040
	Days Compensated ^c	1,937	33,681	6,736	23,098	4,620
SA	Paid-to-Date Costs	\$471,484	\$5,427,874	\$1,085,575	\$3,661,118	\$732,224
	Est. Total Costs ^d	\$2,048,762	\$18,249,743	\$3,649,948	\$14,663,638	\$2,932,728
	Days Compensated ^c	2,290	21,283	4,257	16058	3212
Qld	Paid-to-Date Costs	NA	\$1,307,550	\$326,888	NA	NA
	Est. Total Costs	NA	NA	NA	NA	NA
	Days Compensated	NA	NA	NA	NA	NA
Tas	Paid-to-Date Costs	\$95,753	\$2,319,870	\$463,974	\$1,571,484	\$314,297
	Est. Total Costs	\$385,947	\$3,380,439	\$676,088	\$2,922,247	\$584,449
	Days Compensated ^c	810	2,966	593	2,958	592
Total ^a	Paid-to-Date Costs	\$2,874,025	\$18,969,179	\$4,042,455	\$15,870,553	\$3,174,111
	Est. Total Costs	\$9,602,331	\$68,880,481	\$13,153,156	\$58,493,360	\$11,698,672
	Days Compensated	20,259	126,537	27,060	106,990	21,398

^a Note that these totals exclude states where data was unavailable, marked with NA.

^b NSW days lost figures only include injuries where there was a temporary disability. Injuries resulting in permanent disability do not display days lost in the data.

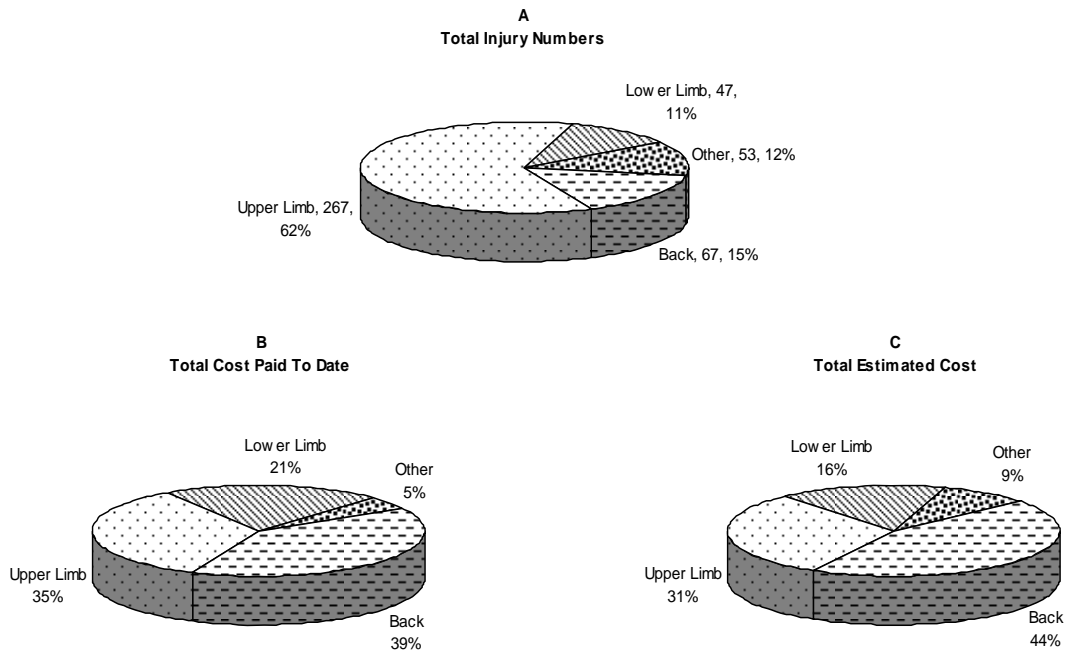
^c To reflect a more accurate estimation of days compensated, the mean of employer funded days paid has been added to the days compensated (where a threshold applies). Adjustments were performed as follows; Tas – 2.5 days added per injury claim, Vic – 5 days added per injury claim, SA – 5 days added per injury claim

^d SA and WA data approximated using the VIC ratio of Est. Total Costs to Paid-to-date costs.

^e NSW data for 2003-04 was not available. Based on the 2002-03 and 2004-05 data, it was assumed injury costs in NSW had plateaued for 2003-04. Thus the tabulated figure is based on an average estimated total costs using 2002-03 and 2004-05 data.

Figure 1: Proportion of total injury numbers and costs incurred in various bodily locations for 2001-02 through 2005-06. These figures are 5 year averages based on injuries reported to Workers compensation authorities in Vic and SA.

Chart A represents total injury numbers. Chart B represents Total Paid-to-Date Costs (PTD). Chart C represents Total Estimated Costs (TEC). For SA, TEC were approximated from PTD, using the ratio of TEC to PTD at each bodily location from the Vic 5 year data.



Back and upper limb injuries were the two major body locations injured.

Injuries to the upper limb (shoulder to fingers included) accounted for 62% of injuries and 31% of total estimated claims costs.

Back injuries accounted for 15% of injuries and 44% of total estimated claims costs. Back and upper limb injuries combined accounted for 77% of injuries and 75% of costs.

6. Premium Rates Paid in the Sheep Shearing Industries

Table 5 Premium Rates Paid by Sheep Shearing Industries

INDUSTRY: Australian and New Zealand Standard Industry Classification (ANZSIC)	2003-04						2004-05						2005-06					
	NSW	WA	VIC ^k	SA	TAS	QLD	NSW	WA	VIC	SA	TAS	QLD	NSW	WA	VIC	SA	TAS	QLD
Grain-Sheep and Grain-Beef Cattle Farming (0122)	10.21	5.29	8.19		5.64		10.09	5.16	4.515		5.56		9.12- 9.60	5.21	3.666	3.80	5.20	
Sheep-Beef Cattle Farming (0123)	9.85	6.83	8.19		6.50		10.23	7.37	6.144		6.30		9.18- 9.67	7.74	5.830	5.80	5.87	
Sheep Farming (0124)	11.51	6.40	8.19		6.79		11.14	6.01	6.144		6.64		9.94- 10.47	6.27	5.830	5.90	6.22	
Shearing Services (0212)	11.64	6.69	6.76		10.96		11.19	6.07	11.790		9.01		10.76- 11.33	6.45	9.868	7.50	8.41	

^k Includes 17% general premium increase.

7. **Case Study: Victoria and South Australia**

One major purpose of this analysis and annual review is to examine the causal factors of sheep shearer injuries and ascertain the associated injury rates and indicative costs based on known claims costs. Specifically, we wanted to examine injuries caused by manual handling of sheep (animal handling) and those involving the shearing handpiece as well as those injuries caused by a combination of both animal handling and the handpiece.

Victoria and South Australia were the only two states able to provide the “free text” accompanying each claim in the unit-level data. This information was necessary to verify whether or not a claim fell into any of the various categories of animal handling or handpiece injuries. Therefore, these states were used as a “case study”, representing a very large sample of the total shearer population for detailed analysis and breakdown. Proportions of total injury numbers and total costs falling under each major category were then applied to the total injury numbers and total costs of the 3 other states (NSW, WA, and Tas) to estimate national figures. (Please see p. 35, Appendix One for further explanation of the extrapolation methods used in this report).

The case study data analysis and figures (Figure 1, p. 24; Figure 2, p. 28, Figure 3, p. 29; Figure 4, p. 30) are now based on five years of data (updated annually) to provide a more robust and reliable indication of shearing injury causal factors.

Injuries were classified according to the following breakdown:

7.1 Animal Handling

Under the major category heading of Animal Handling, the following sub-categories were identified:

- Catching, Tipping, and Dragging (including release of sheep after shearing)
- Wool Removal (bending over to control and shear sheep)
- Gradual or Unspecified Onset Injuries (suspected to result from animal handling)
- Plant Matter / Wool Fibres (foreign matter entering the skin, often leading to infections)
- Other Animal Handling (including being hit by a sheep)

7.2 Animal Handling / Handpiece Combination

Under the major category heading of Animal Handling / Handpiece Combination, the following sub-categories were identified:

- Handpiece Lock-up (specifically caused by animal's movement)
- Handpiece Free and Running (specifically caused by animal's movement)
- Sheep Kicking / Moving (causing handpiece injury – could be lock-up or free and running or other handpiece injury)
- Other Animal / Handpiece Combination (not elsewhere classified)
- Gradual / Unspecified Onset Injuries (suspected to involve both use of the handpiece and handling / controlling of sheep; i.e. a gradual onset

injury such as tendonitis or tennis elbow reported in the elbows/wrists of both arms)

7.3 Handpiece

Under the major category heading of Handpiece, the following sub-categories were identified:

- Lock-up (of the shearing handpiece, where animal movement is not implicated)
- Free and Running (shearing handpiece injury where handpiece was free from the shearer's hand)
- Other / Unspecified Sudden Onset / Traumatic Injury (where a cut, fracture, open wound, etc. was sustained from the handpiece but it is unknown whether there was a lock-up or a free and running event)
- Gradual / Unspecified Onset (i.e. gradual onset injury such as tendonitis or tennis elbow reported in the elbow / wrist of only the right side, as right-hand dominance was assumed)

8. Outcomes of Case Study Investigation

It is important to note that the methodology for this analysis and case study is now based on a rolling five year's data rather than on the less robust one year's data used previously.

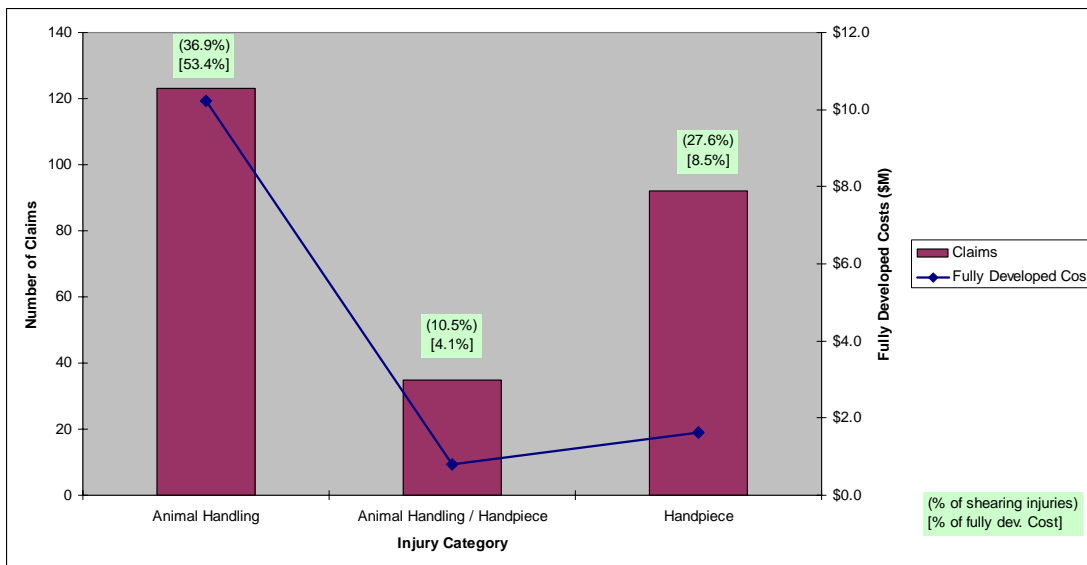
In contrast to the five year analysis reported to AWI in 2005 no further back or upper limb injuries could be categorised beyond those already allocated into the causal factor categories with a high degree of certainty. Vic and SA 2004-05 claims data had no back or upper limb injury claims not already attributed to the following Causal Factor Categories: Animal Handling, Animal Handling/Handpiece Combination or Handpiece which could be attributed to the "Lower Certainty of Cause" categories following a careful analysis of individual injury claim data. Detailed data analysis of these injury claims showed either that the causal factors were rightly "Other" e.g. "hand infection" or insufficient information was available attribute any causal factor.

Figure 2 displays results from the case study of Victoria, showing relative proportions of number of claims and costs of injuries in each of the three major categories.

South Australian data was analysed for causal factor categories and proportions combined with Victorian data for five states extrapolation. However due to SA not using Estimated Total Costs Vic data only is displayed in the case study Figures for clarity.

Figure 2: Causal Factor Summary Table. Victoria workers compensation claim injuries incurred during the 5-year period 2001-02 through 2005-06 involving animal handling and/or the shearing handpiece.

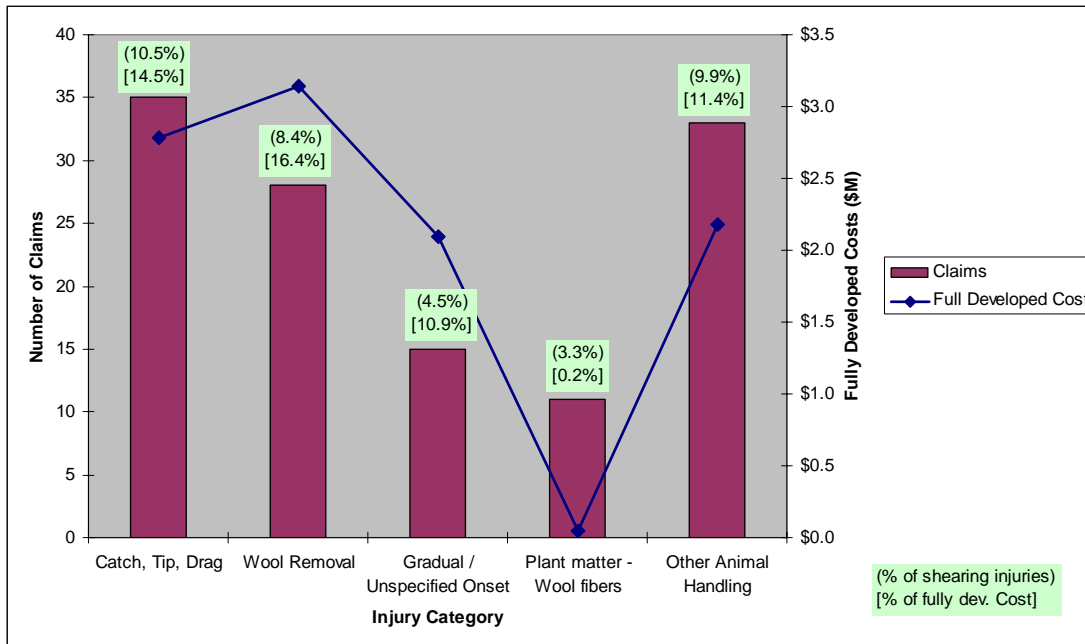
Numbers in round brackets indicate the proportion of all shearer injuries in Victoria for the same period. Numbers in square brackets indicate the proportion of the total fully developed cost of all shearer injuries in Victoria for the same period.



8.1 Animal Handling Injuries

Figure 3 displays results of the case study investigation of injuries in the Animal Handling category only, showing relative proportions of injury numbers and costs in each of the sub-categories of Animal Handling Injuries.

Figure 3: Causal Factor: Animal Handling. Victoria workers compensation claim injuries incurred during the 5-year period 2001-02 through 2005-06 involving animal handling but not involving the shearing handpiece.



The Animal Handling injury category includes both sudden and traumatic onset injuries as well as gradual onset injuries sustained during catching, tipping and dragging or wool removal, as well as injuries caused by a sheep running into or hitting a shearer. This category also includes injuries caused by wool fibres, thistles, burrs and other plant material entering the shearer’s skin.

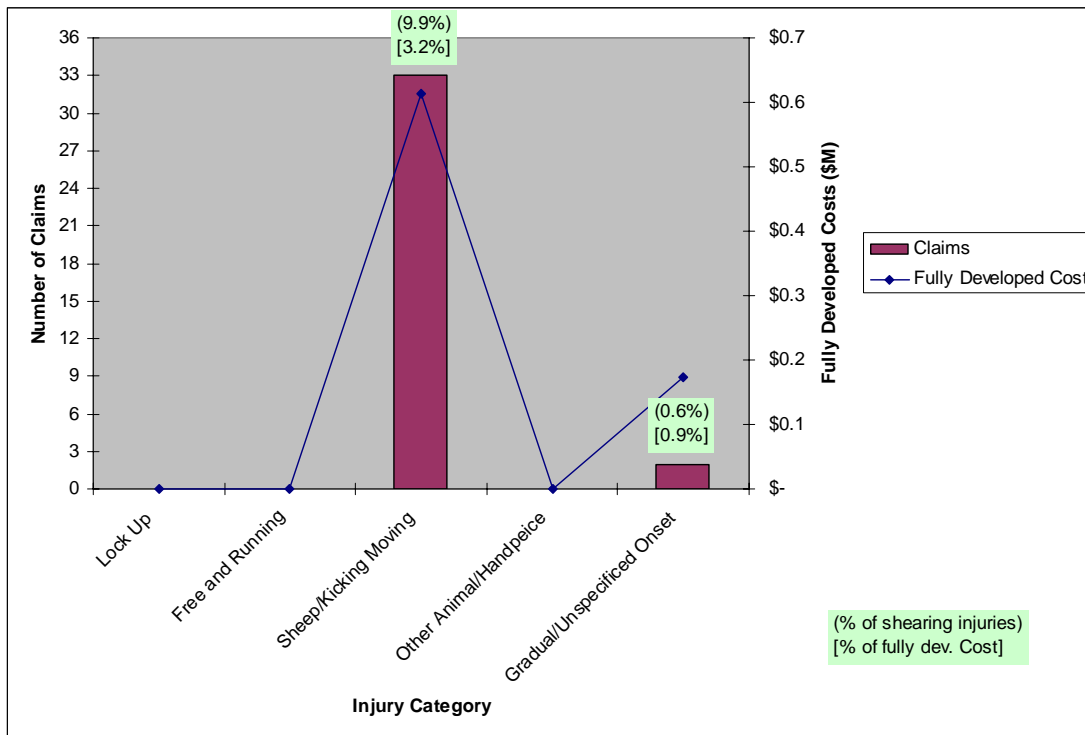
Based on a case study of shearer injuries in Vic (and SA), animal handling activities accounted for at least 37% of injury claims and 53% of total estimated claims costs of all shearing injuries incurred in the five year period 2001-02 to 2005-06 (Figure 2, p. 28).

A significant proportion of animal handling injuries fall into the two categories “Catch, Tip, and Drag” and “Wool Removal”. In Victoria, these two injury causal factors represented 19% of injury claims and 31% of the total estimated injury claims costs). Attempts to address these two major activities involved in shearing is therefore likely to lead to a significantly reduced number of animal handling injuries and reduced total cost of injuries.

8.2 Animal Handling/Handpiece Combination Injuries

Figure 4 displays results of the case study investigation of injuries in the Animal Handling / Handpiece Combination category, showing relative proportions of injury numbers and costs in each of the sub-categories of Animal Handling / Handpiece Combination Injuries.

Figure 4: Causal Factor: Animal Handling and Handpiece. Victoria workers compensation claim injuries incurred during the 5-year period 2001-02 through 2005-06 involving animal handling and the handpiece in combination.



In Victoria injuries caused by the handpiece combined with the sheep kicking or moving accounted for 10.5% of injury claims and 4.1% of the total (fully developed) cost of all shearer injury claims costs.

The Animal Handling/Handpiece Combination injury category includes both sudden and traumatic onset injuries and gradual onset injuries where both the handpiece and animal handling are implicated.

Traumatic injuries in this category include handpiece lock-ups and “free and running” events caused by the movement or kicking of a sheep. It was not possible in many cases to identify instances where the handpiece was kicked free and running based on the available data in many cases where this may have been the cause of injury.

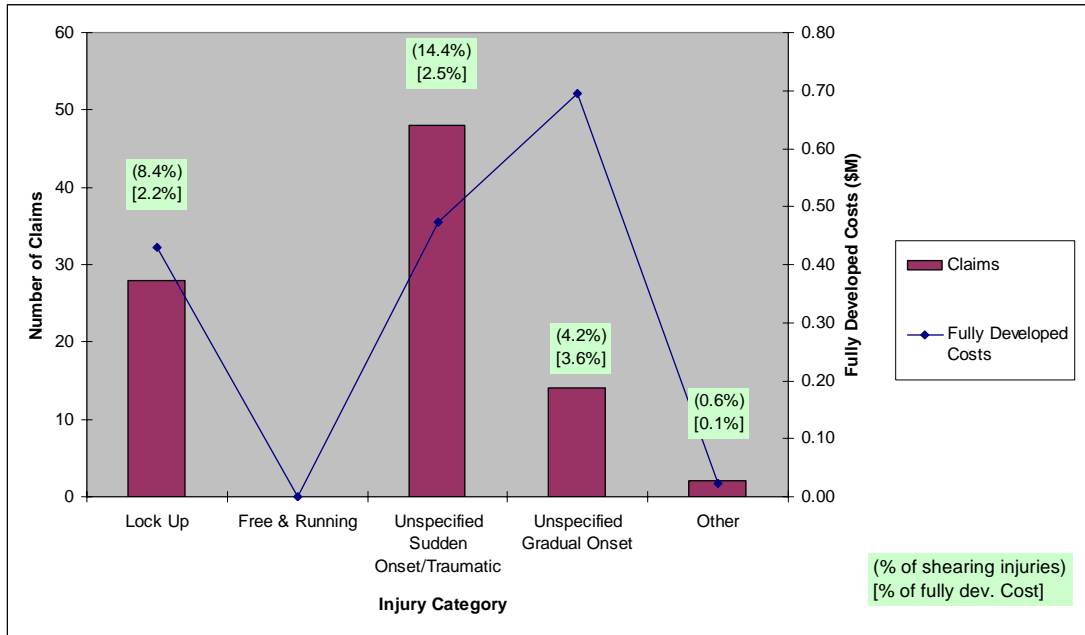
An example of a gradual onset injury in this Animal Handling/Handpiece Combination injury category would be tendonitis to both upper limbs.

Figures in the sub-category of “free and running” may be misleading. Injuries were not given this classification unless the text clearly indicated that the handpiece left the shearer’s hand before striking the body. In most cases the data did not provide this level of detail and therefore most sudden onset or traumatic injuries that clearly involved the handpiece but were not clearly lock-ups were placed in the sub-category of “sheep kicking / moving”. Handpiece injuries in this category could be due to lock-ups or “free and running” events or some other type of handpiece injury. Most of the injuries in this category are caused by the sheep kicking and/or moving during wool removal.

8.3 Handpiece Injuries

Figure 5 displays results of the case study investigation of injuries in the Handpiece category, showing relative proportions of injury numbers and costs in each of the sub-categories of Handpiece Injuries.

Figure 5: Causal Factor: Handpiece. Victoria workers compensation claim injuries incurred during the 5-year period 2001-02 through 2005-06 involving the shearing handpiece but not involving animal handling.



The Handpiece injury category includes both sudden/traumatic onset injuries and gradual onset injuries where only the handpiece is implicated (and not animal handling). Traumatic injuries in this category include handpiece lock-ups and “free and running” events as well as gradual onset injuries such as tendonitis in only the right arm.

In Victoria injuries caused by the handpiece alone accounted for at least 27.6% of injury claims and 8.5% of the total (fully developed) cost of all shearer injury claims costs.

In Victoria injuries caused by the sudden onset or traumatic handpiece injury claims regardless of bodily location (including Lock-up, Unspecified Sudden Onset/Traumatic and Free & Running) accounted for 22.8% of injury claims and 4.7% total (fully developed) claims cost of all shearer injuries reported in the state.

It was not possible based on the level of information in the claims data to identify injuries resulting from handpieces being free and running. This does not mean these injury incidents are insignificant, only that the injury reporting does not capture this detail.

Gradual onset injuries (such as tendonitis, tennis elbow, and carpal tunnel syndrome), accounted for 4.2% of injuries and contributed at least 3.6% to the total (fully developed) cost of all shearer injury claims reported in Victoria in the five-year period.

It is likely that the development of ergonomic improvements and additional safety measures to cut power to any handpiece locked or freed from the shearer's hand could see significant reductions in both numbers and costs of handpiece injuries based on the five year annual average data.

Figures in the sub-category of "free and running" may be misleading. Injuries were not given this classification unless the text clearly indicated that the handpiece left the shearers hand before striking the body. In most cases the data did not provide this level of detail and therefore most sudden onset or traumatic injuries that clearly involved the handpiece but were not clearly lock-ups were considered "other/unspecified sudden onset" injuries.

9. Cost Benefit

Animal Handling and Handpiece related injuries are injuries that can be directly impacted by technology and/or training initiatives that address occupational health & safety improvement.

- A significant proportion of animal handling injuries in the case studies of Victoria (and South Australia) continue to fall into the subcategories of “Catch, Tip and Drag” and “Wool Removal”. Injuries in these two sub-categories made up a total of 17% of all shearer injuries in the 5-year period 2001-02 to 2005-06. These injuries bear estimated 31% of the estimated total cost of all shearer injuries. The five year annual average figures are a more robust indicator of the risk level than the previously reported annual figures. Addressing these two major activities should have significant impacts on occupational health and safety and the costs associated with shearer injuries. For further information refer to Figure 3 (p. 29).
- Animal Handling injuries account for approximately 40% of shearer injuries and 61% of injury costs.
- Handpiece injuries, both from the handpiece alone and from incidents involving both animal handling and the handpiece, make up a total of 38% of all reported shearer injuries and 15% of the total estimated cost of all shearer injuries. It is likely that the development of ergonomic improvements and additional safety measures to cut power to any handpiece freed from the shearers hand could see significant reductions in both numbers and costs of handpiece injuries.

Table 6. Cost Benefits Resulting from Improvement in Key Injury Causal Factors

Handpiece injury cost % reductions per annum (Workcover fully developed claims costs only)		Animal Handling injury cost % reductions per annum (Workcover fully developed claims costs only)			
		10%	20%	30%	40%
20%		\$1,760,877	\$1,928,174	\$1,171,079	\$2,262,768
35%		\$2,830,589	\$2,997,886	\$3,165,183	\$3,332,480
50%		\$3,900,301	\$4,067,598	\$4,234,895	\$4,402,192
65%		\$4,970,012	\$5,137,309	\$5,304,606	\$5,471,903

- Applying a 20% animal-handling injury cost improvement and 50% handpiece-related injury cost improvement provides a benefit per annum of \$2.4 million per annum in workers compensation claims cost savings.
- Based on the calculation that total injury costs to the industry are at least double the workers compensation claims costs, a more realistic benefit estimate is \$4.7 million per annum. These 20% and 50% estimations are on based on the injury cause, planned improvements and clinical recovery pathways typical for these type of injuries.
- For detailed cost benefit modelling and calculations please see Section 10 in the 2005 report to AWI also available on the AWI website: www.wool.com.au.

Appendix One - Extrapolation Methods Used in this Report

The information contained below pertains to 2005-06 data contained in Tables 1, 2, 4 and Figure 1. Clearly however, the data will also inherently be reflected in 5 year average data throughout the report.

A) *Fully Developed Costs (by injury category) – South Australia (SA)*

Injury data from South Australia contains information on Paid to Date (PTD) costs, but not fully developed costs (FDC). As such, FDC for each of the injury categories in SA were estimated using the ratio of fully developed cost to paid-to-date cost from actual Victorian data. These ratios were applied to the actual PTD costs in SA. These ratios are presented in the table below;

Category	Ratio (FDC/PTD) Vic.
Animal Handling	4.8
Animal Handling / Handpiece	2.5
Handpiece	2.9
Other	1.2

For example; if the PTD cost for Animal Handling was \$1000, the FDC for this category would be equal to $4.8 \times \$1000 = \4800

B) *Fully Developed Costs (by injury category) – NSW, Tasmania, and Western Australia*

Data from these States only allowed for the calculation of total value for FDC. Therefore, FDC for each injury category was estimated using proportions generated from actual Vic. data. This was calculated as the ratio of the FDC (injury category) to the total FDC. The proportions for each category were then applied to the total FDC for each state. The proportions are presented in the table below;

Category	Ratio (FDC-Injury Category / FDC Total) Vic.
Animal Handling	76.2%
Animal Handling / Handpiece	11.0%
Handpiece	7.7%
Other	5.0%

For example; if a State had a Total FDC of \$1000, then the proportion of that total attributed to Animal Handling injuries would be $\$1000 \times 76.2\% = \762
Thus the FDC for Animal Handling injuries is \$762

C) *Number of Claims and Days Compensated (by injury category) - NSW, Tasmania, and Western Australia*

Data from these States only allowed for the calculation of total number of claims/injuries. Therefore, claim numbers for each injury category was estimated using proportions generated from average of actual Vic. and SA data (as actual data was available in both of these States). This was calculated as the ratio of the number of claims in each injury category to the total number of claims. The proportions for

each category were then applied to the total number of claims for each state (NSW, Tas. and WA). The proportions are presented in the table below;

Category	Ratio (Claims-Injury Category / Claims Total) Vic and SA data
Animal Handling	52.5%
Animal Handling / Handpiece	11.9%
Handpiece	28.7%
Other	6.9%

For example; if a State had 100 injury claims, then the number of claims in the Animal Handling category would be $100 \times 52.5\% = 52.5$ claims.

D) Summary Notes on Proportional Calculations

Victoria and South Australia were the only two states able to provide the “free text” accompanying each claim in the unit-level data. This information was necessary to verify whether or not a claim fell into any of the various categories of animal handling or handpiece injuries. Therefore injury category data for other states was estimated using Vic and/or SA information. As such, the following statements provide a summary of the calculation and assumptions made above;

- For SA and Vic., the proportions of total claims, FDC and days compensated in each injury category, reflect **actual** data collected in each state.
- For NSW, Tas and WA, the proportions of total FDC in each injury category will be identical to the Vic. proportions. That is; if 50% of FDC occurred in Animal Handling in Vic. then the percentage will be the same in these 3 states.
- For NSW, Tas and WA, the proportions of total claims and days compensated in each injury category will be identical to average of the Vic. and SA proportions.