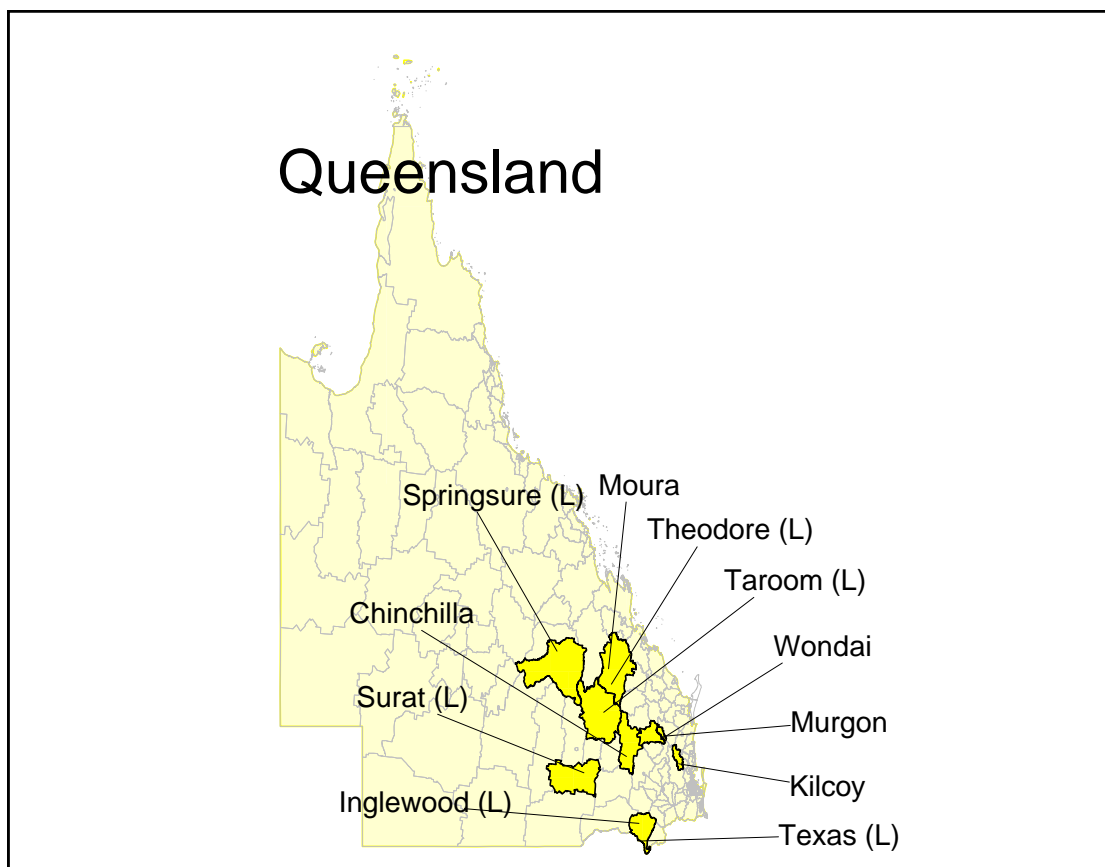


# Rural Injury in Central Queensland

Injury data from eleven Emergency Departments and nine General Practice surgeries, 1995 - 1996.



Richard Franklin  
National Farm Injury Data Centre

A B Chater  
Medical Superintendent with Right to Private Practice  
Theodore Hospital

Lyn Fragar  
Australian Centre for Agricultural Health and Safety

Keith Ferguson  
Division of Workplace Health and Safety  
DETIR Queensland

**Implementation of this study was funded by the Division of Workplace Health and Safety, Department of Employment, Training and Industrial Relations, Queensland.**

© Rural Industries Research and Development Corporation and Australian Centre for  
Agricultural Health and Safety  
All rights reserved

ISBN 1 876491 90 6

Title: Rural Injury in Central Queensland: Injury data from eleven Emergency Departments  
and nine General Practice surgeries, 1995 - 1996  
Authors: Franklin R, Chater AB, Fragar L, & Ferguson K.

Publication No: 00/43

The views expressed and the conclusions reached in this publication are those of the authors  
and not necessarily those of persons consulted. RIRDC and the ACAHS shall not be  
responsible in any way whatsoever to any person who relies in whole or in part on the  
contents of this report.

The report is copyright. However, RIRDC and the ACAHS encourage wide dissemination of  
their research, providing that these organisations are clearly acknowledged. For any other  
enquiries concerning reproduction, contact the RIRDC Publications Manager on phone 02  
6272 3186, or the Manager, NFIDC on 02 6752 8215.

Researcher contact details:

R Franklin  
Australian Centre for Agricultural Health and Safety  
University of Sydney  
PO Box 256  
Moree NSW 2400

Phone: 02 6752 8210  
Fax: 02 6752 6639  
Email: [rfranklin@doh.health.nsw.gov.au](mailto:rfranklin@doh.health.nsw.gov.au)

RIRDC contact details:

Rural Industries Research and Development Corporation  
Level 1, AMA House  
42 Macquaries Street  
Barton ACT 2600  
PO Box 4776  
Kingston ACT 2604

Phone: 02 6272 4539  
Fax: 02 6272 5877  
Email: [rirdc@rirdc.gov.au](mailto:rirdc@rirdc.gov.au)  
Website: [Http://www.rirdc.gov.au](http://www.rirdc.gov.au)

Published in April 2000

## Foreword

---

Local data is of great importance for informing local farm injury prevention programs. However, collection of local farm injury data in such a way that it can also be added to specific industries' databases to describe the nature of injury in the specific agricultural industries, makes such a database even more valuable for Australia's farm injury prevention programs.

The Rural Industries Research and Development Corporation has taken the lead in assembling the Farm Health and Safety Joint Research Venture, a joint program with the Woolmark Company, the Grains Research and Development Corporation and the Cotton research and Development Corporation. The Joint Venture is funding a careful program of research in farm occupational health and safety, including funding of the National Farm Injury Data Collection. This study will make a significant contribution to the National Farm Injury Data Collection, as it has incorporated the key elements of the National Farm Injury Optimal Dataset recommendations into its' design and analysis.

The Rural Industries Research and Development Corporation and the Joint Venture welcome the opportunity to be partners with the rural General Practitioners and rural hospitals in this study, and see this as a model to be followed for future work in partnership with rural Divisions of General Practice in farm injury data collection.

**Peter Core**  
Managing Director  
Rural Industries Research and Development Corporation

## Acknowledgments

---

Implementation of this study was funded by the Division of Workplace Health and Safety, Department of Employment, Training and Industrial Relations, Queensland.

This project would not have been possible without the commitment of Dr Black, Dr Gilmore, Dr O'Brien, Dr Owen, Dr Sondergeld, Dr Lock, Dr Gangemi, Dr McAllister, Dr Chater, Dr Harding, Dr Doolan and the staff at the Surat, Chinchilla, Inglewood, Texas, Wondai, Kilcoy, Theodore, Taroom, Moura, Springsure and Murgon hospitals.

Thanks to Mrs Penny Anderson of Theodore Medical Centre who coordinated the collection from the centres involved and subsequently coded all the data from the study.

## Executive Summary

---

**Title:** Rural Injury in Central Queensland: Injury data from eleven Emergency Departments and Nine General Practice surgeries, 1995-1996.  
**Authors:** R. Franklin, A.B. Chater, L. Fragar & K. Ferguson  
**ISBN:** 1 876491 90 6

From 1 July 1995 to 30 June 1996, one thousand eight hundred injury cases were collected from eleven Emergency Departments (ED) and nine General Practitioner (GP) Surgeries in nine Statistical Local Areas (SLAs). The total population of these SLAs in 1991 was 39 708 of which 52.1% were males and 47.9% were females. The major agricultural commodity in this area is cattle (84.6%) and cereal crops for grain (30.0%). The majority of the areas studied were in drought through the duration of the study and thus grain production was curtailed. It should also be noted that over half of all farms have horses present. The majority of the workforce (81.3%) were farmers and farm managers.

Of the 1 800 injuries collected, three-quarters of these were to males. The average age of those injured was 29.1 years. The average age for males was 29.4 years and for females it was 28.3 years. The indirect age standardised rate for all male injuries in the study was 68.5 / 1 000 males per annum and for all female injury in the study it was 23.7 / 1 000 females per annum.

Emergency Departments collected three quarters of the injury data and nearly half of all injuries were to people under the age of 30 years. The age group with the largest number of injuries was the 20-24 year old males and for females, it was the 10-14 year olds. For those who presented to ED, the indirect age standardised rate was 48.3 and 17.7 per 1 000 per annum for males and females respectively.

The peak month for injuries occurred in April with the peak times for the 12-month cycle being 10 am and between 3 and 5 pm. Weekends also see an increase in injury cases, this due to an increase in transport, sport, leisure / recreation and household activity injuries. Over a third of all injuries were occupational related injuries - household activity and leisure made up another third of injuries. The upper extremity was the body location where most of the injuries occurred followed by lower extremity and head. The three major types of treatment were; *treated, no referral* (40.5%); *treated A&E review* (20%) and *admitted to hospital* (14.3%). For ED, the three main types of injuries were cut / laceration, fracture and haematoma / bruising. For GP Surgeries, the three main nature of injuries were cut / laceration, fracture and sprain / strain.

**Farm injuries** accounted for 28.3% (506) of which 80% were males. The average age of males injured on farms was 34.8 years and for females it was 28.7 years. Farm injury presentations at EDs were three years younger than GP Surgeries ( $P=0.0076$ , t-test). The age structure was similar between the sexes for all injuries except that males had a second minor peak at 35-39 years. There were on average for the study, 42 farm injuries per month with peaks in September and January. Most farm injuries occurred between 10 & 11 am and 3 & 5 pm. Only 4% of farm injuries occur at night (9 pm to 6am).

The majority of farm injuries were *occupational* injuries, followed by *leisure and maintenance*. *Animal handling* and *general maintenance* represented over half of all injuries.

The *owner / farm manager*, was the group most often injured. The crude rate for injuries to owners / farm managers, was 59.8 per 1 000 people per annum whereas the agricultural labourers had a rate nearly double at 112.9 per 1 000 people per annum. The *paddock* was the most common place for injuries to occur followed by the *residence and house yard* and then the *workshop*.

The nature of injury for farm injuries was similar to all injuries with *cut / laceration* the major group, followed by *fractures* and *haematoma / bruising* for emergency department and *foreign body in soft tissues* for GP Surgeries. The three major treatments for farm injuries were; *treated, no referral* (35.4%); *treated, A&E review* (26.3%); and *admitted to hospital* (14.9%).

Of people who received an injury on a farm, only 49 (9.6%) claimed workers compensation for their injuries. Of those people working on farms who were *permanent employees*, 43.4% (85) claimed workers compensation, yet only 21.4% (14) of *casual employees* and 19.4% (36) of *contractors* claimed workers compensation for their injuries. The group of people who made the least number of workers compensation claims was the *owner / family member* group 1.3% (2).

In 93.9% of the farm cases, no safety equipment was present. The farm agent that caused the most injuries was *animal* (22.7%), followed by *other agent* (19.1%) and *farm vehicle* (12.7%).

Farming is an occupation that operates seven days a week and farmers are injured every day of the week. Injuries that are more severe tend to present at ED. GP surgeries also see a large number and variety of injuries and should not be excluded when looking at injury. The number of injuries reported by some of the General Practices may reflect under-reporting. Injuries claiming workers compensation represent only a small number of injuries and do not reflect the extent of injury.

While the general types of injury and body part injured are broadly consistent with other studies, the specific causes and characteristics of farm injuries that present to centres are determined by the commodities and activity in their geographical location. Injury prevention measures for farm injuries therefore need to be targeted at a local level.

In this study, the beef and grains industry were predominant. In the cattle industry, the major areas of concern are animal injuries including falls from horses and cattle handling. In both industries, maintenance activity caused injury especially with foreign body to eyes. In the grains industry, motor cycle injuries were more evident, possibly reflecting greater use in this industry. This could also be compounded by the lack of use of safety equipment. The high number of injuries to the head needs further attention. Education on the threat of injury and the use of protective equipment to help prevent these injuries may need to be considered. Given the higher risk in farm workers, extra education may need to be provided for this group.

The study was limited by some underreporting of injuries and the relative inactivity in the farming sector during the study duration. The reported rates of injury still however fall within the range of other studies.

The study raises a number areas which need investigation:

- ❖ The cause of the apparent higher rate of injury in farm workers per worker compared to owners;
- ❖ The effect on injuries in the cropping and especially grains sector with the conclusion of the drought;
- ❖ The apparent increase in the injury rate as working hours increase; and
- ❖ What are the life threatening or serious injuries (as opposed to common injuries) that may be effectively targeted for prevention?

# Contents

---

<b>FOREWORD</b> .....	<b>III</b>
<b>ACKNOWLEDGMENTS</b> .....	<b>IV</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>V</b>
<b>CONTENTS</b> .....	<b>VIII</b>
<b>LIST OF TABLES</b> .....	<b>IX</b>
<b>LIST OF FIGURES</b> .....	<b>X</b>
<b>INTRODUCTION</b> .....	<b>1</b>
Purpose of Study .....	4
<b>STUDY BACKGROUND</b> .....	<b>5</b>
Location.....	5
Agricultural commodities produced in the study area .....	7
<b>METHODOLOGY</b> .....	<b>10</b>
Definition .....	10
Collection centres .....	10
Data Collection and Coding. ....	10
Statistical analysis .....	11
<b>RESULTS</b> .....	<b>12</b>
Section 1: All Injury .....	12
Section 2: Farm Injuries .....	23
<i>Farm agent of Injury</i> .....	32
Section 2A: Injury in the cattle industry .....	35
Section 2b: Injury in the cropping industries .....	39
<b>DISCUSSION</b> .....	<b>42</b>
Farm Injuries .....	44
<b>CONCLUSION</b> .....	<b>46</b>
<b>NOTES</b> .....	<b>47</b>
<b>GLOSSARY</b> .....	<b>47</b>
<b>REFERENCES</b> .....	<b>48</b>
<b>APPENDIX 1 DATA ITEMS</b> .....	<b>50</b>
<b>APPENDIX 2 COPY OF COLLECTION FORM</b> .....	<b>51</b>
<b>APPENDIX 3 CALCULATION OF CRUDE INJURY RATES FOR SLA'S</b> .....	<b>53</b>



## List of Tables

---

Table 1.1	Annual rate of injury per 100 farms per annum across 4 district zones.....	2
Table 1.2	Rank order of injury cause, nature of injury and body region for unintentional farm injury, presentations at ED, Victoria, 1989/90 – 1996/97.....	2
Table 1.3	Activity at the time of injury, adults (15 years+) emergency department presentations, Victoria, 1989/90-1996/97.....	3
Table 2.1	Towns in the 9 SLA's.....	5
Table 2.2	Study SLA's RRMA classification and agricultural zones.....	7
Table 2.3	Number of farm manager / owners, shearers and agricultural labours for the study area, 1996.....	8
Table 3.1	Centres involved in the collection.....	9
Table 4.1	Number of injuries and average age for all cases and farm cases by collection centre, July 1995 – June 1996 (N=1 800). ....	12
Table 4.2	Age specific injury rates per 1000 population per annum, July 1995 - June 1996.....	13
Table 4.3	Nature of injury by presentations to EDs and GP surgeries, July 1995 - June 1996.....	16
Table 4.4	Context of injury event and outcome, July 1995 - June 1996 (N=1 791).....	19
Table 5.1	Farming enterprise by role on farm of injured person, July 1995 - June 1996 (N=509).....	25
Table 5.2	Nature of injury for farm injury by presentations to ED and GP Surgeries, July 1995 - June 1996 (N=509).....	26
Table 5.3	Workers compensation claim in relation to role on farm, July 1995 - June 1996 (N=314).....	29
Table 5.4	Nature of injury by ED and GP Surgeries – cattle industry, July 1995 - June 1996. (N=355).....	34
Table 5.5	Nature of injury – cropping industries by ED and GP Surgeries, July 1995 - June 1996 (N=145).....	38

## List of Figures

---

Display of the 9 study SLA and their collection centres.....	Cover
Figure 2.1 The 9 study SLA and the towns within. ....	5
Figure 2.2 Population pyramid demonstrating age-sex distributions of the 9 SLA's included in the study (N=39 708), 1996.....	6
Figure 2.3 Percentage of major agricultural establishments found in the study area. ....	7
Figure 4.1 Number of injuries reported by age and sex, July 1995 – June 1996 (N=1 800)..	11
Figure 4.2 Monthly injury presentations for ED and GP surgeries attendance July 1995 - June 1996 (N=1 800).....	13
Figure 4.3 Time of day that the injury occurred for all injuries by ED and GP surgeries, July 1995 - June 1996 (N=1 800).....	14
Figure 4.4 Comparison of daily incidence for ED and GP surgeries, July 1995 - June 1996 (N=1 800) .....	14
Figure 4.5 Context of all injury, July 1995 - June 1996 (N=1 800) .....	15
Figure 4.6 Body location of injury, July 1995 - June 1996 (N=1 800) .....	15
Figure 4.7 Outcome of patients, July 1995 - June 1996 (N=1 800) .....	17
Figure 4.8 Day of the week and context of injury event, July 1995 - June 1996 (N=1 800) .	18
Figure 5.1 Number of injuries reported by age and sex, July 1995 – June -1996 (N=509) ...	20
Figure 5.2 Monthly farm injury presentations for ED and GP surgeries attendance July 1995 – June 1996 (N=509).....	21
Figure 5.3 Time of the day that the injury occurred for farm injuries by ED and GP surgeries, July 1995 – June 1996 (N=509).....	21
Figure 5.4 Comparison of daily incidence of farm injuries for ED and GP surgeries, July 1995 - June 1996 (N=509).....	22
Figure 5.5 Context of injury for those who had an injury on a farm, July 1995 – June 1996 (N=509) .....	22
Figure 5.6 Agricultural industry for farm injuries, July 1995 – June 1996 (N=509). ....	23
Figure 5.7 Broad agricultural injuries at the time of injury, July 1995 – June 1996 (N=509). ....	23
Figure 5.8 The role of the person on the farm who was injured, July 1995 – June 1996 (N=509). ....	24
Figure 5.9 Location on farm where injury event occurred, July 1995 – June 1996. (N=509) .....	25

Figure 5.10 Body part injured in a farm injury, July 1995 – June 1996 (N=509).....	27
Figure 5.11 Outcome for an injured person for farm injuries, July 1995 – June 1996 (N=509) .....	27
Figure 5.12 Workers compensation claims for farm injuries, July 1995 – June 1996 (N=509) .....	29
Figure 5.13 Agent of Injury for farm injuries, July 1995 – June 1996 (N=509).....	30
Figure 5.14 Agent of Injury for those who were injured in the ‘Animal Handling’ context or the ‘General Maintenance’ context, July 1995 – June 1996 (n=259).....	31
Figure 5.15 Number of injuries reported by age and sex for the cattle industry, July 1995 – June 1996 (N=354).....	32
Figure 5.16 Agent of injury in the beef cattle industries, July 1995 – June 1996 (N=353) .....	32
Figure 5.17 Agricultural activity of injury – cattle industry, July 1995 and June 1996 (N=270) .....	33
Figure 5.18 Body part injured – cattle industry, July 1995 – June 1996 (N=352) .....	33
Figure 5.19 Number of injuries reported by age and sex – cropping industries, July 1995 – June 1996 (N=145).....	35
Figure 5.20 Agent of injury – cropping industries, July 1995 – June 1996 (N=138).....	36
Figure 5.21 Agricultural activity at time of injury – cropping industries (N=99).....	36
Figure 5.22 Body part injured – cropping industries, July 1995 – June 1996 (N=138) .....	37

## Introduction

---

Agricultural related injury in Australia continues to be very high. Currently agriculture has the second largest number of work-related deaths after transport and storage and the fifth highest occupation working death rate after forestry and logging, fishing and hunting, mining and transport (NOHSC, 1998). Farm injury information is more difficult to collect and is usually collected from sources such as workers compensation, coroners' records, and hospital admission records. This has a tendency to focus on employees or serious injuries and provide an incomplete picture. Accurate, up-to-date information about the nature and the scale of farm injuries continues to elude researchers and consequently, several research projects around Australia are currently collecting data at a local level.

When injury is ranked against other major causes of mortality and morbidity it is the fifth largest killer of Australians (Harrison & Cripps, 1994). Injury is ranked second for years of potential life lost before age 65 and in-patient episodes, third for hospital bed days and fourth for General Practitioner (GP) visits. Fragar et al (1997) found that death from injury for country Australians was consistently higher than their city cousins.

Over the past 10 years, there has been a number of farm injury studies conducted in different locations around Australia. As well as the area involved in this study, local areas in Australia that are currently collecting farm injury information include the Eyre and York Peninsula's in South Australia, Warrnambool in Victoria and Young in New South Wales.

Wolfenden (1992) reported an injury rate of 164.3 / 1 000 people for the plains zones and 80.9 / 1 000 for the coastal zones, with an overall presentation rate of 109.6 / 1 000. The rates for males in the plains zones was 233.9 / 1 000 and for the coast zones it was 108.2 / 1 000. For females in the plains zones it was 89.6 / 1 000 and in the coast zones it was 54.2 / 1 000. Of the 556 farm injuries in the Wolfenden (1992) study, 58.6% were occupational related for the adults. The study also found that the number of injuries to males exceeded females by greater than 2:1, cut injuries were the most common type of injury and arms, legs and head dominated the body part injured.

The Barwon Health district in NSW collected farm injury presentations at six Emergency Departments (EDs) during 1994. There were 333 farm injuries during this time and the majority of those injured were males (79%). The age group with the largest number of injuries was the 20-29 year olds. For those aged 25 years or less, nearly 50% of the injuries were from motorcycles. When looking at the mechanism of injury, the largest group was from *machinery* (21%), followed by *struck by falling object, caught between objects, hit by object* (20%) and then *motor bike accidents* (14%). The majority of people were discharged to *home* (68%), some were *admitted to the ward* (15%), and a few were *referred to a GP* (9%). The annual rate of injury for the four districts in the study was 18.42 per 100 farms per annum. The rates ranged from 9.09 to 29.65 per 100 farms per annum as in Table 1.1 (Coleman & Wetherspoon, 1995).

**Table 1.1 Annual rate of injury per 100 farms per annum across 4 district zones, 1994**

Zone	Total Injuries	Total Farms	Rate per 100 farms per annum
Moree	108	670	16.11
Narrabri	108	629	17.17
Warialda	102	344	29.65
Bingara	15	165	9.09
<b>Total</b>	<b>333</b>	<b>1808</b>	<b>18.42</b>

Coleman & Whetherspoon, 1995.

Day, Ashby & Stathakis (1997) have examined farm injury on a statewide basis for Victoria. This study used information collected by the Victorian Injury Surveillance System (VISS) from EDs presented in their ongoing series, *Hazard*. The study found that for children presenting at EDs from farm injuries, the three major causes were *horses, motorcycles* and *falls* respectively. The three most common nature of injuries in descending order were *fracture, open wound* and *superficial wound*. The three commonly injured body parts were *hand* (including fingers), *forearm* and *head* respectively (Table 1.2).

**Table 1.2. Rank order of injury cause, nature of injury and body region for unintentional farm injury, presentations at ED, Victoria, 1989 / 90 – 1996 / 97**

	Children (<15)	Adults (>15)
Cause of injury event	<ul style="list-style-type: none"> <li>• Horse</li> <li>• Motorcycle (driver or passenger)</li> <li>• Falls</li> <li>• Struck by or collisions with object or person</li> <li>• Tractor incident</li> </ul>	<ul style="list-style-type: none"> <li>• Falls</li> <li>• Cutting/piercing object</li> <li>• Struck by or collision with object or person</li> <li>• Horse related</li> <li>• Motorcycle (driver or passenger)</li> </ul>
Nature of injury	<ul style="list-style-type: none"> <li>• Fracture</li> <li>• Open wound</li> <li>• Superficial wound</li> <li>• Sprain or strain</li> <li>• Intracranial</li> </ul>	<ul style="list-style-type: none"> <li>• Open wound (excl. Eye)</li> <li>• Fracture</li> <li>• Sprain or strain</li> <li>• Superficial (excl. Eye)</li> <li>• Foreign body</li> </ul>
Body part injured	<ul style="list-style-type: none"> <li>• Hand (incl. fingers)</li> <li>• Forearm</li> <li>• Head</li> <li>• Face (excl. Eye)</li> <li>• Wrist</li> </ul>	<ul style="list-style-type: none"> <li>• Hand (incl. Fingers)</li> <li>• Ankle</li> <li>• Lower leg</li> <li>• Foot (incl. Toes)</li> <li>• Shoulder</li> </ul>

Day, Ashby & Stathakis (1997)

Day, Ashby & Stathakis (1997) found for adults that the three common causes of injury were *falls, cutting / piercing object* and *struck by or collision with object or person*. The three major nature of injuries were *open wound, fracture* and *sprain / strain*. The three major parts of the body injured were *hand, ankle* and *lower leg*. (Table 1.2).

**Table 1.3. Farm Injury - Activity at the time of injury, adults (15 years+) emergency department presentations, Victoria, 1989/90-1996/97**

	Frequency	Percent
Working for income	634	51
Other work	190	15
Leisure	319	26
Sports	16	1
Other specified	52	4
Unspecified/invalid/missing	39	3
<b>Total</b>	<b>1250</b>	<b>100</b>

Source: Day, Ashby & Stathakis 1997.

It can be seen from Table 1.3 that the majority of farm injury presentations to EDs in Victoria were from *working for an income* (51%), followed by *leisure* (26%) and *other work* (15%). Day, Ashby & Stathakis (1997) also reported that for hospitalisations, the rate was 18 / 1 000 farms per year and for ED presentations, it was 83 / 1 000 farms per year.

A 1996 study in Warrnambool by Pedler (1997) found that farm injury presenting to the ED accounted for 3.6% (N=4936) of all injuries. Of the farm injuries, 138 (79%) were males, as opposed to 3 151 (64%) for all injuries presenting at the ED of the Warrnambool & District Base Hospital. The three major causes of injuries were *animal*, *miscellaneous* and *vehicle* respectively. Pedler reported the peak for farm injuries occurred between ages 20 and 49 years. The three most common types of injuries were *soft tissue*, *musculo-skeletal* and *eye* respectively. The study also calculated an incidence rate of 17 per 100 farms in the catchment area (Pedler, 1997).

Harper's (1997) report revealed ED presentations for all causes for the Central Queensland area (10 EDs) was 12 072 per 100,000 persons per annum. The report showed that approximately one in ten injury presentations to hospital were admitted. It was also found that males comprised 70% of presentations and over half (55%) of all injuries were to people less than 25 years of age. For farm injuries, Harper (1997) found they were more severe and comprised 9% of all injuries. Nearly a third (30%) were animal related and a fifth (18%) were transport related. The mean age of all injury presentations was 26.4 years.

In a study looking at injuries presenting at GP surgeries in the Central West Gippsland Division of General Practice over a 12-month period (7-11-94 to 6-11-95), 5 995 injuries were recorded (Day, Giulietta & Ozanne-Smith. 1997). Males represented 60.8% of all injuries; the *home* (34%) was the most common location of injury, followed by *education* (13%) and *transport* (11%). Thirty seven percent of people were participating in a *leisure / recreation* activity at the time of injury, 19% were doing *occupational* activity and 15% were engaged in *sports* (Day, Giulietta & Ozanne-Smith. 1997). The three common external causes of injury by E-code were *hit / struck / crush* (15%), *cutting / piercing* (13%) and *over-exertion* (11%). The part of the body that was most commonly injured was the *upper limbs* (36%), followed by the *lower limbs* (30%) and *head and face* (21%). *Sprain / strain* (21%) was most common nature of injury followed by *bruising* (17%) and *laceration* (17%).

Cole and Foley (1995) examined compensable injury in the agricultural and services to agriculture industries for 1992-93 and reported that the majority (53.3%) of these injuries occur to *agricultural labourers and related workers*, as expected when looking at workers compensation. The incidence of injury for *farmers and farm managers* was 26.8 / 1 000 wage

and salary earners but for *farm hands and assistants* it was 58.1 / 1 000 wage and salary earners (Cole & Foley, 1995). Cole and Foley (1995) reported that 18.2% of all injuries were to people aged 20-24 years and the most common nature of injury for compensable injury was *fracture, sprain, etc* (75.9%), followed by *contusion, burns, etc* (13.3%). The body location of injury that was most commonly compensated was *back* (17.8%), followed by *hand, fingers & thumb* (17.5%), and *knee, lower leg and ankle* (17.1%). *Body stressing* (26.2%), *hit by moving object* (23.8%) and *falls, trips and slip* (22.0%) were the three most common mechanisms of injury (Cole & Foley, 1995).

Chater & Ferguson (1994) found that the annual injury rate was 34 per 100 farm workers and 60 per 100 farms. Ninety two percent of work related injury occurred to males and they were mainly in the 31-50 years age group. Meat and stud cattle industries represented over half of the injuries. Major activities associated with on-farm injury were *maintenance of structures and machinery* (34%), *cattle production* (30%), *crop production* (13%) and *forestry operations* (7%). The four most common agents were *animals* (26%), *farm vehicles / machinery* (22%), *workshop equipment* (11%) and *farm structure* (10%).

It can be seen that the presentation injury rate per farm can vary greatly from 9 / 100 farms to over 60 / 100 farms, from 81 / 1 000 people to 120 / 1 000 people, from 27 / 1 000 workers (Compensable owners) to 340 / 1 000 workers. This depends on factors such as the location, the inclusion or exclusion of general practice data, the completeness of data and the method of collection. Males predominate the injury statistics in all studies. There is a wide range of causal factors of injuries but machinery, vehicle / motorbike and animal predominate. The nature of the injuries tend to be fractures, cut / lacerations and wounds, although there appears to be a cause for concern with foreign body in soft tissue and eyes. The upper extremity of the body seems to be particularly vulnerable to injury, especially the hand. Lower limbs and head then predominate except for compensable injuries, where back injuries are equally prevalent. Most studies have not looked at injury related to production of specific commodities.

## **Purpose of Study**

---

This study was initiated to examine injury presenting at a local area, with a focus on farm injury. The areas considered were predominantly involved in cattle and cropping industries and this study therefore allows a glimpse at the particular characteristics of these industries. It also aimed to examine the number of injury cases presenting to General Practice surgeries compared to EDs presentations and thus provide a more complete picture of farm injury.

The study did not aim to identify causes of death or serious injury but to look broadly at the characteristics of all injury.

This study looks at those injuries that presented to GP surgeries and EDs, in eleven towns in nine shires. This is the second study to come out of the Theodore region. The first study was between August 1992 and July 1993 and was collected in the Callide-Dawson region of Central Queensland. A total of 1 511 cases were collected from the first study of which 251 (17%) occurred on farm and 189 (75%) were work-related.

## Study Background

---

The areas for the study were chosen to expand on the geographical area covered by the previous study while continuing with a focus on the cattle and grain industries. It was hoped to gain more information on other areas of crop production, but this was limited by a seasonal downturn and the paucity of data derived from these areas. The study included both emergency departments (EDs) and general practices (GP) within the SLAs considered so that a comparison between the profiles of these two types of care could be derived.

### Location

---

The information collected in the study comes from nine shires. For this study it is assumed that people injured on farms in the shires go to the towns within the shire with their injuries. Although some may go to other centres outside the study the assumption was made that an equal number will come in and a balance struck.

A map of the location of these shires in relation to Queensland can be seen on the front cover.

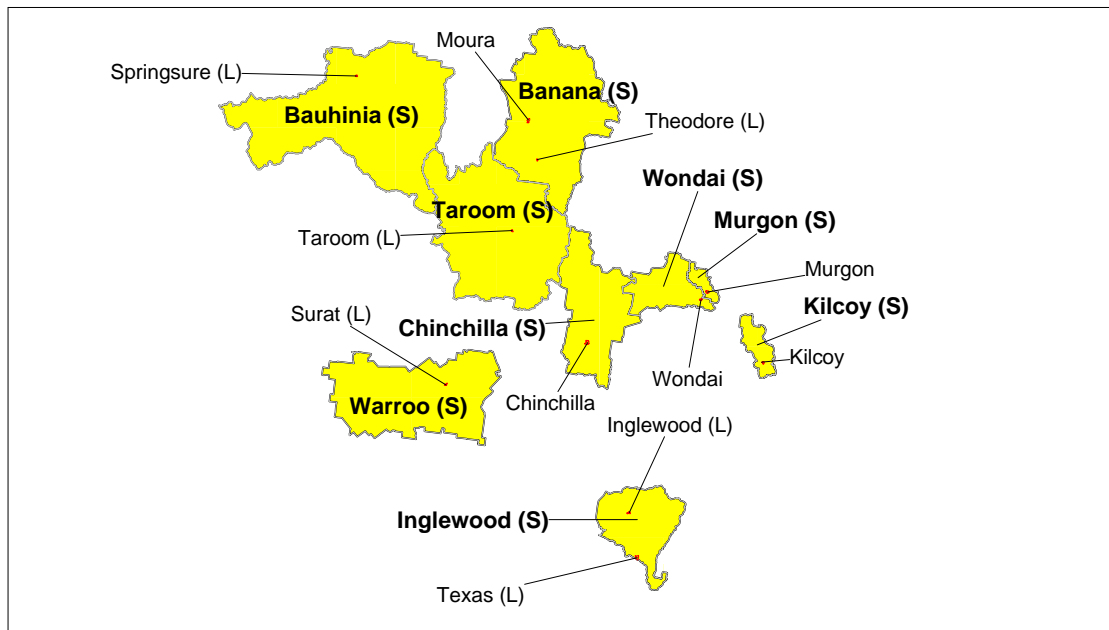
**Table 2.1 Towns in the 9 SLA's**

Statistical Local Area (Shire)	Towns included	Towns not included
Banana	Moura	Biloela
Bauhinia	Theodore	Baralaba
Chinchilla	Springsure	
Inglewood	Chinchilla	
	Inglewood	
	Texas	
Kilcoy	Kilcoy	
Murgon	Murgon	
Warroo	Surat	
Wondai	Wondai	
Taroom	Taroom	Wandoan

The shires and towns can be seen in Figure 2.1.



**Figure 2.1. The 9 study SLA and the towns within**



There is a total population in the nine Statistical Local Area's (SLA's) of 39 708. The age structure of study population is presented in Figure 2.1. The study's population comprised of 20 693 (52%) males and 19 015 (48%) females from the nine SLA's identified in Table 2.1.

**Figure 2.2. Population pyramid demonstrating age-sex distributions of the 9 SLA's included in the study (N=39 708), 1996**

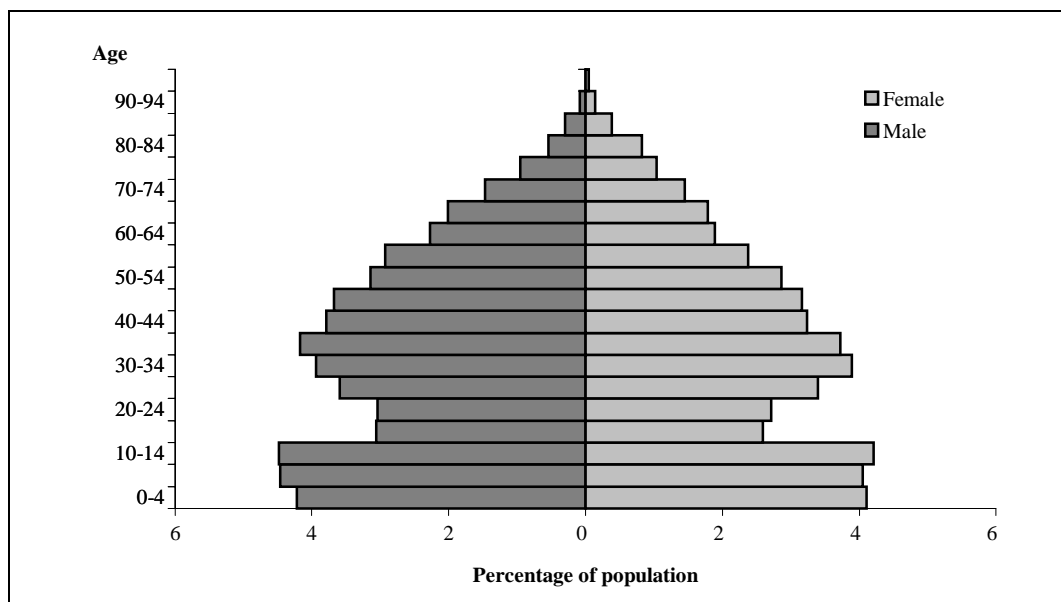


Figure 2.2 population pyramid is similar to other rural classification (Rural, remote and metropolitan area classification, see glossary) (Fragar et al 1997). The most notable thing about these zones is the smaller number of people in the 15-35 age group. This could be related to the exodus of young people to boarding schools and tertiary institutions during their teenage and young adult lives. It may also reflect the gradual drain of the current generation away from the study areas.

## **Agricultural commodities produced in the study area**

---

Commodity information for this study is based on the Agricultural Census data 1993 / 94. This year was used to be consistent with the study completed by Fragar et al (1997). There was a total of 3 146 agricultural establishments in the nine identified SLA's. These establishments were those that had an Estimated Value of Agricultural Operation (EVAO) greater than \$5 000. This number represented 9.2% of Queensland agricultural enterprises that met the EVAO criteria.

Table 2.2 shows SLAs in the study in respect to their Rural, Remote and Metropolitan Area Classification (RRMA) and their agricultural zones (Fragar et al 1997). Six of the SLA's are classified as '*other rural*' and three are '*other remote*'. The agricultural zones have a strong bias towards beef and grains with some sheep, dairy and pigs. More information about RRMA and agricultural zones can be found in Fragar et al (1997).

**Table 2.2. Study SLA's RRMA classification and agricultural zones**

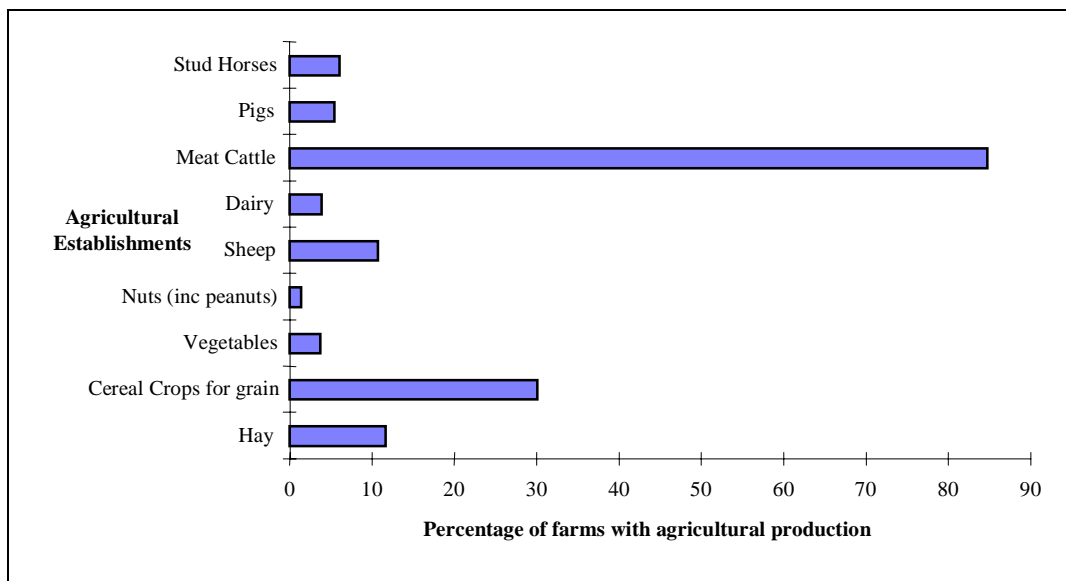
<b>SLA</b>	<b>RRMA classification</b>	<b>Agricultural zone*</b>
Banana	Other rural	BGI
Bauhinia	Other remote	BG
Chinchilla	Other rural	BGP
Inglewood	Other rural	SB
Kilcoy	Other rural	BD
Murgon	Other rural	BDGP
Taroom	Other remote	BG
Warroo	Other remote	SBG
Wondai	Other rural	BDGP

\*B=Beef, D=Dairy, G=Grain, I=Irrigation, P=Pigs, S=Sheep

Source: Fragar et al (1997).

In Figure 2.3 it can be seen that the 84.6% agricultural establishments in the nine study SLA's have beef cattle, 30.0% produce cereal grain crops (although drought has effected this since the time of the Census) and 50.6% have horses on their farms. As already shown by the agricultural zones, sheep, pigs and dairy are also represented.

**Figure 2.3 Percentage of major agricultural establishments found in the study area**



Source: Agstats 1993/4

Table 2.3 displays the agricultural workforce for each of the nine SLAs. The majority of the work-force is farmers and farm managers (81.3%), followed by agricultural and horticulture labourers (17.6%). Horticulture tradespersons have been excluded, as there were none injured during the study period. An assumption was made that nursery persons, greenkeepers and gardeners all work in the towns and not on farms.

**Table 2.3. Number of farm manager / owners, shearers and agricultural labours for the study area, 1996**

	Banana	Bauhinia	Chinchilla	Inglewood	Kilcoy	Murgon	Warroo	Wondai	Taroom	Total
<b>Farmers &amp; Farm Managers</b>	1065	375	519	269	127	211	214	357	550	3687
<i>Skilled Agricultural Wkrs nfd</i>	0	0	0	0	0	0	0	0	0	0
<i>Farm Overseers</i>	4	3	3	6	0	0	3	0	3	22
<i>Shearers</i>	0	0	3	6	0	0	6	0	0	15
<i>Wool, Hide &amp; Skin Classers</i>	0	0	0	3	0	0	0	0	0	3
<b>Skilled Agricultural Workers</b>	4	3	6	15	0	0	9	0	3	40
<b>Ag &amp; Horticultural Labourers</b>	198	120	83	80	50	63	42	48	113	797
<b>Total Exposed Workforce*</b>	1267	498	608	364	177	274	265	405	666	4524

\*This is the total of farm workers and excludes: Nursery persons, Greenkeepers and Gardeners

Source: Australian Bureau Statistics (1998).

Note: When comparing this information the farmers and farm managers are the same as owners / farm manager combined with managers and the agricultural and horticultural labourers is the same as the permanent and part time employees combined.

# Methodology

---

## Definition

---

The definition of farm injury in this study is all injuries that occurred on a farm including those that occur in the residence and house yard.

## Collection centres

---

The centres involved in the collection are shown in Table 3.1.

**Table 3.1 Centres involved in the collection**

Hospitals	Doctor Surgeries
Chinchilla Hospital	Drs' Black, Gilmore and O'Brien, Chinchilla
Inglewood Hospital	Dr C Owen, Inglewood
Kilcoy Hospital	Dr T Doolan, Kilcoy
Moura Hospital	Dr J Gangemi, Murgon
Murgon Hospital	Dr G McAllister, Murgon
Springsure Hospital	Dr J Lock, Springsure
Surat Hospital	Dr P Harding, Taroom
Taroom Hospital	Dr S Sondergeld, Texas
Texas Hospital	Dr B Chater, Theodore
Theodore Hospital	
Wondai Hospital	

---

The SLA's and the centres from which the information was collected are illustrated on the front cover.

For the following centres, no information was recorded and therefore they were excluded from the study: Woorabinda Hospital; Mundubbera Hospital; Biloela Hospital: GP surgeries in Biloela; Dr RJ Williams, Surat; Dr J Gillett, Miles; and Dr P Lip, Wondai.

## Data Collection and Coding.

---

The injury information was collected over 12 months between the 1 July 1995 and the 30 June 1996, using a specifically designed collection form (Appendix 2). The form was developed for the National Injury Surveillance Information System (NISIS) and was modified for a rural collection system (Chater and Ferguson 1994). The data items collected can be found in Appendix 1. The collection form and coding used are consistent with the coding used in the first study by Chater and Ferguson (1994).

All person presenting with an injury at the participating centres were asked to complete the form (Appendix 2). The information was then coded and entered into a database in Epi-info (Dean et al, 1990). No identifying information was recorded on the collection form that could identify individuals. People were asked if they would like to participate in the study. For those who declined, their information was not recorded. Once all the information was

recorded in the database, the forms were stored in a locked cupboard and will be destroyed in 2001.

### **Statistical analysis**

---

The statistical analysis was carried out using SAS<sup>®</sup> Version 6.22. Significance test was achieved using a *t*-test with a confidence interval of 95%. Charts were produced from Microsoft<sup>®</sup> Excel 97.

## Results

---

The results will be presented in two sections. **Section 1** will display the results for all injuries collected and the **Section 2** will concentrate solely on farm injury.

### Section 1: All Injury

---

This study collected 1 800 cases between 1 July 1995 and 30 June 1996. Of these, 1,353 (75.2%) were males and 447 (24.8%) were females. The average age of the injured people was 29.1 years and the male and female ages were 29.4 and 28.3 years respectively (this was not significantly different). There was no significant difference in age between those that presented to either ED or GP surgeries. There were two deaths in the study, both from leisure / recreational injuries. (Table 4.1)

**Figure 4.1. Number of injuries reported by age and sex, July 1995 – June 1996 (N=1 800)**

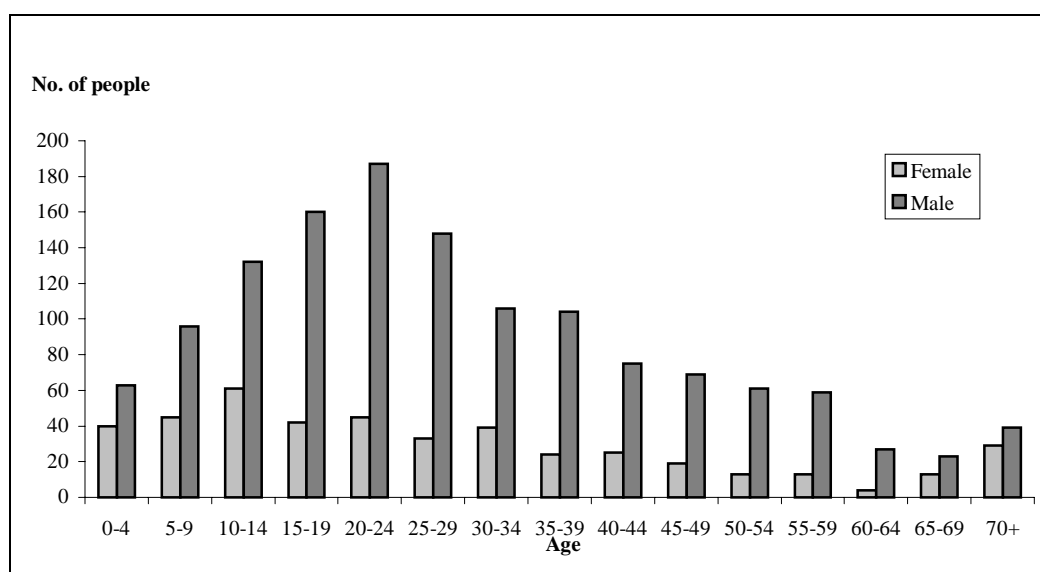


Figure 4.1 shows a peak in the males aged 20-24 years and for the females in the 10-14 age group, with minor peaks in the 20-24 and 30-34 age groups. Nearly half (47.0%) of the injuries occurred to people under the age of 30.

The indirect age standardised rates for injury presenting at ED and GP surgeries were 68.5 / 1 000 males per annum and 23.7 / 1 000 females per annum. The average ages ranged from 3 to 40.5 years and are displayed in Table 4.1 for each collection centre for all injury and farm injury. The indirect age standardised rate for males presenting at emergency departments was 48.3 / 1000 people per annum and for females it was 17.7 / 1 000 people per annum (standardised against the Queensland population).

**Table 4.1 Number of injuries and average age for all cases and farm cases by collection centre, July 1995 - June 1996 (N=1 800).**

Centre Name	ALL INJURY CASES									FARM INJURY CASES						
	People	Females	Male	Av.	SD	Average	SD	Average	SD	Total	% of all injury cases	Female	Male	Av.	Av.	Av.
				Age		Age		Age						Age	Female	Male
						Females		Males						Age	Age	Age
Surat Hospital	29	3	26	37.2	17.7	24.3	10.3	38.7	17.9	12	41		12	43.3		43.3
Chinchilla Hospital	160	26	134	25.7	17.3	19.8	14.6	26.8	17.6	36	23	6	30	34	26.8	35.4
Inglewood Hospital	2	1	1	3		3				0	0					
Texas Hospital	72	18	54	30.8	18.3	29.3	21.8	31.4	17.1	33	46	4	29	37.8	45.5	36.8
Wondai Hospital	79	31	48	30.1	19.7	35.6	25.9	26.5	13.2	20	25	7	13	29.3	27.6	30.2
Springsure Hospital	153	52	101	23.2	17.9	22.6	20.6	23.6	16.4	52	34	16	36	25.1	16.1	29.2
Kilcoy Hospital	212	40	172	29.4	19.2	30	17.5	29.3	19.6	29	14	4	25	35.3	30	36.2
Theodore Hospital	66	22	44	24.3	16.4	24	17.1	24.4	16.3	14	21	3	11	32.1	41	29.6
Taroom Hospital	148	39	109	32.7	21.8	34.3	26.8	32.1	19.9	60	41	10	50	38.3	26.7	40.6
Moura Hospital	181	39	142	27.5	16	25.9	17.4	27.9	15.6	50	28	7	43	29.9	29.4	30
Murgon Hospital	179	60	119	27.8	17.8	27.8	19.9	27.9	16.8	37	21	10	27	33.7	34.7	33.3
Drs' Black, Gilmore and O'Brien, Chinchilla	15	1	14	33.5	18.5	76		30.5	14.9	3	20	0	3	34		34
Dr C Owen, Inglewood	2	0	2	40.5	19.1			40.5	19.1	2	100	0	2	40.5		40.5
Dr S Sondergeld, Texas	11	1	10	35.4	13.5	36		35.3	14.1	7	64	1	6	32	36	31.3
Dr J Lock, Springsure	5	0	5	38.4	15.4			38.4	23.1	5	100	0	5	38.4		38.4
Dr J Gangemi, Murgon	107	17	90	33.7	19.3	34.3	23.1	33.6	18.8	17	16	3	14	46.6	39.7	48.1
Dr G McAllister, Murgon	222	59	163	29.2	19.1	27.2	21.5	29.9	18.2	50	23	17	33	27.6	20.2	31.5
Dr B Chater, Theodore	141	34	107	32.7	19.3	33	22.7	32.6	18.2	74	52	15	59	34.8	38.1	34
Dr P Harding, Taroom	7	2	5	30.7	23.7	10	1.4	39	23.2	2	29		2	63		63
Dr T Doolan, Kilcoy	9	2	7	33.2	16.4	44	19.8	30.1	15.7	6	67	2	4	32.8	44	27.3
<b>Total</b>	<b>1800</b>	<b>447</b>	<b>1353</b>	<b>29.1</b>	<b>18.8</b>	<b>28.3</b>	<b>21.2</b>	<b>29.4</b>	<b>17.9</b>	<b>509</b>	<b>28</b>	<b>105</b>	<b>404</b>	<b>33.5</b>	<b>28.7</b>	<b>34.8</b>

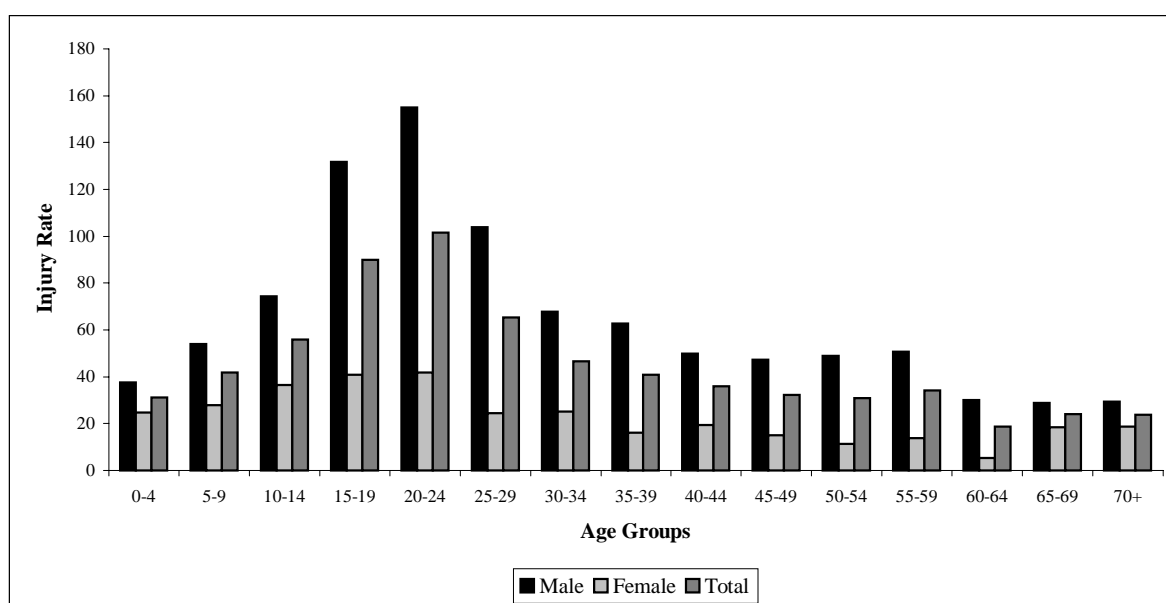


**Table 4.2 Age specific injury rates per 1 000 population per annum, July 1995 – June 1996**

Sex	Male Injury Rate	Female Injury Rate	Total	Ratio M:F
<b>Age</b>				
0-4	37.6	24.6	31.2	1.53
5-9	54.1	28.0	41.7	1.93
10-14	74.2	36.5	55.9	2.03
15-19	131.8	40.9	90.1	3.22
20-24	155.1	41.7	101.6	3.72
25-29	103.9	24.4	65.2	4.26
30-34	67.8	25.2	46.6	2.69
35-39	62.8	16.2	40.8	3.88
40-44	49.9	19.5	35.9	2.56
45-49	47.3	15.1	32.4	3.13
50-54	48.9	11.4	31.0	4.29
55-59	50.7	13.8	34.2	3.67
60-64	29.9	5.3	18.7	5.64
65-69	28.8	18.4	23.9	1.57
70+	29.4	18.8	23.7	1.56
<b>Total</b>	<b>65.2</b>	<b>23.4</b>	<b>45.2</b>	<b>2.79</b>

Table 4.2 shows that injury rates for males ranged from 28.7 / 1 000 males per annum for the 65-69 year olds to 155.1 / 1 000 males per annum for 20-24 year olds with an overall crude rate of 65.1 / 1 000 males per annum. The injury rates for females ranged from 5.3 / 1 000 per annum for 60-64 year olds to 41.7 / 1 000 per annum for the 20-24 year olds with an overall crude rate of 23.4 / 1 000 per annum.

**Figure 4.2 Age specific injury rates per 1000 population per annum, July 1995 – June 1996**



The age specific injury rates further emphasise the higher rate of injury in the adolescent and young adult males. This is also reflected in the females but not as markedly. There is a steady decline in both groups thereafter until the 55-59 age group when there is a slight rise.

**Figure 4.3 Monthly injury presentations for ED and GP surgeries attendance July 1995 - June 1996 (N=1 800)**

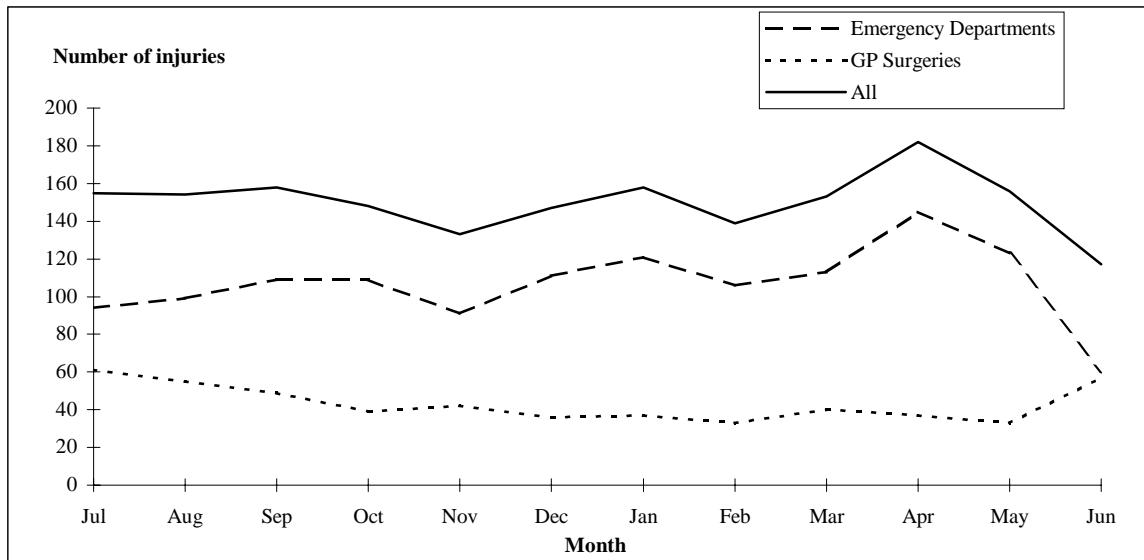


Figure 4.2 shows the comparison of monthly injury incidence for ED and GP surgeries. There appears to be a peak in injuries in April. GP surgeries saw a consistent number of people throughout the whole year with a slight increase between December and February. There was a large drop off of cases recorded attending ED towards May and June.

**Figure 4.4 Time of day that the injury occurred for all injuries by ED and GP surgeries, July 1995 - June 1996 (N=1 800)**

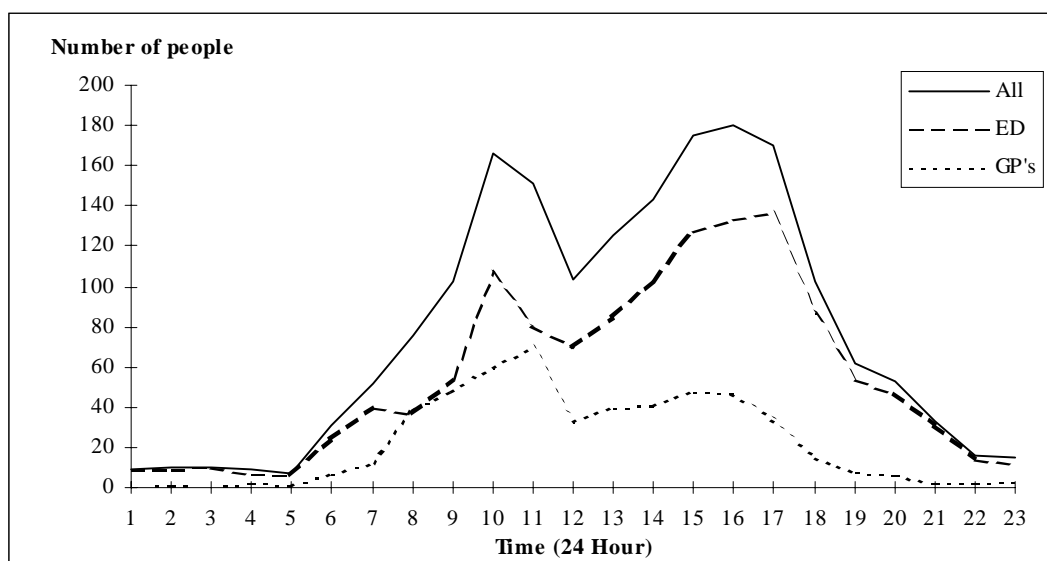


Figure 4.4, shows two peaks at 10 am and between 3 and 5 pm at the time of day the injury occurred. Very few injuries occurred between 7 pm and 7 am (2.4% of all injuries) and the

majority of these presented to the ED. GP surgeries saw the most injuries in any hour at 11 am, which is an hour after the ED morning peak, the injuries even out over the afternoon and steadily decrease from 5 pm onwards. There is a sharp drop around midday – a tendency found in the previous study.

**Figure 4.5 Comparison of daily incidence for ED and GP surgeries, July 1995 - June 1996 (N=1 800)**

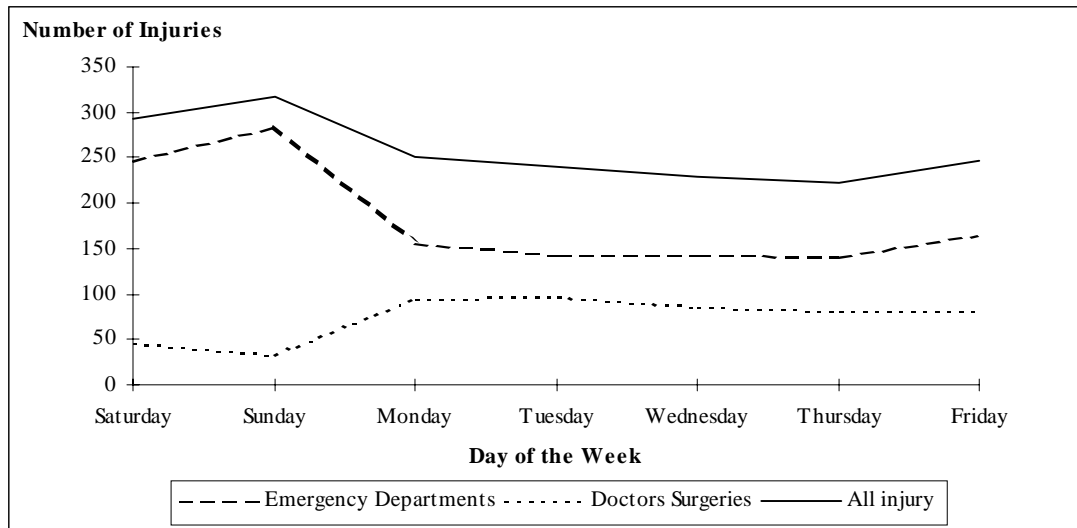
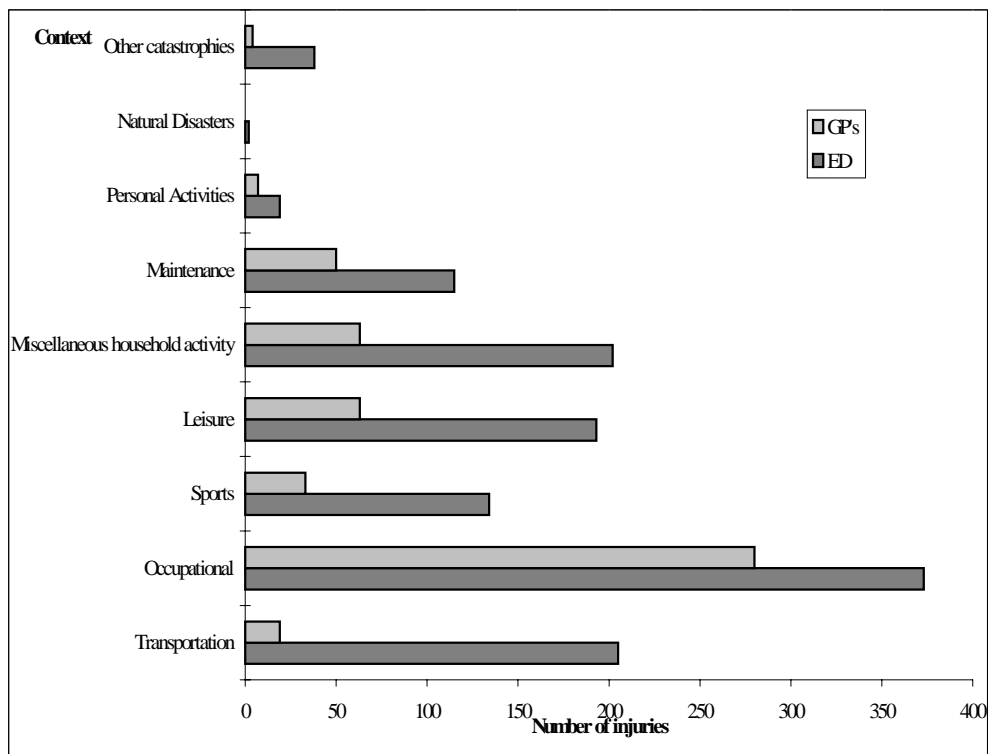


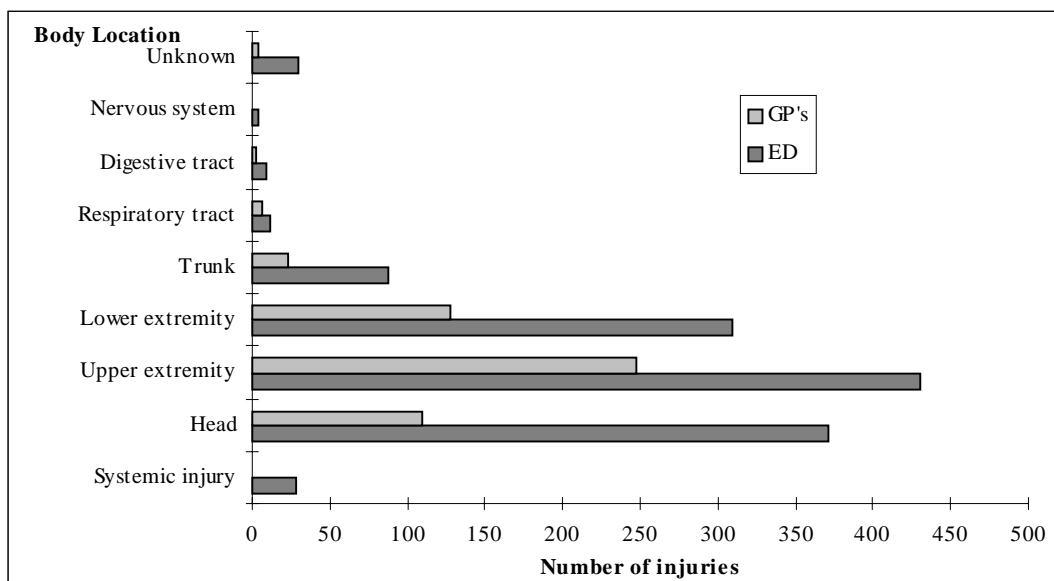
Figure 4.5 shows the day of injury and the place patients went to have the injury examined. It should be noted that the weekends see an increase in the number of injury cases and they are mostly seen in EDs. The rest of the week is very consistent.

**Figure 4.6 Context of all injury, July 1995 - June 1996 (N=1 800)**



In Figure 4.6, the context in which the injury event occurred is presented. It can be seen that the highest proportion of injuries were *occupational injuries* (36.3%), followed by *miscellaneous household activity* (14.7%) and *leisure* (14.2%). *Transportation* (12.4%), *sports* (9.3) and *maintenance* (9.2%), were the other significant injury groups. It is interesting to note that although *transportation* was the fourth largest groups of injuries, it was the third largest for ED presentations and only the 6th largest for GP surgery presentations. This could be due to traffic accidents being taken or directed preferentially to hospital EDs.

**Figure 4.7 Body location of injury, July 1995 - June 1996 (N=1 800)**



Note: Upper extremity includes shoulder to finger, lower extremity includes hip to toes.

Figure 4.7 displays the body location of the injury. The top three areas that were injured and presented at ED were *upper extremity* (33.6%), *head* (29.0%) and *lower extremity* (24.1%). For those people who presented at GP surgeries, the top three body locations injured are; *upper extremity* (47.8%), *lower extremity* (24.7%) and *head* (21.0%). As with transport injuries, head injuries would seem to preferentially go to hospital EDs.

**Table 4.3 Nature of injury by presentation to EDs and GP surgeries, July 1995 - June 1996**

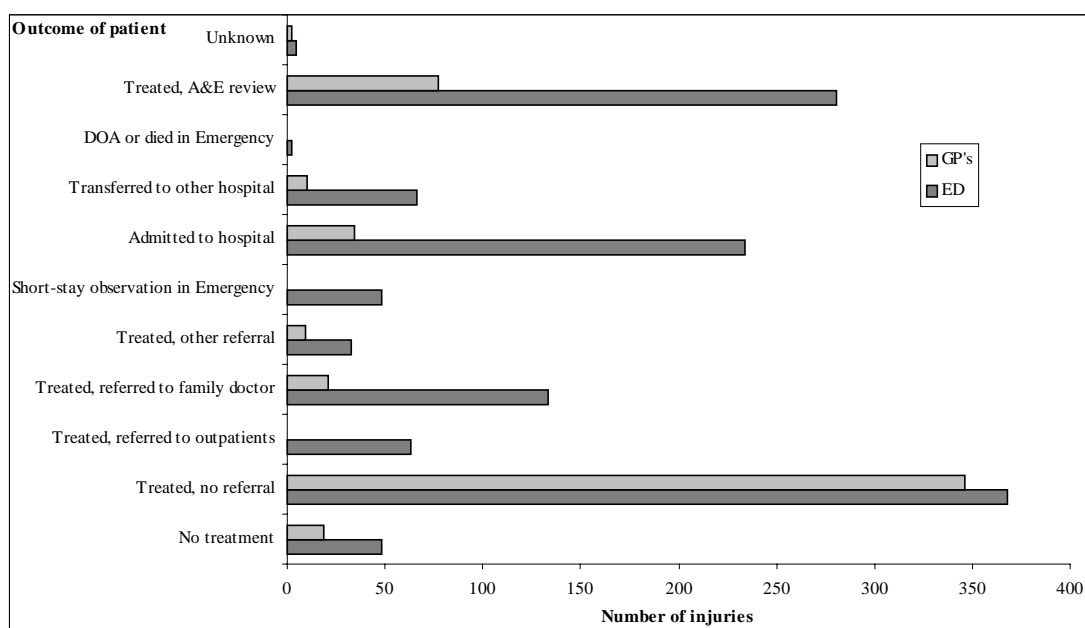
Nature of Injury	ED	GP Surgery	Total
	Presentations (N=1281)	Presentations (N=519)	%
	%	%	%
Cut/Laceration (N=637)	64	36	100
Puncture (N=57)	81	19	100
Bite (N=40)	80	20	100
Superficial Abrasion (N=51)	82	18	100
Penetrating wound (N=39)	67	33	100
Other wound inc. Amputation (N=12)	75	25	100
Haematoma / bruising (N=146)	78	22	100
Haemorrhage (N=5)	100		100
Inflammation / oedema / tenderness (n=77)	79	21	100
Burn, full thickness (N=6)	83	17	100
Burn, partial thickness (N=60)	77	23	100
Foreign body in soft tissues (N=77)	57	43	100
Crushing injury (N=45)	76	24	100
Fracture (N=205)	70	30	100
Dislocation (N=39)	90	10	100
Sprain / strain (N=124)	61	39	100
Poisoning (N=72)	90	10	100
Asphyxiation or respiratory difficulty (N=15)	53	47	100
Electric (N=2)	100		100
Over-exertion, heat/cold stress (N=3)	100		100
Concussion (N=60)	90	10	100
Dental Injury (N=1)	100		100
No injury detected (N=17)	82	18	100
Unknown (N=10)	80	20	100
<b>Total (N=1 800)</b>	<b>71</b>	<b>29</b>	<b>100</b>

Table 4.3 displays the major injuries sustained presenting to ED as *cut / laceration* (31.8%), followed by *fracture* (11.2%), *haematoma / bruising* (8.9%), *Sprain / strain* (5.9%) and *Poisoning* (5.1%). The five main injuries by nature presenting at GP surgeries were respectively, *cut / laceration* (44.3%), *fracture* (11.8%), *sprain / strain* (9.2%), *foreign body in soft tissue* (6.4%) and *haematoma / bruising* (6.2%).

Although, in the data collected, EDs exceed GP surgeries in all areas, the GP surgeries tend to see comparable numbers of lacerations, foreign bodies in tissues, sprains and asphyxiation or respiratory difficulties. EDs predominate in areas of haemorrhage, burns, dislocation, poisoning, electrocution, over-exertion / heat / cold stress, concussion and dental injury.

Of people who received a *head* injury, 40.9% had a *cut / laceration*, 11.9% had *foreign bodies in soft tissue* (usually *foreign bodies in eyes*), 8.6% had a *concussion* and 7.3% had a *haematoma / bruising*. People who received an injury to their *upper extremity* the majority were *cut/laceration* (40.1%), followed by *fractures* (18.1%), *haematoma / bruising* (6.5%), *sprain / strain* (5.8%) and *dislocation* (4.7). For the *lower extremity* injuries, *cut / laceration* (35.8%) made up the largest proportion, then *fracture* (13.3%), *sprain / strain* (13.1%) and *haematoma bruising* (7.6%).

**Figure 4.8 Outcome for patients, July 1995 - June 1996 (N=1 800)**



In Figure 4.8, the outcome for patients after presentation is shown for ED and GP surgeries. Of those who presented at ED, 28.7% were *treated, with no referral*, 21.9% were *treated, and A&E review* and 18.2% were *admitted to hospital*. There were two deaths in the study, both of the death occurred in the ED and were involved in *leisure / recreational* activities when the injuries were sustained. Only 4.2% required *transfer to another hospital* – most injuries appear to have been dealt with effectively at a local level.

Of those who went to GP Surgeries, 66.9% were *treated, with no referral*, 14.8% were *treated and A&E reviewed* and 6.6% were *admitted to hospital*. Overall, the three main outcome types were *treated, no referral* (40.5%), *treated, A&E referred* (20.0%), and *admitted to hospital* (14.3%).

The four most common injuries in descending order were *cut / laceration* (36.2%), *fracture* (11.6%), *haematoma / bruising* (8.3%) and *sprain / strain* (7.1%). Of those who received a *cut / laceration*, 49.0% were *treated and no referral*, 26.5% were *treated and A&E reviewed* and 8.8% were *treated and referred to the family GP*. For those who received a *fracture*, 27.0% were *admitted to hospital*, 24.0% were *treated with no referral*, a similar number of people were *transferred to other hospitals* (15.2%) and *treated, A&E review* (14.7%). People who had a *haematoma or bruising* (45.2%) were *treated, no referral*, 18.5% were *admitted to hospital*, and the same number were given *no treatment* (11.6%) and *treated, A&E review* (11.6%).

When examining the three most common body parts injured - *upper extremity* (38.4%), *head* (27.1%) and *lower extremity* (24.7%), the outcome from treatment was the following: For the *upper extremity*, 45.9% were *treated with no referral*, 20.6% were *treated, A&E reviewed*, 9.9% were *treated and referred to the family GP*, and 9.8% were *admitted to hospital*. For the *head*, 36.0% were *treated with no referral*, 23.1% were *treated, A&E reviewed* and 16.6% were *admitted to hospital*. For the *lower extremity*, 44.6% were *treated with no referral*, 19.3% were *treated, A&E reviewed* and 11.3% were *admitted to hospital*.

**Figure 4.9 Day of the week and context of injury event, July 1995 - June 1996 (N=1 800)**

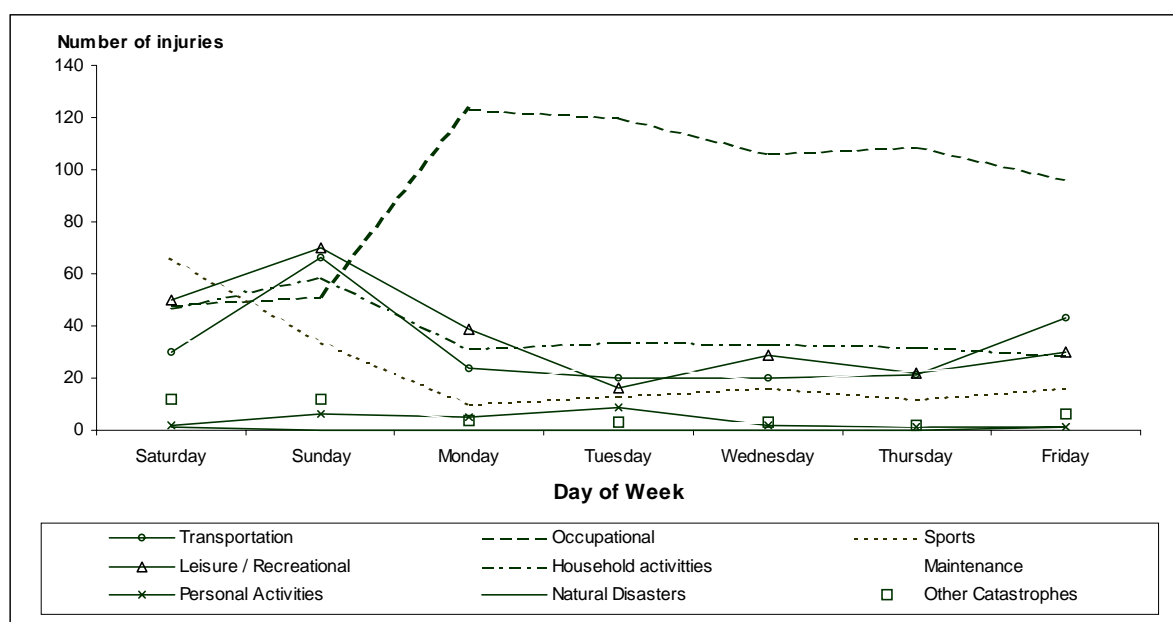


Figure 4.9 displays the relationship between the day of the week and the context in which injury event occurred. It can be seen that occupational injuries occur mainly through the week, sport and maintenance occurs on weekends with Saturday seeing the largest numbers. The weekend also sees large number of transportation, leisure / recreational and household activities being the context of the injury, with Sunday dominating.

**Table 4.4 Context of injury event and outcome, July 1995 - June 1996 (N=1 791)**

	Nil %	Minor %	Treated / Referred %	Stay in ED %	Admitted to Hospital %	Total* %
Transportation (n=222)	8.1	22.1	16.2	19.4	34.2	100.0
Occupational (n=650)	1.5	43.1	12.2	24.8	18.5	100.0
Sports (n=167)	4.8	36.5	13.8	26.3	18.6	100.0
Leisure/Recreational (n=254)	4.3	43.3	16.9	18.5	16.9	100.0
Household activities (n=263)	4.6	40.7	17.5	22.8	14.4	100.0
Maintenance (n=165)	4.8	50.9	10.9	20.6	12.7	100.0
Personal Activities (n=26)	0.0	38.5	11.5	23.1	26.9	100.0
Natural Disasters (n=2)	0.0	0.0	0.0	0.0	100.0	100.0
Other Catastrophes (42)	0.0	31.0	28.6	26.2	14.3	100.0
<b>Total (N=1 791)</b>	<b>3.7</b>	<b>39.9</b>	<b>14.5</b>	<b>22.7</b>	<b>19.2</b>	<b>100.0</b>

\* Note some totals don't equal 100 due to rounding.

Table 4.4 displays the context of the injury event in relation to the outcome of treatment received. It can be seen that those who received nil treatment represented very few injury cases. Of this group, transportation injuries are larger than the average. Minor injuries was the largest group of injuries (39.9%). For injuries of this severity, those with injuries from maintenance related activities had half (50.9%) of the injuries in this group. For those injuries that were treated and referred other catastrophes have nearly double the average. For injuries



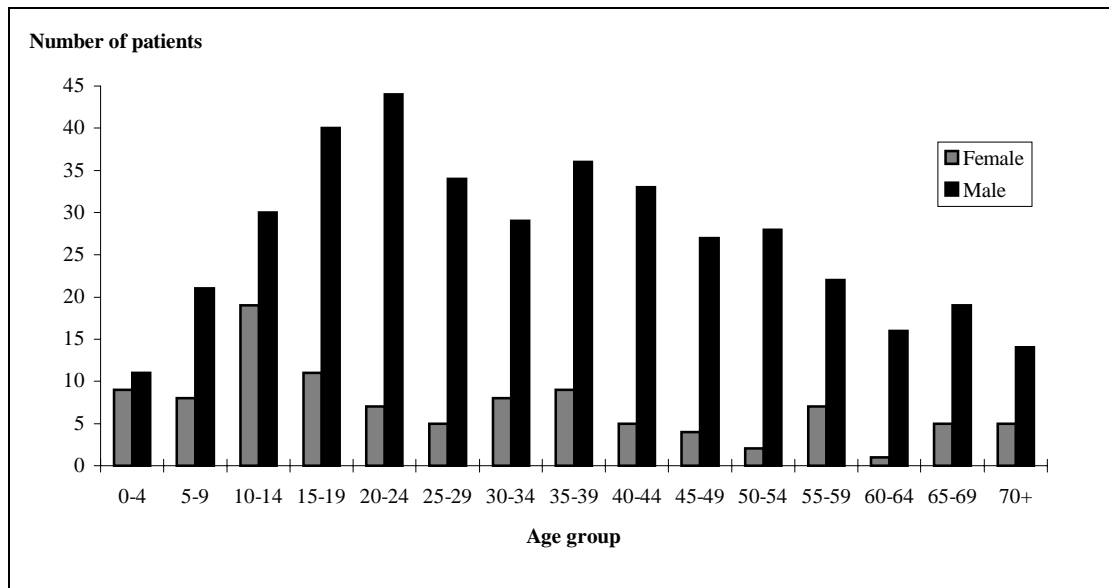
that required a short stay in an ED, most activities had about 20% of all their injuries in this group.

As the severity of the injury increased, transport, compared to the rest, had a larger number of injuries. Injuries that required a person to be admitted to hospital comprised 19.2% of all injuries, but for transport injuries it was 34.2% of all injuries, and for those involved in personal activities, 26.9% were admitted to hospital.

## Section 2: Farm Injuries

There were 509 farm injuries during the study period. Of these, 105 (21%) were females and 404 (79%) were males. The average age of those injured on farms was 33.5 years - for males 34.8 years and for females 28.7 years which was significantly younger ( $p=0.0076$ , t-test) than the males. Those who presented to ED with a farm injury were on average 3 years ( $p=0.0076$ , t-test) younger than those presenting to GP surgeries.

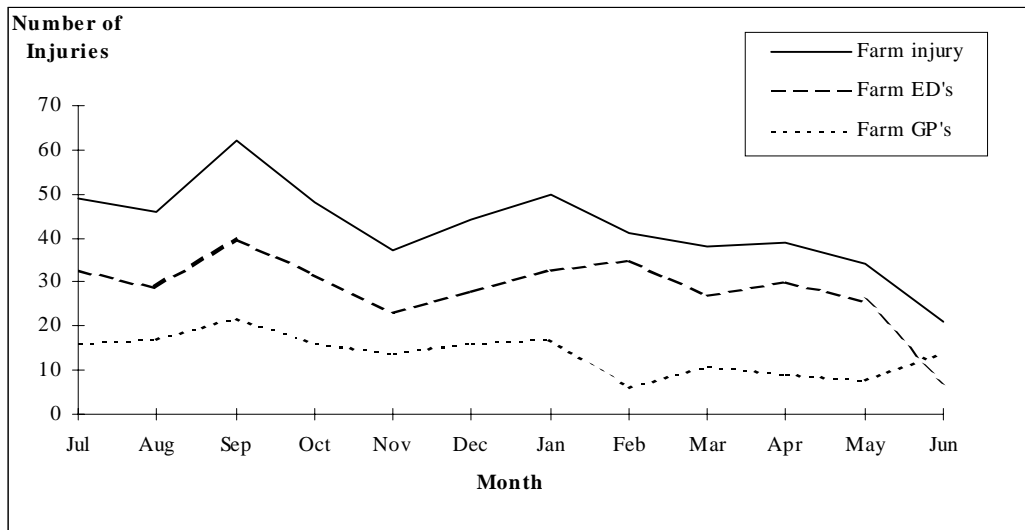
**Figure 5.1. Number of injuries reported by age and sex, July 1995 - June -1996 (N=509)**



For farm injuries, 77% occurred to people under the age of 50 years and 39% of the injured population was aged 24 years or less. Injuries to females on farms showed a major peak in the 10-14 age group and minor peaks in the 35-39 age group and the 55-59 age group. For female farm injuries, 51% occurred to females less than 25 years of age, 77% of the injuries were to females less than 45 years old.

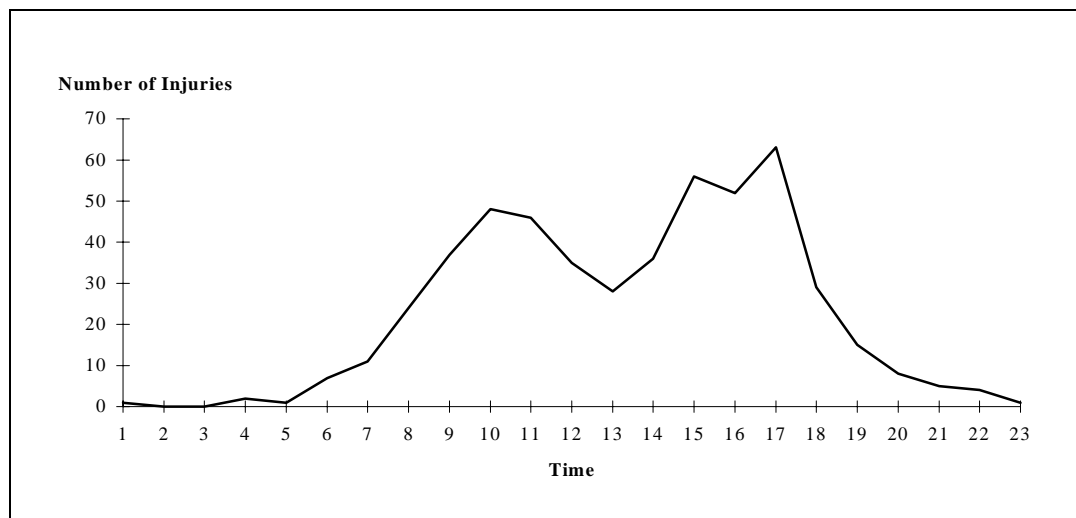
Males farm injuries peak at the 20-24 age group with minor peaks at 35-39 years and 50-54 years. In the males over half (52%) of those injured were less than 35 years and 75% of the males were aged less than 50 years. Both sexes had a minor peak at 65-69. It was not possible to calculate age-specific rates as there was no denominator data.

**Figure 5.2. Monthly farm injury presentations for ED and GP surgeries attendance July 1995 - June 1996 (N=509)**



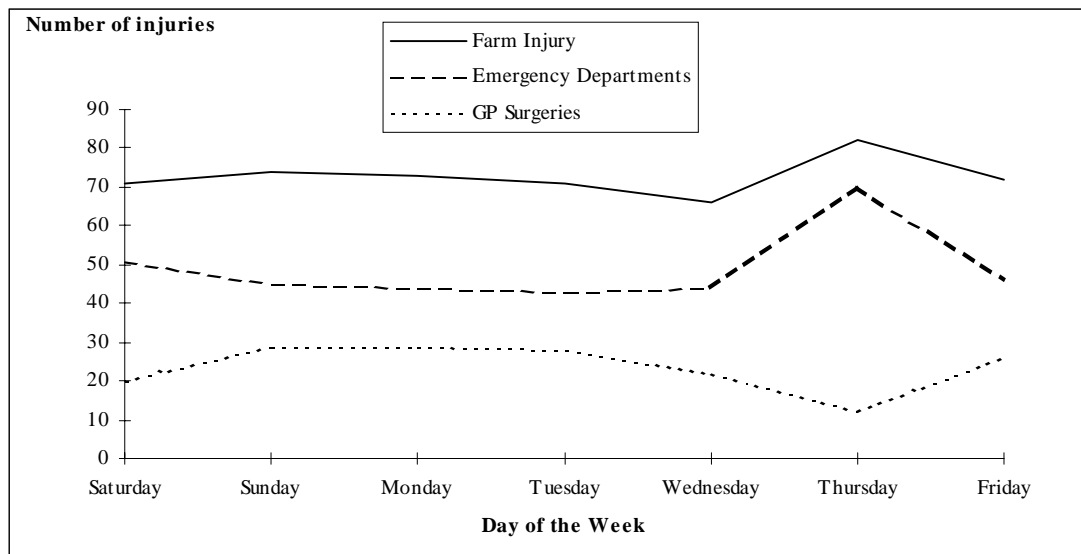
The average number of farm injury cases per month was 42, which was on average 9.8 cases per week for the study area. There was a major peak of cases around September and another in January. There was a decline in cases from the middle of the study onwards. GP surgeries saw more injuries than the emergency departments in June due to a decline in ED reports.

**Figure 5.3. Time of the day that the injury occurred for farm injuries by ED and GP surgeries, July 1995 – June 1996 (N=509)**



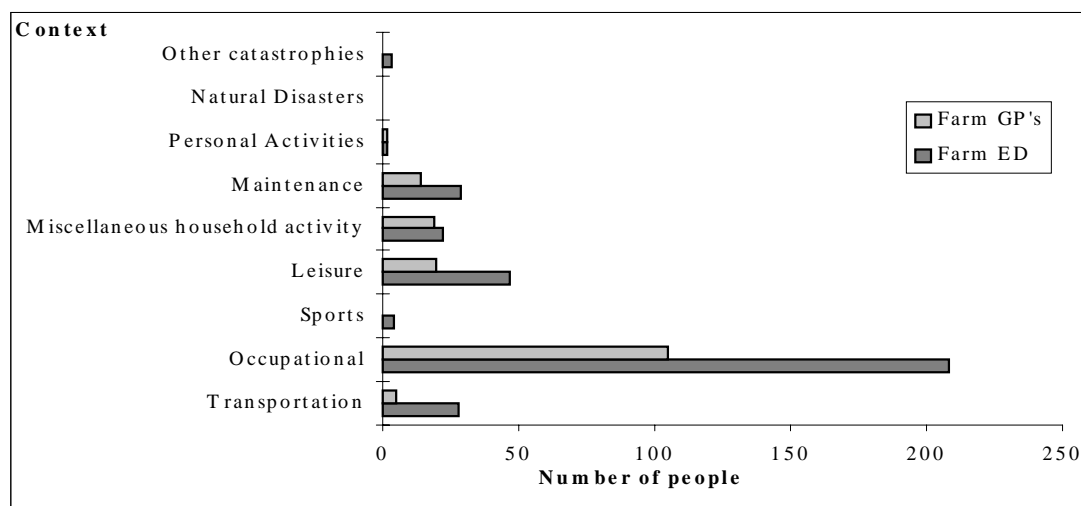
As can be seen in Figure 5.3 there were peaks in injuries between 10 and 11 am and from 3 - 5 pm. There was a steady decline in injuries from 5 to 9 pm. There are very few farm injury cases between 9 pm and 6 am (4% of all farm cases) and a decline in injuries around 1pm.

**Figure 5.4. Comparison of daily incidence of farm injuries for ED and GP surgeries, July 1995 - June 1996 (N=509)**



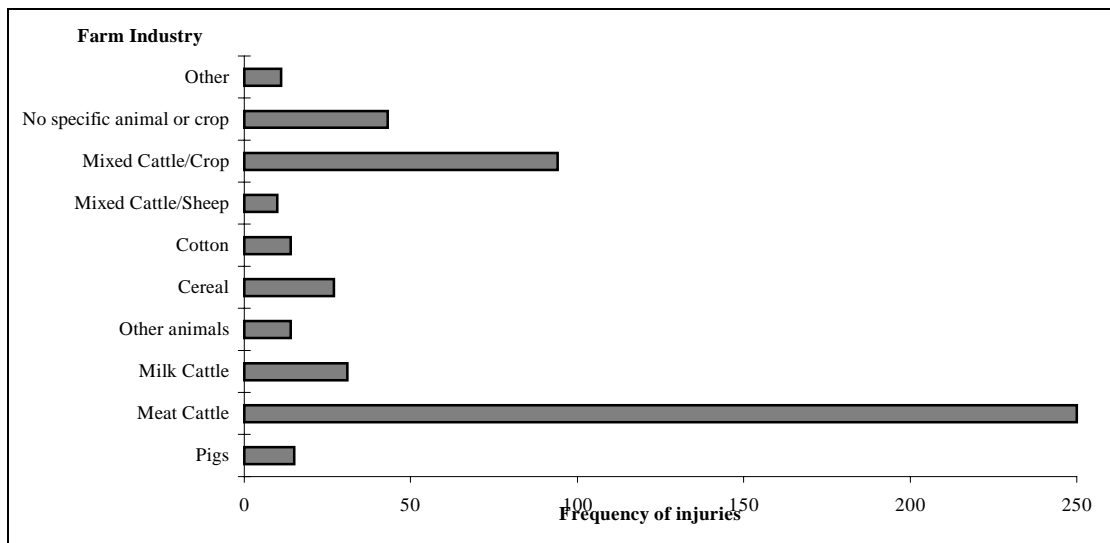
In Figure 5.4, farm injury presentations were fairly consistent throughout the whole week with the exception of Thursday, where there was a slight increase in cases presenting at ED with a corresponding decline in patients being seen at GP surgeries. The cause of this is not evident from the data.

**Figure 5.5. Context of injury for those who had an injury on a farm, July 1995 – June 1996 (N=509)**



The majority of farm injuries as seen in Figure 5.5 are *occupational injuries* (61.5%), followed by *leisure* (13.2%), then *maintenance* (8.4%) and *miscellaneous household activity* (8.1%).

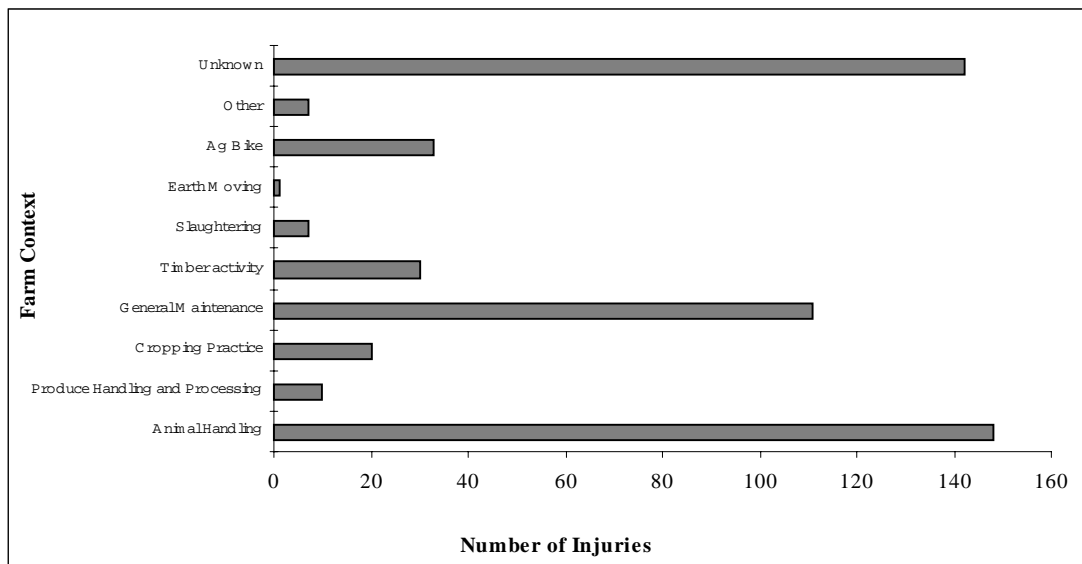
**Figure 5.6. Agricultural industry for farm injuries, July 1995 – June 1996 (N=509)**



Note: Other includes the following industries: Peanuts, tobacco, fodder/hay/forestry and mixed sheep/crop; other animal includes: poultry, sheep, goats, horses, stud cattle and other animal and cereal includes: wheat, sorghum and cereal general. These have been grouped due to the small number of injuries.

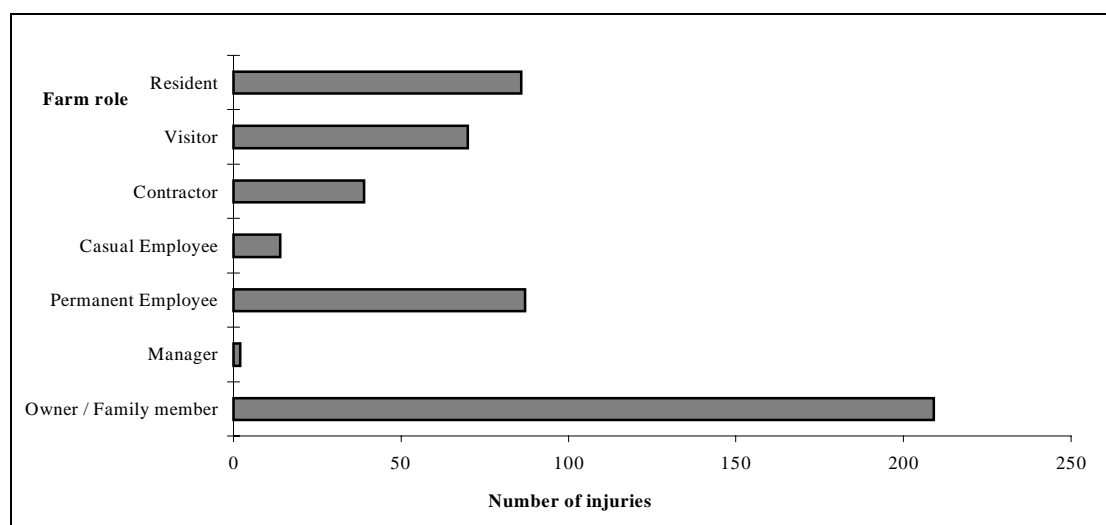
In Figure 5.6, agricultural industry of farm where injury occurred is presented, *meat cattle* represent half (49%) of those injured, followed by *mixed cattle / crop* (18.5%).

**Figure 5.7. Broad agricultural activity at the time of injury, July 1995 – June 1996 (N=509)**



In Figure 5.7, the agricultural activity at time of injury is displayed. *Animal handling* (29.1%) followed by *general maintenance* (21.8%), represent over half of all injuries. The ‘*unknown*’ category is the second largest category (27.9%), representing over a quarter of all injuries.

**Figure 5.8. The role of the person on the farm who was injured, July 1995 – June 1996 (N=509)**



The role of the person on the farm who was injured is presented in Figure 5.8. The largest number of injuries occurred to the *owner / farm manager* group (41.1%), followed by *permanent employees* (17.1%) and then *residents* (16.9%). However, the rate of injury for *owners / farm managers* is 59.8 / 1 000 people per annum but for the *agricultural and horticulture labourers*, it was 112.9 / 1 000 people per annum. The crude injury rate for each SLA varied from 19.6 to 237.0 per annum per 1 000 people for farm *owners/managers* and from 24.1 to 237.5 per annum per 1 000 people for *farm labourers* (See Appendix 3).

**Table 5.1. Farming enterprise by role on farm of injured person, July 1995 – June 1996 (N=509)**

Farm industry	Owner / manager*	Employee**	Contractor	Visitor	Resident	Total
Other	3	3	2	1	1	10
No specific animal or crop	17	0	2	12	12	43
Mixed Cattle / Crop	39	16	6	9	24	94
Mixed Cattle / Sheep	7	0	1	2	0	10
Cotton	4	7	0	1	2	14
Cereal	10	0	4	3	10	27
Other animals	5	2	2	3	2	14
Milk Cattle	14	4	2	6	5	31
Meat Cattle	105	66	20	32	27	250
Pigs	7	3	0	1	3	15
Total	211	101	39	70	86	508

\* Owner manager includes individuals of owners, family member working and manager

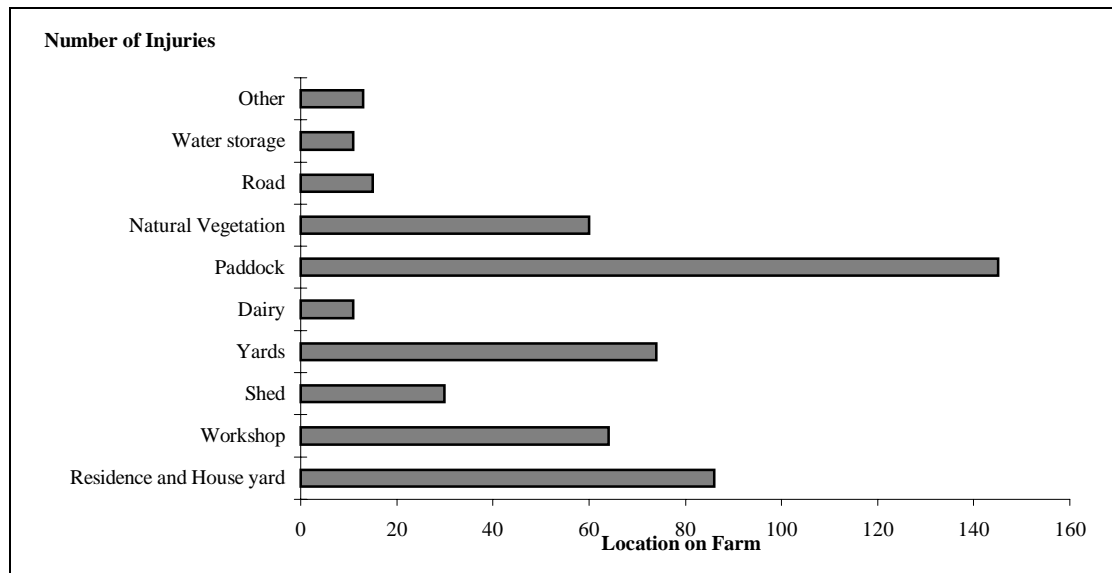
\*\* Employee includes individuals of both full-time and part time employees

In Table 5.1 the farming enterprise by role of injured person, shows that although 41.5% of injuries occurred to *farm owner / manager*, the group of *visitors* (13.8%) and *residents* (16.9%) made up 30.7% of all injured. This is particularly true in the *no specific animal or crop* where *visitor & resident* exceed 50% – this may represent smaller farms where farming is not the major source of income.

There was not a significant difference in the average age of people presenting at ED and GP surgeries for farm injuries. The only group of people that had a significant difference in age

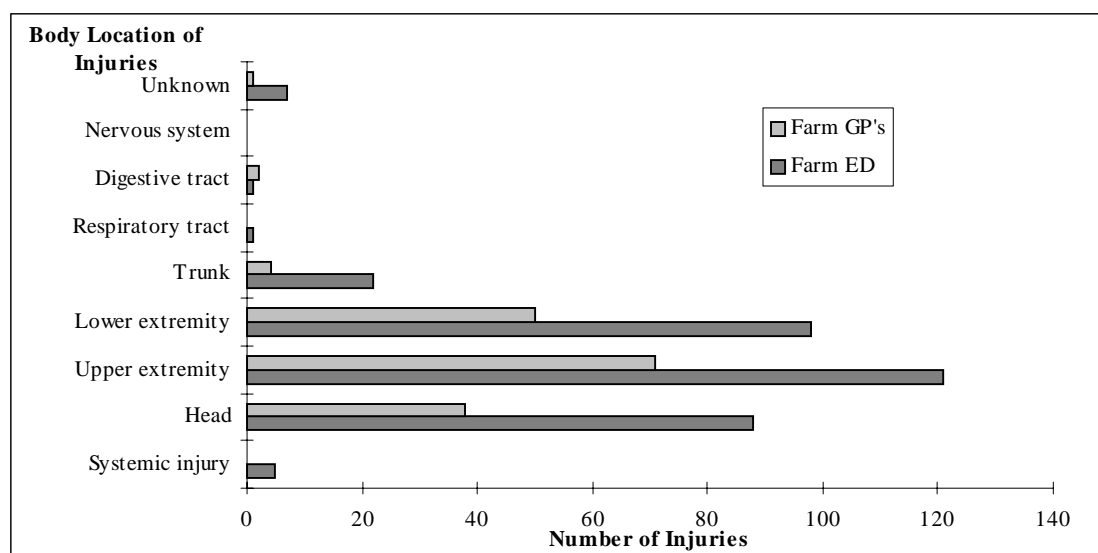
for farm role was the *farm owners / farm managers* and *family members* for presentation at ED and GP surgeries. Those presenting at ED were on average, 7 years older than those who presented at GP surgeries.

**Figure 5.9 Location on farm where injury event occurred, July 1995 – June 1996. (N=509)**



In Figure 5.9, the location on farm where the injury event occurred is displayed. The *paddock* (28.5%) was where most injuries occurred, followed by the *residence and house yard* (16.9%), *yards* (14.5%), *workshop* (12.6%) and *natural vegetation* (11.8%).

**Figure 5.10 Body part injured in a farm injury, July 1995 – June 1996 (N=509)**



Note: Upper extremity includes shoulder to finger, lower extremity includes hip to toes.

**Table 5.2 Nature of injury for farm injury by presentations to ED and GP Surgeries, July 1995 - June 1996 (N=509)**

Nature of Injury	Emergency Department Presentations (N=343)	GP Surgeries Presentations (N=166)
	%	%
Cut / Laceration	32.4	43.4
Puncture	3.5	0.6
Bite	1.7	1.8
Superficial Abrasion	3.5	0.6
Penetrating wound	3.2	0.6
Other wound inc. amputation	0.6	1.2
Haematoma / bruising	5.8	6.0
Haemorrhage	0.6	0.0
Inflammation / oedema / tenderness	5.0	3.6
Burn, full thickness	0.3	0.0
Burn, partial thickness	5.2	2.4
Foreign body in soft tissues	4.4	12.0
Crushing injury	2.9	3.6
Fracture	13.1	14.5
Dislocation	4.1	0.0
Sprain / strain	5.5	4.8
Poisoning	1.7	1.8
Asphyxiation or respiratory difficulty	0.9	0.6
Electric	0.3	0.0
Over-exertion, heat / cold stress	0.6	0.0
Concussion	3.2	1.8
Dental Injury	0.3	0.0
No injury detected	0.3	0.6
Unknown	0.9	0.0
Total	100.0	100.0

In Table 5.2, the nature of injury for farm injuries is displayed for ED and GP surgeries. In ED, *cut / laceration* is the major injury group (32.4%), followed by *fracture* (13.1%), *haematoma / bruising* (5.8%) and *Inflammation / oedema / tenderness* (5.0%). For those people with farm injuries that presented at GP surgeries, the major injury group was *cut / laceration* (43.4%), followed by *fractures* (14.5%) and *foreign body in soft tissue* (12.0%). General practices deal with a significant number of these injuries requiring more procedural interventions.

Figure 5.10 displays the body part injured by ED and GP surgery presentations for farm injuries. The major area of the body that was injured, presenting at both ED and GP surgeries, was the *upper extremity* 35.3% and 42.8%, *lower extremity* 28.6% and 30.1% and the *head* 25.7% and 22.3% respectively. The larger number presentation of head injuries probably reflects the potential severity of these injuries.



**Figure 5.11. Outcome for an injured person for farm injuries, July 1995 – June 1996 (N=509)**

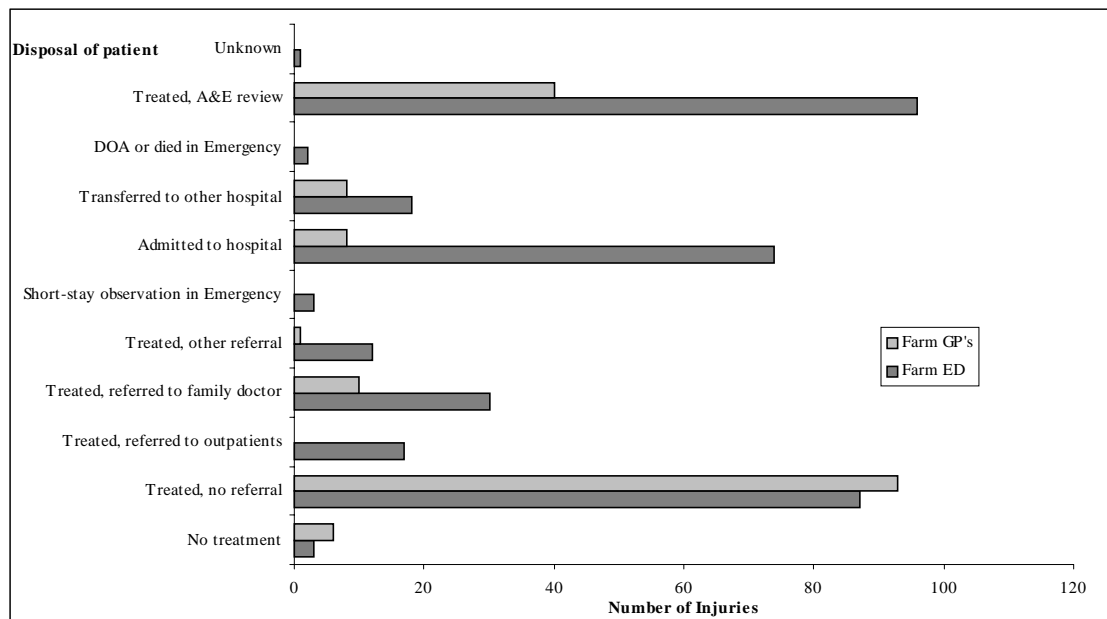


Figure 5.11 exhibits the outcome of injury after the person presented with a farm injury. For the ED the largest group was *treated, A&E referral* (28.0%), followed by *treated, no referral* (25.4%), *admitted to hospital* (21.6%) and *treated, referred to family GP* (8.7%). For those who presented to GP surgeries with farm injuries, the majority were *treated and no referral* (56.0%), followed by *treated, A&E referral* (24.1%), *treated referred to family GP* (6.0%) and *Admitted to hospital* (4.8%) and *transferred to hospital* (4.8%). For farm injuries, 76.6% of the treatment was: *treated, no referral* (35.4%); *treated, A&E review* (26.3%); and *admitted to hospital* (14.9%). These are similar to the overall injury picture.

The three major body regions presenting within farm injuries were examined for the nature of injuries - *upper extremity* (37.7%), *lower extremity* (29.1%) and *head* (24.6%). When these three areas were further divided into nature of injury - the following results. For *upper extremity*, *cut / laceration* (42.2%) was the largest group followed by *fracture* (19.3%), and then *haematoma / bruising* (6.3%). The *lower extremity* also had *cut / lacerations* (39.2%) as the largest group, then *fracture* (15.5%) and thirdly *sprain / strain* (8.8%). The nature of injury to the *head* were as follows *cut / laceration* (34.4%) followed by *foreign body in soft tissue* (21.6%), *concussion* (9.6%) and *burn, partial thickness* (8.8%).

A review of the treatment provided for the three major body areas affected by injury revealed that the upper extremity, the largest group, was *treated, no referral* (40.1%); followed by *treated, A&E review* (28.6%); then *admitted to hospital* (11.5%) and *treated, referred to family GP* (8.3%). For those who received injuries to their *lower extremities* from farm injuries received the following treatment: *treated, no referral* (41.2%); *treated, A&E reviewed* (26.4%); *admitted to hospital* (10.8%); and *treated, referred to family GP* (8.1%). For farm injuries to the *head* the following occurred: *treated, no referral* (28.8%); *treated, A&E reviewed* (28.0%); and *admitted to hospital* (20.0%). The higher rate of hospital admission is consistent, as discussed above, with the potential severity of the injuries.

The nature of injury can be divided into four major groups, *cut / laceration* (36.0%), *fracture* (13.6%), *foreign body in tissue* (6.9%) and *haematoma / bruising* (5.9%). Of those with farm

injuries who received a *cut / laceration*, 45.4% were *treated with no referral*, 8.2% were *treated and referred to family GP* and 4.9% were *admitted to hospital*.

For those who sustained a *fracture*, the following treatment was given: *admitted to hospital* (27.5%), *treated, no referral* (26.1%), *transferred to another hospital* (17.4%) and *treated A&E reviewed* (14.5%). The 17.4% of fractures that were transferred to another hospital may represent more severe fractures requiring specialist services. In contrast, farm injuries caused by a *foreign body in soft tissues* are most commonly treated locally and discharged, with 45.7% being *treated, no referral* and 42.3% being *treated, A&E reviewed*.

For *haematoma / bruising* injuries on farm, 43.3% were *treated, no referral*; 23.3% were *treated, A&E reviewed*; and 20.0% were *admitted to hospital*.

**Figure 5.12. Workers compensation claims for farm injuries, July 1995 – June 1996 (N=509)**



Figure 5.12 shows those who submitted claims for workers compensation, for farm injuries. Overall, very few (49: 9.6%) farmers claimed workers compensation. There was no statistical difference in the number of people presenting at GP surgeries (13: 7.8%) and ED (36: 10.5%) who claimed workers compensation. There were 5 people under the age of 15 who were working on farm at the time but none of them claimed workers compensation.

**Table 5.3 Workers compensation claim in relation to role on farm, July 1995 – June 1996 (N=314)**

	Owner / Family Member (156) %	Manager (2) %	Permanent Employee (85) %	Casual Employee (14) %	Contractor (36) %	Visitor (11) %	Resident (10) %	Total (314) %
Not on the Job (4)	2.6	0.0	0.0	0.0	0.0	0.0	0.0	1.3
On the Job - Workers Compensation Claimed (49)	1.3	0.0	42.4	21.4	19.4	9.1	0.0	15.6
On the Job - Workers Compensation Not Claimed (224)	88.5	100.0	47.1	57.1	52.8	63.6	100.0	71.3
On the Job - Not Known If Workers compensation claimed (37)	7.7	0.0	10.6	21.4	27.8	27.3	0.0	11.8
<b>Total*</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

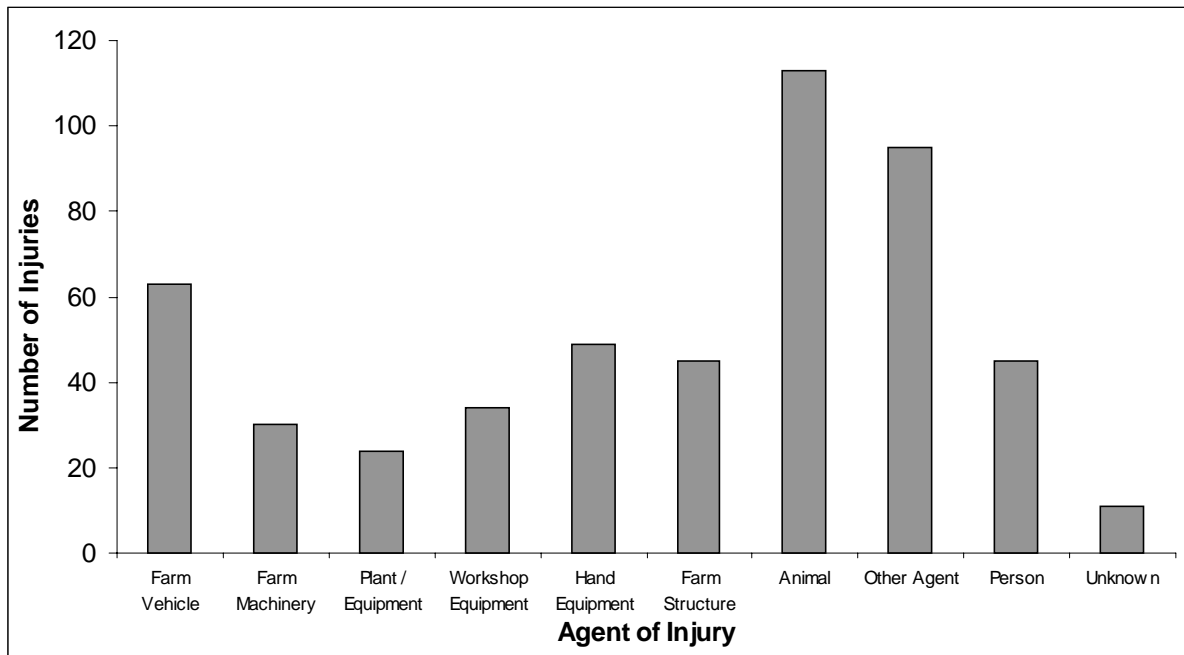
\*Note: Some totals don't add to 100 due to rounding.

Table 5.3 displays workers compensation claims according to role on farm. Of injuries to *owner / family member*, 96.2% of the injuries were on the job, but only 1.3% of these claimed compensation through the workers compensation scheme. Of injuries to *permanent employees*, all are on the job and nearly half (42.4%) claimed workers compensation. For injuries to *casual employee's* 21.4% claimed workers compensation. *Contractors* claimed workers compensation on 19.4% of all work injuries. Claims for workers compensation represented 49 (15.6%) of the job injuries, but *permanent employees* made up nearly three-quarters (73.5%) of all these claims.

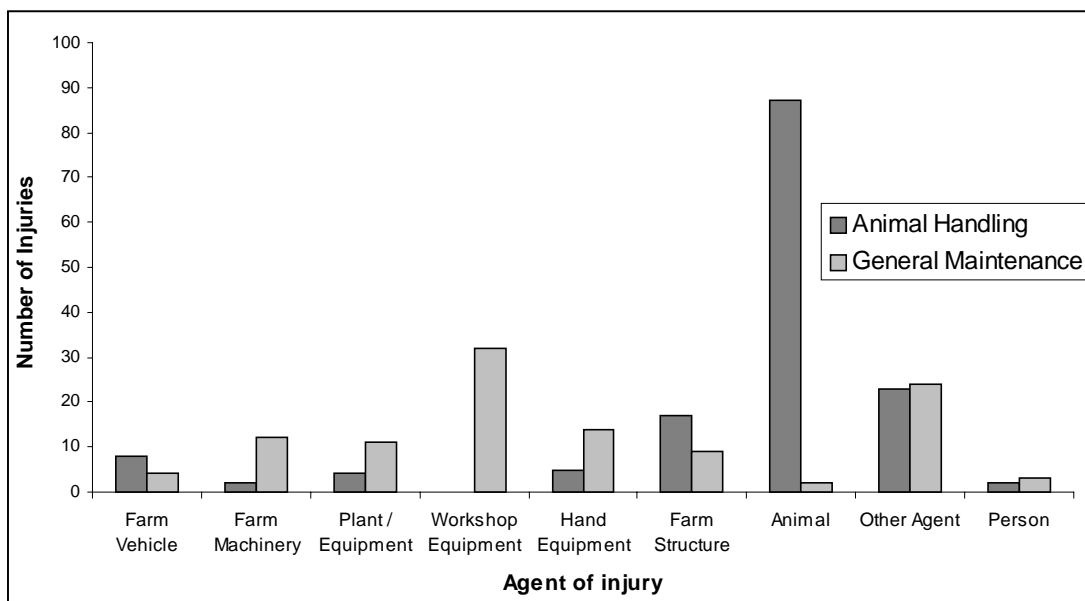
### ***Farm agent of Injury***

Figure 5.13, shows that 22.7% of all injuries were caused by *animals*, the next largest group was the *other agent* (19.1%), followed by *farm vehicle* (12.7%). *Hand equipment* (9.8%), *farm structure* (9.0%) and *person* (9.0%) each represented close to 10% of all injuries.

**Figure 5.13 Agent of Injury for farm injuries, July 1995 - June 1996 (N=509)**



**Figure 5.14. Agent of Injury for those who were injured in the ‘Animal Handling’ context or the ‘General Maintenance’ context, July 1995 – June 1996 (n=259)**



Of the injuries from where the context was *animal handling*, the major agent of injury was *animals* (59%) - of these 48 (55%) were from *horses* and 35 (40%) were from *cattle*. Of those injured by a *horse*, for 17 (35%) the cause was from *falling off the horse*. For those people injured by *cattle*, 16 (46%) were due to the *animal charging*. There were only eight *farm vehicle* related injuries while *animal handling* - of these six (75%) were from 2 *wheeled-motorcycles*.

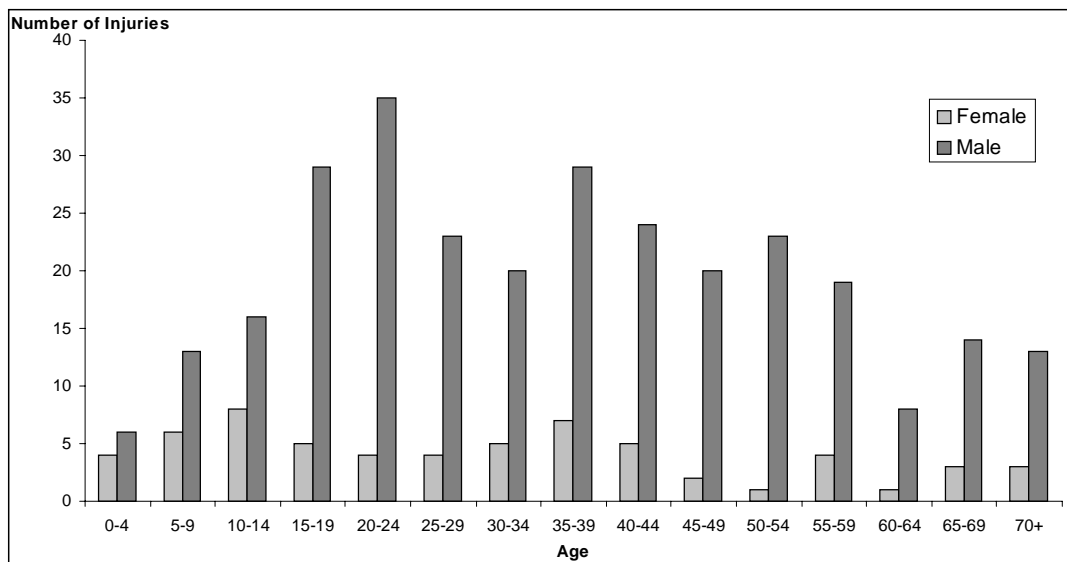
Thirty-two (29%) of injuries from activities associated with *general maintenance*, were associated with *workshop equipment*. Of those injuries that occurred in the *workshop*, 10 (31%) were from *angle grinders*.

## Section 2A: Injury in the cattle industry

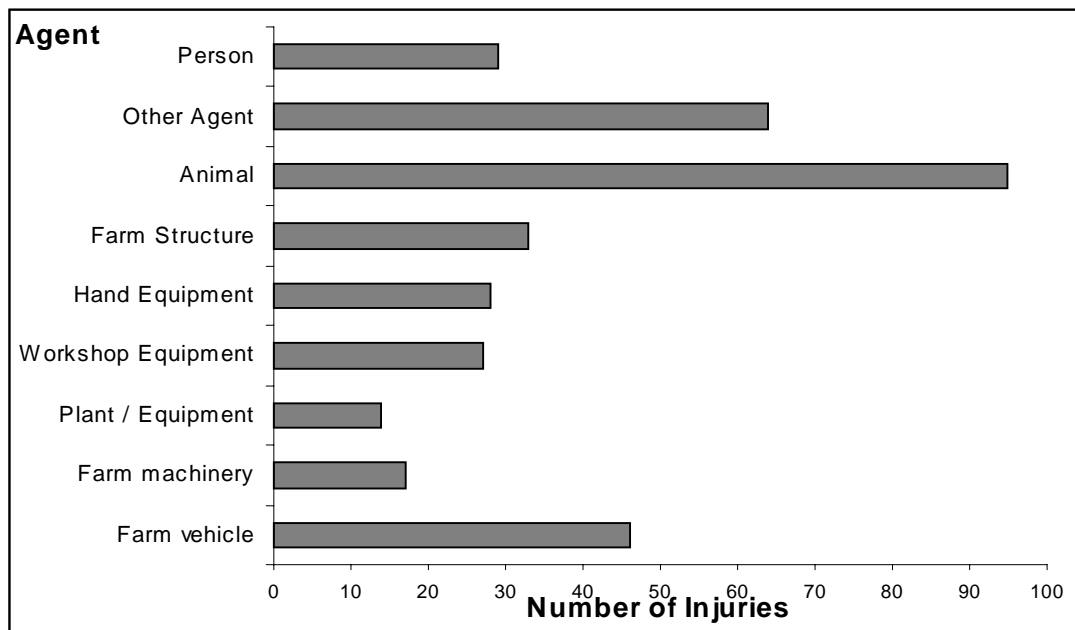
Large numbers of injuries on farms (354: 70%) in this study were associated with the cattle industry. A summary profile is included. The commodity groups that were included were; meat cattle, mixed cattle / sheep and mixed cattle /crop.

Males represented 292 (82.4%) of all injuries on farms with beef cattle. In Figure 5.15, it can be seen that female have slight peaks in the 10-14 age group and the 35-39 age group, but are not significant. The males have a steady increase in injuries until the 20-24 age group and then a steady decline, with a slight increase in the 35-39 age group and the 50-54 age group. Both sexes show a slight increase in older age groups, specifically the 65-69 age group this may be due to a decrease in agility in this group.

**Figure 5.15. Number of injuries reported by age and sex for the cattle industry, July 1995 – June 1996 (N=354)**

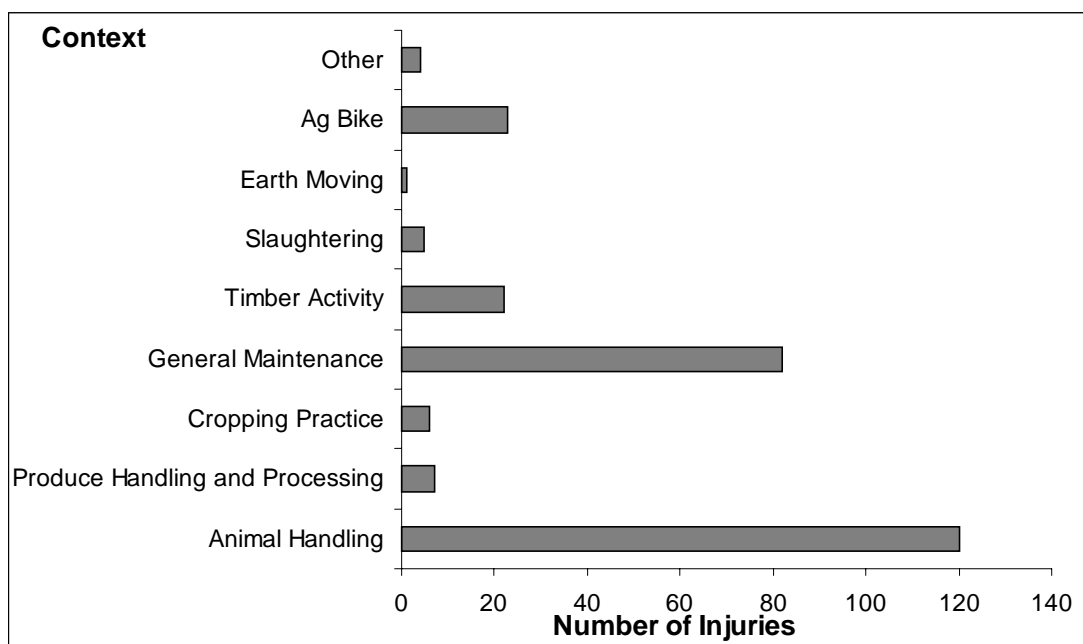


**Figure 5.16. Agent of injury in the beef cattle industries, July 1995 – June 1996 (N=353)**



The major agent of injury as presented in Figure 5.16 was *animal* 95 (26.9%), followed by *other agent* 64 (18.1%) and *farm vehicle* 17 (4.8%). For those injured by an *animal* 84 (88.4%), they were either from a *horse* 52 (54.7%), or *cattle* 32 (33.7%). For those injuries by a *horse*, 18 (34.6%) were from *falling off the horse* and for injuries caused by *cattle*, 16 (50.0%) were from *cattle charging*.

**Figure 5.17. Agricultural activity of injury – cattle industry, July 1995 and June 1996 (N=270)**



In Figure 5.17, *animal handling* represents 120 (44.4%) of all injuries on beef cattle farms followed by *general maintenance* with 82 (30.4%), *timber activity* had 22 (8.1%) and *Ag bike* 23 (8.5%) injuries.

**Figure 5.18 Body part injured – cattle industry, July 1995 - June 1996 (N=352)**

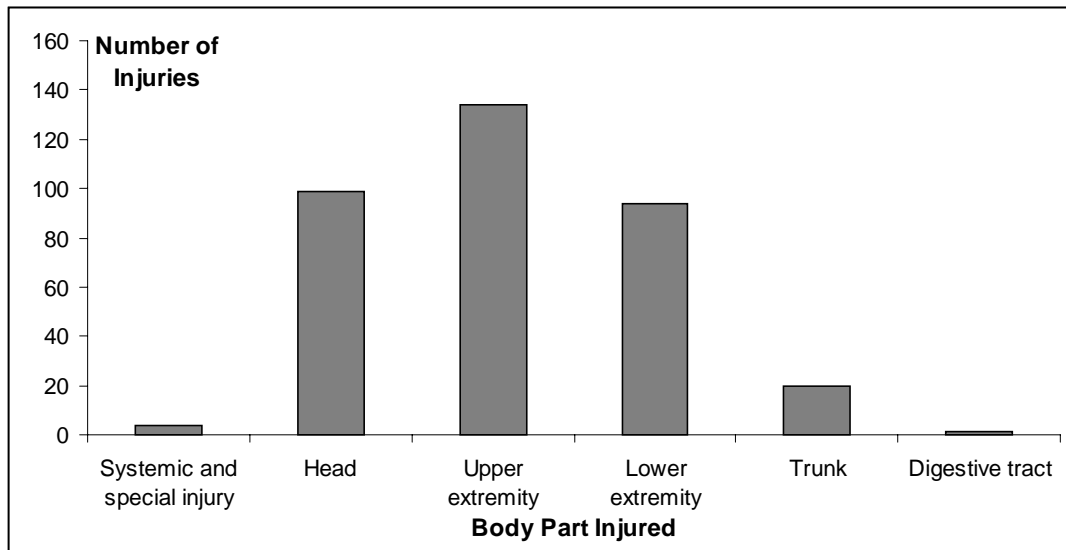


Figure 5.18 displays the body part that was injured. The *upper extremity* had 134 (38.1%) people who sustained the most injuries followed by the *head* with 99 (28.1%) injuries and *lower extremity* with 94 (26.7%) injuries. For injuries sustained to the *upper extremity*, over half were to the *hand* (70: 52.2%), the *forearm / wrist* sustained 31 (23.1%) of the injuries. The injuries to the *head* were mainly the *eye* 43 (43.4%) (of which 19, 44.2% were from foreign body in eye) and *face / cheek / forehead / scalp* with 31 (31.3%) injuries. The major injuries to the *lower leg* were to the *ankle / foot* with 38 (42.2%) and *knee* with 14 (15.6%).



**Table 5.4 Nature of injury by ED and GP Surgeries – cattle industry, July 1995 – June 1996. (N=355)**

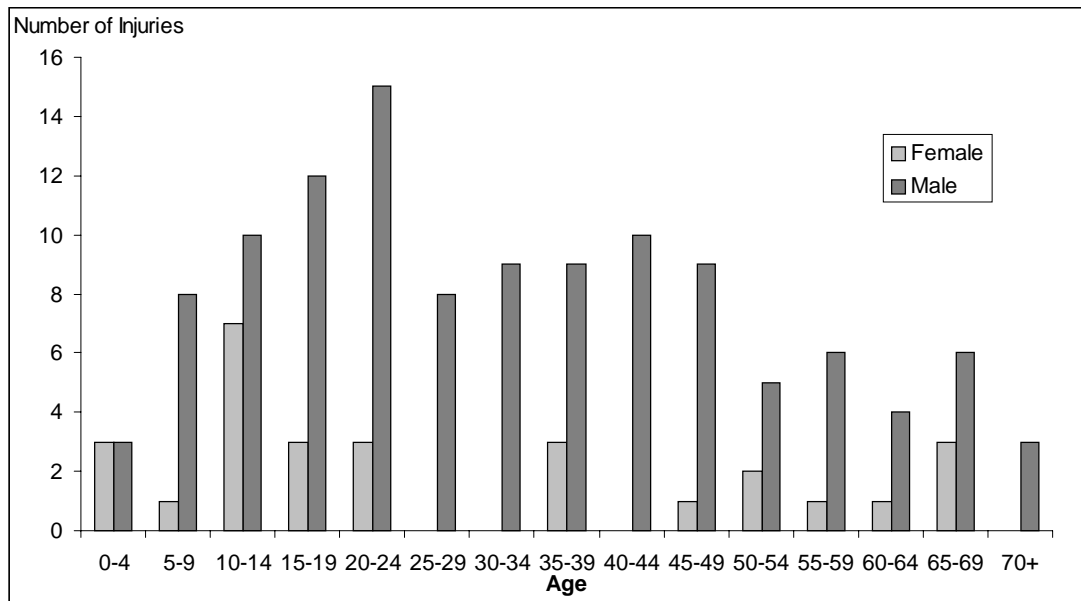
Nature of Injury	ED Presentations (N=251) %	GP Surgeries Presentations (N=104) %
Cut/Laceration	31.5	39.4
Puncture	2.8	0.0
Bite	2.4	2.9
Superficial Abrasion	3.2	1.0
Penetrating wound	2.8	0.0
Other wound inc. amputation	0.8	1.0
Haematoma / bruising	6.4	3.8
Haemorrhage	0.8	0.0
Inflammation / oedema / tenderness	4.8	3.8
Burn, full thickness	0.4	0.0
Burn, partial thickness	5.2	2.9
Foreign body in soft tissues	4.0	13.5
Crushing injury	3.6	3.8
Fracture	14.7	18.3
Dislocation	4.0	0.0
Sprain / strain	5.6	4.8
Unknown	0.4	0.0
Poisoning	1.6	1.0
Asphyxiation or respiratory difficulty	0.8	0.0
Electric	0.0	0.0
Over-exertion, heat/cold stress	0.8	0.0
Concussion	3.2	2.9
Dental Injury	0.4	0.0
No injury detected	0.0	1.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

Table 5.4 shows the nature of the injury by presentation site. For ED, there were two major types of injuries that presented, *cut / laceration* 31.5%, followed by *fracture* 14.7%. For GP surgeries, there were three major types of injuries that presented, *cut / laceration* 39.4% followed by *fracture* 18.5% and then *foreign body in soft tissue* 13.5%. ED saw a greater percentage of cases compared to GP surgeries for the following types of injuries; *puncture wounds, superficial abrasion, penetrating wound, haematoma / bruising, inflammation / oedema / tenderness, burns, dislocation, sprain / strain, poisoning and concussion*

## Section 2b: Injury in the cropping industries

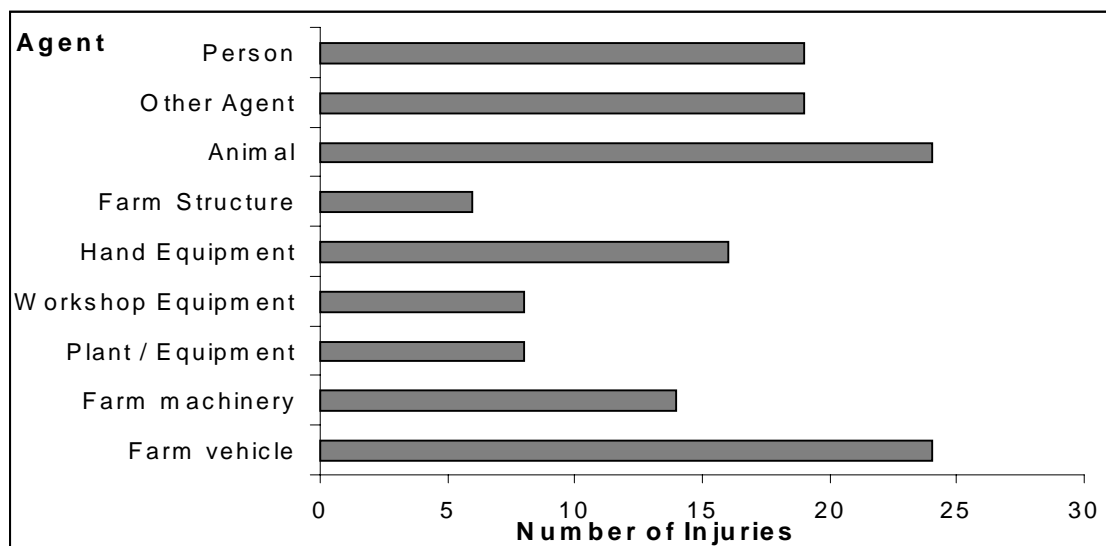
Those farms that had a form of cropping (145: 28.5%) were the second largest commodity group and a summary profile for the cropping industry is included. The commodities that were included in this profile are mixed cattle / crop, mixed sheep / crop, cotton, cereal crops, wheat, sorghum, tobacco, fodder / hay and peanuts.

**Figure 5.19 Number of injuries reported by age and sex – cropping industries, July 1995 – June 1996 (N=145)**



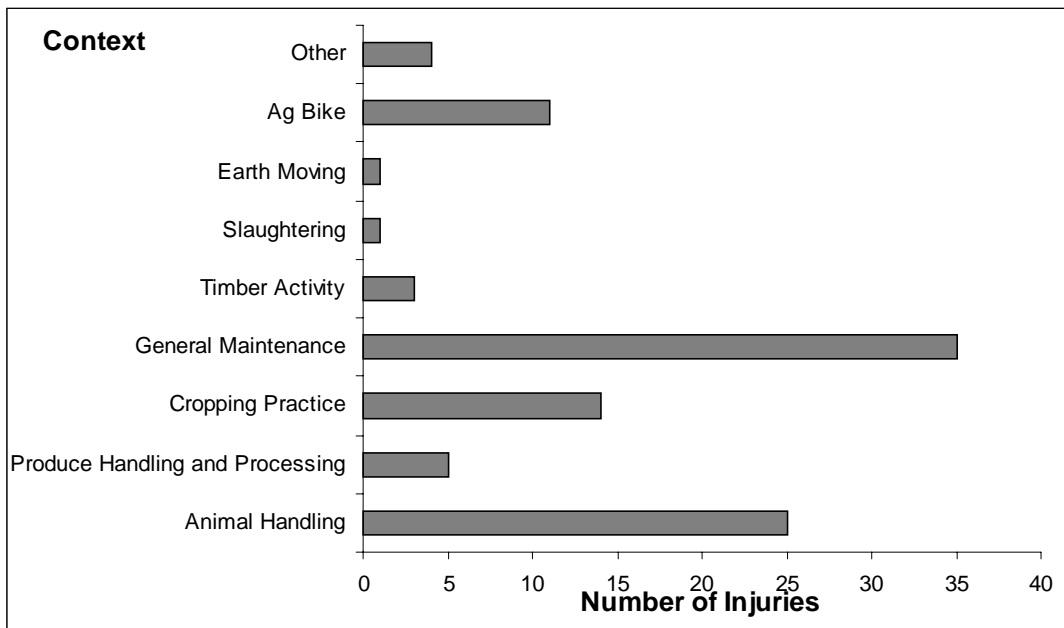
Males represented 117 (80.7%) of the injuries in the cropping group. In figure 5.19, it can be seen that the occurrence of injuries to females across age groups is sporadic, with the 10-14 age group having the largest number of injuries. For male injuries, there was a steady increase until the 20-24 age group when the injuries dropped off and remained steady until the 45-49 age group. From there, there was a steady decline except for a slight kick up after 65.

**Figure 5.20. Agent of injury – cropping industries, July 1995 – June 1996 (N=138)**



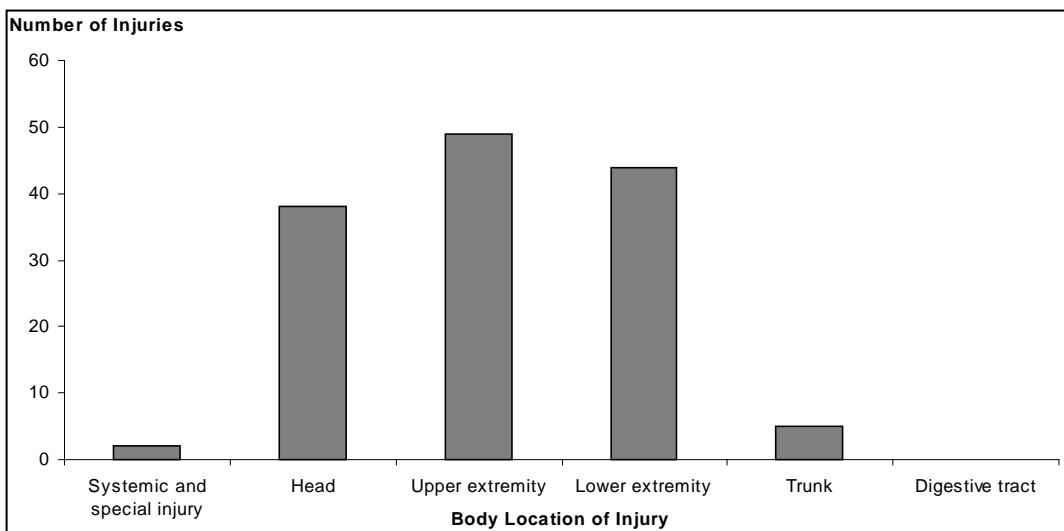
In Figure 5.20, the large grouping of agent of injury is displayed. *Animal* 24 (17.4%) and *farm vehicle* 24 (17.4%) are the largest categories, followed by *person* 19 (13.8%) and *other agent* 19 (13.8%). For injuries caused by an *animal*, the majority were caused by *horses* (10: 41.7%) and *cattle* (10: 41.7%). For injuries caused by a *farm vehicle*, over half were from *motorcycles* 16 (66.7%) of which 10 (62.5%) were *2-wheel motorcycles*.

**Figure 5.21. Agricultural activity at time of injury – cropping industries (N=99)**



In Figure 5.21, with respect to activity, *general maintenance* (35: 35.4%) represents over a third of all injuries, followed by *animal handling* (25: 25.3%), *cropping practice* (14: 14.1%) and *ag bike – rider error* (11: 11.1%).

**Figure 5.22 Body part injured – cropping industries, July 1995 – June 1996 (N=138)**



The body location of the injury is displayed in Figure 5.22. The *upper extremity* was the most commonly injured body part (49: 35.5%). This included *hand* (26: 53.1%) and *forearm /*

wrist 13 (26.5%). The *lower extremity* was involved in 44 (31.9%) injuries, of these the *ankle / foot / toes* made two-fifths (19: 43.2%) of the injuries. The *head* was involved in over a quarter (38: 27.5%) of injuries, of these 16 (42.1%) were to the *eye* and 12 (31.6%) were to the *face / cheek / forehead / scalp*.

**Table 5.5 Nature of injury – cropping industries by ED and GP Surgeries, July 1995 – June 1996 (N=145)**

Nature of Injury	ED Presentations (N=92) %	GP Surgeries Presentations (N=53) %
Cut / Laceration	38.0	45.3
Puncture	4.3	1.9
Bite	1.1	3.8
Superficial Abrasion	2.2	0.0
Penetrating wound	1.1	1.9
Other wound inc. amputation	1.1	1.9
Haematoma / bruising	2.2	3.8
Haemorrhage	0.0	0.0
Inflammation / oedema / tenderness	7.6	5.7
Burn, full thickness	0.0	0.0
Burn, partial thickness	4.3	1.9
Foreign body in soft tissues	3.3	17.0
Crushing injury	3.3	1.9
Fracture	13.0	9.4
Dislocation	3.3	0.0
Sprain / strain	5.4	3.8
Unknown	1.1	0.0
Poisoning	3.3	0.0
Asphyxiation or respiratory difficulty	1.1	1.9
Electric	0.0	0.0
Over-exertion, heat/cold stress	1.1	0.0
Concussion	3.3	0.0
Dental Injury	0.0	0.0
No injury detected	0.0	0.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

For injuries on farms that had a form of crop, 92 (63.4%) went to the ED to have their injuries attended and 53 (36.6%) went to GP surgeries. The three most common types of injuries presenting at ED was *cut / laceration* 38.0%, *fracture* 13.0% and *inflammation / oedema / tenderness* 7.6%. The three common injuries presenting at GP surgeries are *cut / lacerations* 45.3%, *foreign body in soft tissue* 17.0% and *fracture* 9.4%. ED presentations were more commonly *puncture wounds*, *inflammation / oedema / tenderness*, *burns*, *fractures*, *dislocations*, *sprain / strain*, *poisoning* and *concussion*.

## Discussion

---

During the 12-month study, 1800 injury cases were collected from a resident population of 39 708. There were 3 146 agricultural establishments meeting EVAO criteria in the study area. The data has been analysed with respect to total injuries and farm injuries – the latter being considered further under the two major industries of cattle and cropping.

### Total Injuries

The crude rate of injury was 45.3 / 1 000 people per annum (the age-standardised rate for males was 68.5 / 1 000 per annum and 23.7 / 1 000 per annum for females). The indirect age standardised rates were 2.9 times higher for males than females.

The ratio of males to females was 3:1 for all injuries but ranged from 1.3:1 in the 70+ age group to 6.7:1 in the 60-64 age group. The age-standardised rates show less variation between ages. The variation in the 70+ age group reflects the relative imbalance towards females in the population at this age group and may reflect the increased responsibility in this age group taken on by solo females. The lower rate of the 60-64 age female group may reflect a “pulling back” from active work on the farm. The rates in this survey are generally higher than the Day, Valuri & Ozanne-Smith (1995) study, where they found that the male to female ratio was 1.6:1 and the highest ratio was 2.7:1 for the 25-29 year age group. In Harrison and Cripps (1994), the male to female ratio for ED visits was 1.8:1.

The average age of people being injured was higher for the farming population, 33.5 years compared to 29.1 years for all injuries and the age and number of injured males were consistently higher than females.

It is interesting to note that a large number of the injuries occurred to males less than 30 years of age. The 20-24 age group had a crude rate of 155.1 / 1 000 people being injured, which was 12.9% of the total injuries and 17.1% of people injured over the working age of 15 years (as found in workers compensation data). This is consistent with other findings such as Cole & Foley (1995) who found that, for workers compensation injury, the 20-24 age group represented 18.2% of all cases and had an incidence rate of 57.8 / 1 000 wage and salary earners. This was second only to the 25-29 age group who had an incidence of 66.2 / 1 000 wage and salary earners. For farm injuries, the 20-24 year olds are the largest group but unlike all injuries where there is a steady decline in injury numbers as the age increases, farm injuries decline very slowly. This may be due to an older population working on farms but more work needs to be done looking at resident population on farms by age and sex (Fragar et al, 1998).

In this study, a larger number of injured people were reported as presenting to the ED in their local community than to GP surgeries at a ratio of 2.5:1. The ratio of ED to GP surgery presentations was 2.1:1 for farm injuries. This rate is lower than the general population, thus indicating that for farm injuries more people who are injured present to General Practices. Using only ED information in farm studies therefore under-represents the true number of injuries occurring by 28.8% for all injury and by 32.6% for farm injury. The large number of people presenting to ED for treatment, especially on the weekends, indicates the key role of ED, especially over these times and the need for skilled staff to be available after hours

The number of cases per month was 150 and this remained reasonably constant throughout the study period with a slight decline in the last month - this was due largely to a decline in ED cases. This study has had a steady caseload throughout the study, whereas, in the first study (Chater & Ferguson, 1994) there was a steady decline throughout. Presentations to GP surgeries declined marginally throughout the study except for the last month where there was a large increase in cases.

There was a large increase in injury cases for Saturday and Sunday and this was representative of an increase in ED presentations, but there was also a decrease in the number of GP surgery presentations. The increase in injuries on the weekend was from sport and maintenance (especially Saturday) and transportation, leisure / recreational and household activities (particularly on Sunday). During the week, occupational injuries were the largest group.

Transportation injuries were the fourth largest group of injuries generally but third and sixth for ED and GP surgeries respectively. This could be due to traffic accidents being taken or directed preferentially to hospital ED. Whatever the reason for the variation in ranking, the absolute ranking may mean that transportation injuries are not as numerous as previously considered but may be more severe when they occur. It may also reflect the reduction in transport injuries attained in Australia since earlier studies.

When examining the outcome for injuries to different body parts for upper and lower extremities about one-tenth of all injuries seen were admitted to hospital and one-fifth were treated in an emergency department. For head injuries, 15% were admitted to hospital and 20% were treated in the ED. Also, people with a head injury were more inclined to present at a ED than a GP surgery.

It is also interesting to note that 25% of all fractures are admitted to hospital but 15% are transported to another hospital. Thus 60% are treated without admission, 25% with local admission and only 15% require transfer to another facility. Also people with head injury were more inclined to present at an ED than a GP surgery.

Overall, only 4.2% required transfer to another hospital – most injuries appear to be effectively at a local level. The extra number of cases on Thursday at EDs and less at General Practices is difficult to explain.

Those injuries that appear to be serious or may require admission, such as puncture wounds, burns, dislocation, poisoning and concussion, more often go straight to the ED. Of all GP cases, 66.9% were *treated, no referral*, but only 28.7% of ED patients were *treated, no referral*. In ED, 21.9% were *treated and referred to the family doctor*. This supports the need for GP services which effectively triage and continue the care of many cases and allow the ED to deal with the often serious cases. There was only a slight difference in hospital admissions as 18.3% of ED cases and 14.3% of GP cases were admitted to hospital.

## Farm Injuries

---

There were 509 injuries on farms in this study. Of these, 79% were to males, this was lower than the 92% (169) males found in the Chater & Ferguson (1994) study. As with the Chater & Ferguson (1994) study the largest group of injuries was in the 20-29 age group (21-30 age group in the Chater & Ferguson study). The average number of farm injury cases was 42 or 9.8 per week. Injury rates for this study were found to be 16.7 / 100 farms per annum but in the Chater & Ferguson (1994) study they were 60 / 100 farms per annum. The rate in Chater & Ferguson (1994) was five times the rate of this study, after a leakage factor had been calculated. The actual rate Chater & Ferguson (1994) reported was 25 / 100 farms per annum only 1.5 times higher.

Most farm injuries occur during the working hours of 7am and 7pm and there appears to be peaks between 9am and 10am and 4pm and 5pm. There appears to be a decline over lunch (11am till 2pm) and a step decline in injuries from 5pm onwards. More research needs to be done examining the increase in injuries as the total working hours increase. This may be due to a progressive recruitment of workforce or related to fatigue or other factors.

There appears to be some seasonal variation in injuries throughout the year with peaks in September and January. This is hard to confirm, however there was a general decline in the number of farm cases throughout the year. Farm injuries throughout the week remained constant although there was a slight increase on Thursday.

The context of farm injury is dominated by occupational injuries (61.5%), followed by leisure (13.2%) and general maintenance (8.4%).

Similar to the Chater and Ferguson (1994) study, the meat cattle industry was the largest commodity in the area and they also had the largest number of injuries, this was followed by the meat cattle / cropping group. Animal handling was the largest group for agricultural activity at time of injury which is expected when such a large number of farms have horses and other animals. There was a large number of injuries in which the activity was unknown. It would be interesting to see if this was because it was hard to explain or categorise what the context of the injuries were or if people didn't want to say or they were unsure.

This study found that the injury rate to agricultural and horticulture labourers was 112.9 / 1 000 people per annum. The Chater & Ferguson study (1994) found that the rate was 35 / 100 workers per annum, three times higher than this study, after a leakage factor had been calculated. Once again, the actual rate Chater & Ferguson (1994) reported was 14 / 100 workers per annum, only 1.24 times higher.

The study showed a higher rate of injury for agricultural and horticultural workers compared to owners / farm managers – a finding consistent with the study of compensable injuries by Cole and Foley (1995). The cause of this needs further elucidating.

Chater and Ferguson (1994) reported that the workers compensation rate was 6 / 100 agricultural employees, which is comparable to this study.

It is interesting to note that out of the 509 injuries that occurred on farms, in the study only 49 (9.6%) attempted to claim workers compensation. Even if you take a conservative measurement of those that were old enough to claim and were on the job, 49 represents less than one fifth (18.3%) of the 268 cases. Thus to use workers compensation data to estimate

the level of injury would in this instance underestimate the amount of injuries by a factor of 5.

For this study, the three most commonly injured body regions in descending order are, upper extremity, lower extremity and head. Over one-fifth of all injuries were caused by animals of which horses and cattle made the majority of the injuries. Farm vehicles also represent a large group of agents (12.7%), and 2-wheeled motor cycles made up a large group of these. For injuries that occurred due to general maintenance, nearly one-third were in the workshop – 31% were from angle grinders

A profile of cattle injuries and cropping was presented in the result's section. The age structures appear to be similar although there are less females in the cropping group. There also appears to be a larger percentage of accidents from farm vehicles in the cropping group than the cattle group, whereas animals represent a larger percentage of the cattle group. For the context of injury in the cattle group, animals handling followed by general maintenance, were the two largest groups. However for the cropping group, it was the other way around with general maintenance being the largest group followed by animal handling. For the body region injured, the largest area was the upper extremity for both commodities. For cattle the head was the next most injured area and then the lower extremity. For the cropping group it was lower extremity followed by the head. The higher rate of head injuries in the cattle industry may need attention.



## Conclusion

---

Farm injuries in this study represented 28% of all injuries, although in some centres it was up to half of all injury cases. In most studies of farm injury and total injury the role of the GP is often hard to record, yet in rural areas they play a vital role in treating injuries and have the potential to inform farmers about injury problems.

This study showed that to only use injury cases that present to ED would under represent the number of case by one-third and to use only workers compensation statistics for farm injuries would underestimate the number of injuries by a factor of five.

There is a particularly high risk to young people (especially those aged 20-29 years) from injuries on the farm. As this group is already proportionally under-represented, further declines due to injuries could significantly impact on Australia's farming population. The average age of the farm injury group is higher due to the average age of farmers being higher. This in turn may result in longer convalescent times, long term damage to the body and higher financial cost to the farmer. The study confirms that for many, farming is a life long occupation and life long injury risk with an increase in that risk as individuals increase in age over 60 years.

It is important to note that different centres in the study have varying ratios of presentations between GP and ED. Areas with different commodities presented, have different proportions of people involved in agriculture.

The importance of skilled emergency staff in rural ED and general practice cannot be understated. There is a particular need for skilled staff outside normal working hours in ED as farmers have a seven-day working week.

The study points to the need for specific education and prevention programs in rural industry. In the cattle industry, the major areas of concern are animal injuries including falls from horses and cattle handling. In the cropping industries, motor cycle injuries were more evident, possibly reflecting greater use in this industry.

In both, maintenance activity caused injury especially with foreign body to eyes. The high rate of injuries to the head, common to many studies, may need special attention. The frequency and severity of some of these injuries could be compounded by the apparent lack of use of safety equipment.

Education on the threat of injury and the use of protective equipment to help prevent these injuries may need to be considered. Given the higher risk in farm workers, specific measures may be needed for this group

## Notes

---

The coding for context of farm injury diving - 96 has been interpreted as driving

SLA and shires have been used interchangeably and in this study refer to SLA as defined in the 1996 population census and 1993/94 agricultural census by the ABS.

Ethnicity has been left out of the analysis because there were only 54 from the sample who were asked what their ethnicity was. Consent was obtained with each completed questionnaire and otherwise has no relevance for this study

The following places were not included in the study as there was no data collected from their centres:

Woorabinda Hospital

Mundubbera Hospital

Biloela Hospital

Biloela General practices

Dr RJ Williams, Surat

Dr J Gillett, Miles

Upper extremity includes shoulder to fingers and lower extremity includes hip to toes.

Although the questionnaire used disposal of patients, this study uses outcome of patient.

A&E is only used in the text when talking about patient outcomes and should be read as ED.

## Glossary

---

E-Code	External causes of injury and poisoning – Code as used in the International Classification of Diseases
ED	Emergency Department
EVAO	Estimated Value of Agriculture production
GP	General Practice
RRMA	Remote, Rural and Metropolitan Area's classification – "...Categorises all SLAs in Australia according to their remoteness with an index of remoteness being calculated for each SLA in non-metropolitan Australia. Remoteness is conceptualised in terms of low population density and long distances to large population centres..." (Fragar et al, 1997)
SLA	Statistical Local Area
A&E	Read as ED
Disposal	Outcome

## References

---

- Australian Bureau of Statistics (1998). 1996 census data for farm workers for 9 study SLA's. Personal correspondence.
- Chater, A.B. & Ferguson, K.H. (1994). A 12 Month Study of Farm Work Related Injury Based on Collections From Hospital and Medical Practices in the Callide-Dawson Region of Central Queensland. RIRDC.
- Cole, Brad & Foley, Greg (1995). Occupational Health and Safety Performance Overviews, Selected Industries. Issue No. 9 agriculture and services to agriculture industries. Worksafe Australia. Australian Government Printing Service, Canberra.
- Coleman, Richard & Wetherspoon, Donna (1995). Farm Injury Presentations to Barwon District Emergency Departments in 1994. Australian Agricultural Health Unit.
- Day, Lesley (1995). Rural Injury Prevention. In Injury Research and Prevention: A Text. Ed Joan Ozanne-Smith and Fiona Williams. Chapter 8. 98-108
- Day, Lesley; Ashby, Karen; and Stathakis, Voula (1997). Unintentional Farm Injury. Hazard 33. 1-9.
- Day, Lesley; Valuri, Giulietta; & Ozanne-Smith, Joan (1995). General Practice Injury Surveillance in the Latrobe Valley. Monash University Accident Research Centre.
- Dean, A.G., Dean, J.A., Burton, A.H., & Dicker, R.C. (1990). Epi info, Version 5: a word processing, database, and statistics program for epidemiology on microcomputers. USD, Incorporated, Stone Mountain, Georgia.
- Fragar, L.J.; Gray, E.J.; Franklin, R.C.; & Petrauskas, V. (1997). A picture of health? A preliminary report of the health of country Australians. Australian Agricultural Health Unit
- Fragar, L; Franklin, R.; Gray, L.; & Petrauskas, V. (1998). The health of Australian populations – a vignette. Preliminary Report October 1997. National Rural Public Health Forum 12-15 October 1997. National Rural Health Alliance: Canberra.
- Harper, Catherine (1997). Epidemiology of injuries in Central Queensland: Rural Injury Surveillance. Central Public Health Unit - Rockhampton.
- Harrison, James E. and Cripps, Raymond A. (1994). Injury in Australia. An epidemiological review. National Injury Surveillance Unit. Australian Institute of Health and Welfare. Australian Government Publishing Service Canberra.
- NOHSC (1998). Work-related traumatic fatalities in Australia, 1989 to 1992: Summary Report. National Occupational Health and Safety Commission.
- Pedler, Daryl (1997). Farm Injury - A Base Hospital Perspective. Farm Injury Beyond 2001 - Conference proceedings 1997.

Wolfenden, K. (1992). Non-fatal rural injury: A study in costal and inland areas of the New England region, Australia. Doctoral Dissertation.

## Appendix 1 Data Items

---


Name of Variable	Description of variable
Centre	The name of the centre where the information was collected
urnumber	
name	The initials of the patient
postcode	The postal code where the person lives
date	The date of birth of the person
age	The age of the person
sex	The gender of the person
injdate	The date that the injury occurred
injtime	The time that the injury occurred
placeocc	The place that the injury occurred
locatco	
locfarm	The location on the farm where the injury occurred
farmind	The farming industry that the person was involved in
farmrole	The role on the farm that the person had
whathap	A text description of the injury event
farcontx	The farming context in which the injury occurred
context	The general context in which the injury occurred
jobwستا	The job status of the person
occ	The occupation of the person who was injured
industgp	The industry grouping
breakdown	The breakdown of the injury event
mechanis	The mechanism of the injury
injcaus	A text description of the cause of the injury
faragent	The farm agent involved in the injury occurring on the farm
safeuse	Was there any safety equipment used
consent	Does the person consent to be followed up for additional information if necessary
ethnic	The ethnicity of the injured person
natinj1	The nature of the injury
bodypar1	The body part injured
natinj2	As above 2nd major
bodypar2	As above 2nd major
natinj3	As above 3rd major
bodypar3	As above 3rd major
intent	The intent of how the person was injured
disposal	What happened to the patient after they were seen.

# Appendix 2 Copy of collection form

<p align="center"><b>RURAL INJURY PREVENTION PROGRAMME</b> For all injuries and poisonings <i>Complete only for FIRST attendance of a particular episode.</i></p> <p align="center"><b>HOSPITAL</b></p> <p>_____</p> <p>TRIAGE _____</p> <p>WAS THIS PATIENT TRANSFERRED FROM ANOTHER HOSPITAL? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>*IF YES, which hospital _____</p>	<p>U.R. NO. _____</p> <p>SURNAME _____</p> <p>Given Names _____</p> <p>Address _____</p> <p align="right">Postcode _____</p> <p>Date of Birth _____ Sex _____</p> <p>Occupation _____ Doctor _____</p> <p>Phone _____ Medicare No. _____</p> <p>Vol. Affairs _____ Workers Comp. _____ 3rd Party _____</p> <p>Vol. Affairs/Pension No. _____</p> <p>Date _____ Time _____</p>
---	---

Please circle correct answer

1. When did the injury occur? Date \_\_\_\_\_ Time \_\_\_\_\_  AM  PM
2. Where did the injury occur? For example: at home in the bathroom, at Minstead High School oval, on Ipswich Road, at Apex Industries tooling department, wheel paddock, dairy beds, camping area, oyster lease, etc.  
\_\_\_\_\_
3. Did the injury occur on a farm (site of primary production, including farm house)?  YES  NO  
*\*IF YES What type of farm? For example: Wheat & Sheep, Wheat, Dairy & Pigs, Dairy, Cotton, Beef, Fishing, Timber/Forestry, Hobby, etc.*  
\_\_\_\_\_
4. If YES to Question 3, were you on the farm as a:  
 Visitor?  YES  NO  
 Employee/Contractor?  YES  NO  
 Owner/Resident?  YES  NO
5. What was the injured person doing at the time he/she was injured? For example: washing up, playing football, driving a car, making a steel pipe, harvesting crop, shearing sheep, repairing tractor, attending business, etc.  
\_\_\_\_\_
6. Was he/she injured on the job?  YES  NO  
 \*IF YES,
  - i) Does the injured person plan to claim compensation?  YES  NO
  - ii) What is the injured person's occupation? \_\_\_\_\_
  - iii) In what sort of business is he/she employed? \_\_\_\_\_
7. What went wrong? For example: fell from a tree onto fence, lost control of bicycle and hit post, tripped on rock, spill coffee, car collided with bus, dropped steel pipe, slipped on wet floor, etc.  
\_\_\_\_\_
8. What actually caused the injury? For example: landed on concrete, jammed hand in harvester, caught hand in net, thrown against wire screen, swallowed digoxin pill, spill pesticide, welding flash, etc.  
\_\_\_\_\_
9. Was the injured person using any safety equipment? For example: seatbelt, motorcycle helmet, bike helmet, hard hat, safety glasses, lifejacket etc.  YES  NO  
\*IF YES, please specify \_\_\_\_\_
10. Was a specific product or article involved? For example: Ricardo 10-speed bike, Black & Decker circular saw model 133, Detol (toilet bottle), etc.  YES  NO  
\*IF YES, please specify, include brand name and model, if known: \_\_\_\_\_
11. Was a motor vehicle involved?  YES  NO  
\*IF YES, please specify make/model/year of vehicle \_\_\_\_\_  
What sort did the injured person occupy? \_\_\_\_\_ 
12. Are you an Aboriginal Australian?  YES  NO
13. In order to prevent future injuries, we are collecting details about particular incidents. If we need to, may we contact you for further information?  YES  NO

Signature \_\_\_\_\_

ACCIDENT & EMERGENCY INJURY INFORMATION

Complete only for first attendance of a particular episode

<p><b>1. NATURE OF THE INJURY</b></p> <p><input type="checkbox"/> <input type="checkbox"/> SEVEREST  <input type="checkbox"/> <input type="checkbox"/> SECOND  <input type="checkbox"/> <input type="checkbox"/> THIRD</p> <p>SELECT UP TO THREE CODES</p> <p><b>systemic and special injury</b>  91 poisonings (bru skin/lungs/mouth etc)  93 asphyxiation or respiratory difficulty  94 electric shock  95 over-exertion, heat/cold stress  96 concussion  97 dental injury  99 no injury detected</p> <p><b>soft tissue</b>  01 cut/laceration  02 puncture  03 bite  04 superficial abrasion  05 penetrating wound  06 other wound, incl. amputation  07 haematoma/bruising  08 haemorrhage  09 inflammation/odema/tenderness  10 burn, full thickness  11 burn, partial thickness  12 foreign body in soft tissues  13 damage to major blood vessel  14 crushing injury</p> <p><b>bone, tendon or joint</b>  20 fracture  21 dislocation  22 sprain/strain</p>	<p><b>2. BODY PART</b></p> <p><input type="checkbox"/> <input type="checkbox"/> SEVEREST  <input type="checkbox"/> <input type="checkbox"/> SECOND  <input type="checkbox"/> <input type="checkbox"/> THIRD</p> <p><b>head</b>  101 eye  102 ocular adnexum  103 nose  104 mouth external, e.g. jaw, lip  105 ear  106 face/cheek/forehead/scalp  107 skull base  108 skull vault  109 neck, NEC  198 other injury to head</p> <p><b>upper extremity</b>  201 clavicle  202 scapula  203 shoulder, NEC  204 humerus  205 upper arm, NEC  206 radius, ulna  207 elbow  208 forearm  209 wrist  210 carpal bone  211 metacarpal bone  212 digit/phalanx  213 hand, NEC  298 other injury to upper extremity</p> <p><b>lower extremity</b>  301 hip  302 femur  303 upper leg, NEC  304 knee  305 tibia/tibula  306 lower leg, NEC  307 ankle  308 tarsal bone  309 metatarsal bone  310 digit/phalanx  311 foot, NEC  398 other injury to lower extremity</p> <p><b>trunk</b>  401 rib(s)  402 sacroiliac joint  403 spine (inc. cervical), excluding cord  404 pelvis  405 chest, NEC  406 abdomen, NEC  407 upper back, NEC  408 lower back, NEC  409 genitalia  110 heart  498 other injury to trunk</p> <p><b>respiratory tract</b>  501 pharynx  502 larynx  503 trachea  504 bronchus  505 lung  598 other injury to respiratory tract</p> <p><b>digestive tract</b>  601 mouth internal, e.g. gum, palate  602 oesophagus  603 stomach  604 small bowel  605 colon  606 rectum  607 liver  608 spleen  609 injury to other internal organs  698 other injury to digestive tract</p> <p><b>nervous system</b>  701 brain, not concussion  702 brain stem  703 cervical spinal cord  704 thoracic spinal cord  705 lumbar spinal cord  706 peripheral nerve  798 other injury to nervous system</p> <p><b>systemic and special injury</b>  000 defined as in Section 1 at left</p>
<p><b>3. INTENT OF INJURY</b></p> <p><input type="checkbox"/> SELECT ONE CODE</p> <p>0 accidental injury (ie, unintentional)  1 intentionally self-inflicted, or possibly so  2 victim of assault, or possibly so  3 unknown intent</p>	<p><b>4. WHAT YOU DID WITH YOUR PATIENT</b></p> <p><input type="checkbox"/> <input type="checkbox"/> SELECT ONE CODE</p> <p>01 no treatment  02 treated, no referral  10 treated, A &amp; E review  03 treated, referred to outpatients  04 treated, referred to family doctor  05 treated, other referral  06 short-stay observation in Emergency  07 admitted to hospital  08 transferred to other hospital  09 DQA or died in Emergency</p>

Note: NEC means "not elsewhere classified"

## Appendix 3 Calculation of crude injury rates for SLA's

	Banana		Bauhinia		Chinchilla		Inglewood		Kilcoy		Murgon	
	M	W	M	W	M	W	M	W	M	W	M	W
Other Animals	1	0	0	0	1	0	1	1	1	0	1	0
Pigs	1	1	0	0	0	0	0	0	0	0	5	1
Meat Cattle	30	19	8	7	4	2	6	17	10	2	21	2
Milk Cattle	1	2	0	0	0	0	0	0	5	0	7	1
Cereal	4	0	0	0	1	0	1	0	0	0	3	0
Other	2	0	0	0	0	0	0	0	0	0	1	1
Cotton	4	7	0	0	0	0	0	0	0	0	0	0
Mixed cattle/sheep	0	0	0	0	1	0	4	0	0	0	0	0
Mixed cattle/crop	15	9	4	3	6	0	1	1	0	0	9	0
No specific animal or crop (Hobby)	3	0	0	0	1	0	2	0	5	0	3	0
All	61	38	12	10	14	2	15	19	21	2	50	5
Note: M=Owner/Manager/family member & W=Permanent employee/part-time employee												
Total workers	1065	198	375	120	519	83	269	80	127	50	211	63
Crude injury rate	57.3	191.9	32.0	83.3	27.0	24.1	55.8	237.5	165.4	40.0	237.0	79.4

	Taroom		Warroo		Wondai		All	Total	
	M	W	M	W	M	W	M	W	
Other Animals	0	0	0	1	0	0	5	2	7
Pigs	0	0	0	0	1	1	15	10	25
Meat Cattle	22	16	3	1	1	0	97	59	156
Milk Cattle	0	0	0	0	1	1	14	4	18
Cereal	0	0	0	0	1	0	10	0	10
Other	0	1	0	1	0	0	3	3	6
Cotton	0	0	0	0	0	0	4	7	11
Mixed cattle/sheep	1	0	1	0	0	0	11	3	14
Mixed cattle/crop	4	1	1	1	0	0	36	12	48
No specific animal or crop (Hobby)	0	0	0	0	3	0	29	10	39
All	27	18	5	4	7	2	200	90	290
Note: M=Owner/Manager/family member & W=Permanent employee/part-time employee									
Total workers	550	113	214	42	357	48	3344	797	4141
Crude injury rate	49.1	159.3	23.4	95.2	19.6	41.7	59.8	112.9	70.0



