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Rural Industries Research and Development Corporation

Fall Related Injuries in Australian Agriculture

A report of the National Farm Injury Data Centre for the Farm Safety Joint Venture—managed by the Rural Industries Research and Development Corporation

by
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Foreword

This report provides a comprehensive examination of fall related injuries in Australian agriculture. Fall related events are complex and diverse, with a range of factors and injuries making the prevention of such events complex.

This report provides reliable baseline information from which future health and safety programs will be established and monitored. The information contained within this report will also be useful for:

- defining key hazards related to falls and program needs for specific agricultural industries
- defining key hazards related to falls that are generic across all agricultural industries
- development of effective health and safety programs that relate to fall related
- defining further research needs to improve health and safety in Australian agriculture.

The Rural Industries Research and Development Corporation and the Australian Centre for Agricultural Health and Safety are both proud members of Farmsafe Australia, and have taken responsibility for improving the data and evidence base that the industry is using to guide its injury prevention programs.

The project was funded by the research and development corporations contributing to the Farm Health and Safety Joint Venture - Rural Industries Research and Development Corporation, Grains Research and Development Corporation, Australian Wool Innovation Limited, Cotton Research and Development Corporation, Sugar Research and Development Corporation, Dairy Australia and Meat and Livestock Australia. The Joint Venture is committed to improving the well-being and productivity of the agricultural industries through careful investment in research and development programs that assist industry to manage Occupational Health and Safety risks in a cost effective way.

This report, a new addition to RIRDC's diverse range of over 1000 research publications, forms part of our Human Capital, Communications and Information Systems R&D program, which aims to enhance human capital and facilitate innovation in rural industries and communities.

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The report was produced to inform the Australian farming community about the Health and Safety risks associated with agricultural falls in Australia.

The authors would like to acknowledge the assistance of the NSW Health Department, Queensland Division of Workplace Health and Safety, the Australian Bureau of Statistics, National Occupational Health and Safety Commission and all other individuals and organizations which provided advice and guidance developing this profile.

Abbreviations

ABS	Australian Bureau of Statistics
ACAHS	Australian Centre for Agricultural Health and Safety
CAISP	Canadian Agricultural Injury Surveillance Program
CDC	Centre for Diseases and Control
CIHI	Canadian Institute for Health Information
ED	Emergency Department
exc	Excluding
Ext	External
ICD	International Classification of Diseases
NCIS	National Coroners Information System
NEC	Not elsewhere classified
NFIDC	National Farm Injury Data Centre
NIOSH	National Institute of Occupational Safety and Health
NIPAC	National Injury Prevention Advisory Council
NIPP	National Injury Prevention Plan
NOHSC	National Occupational Health and Safety Commission
NOSI	NOHSC Online Statistics Interactive
NSW	New South Wales
NZ	New Zealand
Pois	Poison
RIRDC	Rural Industries Research Development Corporation
SNAP	Senior Neighbour Aid Project
WHO	World Health Organisation
UK	United Kingdom
USA	United States of America
USDHHS	United States Department of Health and Human Services
WA	Western Australia
WCA	Work Cover Authority
WCC	Worker Compensation Claim

Executive Summary

Introduction

Accidental falls represent a significant cause of injury on farms. However to date there has been very little undertaken in both the study of falls and prevention. In Australia there are four major ongoing datasets that collect information about farm injuries. These are coroners' information, Australian Bureau of Statistics (ABS) deaths register, hospital admissions, and workers compensation. These data sources and an ad hoc collection of Emergency Department presentations have been used in this report to provide a profile of falls in agriculture.

A fall, especially in agriculture is a complex event, often with many factors extrinsic (environmental) and intrinsic (personal) involved. As falls are complex phenomena, prevention will require the cooperation of various fields such as epidemiology, engineering, health promotion, architecture, and medicine to progress.

Definition

In this study accidental falls (falls) are defined as an event in which a person slips, trips or stumbles on the same level or from one level to another and is associated with stationary non-hazardous objects (such as furniture, stairs or steps, trees, buildings or structures) and includes events associated with moving vehicles or animals. This definition does vary slightly depending on the data source.

Aims

- To collate available information about falls on Australian farms or to agricultural workers,
- Identify the nature, circumstances and agents responsible for falling incidents on farms, and
- To suggest preventive measures to stop or reduce the reoccurrence of these incidents.

Literature Review

The literature on falls was found to be extensive and growing; as such the literature review in this report tries to briefly summarise the information found for general falls and provide greater detail for falls in agriculture.

Fall related deaths in agriculture in other countries ranged from 5% in Kentucky and Wisconsin (United States) to 22% in United Kingdom of total deaths; however this varied when examined by different categories such as machinery/non machinery, animal/non-animal related and height/same level. Injuries from falls were also common with 21% of farm injuries in Sweden a result of a fall, however there was very little information about the circumstances surrounding the falls and prevention activities.

There are very few studies in Australia that have examined falls, with the most comprehensive information being provided by a study of farm-related death during 1989-1992, this information is also used in this report. Studies found that fall related deaths range from 10%-24% of farm-related fatalities. Farm-related injuries that present to emergency departments, hospitals, and medical practitioners, as well as claims for workers compensation have all reported fall related injury as a major issue with agents such as motorcycles, horses, ladders, tractors and other farm vehicles being common.

Fatalities

Two sources of information were examined for fatality information, these were ABS deaths register from 1990-1992 and falls related deaths in the study *"Farm-related fatalities, 1989-1992"*.

The ABS death register information was examined for fall-related fatalities as defined by the International Classification of Disease (ICD) versions 9 and 10 for farmers, farm managers and farm labourers. There were 461 deaths with 90% males and the number of deaths increasing as the farmer aged. The majority of the falls were classified as unspecified. NSW and Victoria had the most number of deaths as would be expected by their size.

For farm related fatalities between 1989 and 1992 there were 42 fatal incidents, commonly involving males aged 20 to 64 years. The falls were primarily from horses, machinery and farm vehicles in paddocks, areas of natural vegetation and stock yards. Head injuries were the main cause of death. Usually the injured people were residents of the farm.

Hospital Admissions

Hospital separations in NSW between 1 July 1989 and 30 June 2000 where the principal diagnosis was injury, the place of occurrence was farm and the external cause was classified as a fall were examined. There were 1,917 people injured in a fall on a farm during this period. Predominantly males were injured, who tended to be older.

Falls related injuries were more likely to occur to younger people and same level falls were more likely to occur to older people, the number of unspecified falls also increased with age. Fractures of upper and lower limbs were common, followed by fractures of the neck and trunk and intracranial injuries.

There was very little seasonal variation with a slight peak in November and a trough in June. The mean length of stay was 5.8 days which varied by principal diagnosis with fracture o the neck and trunk staying the longest.

Emergency Department Presentations

Emergency department data should capture a greater number of farm related injuries because they include the less severe injuries which are treated and sent home. This information was collected by a range of hospital in the 1990's and with the analysis predominantly based on the one-line text description provided.

There were a greater number of falls from a height than on the same level. Falls from a height in this analysis were categorised as lotic (the object they were on was moving at the time) or static. There were three times as many lotic falls and the majority of these were from horses. Other common agents included bikes (including motorbikes), tractors and trucks. For static falls common agents were horses, trees, ladders and fences. Many same level falls were caused by agents that moved and were either *hit by* or *hit against them*.

Common injuries were sprain or strain, cut/laceration, and fractures predominantly of the upper and lower limbs. The majority of people injured were involved in recreation at the time of injury. As with hospital presentations, the percentage of falls from a height decreased and same level falls increased as people aged.

Workers Compensation Claims

Workers compensation claims provide a basis for the ongoing monitoring of work-related injuries of employees in agriculture. Between 1994/95 and 1999/00 there were approximately 5,500 people in agriculture who claimed workers compensation for a fall. People who submitted claims were predominantly males aged 20-44 years from NSW, Victoria and Queensland. Although the age distribution is dissimilar form other data collections this may be due to exposed population rather than less falls.

Common industries were grain, sheep and beef cattle farming and horticulture and fruit growing. Common agency of injury groupings were *animal, human and biological*; non-powered hand tools, appliances and equipment; *mobile plant and transport*; and *environmental agencies*. Common injuries were fractures and sprain and strains.

An analysis of Queensland workers compensation was undertaken to gain a greater understanding of workers compensation claims from falls in agriculture. During the period 1992/93 to 1998/99 there were 2,585 workers compensation claims with a slightly higher number of falls from a height than on the same level. Similar to the Australian data, the number of falls decreased as age increased. Tractors, trailers and caravans, and trucks/semi-trailers/lorries, ladders, holes in the ground, traffic and ground surfaces and horses were common agents.

A significant amount of time was taken off work due to a fall, with over a third of people requiring 21 or more days off work. The average claim for a fall from a height was $2,358 and for a fall on the same level was $1,587.

Discussion

This report represents the most significant examination of falls in agriculture ever undertaken in Australia. The use of multiple data sources provides a detailed picture of the size of the problem of falls in Australia. Predominantly the information from previous studies on falls in agriculture describes the size of the problem and little else.

Using the ABS deaths register information provided some challenges including lack of specificity about farm-related and work related cases, poor collection of female deaths and problems with changes from ICD9 to ICD10 coding.

Recommendation A: Further work needs to be undertaken to explore ABS Death Register information, in particular focusing on the change form ICD9 to ICD10 and how it can be used for surveillance purposes.

The use of ABS deaths register information does provide a proxy for surveillance of farmer, farm manager and agricultural labourer and related worker fatalities. Supplementing this information with coroners information should provide greater detail about the circumstances surround the death.

Recommendation B: The National Coroners Information System should be used to examine falls on farms and determine if known prevention strategies would work in an agricultural setting.

The coroner's information will in time provide valuable time series information and allow monitoring of programs designed to prevent fall-related deaths.

Recommendation C: Information from the National Coroners Information System should be collected on a regular basis and the information coded against the Farm Injury Optimal Data Set to help with monitoring and direction of prevention programs.

Information from hospital separations provides an on-going source of information to monitor more sever fall related injuries. However further examination of changes in coding from ICD9 to ICD10 is required. Older males comprise a large proportion of the cases seen in hospital.

Recommendation D: Work be undertaken to reduce the number of fall fatalities and hospitalisations of farmers, farm workers and those living on farms over the age of 65 years.

Some common agents were found in the hospital information such ladders for middle aged people, however a large number of injuries were categorised into generic groups in such a way that much of the information was inadequate.

Recommendation E: Further work should be undertaken to examine falls on farm resulting in hospitalisation, in particular focusing on the circumstances surrounding the fall.

There were 174 injuries per annum requiring hospital treatment. A recent study estimated the direct cost of a hospitalised fall to be $3,851, thus we can assume that falls in agriculture cost the NSW hospital system $670,000 per annum. As NSW represents 29.8% of Australian farms, multiplying this figure suggests that the direct cost of farm-related fall injuries to the Australian hospital system would be around $2.2 million.

Emergency department datasets provide a wealth of information about injuries. Unfortunately there is currently no ongoing collection system available to allow examination of farm related injuries. In this study some of the most valuable information was provided by the one-line text description. There were a large number of agents

involved in falls on farm that presented to EDs, however some agents were more common than others such as horses, bikes (including motorcycles), trucks, trees, ladders, fences and ground surfaces.

Recommendation F: For same level falls examination of the surface, type of footwear, activity, speed of person by injury type, age and gender would provide information for prevention activities.

Using the three categories of *lotic*, *static* and *same level* falls enable exploration of falls in greater detail and also provide some direction for prevention. Horse related falls were predominately lotic falls and as such appropriate head wear, lower and upper limb guards may also reduce the number of injuries.

Recommendation G: When exploring falls in agriculture the categories of *lotic* and *static* falls from a height and *same level* falls be used to analyse the information due to the differences in these types of falls.

Workers compensation claims are an excellent method in which to gather information about people employed in agriculture and is fairly robust over time. Australia wide there is about 900 claims per annum due to a fall on a farm, most of these injuries occur to younger worker (although this is probably a reflection of the lack of older employees than an increased risk). There was a slightly higher number of falls from a height.

Recommendation H: There should be a fall prevention program developed for farm employees. This prevention program should target people entering the workplace and younger people in the workplace.

The Queensland Workers Compensation information was used to examine falls in greater detail. Common agents associated with falls included tractors, trucks, ladders, traffic and ground surfaces and horses.

Recommendation I: Further work is required to find preventative measures for falls on or from machinery, ladders, horses, and traffic and ground surfaces.

The average cost of a claim for a fall from a height for Queensland workers compensation was $2,358 and far a fall on the same level it is $1,587. Australia wide there are about 900 (500 height and 400 same level) falls per annum costing the workers compensation system $1.8 million per annum.

Falls in agriculture in Australia represents a significant problem costing the health system an estimated $2.2 million per annum and the workers compensation system $1.8 million. This study is only a starting point for the reduction of falls on farms and did not address issues of effective prevention programs. Other industries have developed prevention tools such as fall arrest devices and devices that can be operated form the ground instead at height.

Recommendation J: Use of fall arrest devises and safety equipment in other industries which could be utilised by farmers for common situations such as work on ladders, windmills or roofs needs to be investigated.

Although there are still major gaps in our knowledge of falls prevention Farmsafe Australia is well poised with the Managing Farm Safety Course and their other extension activities to help address the problem of falls on farms.

Recommendation K: Farmsafe Australia should add falls prevention to their key priority areas.

1. Introduction

Accidental falls represent a significant cause of injury on farms. To date very few studies have examined falls on farms in any detail (Nordstrom et al, 1996; Day et al, 1997; Wolfenden, 1993). This report aims to investigate falls that occur on farms or to farmers and farm workers in the course of their work. For all injuries that occur on farms there are three major sources of information: coronial records, hospital records (both emergency department and inpatient data), and workers compensation claims. All three data sources will be used to examine falls on farms in the following report.

Accidental falls (herein after known as falls) can be defined as an event in which a person slips, trips or stumbles on the same level or from one level to another and is associated with stationary non-hazardous objects (such as furniture, stairs and steps, ladders, trees, scaffolding, buildings or structures) and includes events associated with moving vehicles or animals (ICD 9 CM, 1991). Where possible we have included falls from moving vehicles and animals as these represent a significant risk to people working in agriculture.

A fall, especially an agricultural-related fall, may be a complex event with many factors associated with the incident. For example, a fall from a ladder resulting in an injury may be prejudiced by ladder type, height and position; type of ground and level; wind speed and direction; the way the person fell, what they were wearing and the activity they were undertaking at the time. Apart from the above extrinsic (environmental) factors, intrinsic factors such as the effects of ageing, eyesight, short-term memory loss, mood, sense of balance, flexibility, reaction time, and medications (Department of Health and Aged Care, 2001a) may also be involved in a fall. As falls are complex phenomena, Purschwitz et al, (1990) stressed that cooperation of various scientific fields, including epidemiology, engineering, ergonomics, architecture, and more are needed to advance the prevention of fall-related injuries in agriculture. Injuries associated with farm-related falls are no less severe than injuries associated with farm machinery or farm animals (Nordstrom et al, 1995).

The World Health Organisation (WHO) (1999) reported a mortality rate from fall-related injury of 5.4 per 100,000 people worldwide. WHO reports that falls are the leading cause of the burden of disease for children aged 5-14 years and the 14th leading cause for all age groups. In the United States ten percent of all occupational deaths are fall-related (Surada et al, 1995). Surada also reported that falls were the fourth leading cause of death in the US workforce and that over 500 US workers are killed as a result of falls each year. In Canada, more than half (54%) of hospital injury admissions were caused by falls (CIHI, 2002). In Australia, twelve percent of all work-related fatalities are due to falls (NOHSC, 2000). Franklin et al (2000) found that an average of 10 fall-related fatalities occurred on Australian farms per year between 1989 and 1992. and a significant proportion of unintentional falls were work-related for people aged between 18 and 65 years.

As a cause of death from unintentional injury throughout the world, falls are exceeded only by highway injury (Waller, 1985). In Australia each year there are 1,000 deaths due to falls and 100,000 hospitalisations (Steenkamp and Cripps, 2001). Moller (1998) reported that the estimated cost of injury from falls in Australia in 1995-96 was $3 billion.

Falls are a leading cause of unintentional injury in children (Steenkamp and Cripps, 2001; Kidsafe 2000 Fact sheet, 2000) and elderly people (Fildes, 1994; Ontario Public Health Association, 1998). During 1996/97 to 1998/99 financial years, there were 51,539 children admitted to hospital emergency departments for a fall-related injuries in Victoria (Steenkamp and Cripps, 2001). Fildes (1994) reported that more than 1,000 older people die annually from falls in Australia and the public health cost of this trauma has been estimated to be around $2.5 billion. The Australian Bureau of Statistics (ABS) found that 43% of all injury-related deaths for people over the age of 65 years were fall-related (ABS, 1995). As falling is the major cause of injury in older people in Australia and elsewhere, various programs and events such as National Falls Prevention for Older People Initiative, SNAP (Senior Neighbour Aid Project), and community demonstration projects have been developed for older people to prevent and reduce fall-related injuries.

Reports focusing on fall-related farm injury are scant even though falls are one of the main causes of farms injury. Falls represented 22% of all injury requiring hospitalisation in Victorian farms between July 1993 and June 1996 (Day et al, 1997). NOHSC (2000) reported that the origin of fatalities associated with machinery, animals, electricity and drowning can be due to a small slip, trip or unbalance; and that activities which increase the risk of a fall such as working with machinery or on slippery surfaces, climbing ladders, working in high places, and moving from one level to another level are common day-to-day activities on farm. A report by the Department of Labour (1991) concluded that although falls are a major cause of workplace injury, they are preventable if proper preventive methods are followed.

Farmsafe Australia's Goals, Targets and Strategy 1996-2001, Mid-term Review (Fragar and Franklin 1999) identified that further examination of fall-related injury on farms should be undertaken to define the nature and scale of this problem and recommend possible solutions.

1.1 Aim

The aim of this study is:

- to collate available information about falls on Australian farms and to agricultural workers,
- identify the nature, circumstances and agents responsible for falling incidents on farms, and
- to suggest preventive measures to stop or reduce the reoccurrence of these incidents.

1.2 Definition of fall for this study

Accidental falls, or a fall, in this study are defined as an event in which a person slips, trips or stumbles on the same level or from one level to another and is associated with stationary non-hazardous objects (such as furniture, stairs and steps, ladders, trees, scaffolding, buildings or structures) and includes events associated with moving vehicles or animals. Each chapter has a definition of what has been included and excluded when examining falls from the particular data source. Where possible we have included falls from moving vehicles and animals as these represent a significant risk to people working in agriculture.

2. Literature Review

2.1 Methodology

The available information on farm-related falls was collected as follows.

1) Research papers and articles at ACAHS were examined for falls on farms information in Australia and other countries (USA, Canada, Great Britain, Sweden, New Zealand).
2) The following websites were examined for information about falls in Australia.
   - Monash University http://general.monash.edu.au/muarc
   - National Injury Surveillance Unit http://www.nisu.flinders.edu.au
   - National Occupational Health and Safety Commission http://noshc.gov.au
   - NSW Workcover Authority http://www.workcover.nsw.gov.au
   - Victorian Workcover Authority http://www.workcover.vic.gov.au
   - Worksafe Western Australia http://www.safetyline.wa.gov.au
   - South Australian Workcover Authority http://www.workcover.com
   - Queensland Division of Workplace Health & Safety http://www.whs.qld.gov.au
   - Workplace Standards Tasmania http://www.wsa.tas.gov.au
   - Northern Territory Work Health Authority http://www.nt.gov.au
   - ACT Workcover http://www.workcover.act.gov.au
   - Injuries Australia http://www.injuriesaustralia.com.au
3) Websites in USA, Canada, Great Britain, Sweden, France, Germany, Finland, Denmark, and New Zealand were searched for falls information. The WHO (http://www.who.int) website was also examined.

   USA
   - National Institute for Occupational Safety and Health http://www.cdc.gov/niosh
   - Occupational Health and Safety Administration http://www.osha.gov
   - National Agricultural Safety Database http://www.cdc.gov/noish/nasd
   - National Safety Council http://www.nsc.org
   - Department of Health & Human Services http://aspe.hhs.gov
   - National Farm Medicine Centre http://www.marshfieldclinic.org
   - Farm Safety & Health Information Clearing House http://gaia.bae.umn.edu
   - Centre for Public Safety and Injury Prevention, University of Albany http://www.albany.edu.sph

   Canada
   - Canadian Centre for occupational Health and Safety http://www.ccohs.ca
   - Canadian Agricultural Injury Surveillance Program http://www.virtuo.com
   - Institute for Work & Health http://www.iwh.on.ca
   - Occupational Health and Safety Research Institute http://www.irrst.qc.ca

   Great Britain
   - Health and Safety Executive http://www.hsc.gov.uk

   Sweden
   - The Occupational Safety and Health Administration http://www.av.se
   - Swedish National Institute for working life http://www.niwl.se

   France
   - National Research and Safety Institute for the Prevention of occupational Accidents and Diseases http://www.inrs.fr

   Germany
   - Federal Institute for occupational Safety and Health http://www.baua.de
   - German Federation of Institutions for Statutory Insurance and Prevention http://www.hvbg.de/d/bia/starte.htm

Finland

- Finnish Institute of Occupational Health http://www.occuphealth.file

Denmark

- National Institute of Occupational Health http://www.ami.dk/english/nyheder

New Zealand

- Health and Safety Net http://www.osh.dol.govt.nz

4) A Medline database search was conducted using the key words "fall", "farm", and "injury". This identified an additional two papers related to falls on farms not already in ACAHS collection.
5) A search of the web for falls on farms was conducted using the following search engines; Agnet, Yahoo, AltaVista, Lycos, WebCrawler using the combination of key words "fall", "slip", "trip", "injury", "fatality", "farm" and "agriculture".
6) A wider search on worldwide falls was also conducted using "injury", "falls", "slips", "trips", "farm", and "agriculture" with the above search engines.

The data in the research papers and reports were collected and categorized as follows:

- falls in other countries
  - work-related falls in other countries
  - falls in children in other countries
  - falls in older people in other countries
- falls in Australia
  - work-related falls in Australia
  - falls in children in Australia
  - falls in older people in Australia
- farm-related falls in other countries
- farm-related falls in Australia.

There were 126 reports or papers examined that had information about falls. Of these 81 were from overseas (only one report was exclusively about farm-related falls). Of the 45 from Australia, 14 gave some information about 'falls on farms' and of these five highlighted falls in the farm workplace.

2.2 International literature

USA

Falls are the number one cause of accidental injury in the USA, accounting for more than 13 million injuries, 12,000 deaths and 21% of all emergency room visits in 1995 (Keyserling, 2000). In New York State between 1991 and 1993, 10% of deaths and 41% of hospitalised injuries were due to falls (New York State Department of Health, 1997). Falls were the second leading cause of traumatic brain injuries (24% of all brain injuries) in Oklahoma from 1992 to 1993 (Injury update, 1995).

Canada

In Canada, falls continue to be the leading cause of injury admissions to acute care hospitals, accounting for 54% of all injury hospitalisations and 76% of all in-hospital deaths among people admitted for injuries (CIHI, 2002). Each year there are 26 deaths and approximately 21,000 hospitalisations of Canadians under the age of 20 due to falls (Choiniere and Dorval, 1998). Canadian children and youth represent, more than one-quarter of injury-related hospitalisations (Choiniere and Dorval, 1998) and there are 600,000 emergency rooms visits every year as a result of a fall (Robitaille, 1998).

United Kingdom

In the United Kingdom (UK), it is estimated that 39% of all (treated) accidents in the home (total 2.8 million) in 1989 were attributable to falls (Personal Injury and Accident Claims Advice Bureau, 2002).

Other

In 1991, 12,225 people in Germany and 11,502 people in France died as a result of a fall (Arabsafety, 2002). In New Zealand in 1982, there were 310 deaths and 13,882 hospitalisations due to fall-related injuries (Langley, 1987).

2.2.1 Work-related falls

Falls were identified as the fourth leading cause of all occupational injury-related fatalities in the USA (USDHHS, 1993). Each year in the USA, 1,500 deaths and approximately 300,000 injuries are due to work-related falls (Cleaning Report, 2002). Fatal occupational injuries due to a fall during 1980 to 1994, represented 10% of all fatal occupational injuries (USDHHS, 2000). Workers in the construction, mining, and agriculture/forestry/fishing industries had the highest occupational fatality rates due to falls during 1980 to 1989 (USDHHS, 1993).

The Health and Safety Executive (2002) reported that approximately one third of all workplace non-fatal major injuries in the UK are caused by falls, and that fall-related injuries cost employers over £300 million a year in lost production and other costs. In Sweden, falls are the most common kind of work accident for men and the second most common accident for women, and accounted for 22% of all occupational injuries in 1999 (Bengtsson and Nordin, 2001). In New Zealand falls, trips or slips represented 22% of work-related accident claims for the 1999/00 financial year (Matthews and Carryer, 2001).

2.2.2 Falls in children

In the USA, there are approximately 300 childhood deaths each year due to falls (Rivera *et al*., 1993) and more than two and half million children (0-14 years) treated annually at hospital emergency rooms and of these, half are less than 5 years old (Online Health, 2001). Thirty nine percent of admissions to Canadian hospitals of children (<20 years) were due to a fall, in the 1999/00 financial year (CIHI, 2002).

In England and Wales, 10% of childhood (<15 years) deaths in 1998 were due to falls (The Child Accident Prevention Trust, 2000). In NZ between 1994 and 1998, five deaths of children (<15 years) and 43% of hospitalisation were due to a fall (Kidsafe Week 2000 Fact Sheet, 2000).

2.2.3 Falls in older people

Every hour an older adult (65 years +) dies in the USA due to a fall (CDC, 2000) and each year an estimated one-third of senior Americans (65 years +) suffer injuries as the result of a fall (Homles, 1998). The hospitalisation fall rate for seniors (70 years +) in New York in 1994 was more than 10 times than for persons less than 70 years of age (New York State Department of Health, 1997) (Fig. 2.2.1) and death rate for seniors (65 years +) in the USA is 27 times greater than for persons less than 65 years of age (Injury Epidemiology and Surveillance Program, 1999). In 1998, more than 9,600 persons 65 years and older died from a fall-related injury in the USA (CDC, 2000) and there were 2,365 (28%) work-related injuries in older people (63 years +) due to falls reported by Castillo and Rodriguez (1997).

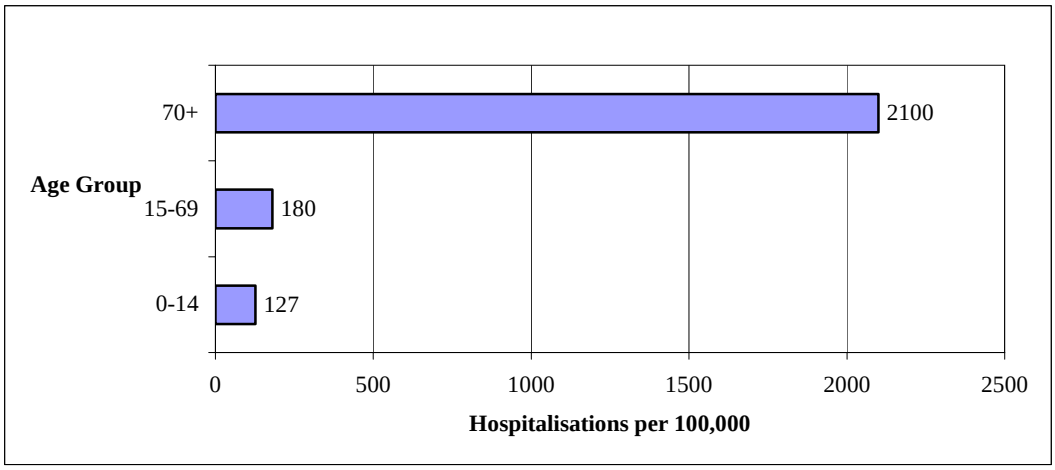


Figure 2.2.1 Annual age-specific hospitalisation rates due to falls in New York State, 1994

Source: New York State Department of Health (1997)

In Canada, falls injury requiring hospitalisations in seniors (>65 years) accounted for 85% (62,008) of all injuries in 1999/00 financial year (CIHI, 2002). In Ontario, between 1985 and 1990, nearly 600 persons over 65 years died each year as a direct or indirect result of falling (Ontario Public Health Association, 1998). In Finland, in 1995 there were 21,577 fall-related hospital admissions in elderly people (>50 years) (Bandolier, 1999).

2.3 Australian literature

Fall fatality rates in Australia range from 12-14% of injuries (Harrison and Cripps, 1994; Bordeaux and Harrison, 1996; 1998) and fall-related injuries range from 20-40% of all injuries (Moller, 1996, Gilbert & Gordon, 1996, Watt and Ozanne-Smith, 1996, ABS, 1999). One quarter (24%) of spinal cord injuries in Australia in 1996/97 financial year were as a result of fall from a height (Cripps and O'Connor, 1998). Falling was the second major cause of injury death after transportation with a rate of 5.5 per 100,000 people (Harrison and Cripps, 1994).

2.3.1 Work-related falls

A study by NOHSC (2000) reported that 12% of all work-related Australian fatalities were a result of a fall from a height, with 143 fatalities occurring during the period 1989-1992 as a direct result of the fall, and falls contributing to a further 71 fatalities. Of the work-related fall fatalities 32 were in the agricultural industry. The construction industry (66) and the agricultural industry (32) had the highest number of fatalities due to a fall. Ten percent of all agricultural related fatalities were due to a fall. However the manufacturing (50%), construction (28%), and recreation/personal services (24%) industries, had more fall-related fatal injuries as a percentage of total fatalities within their industry. The death rate due to falls per 100,000 persons was 1.84 in the whole farming industry - this is three times higher than the average workers fatality rate for all other industries (Table 2.3.1).

Table 2.3.1 Industry of workers fatally injured as a result of a fall, Australia, 1989-92

Industry	Number	% of falls[1]	% of group[2]	Rate[3]	
Agriculture	32	15.5	10.3	1.84	1.25-2.61
Fishing and hunting	12	5.6	20.0	19.10	9.89-33.5
Mining	20	9.3	14.5	5.23	3.19-8.08
Manufacturing	19	8.9	48.8	0.41	0.25-0.64
Electricity, gas and water	6	2.8	20.1	1.40	0.51-3.05
Construction	66	30.8	28.2	2.95	2.28-3.76
Whole trade and retail trade	11	5.1	3.1	0.17	0.09-0.31
Transport and storage	18	8.4	4.7	0.90	0.49-1.50
Finance and property	2	0.9	4.2	0.06	0.01-0.20
Public administration and defence	3	1.4	3.2	0.07	0.00-0.40
Community services	4	1.9	5.6	0.07	0.02-0.18
Recreation and personal services	20	9.3	23.5	0.80	0.80-1.25
Unknown	1	0.5	11.1	-	-
Total	**214**	**100.0**	**12.0**	**0.67**	**0.58-0.76**

1: Percent of all work-related traumatic deaths of working persons that were due to falls.
2: Percent of work-related traumatic deaths of working persons in the industry that was due to falls.
3: Deaths per 100,000persons per year with 95% confidence intervals.
Source: NOHSC (2000) Table 6

In Victoria, there were 1,579 workers compensation claims due to a fall from a height between 1 July 1993 and 30 June 1997 (four years). Among the industries, agricultural workers represented 8% of total fall claims. Within the agriculture industry 11% of all workers compensation claims were due to a fall from a height (Field *et al*., 2000).

2.3.2 Falls in children

In Australia, child-related falls are a priority for injury prevention and was identified in the 2001-2003 National Injury Prevention Plan (NIPP). Falls in children has been one of the four-priority areas for immediate action as it represents a substantial burden of injury and cost to the health system (Department of Health and Aged Care, 2001b).

In children aged 0-14 years, hospitalisation due to a fall is one of the leading causes of injury. Steenkemp and Cripps (2001) reported that fall-related deaths accounted for 2% (n=225) of all deaths to children in Australia between 1979 and 1998. Moller and Kreisfeld (1997) reported 21,760 hospitalisations during 1992/93. More than 23,000 fall-related injuries (38% of all injuries) were reported for the 1996/97 financial year (Commonwealth of Australia, 2001); and 25,401 child hospitalisations were recorded in the 1997/98 financial year by Steenkemp and Cripps (2001). Steenkemp and Cripps (2001) also reported 51,539 emergency department presentations (34% of all child injury presentations) in Victoria due to falls between 1 July 1996 and 30 June 1999 .

2.3.3 Falls in older people

Falls in older people in Australia have been also identified as a priority for injury prevention by the 2001-2003 NIPP, being the leading cause of injury of older people and a burden to the health system (Department of Health and Aged care, 2001b). The National Injury Prevention Advisory Council (NIPAC) identified falls in the elderly as one of the four-priority area for immediate action. In 1997 there were 997 deaths and 32,000 injuries leading to hospitalisation in people age 65 years and over in Australia. Falls related injury in the 1996/97 financial year made up to 42% of all bed-days in people aged 65 years and over (Department of Health and Aged Care, 2001b).

In NSW, 16,951 persons aged 65 years+ were hospitalised for more than one day due to falls in the financial year 1997/98. The total cost of falls for people 65 years and over in NSW during 1997 was estimated to be $302 million (NSW Health, 2001).

2.4 Farm-related falls in other countries

In the USA, fall fatalities on farm range from 5% to 8% of all farm fatalities (Meyers, 2001; Purschwitz,. 1997; Stallones, 2001) and fall injuries range from 10%-20% of all farm injuries (Meyers, 2001; Randolph, 1999; Becker, 2001) (see Table 2.4.1). On Virginian farms, 9% of all work-related injury between 1990 and 1994 were due to a fall (Hetzel and Zhao, 1996). On Pennsylvanian farms, falls were the cause of 28% of injuries associated with non-tractor and machinery fatalities (Murphy and Ambe, 2001).

In a fall-related farm injury study in the USA, Nordstrom et al, (1996) reported an incidence rate of 7 per 1,000 person-years for farm residents. Of the 48 fall-injured farm residents interviewed by the above authors, 30 presented to an emergency department, 4 were hospitalised and 14 attended as outpatients.

Table 2.4.1 Fatality and injury on American farms due to falls

Fatality/ Injury	Place	Year	% of injuries/ fatalities	Reference
Fatality	California	1981-1990	8	Meyers (2001)
	Kentucky	1979-1985	5	Stallones (2001)
	Wisconsin	1992-1996	5	Purschwitz (1997)
Injury	California	1981-1990	17	Meyers (2001)
	North Carolina	1992-1996	10	Randolph (1999)
	Florida	1992	20	Becker (2001)

In Canada, 4% of all farm-related fatalities between 1991 and 1995 were due to a fall, (CAISP, 1997). Of these, 50% occurred to farmers who were 60 years of age or older. Male farmers accounted for 94% of fatalities during this period (Table 2.4.2). Falls from structures and ladders were the leading cause (33%) of non-machinery-related injury in Canada. In Alberta, falls on farms resulted in 12% of non-machinery fatalities and 30% of non-machinery hospitalisation, 1991-1996 (Voaklander et al, 1999).

Table 2.4.2 Canadian work-related farm fatalities due to falls, by age and sex 1991-95

Age Group	Male		Female		Total	
	n	%	n	%	n	%
0-14	-	-	-	-	-	-
15-59	8.0	47.1	1.0	100.0	9.0	50.0
60+	9.0	52.9	-	-	9.0	50.0
Total	**17.0**	**100.0**	**100.0**	**100.0**	**18.0**	**100.0**

Source: Canadian Agricultural Injury Surveillance Program (1997)

In the UK the Health and Safety Executive (1986) reported that 11% of fatal accidents in the UK agricultural industry were primarily due to falls from 1981-84. Of fatalities related to self-propelled machines, field machinery, animal and drowning, 11% were mainly due to a fall and 22% of all fatalities a result of a fall. (Table 2.4.3). In the 1998/99 financial year 18% of fatalities were due to a fall in the farming, forestry, horticulture, and associated industries (Health and Safety Executive, 1999).

Falls were one of the main causes of injury in the Swedish agricultural industry where 21% of farm injuries were related to a fall. Of these, 14% were from a height and 9% were on the same level (Lundqvist and Gustafsson, 1992). Schelp, (1992) reported that 13% of all Swedish farm-related injuries were due to falls.

Table 2.4.3 Agricultural black spot fatal accidents in Great Britain during 1981-84

Cause	Total		Falls		Others	
	n	%	nr	%	n	%
Falls as main factor	33	11.1	33	11.1	-	-
Self-propelled machines	89	3.0	6	6.7	83	93.3
Field machinery	38	12.8	10	26.3	28	73.7
Animals	26	8.7	8	30.8	18	69.2
Drowning/asphyxiation	24	8.1	9	37.5	15	62.5
Falling object	32	10.8	-	-	32	10.8
Electrical equipment	15	5.0	-	-	15	5
Others	39	13.2	-	-	39	13.2
Total	**296**	**100.0**	**66**	**22.2**	**230**	**77.8**

Source: Health and Safety Executive (1986)

In New Zealand, 5% of farm related fatalities during 1986-91 were due to falls, and in 1989 10% of total hospitalised farm injury was a result of a fall (Clarke et al, 1995). Falls from animals and vehicles are not included in the above data. Clarke et al, (1995) also reported 201 horse-related events as a result of falls (71% of horse-related injury). There were 1,496 on-farm motorcycle crashes (75% of motorcycle injuries) and 20% of tractor-related hospitalised injury events due to falls during 1980-89. In children (0-15 years), falls are one of the leading causes of non-fatal farm injury accounting for 12% of total hospitalised child injury on farms (Clarke et al, 1995) (Table 2.4.4)

Table 2.4.4 New Zealand injury and fatality in farms due to falls

Injury/fatality	n	%
Hospitalised fall injuries		
Falls as a main factor (in all injuries) (1989)	**132**	**10**
Horse related falls (1989)	201	71
Motorcycle-related falls (1980-89)	1496	75
Tractor-related falls (1980-89)	230	20
Fatal fall injuries (1986-1991)	**14**	**5**

Source: Clarke *et al*., (1995)

2.5 Farm-related falls in Australia

In Australia, Fragar and Franklin (2000) reported that farm-related injury resulted in 150 deaths, 6,500 admissions to hospital and 6,000 workers compensation claims per year. Farming was second to the construction industry in the number of fatalities resulting from falls, and had a slightly greater percentage of fall-related fatalities (14%) compared to an all industries average of 12%. Ladders, roofs and horses were the common agents associated with falls (NOHSC, 2000).

Franklin et al, (2000) reported 67 fatalities on Australian farms from 1989-92 due to falls from a height. Cole and Foley (1995) reported that 22% of work-related injuries on farms resulted from a fall in 1992-93, of these 56% were from a height. Erlich et al, (1993) reported 5% of agricultural fatalities resulting from falls during 1982-84, most of which were horse-related.

In the New England Region of NSW during the period 1990/91, falls resulted in 19% adult and 28% child hospitalisations (Wolfenden, 1993). Robson (1994) also found a similar trend where 15% of farm injuries presented to the Parkes District Hospital emergency department (ED), NSW were due to falls. Farm-related falls resulted in 12% of farm emergency presentations in Barwon Health District, NSW, in 1994 and another 11% of falls were animal-related (Coleman & Wetherspoon, 1994). Renwick (1986) reported that falls were the third most common cause of work-related injury on farms where 13% of the total farm injuries in New

England region, NSW, were due to falls. WorkCover NSW found that 24% of injuries in the agricultural industry were due to falls, trips and slips (WCA, 1993).

Day et al (1997) found that falls were the leading cause of injury to farm injury cases presenting to emergency departments in Victoria during 1996/97. Sixteen percent of presentations were due to falls excluding those related to moving objects (motorbikes, tractors, horses, other animals etc). Falls were the second most common injury (after transport) for hospital admissions. Of farm injury hospitalisation, 22% were due to falls from July 1993 to June 1996. In the hospital data, 42% of falls were coded as "unspecified cause" (Day et al, 1997). Agriculture represented 8% of total falls from a height injury based on Victorian workers compensation claims during 1993/94 to 1996/97 (Field et al, 2000) with the falls injury rate being 12 per 10,000 workers. This was triple the average injury rate (4 per 10,000 workers) of all industries combined.

In Queensland, Harper (1997) reported that fall-related injury was the most common external cause of injury presenting to rural hospitals. Ferguson (1999) found that about 10% of work-related farm deaths in Queensland occurred due to falls during 1990-1998 and that most of these fatalities were associated with horses.

Falling was the leading major external cause of death (24% of all agriculture related deaths) for the years 1991-96; the leading primary trauma cause (30% of all agriculture related injury); and the major cause resulting in workers compensation claims (18% of all agricultural related claims) during 1995/96 to 1997/98 on South Australian farms (Franklin et al, 1999). Morton and Van Rooijen (1998) found that farm-related falls were the second major cause of injury (16%) in the Eyre Peninsula of South Australia between October 1996 and April 1998.

The Department of Occupational Health, Safety and Welfare (1995) reported that the proportion of lost time injury/diseases (LTI/Ds) caused by a fall injury was greater in females (23%) than in males (15%) in Western Australian agricultural workers in 1993/94.

Most of the farm injury reports give only an estimate of the number of falls with little or no information on the details and events surrounding the fall. In Victorian emergency departments, 107 (50%) falls were horse-related (Day et al, 1997) and 23 (18%) were tractor-related (Ashby and Day, 1995). Wolfenden (1993) reported that 19% of falls occurred to employee/contractors, 18% to owner/residents and 21% to visitors. Of injuries in the sheep and grain industries, 14% and 27% respectively were due to falls as reported by the Eyre Peninsula Division of General Practice, SA, from October 1996 to April 1998 (Morton and Van Rooijen, 1998). NSW WorkCover (1993) reported that 26% of injuries to farm hand/assistants and 27 % of sprains/strains were as a result of a fall in the 1991/92 financial year. Workers' Compensation Claim (WCC) studies, in Victoria, found that 52% of falls from a height in agriculture were falls from a ladder in the 1993/94-96/97 financial years. Fourteen percent of all falls from a height, due to ladders, occurred in the agricultural industry (Field et al, 2000).

Although there are reports on the nature and circumstances of falls, with special references to elder people and workplace falls, little information is available regarding the nature and circumstances of farm-related falls in Australia.

3. Fatalities Due To Falls On Farms

In Australia all traumatic deaths are investigated by a coroner and as such provide rich detail surrounding the fatality. Fatality counts also give an indication to the size of a problem as they represent the tip of the injury pyramid. Falls was the second leading major cause of unintentional injury death next to transport in Australia in 1996 (Bordeaux, 1998).

Franklin et al (2000) found that between 1989 and 1992 there were 42 deaths on Australia farms due to falls and a further 25 fatalities from where the mechanism of death was not a fall but a fall was involved. A summary of these findings is presented below. An examination of Australian Bureau of Statistics data from 1989 to 2000 is also presented.

3.1 Deaths due to a fall to a farmer or farm worker 1990-2000

3.1.1 Methodology

Information from the Australian Bureau of Statistics (ABS) deaths register was analysed for cases where death had been registered with the ABS between 1 January 1990 and 31 December 2000, where occupation was stated as farming and cause of death was classified as a fall (see Appendix 1). The occupation codes were classified as *farmers and farm managers* (n=1400), *retired farmers and farm managers* (n=1410), *unemployed farmers and farm managers* (n=1420), *agricultural labourers and related workers* (n=8200), *retired agricultural labourers and related workers* (n=8210), *unemployed agricultural labourers and related workers* (n=8220).

The use of the registration year has a two fold purpose, firstly it was the first year that the occupation codes were used in the above format and as such provides a consistent definition of farmer and farm worker occupation over the time period. Secondly, in the year 2000 not all deaths were recorded because some deaths (especially those occurring in the later part of the year) were not registered until the following year .

There were a total of 1,374,6126 people who died and were registered with the ABS between 1 January 1990 and 31 December 2000. Of the cases where occupation was recorded, 67,647 were identified as being involved in farming. A further reduction was made to exclude all non-fall related cases (see Appendix 1 for inclusion).

The information subsequently provided should be used with care as it provides an indication only of the type of death occurring to people identified as farmers and farm labourers. The injuries sustained may or may not have occurred on a farm and may or may not have been part of their work. The analysis is only provided as an indication of fall-related death whereas Section 3.2 provides a more detailed analysis of falls that occurred on a farm or during the course of farm work. No work has been undertaken to validate the information provided by the ABS.

Please note that a change in coding from ICD9 to ICD10 occurred in 1999 and this change is reflected as a reduction in the number of deaths reported.

3.1.2 Results

There were 461 deaths of farmers and farm workers registered by the ABS for the period 1 January 1990-December 2000. Of these 417 (90.5%) were males and 44 (9.5%) were females. This result is not unexpected due to the poor collection of occupation data regarding female farmers (Burke, 1997) and the traditional over representation of males in farming.

The predominant occupation recorded was *farmers and farm managers* (70.3%), followed by *retired farmers and farm managers* (15.6%) (Table 3.1.1).

Table 3.1.1 Occupation of farmers and farm workers fatally injured by a fall 1990-2000

Occupation	Frequency	Percent
Farmers & farm managers	324	70.3
Retired farmers & farm managers	72	15.6
Agricultural labourers & related workers	54	11.7
Retired agricultural labourers & related workers	11	2.4
Total	**461**	**100.0**

Note: change in coding in 1999 from ICD9 to ICD10

The majority of farmers and farm workers dying as a result of a fall were aged over 70 years (83%). For the *agricultural labourers and related workers* occupational group there were a small consistent number of deaths until the age of 75 where there was a slight increase (Table 3.1.2)

Table 3.1.2 Age group, by occupation, of farmers and farm workers fatally injured by a fall 1990-2000

	Occupation				
Age group	**Farmers & farm managers**	**Retired farmers & farm managers**	**Agricultural labourers & related workers**	**Retired agricultural labourers & related workers**	**Total**
20-24 yrs	4	0	3	0	7
25-29 yrs	0	0	5	0	5
30-34 yrs	0	0	5	0	5
35-39 yrs	2	0	3	0	5
40-44 yrs	2	0	3	0	5
45-49 yrs	6	0	2	0	8
50-54 yrs	3	0	2	1	6
55-59 yrs	8	0	2	0	10
60-64 yrs	5	1	2	0	8
65-69 yrs	13	2	2	1	18
70-74 yrs	16	3	2	1	22
75-79 yrs	31	13	7	2	53
80-84 yrs	67	9	6	1	83
85+ yrs	167	44	10	5	226
Total	**324**	**72**	**54**	**11**	**461**

Note: change in coding in 1999 from ICD9 to ICD10

The number of fall-related deaths per annum averaged 41 (excluding 1989), however in 1999 when the coding used for falls changed from ICD9 to ICD10 there was a large drop in numbers from 51 in 1998 to 18 in 1999. It was also not unexpected to observe numbers for 1998 and 2000 down compared to other years because registration years were used as the criteria for inclusion (Table 3.1.3).

Table 3.1.3 Year of death of fall for farmers and farm workers

Year of death	n	%
1989	8	1.74
1990	50	10.85
1991	38	8.24
1992	37	8.03
1993	39	8.46
1994	49	10.63
1995	53	11.5
1996	55	11.93
1997	48	10.41
1998	51	11.06
1999	18	3.9
2000	15	3.25
Total	461	100

Note: change in coding in 1999 from ICD9 to ICD10

The state of NSW had the most fall-related deaths (31.0%), followed by Victoria (27.1%) and Queensland (21.5%). Not surprisingly, the number of falls in a given year for each state was variable as was a decline in the last two years (corresponding to the change from ICD9 to ICD10) (Table 3.1.4).

Table 3.1.4 State of residence, by year of death, of farmers and farm workers suffering a fall

Year of death	State							
	NSW	Vic	Qld	SA	WA	Tas	NT	Total
1989	0	5	2	0	0	0	1	8
1990	11	18	10	3	6	0	2	50
1991	10	14	8	4	1	1	0	38
1992	8	19	3	2	5	0	0	37
1993	12	11	10	4	2	0	0	39
1994	21	11	10	3	3	1	0	49
1995	19	13	12	4	5	0	0	53
1996	20	14	8	9	1	3	0	55
1997	14	7	19	3	4	1	0	48
1998	15	8	10	4	9	4	1	51
1999	8	4	3	2	1	0	0	18
2000	5	1	4	1	2	1	1	15
Total	**143**	**125**	**99**	**39**	**39**	**11**	**5**	**461**

Note: change in coding in 1999 from ICD9 to ICD10

For the early years the majority of fall related cases were classified as “E887 Fracture, cause unspecified” however with the change in classification from ICD9 to ICD10 this group is no longer present. For all other causes of death the numbers remain reasonably consistent (Table 3.5).

Table 3.1.5 Cause of fall-related death, by year of death, for farmers and farm workers

	Year of death												
Cause of death	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**Total**
E880.9 Fall on or from stairs or steps - other stairs or steps	0	2	0	0	1	0	1	2	1	2	0	0	9
E881.0 Fall on or from ladders or scaffolding - fall from ladder*	0	0	0	0	0	0	2	3	0	0	2	1	8
E882 Fall from or out of building or other structure %	1	1	3	1	0	2	1	2	2	1	2	2	18
E884.1 Other fall from one level to another - fall from cliff	1	0	0	0	0	0	0	1	0	0	0	0	2
E884.2 Other fall from one level to another - fall from chair	1	2	3	2	0	4	1	0	3	1	0	0	17
E884.9 Other fall from one level to another - other fall from one level to another ##	0	4	4	1	2	1	2	1	0	1	0	1	17
E885 Fall on same level from slipping, tripping, or stumbling#	1	3	1	2	0	3	5	3	3	4	2	0	27
E886 Fall on same level from collision, pushing, or shoving, by or with other person	0	0	0	0	0	2	1	0	1	0	0	0	4
E887 Fracture, cause unspecified	2	33	23	24	28	32	29	35	30	31	0	0	267
E888 Other and unspecified fall **	2	5	4	7	8	5	11	8	8	11	12	11	92
Total	**8**	**50**	**38**	**37**	**39**	**49**	**53**	**55**	**48**	**51**	**18**	**15**	**461**

For the years 1999 and 2000 this includes W01 Fall on same level from slipping, tripping and stumbling and for the years 1998-2000 includes W18 Other fall on same level; * For the years 1999 and 2000 this includes W11 Fall on and from ladder; % For the years 1999 and 2000 this includes W13 Fall from, out of or through building or structure; ## For the years 1999 and 2000 this includes W17 Other fall from one level to another; ** For the years 1999 and 2000 this includes W19 Unspecified fall; Note: change in coding in 1999 from ICD9 to ICD10

There was no discernable difference in distribution of cause of death for the different farming occupations (Table 3.1.6)

Table 3.1.6 Cause of fall-related death, by occupation, for farmers and farm workers 1990-2000

	Occupation				
Cause of death	**Farmers & farm managers**	**Retired farmers & farm managers**	**Agricultural labourers & related workers**	**Retired agricultural labourers & related workers**	**Total**
E880.9 Fall on or from stairs or steps - other stairs or steps	5	1	1	2	9
E881.0 Fall on or from ladders or scaffolding - fall from ladder*	3	1	4	0	8
E882 Fall from or out of building or other structure %	12	2	3	1	18
E884.1 Other fall from one level to another - fall from cliff	1	0	1	0	2
E884.2 Other fall from one level to another - fall from chair	14	3	0	0	17
E884.9 Other fall from one level to another - other fall from one level to another ##	11	0	6	0	17

Table 3.6.1 (cont)

Cause of death	Farmers & farm managers	Retired farmers & farm managers	Agricultural labourers & related workers	Retired agricultural labourers & related workers	Total
E885 Fall on same level from slipping, tripping, or stumbling[#]	17	3	6	1	27
E886 Fall on same level from collision, pushing, or shoving, by or with other person	2	0	2	0	4
E887 Fracture, cause unspecified	203	39	20	5	267
E888 Other and unspecified fall **	56	23	11	2	92
Total	**324**	**72**	**54**	**11**	**461**

For the years 1999 and 2000 this includes W01 Fall on same level from slipping, tripping and stumbling and for the years 1998-2000 includes W18 Other fall on same level; * For the years 1999 and 2000 this includes W11 Fall on and from ladder; % For the years 1999 and 2000 this includes W13 Fall from, out of or through building or structure; ## For the years 1999 and 2000 this includes W17 Other fall from one level to another; ** For the years 1999 and 2000 this includes W19 Unspecified fall; Note: change in coding in 1999 from ICD9 to ICD10

3.2 Death due to a fall on a farm 1989-1992

The following is a précis from the report "*Farm-related fatalities in Australia, 1989-1992*" by Franklin et al (2000) where full details can be found on pages 275-283 and methodology in Chapter 2. All material is reproduced with permission of the authors.

Falls from a height include all people who fall from any height, but exclude slips, trips and falls on the same level. People fatally injured, but not in connection with work activity or equipment are included as *other farm* fatalities (for example a person riding a horse for recreation) whereas *bystanders* were nonworking people fatally injured (such as children or visitors) in association with farm equipment or structures (such as a dam or tractor).

Between 1989 and 1992, there were 587 unintentional fatalities on Australian farms of which 42 cases were where an individual fell from a height. This is an average of 10 fatalities per year. Of the 42 fatalities, 29(69.0%) occurred to people working at the time of the incident (Table 3.3.1).

Table 3.2.1 Fatalities per year, by work status, where fall was from a height and farm-related 1989-92

Year	Working		Bystander		Other farm		Total	
	n	%	n	%	n	%	n	%
1989	6	20.7	2	40.0	4	50.0	12	28.6
1990	7	24.1	-	-	1	12.5	8	19.0
1991	8	27.6	3	60.0	1	12.5	12	28.6
1992	8	27.6	-	-	2	25.0	10	23.8
Total	**29**	**100.0**	**5**	**100.0**	**8**	**100.0**	**42**	**100.0**

There were 25 additional fatalities involving a worker falling from a height where the main mechanism of the fatal incident was not a fall. Seven (7) incidents involved the worker falling from a tractor and subsequently being run over by the tractor; 3 incidents involved a worker falling from a horse and then being either trapped under the horse, colliding with a tree or falling into a flooded river and drowning; one worker fell from a truck and was subsequently run over; one worker fell from a ladder after receiving an electric shock; and one worker fell down a well and drowned.

Six (6) of the bystanders fell from a tractor and were subsequently run over; one bystander fell from a utility and then was run over; one bystander fell from a fence while intoxicated; and one bystander fell into a bore hole and drowned.

The 3 other farm fatalities involved a person falling from a panel van and subsequently being run over; a person falling from a bridge and drowning; and a person receiving an electric shock while up a ladder and then falling from the ladder.

3.2.1 Gender and age

Thirty-one of the 42 fatalities (73.8%) involving falls from a height were of people aged 20-64 years, although persons of all ages were involved. Twenty-eight (96.6%) workers, 3 (60.0%) bystanders and 5 (62.5%) cases in other farm fatalities were male (Table 3.3.2).

Table 3.2.2 Age group, by work status, where fall was from a height and farm-related 1989-92

Age Group	Working	Bystander	Other farm	Total	%
<5	-	1	-	1	2.4
5 - 9	1	2	-	3	7.1
10 - 14	-	1	1	2	4.8
15 - 19	-	-	-	-	-
20 - 24	2	-	1	3	7.1
25 - 29	1	-	-	1	2.4
30 - 34	2	-	2	4	9.5
35 - 39	3	-	-	3	7.1
40 - 44	4	-	-	4	9.5
45 - 49	3	-	-	3	7.1
50 - 54	2	1	1	4	9.5
55 - 59	2	-	1	3	7.1
60 - 64	5	-	1	6	14.3
65 - 69	1	-	1	2	4.8
70 - 74	1	-	-	1	2.4
75+	2	-	-	2	4.8
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.2 Farm enterprise

The type of farm enterprise where the fatality occurred could be identified in 39 (92.9%) incidents. The most common farm enterprise was classified as meat cattle (21.4%) (Table 3.3.3).

Table 3.3.3 Farm enterprise, by work status, where fall was from a height and farm-related 1989-92

Farm enterprise	Working	Bystander	Other farm	Total	%
Agriculture	**27**	**5**	**8**	**40**	**95.2**
Poultry for meat	*1*	-	-	*1*	*2.4*
Fruit	*1*	-	-	*1*	*2.4*
Orchard and other fruit	*2*	-	-	*2*	*4.8*
Vegetables including potatoes	-	*1*	-	*1*	*2.4*
Cereal grain/sheep/cattle/pigs	*3*	-	*2*	*5*	*11.9*
Meat cattle/cereal grains	*3*	-	-	*3*	*7.1*
Table 3.3.3 (cont) Farm enterprise	**Working**	**Bystander**	**Other farm**	**Total**	**%**
Sheep/meat cattle	*2*	*1*	-	*3*	*7.1*
Sheep	*4*	-	-	*4*	*9.5*
Meat cattle	*5*	*2*	*2*	*9*	*21.4*
Dairy	-	*1*	-	*1*	*2.4*
Sugar cane	*2*	-	-	*2*	*4.8*
Agriculture NEC	*2*	-	*2*	*4*	*9.5*
Services to agriculture	*1*	-	-	*1*	*2.4*
Agriculture not known	*1*	-	*2*	*3*	*7.1*
Other	**2**	-	-	**2**	**4.8**
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.3 Location of fatal incident

Six (14.3%) of the fatalities occurred in areas of natural vegetation, with *paddocks under crop* (11.9%), *paddocks clear for grazing* (11.9%) and *stockyards* (11.9%) being the next most common locations where the fatal incident occurred (Table 3.3.4).

Table 3.3.4 Location, by working status, where fall was from a height and farm-related 1989-92

Location on Farm	Working	Bystander	Other Farm	Total	%
Paddock under crop	4	1	-	5	11.9
Paddock clear for grazing	3	-	2	5	11.9
Natural vegetation	3	2	1	6	14.3
Stockyards including horse yards	3	-	2	5	11.9
Roads, lanes	2	1	1	4	9.5
Hay shed	1	-	-	1	2.4
Shed, farm building NEC	1	1	1	3	7.1
Woolshed shearing shed	1	-	-	1	2.4
Storage shed other	1	-	-	1	2.4
Disposal pit	1	-	-	1	2.4
Windmill including troughs	3	-	-	3	7.1
Animal shed other including broiler shed	1	-	-	1	2.4
Farm residence	2	-	-	2	4.8
Farm yard or garden	1	-	1	2	4.8
Other place associated with agricultural work	1	-	-	1	2.4
Not relevant	1	-	-	1	2.4
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.4 Agent/situation from which person fell

Horses (28.6%) and ladders (14.3%) were the most common agents that the person fell from at the time of the fatality. Other common items or structures that workers fell from were windmills (10.3%), tractors (6.9%), roofs (6.9%) and trees (6.9%). For bystanders, trailers (40.0%) were the most common agent. Other farm fatalities commonly involved falls from horses (50.0%) or ladders (25.0%) (Table 3.3.5).

Table 3.3.5 Agent/situation from which person fell, by work status, where fall was from a height and farm-related 1989-92

Item	Working	Bystander	Other Farm	Total	%
Machinery & mainly fixed plant					
Windmill	3	-	-	3	7.1
Escalator	1	-	-	1	2.4
Total machinery & mainly fixed plant	**4**	**-**	**-**	**4**	**9.5**
Mobile plant & transport					
Tractor	2	1	-	3	7.1
Trailer	-	2	-	2	4.8
Trucks, semi-trailers, lorries	1	-	-	1	2.4
Tray, loading board or table top of truck or semi-trailer	1	-	-	1	2.4
Cars, station wagons, vans, utilities	-	1	-	1	2.4
Pushbikes	-	-	1	1	2.4
Horse drawn sulky	1	-	-	1	2.4
Total mobile plant & transport	**5**	**4**	**1**	**10**	**23.8**
Non-powered handtools, appliances & equipment					
Ladders, mobile ramps and stairways	3	-	2	5	11.9
Step ladders	1	-	-	1	2.4
Total non-powered handtools, appliances & equipment	**4**	**-**	**2**	**6**	**14.3**
Environmental agencies					
Pits	1	-	-	1	2.4
Embankment or ravine	1	-	-	1	2.4
Roof	2	-	-	2	4.8
Buildings under construction or demolition	1	-	-	1	2.4
Fencing	-	-	1	1	2.4
Trees	2	-	-	2	4.8
Horse	7	1	4	12	28.6
Haystack	1	-	-	1	2.4
Total environmental agencies	**15**	**1**	**5**	**21**	**50.0**
Not known	1	-	-	1	2.4
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.5 Activity at time of fatal incident

Working with animals (31.0%) and *performing maintenance activities* (20.7%) were the two most common activities being undertaken by workers at the time of the fatality. Bystanders were involved in *transport for recreation* (60.0%) and *recreation or playing activities* (40.0%). Persons who were fatally injured in other farm incidents were commonly involved in *transport for recreation* (37.5%) and *recreation or playing activities* (25.0%) (Table 3.3.6).

Table 3.3.6 Activity at time of fatality, by work status, where fall was from a height and farm-related 1989-92

Activity	Working	Bystander	Other Farm	Total	%
Transport for work purposes	1	-	-	1	2.4
Transport for recreation	-	3	3	6	14.3
Constructing or installing	2	-	1	3	7.1
Maintenance	6	-	1	7	16.7
Earthmoving or digging	1	-	-	1	2.4
Hunting	1	-	-	1	2.4
Working with animals	9	-	-	9	21.4
Working with crops	3	-	-	3	7.1
Monitoring, observing inspecting	1	-	-	1	2.4
Moving goods	4	-	-	4	9.5
Recreation or playing	-	2	2	4	9.5
Other	1	-	-	1	2.4
Not known / not stated	-	-	1	1	2.4
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.6 Pathophysiological cause of death and blood alcohol content

The most common pathophysiological cause of death was *head injuries* (54.8%). This was true for working (48.3%), bystander (60.0%) and other farm fatalities (75.0%) (Table 3.3.7).

Table 3.3.7 Pathophysiological cause of death, by work status, where fall was from a height and farm-related 1989-92

Pathophysiological Cause of Death	Working	Bystander	Other farm	Total	%
Head injuries	14	3	6	23	54.8
Neck injuries	2	-	-	2	4.8
Chest injuries	3	-	-	3	7.1
Trunk injuries	-	-	2	2	4.8
Abdominal injuries	1	-	-	1	2.4
Multiple injuries to head and other body parts	1	-	-	1	2.4
Multiple injuries - other	2	1	-	3	7.1
Fat embolism crush injury syndrome	1	-	-	1	2.4
Not known	1	-	-	1	2.4
Medical complications	4	1	-	5	11.9
Total	**29**	**5**	**8**	**42**	**100.0**

3.2.7 Farm visitors

Of the 42 fatalities, 15 (35.7%) occurred to people classified as *visitors* to the farm, compared to 25 (59.5%) *residents*. In two (2) cases it was *not relevant or not known* if the person was a visitor to the farm.

3.3 Summary

Deaths due to a fall to a farmer or farm worker 1990-2000

- There were 41 deaths per annum to farmers and farm workers due to a fall.
- The majority were over 70 years of age.
- NSW, Victoria and Queensland were the states with the highest number of deaths.

Farm-related fatalities in Australia, 1989-1992

- There were 42 fatal incidents on Australian farms between 1989 and 1992 where an individual fell from a height. The majority of fatal incidents involved males aged 20-64 years.
- There were a large number of different farm enterprises where fatal incidents occurred, however meat cattle farming was the most common.
- Paddocks (either under crop or clear for grazing), areas of natural vegetation and stock yards (including horse yards) were the most common locations of fall-related fatalities.
- Falls were commonly associated with horses and a variety of machinery and farm vehicles for farm workers. Bystanders commonly fell from farm vehicles. Other farm persons commonly fell from horses.
- Workers were most likely to be working with animals or performing maintenance activities at the time of the fatal fall. Bystanders and other farm persons were usually involved in recreation-related transport at the time of the fall.
- Head injuries resulting from a fall were the most common cause of death for all three groups.
- The fatal fall usually occurred most commonly to residents of the farm. One third of the fatalities occurred to farm visitors.

4. Hospitalisation from a Fall on a Farm, NSW

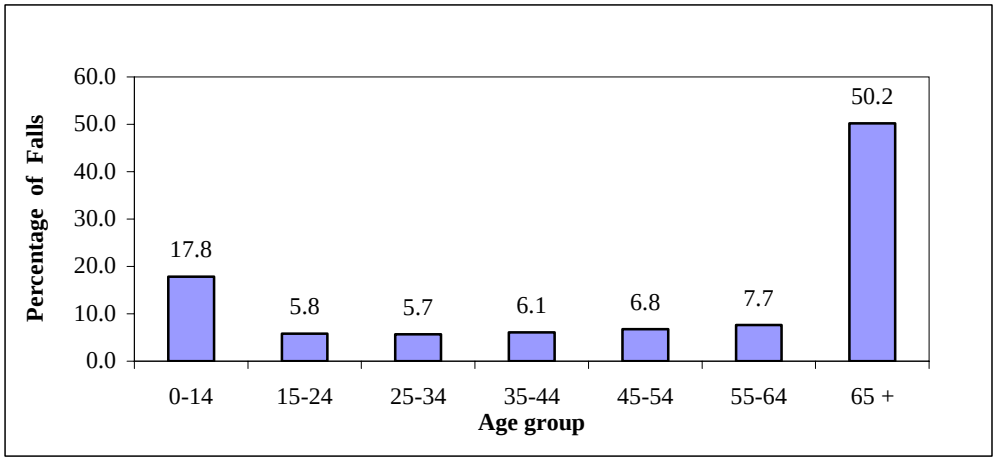
4.1 Introduction

In NSW each year there are on average 1,616,976 people hospitalised (Public Health Division, 2000, based on 1989/90-1997/98 financial years). Information was collected about each of these cases, primarily for funding purposes. The data includes information about the patient (age, gender, marital status, country of birth, usual area of residence); diagnosis; treatments received; length of stay; date of admission; date of discharge; referral; and for injury the location where the injury occurred and the external cause of the injury.

Using the location of incident (when it is farm) and other information collected by the hospital, the ACAHS has attempted to define the nature and scale of the farm-related injury problem in Australia, although there are some limitations (Fragar and Franklin, 2000), including accuracy of place coding and the purpose for which the information was collected.

Of the 1,616,976 people hospitalised in NSW each year, 106,256 (6.6%) people are admitted as a result of an injury or poisoning (1989/90-1997/98 financial years). The rate of fall-related injury requiring hospitalisation in NSW was 28,102 (1989/90-1997/98 financial years) per annum. More than a quarter (26%) of people hospitalised due to an injury or poisoning, sustained the injury from a fall, of these 56% were females, 47% were aged 65 years and over (of these 73% were females) (Public Health Division, 2000). Schmertmann and Williamson, (2002) reported that older people (65 years and over) and children (<15) accounted for half (50%) and nearly one-fifth (18%) of all NSW cases requiring hospitalisation due to a fall from 1995-1999 (Figure 4.1.1).

Figure 4.1.1 Percentage of people hospitalised due to a fall, by age group, NSW 1995-99 (n=224,141)



Source: Schmertmann & Williamson, 2002

The hospitalisation rate of fall cases has increased by 12% over the last eight years in NSW (1989/90-1997/98 financial years) (Public Health Division, 2000). The estimated lifetime cost of injuries from falls in 1995/96 financial year in NSW was $1 billion (Moller, 1998), this is nearly twice the cost of road trauma (Public Health Division, 2000). Moller (2002) reported that the projected costs to the health system from falls in NSW would jump from $300 million in 1993 to more than $600 million in 2051.

In 1998, there were 42,496 (29%) agricultural establishments (with an estimated value of agricultural output (EVAO) of greater than $5,000) in NSW (ABS, 1999). Injuries on farms result in 1,485 people being hospitalised each year in NSW (1989/90-1999/00 financial years) and of these 75% were male. ACAHS has used some external cause codes with a higher probability of being farm-related to report on hospital admissions. Fragar and Franklin (2000) found 1,062 on-farm NSW hospitalisation injuries in 1995/96, however this excluded falls.

The number of people requiring hospitalisation due to farm injury per agricultural establishment was higher in NSW compared to Victoria and Western Australia (Table 4.1.1). In Victoria there were 1,991 (664 per year) farm injury hospitalisations between 1 July 1993 to 30 June 1996; of these 437 (22%) were due to falls (Day et al, 1997). In Western Australia, 3,420 (428 per year) farm-injured people were admitted to hospitals between July 1991 and June 1999; of these 376 (11%) were due to falls (Franklin and Fragar, 2002).

Table 4.1.1 People requiring hospitalisation per agricultural establishment in the three States

States	Average no. of farms (EVAO $5000) in a year	% of farms	No. of farm injuries/ year	Rate per 1000 farms
New South Wales*	42,932[a]	28.9	1,539	36
Victoria**	37,391[b]	25.0	664	18
Western Australia*	14,297[a]	9.6	423	30

Source: ABS (1999); Day et al., (1997); Franklin & Fragar, (2002)
*---1992/93-1998/99 financial years a--Average of 1992-98
**--1993/94-1995/96 financial years b--Average of 1993-95

This chapter examines information collected by NSW Health about farm-related cases requiring hospitalisation from 1989/90 to 1999/00 financial years due to a fall.

4.2 Methodology of NSW hospitalisation

Information from the NSW Inpatient Statistic Collection (ISC) was used to provide the number of falls on a farm requiring hospitalisation, who were discharged from hospital between 1 July 1989 and 30 June 2000 (11 Years). The data was captured where the incident was on a farm and the primary diagnosis was an injury and had an E-Code (External Cause Code) of a fall (Table 4.2.1).

Falls in this chapter are defined as an event in which a person slips, trips or stumbles on same level or from one level to another level associated with stationary non-hazardous objects (furniture, stairs and steps, ladder, tree, scaffolding, building or structure) and **excludes** the events in association with moving vehicles or animals. This definition corresponds to the "Accidental Falls" section of ICD10 - W00-W19 and ICD9 - 880-888 which specifically excludes assault and falls from animals, burning buildings, into fire, into water, from or into machinery (in operation), from or into transport vehicle and falls from intentional self harm.

A change in coding from ICD9 to ICD10 occurred in NSW in the 1997/98 financial year.

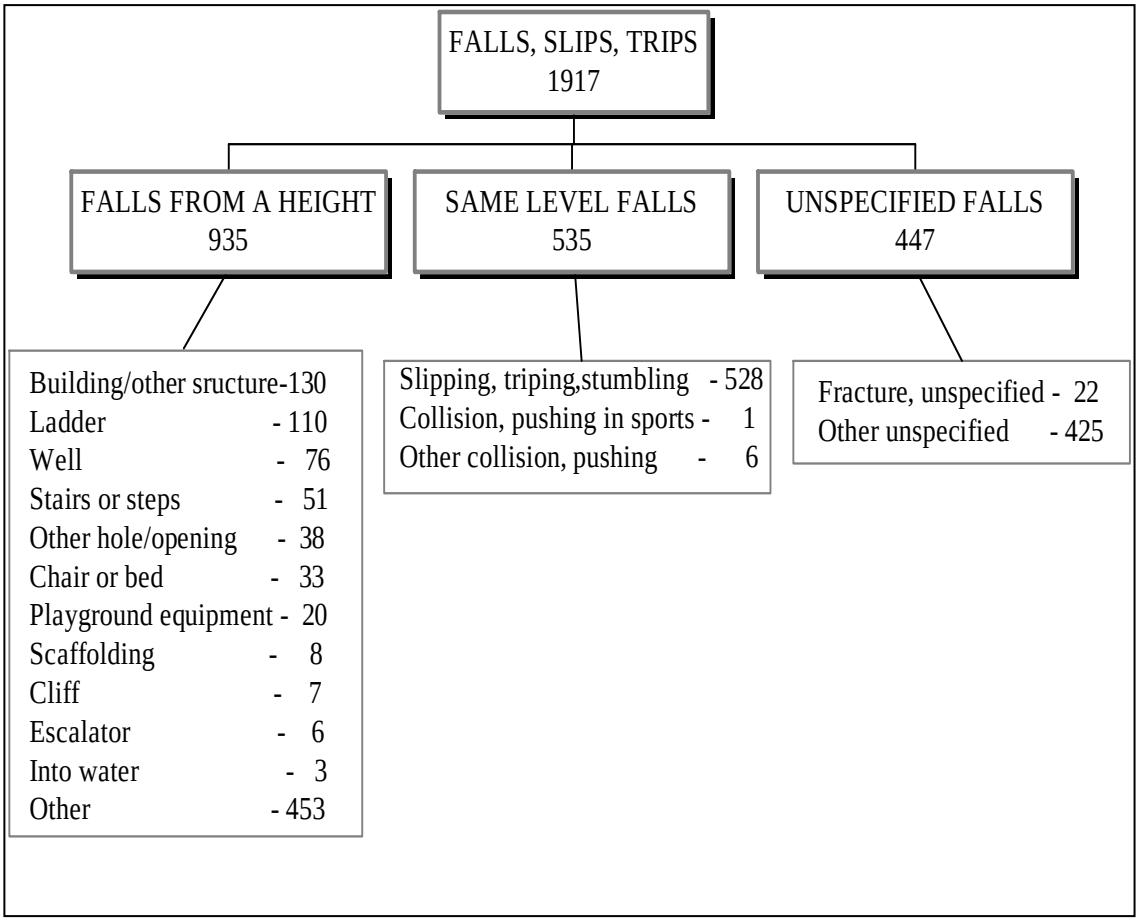
Table 4.2.1 Accidental fall codes and descriptions for ICD 9 and ICD 10 classification systems

ICD 9 Code	Description	ICD 10 Code	Description
E885	Fall on same level from slipping, tripping, or stumbling	W00	Fall on same level involving ice and snow
E885	Fall on same level from slipping, tripping, or stumbling	W01	Fall on same level from slipping, tripping and stumbling
E886.0	In sports	W02	Fall involving ice-skates, skis, roller-skates or skateboards
E886/ E886.9	Fall on same level from collision, pushing, or shoving, by or with other person/other and unspecified	W03	Other fall on same level due to collision with, or pushing by, another person
E884/ E886.9	Other fall from one level to another/other and unspecified	W04	Fall while being carried or supported by other persons
E884.2	Fall from chair or bed	W05	Fall involving wheelchair
E884.2	Fall from chair or bed	W06	Fall involving bed
E884.2	Fall from chair or bed	W07	Fall involving chair
E884.9	Other fall from one level to another	W08	Fall involving other furniture
E884.0	Fall from playground equipment	W09	Fall involving playground equipment
E880/ E880.9	Fall on or from stairs or steps/other stairs or steps	W10	Fall on and from stairs and steps
E881.0	Fall from ladder	W11	Fall on and from ladder
E881.1	Fall from scaffolding	W12	Fall on and from scaffolding
E882	Fall from or out of building or other structure	W13	Fall from, out of or through building or structure
E884.9	Other fall from one level to another	W14	Fall from tree
E884.1	Fall from cliff	W15	Fall from cliff
E883.0	Accident from diving or jumping into water (swimming pool)	W16	Diving or jumping into water causing injury other than drowning or submersion
E884/ E886.9	Other fall from one level to another/other and unspecified	W17	Other fall from one level to another
E886	Fall on same level from collision, pushing or shoving, by or with other person	W18	Other fall on same level
E888	Other and unspecified fall	W19	Unspecified fall

4.3 NSW hospitalisation results

A total of 1,917 persons were injured due to farm-related falls in NSW and discharged from NSW hospitals between 1 July 1989-30 June 2000, equating to an average of 174 farm-related fall injuries per year in NSW requiring hospitalisation. The most common fall injuries occurred due to fall from a height (48.8%). However 447 (23.3%) fall-related injuries were coded *unspecified falls*. The most common falls from a height were *fall from or out of building or other structures* (13.9%), *fall from ladder* (11.8%), *fall from other stairs or steps* (5.5%), *fall into other hole or other opening in surface* (4.1%), *and fall from chair or bed* (3.5%). *Slipping, tripping and stumbling falls* (98.7%) was the most common classification of same-level fall (Figure 4.3.1).

Figure 4.3.1 People hospitalised following a fall on a farm, by type of event, NSW 1989-200



4.3.1 Yearly hospitalisation of fall injuries

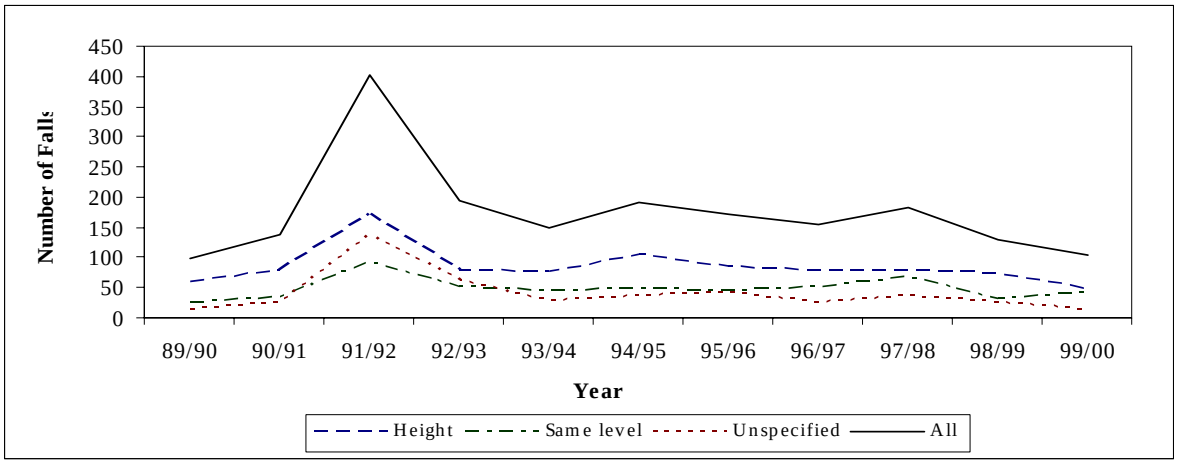
Height-related falls were consistently higher in all years of data collection than falls on the same level. From 1989/90-1997/98, a number of falls were coded as *other fall from one level to another* and in 1998/99-1999/00, no falls were coded in this category; instead a number of falls were coded as *fall into well* during this period whereas in the previous years the number of *fall into well* cases was almost nil. There was no remarkable change in other subgroups throughout the study period (Table 4.3.1).

Table 4.3.1 People requiring hospitalisation due to a fall on a farm, by external cause, by year, NSW 1989-2000

Cause	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	All	%
Falls from a height	60	78	172	80	76	105	85	79	79	72	49	935	48.8
Fall on or from escalator	-	-	-	-	-	-	-	-	-	3	3	6	0.3
Fall from other stairs or steps	2	4	20	3	1	2	9	3	7	0	0	51	2.7
Fall from ladder	3	7	13	13	7	11	15	12	11	11	7	110	5.7
Fall from scaffolding	1	1	1	-	-	1	-	2	-	2	-	8	0.4
Fall from or out of building or other structure	17	10	21	13	9	13	11	8	11	12	5	130	6.8
Accident from diving jumping into water	-	-	-	-	-	-	-	1	1	-	1	3	0.2
Accident fall into well	-	-	-	-	1	-	-	-	-	44	31	76	4.0
Fall into other hole or other opening in surface	4	2	8	7	4	3	4	3	3	-	-	38	2.0
Fall from playground equipment	1	1	8	2	3	-	1	1	3	-	-	20	1.0
Fall from cliff	-	-	-	-	-	-	1	3	1	-	2	7	0.4
Fall from chair or bed	-	1	22	1	3	2	3	-	1	-	-	33	1.7
Other fall from one level to another	32	52	79	41	48	73	41	46	41	-	-	453	23.6
Falls on same level	24	34	94	51	45	49	45	51	68	32	42	535	27.9
Fall on same level from slipping, tripping, or stumbling	24	34	94	51	45	49	43	50	67	30	41	528	27.5
Fall on same level from collision, pushing, or shoving, by or with other person in sports	-	-	-	-	-	-	-	-	1	-	-	1	0.1
Fall on same level from collision, pushing, or shoving, by or with other person by other and unspecified ways	-	-	-	-	-	-	2	1	-	2	1	6	0.3
Unspecified	14	25	137	63	28	36	42	26	37	26	13	447	23.3
Fracture, cause unspecified	1	4	7	3	1	1	1	1	3			22	1.1
Other and unspecified fall	13	21	130	60	27	35	41	25	34	26	13	425	22.2
Total	**98**	**137**	**403**	**194**	**149**	**190**	**172**	**156**	**184**	**130**	**104**	**1917**	**100.0**

The number of farm-related falls per annum remains fairly constant except for the 1991/92 financial years and a small decline in the last two financial years. A number of falls were reported as *unspecified* throughout the study period. It is unknown why there is such an increase in falls in the 1991/92 financial year (Figure 4.3.1)

Figure 4.3.1 People requiring hospitalisation due to a fall on a farm, by year, NSW 1989-2000



4.3.2 Gender

Nearly two-thirds of people hospitalised due to a farm-related falls were male (62.6%). In all years males had more injuries than females except in 1991/92 where female injuries were slightly higher (Table 4.3.2).

Table 4.3.2 People requiring hospitalisation due to a fall on a farm, by gender, by year, NSW 1989-2000

Year	Male	Female	All	%
89/90	72	26	98	5.1
90/91	90	47	137	7.1
91/92	196	207	403	21.0
92/93	123	71	194	10.1
93/94	99	50	149	7.8
94/95	131	59	190	9.9
95/96	114	58	172	9.0
96/97	96	60	156	8.1
97/98	112	72	184	9.6
98/99	95	35	130	6.8
99/00	72	32	104	5.4
Total	**1200**	**717**	**1917**	**100.0**

For falls from a height occurring to males, most of the injuries were from *ladders* (77.3%), *building or other structure* (86.9%), and *falls into wells* (86.8%). Females were injured more often from *falls on same level* (51.0% and *fall unspecified* (53.7%) (Table 4.3.3)

Table 4.3.3 People requiring hospitalisation due to a fall on a farm, by gender, by external cause, NSW 1989-2000

Cause	Male	Female	All	%
Falls from a height	731	204	935	48.8
Fall on or from escalator	*3*	*3*	*6*	*0.3*
Fall from other stairs or steps	*29*	*22*	*51*	*2.7*
Fall from ladder	*85*	*25*	*110*	*5.7*
Fall from scaffolding	*8*	*-*	*8*	*0.4*
Fall from or out of building or other structure	*113*	*17*	*130*	*6.8*
Accident from diving or jumping into water	*3*	*-*	*3*	*0.2*
Accidental fall into well	*66*	*10*	*76*	*4.0*
Fall into other hole or other opening in surface	*29*	*9*	*38*	*2.0*
Fall from playground equipment	*9*	*11*	*20*	*1.0*
Fall from cliff	*5*	*2*	*7*	*0.4*
Fall from chair or bed	*15*	*18*	*33*	*1.7*
Other fall from one level to another	*366*	*87*	*453*	*23.6*
Falls on same level	262	273	535	27.9
Fall on same level from slipping, tripping, or stumbling	*257*	*271*	*528*	*27.5*
Fall on same level from collision, pushing, or shoving, by or with other person in sports	*1*	*-*	*1*	*0.1*
Fall on same level from collision, pushing., or shoving, by or with other person by other and unspecified ways	*4*	*2*	*6*	*0.3*
Unspecified	207	240	447	23.3
Fracture, cause unspecified	*14*	*8*	*22*	*1.1*
Other and unspecified fall	*193*	*232*	*425*	*22.2*
Total	**1200**	**717**	**1917**	**100.0**

4.3.3 Fall injuries in different age groups

For persons aged 75 years or over, females represented two-third of fall injuries (66.4%). Male children sustained nearly two-third (64.4%) of fall injuries. Fall-related injuries in males were also high in young adults (15-29 years), and middle-aged adults aged 30-60 years) (Table 4.3.4).

Table 4.3.4 People requiring hospitalisation due to a fall on a farm, by gender, by age group, NSW 1989-2000

Age group	Male	Female	All	%
0-4	43	38	81	4.2
5-9	81	29	110	5.7
10-14	53	31	84	4.4
15-19	56	14	70	3.7
20-24	49	12	61	3.2
25-29	76	15	91	4.7
30-34	70	24	94	4.9
35-39	77	29	106	5.5
40-44	92	38	130	6.8
45-49	96	21	117	6.1
50-54	107	37	144	7.5
55-59	81	37	118	6.2
60-64	76	57	133	6.9
65-69	61	50	111	5.8
70-74	64	52	116	6.1
75-79	50	86	136	7.1
80-84	40	74	114	5.9
85 +	28	73	101	5.3
Total	**1200**	**717**	**1917**	**100.0**

The numbers of fall injuries were higher in middle (30-44 and 45-59 years) and elder (60-74 and over 75 years) age groups than children (0-14 years) and young adults (15-29 years). Nearly one-third (30.1%) of hospitalised persons were over 65 years. Half (50.8%) of the fall injuries occurred to persons of aged 50 years and over (Table 4.3.5).

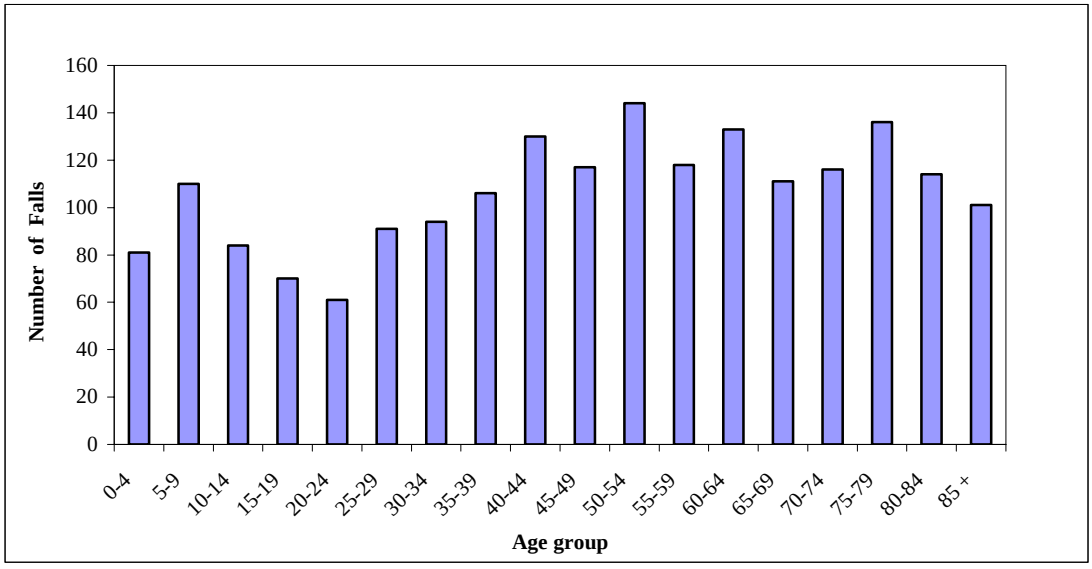
Children (18.5%), young adults (20.8%), and middle-aged persons (48.5%) had more fall-related injuries from *buildings or other structures*. The majority of the *ladder* injuries (63.6%) occurred to middle-aged persons. The elder-aged persons (60-74 and 75 years +) had slightly more number of *fall injuries from stairs or steps* than other groups. Fifteen children (19.7%) *accidentally fell into well* and another 39 (51.3%) middle-aged persons (30-44 and 45-59 years) *accidentally fell into well*. Half (54.5%) of the fall injuries from *chair or bed* also occurred to children. There were also 14 (42.4%) *chair or bed* fall injuries that occurred to persons 60 years of age or above (Table 4.3.5).

Table 4.3.5 People requiring hospitalisation due to a fall on a farm, by cause, by age group, NSW 1989-2000

Cause	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	All
Falls from a height	63	86	58	46	41	53	56	64	76	74	80	60	53	34	33	30	16	12	935
Fall on or from escalator	*1*	*-*	*-*	*-*	*-*	*1*	*1*	*-*	*1*	*1*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*6*
Fall from other stairs or steps	*6*	*1*	*1*	*1*	*2*	*4*	*1*	*4*	*4*		*1*	*2*	*5*	*2*	*5*	*5*	*6*	*1*	*51*
Fall from ladder	*2*	*2*	*1*	*4*	*2*	*8*	*9*	*8*	*10*	*17*	*12*	*14*	*5*	*6*	*5*	*2*	*2*	*1*	*110*
Fall from scaffolding	*0*	*1*	*-*	*1*	*-*	*-*	*-*	*-*	*1*	*-*	*1*	*-*	*3*	*-*	*1*	*-*	*-*	*-*	*8*
Fall from or out of building or other structure	*10*	*9*	*5*	*13*	*3*	*11*	*9*	*8*	*11*	*19*	*15*	*1*	*9*	*3*	*1*	*2*	*1*	*-*	*130*
Accident from diving or jumping into water	*-*	*-*	*-*	*-*	*2*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*3*
Accidental fall into well	*1*	*9*	*5*	*2*	*2*	*6*	*7*	*7*	*5*	*6*	*8*	*6*	*3*	*2*	*5*	*1*	*1*	*-*	*76*
Fall into other hole or other opening in surface	*-*	*-*	*2*	*4*	*4*	*4*	*-*	*4*	*3*	*-*	*2*	*2*	*-*	*1*	*3*	*6*	*2*	*1*	*38*
Fall from playground equipment	*6*	*9*	*3*	*1*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*20*
Fall from cliff	*-*	*-*	*-*	*-*	*3*	*-*	*-*	*1*	*-*	*-*	*1*	*2*	*-*	*-*	*-*	*-*	*-*	*-*	*7*
Fall from chair or bed	*9*	*5*	*4*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*1*	*-*	*1*	*2*	*1*	*3*	*3*	*4*	*33*
Other fall from one level to another	*28*	*50*	*37*	*20*	*23*	*19*	*28*	*31*	*41*	*31*	*38*	*33*	*27*	*18*	*12*	*11*	*1*	*5*	*453*
Falls on same level	7	10	11	10	10	24	26	24	38	29	38	38	48	45	44	48	45	40	535
Fall on same level from slipping, tripping, or stumbling	*7*	*9*	*11*	*9*	*10*	*24*	*26*	*23*	*37*	*29*	*38*	*37*	*47*	*45*	*44*	*47*	*45*	*40*	*528*
Fall on same level from collision, pushing, or shoving, by or with other person in sports	*-*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*1*
Fall on same level from collision, pushing, or shoving, by or with other person by other and unspecified ways	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*1*	*1*	*-*	*-*	*1*	*1*	*-*	*-*	*1*	*-*	*-*	*6*
Unspecified	11	14	15	14	10	14	12	18	16	14	26	20	32	32	39	58	53	49	447
Fracture, cause unspecified	*-*	*-*	*3*	*4*	*-*	*3*	*-*	*2*	*2*	*-*	*-*	*-*	*1*	*2*	*2*	*2*	*1*	*-*	*22*
Other and unspecified fall	*11*	*14*	*12*	*10*	*10*	*11*	*12*	*16*	*14*	*14*	*26*	*20*	*31*	*30*	*37*	*56*	*52*	*49*	*425*
Total	**81**	**110**	**84**	**70**	**61**	**91**	**94**	**106**	**130**	**117**	**144**	**118**	**133**	**111**	**116**	**136**	**114**	**101**	**1917**

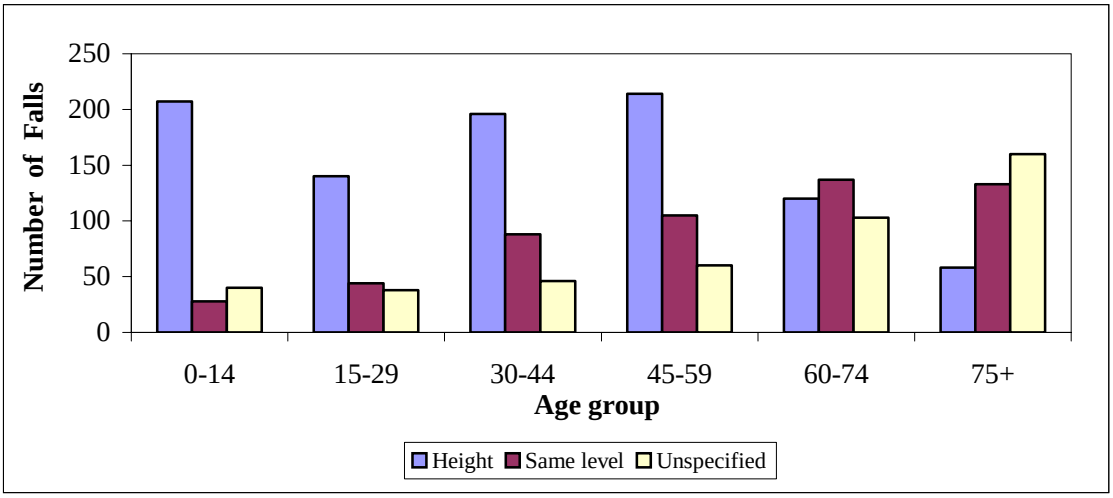
In children, 5-9 year olds had more fall injuries than the other two age groups. In young adults (15-29 years) there were 222 fall-related injuries (Figure 4.3.2).

Figure 4.3.2 People requiring hospitalisation due to a fall on a farm, by age group, NSW 1989-2000



In children, young adults (15-29 years), and middle-aged adults (30-59 years) fall injuries from a height were more common than same level fall injuries. Seventy five percent (75.3%) of falls to children were height related. In older adults (60+years) the number of falls on same the level was more common. The number of unspecified falls increases with the increase of age. (Figure 4.3.3)

Figure 4.3.3 People requiring hospitalisation due to a fall on a farm, by age group, by height, NSW 1989-2000



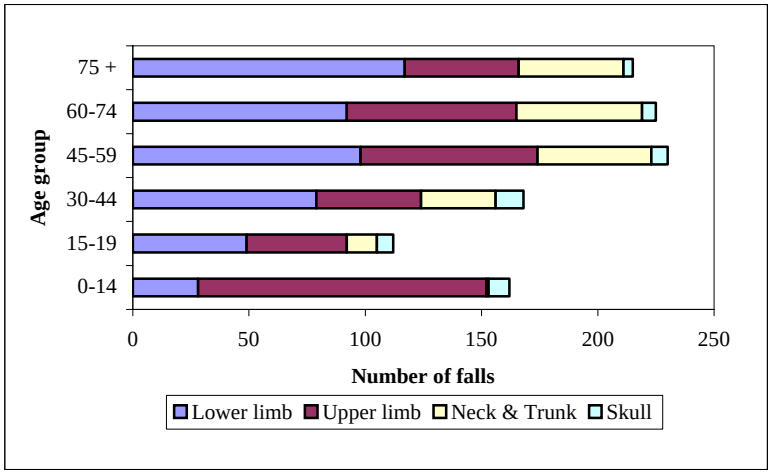
4.3.4 Nature and body locations of fall injuries

Fracture was the most common nature of injury (58.0%); *intracranial injury (exc. skull fracture), open wound, contusion, dislocation and sprains and strains* were other common injuries in all age groups. Children had the highest number of *intracranial injury* (39.4%) than any other age group. In the 30-44 years age group, *dislocation and sprains and strains* were common nature of injuries and in 75+ years age-group, *open wound and contusion* were common nature of injuries. (Table 4.3.6).

Table 4.3.6 People requiring hospitalisation due to a fall on a farm, by age group, by principal diagnosis, NSW 1989-2000

Principal Diagnosis	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +	Total	%
Fracture of skull	5	2	2	3	2	2		4	8	1	3	3	2	2	2	2		2	45	2.3
Fracture of neck & trunk	0		1	3	4	6	8	13	11	16	21	12	21	18	15	17	17	11	194	10.1
Fracture of upper limb	18	64	42	13	13	17	13	17	15	29	28	19	28	27	18	23	16	10	410	21.4
Fracture of lower limb	9	6	13	12	13	24	21	18	40	30	36	32	33	26	33	40	42	35	463	24.2
Dislocation	1	-	4	5	3	11	10	17	6	7	10	8	14	3	6	7	1	2	115	6.0
Sprains & strains of joints & adjacent muscles	1	-	1	7	4	5	8	12	15	-	10	9	7	5	10	5	5	8	112	5.8
Intracranial injury, excluding those with skull fracture	33	29	9	11	8	7	8	9	5	7	11	15	7	2	8	3	6	2	180	9.4
Internal injury of chest, abdomen, & pelvis	-	1	-	-	1	1	1	2	3	1	2	3	2	2	-	1	1	-	21	1.1
Open wound	7	4	4	7	6	6	11	4	2	5	5	7	3	10	7	13	9	9	119	6.2
Injury to blood vessels	-	-	-	-	-	-	-	-	1	-	-	-	-	2	1	-	-	-	4	0.2
Late effects of injury, poisoning, toxic effects & other ext causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.1
Superficial injury	-	1	-	-	-	-	-	-	1	2	1	-	2	-	1	2	4	3	17	0.9
Contusion with intact skin surface	5	1	4	4	2	4	6	6	7	10	7	1	4	7	10	13	8	11	110	5.7
Injury to nerves & spinal cord	-	1	-	-	1	1	2	-	-	2	1	1	1	-	-	-	-	-	10	0.5
Certain traumatic complications & unspecified injuries	2	1	4	5	4	7	5	4	15	7	9	8	8	5	5	7	5	8	109	5.7
Other & unspecified effects of external causes	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	2	0.1
Complications of surgical & medicinal care, NEC	-	-	-	-	-	-	-	-	-	-	-	-	1	2		2	-	-	5	0.3
Total	**81**	**110**	**84**	**70**	**61**	**91**	**94**	**106**	**130**	**117**	**144**	**118**	**133**	**111**	**116**	**136**	**114**	**101**	**1917**	**100.0**

Figure 4.3.4. People requiring hospitalisation due to a fall on a farm, by age group, by fracture injuries, by body location, NSW 1989-2000



Fracture injuries were high in people over 45 years, *lower limb* and *neck and trunk fracture* injuries were higher than other age groups. In children the number of *upper limb fracture* injuries was very high. In all other age groups, fractures of *lower limb* were more common. *Head fracture* injuries were higher in the 0-14 and 30-44 year age groups (Figure 4.3.4).

Most of the injuries of *falls from stairs or steps* (54.9%), *ladder* (65.5%), *building or other structures* (62.3%), *into well* (56.6%), and *chair or bed* (51.5%) led to fractures. *Intracranial injury (exc. skull fracture)* was the second most common injury (12.9%) resulting from a fall from a height. There was no remarkable variation in height and same level falls for other common injuries such as *sprains and strains*, *dislocation*, *open wound*, and *contusion* (Table 4.3.7).

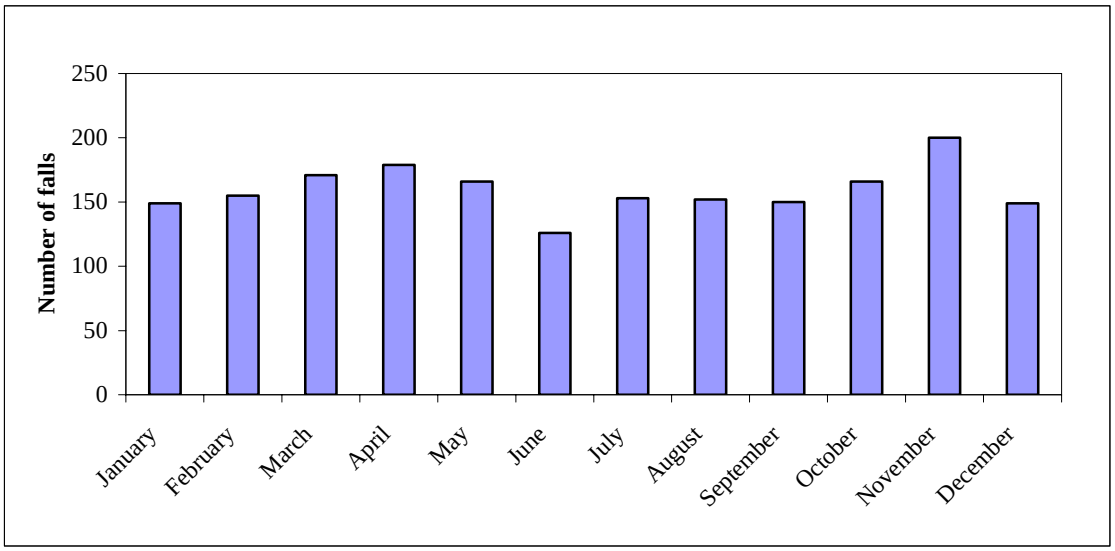
Table 4.3.7 People requiring hospitalisation due to a fall on a farm, by cause, by principal diagnosis, NSW 1989-2000

Cause	Fracture of skull	Fracture of neck & trunk	Fracture of upper limb	Fracture of lower limb	Dislocation	Sprains & strains of joints & adjacent muscles	Intracranial injury, excluding those with skull fracture	Internal injury of chest, abdomen, & pelvis	Open wound	Contusion with intact skin surface	Certain traumatic complications & unspecified injuries	Other	Total	%
Falls from a height	23	130	224	164	44	49	121	12	50	53	53	12	935	48.8
Fall on or from escalator	*-*	*-*	*3*	*2*	*-*	*-*	*-*	*-*	*1*	*-*	*-*	*-*	*6*	*0.3*
Fall from other stairs or steps	*1*	*3*	*10*	*14*	*4*	*2*	*5*	*-*	*6*	*2*	*3*	*1*	*51*	*2.7*
Fall from ladder	*1*	*19*	*27*	*25*	*4*	*2*	*10*	*4*	*3*	*5*	*10*	*-*	*110*	*5.7*
Fall from scaffolding	*-*	*1*	*-*	*1*	*1*	*1*	*4*	*-*	*-*	*-*	*-*	*-*	*8*	*0.4*
Fall from or out of building or other structure	*5*	*29*	*27*	*20*	*3*	*4*	*16*	*3*	*4*	*11*	*7*	*1*	*130*	*6.8*
Accident from diving or jumping into water	*-*	*2*	*-*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*3*	*0.2*
Accidental fall into well	*2*	*11*	*17*	*13*	*1*	*10*	*9*	*1*	*5*	*2*	*2*	*3*	*76*	*4.0*
Fall into other hole or other opening in surface	*-*	*4*	*-*	*17*	*6*	*6*	*1*	*-*	*1*	*2*	*1*	*-*	*38*	*2.0*
Fall from playground equipment	*-*	*-*	*12*	*2*	*-*	*1*	*3*	*1*	*1*	*-*	*-*	*-*	*20*	*1.0*
Fall from cliff	*-*	*-*	*2*	*2*	*-*	*-*	*-*	*2*	*-*	*-*	*-*	*1*	*7*	*0.4*
Fall from chair or bed	*1*	*2*	*10*	*4*	*1*	*-*	*6*	*-*	*3*	*5*	*1*	*-*	*33*	*1.7*
Other fall from one level to another	*13*	*59*	*116*	*64*	*24*	*22*	*67*	*1*	*26*	*26*	*29*	*6*	*453*	*23.6*
Falls from same level	10	26	98	182	44	40	19	4	41	29	27	15	535	27.9
Fall on same level from slipping/tripping/ stumbling	*10*	*26*	*97*	*181*	*43*	*40*	*17*	*3*	*40*	*29*	*27*	*15*	*528*	*27.5*
Fall on same level from collision/pushing/shoving, by or with other person in sports	*-*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*1*	*0.1*
Fall on same level from collision/ pushing/shoving, by or with other person by other & unspecified ways	*-*	*-*	*1*	*-*	*1*	*-*	*2*	*1*	*1*	*-*	*-*	*-*	*6*	*0.3*
Unspecified	12	38	88	117	27	23	40	5	28	28	29	12	447	23.3
Fracture, cause unspecified	*6*	*2*	*7*	*5*	*-*	*-*	*1*	*-*	*-*	*-*	*-*	*1*	*22*	*1.1*
Other & unspecified fall	*6*	*36*	*81*	*112*	*27*	*23*	*39*	*5*	*28*	*28*	*29*	*11*	*425*	*22.2*
Total	**45**	**194**	**410**	**463**	**115**	**112**	**180**	**21**	**119**	**110**	**109**	**39**	**1917**	**100.0**

4.3.5 Month and year of admission

Injuries commonly occurred during the month of November (10.4%), April (9.3%), and March (8.9%). The lowest number of injuries (6.6%) occurred in the month of June (Figure 4.3.6).

Figure 4.3.6 People requiring hospitalisation due to a fall on a farm, by month, NSW 1989-2000



4.3.6 Length of stay in hospital due to fall injuries

Mean length of stay was high for injuries resulting from *diving or jumping into water*. Injuries that occurred due to *falling into other hole or other opening in surface*, and *fall from chair or bed* also had a high mean length of stay (Table 4.3.8).

Table 4.3.8 People requiring hospitalisation due to a fall on a farm, by cause, by length of stay, NSW 1989-2000

Cause	n	Mean	Std. Deviation	Total
Fall on or from escalator	6	1.7	1.2	10
Fall from other stairs or steps	51	5.3	8.6	268
Fall from ladder	110	4.3	4.9	474
Fall from scaffolding	7	3.3	3.5	23
Fall from or out of building or other structure	130	4.8	8.2	622
Accident from diving or jumping into water	2	461.0	650.5	922
Accidental fall into well	76	4.2	8.9	319
Fall into other hole or other opening in surface	38	6.8	9.3	257
Fall from playground equipment	20	1.3	0.4	25
Fall from cliff	7	1.6	1.1	11
Fall from chair or bed	33	6.5	13.9	214
Other fall from one level to another	452	3.3	4.6	1481
Fall on same level from slipping, tripping, or stumbling	528	5.5	8.9	2915
Fall on same level from collision, pushing., or shoving, by or with other person in sports	1	1.0	-.	1
Fall on same level from collision, pushing, or shoving, by or with other person by other and unspecified ways	6	1.8	1.3	11
Fracture, cause unspecified	22	3.4	4.2	75
Other and unspecified fall	425	8.0	13.8	3417
Total	**1914**	**5.8**	**22.9**	**11045**

The mean length of stay by principal diagnosis was longest for *fracture of neck and trunk* (15.5), *injury to nerves and spinal cord* (9.1) and *fracture of lower limbs* (8.0). *Fracture of neck and trunk* (921 days), *fracture of lower limb* (65 days), *contusion* (67 days) and *injury to nerves and spinal cord* (64 days) resulted in the longest length of stay in hospital (Table 4.3.9).

Table 4.3.9 People requiring hospitalisation due to a fall on a farm, by principal diagnosis, by length of stay, NSW 1989-2000

Principal Diagnosis	Number	Mean	Std. Deviation	Minimum	Maximum	Sum
Fracture of skull	45	4.0	6.0	1	36	180
Fracture of neck & trunk	193	15.5	67.8	1	921	2988
Fracture of upper limb	410	2.8	4.3	1	43	1135
Fracture of lower limb	462	8.0	10.1	1	65	3681
Dislocation	115	2.5	5.5	1	49	287
Sprains & strains of joints & adjacent muscles	112	4.5	6.4	1	43	506
Intracranial injury, excluding those with skull fracture	180	2.4	4.7	1	37	429
Internal injury of chest, abdomen, & pelvis	21	4.3	2.9	1	11	90
Open wound	119	3.9	5.6	1	30	468
Injury to blood vessels	4	4.0	5.4	1	12	16
Late effects of injury, poisoning, toxic effects, & other external causes	1	14.0	-	14	14	14
Superficial injury	17	3.5	4.1	1	17	59
Contusion with intact skin surface	110	4.3	7.4	1	67	471
Injury to nerves & spinal cord	9	9.1	20.7	1	64	82
Certain traumatic complications & unspecified injuries	109	4.9	7.8	1	52	530
Other & unspecified effects of external causes	2	2.0	1.4	1	3	4
Complications of surgical & medicinal care, NEC	5	21.0	37.8	1	88	105
Total	**1914**	**5.8**	**22.9**	**1**	**921**	**11045**

4.4 Summary

- 1,917 people (174 per year) were injured due to farm-related falls and discharged from NSW hospitals between 1 July 1989 and 30 June 2000.
- Nearly two-thirds (63.6%) of falls occurred from a height and the reminder (36.4%) of falls were on the same level.
- Nearly two-thirds (62.6%) of farm-related fall injuries occurred to males.
- Most of the injuries due to a fall from a height occurred to males (78.2%). In falls on the same level female injuries were slightly higher (51.0%).
- *Buildings or structures*, *ladders*, *stairs or steps* were commonly associated with falls from a height.
- Most of the same-level falls (98.7%) occurred due to slipping, tripping or stumbling.
- The male: female ratio was 1.8: 1 in children; 4.4: 1 in young adults; 2.8: 1 in middle aged adults (30-59 years):; 1.3: 1 in elder adults (60-74 years)and 0.5: 1 in 75 + years.
- Half (50.8%) of the fall injuries occurred to people aged 50 years and over, and nearly one-third (30.1%) of hospitalised cases were aged 65 and over.
- Fifteen percent (14.9%) of fall-related injuries occurred to children.
- In children the relative number of fall injuries from a height (75.3%) was high, compared to young adults (72.1%) and all other adults (56.5%) and the highest number of height –related injuries occurring to children were from *other fall from one level to another* (41.8%).
- In older farmers (60 + years) the number of fall injuries on same level was higher; falls on same level appeared to increase with age.
- Children had relatively high number (39.4%) of intracranial injury (excluding skull injury) compared to other age groups.
- In children, most of the fracture injuries occurred to the upper limbs (76.5%).
- Fracture was the most common injury (57.9% of all injuries) across all age groups.
- Other common injuries were *intracranial injury* (excluding. skull fractures) (9.4%), *open wound* (6.2%), *dislocation* (6.0%), *sprains and strains* (5.8%) and *contusion* (5.7%).
- The number of *neck and trunk* (83.3%), *head* (69.7%) and *upper limb* (69.6%) fracture injuries was high in those falls occurring from a height.

5. Emergency Department Presentations Due To Falls On A Farm

5.1 Introduction

Emergency department (ED) data captures a high proportion of farm injury cases compared to other databases as it includes presentation of less severe injuries. This data provides information about frequency, or risk, of farm injury in relation to severity of injury and outcome (Fragar and Franklin, 2000). Brief descriptions of the injury event in ED presentations help provide information on the nature of the problem. ED presentations overlap with hospitalisation data as people who present to ED's may then further be admitted to hospital. ED data is considered to be reasonably representative of Australian injury patterns (Moller, 1995) and may give an overall picture as it covers a wider spectrum than Coroners records, Workers Compensation claims and hospital separations data.

There was a total of 149,922 ED presentations for fall-related injury between 1996/97 and 1998/99 in Victoria. Of these 51,539 (34.4%) occurred to children which represented 38.4% of total ED childhood injury presentations (Steenkamp and Cripps, 2001) (Table 5.1.1). Child fall ED presentations range from 34% to 53% (Nirui et al, 1999, Robitaille, 1998; Steenkamp and Cripps, 2001). Falls accounted for two-thirds (66.4%) of emergency presentations of elderly people (over 65 years) in Victoria between 1996/97-1999/00 (Casell and Lee, 2000).

Table 5.1.1 Hospital separations and ED presentations of children (0-14 years)

Hospital data	Total falls	Children falls	%
Hospital separation (Australia)*	112,713	25,401	22.5
ED presentations (Victoria)**	49,974	17,179	34.4

Source: Steenkamp & Cripps, 2001; * 1997/98 financial year; ** Average of 1998/97-1998/99 financial years

Farm-related falls presenting to ED range from 10% to 17% of all farm-related injuries (Stueland et al, 1990; Cameron and Bishop 1992). Falls of children presenting to emergency departments range from 35% to 37% of all farm-related child injury (Cameron et al, 1992; Schelp 1992).

In NSW, farm-related fall injuries range from 12%-15% for ED presentations (Coleman and Wetherspoon, 1994; Robson 1994). There were 1,515 ED presentations in the Parkes and District Hospital, NSW, in 1993/94 financial year; of these 78 (5.2%) were farm injuries. Falls was the third leading major cause of farm-related injury following to motorbikes and machinery/tools (Robson 1994).

Harper (1997) reported that in Central Queensland, 103 (20%) injury cases presented to EDs due to a fall. About 9% of farm injuries (excluding animal and vehicle injuries) were fall-related and of the 30% animal-related injuries most were due to a fall. Day et al (1997) found that fall-related injuries represented 16% of all farm-related injury presenting to EDs and that half of all horse-related injury was associated with a fall.

Falls was the major cause of injury in adults (over 15 years), and third major cause after horses and motorcycles in children presenting with farm injuries at EDs in Victoria during 1996/97 (Day et al, 1997). Eighteen percent (18%) of tractor-related ED presentations have been reported to be associated with a fall (Ashby and Day 1995).

This chapter presents various types of falls presenting to EDs in Australia. This includes falls from animals, vehicles in motion, stationary vehicles, same level falls, and falls from a height. As most of the animal-related, especially horse-related injuries are due to falls, inclusion or exclusion of animal and vehicle related falls significantly change the type and number of falling events.

5.2 Methodology of ED presentations

Emergency data presentations where location of injury was recorded as *farm*, *field*, or *paddock* revealed a total of 10,480 injuries throughout Australia. This information was collected over various time periods, with some EDs moving in and out of the collection system. As such this information can not be used to calculate rates or provide an accurate indication of the extent of fall-related injuries on farms.

The data was analysed using SPSS ™. Examination of the data used the break categories; *slipped on, tripped on, fell on same level, fell from up to one metre, fell from over one metre,* and *ejected from*. Total number of injuries due to all these six break factors was 3,214.

Data from the category *ejected from* included both persons ejected and materials ejected that hit a person. The materials ejected data have been excluded. Similarly the *slipped on* category had injuries where materials slipped onto a person and these have also been excluded. There were nine fall injuries where gender was unknown and these have also been excluded from the analysis. The final number of fall injuries examined was 3,072.

A classification was developed to enable an understanding of the various events of a fall and to help suggest preventive measures. Based on description of the events, the following classification of fall events was established. Falls are divided into two categories, *falls from a height* and *falls on same level*.

The *falls from a height* category (also termed *height-related falls* in the text of this report) was divided into *lotic falls* and *static falls*. Lotic falls were further divided into *animal* and *vehicle* related falls. The *lotic falls from a height* group includes all falls from a height (i.e. off an animal or vehicle) while moving. *Static falls from a height* was further organised into *animal/vehicle* and *structures* groups. The *static falls from a height* group includes fall from agents not in motion (e.g. when a person is climbing into a tractor and the tractor is stationary).

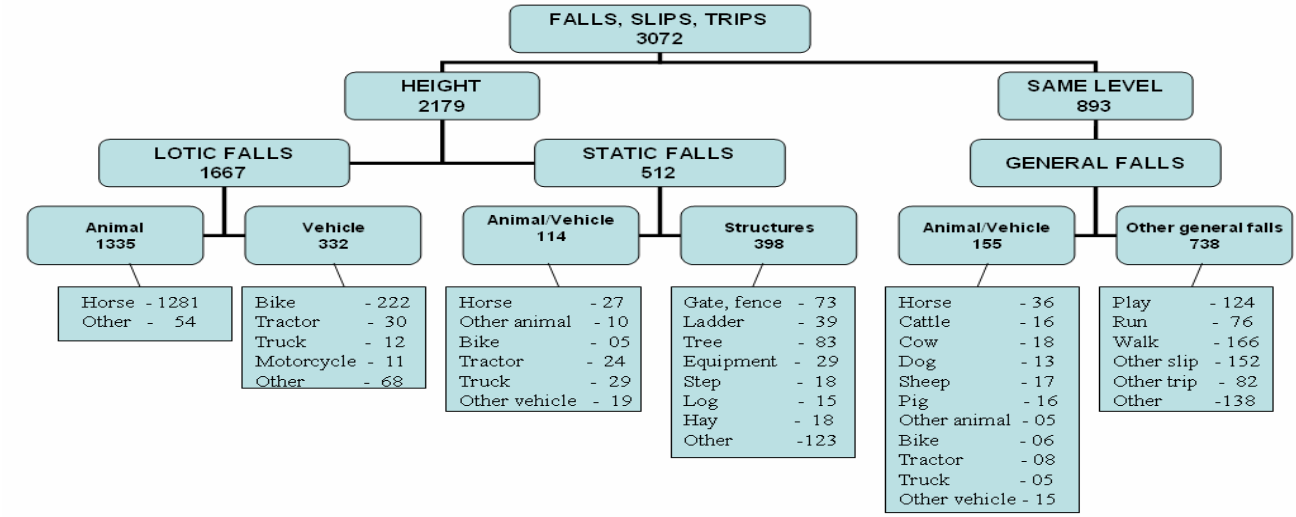
The *falls on same level* category was subdivided into *animal/vehicle* and *other* groups. Examples of *falls on the same level* related to *animal/vehicle* were where the person was leading or beside an animal when they fell; where they were loading or unloading a vehicle when they fell on the same level; or where a person on the back of a stationary vehicle fell onto the back i.e. same level.

5.3 ED presentation results

This analysis examined 3,072 fall related injuries which occurred on a farm and presented to emergency departments across Australia over various time periods. Of these 2,179 (70.9%) injuries were from falls from a height (or height-related) and 893 (29.1%) were same level falls.
Three-quarters (76.5%) of injuries sustained from a fall from a height occurred while the injured persons was on a moving item (lotic falls). The majority of the lotic fall injuries were from moving animals (80.1%) and the rest (19.9%) were from moving vehicles. For falls from animals, the majority (96.0%) occurred from a horse. For falls from a vehicle, the majority were from a bike (66.9%); followed by tractors (9.0%), trucks (3.6%), and motorcycles (3.3%). It must be noted that many of the injuries recorded in the bike category may have been due to motorcycles. The majority of the stationary fall injuries from a height were from *structures* (77.7%). One-fifth (22.3%) of the static falls occurred either from animals or vehicles; of these nearly a quarter (23.7%) were from a *horse*, other common agents included *tractor* (21.1%) and *truck* (25.4%). Common stationary objects from which people fell were *trees* (20.9%), *gates* (18.3%), *fences* (18.3%), *ladders* (9.8%), *equipment* (7.3%), *steps* (4.5%), *hay* (4.5%) and *logs* (3.8%).

For same level falls, 17.4% were either related to animals or vehicles. Common same level falls involved with animals included horses (29.8%); cattle (28.1%), sheep (14.0%), pigs (13.2%) and dogs (10.7%). Playing (16.8%), running (10.3%) and walking (22.5%) were common activities associated with same level falls in the other falls group (Figure 5.3.1).

Figure 5.3.1 Australian ED presentations due to a fall on a farm, field or paddock, by type of event



5.3.1 Gender

The majority (78.7%) of fall injuries of females occurred from a height. For males, the ratio of *falls from a height* (64.4%) and *same level falls* (35.6%) was about 2:1, whereas for females it was about 7:2. In females, the majority of the *falls from a height* (88.1%) were lotic fall injuries (Table 5.3.1).

Table 5.3.1 Australian ED presentations due to a fall on a farm, field or paddock, by gender, by height

Sex	Lotic	Static	Same level	Total	%
Male	693	380	593	1,666	54.2
Female	974	132	300	1,406	45.8
All	**1,667**	**512**	**893**	**3,072**	**100.0**

Female children (aged less than 15 years) (64.2%) were injured more often than male children (35.8%) in the *lotic falls from a height* category, whereas male children were injured more often in the *static falls from a height* and *same level falls* groups. In young adults (15-29 years), lotic falls were more common for females (60.1%) (Table 5.3.2).

Table 5.3.2 Australian ED presentations due to a fall on a farm, field or paddock, by gender, by age group

Age group	Lotic				Static				Same level			
	Male	Female	All	%	Male	Female	All	%	Male	Female	All	%
0-4	22	20	42	2.5	24	12	36	7.0	32	25	57	6.4
5-9	96	101	197	11.8	60	30	90	17.6	65	31	96	10.8
10-14	161	379	540	32.4	67	30	97	18.9	107	55	162	18.1
15-29	235	354	589	35.3	95	28	123	24.0	186	66	252	28.2
30-44	127	95	222	13.3	74	15	89	17.4	93	42	135	15.1
45-59	40	21	61	3.7	39	10	49	9.6	78	43	121	13.5
60-74	10	1	11	0.7	17	6	23	4.5	25	31	56	6.3
75 +	2	3	5	0.3	4	1	5	1.0	7	7	14	1.6
All	**693**	**974**	**1,667**	**100.0**	**380**	**132**	**512**	**100.0**	**593**	**300**	**893**	**100.0**

Males (51.9%) and females (48.1%) were injured in similar numbers in the *hit against victim moving* category. In *hit by other moving* category, males and females were injured in similar numbers. In the *grazed/abraded/lacerated/punctured* group, males (78.6%) were injured in greater numbers than females (Table 5.3.3).

Table 5.3.3 Australian ED presentations due to a fall on a farm, field or paddock, by gender, by mechanism

Mechanism	Male	Female	Total	%
Hit against victim moving	1,308	1,213	2,521	82.1
Hit by other moving	71	67	138	4.5
Caught in or between	42	27	69	2.2
Strain or over-exertion	83	51	134	4.4
Grazed/abraded/lacerated/punctured	136	37	173	5.6
Other	26	11	37	1.2
Total	**1,666**	**1,406**	**3,072**	**100.0**

Females sustained more injuries (64.6%) than males (35.4%) on r*ecreation-outdoor land*. In almost all other contexts such as *playing*, *injured on duty*, *other recreation*, *walking or running* and *motor cycle or scooter* males were more often injured. For injuries while on duty, associated with a *motorcycle or scooter*, the number females injured was very low (Table.5.3.4)

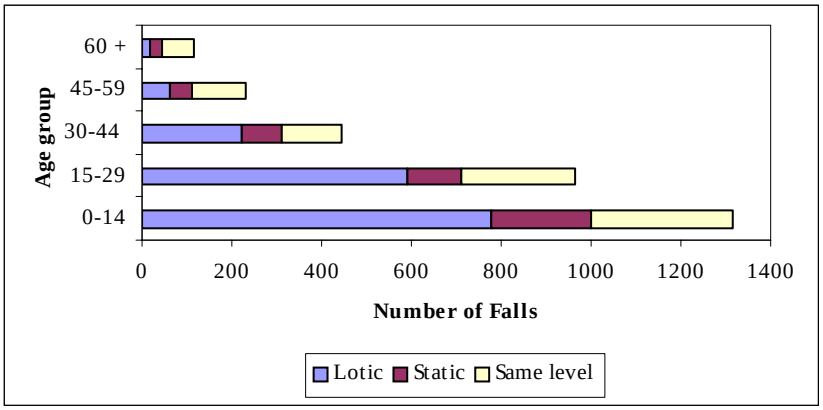
Table 5.3.4 Australian ED presentations due to a fall on a farm, field or paddock, by gender, by context,

Context	Male	Female	Total	%
Other unpowered transport	6	17	23	0.7
Motorcycle or scooter	156	20	176	5.7
Motorcycle or scooter passenger	9	6	15	0.5
Passenger car	11	4	15	0.5
Other 4 or more wheeled	16	7	23	0.7
Injured on duty	285	50	335	10.9
Sports organised	13	5	18	0.6
Sports informal	17	10	27	0.9
Playing	230	105	335	10.9
Recreation-outdoor land	505	921	1,426	46.4
Recreation-outdoor on water	6	2	8	0.3
Other recreation	119	101	220	7.2
Walking or running	115	92	207	6.7
Gardening	4	4	8	0.3
DYI not vehicle	38	5	43	1.4
Other maintenance	50	24	74	2.4
Other catastrophe	18	11	29	0.9
Bicyclist	28	4	32	1.0
Other	40	18	58	1.9
Total	**1,666**	**1,406**	**3,072**	**100.0**

5.3.2 Fall injuries in different age groups

The information presented may not accurately determine the burden of fall-related injury for age groups, however an examination of each age group by type of fall can be useful in determining appropriate prevention strategies. The ratio of *fall injuries from a height* to the *same level falls* was slightly more in children (76.1%) than young adults (73.9%). The number of *fall injuries from a height* was more than *same level falls* till the 45-59 years age group where the opposite occurred. The majority of the fall injuries from a height of children (77.7%), young adults (82.7%), and middle aged adults (71.4%) were lotic fall injuries (Table 5.3.2). The *same level falls* injuries were more common in middle-aged elder adults. Same level fall injuries were more common than the static fall injuries in all the age groups (Figure 5.3.2).

Figure 5.3.2 Australian ED presentations due to a fall on a farm, field or paddock, by age group, by categories of falls



One-third of fall injuries in young adults (15-29 years) and elder children (10-14 years) (34.8% and 32.3% respectively), occurred while on *recreation-outdoor land*. Other common contexts for young people included *other recreation*, *walking or running*, and *motorcycle or scooter* (Table 5.3.5).

Table 5.3.5 Australian ED presentations due to a fall on a farm, field or paddock, by age group, by context

Context	0-4	5-9	10-14	15-29	30-44	45-59	60-74	75 +	Total	%
Bicyclist	1	15	12	2	2	-	-	-	32	1.0
Other un-powered transport	1	4	9	4	3	-	-	2	23	0.7
Motorcycle or scooter	4	16	52	97	18	4	-	-	191	6.2
Passenger car	2	3	3	4	1	1	1	-	15	0.5
Other 4 or more wheeled	6	5	6	4	1	1	-	-	23	0.7
Injured on duty	-	-	6	115	106	71	30	7	335	10.9
Sports organised	-	1	10	4	1	2	-	-	18	0.6
Sports informal	-	7	4	11	3	2	-	-	27	0.9
Playing	66	123	122	20	1	1	-	2	335	10.9
Recreation-outdoor land	27	152	460	496	200	66	23	2	1426	46.4
Recreation-outdoor on water	-	-	2	4	2	-	-	-	8	0.3
Other recreation	6	18	47	89	39	16	4	1	220	7.2
Walking or running	12	19	44	53	29	29	17	4	207	6.7
DYI not vehicle	-	2	2	11	9	13	5	1	43	1.4
Other maintenance	2	6	5	23	18	14	5	1	74	2.4
Other catastrophe	1	-	6	10	5	4	2	1	29	0.9
Other	7	12	9	17	8	7	3	3	66	2.1
Total	**135**	**383**	**799**	**964**	**446**	**231**	**90**	**24**	**3072**	**100.0**

Children often sustained fractures from lotic (46.0%) and static (41.7%) falls and one-third (33.3%) of same level falls to children resulted in *cut/laceration* injuries. One-third (32.4%) of young adult lotic fall injury resulted in a *fracture*, whereas 16.3% and 13.1% of injuries in the other fall categories resulted in fractures sustained from lotic falls. One-third (32.9%) of fall injuries in young adults were *sprains and strains*. *Fracture* and *sprains and strains* were common in all the age groups except 60 years and over (Table 5.3.6)

Table 5.3.6 Australian ED presentations due to a fall on a farm, field or paddock, by age group, by injury

Nature of injury	Lotic						Static						Same level					
	0-14	15-29	30-44	45-59	60 +	All	0-14	15-29	30-44	45-59	60 +	All	0-14	15-29	30-44	45-59	60 +	All
Cut/laceration	54	38	14	1	3	110	33	19	7	6	6	71	105	57	19	24	11	216
Puncture	2	-	-	-	-	2	5	2	1	-	-	8	10	5	2	2	-	19
Superficial abrasion	24	24	4	-	1	53	7	2	3	1	1	14	6	7	1	2	3	19
Penetrating wound	5	1	-	-	-	6	1	2	-	-	-	3	5	3	2	-	-	10
Haematoma or bruising	111	106	38	10	2	267	19	12	9	7	7	54	20	22	13	9	6	70
Inflammation oedema tenderness	42	53	22	5	-	122	14	9	2	7	-	32	10	18	9	5	-	42
Burn	4	3	1	-	-	8	2	-	-	1	-	3	9	2	3	1	-	15
Foreign body in soft tissue	1	-	-	-	-	1	2	1	1	-	-	4	9	6		-	-	15
Crushing injury	10	9	7	2	1	29	-	-	-	-	-	-	3	5	1	-	1	10
Fracture	358	191	73	23	7	652	93	20	34	9	10	166	64	33	32	40	32	201
Dislocation	11	13	6	3	-	33	-	4	2	2	-	8	2	5	3	4	5	19
Sprain or strain	74	98	34	15	1	222	24	47	28	15	3	117	55	83	45	26	11	220
Concussion	56	36	17	1	-	110	13	2	-	-	1	16	5	2	1	-	-	8
Injury not specified	10	12	3	-	1	26	4	2	1	-	-	7	5	2	3	2	-	12
Other	17	5	3	1	-	26	6	1	1	1	-	9	7	2	1	6	1	17
All	**779**	**589**	**222**	**61**	**16**	**1667**	**223**	**123**	**89**	**49**	**28**	**512**	**315**	**252**	**135**	**121**	**70**	**893**

For children, *upper limb* injuries due to lotic (54.8%) and static (48.4%) falls were common while in same level falls 41.8% of injuries were of the *lower limb*. The *radius or ulna* (74.4%), *fore arm* (64.4%) and *elbow* (56.6%) were common locations for injury. In young adults, *lower limb* injuries were common in *same level falls* (58.3%). In older age groups *upper limb* injuries were more common for lotic falls whereas lower limb injuries were more common in static and same level falls (Table 5.3.7). The *ankle* (77.8%), *wrist* (54.4%), and *knee* (65.1%) were common body locations injured in adults.

Table 5.3.7 Australian ED presentations due to a fall on a farm, field or paddock, by age group, by body location

	Lotic						Static						Same level					
Body location of injury	**0-14**	**15-29**	**30-44**	**45-59**	**60 +**	**All**	**0-14**	**15-29**	**30-44**	**45-59**	**60 +**	**All**	**0-14**	**15-29**	**30-44**	**45-59**	**60 +**	**All**
Head	78	68	29	4	2	181	30	6	5	2	5	48	49	11	6	1	6	73
Upper limb	427	229	73	24	5	758	108	43	22	11	7	191	119	80	38	35	33	305
Lower limb	144	151	54	10	3	362	40	61	39	25	8	173	121	147	78	67	29	442
Trunk	43	84	41	21	5	194	22	7	20	10	7	66	8	9	8	12	2	39
Internal organs	5	3	1	-	-	9	1	1	1	-	-	3	-	-	-	-	-	-
Other	3	2	1	-	-	6	1	1	-	1	-	3	1	-	-	1	-	2
Unknown	79	52	23	2	1	157	21	4	2	-	1	28	17	5	5	5	-	32
All	**779**	**589**	**222**	**61**	**16**	**1667**	**223**	**123**	**89**	**49**	**28**	**512**	**315**	**252**	**135**	**121**	**70**	**893**

5.3.3 Context of falls

Nearly half of the injuries (46.4%) were due to recreation on outdoor land and most of these injuries were *falls from a height* (88.4%). Predominately (98.9%) of motorcycle injuries were *falls from a height*. Where people were playing, or injured on duty, an equal number of injuries occurred on the same level and from a height. Most of the fall injuries sustained while playing (89.8%), or on duty (75.9%) were due to static falls (Table 5.3.8).

Table 5.3.8 Australian ED presentations due to a fall on a farm, field or paddock, by context by height

Context	**Lotic**	**Static**	**Same level**	**Total**	**%**
Bicyclist	31	1	-	32	1.0
Other unpowered transport	23	-	-	23	0.7
Motorcycle or scooter	183	6	2	191	6.2
Passenger car	8	5	2	15	0.5
Other 4 or more wheeled	19	2	2	23	0.7
Injured on duty	40	126	169	335	10.9
Sports organised	5	2	11	18	0.6
Sports informal	11	1	15	27	0.9
Playing	17	150	168	335	10.9
Recreation-outdoor land	1173	87	166	1426	46.4
Other recreation	116	34	70	220	7.2
Walking or running	-	29	178	207	6.7
DYI not vehicle	2	10	31	43	1.4
Other maintenance	9	24	41	74	2.4
Other catastrophe	6	12	11	29	0.9
Other	24	23	27	74	2.4
All	**1667**	**512**	**893**	**3072**	**100.0**

Half (52.9% and 57.3 respectively) of the *fracture* and *haematoma or bruising* injuries occurred on recreational outdoor land. *Fracture* was the most common nature of injury. *Fracture* and *cut/laceration* were the common injuries associated with people playing (Table 5.3.9).

Table 5.3.9 Australian ED presentations due to a fall on a farm, field or paddock, by context, by nature of injury

Context	Cut/laceration	Haematoma or bruising	Inflammation oedema tenderness	Fracture	Sprain or strain	Concussion	Other	Total	%
Bicyclist	8	1	1	10	2	3	7	32	1.0
Other unpowered transport	2	3	1	15	-	-	2	23	0.7
Motorcycle or scooter	33	26	17	58	20	2	35	191	6.2
Passenger car	3	-	-	3	3	3	3	15	0.5
Other 4 or more wheeled	3	-	1	7	2	2	8	23	0.7
Injured on duty	62	34	17	78	99	4	41	335	10.9
Sports organised	3	2	-	6	2	2	3	18	0.6
Sports informal	1	5	2	7	10	1	1	27	0.9
Playing	89	21	12	110	44	12	47	335	10.9
Recreation-outdoor land	86	224	114	539	229	91	143	1426	46.4
Other recreation	25	28	12	75	50	6	24	220	7.2
Walking or running	40	18	12	56	54	2	25	207	6.7
DYI not vehicle	9	10	1	7	8	1	7	43	1.4
Other maintenance	13	7	2	24	18	3	7	74	2.4
Other catastrophe	9	5	1	4	5	-	5	29	0.9
Other	11	7	3	20	13	2	18	74	2.4
Total	**397**	**391**	**196**	**1019**	**559**	**134**	**376**	**3072**	**100.0**

Nearly half of *head* (46.4%) and more than half of the *upper limb* (52.1%) injuries occurred on recreational outdoor land. Playing resulted in 56 (18.5%) *hand injuries*. *Upper limb* injuries were also common in *playing* (11.0%), *injured on duty* (7.4%), *other recreation* (6.7%), *walking or running* (5.7%) and *motorcycle or scooter* (5.7%). (Table 5.3.10)

Table 5.3.10 Australian ED presentations due to a fall on a farm, field or paddock, by context, by body

Context	Head	Upper limbs	Lower limbs	Trunk	Internal organ	Other	Un known	Total	%
Bicyclist	4	14	5	2	-	-	7	32	1.0
Other unpowered transport	3	16	2	2	-	-	-	23	0.7
Motorcycle or scooter	15	72	74	15	-	-	15	191	6.2
Passenger car	2	6	3	1	-	-	3	15	0.5
Other 4 or more wheeled	4	4	11	1	-	1	2	23	0.7
Injured on duty	18	93	163	50	1	-	10	335	10.9
Sports organised	2	5	7	2	-	-	2	18	0.6
Sports informal	5	11	9	1	-	-	1	27	0.9
Playing	56	138	99	17	2	1	22	335	10.9
Recreation-outdoor land	140	653	342	158	8	6	119	1426	46.4
Other recreation	20	84	72	29	1	1	13	220	7.2
Walking or running	14	71	110	5	-	-	7	207	6.7
DYI not vehicle	2	18	15	5	-	-	3	43	1.4
Other maintenance	5	30	29	5	1	-	4	74	2.4

Context	Head	Upper limbs	Lower limbs	Trunk	Internal organ	Other	Un known	Total	%
Other catastrophe	2	11	8	3	-	1	4	29	0.9
Other	10	28	28	3	-	-	5	74	2.4
All	**302**	**1254**	**977**	**299**	**13**	**10**	**217**	**3072**	**100.0**

5.3.4 Nature of fall injuries

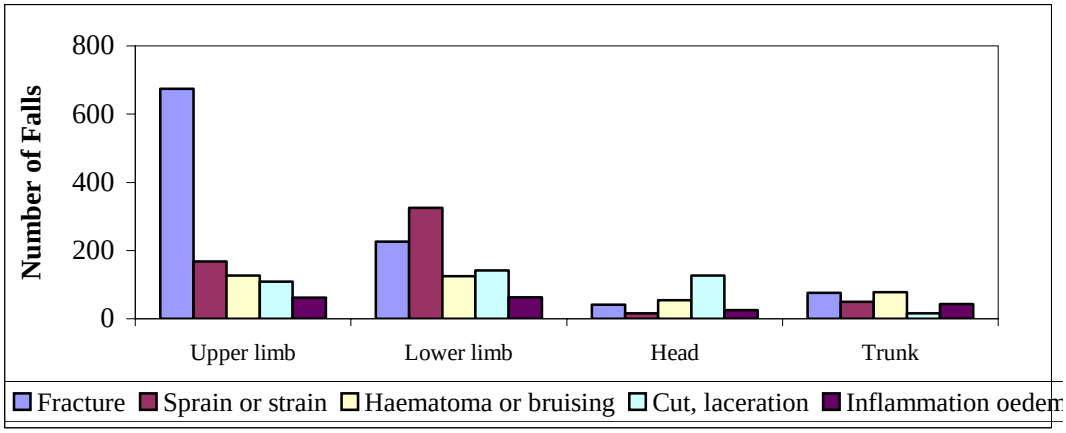
One-third of fall injuries resulted in a *fracture* (33.2%). Other common injuries were *sprain or strain* (18.2%), *cut/laceration* (12.9%), and *haematoma or bruising* (12.7%). The occurrence of a *fracture* (80.3%) and *haematoma* (82.1%) were high for all falls from a height (Table 5.3.11).

Table 5.3.11 Australian ED presentations due to a fall on a farm, field or paddock, by nature of injury, by height

Nature of Injury	Lotic	Static	Same level	Total	%
Cut/laceration	110	71	216	397	12.9
Puncture	2	8	19	29	0.9
Superficial abrasion	53	14	19	86	2.8
Penetrating wound	6	3	10	19	0.6
Other wound including amputation	1	2	3	6	0.2
Haematoma or bruising	267	54	70	391	12.7
Haemorrhage	2	2	1	5	0.2
Inflammation oedema tenderness	122	32	42	196	6.4
Burn	8	3	15	26	0.8
Foreign body in soft tissue	1	4	15	20	0.7
Crushing injury	29	-	10	39	1.3
Fracture	652	166	201	1019	33.2
Dislocation	33	8	19	60	2.0
Sprain or strain	222	117	220	559	18.2
Concussion	110	16	8	134	4.4
Injury not specified	26	7	12	45	1.5
No injury detected	18	4	6	28	0.9
Other	5	1	7	13	0.4
All	**1667**	**512**	**893**	**3072**	**100.0**

Upper limb fractures were the most common type and body location of injury. Lower limb injuries most commonly resulted in *sprain or strain*. Head injuries most commonly resulted in *cut/lacerations* (Figure 5.3.3).

Figure 5.3.3. Australian ED presentations due to a fall on a farm, field or paddock, by nature of injury, by body location



The incidence of head *fracture* (16.0%) for lotic falls was more than static (12.5%) and same level (8.2%) falls. *Haematoma or bruising* (23.8%), *superficial abrasion* (8.85), *inflammation oedema tenderness* (10.5%) and *sprain or strains* (6.6%) were common head injuries for lotic falls. *Sprain or strain* (11.7%) and *haematoma or bruising* (11.7%) were common injuries of upper limbs for lotic falls. *Fractures* (34.7%) and *cut/laceration* (22.3%) were the common upper limb injuries from same level falls. *Fractures* and *sprain or strain* were the common injuries of lower limbs in all three categories of falls. (Table 5.3.12)

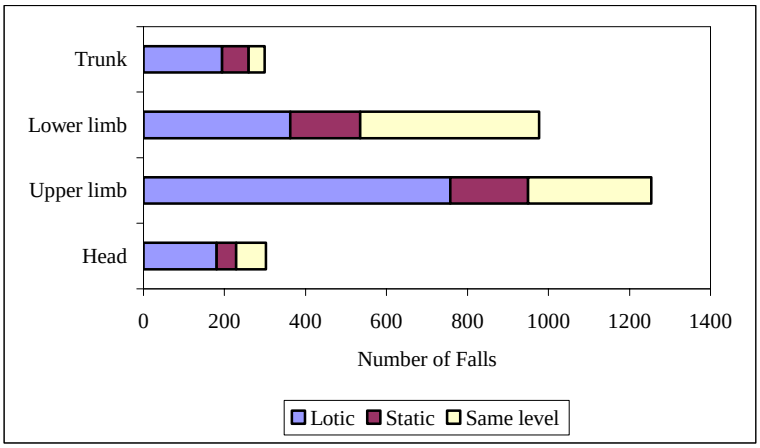
Table 5.3.12 Australian ED presentations due to a fall on a farm, field or paddock, by nature of injury, by body location

	Lotic						Static						Same level					
Nature of injury	**Head**	**Upper limb**	**Lower limb**	**Trunk**	**All**	**%**	**Head**	**Upper limb**	**Lower limb**	**Trunk**	**All**	**%**	**Head**	**Upper limb**	**Lower limb**	**Trunk**	**All**	**%**
Cut/laceration	53	21	32	4	110	6.6	24	20	19	6	71	13.9	50	68	91	6	216	24.2
Puncture	1	1	-	-	2	0.1	1	-	5	1	8	1.6	2	6	10	1	19	2.1
Superficial abrasion	16	16	12	9	53	3.2	3	1	4	6	14	2.7	5	4	10	-	19	2.1
Penetrating wound	2	-	1	2	6	0.4	-	1	2	-	3	0.6	-	1	9	-	10	1.1
Haematoma or bruising	43	89	71	57	267	16.0	5	16	16	17	54	10.5	6	22	38	4	70	7.8
Inflammation oedema tenderness	19	45	28	28	122	7.3	5	4	14	8	32	6.3	1	13	21	7	42	4.7
Burn	1	1	6	-	8	0.5	-	1	-	2	3	0.6	-	8	4	3	15	1.7
Foreign body in soft tissue	1	-	-	-	1	0.1	-	3	1	-	4	0.8	1	6	8	-	15	1.7
Crushing injury	2	9	8	8	29	1.7	-	-	-	-		0.0	-	2	7	1	10	1.1
Fracture	29	457	112	52	652	39.1	6	111	35	14	166	32.4	6	106	79	10	201	22.5
Dislocation	-	28	3	2	33	2.0	-	7	1	-	8	1.6	-	14	4	1	19	2.1
Sprain or strain	12	89	89	32	222	13.3	2	27	76	12	117	22.9	2	52	160	6	220	24.6
Concussion	-	-	-	-	110	6.6	-	-	-	-	16	3.1	-	-	-	-	8	0.9
Injury not specified	-	-	-	-	26	1.6	-	-	-	-	7	1.4	-	-	-	-	12	1.3
No injury detected	-	-	-	-	18	1.1	-	-	-	-	4	0.8	-	-	-	-	6	0.7
Other	2	2	-	-	8	0.5	2	-	-	-	5	1.0	-	3	1	-	11	1.2
All	**181**	**758**	**362**	**194**	**1667**	**100.0**	**48**	**191**	**173**	**66**	**512**	**100.0**	**73**	**305**	**442**	**39**	**893**	**100.0**

5.3.5 Body location of fall injury

For lotic fall-related injuries, a large number were to *upper limbs*. Static fall injuries resulted in similar numbers of *lower* and *upper limb* injuries (Figure 5.3.4).

Figure 5.3.4 Cases presenting to Emergency Departments due to a fall on a farm or field or paddock, by body location, by height



The incidence of *head injury* was slightly higher in lotic falls (10.9%) compared to the static (9.4%) and same level (8.2%) falls. *Upper limb* injury was common in lotic (45.5%), static (37.3%) and same level (34%) falls. *Lower limb* injury occurred in nearly half (49.5%) of all same level falls. The *ankle* (11.5%) was the most commonly injured body part of all fall injury. A greater percent of ankle injury occurred as a result of same level falls (20%), than static falls (15.6%) and lotic falls (5.6%) (Table 5.3.13).

Table 5.3.13 Australian ED presentations due to a fall on a farm, field or paddock, by body location by height

Body location	Lotic	Static	Same level	Total	%
Head	181	48	73	**302**	**9.8**
Eye	*3*	*2*	*6*	*11*	*0.4*
Nose	*11*	*3*	*-*	*14*	*0.5*
Mouth external	*20*	*5*	*6*	*31*	*1.0*
Ear	*5*	*2*	*2*	*9*	*0.3*
Face cheek forehead scalp	*71*	*21*	*48*	*140*	*4.6*
Skull	*36*	*6*	*4*	*46*	*1.5*
Neck, NEC	*24*	*3*	*3*	*30*	*1.0*
Other injury to head	*11*	*6*	*4*	*21*	*0.7*
Upper limb	758	191	305	**1254**	**40.8**
Clavicle & scapula	*63*	*11*	*16*	*90*	*2.9*
Shoulder, NEC	*79*	*9*	*20*	*108*	*3.5*
Humerus	*69*	*4*	*5*	*78*	*2.5*
Upper arm, NEC	*17*	*2*	*5*	*24*	*0.8*
Radius or ulna	*181*	*51*	*41*	*273*	*8.9*
Elbow	*96*	*22*	*29*	*147*	*4.8*
Forearm	*68*	*13*	*37*	*118*	*3.8*
Wrist	*109*	*34*	*52*	*195*	*6.3*
Carpal & metacarpal bone	*24*	*6*	*19*	*49*	*1.6*
Upper extremity digit & hand or NEC	*51*	*39*	*81*	*171*	*5.6*
Other injury to upper extremity	*1*	*-*	*-*	*1*	*0.0*
Lower limb	362	173	442	**977**	**31.8**
Hip	*47*	*3*	*6*	*56*	*1.8*

Body location	Lotic	Static	Same level	Total	%
Femur	*22*	*3*	*1*	*26*	*0.8*
Upper leg or NEC	*16*	*8*	*24*	*48*	*1.6*
Knee	*58*	*23*	*88*	*169*	*5.5*
Tibia or fibula	*43*	*11*	*29*	*83*	*2.7*
Lower leg or NEC	*38*	*17*	*38*	*93*	*3.0*
Ankle	*93*	*80*	*179*	*352*	*11.5*
Tarsal & metatarsal bone	*12*	*4*	*11*	*27*	*0.9*
Lower extremity digit & foot or NEC	*32*	*22*	*64*	*118*	*3.8*
Other lower extremity	*1*	*2*	*2*	*5*	*0.2*
Trunk	194	66	39	**299**	**9.7**
Ribs	*24*	*22*	*13*	*59*	*1.9*
Sacroiliac joint, spine & pelvis	*61*	*6*	*3*	*70*	*2.3*
Chest & abdomen or NEC	*36*	*13*	*7*	*56*	*1.8*
Back or NEC	*63*	*21*	*11*	*95*	*3.1*
Other trunk injury	*10*	*4*	*5*	*19*	*0.6*
Internal organs	9	3	1	**13**	**0.4**
Other and unknown	163	31	33	**227**	**7.4**
All	**1667**	**512**	**893**	**3072**	**100.0**

5.3.6 Treatment of injuries

Most *fracture* injuries were either admitted (32.8%) or treated (26.7%) with a referral to an Out Patients Department (OPD). Almost half (47.2%) of *sprain or strain injuries* were treated with no referral. Most of the *haematoma or bruising* (46.0%) and *inflammation oedema tenderness* (45.9%) injuries were treated with no referral. *Cut/laceration injuries* were either treated with no referral (32.2%) or causality review (29.5%). A small number of the *cut/laceration* injuries (20.4%) were treated with referral to a general practitioner (Table 5.3.14).

Table 5.3.14 Australian ED presentations due to a fall on a farm, field or paddock, by injury, by treatment

Injury	No treatment	Treated no referral	Treated referral OPD	Treated referral GP	Treated other referral	Short stay ward observation	Admitted	Transferred	Casualty review	Total	%
Cut/laceration	4	128	12	81	5	4	41	5	117	397	12.9
Puncture	2	12	3	2	1	-	3	-	6	29	0.9
Superficial abrasion	6	39	2	11	2	2	6	-	18	86	2.8
Penetrating wound	-	4	-	2	-	-	9	-	4	19	0.6
Haematoma or bruising	52	180	13	53	6	4	32	4	47	391	12.7
Inflammation oedema tenderness	14	90	10	24	3	9	11	3	32	196	6.4
Burn partial thickness	-	3	6	3	-	-	4	-	6	22	0.7
Foreign body in soft tissue	1	8	-	3	-	-	4	-	4	20	0.7
Crushing injury	-	8	4	3	1	-	8	2	13	39	1.3
Fracture	5	52	272	76	64	13	334	55	148	1019	33.2
Dislocation	1	5	11	11	5	2	17	4	4	60	2.0
Sprain or strain	36	264	37	93	24	3	13	5	84	559	18.2
Concussion	11	28	1	6	1	8	66	8	5	134	4.4
Injury not specified	17	8	2	1	1	-	7	-	9	45	1.5

Injury	No treatment	Treated no referral	Treated referral OPD	Treated referral GP	Treated other referral	Short stay ward observation	Admitted	Transferred	Casualty review	Total	%
No injury detected	9	5	-	2	3	-	4	-	5	28	0.9
Other	-	5	1	-	3	-	16	2	1	28	0.9
Total	**158**	**839**	**374**	**371**	**119**	**45**	**575**	**88**	**503**	**3072**	**100.0**

5.3.7 Occupation and work status at time of injury

Information on occupation was available for only 298 (9.7%) cases presenting with a fall injury. Of this data, the commonly affected occupational groups recorded were *labourers and related workers* (4.1%) and *managers and administrators* (3.1%) (Table 5.3.15).

Table 5.3.15 Australian ED presentations due to a fall on a farm, field or paddock, by occupation, by height

Occupation	Lotic	Static	Same level	Total	%
Managers & administrators	13	29	53	95	3.1
Farmers & farm managers	*13*	*27*	*51*	*91*	*3.0*
Professionals	-	5	4	9	0.3
Para professionals	2	4	6	12	0.4
Tradespersons	8	8	11	27	0.9
Salesperson & personal service workers	-	1	1	2	0.1
Plant & machine operators & drivers	1	17	10	28	0.9
Labourers & related workers	14	45	66	125	4.1
Farm hands & assistants	*12*	*33*	*40*	*85*	*2.8*
Unknown	1629	403	742	2774	90.3
All	**1667**	**512**	**893**	**3072**	**100.0**

Table 5.3.16 Australian ED presentations due to a fall on a farm, field or paddock, by job, by height

Job	Lotic	Static	Same level	Total	%
Not on the job	1629	403	741	2773	90.3
On the job, workers compensation claimed	18	48	57	123	4.0
On the job, workers compensation not claimed	12	37	62	111	3.6
On the job, not known if workers compensation claimed	8	24	32	64	2.1
Unknown	-	-	1	1	0.0
All	**1667**	**512**	**893**	**3072**	**100.0**

A large proportion of cases (90.3%) were recorded as *not on the job* at the time of the fall. Of the 9.3% people who recorded that they were working at the time of injury, 41.3% claimed workers compensation (Table 5.3.16).

5.3.8 Safety devices used during falling

Most individuals injured (79.0%) did not appear to be utilising safety devices at the time of injury. There were 294 (9.6%) persons using a hardhat, 73 (2.4%) using a motorcycle helmet, and 217 (7.1%) using other safety devices. Nearly one-third (34.4%) of safety devices used were in association with lotic falls. (Table 5.3.17). Only 392 (18%) of injury presentations resulting from a height-related fall reported wearing head protection.

Table 5.3.17 Australian ED presentations due to a fall on a farm, field or paddock, by safety mechanism, by height

Safety mechanism	Lotic	Static	Same level	Total	%
No safety device	1093	484	851	2428	79.0
Motor vehicle safety belt, approved restraint	2	-	2	4	0.1
Motor cycle helmet	68	3	2	73	2.4
Bicycle safety helmet	36	2	-	38	1.2
Work boots	3	6	8	17	0.6
Safety glasses	-	-	1	1	0.0
Hard hat	275	8	11	294	9.6
Other safety device	190	9	18	217	7.1
All	**1667**	**512**	**893**	**3072**	**100.0**

5.4 Summary

- A total of 3,072 farm-related injuries that presented to EDs across Australia were examined.
- The majority of the fall injuries occurred from a height (70.9%).
- More than three-fourth of the falls (76.5%) from a height were due to *lotic* falls.
- Lotic falls occurred from animals (80.1%), in particular horses (76.8%)
- More than one-fifth (22.2%) of the static falls occurred from animals and vehicles.
- Horses (23.7%), tractors (21.1%), and trucks (25.4%) were the common agents for lotic falls.
- Trees (20.9%), gates (18.3%), fences (18.3%), ladders (9.8%), equipment (7.3%), steps (4.5%), hay (4.5%), and logs (3.8%), were common structures from which stationary falls occurred.
- Nearly one-fifth (17.4%) of the same level falls occurred due to an animal or vehicle.
- Horses (23.2%), cattle (10.3%), cows (11.6%), dogs (8.4%), sheep (11.0%), and pigs (10.3%) were the common animals related to same level falls.
- Nearly one-quarter of total falls (24.0%) occurred while playing, running, walking and due to other slips and trips on same the level.

Gender

- More males were injured than females.
- Most of the fall injuries of females occurred from a height (78.7%).
- More females (58.4%) were injured in lotic falls than males.
- More female children (51.9%) were injured than male children.
- The injuries on recreation outdoor land predominantly occurred to females. In all other common contexts males had more injuries.

Age group

- More than three-quarters (77.7%) of children injuries from a height were lotic falls.
- Most of the fall injuries of children (76.1%), young adults (73.9%) and people aged 30-44 years (69.7%) occurred due to a fall from a height.
- A number of fall injuries in children (48.5%) and young adults (51.5%) occurred while on recreation outdoor land.
- One-third of same level fall injuries in children were cut or lacerations.
- In all age groups (except 60 years and over) fractures, and sprain/strains were common injuries.
- In adults, ankles (77.8%), wrists (54.4%), and knees (65.1%) were commonly injured body parts. In children, the radius or ulna (74.4%), the forearm (64.4%) and the elbow (56.6%) were commonly injured body parts.
- In children, upper arm injuries were twice as common (55.0%) as lower arm (25.7%) injuries.
- In younger adults, upper arm (39.3%) and lower arm (40.1%) injuries were equally common whereas the number of lower arm injuries were higher in adults aged 30-59 years.

Nature of injuries

- One-third of the fall injuries resulted in a fracture (33.2%). Most of the fractures (80.3%) occurred due to fall from a height. The other common injuries were sprain or strain (18.2%), cut or laceration (12.9%), and haematoma or bruising (12.7%).
- Fracture was the most common upper arm injury (53.7%). Sprain or strain was the most common lower arm injury (33.3%).
- Most of the injuries from lotic (60.3%) and static (58.1%) falls were fracture injuries.
- Most of the fractures (79.7%), haematoma or bruising (83.2%), and concussion (87.3%) injuries of height-related falls occurred during motion.

Body location of injuries

- Head injuries were slightly more common in lotic falls.
- Upper limb injuries occurred in more than a third of all lotic, static and same level falls.
- Lower limb injuries occurred in nearly half of all same level falls.
- Ankles (11.5%), the radius or ulna (8.9%), wrists (6.3%), knees (5.5%), and elbows (4.8%), were commonly injured body parts.
- Head (75.8%) and trunk (87.0%) injuries resulted predominantly from height-related falls.
- The radius or ulna (78.0%), wrist (76.2%), elbow (81.4%) and ankle (53.8%) were commonly injured body parts in lotic falls.

Occupation

- Labourers and related workers (4.1%) and managers and administrators (3.1%) were the commonly affected occupational groups.
- Most of the injured persons (90.3%) were not on the job.

Safety device

- Most of the injury presentations (79.0%) did not report use of a safety device at the time of injury.
- Only 18% of injury presentations resulting from a height-related fall reported wearing head protection

6. Workers Compensation Information (Australia)

6.1 Introduction

Workers compensation claims provide information about workplace injuries and detail regarding nature and circumstances of the injury, number of lost working days, and cost to the system. Occupational injury and disease data is compiled by work health authorities every financial year from information provided by insurance companies, self-insurers and some government departments. In 1998 there were 144,863 agricultural establishments (EVAO =>$5,000) and 301,000 people were working on Australian farms (EVAO >$22,500) (ABS, 1999). There were 26,252 claims submitted by the agricultural industry for the 1994/95-1999/00 financial years (NOHSC, 2001) equating to a rate of 4,375 claims per year.

NOHSC (1999) reported a total of 117,473 Australian workers compensation claims for the 1997/98 financial year. Falls, trips and slips in all industries accounted for 22,532 injuries (19.3%). For the group agriculture, forestry and fishing, the total number of claims was 5,175. There were 1,073 (20.7%) compensation cases due to falls in this industry which comprised 4.8% of total work-related falls across all industries. NSW Workers Compensation statistics for 1991/92 indicated that 'falls on the same level' accounted for 15.7% of all injuries (NOHSC, 1994). Cole and Foley (1995) reported that 22% of the 5,885 agricultural work-related injuries in Australia (excluding Victoria) were due to falls.

The NSW Work Cover Authority (1993) reported falls, slips, and trips as the leading major cause of workplace injury in the agricultural sector in 1991/92, which accounted for 400 (23.9%) agricultural injuries. There were 5,177 fall, slip and trip injuries across all Western Australian agricultural industries in 1995/96 and of these 236 (4.6%) fall injuries occurred in agriculture, forestry and fishing which equated to 15.7% of occupational injuries for this sector (White 1997) (Table 6.1.1).

Table 6.1.1 Number of workers claiming injury compensation in Australia and some selected states

Place	Farm injury/1000 farms per year	Falls on a farm/1000 farms per year
Australia (1997/98)	36	7
NSW (1991/92)	38	9
Qld (1995/96)	40	-
WA (1995/96)	108	17

Source: NOHSC (1999), WCA (1993), Workplace Health and Safety (1997), White (1997)

There were 137 (17.8%) farm-related fall injury claims in South Australia between 1995/96-1997/98 financial years (Franklin et al, 1999). In Victoria, agriculture represented 8% (n=1,579) of total workers compensation fall-related claims from 1 July 1993 to 30 June 1997 (four years). Within the agriculture industry 11% of all workers compensation claims were due to a fall from a height (Field et al, 2000).

This chapter examines workers injury compensation claims due to falls in Australia between the 1994/95-1999/00 financial years.

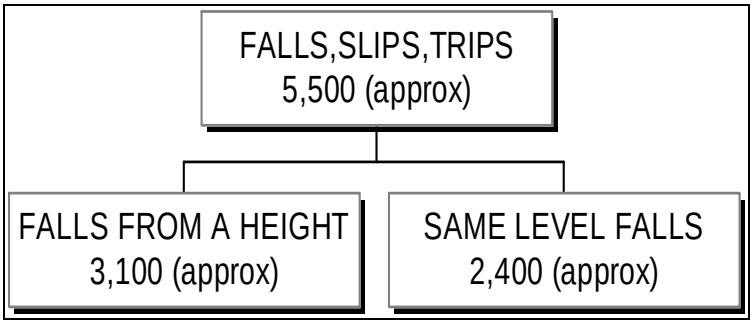
6.2 Methodology of Australian Workers Compensation

National Occupational Health and Safety Commission in their website 'www.nohsc.gov.au', provided Workers Compensation data from the 'NOSI' database' where data for 1994/95-1999/00 was available. Separate analysis for each year was undertaken and grouped together. The data represents both fatal and non-fatal claims. There were only seven fatal injury claims over the six years. In 1994/95, there were four claims and in 1996/97, 1998/99, and 1999/00, there was one claim. All others were non-fatal workers compensation claims. There were many 'non-processed' (np) data which were not available for separate publication due to confidentiality restrictions. Mechanism of injury equal to *falls, trips and slips* was used to restrict cases.

6.3 Australian Workers Compensation results

There were a total of around 5,500 claims due to falls across Australia between 1994/95-1999/00. 'NOSI" database gave slightly different number of compensation claims for each type of query. There were approximately 3,100 injury claims due to falls from a height and approximately 2,400 claims due to falls on the same level (Figure 6.3.1).

Figure 6.3.1 Australian worker compensation claims due to a fall from a height or on the same level 1994-2000



6.3.1 Gender

Of the falls from a height, there were 3,069 compensation claims over five years of which 2,558 (83.3%) were male. (Table 6.3.1). For falls on the same level, male injury claims were two-thirds (69.0%) of all claims. The number of male claims were lower for same level falls for all years while females were higher (Table 6.3.2).

Table 6.3.1 Australian worker compensation claims due to a fall from a height, by gender 1994-2000

Sex	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	All	%
Male	448	441	458	462	382	367	2558	83.3
Female	95	82	77	96	83	78	511	16.7
Total	**543**	**523**	**535**	**558**	**465**	**445**	**3069**	**100.0**

Table 6.3.2 Australian worker compensation claims due to a fall on same level, by gender, 1994-2000

Sex	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	All	%
Male	311	320	249	301	105	106	1392	69.0
Female	89	111	109	105	106	106	626	31.0
Total	**400**	**431**	**358**	**406**	**211**	**212**	**2018**	**100.0**

6.3.2 Age group

The 20-24 year age group had the most height-related fall injury (18.1%), followed by the 25-29 year age group (14.0%). Same level falls were also slightly higher in the lower age groups over 20 years (Tables 6.3 3 and 6.3.4).

Table 6.3.3 Australian worker compensation claims due to a fall from a height, by age group 1994-2000

Age group	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	All	%
< 20	76	63	57	57	45	55	353	11.4
20-24	106	100	109	119	69	60	563	18.1
25-29	75	100	79	71	53	57	435	14.0
30-34	61	53	54	56	68	59	351	11.3
35-39	44	42	52	68	53	51	310	10.0
40-44	48	58	46	45	44	45	286	9.2
45-49	45	57	40	48	39	37	266	8.6
50-54	28	39	38	50	33	22	210	6.8
55 +	56	35	65	61	54	64	335	10.8
Total	**539**	**547**	**540**	**575**	**458**	**450**	**3109**	**100.0**

Table6.3.4 Australian worker compensation claims due to a fall on same level, by gender 1994-2000

Age group	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	All	%
< 20	32	28	34	35	29	26	184	7.4
20-24	59	68	37	65	48	55	332	13.4
25-29	55	68	54	47	58	37	319	12.9
30-34	57	58	32	43	59	55	304	12.3
35-39	53	46	55	50	54	41	299	12.1
40-44	42	47	44	50	46	52	281	11.3
45-49	37	44	28	42	38	53	242	9.8
50-54	36	39	42	39	38	32	226	9.1
55 +	50	57	33	49	48	57	294	11.9
Total	**421**	**455**	**359**	**420**	**418**	**408**	**2481**	**100.0**

6.3.3 States and territories

More than one-third of fall injuries occurred in NSW (33.7%) and more than one-fifth occurred in Queensland (22.2%). This trend was similar for same level falls (Tables 6.3.5 and 6.3.6).

Table 6.3.5 Australian worker compensation claims due to a fall from a height, by state, 1994-2000

States	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
NSW	155	155	173	209	175	169	1036	33.7
Vic	82	78	88	82	51	67	448	14.6
QLD	150	137	127	101	100	67	682	22.2
WA	59	88	72	88	57	65	429	14.0
SA	29	34	38	34	35	50	220	7.2
Tas	24	12	9	12	11	11	79	2.6
NT	34	29	34	32	31	19	179	5.8
Total	**533**	**533**	**541**	**558**	**460**	**448**	**3073**	**100.0**

Table 6.3.6 Australian worker compensation claims due to a fall on same level, by state, 1994-2000

States	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
NSW	118	174	134	157	143	158	884	36.5
Vic	45	45	46	44	60	57	297	12.3
QLD	112	82	56	74	78	57	459	18.9
WA	58	60	48	59	71	68	364	15.0
SA	43	45	45	52	55	45	285	11.8
Tas	20	15	18	20	13	10	96	4.0
NT	8	11	np	np	10	9	np	-
Total	**404**	**432**	**347**	**406**	**430**	**404**	**2423**	**100.0**

6.3.4 Agricultural industry

The *grain, sheep and beef cattle industry* group had the highest numbers of fall from a height injury (48.2%) followed by *horticulture and fruit growing* (30.5%) across all industries (Table 6.3.7). For falls on the same level, there were a more injuries in the *horticulture and fruit growing* (35.4%), and *grain, sheep and beef cattle farmin*g (32.9%) industries (Table 6.3.8).

Table 6.3.7 Australian worker compensation claims due to a fall from a height, by industry 1994-2000

Industry	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Horticulture & fruit growing	162	152	160	167	147	154	942	30.5
Grain, sheep & beef cattle farming	274	275	278	256	210	195	1488	48.2
Dairy cattle farming	22	26	26	21	22	25	142	4.6
Poultry farming	23	18	21	26	28	16	132	4.3
Other livestock farming	35	35	18	51	32	36	207	6.7
Other crop growing	26	26	31	38	28	28	177	5.7
Total	**542**	**532**	**534**	**559**	**467**	**454**	**3088**	**100.0**

Table 6.3.8 Australian worker compensation claims due to a fall from same level, by industry 1994-2000

Industry	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Horticulture & fruit growing	132	158	126	143	159	149	867	35.4
Grain, sheep & beef cattle farming	143	153	117	111	147	135	806	32.9
Dairy cattle farming	23	37	30	27	23	27	167	6.8
Poultry farming	42	43	40	50	37	39	251	10.3
Other livestock farming	24	18	19	41	29	26	157	6.4
Horticulture & fruit growing	42	30	27	35	33	32	199	8.1
Total	**406**	**439**	**359**	**407**	**428**	**408**	**2447**	**100.0**

6.3.5 Agency of injury

A number of falls from a height were due to *animal, human and biological* agencies (26.5%). The second common agency group was *non-powered hand tools, appliances and equipment* (22.4%), and the third was *mobile plant and transport* (21.8%) For falls from the same level, *environmental agencies* (60.7%) were common. There were also a number of injuries from *animal, human and biological agencies* (13.1%), *mobile plant and transport* (9.1%) and *non-powered hand tools, appliances and equipment* (7.8%) (Tables 6.3.9 and 6.3.10).

Table 6.3.9 Australian worker compensation claims due to a fall from a height, by agency 1994-2000

Agency	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Machinery & (mainly) fixed plant	9	6	19	19	13	10	76	2.5
Mobile plant & transport	99	108	115	122	112	95	651	21.8
Powered equipment tools appliances	-	np	-	-	-	np	np	-
Non-powered hand tools, appliances & equipment	138	107	110	105	101	109	670	22.4
Chemicals & chemical products	-	-	np	np	-	-	np	-
Materials & substances	8	14	np	13	10	16	np	-
Environmental agencies	103	102	102	120	93	97	617	20.6
Animal, human & biological agencies	160	163	102	150	118	101	794	26.5
Other & unspecified agencies	25	30	16	21	17	13	122	4.1
Total	**542**	**530**	**464**	**550**	**464**	**441**	**2991**	**100.0**

Table 6.3.10 Australian worker compensation claims due to a fall from same level, by agency 1994-2000

Agency	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Machinery & (mainly) fixed plant	np	np	np	12	9	10	np	-
Mobile plant & transport	39	29	53	36	45	37	239	9.1
Powered equipment tools appliances	np	np	-	-	np	-	np	-
Non-powered hand tools appliances & equipment	30	35	27	31	35	46	204	7.8
Chemicals & chemical products	np	-	-	np	np	-	np	-
Materials & substances	14	18	np	10	15	22	np	-
Environmental agencies	265	300	242	284	258	244	1593	60.7
Animal, human & biological agencies	17	18	242	17	29	21	344	13.1
Other & unspecified agencies	22	15	19	12	32	33	133	5.1
Total	**387**	**415**	**583**	**390**	**414**	**403**	**2623**	**100.0**

6.3.6 Occupation

Labourers and related workers were the major group of people injured due to falls from a height (74.8%) and same level falls (72.3%). The other common groups were *managers and administrators* (14.9% and 14.2% for height-related and same level falls respectively) (Tables 6.3.11 and 6.3.12).

Table 6.3.11 Australian worker compensation claims due to a fall from a height, by occupation 1994-2000

Occupation	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Managers & administrators	50	74	84	78	85	72	443	14.9
Professionals	np	-	-	np	-	np	np	-
Para-professionals	np	-	-	8	np	np	np	-
Tradespersons	23	29	23	19	16	28	138	4.6
Clerks	-	np	np	np	-	-	-	-
Salesperson & personal service workers	np	np	np	np	np	np	np	-
Plant & machine operators & drivers	19	30	29	34	21	27	160	5.4
Labourers & related workers	407	375	382	410	326	321	2221	74.8
Total	**499**	**508**	**518**	**549**	**448**	**448**	**2970**	**100.0**

Table 6.3.12 Australian worker compensation claims due to a fall from same level, by occupation 1994-2000

Occupation	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Managers & administrators	54	65	42	55	59	52	327	14.2
Professionals	-	np	np	-	-	-	np	-
Para-professionals	np	np	-	np	-	np	np	-
Tradespersons	29	31	22	20	24	32	158	6.9
Clerks	-	np	-	np	np	-	np	-
Salesperson & personal service workers	np	np	-	np	np	np	np	-
Plant & machine operators & drivers	24	21	25	33	27	23	153	6.6
Labourers & related workers	271	283	259	285	284	284	1666	72.3
Total	**378**	**400**	**348**	**393**	**394**	**391**	**2304**	**100.0**

6.3.7 Nature of fall injuries

Sprains and stains (39.4%), *fractures* (36.7%) and c*ontusion* (12.1%) were the most common form of injury resulting from a height-related fall (Table 6.3.13). S*prains and stains* occurred in a larger percent of same level falls (62.3%) followed by *fractures* (21.5%), *open wound* (6.7%) and *contusion* (7.3%) (Table 6.3.14).

Table 6.3.13 Australian worker compensation claims due to a fall from a height, by nature of injury 1994-2000

Injury	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Contusion	70	57	61	59	51	62	360	12.1
Dislocation	16	21	22	12	9	15	95	3.2
Fracture of vertebral column	8	13	15	16	11	7	70	2.3
Fractures	177	183	211	190	170	165	1096	36.7
Concussion	8	8	9	10	6	7	48	1.6
Multi injuries	-	-	-	-	np	7	np	-
Open wound	26	18	17	26	15	15	117	3.9
Sprains & stains	210	196	196	229	181	164	1176	39.4
Superficial injuries	-	8	np	np	-	-	np	-
Unspecified injuries	7	np	np	-	-	np	np	-
Total	**522**	**504**	**531**	**542**	**443**	**442**	**2984**	**100.0**

Table 6.3.14 Australian worker compensation claims due to a fall from same level, by nature of injury 1994-2000

Injury	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Contusion	34	26	24	28	32	27	171	7.3
Dislocation	np	11	9	15	np	10	np	-
Fracture of vertebral column	-	-	-	np	np	np	np	-
Fractures	77	94	78	83	90	79	501	21.5
Concussion	-	-	np	np	-	-	np	-
Multi injuries	-	-	-	-	np	-	np	-
Open wound	22	36	31	32	18	16	155	6.7
Sprains & stains	240	255	200	257	253	244	1449	62.3
Superficial injuries	-	np	np	np	-	-	np	-
Unspecified injuries	6	-	-	np	-	np	np	-
Total	**379**	**422**	**342**	**415**	**393**	**376**	**2327**	**100.0**

6.3.8 Body location

For falls from a height, more than one-third of the injuries (36.9%) occurred to *lower limbs*. *Upper limbs* (29.1%), *trunk* (24.4%) and *head* (3.5%) were other commonly injured locations (Table 6.3.15). For falls on the same level, more than half (55.9%) of the injuries occurred to *lower limbs*. Other commonly injured body locations were *trunk* (22.0%) and *upper limbs* (19.0%) (Table 6.3.16).

Table 6.3.15 Australian worker compensation claims due to a fall from a height, by body location 1994-2000

Body location	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Head	29	24	12	18	12	12	107	3.5
Neck	7	9	np	11	np	9	np	-
Trunk	146	130	138	136	99	98	747	24.4
Upper limbs	140	154	161	150	147	140	892	29.1
Lower limbs	189	189	192	214	182	164	1130	36.9
Multiple locations	19	24	28	30	22	30	153	5.0
Total	**530**	**530**	**531**	**559**	**462**	**453**	**3065**	**100.0**

Table 6.3.16 Australian worker compensation claims due to a fall from same level, by body location 1994-2000

Body location	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
Head	np	np	np	np	np	-	np	-
Neck	8	np	np	np	np	10	np	-
Trunk	83	101	80	74	106	86	530	22.0
Upper limbs	64	86	68	79	88	74	459	19.0
Lower limbs	240	236	193	238	213	228	1348	55.9
Multiple locations	8	15	np	12	9	12	np	-
Total	**403**	**438**	**341**	**403**	**416**	**410**	**2411**	**100.0**

6.3.9 Length of absence

For falls from a height 2,996 workers (97.7%) took five or more days leave from work as a result of injury. Of those, 2,441 (79.6%) were absent for ten or more days and 877 (28.6%) were away from work for 60 or more days (Table 6.3.17).

For falls on the same level 2,348 workers (96.2%) stayed away from work for five days or more. Of those, 1,771 (72.5%) were away for ten days or more and 598 (24.5%) persons were away for 60 days or more (Table 6.3.18).

Table 6.3.17 Australian worker compensation claims due to a fall from a height, by days of absence 1994-2000

Days of absence	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
0-4	18	14	11	10	9	9	71	2.3
5 or more	525	516	515	543	453	444	2996	97.7
10 or more	*412*	*400*	*428*	*450*	*374*	*377*	*2441*	*79.6*
30 or more	*230*	*233*	*269*	*285*	*235*	*244*	*1496*	*48.8*
60 or more	*122*	*126*	*151*	*181*	*146*	*151*	*877*	*28.6*

Table 6.3.18 Australian worker compensation claims due to a fall from same level, by days of absence 1994-2000

Days of absence	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	All	%
0-4	21	14	14	8	17	20	94	3.8
5 or more	377	420	344	404	408	395	2348	96.2
10 or more	*275*	*317*	*278*	*293*	*301*	*307*	*1771*	*72.5*
30 or more	*151*	*178*	*161*	*156*	*160*	*194*	*1000*	*41.0*
60 or more	*86*	*105*	*96*	*89*	*87*	*135*	*598*	*24.5*

6.4 Summary

- There were approximately 5,500 workers compensation injuries due to a fall between 1994/95-1999/00.
- Fall injuries from a height were more common than falls on the same level

Gender

- The majority of fall injuries from a height occurred to males (83.3%)
- In the same level also, relatively high number of injuries occurred in males (69.0%).

Age group

- In both falls from a height and falls on the same level, younger age groups (except under 20 and over 55 years) had more number of injuries than elder age groups.
- In both falls from a height and falls on the same level, 20-24 years age group had most number of injuries.
- In all the age groups, fall injury from the height was greater, except 50-54 years.

States

- NSW had the most injuries due to a falls from a height.
- In falls on the same level one-third (36.5%) of the fall injuries occurred in NSW.

Industries

- Grain, sheep and beef cattle farming (41.4%) and horticulture and fruit growing (32.7%) were the common industries for falls from a height and falls on the same level.
- In the grain, sheep and beef cattle farming industry the fall injuries were very high in falls from a height whereas in horticulture and fruit growing the fall injuries were slightly more than falls on the same level.

Agencies

- *Environmental* (39.4%), *animal, human and biological* (20.3%), *non-powered hand tools appliances and equipment* (15.6%) and *mobile plant and transport* (15.9%) were the common agencies in falls.
- *Environmental agencies* (60.5%) were more common in falls on the same level.

Occupation

- Labourers and related workers (73.7%) was the most common occupational group injured in both falls from a height and falls on the same level.

Nature of injuries

- *Sprains and strains, fractures, contusion* and *open wound* were common nature of injury groups in both falls from a height and on the same level.
- The number of *fractures* and *contusion* were more common in falls from a height whereas *sprains and strains* and *open wound* were more common in falls on the same level.

Body locations

- In falls from a height more than one-third of the fall injuries (36.9%) occurred in *lower limbs.*
- For falls on the same level, more than half (55.9%) of the fall injuries occurred in *lower limbs.*

Length of absence

- More than 95% of the fall injured persons were away from work for more than 5 days.

7. Queensland Workers Compensation Claims Following Fall-Related Injury In The Agricultural Industry

7.1 Introduction

Workers compensation information in Queensland provides a greater insight into fall-related injuries than can be gathered from the NOSI database. In 1998 Queensland had one-fifth (30,951; 21.4%) of agricultural establishments (EVAO =>$5,000) in Australia (ABS, 1999). In reality only a small percent of farm owner injury is covered or represented by workers compensation claims. Chater and Ferguson (1994) and Ferguson (1994) reported that workers compensation claims represented between 6-19% of all injury sustained. Chater and Ferguson (1994) also reported that the workers' compensation rate was 6/100 in the Callide-Dawson region of Central Queensland for agricultural employees presenting to doctor's surgeries and EDs between August 1992 and July 1993. In Central Queensland Harper (1997) found that more than half of farm injuries (56%) occurred while working for an income. In Central Queensland throughout 1995/96 Franklin *et al.*, 2000 reported that of 509 farm injuries presenting to EDs and GP surgeries, 61.5% were occupational injuries and only 15.6% claimed workers compensation .

Workplace Health and Safety (1994) in Queensland reported that for the 1992/93 financial year rural injuries occurred most commonly due to falls from a height, accounting for 294 (16.3%) of total rural injuries (falls accounted for 7.1% across all industries). Falls from horses during mustering was identified as a workplace health and safety issue for younger employees between 15 and 29 years of age since the group was associated with 53% of all horse-related deaths (Ferguson, 1999).

Workplace Health and Safety (1997) Queensland found that almost 50% of compensation paid in the rural industry went to the beef cattle, horticultural and cropping industries. Beef cattle farming and sugar cane growing were the most common agricultural establishments in Queensland (ABS, 1997) (Table 7.1.1).

Table 7.1.1 The main industries of Queensland agricultural establishments in 1996 (EVAO $5000 and over)

Industry	Number	%
Beef cattle farming	11,751	36.5
Sugar cane growing	4,603	14.3
Fruit growing NEC	2,127	6.6
Dairy cattle farming	1,912	5.9
Grain-sheep/beef cattle farming	1,900	5.9
Grain growing	1,764	5.5
Vegetable growing	1,376	4.3
Sheep-beef cattle farming	1,022	3.2

Source: ABS (1997)

This chapter examines the workers compensation claims made in Queensland due to a fall between 1992/93-1998/99.

7.2 Methodology of Queensland Workers Compensation data

Queensland Workers Compensation information was provided by the Queensland Department of Industrial Relation for the financial years 1992/93 to 1998/99 where the Australian and New Zealand Industry Classification (ANZIC) was agriculture, forestry and fishing. Forestry and fishing industries were subsequently removed from the analysis.

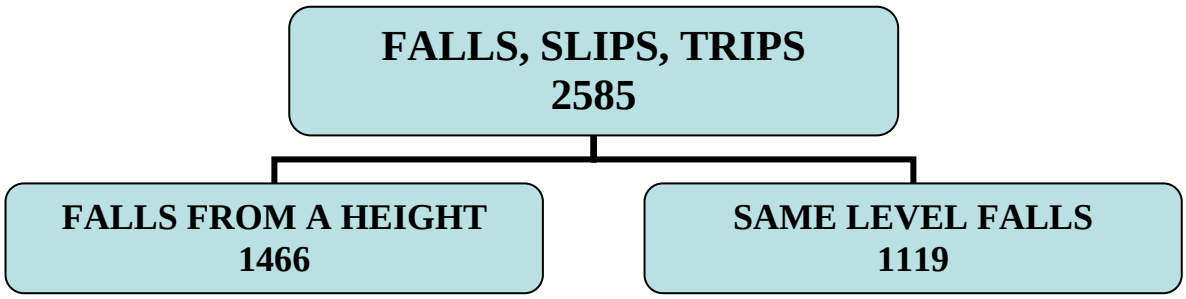
The information was then further refined by mechanism equal to falls, trips and slips of a person. Mechanism of injury level 2 category *stepping, kneeling or sitting on objects* was also removed from the analysis.

The analysis was undertaken using SPSS ™.

7.3 Queensland Workers Compensation results

There was a total of 2,585 workers injury compensation claims in Queensland between 1992/93-1998/99 financial years. The number of falls from a height was slightly greater (56.7%) than falls on the same level (43.3%) (Figure. 7.3.1).

Figure 7.3.1 Queensland workers compensation fall-related claims 1992-99



7.3.1 Year of claim

The highest number (20.6%) of fall injuries occurred in 1993. In the succeeding years there was a decline with 10.3% in 1998. In all the years the number of fall injuries from a height was higher than the fall injuries from the same level (Table 7.3.1).

Table 7.3.1 Queensland workers compensation fall-related claims over time 1992-99

Year	Height	Same level	Total	%
1992*	188	135	323	12.5
1993	316	216	532	20.6
1994	244	219	463	17.9
1995	193	161	354	13.7
1996	176	108	284	11.0
1997	152	103	255	9.9
1998	141	126	267	10.3
1999*	56	51	107	4.1
Total	**1466**	**1119**	**2585**	**100.0**

* This years are only half years as information is provided by financial years

7.3.2 Age group

Younger workers appeared to submit more claims for fall injuries than older workers. For both falls from a height and falls on the same level, the 20-24 year age group had the highest number of claims, followed by the 25-29 and 30-34 year age groups. For farmers and farm workers aged over 50 years the number of claims decreased further. More than half (50.2%) of the height-related and 42.4% of same level fall injuries occurred to young adults aged 15-29 years (Table 7.3.2).

Table 7.3.2 Queensland workers compensation fall-related claims, by age group 1992-99

Age group	Height		Same level			
	Number	%	Number	%	Total	%
0-14	1	0.1	-	0.0	1	0.0
15-19	234	16.0	84	7.5	318	12.3
20-24	369	25.2	217	19.4	586	22.7
25-29	219	14.9	174	15.5	393	15.2
30-34	147	10.0	148	13.2	295	11.4
35-39	129	8.8	110	9.8	239	9.2
40-44	96	6.5	102	9.1	198	7.7
45-49	116	7.9	102	9.1	218	8.4
50-54	56	3.8	82	7.3	138	5.3
55-59	60	4.1	48	4.3	108	4.2
60-64	31	2.1	42	3.8	73	2.8
65+	8	0.5	10	0.9	18	0.7
Total	**1466**	**100.0**	**1119**	**100.0**	**2585**	**100.0**

Age and industry

More than half (53.0%) of height-related fall injury occurred in the beef cattle farming industry; of which nearly two thirds (63.1%) occurred to young adults aged 15-29 years. In other livestock farming nearly two thirds (63.3%) of height-related fall injury occurred to young adults. In the fruit growing industry, 38.4% of same level falls occurred to young adults. In other crop farming 40.6% of same level falls occurred to young adults (Table 7.3.3).

Table 7.3.3 Queensland workers compensation fall-related claims, by age group, by industry 1992-99

Industry	M	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Horticulture and Fruit Growing	H	**-**	**34**	**38**	**41**	**36**	**32**	**22**	**33**	**19**	**22**	**4**	**1**	**282**
	S	**-**	**37**	**83**	**69**	**48**	**31**	**44**	**34**	**28**	**14**	**11**	**3**	**402**
Plant nurseries	*H*	*-*	*4*	*1*	*3*	*2*	*2*	*-*	*-*	*1*	*2*	*-*	*-*	*15*
	S	*-*	*5*	*12*	*11*	*5*	*4*	*9*	*4*	*2*	*3*	*4*	*-*	*59*
Vegetable growing	*H*	*-*	*1*	*6*	*2*	*2*	*1*	*2*	*1*	*1*	*2*	*-*	*-*	*18*
	S	*-*	*7*	*14*	*3*	*6*	*6*	*3*	*8*	*6*	*1*	*1*	*-*	*55*
Fruit growing NEC.	*H*	*-*	*29*	*29*	*36*	*32*	*27*	*20*	*32*	*17*	*18*	*4*	*1*	*245*
	S	*-*	*25*	*56*	*54*	*35*	*19*	*32*	*21*	*20*	*10*	*6*	*3*	*281*
Grain, Sheep and Beef Cattle Farming	H	**1**	**161**	**262**	**126**	**81**	**66**	**48**	**48**	**19**	**29**	**22**	**5**	**868**
	S	**-**	**23**	**60**	**36**	**24**	**25**	**26**	**18**	**13**	**6**	**9**	**3**	**243**
Sheep-beef cattle farming	*H*	*-*	*15*	*14*	*10*	*4*	*4*	*-*	*2*	*2*	*2*	*2*	*-*	*55*
	S	*-*	*1*	*6*	*3*	*4*	*-*	*-*	*1*	*4*	*1*	*3*	*-*	*23*
Sheep farming	*H*	*-*	*4*	*9*	*4*	*4*	*3*	*-*	*-*	*-*	*2*	*-*	*-*	*26*
	S	*-*	*2*	*3*	*5*	*2*	*3*	*2*	*1*	*1*	*1*	*-*	*1*	*21*
Beef cattle farming	*H*	*1*	*140*	*238*	*112*	*71*	*58*	*47*	*46*	*16*	*23*	*20*	*5*	*777*
	S	*-*	*19*	*48*	*27*	*14*	*20*	*23*	*15*	*8*	*4*	*6*	*2*	*186*
Dairy Cattle Farming	H	**-**	**7**	**7**	**4**	**1**		**1**	**1**	**-**	**-**	**-**	**-**	**21**
	S	**-**	**3**	**3**	**2**	**7**	**4**	**2**	**3**	**-**	**1**	**-**	**-**	**25**
Poultry Farming	H	-	1	5	2	1	1	4	2	2	1	-	-	**19**
	S	-	2	4	2	8	9	6	12	12	4	3	-	**62**
Other Livestock Farming	H	-	23	27	12	8	9	5	7	3	4	-	-	**98**
	S	-	4	16	14	11	6	5	2	9	5	4	-	**76**
Pig farming	*H*	*-*	*1*	*4*	*2*	*1*	*3*	*2*	*2*	*1*	*2*	*-*	*-*	*18*
	S	*-*	*2*	*9*	*10*	*5*	*6*	*3*	*1*	*4*	*3*	*3*	*-*	*46*
Horse farming	*H*	*-*	*12*	*11*	*6*	*6*	*2*	*1*	*2*	*1*	*-*	*-*	*-*	*41*
	S	*-*	*1*	*5*	*1*	*2*		*1*	*-*	*2*	*1*	*-*	*-*	*13*

Industry	M	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Livestock farming NEC.	*H*	-	*10*	*12*	*3*	*1*	*4*	*2*	*3*	*1*	*2*	-	-	*38*
	S	-	*1*	*2*	*3*	*4*		*1*	*1*	*3*	*1*	*1*	-	*17*
Other Crop Farming	H	-	5	17	23	13	19	12	17	12	3	3	1	**125**
	S	-	13	35	36	29	24	15	23	8	12	9	3	**207**
Sugar cane growing	*H*	-	*1*	*12*	*14*	*5*	*8*	*4*	*11*	*6*	*2*	*2*	-	*65*
	S	-	*2*	*10*	*15*	*15*	*13*	*3*	*7*	*3*	*4*	*3*	*2*	*77*
Crop and plant growing NEC.	*H*	-	*3*	*5*	*8*	*7*	*10*	*7*	*6*	*4*	*1*	*1*	*1*	*53*
	S	-	*8*	*21*	*18*	*13*	*10*	*11*	*14*	*5*	*7*	*6*	*1*	*114*
Services to Agriculture	H	-	3	13	11	7	2	4	8	1	1	2	1	**53**
	S	-	2	16	15	21	11	4	10	12	6	6	1	**104**
Total		**1**	**318**	**586**	**393**	**295**	**239**	**198**	**218**	**138**	**108**	**73**	**18**	**2585**

M= Mechanism, H= Height, S= Same level

Age and agency of injury

More than half (51.2%) of height-related falls were associated with *horses, donkeys, mules* and of these 70.0% occurred to young adults (15-29 years). Over sixteen percent (16.4%) were associated with *mobile plant and transport* and of these 40.6% occurred to young adults (Table 7.3.4).

For all fall injuries associated with *mobile plant and transport* a greater number of injuries (40.1%) occurred to young adults aged 15-29 years.

Table 7.3.4 Queensland workers compensation fall-related claims, by age group, by agency 1992-99

Agency	M	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Machinery & (mainly) fixed plant	H	-	5	1	5	3	2	1	4	1	2	-	-	**24**
	S	-	3	2	4	4	1	1	-	-	-	-	1	**16**
Power hoist	*H*	-	*2*	-	*2*	*1*	-	-	*4*	*1*	*1*	-	-	*11*
	S	-	*1*	*1*	-		-	-	-	-	-	-	-	*2*
Mobile plant & transport	H	-	18	44	36	30	31	21	25	15	14	6	1	**241**
	S	-	13	15	19	17	14	14	8	8	6	5	1	**120**
Tractors, agricultural or otherwise	*H*	-	*6*	*15*	*12*	*13*	*8*	*8*	*9*	*6*	*1*	*1*	-	*79*
	S	-	*2*	*4*	*5*	*4*	*5*	*1*	*3*	*2*	*1*	*2*	*1*	*30*
Trailers, caravans	*H*	-	*4*	*8*	*8*	*4*	*5*	*4*	*1*	*3*	*2*	-	-	*39*
	S	-	*5*	*3*	-	*7*	*1*	*3*	*2*	-	*4*	-	-	*25*
Trucks, semi-trailers, lorries	*H*	-	*2*	*7*	*10*	*9*	*11*	*3*	*7*	*4*	*6*	*2*	-	*61*
	S	-	*1*	-	*4*	*1*	*5*	*5*	-	*1*	*1*	*1*	-	*19*
Powered equipment tools and appliances	S	-	-	-	-	-	-	-	1	-	-	-	-	**1**
Non-powered hand tools appliances & equipment	H	-	9	22	27	24	29	22	29	14	12	6	1	**195**
	S	-	8	21	11	8	13	8	7	6	4	8	1	**95**
Ladders, mobile ramps and stairways	*H*	-	*6*	*15*	*19*	*19*	*22*	*20*	*20*	*10*	*9*	*3*	-	*143*
	S	-	*3*	*3*	*7*	*2*	*4*	*3*	*3*	*2*	*1*	*2*	*1*	*31*
Chemicals & chemical products	H	-	-	-	-	*0*	-	-	-	-	*1*	-	-	***1***
	S	-	-	-	*1*	*0*	-	-	-	*1*	-	-	-	***2***
Materials & substances	H	-	1	1	1	0	-	-	1	1	-	-	-	**5**
	S	-	2	7	1	3	2	3	3	1	1	3	-	**26**
Rocks, stones, boulders	*S*	-	*1*	*4*	-	*2*	*1*	*2*	*2*	*1*	*1*	*1*	-	*15*
Environmental agencies	H	-	28	49	27	18	17	10	20	12	8	4	1	**194**
	S	-	52	145	121	105	72	69	70	63	33	23	7	**760**
Holes in the ground	*H*	-	*6*	*15*	*5*	*3*	*5*	*2*	*4*	*2*	-	*2*	-	*44*
	S	-	*10*	*17*	*18*	*16*	*10*	*14*	*8*	*11*	*8*	*1*	-	*113*
Wet, oily or icy traffic & ground surfaces	*H*	-	*2*	-	-	-		-	*1*	-	-	-	-	*3*
	S	-	*3*	*11*	*14*	*10*	*6*	*8*	*12*	*3*	*3*	-	*1*	*71*
Traffic & ground surfaces	*H*	-	*3*	*2*	*3*	*3*	*2*	*1*	*2*	*1*	-	-	-	*17*

Agency	M	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
	S	-	*24*	*73*	*56*	*52*	*28*	*29*	*17*	*19*	*9*	*11*	*3*	*321*
Vegetation	*H*	-	*10*	*9*	*6*	*3*	*2*	*5*	*4*	*6*	*3*	-	*1*	*49*
	S	-	*2*	*15*	*5*	*2*	*6*	*2*	*7*	*3*	*5*	*1*	*1*	*49*
Steps & stairways	*H*	-	*1*	*5*	*4*	*2*	*1*	*1*	*3*	-	*1*	-	-	*18*
	S	-	*1*	*2*	*1*	*2*	*3*	*3*	*2*	*2*	-	*1*	-	*17*
Wet, oily or icy other internal traffic & ground areas	*S*	-	*1*	*5*	*5*	*4*	*2*	*1*	*6*	*5*	-	*2*	-	*31*
Other internal traffic & ground areas	*H*	-	*1*	-	-	-	*2*	-	-	*1*	-	-	*0*	*4*
	S	-	*9*	*18*	*17*	*17*	*12*	*12*	*17*	*19*	*6*	-	*2*	*135*
Animal human & biological agencies	H	1	171	251	120	69	46	40	30	11	22	14	5	**780**
	S	-	1	7	4	4	2	4	3	1	1	1	-	**28**
Horses, donkeys, mules	*H*	*1*	*166*	*245*	*116*	*69*	*43*	*37*	*29*	*11*	*19*	*12*	*5*	*753*
	S	-	-	*4*	-	*3*		*2*	-	-	-	-	-	*9*
Other & unspecified agencies	H	-	2	1	3	3	4	2	7	2	1	1	-	**26**
	S	-	5	21	13	7	6	3	10	2	3	2	-	**72**
Total		**1**	**318**	**586**	**393**	**295**	**239**	**198**	**218**	**138**	**108**	**73**	**18**	**2585**

M – Mechanism, H – Height, S- Same level

Age and occupation

Fall-related injuries of *farm hands* and f*armer/grower*s occurred predominantly (over 50%) to young adults aged 15-29 years (Table 7.3.5).

Table 7.3.5 Queensland workers compensation fall-related claims, by age group, by occupation 1992-99

Occupation	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Managers & administrators	1	45	50	26	18	17	22	28	13	19	11	2	**252**
Farmer/ grower	*1*	*45*	*50*	*26*	*18*	*15*	*21*	*27*	*12*	*19*	*11*	*2*	*247*
Professionals	-	-	2	1	1	-	2	2	-	-	2	-	**10**
Para-professionals	-	-	1	4	4	3	-	2	2	-	-	-	**16**
Tradespersons	-	4	15	14	12	2	7	8	7	5	5	1	**80**
Clerks	-	-	1	-	-	1	1	3	5	1	-	-	**12**
Salespersons & personal service workers	-	1	2	-	-	-	-	1	1	-	-	-	**5**
Plant & machine operators & drivers	-	4	20	33	24	25	19	21	12	9	7	3	**177**
Truck drivers	-	*1*	*2*	*14*	*8*	*12*	*10*	*7*	*6*	*3*	*4*	*1*	*68*
Farm and machinery operator	-	*1*	*15*	*14*	*10*	*9*	*7*	*7*	*3*	*2*	*2*	*2*	*72*
Labourers & related workers	-	264	495	315	236	191	147	153	98	74	48	12	**2033**
Farm hands	-	*239*	*440*	*279*	*210*	*162*	*125*	*136*	*84*	*63*	*44*	*11*	*1793*
Attendants	-	*10*	*28*	*13*	*10*	*13*	*3*	*7*	*8*	*6*	*1*	*1*	*100*
Other labourers & related workers	-	*5*	*10*	*7*	*4*	*6*	*4*	*1*	*2*	*2*	*1*	-	*42*
Total	**1**	**318**	**586**	**393**	**295**	**239**	**198**	**218**	**138**	**108**	**73**	**18**	**2585**

Age and nature of injury

Fracture injuries were more common from falls from a height (58.0%) than falls on the same level (36.8%) for young adults (15-29 years). *Fracture of vertebral column* were predominantly (91.5%) from falls from a height. More than two-thirds (70.3%) of the *open wound injuries* and *contusion, crushing injury* (56.4%) were due to a fall from a height to young adults (Table. 7.3.6).

Table 7.3.6 Queensland workers compensation fall-related claims, by age group, by nature of injury 1992-99

Nature of Injury/Disease	M	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Fractures	H	96	135	71	57	40	26	43	16	24	11	2	521
	S	16	34	21	19	21	23	21	18	7	10	3	193
Fracture of vertebral column	H	4	8	11	2	4	5	3	1	3	2	-	43
	S	-	1	-	-	1	-	2	-	-	-	-	4
Dislocation	H	6	15	8	4	3	4	-	1	1	-	-	42
	S	3	8	3	3	1	-	-	-	-	1	-	19
Sprains and strains	H	70	125	81	60	51	38	48	26	20	10	1	530
	S	47	132	112	100	62	64	62	47	30	20	6	682
Intracranial injury, including concussion	H	4	8	5	3	1	1	-	-	1	-	1	24
	S	-	-	1	1	-	-	-	-	-	-	-	2
Open wound	H	12	21	12	3	3	5	4	-	2	1	1	64
	S	12	22	19	12	10	3	6	6	5	3	-	98
Contusion/ crushing injury	H	32	49	21	14	19	11	9	10	7	6	3	181
	S	5	16	12	12	8	11	10	8	5	6	1	94
Multiple injuries	H	5	4	6	1	5	2	3	1	-	1	-	28
	S	-	1	-	-	-	1	-	-	1	-	-	3
Total		**318**	**586**	**393**	**295**	**239**	**198**	**218**	**138**	**108**	**73**	**18**	**2585**

M – Mechanism, H – Height, S- Same level

Age and body location

Two-thirds (69.5%) of *head injuries* for a fall from a height occurred to young adults. In the middle age group (45-59 years) the proportion of *upper limb injuries* due to falls from a height was less (13.7%) than for falls on the same level (24.2%) (Table 7.3.7).

Table 7.3.7 Queensland workers compensation fall-related claims, by age group, by body location 1992-99

Body location	M	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
Head	H	1	20	26	11	6	5	4	4	-	3	-	2	82
	S	-	3	3	1	3	2	-	2	3	-	-	-	17
Neck	H	-	4	7	4	5	1	2	-	5	2	-	-	30
	S	-	-	-	1	3	1	1	1	1	-	1	-	9
Trunk	H	-	44	82	55	33	47	29	43	17	17	13	1	381
	S	-	10	34	37	31	29	23	30	19	17	9	1	240
Upper limbs	H	-	86	117	68	48	30	26	26	16	20	10	4	451
	S	-	13	46	22	21	22	11	21	17	8	8	1	190
Lower limbs	H	-	75	133	77	50	41	31	36	16	15	7	1	482
	S	-	58	133	112	90	55	66	47	42	22	23	8	656
Multiple locations	H	-	5	4	4	3	4	2	3	1	2	1	-	29
	S	-	-	1	-	-	1	1	1	-	1	1	-	6
Systemic locations	H	-	-	-	-	-	-	-	1	-	-	-	-	1
Unspecified locations	H	-	-	-	-	2	1	2	3	1	1	-	-	10
	S	-	-	-	1	-	-	-	-	-	-	-	-	1
Total		**1**	**318**	**586**	**393**	**295**	**239**	**198**	**218**	**138**	**108**	**73**	**18**	**2585**

M – Mechanism, H – Height, S- Same level

7.3.3 Agricultural industry

Beef cattle farming, fruit growing NEC, crop and plant growing NEC, sugar cane growing NEC, plant nurseries and *vegetable growing* were common industries in which workers sustained fall injuries. *Beef cattle farming* accounted for 37.3% of total falls, of which 80.7%s were height-related. In the *crop and plant growing NEC* and *plant nursery* industries most falls were on the same level (68.3% and 79.7% respectively). The type of falling event differs widely among the commodity groups. In *pig farming* most of the injuries were due to same level falls, whereas most of the injuries were height-related in the *horse farming* industry (Table 7.3.3).

Table 7.3.8 Queensland workers compensation fall-related claims, by industry by agency 1992-99

Industry	M	MFP	MPT	PT	NPT	CCP	MS	EA	AA	OU	Total
Horticulture and Fruit Growing	H	12	82	-	115	1	-	62	3	7	**282**
	S	6	40	-	31	2	9	292	1	21	**402**
Plant Nurseries	*H*	*-*	*8*	*-*	*3*	*-*	*-*	*3*	*-*	*1*	*15*
	S	*-*	*10*	*-*	*5*	*-*	*2*	*39*	*-*	*3*	*59*
Vegetable Growing	*H*	*-*	*14*	*-*	*3*	*-*	*-*	*1*	*-*	*-*	*18*
	S	*2*	*6*	*-*	*3*	*1*	*1*	*38*	*-*	*4*	*55*
Fruit Growing NEC.	*H*	*12*	*60*	*-*	*105*	*1*	*-*	*58*	*3*	*6*	*245*
	S	*4*	*24*	*-*	*23*	*1*	*6*	*208*	*1*	*14*	*281*
Grain, sheep, Beef Cattle Farming	H	2	57	-	32	-	1	88	683	5	**868**
	S	3	11	-	24	-	7	166	13	19	**243**
Sheep-Beef Cattle Farming	*H*	*-*	*5*	*-*	*2*	*-*	*-*	*5*	*42*	*1*	*55*
	S	*-*	*2*	*-*	*2*	*-*	*1*	*18*	*-*	*-*	*23*
Beef Cattle Farming	*H*	*2*	*42*	*-*	*29*	*-*	*1*	*75*	*625*	*3*	*777*
	S	*3*	*8*	*-*	*19*	*-*	*6*	*124*	*10*	*16*	*186*
Dairy Cattle Farming	H	-	3	-	-	-	-	1	17	-	**21**
	S	1	4	-	1	-	1	15	1	2	**25**
Poultry Farming	H	2	3	-	8	-	-	6	-	-	**19**
	S	-	3	-	9	-	-	46	-	4	**62**
Other Livestock Farming	H	2	11	-	9	-	-	12	63	1	**98**
	S	-	4	1	6	-	3	51	6	5	**76**
Pig Farming	*H*	*1*	*5*	*-*	*4*	*-*	*-*	*7*	*1*	*-*	*18*
	S	*-*	*-*	*-*	*5*	*-*	*2*	*33*	*3*	*3*	*46*
Horse Farming	*H*	*1*	*2*	*-*	*1*	*-*	*-*	*1*	*35*	*1*	*41*
	S	*-*	*1*	*-*	*1*	*-*	*1*	*7*	*2*	*1*	*13*
Livestock Farming NEC.	*H*	*-*	*4*	*-*	*4*	*-*	*-*	*3*	*27*	*-*	*38*
	S	*-*	*3*	*1*	*-*	*-*	*-*	*11*	*1*	*1*	*17*
Other Crop Farming	H	2	63	-	27	-	3	19	3	8	**125**
	S	6	42	-	15	-	5	121	1	17	**207**
Sugar Cane Growing	*H*	*-*	*40*	*-*	*6*	*-*	*-*	*12*	*3*	*4*	*65*
	S	*2*	*22*	*-*	*2*	*-*	*4*	*41*	*1*	*5*	*77*
Crop and Plant Growing NEC.	*H*	*-*	*20*	*-*	*21*	*-*	*3*	*6*	*-*	*3*	*53*
	S	*2*	*15*	*-*	*12*	*-*	*1*	*72*	*-*	*12*	*114*
Services to Agriculture	H	4	22	-	4	-	1	6	11	5	**53**
	S	-	16	-	8	-	1	69	6	4	**104**
Shearing Services	*H*	*-*	*-*	*-*	*-*	*-*	*-*	*1*	*-*	*-*	*1*
	S	*-*	*-*	*-*	*2*	*-*	*1*	*13*	*3*	*1*	*20*
Services to Agriculture NEC.	*H*	*2*	*18*	*-*	*3*	*-*	*1*	*4*	*10*	*4*	*42*
	S	*-*	*12*	*-*	*2*	*-*	*-*	*47*	*3*	*2*	*66*
Total		**40**	**361**	**1**	**289**	**3**	**31**	**954**	**808**	**98**	**2585**

M-Mechanism, H- Height, S- Same level, MFP – Machinery and Fixed Plant, MPT – Mobile Plant Transport, PT – Powered Hand tools and Appliances and Equipment, NPT – Non-Powered Hand tools and Appliances and Equipment, CCP – Chemical and Chemical Products, MS – Materials and Substances, EA – Environmental Agencies, AA – Animal Human and Biological Agencies, OU – Other and Unspecified Agencies

For falls from a height, *animal, human and biological agencies* resulted in more than half of the injuries (53.2%). The common agencies involved in same level fall injuries in the fruit growing industry were *non-powered hand tools and appliances and equipment* (42.9%), *environmental agencies* (23.7 %) and *mobile plant and transport* (24.5%). In the sugar industry most of the injuries (61.5%) were as a result of *mobile plant and transport* (Table 7.3.8).

More than two-thirds (67.9%) of same level fall injuries were as a result of *environmental agencies*. Most of the injuries (74.0%) in the fruit growing industries were due to *environmental agencies*. Other common industries for same level fall injuries due to *environmental agencies* were beef cattle farming, crop and plant growing, plant nurseries, sugar cane growing and pig farming. Fruit growing, sugar cane growing, crop and plant growing were common industries from fall injuries due to *mobile plant and transport* (Table 7.3.8).

Fall injuries to *managers and administrators* most often occurred in the beef industry (Table 7.3.9).

Table 7.3.9 Queensland workers compensation fall-related claims, by industry by occupation 1992-99

Industry	M	P	PP	T	C	SPS	PMD	LRW	Total
Horticulture and Fruit Growing	16	3	1	20	3	1	28	612	**684**
Plant Nurseries	*2*	*1*	*1*	*14*	*2*	*1*	*10*	*43*	*74*
Vegetable Growing	*1*	-	-	*1*	-	-	*4*	*67*	*73*
Fruit Growing NEC.	*12*	*2*	-	*5*	*1*	-	*14*	*492*	*526*
Grain, sheep and Beef Cattle Farming	172	1	1	21	4	2	27	883	**1111**
Sheep-Beef Cattle Farming	*12*	-	-	*3*	*1*	-	*4*	*58*	*78*
Sheep Farming	*4*	-	-	*9*	-	-	*3*	*31*	*47*
Beef Cattle Farming	*153*	*1*	*1*	*9*	*3*	*2*	*20*	*774*	*963*
Dairy Cattle Farming	10	-	-	1	-	-	2	33	**46**
Poultry Farming	5	-	-	2	-	-	8	66	**81**
Other Livestock Farming	22	-	4	9	3	1	5	130	**174**
Pig Farming	*1*	-	-	-	-	-	*2*	*61*	*64*
Horse Farming	*3*	-	*4*	*6*	*2*	-	*2*	*37*	*54*
Livestock Farming NEC.	*17*	-	-	*3*	*1*	*1*	*1*	*32*	*55*
Other Crop Farming	23	1	-	10	-	-	61	237	**332**
Sugar Cane Growing	*9*	*1*	-	*4*	-	-	*44*	*84*	*142*
Cotton Growing	*3*	-	-	*1*	-	-	*4*	*15*	*23*
Crop and Plant Growing NEC.	*11*	-	-	*5*	-	-	*13*	*138*	*167*
Services to Agriculture	4	5	10	17	2	1	46	72	**157**
Services to Agriculture NEC.	*3*	*5*	*6*	*6*	*2*	*1*	*37*	*48*	*108*
Total	**252**	**10**	**16**	**80**	**12**	**5**	**177**	**2033**	**2585**

M – Managers/ Administrators, P – Professionals, PP – Para-Professionals, T – Tradespersons, C – Clerks, SPS – Salespersons/ Personal Service Workers, PMD – Plant and Mobile Operators and Drivers, LRW – Labourers and Related Workers

For falls from a height in the beef cattle industry fractures (41.4%), *sprains and strains* (29.1%), *contusion* (13.9 %) were common injuries sustained. Other common industries where the number of *fractures* due to a fall from a height was high were fruit growing (25.3%), sheep beef cattle farming (43.6%) and horse farming (48.8%). For falls on the same level, *sprains and strains* were the common injuries in fruit growing (63.3%), beef cattle farming (57.0%), crop and plant growing (50.9%) and sugar cane growing (63.6%). (Table 7.3.10)

Table 7.3.10 Queensland workers compensation fall-related claims, by industry by nature of injury 1992-99

Industry	M	F	FVC	D	SS	ICI	OW	SI	CC	MI	OT	Total
Horticulture and Fruit Growing	H	69	4	6	134	-	24	3	33	4	3	**282**
	S	52	2	5	251	1	50	1	32	2	3	**402**
Plant Nurseries	*H*	*3*	*-*	*-*	*9*	*-*	*1*	*-*	*1*	*1*	*-*	*15*
	S	*9*	*1*	*1*	*32*	*-*	*5*	*1*	*8*	*1*	*-*	*59*
Vegetable Growing	*H*	*2*	*2*	*-*	*9*	*-*	*1*	*1*	*1*	*-*	*-*	*18*
	S	*7*	*-*	*2*	*36*	*-*	*7*	*-*	*3*	*-*	*-*	*55*
Fruit Growing NEC.	*H*	*62*	*2*	*6*	*115*	*-*	*21*	*2*	*31*	*3*	*3*	*245*
	S	*36*	*1*	*2*	*178*	*1*	*38*	*-*	*19*	*1*	*3*	*281*
Grain, sheep Beef Cattle Farming	H	357	33	27	259	22	18	3	118	19	4	**868**
	S	58	-	8	139	-	15	2	17	-	-	**243**
Sheep-Beef Cattle Farming	*H*	*24*	*4*	*1*	*16*	*3*	*-*	*-*	*6*	*1*	*-*	*55*
	S	*2*	*-*	*1*	*14*	*-*	*1*	*1*	*3*	*-*	*-*	*23*
Sheep Farming	*H*	*9*	*-*	*-*	*12*	*-*	*2*	*-*	*3*	*-*	*-*	*26*
	S	*3*	*-*	*-*	*13*	*-*	*2*	*-*	*3*	*-*	*-*	*21*
Beef Cattle Farming	*H*	*322*	*29*	*26*	*226*	*19*	*15*	*3*	*108*	*18*	*4*	*777*
	S	*49*	*-*	*7*	*106*	*-*	*9*	*1*	*11*	*-*	*-*	*186*
Dairy Cattle Farming	H	6	-	1	8	1	2	-	3	-	-	**21**
	S	4	-	3	13	-	3	-	2	-	-	**25**
Poultry Farming		2	-	-	13	-	1	1	-	-	2-	**19**
		10	-	-	42	-	4	-	5	-	1	**62**
Other Livestock Farming	H	36	2	3	36	-	7	1	11	-	1	**98**
	S	7	-	1	55	-	4	-	8	-	1	**76**
Pig Farming	*H*	*2*	*-*	*-*	*11*	*-*	*1*	*-*	*3*	*-*	*1*	*18*
	S	*3*	*-*	*-*	*33*	*-*	*2*	*-*	*7*	*-*	*1*	*46*
Horse Farming	*H*	*20*	*1*	*2*	*12*	*-*	*3*	*-*	*3*	*-*	*-*	*41*
	S	*2*	*-*	*-*	*10*	*-*	*-*	*-*	*1*	*-*	*-*	*13*
Livestock Farming NEC.	*H*	*14*	*1*	*1*	*12*	*-*	*3*	*1*	*5*	*-*	*-*	*38*
	S	*2*	*-*	*1*	*12*	*-*	*2*	*-*	*-*	*-*	*-*	*17*
Other Crop Farming	H	30	2	3	62	1	9	-	12	4	2	**125**
	S	47	1	1	116	-	16	1	18	1	1	**207**
Sugar Cane Growing	*H*	*13*	*-*	*1*	*40*	*-*	*4*	*-*	*3*	*3*	*1*	*65*
	S	*14*	*-*	*-*	*49*	*-*	*7*	*-*	*3*	*1*	*-*	*77*
Cotton Growing	*H*	*1*	*-*	*-*	*4*	*-*	*-*	*-*	*2*	*-*	*-*	*7*
	S	*4*	*1*	*-*	*9*	*-*	*1*	*-*	*1*	*-*	*-*	*16*
Crop & Plant Growing NEC.	*H*	*16*	*2*	*2*	*18*	*1*	*5*	*-*	*7*	*1*	*1*	*53*
	S	*29*	*-*	*1*	*58*	*-*	*8*	*1*	*14*	*-*	*1*	*114*
Services to Agriculture	H	21	2	2	18	-	3	-	4	1	1	**53**
	S	15	1	1	66	1	6	1	12	-	-	**104**
Services to Agriculture NEC.	*H*	*17*	*2*	*2*	*14*	*-*	*2*	*-*	*3*	*-*	*1*	*42*
	S	*9*	*1*	*1*	*41*	*-*	*3*	*-*	*10*	*-*	*-*	*66*
Total		**714**	**47**	**61**	**1212**	**26**	**162**	**13**	**275**	**31**	**19**	**2585**

M – Mechanism, H – Height, S – Same level, F – Fractures, FVC – Fracture of Vertebral Column, D – Dislocation, SS – Sprains and Strains, ICI – Intracranial Injury, OW – Open Wound, SI – Superficial Injury, CC – Contusion, MI – Multiple Injuries, OT – Other

For falls from a height in the beef cattle farming industry the *lower leg* (30.1%) and *upper leg* (32.2%) were most commonly injured. In height-related falls in the fruit growing industry *upper limbs* (36.7%), *lower limbs* (29.8%) and *trunk* (27.8%) were most commonly injured. In the sugar cane growing industry more than half (52.3%) of injuries occurred to *lower limbs* (Table 7.3.11).

Table 7.3.11 Queensland workers compensation fall-related claims, by industry, by body location 1992-99

Industry	M	H	N	T	UL	LL	ML	SL	USL	Total
Horticulture and Fruit Growing	H	4	3	78	101	87	7	-	2	**282**
	S	5	2	91	78	224	2	-	-	**402**
Plant Nurseries	*H*	*-*	*-*	*4*	*5*	*5*	*1*	*-*	*-*	*15*
	S	*-*	*1*	*11*	*10*	*36*	*1*	*-*	*-*	*59*
Vegetable Growing	*H*	*-*	*-*	*6*	*4*	*7*	*1*	*-*	*-*	*18*
	S	*1*	*1*	*15*	*16*	*22*	*-*	*-*	*-*	*55*
Fruit Growing NEC.	*H*	*4*	*3*	*68*	*90*	*73*	*5*	*-*	*2*	*245*
	S	*4*	*-*	*62*	*50*	*164*	*1*	*-*	*-*	*281*
Grain, sheep and Beef Cattle Farming	H	65	25	217	274	270	16	-	1	**868**
	S	4	4	43	37	154	1	-	-	**243**
Sheep-Beef Cattle Farming	*H*	*5*	*-*	*13*	*17*	*19*	*1*	*-*	*-*	*55*
	S	*-*	*1*	*2*	*3*	*16*	*1*	*-*	*-*	*23*
Sheep Farming	*H*	*2*	*1*	*7*	*3*	*13*	*-*	*-*	*-*	*26*
	S	*-*	*-*	*4*	*5*	*12*	*-*	*-*	*-*	*21*
Beef Cattle Farming	*H*	*58*	*23*	*196*	*250*	*234*	*15*	*-*	*1*	*777*
	S	*3*	*3*	*35*	*26*	*119*	*-*	*-*	*-*	*186*
Dairy Cattle Farming	H	2	-	5	6	7	1	-	-	**21**
	S	-	-	5	3	17	-	-	-	**25**
Poultry Farming	H	-	-	2	6	9	-	-	2	**19**
	S	2	-	23	14	22	1	-	-	**62**
Other Livestock Farming	H	3	1	28	26	36	2	1	1	**98**
	S	-	2	19	9	45	-	-	1	**76**
Pig Farming	*H*	*-*	*-*	*5*	*2*	*10*	*-*	*-*	*1*	*18*
	S	*-*	*1*	*12*	*5*	*27*	*-*	*-*	*1*	*46*
Horse Farming	*H*	*-*	*1*	*10*	*14*	*16*	*-*	*-*	*-*	*41*
	S	*-*	*-*	*3*	*1*	*9*	*-*	*-*	*-*	*13*
Livestock Farming NEC.	*H*	*3*	*-*	*13*	*10*	*9*	*2*	*1*	*-*	*38*
	S	*-*	*1*	*4*	*3*	*9*	*-*	*-*	*-*	*17*
Other Crop Farming	H	7	1	34	26	52	3	-	2	**125**
	S	4	1	36	35	130	1	-	-	**207**
Sugar Cane Growing	*H*	*2*	*1*	*16*	*9*	*34*	*2*	*-*	*1*	*65*
	S	*1*	*-*	*15*	*14*	*46*	*1*	*-*	*-*	*77*
Cotton Growing	*H*	*-*	*-*	*3*	*-*	*4*	*-*	*-*	*-*	*7*
	S	*-*	*-*	*2*	*3*	*11*	*-*	*-*	*-*	*16*
Crop & Plant Growing NEC.	*H*	*5*	*-*	*15*	*17*	*14*	*1*	*-*	*1*	*53*
	S	*3*	*1*	*19*	*18*	*73*	*-*	*-*	*-*	*114*
Services to Agriculture	H	1	-	17	12	21	-	-	2	**53**
	S	2	-	23	14	64	1	-	-	**104**
Services to Agriculture NEC.	*H*	*-*	*-*	*13*	*11*	*16*	*-*	*-*	*2*	*42*
	S	*-*	*-*	*17*	*8*	*40*	*1*	*-*	*-*	*66*
Total		**99**	**39**	**621**	**641**	**1138**	**35**	**1**	**11**	**2585**

M – Mechanism, H – Height, S – Same level, H – Head, N – Neck, T – Trunk, UL – Upper Limb, LL – Lower Limb, ML – Multiple Locations, SL – Systemic Locations, USL – Unspecified Locations.

7.3.4 Agency

Most of the fall injuries due to *animal, human and biological agencies* (96.5%), *mobile plant and transport* (66.8%), *non-powered hand tools appliances and equipment* (64.5%), and *machinery fixed plant* (60.0%) occurred from a height. For falls due to *environmental agencies* the majority (79.7%) of falls were on the same level. *Traffic and ground surfaces other* (25.4%), *holes in the ground* (16.5%) and *vegetation* (10.3%) were the predominant agents in the environmental agencies group. *Ladders, mobile ramps and stairways* (60.2%) was the predominant subcategory of non-powered hand tools, appliances and equipment. *Tractors,*

agriculture or otherwise was the predominant group (31.0%) in *mobile plant transport* (Tables 7.3.8 and 7.3.13).

Falls of labourers and related workers, the largest occupational group (78.6%), were most commonly in association with *horses donkeys mules* (30.5%), *traffic and ground surfaces* (12.4%) and *ladders mobile ramps stairways* (7.6%). For managers and administrators, nearly half (49.6%) of the fall-related injuries were due to *horses donkey mules* (Table 7.3.12).

Table 7.3.12 Queensland workers compensation fall-related claims, by agency, by occupation 1992-99

Agency	M	P	PP	T	C	SPS	PMD	LRW	Total
Machinery & (mainly) fixed plant	6	-	-	3	-	-	7	24	**40**
Power hoist	*2*	-	-	*1*	-	-	*1*	*9*	*13*
Mobile plant & transport	28	1	1	7	-	1	80	243	**361**
Tractors, agricultural or otherwise	*7*	-	-	*1*	-	-	*26*	*75*	*109*
Trailers caravans	*3*	-	*1*	*2*	-	-	*3*	*55*	*64*
Trucks semi-trailers lorries	*7*	-	-	*2*	-	*1*	*22*	*48*	*80*
Powered equipment tools & appliances	-	-	-	-	-	-	-	1	1
Non-powered hand tools appliances & equipment	15	1	-	7	1	-	23	242	**289**
Ladders, mobile ramps, stairways	*6*	-	-	*4*	-	-	*10*	*154*	*174*
Chemicals & chemical products	-	-	-	-	-	-	-	3	**3**
Materials & substances	3	-	1	1	-	-	1	25	**31**
Environmental agencies	64	6	9	39	11	3	51	771	**954**
Holes in the ground	*14*	-	*2*	*1*	-	-	*5*	*135*	*157*
Wet, oily or icy traffic & ground surfaces	*6*	-	*1*	*1*	-	-	*2*	*64*	*74*
Traffic and ground surfaces	*27*	*2*	*3*	*16*	*1*	*0*	*24*	*255*	*328*
Vegetation	*4*	-	-	-	-	-	*1*	*93*	*98*
Steps and stairways	*1*	*1*	*1*	*5*	*2*	*1*	*2*	*22*	*35*
Animal human & biological agencies	132	-	5	16	-	1	2	652	**808**
Horses, donkeys, mules	*125*	-	*5*	*11*	-	*1*	-	*620*	*762*
Other & unspecified agencies	4	2	-	7	-	-	13	72	**98**
Total	**252**	**10**	**16**	**80**	**12**	**5**	**177**	**2033**	**2585**

M – Managers/ Administrators, P – Professionals, PP – Para-Professionals, T – Tradespersons, C – Clerks, SPS – Salespersons/ Personal Service Workers, PMD – Plant and Mobile Operators and Drivers, LRW – Labourers and Related Workers

For height-related falls horses, donkeys or mules were associated with 63.2% of all *fractures*; 39.7% of all *sprains and strains*; 79.2% of all *intracranial injury*; 65.1% of all *vertebral column injury*; 64.3% of all *dislocations*; and 54.4% of all *contusions.* Most of the *tractors, agriculture or otherwise* and *trucks, semi-trailers, lorries* associated injuries were *sprains and strains* (63.3% and 52.5% respectively). For falls on the same level, 65.1% of *traffic and ground surfaces other*, associated injury were *sprain and strain* injuries. Most of the holes in the ground (78.8%), wet, oily or icy traffic and ground surfaces (69.0%), vegetation (60.0%), and other internal traffic and ground areas (51.8%) injuries were sprains and strains (Table 7.3.13).

Table 7.3.13 Queensland workers compensation fall-related claims, by agency, by nature of injury 1992-99

Agency	M	F	FVC	D	SS	INC	OW	CC	MI	Total
Machinery & (mainly) fixed plant	H	8	0	0	8	0	1	2	3	**24**
	S	3	0	0	8	0	1	4	0	**16**
Power hoist	*H*	*3*			*4*				*2*	*11*
	S	*1*			*1*					*2*
Mobile plant & transport	H	58	2	3	128	0	14	23	3	**238**
	S	21	0	0	61	0	14	13	1	**114**
Tractors, agricultural or otherwise	*H*	*12*		*2*	*50*		*4*	*9*		*79*
	S	*8*			*18*		*2*	*1*		*30*
Trailers, caravans	*H*	*13*			*15*		*7*	*3*		*39*
	S	*3*			*11*		*7*	*4*		*25*
Trucks, semi-trailers, lorries	*H*	*16*	*1*		*32*			*7*	*2*	*61*
	S	*1*			*15*		*1*	*1*		*19*
Powered equipment tools and appliances	H				1					**1**
Non-powered hand tools appliances & equipment	H	46	6	7	89	2	12	24	6	**195**
	S	19	1	2	50	0	9	10	0	94
Ladders, mobile ramps and stair ways	*H*	*30*	*6*	*5*	*70*		*8*	*19*	*3*	*143*
	S	*5*		*1*	*19*		*3*	*2*		*31*
Chemicals & chemical products	H	0	0	0	1	0	0	0	0	**1**
	S	0	0	0	1	0	0	1	0	**2**
Materials & substances	H	5	0	0	0	0	0	0	0	**5**
	S	6	0	0	15	0	3	1	0	**26**
Rocks, stones, boulders	*S*	*3*			*8*		*2*	*1*		*15*
Environmental agencies	H	54	6	5	77	2	14	28	3	**194**
	S	118	2	14	483	2	66	60	2	**760**
Holes in the ground	*H*	*18*	*2*		*10*	*2*		*9*	*2*	*44*
	S	*15*		*1*	*89*		*5*			*113*
Wet, oily or icy traffic & ground surfaces	*H*	*1*		*1*	*1*					*3*
	S	*9*	*1*	*1*	*49*		*7*	*3*		*71*
Traffic and ground surfaces	*H*	*3*	*0*	*0*	*13*	*0*	*0*	*1*	*0*	*17*
	S	*49*	*1*	*7*	*206*	*1*	*32*	*22*	*0*	*321*
Vegetation	*H*	*11*	*1*	*1*	*18*		*7*	*9*		*49*
	S	*9*		*2*	*29*		*4*	*3*		*49*
Steps and stairways	*H*	*7*			*7*		*1*	*2*	*1*	*18*
	S	*4*			*8*		*3*	*2*		*17*
Wet, oily or icy and other internal traffic & ground areas	*S*	*5*			*17*	*1*	*3*	*5*		*31*
Other internal traffic and ground areas	*H*	*1*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*4*
	S	*26*	*0*	*0*	*69*	*0*	*12*	*22*	*2*	*135*
Animal human & biological agencies	H	342	28	27	216	19	22	102	12	**780**
	S	4	0	3	20	0	0	1	0	**28**
Horses, donkeys, mules	*H*	*329*	*28*	*27*	*211*	*19*	*22*	*98*	*8*	*753*
	S	*2*		*2*	*5*					*9*
Other & unspecified agencies	H	8	1		9	1	1	1	1	**26**
	S	20			41		4	4		**72**
Total		**714**	**47**	**61**	**1212**	**26**	**162**	**275**	**31**	**2585**

M – Mechanism, H – Height, S – Same level, F – Fractures, FVC – Fracture of Vertebral Column, D – Dislocation, SS – Sprains and Strains, ICI – Intracranial Injury, OW – Open Wound, SI – Superficial Injury, CC – Contusion, MI – Multiple Injuries, OT – Other

For falls from a height from *horses, donkeys and mules*, upper limb injuries (34.1%) were slightly more common than lower limb injuries (28.5%). For *ladders, mobile ramps and stairways* fall-related injuries upper limb injuries (37.8%) more common than lower limb injuries (28.0%). More than half of the *tractors, agricultural or otherwise* injuries (59.5%) were to the lower limb. For falls on the same level due to *traffic*

and ground surfaces, two-third of the injuries were to the lower limbs (63.7%). The majority of same level fall injuries from *holes in the ground* (79.6%) were to lower limbs. More than half (58.1%) of same level falls injuries from *ladders, mobile ramps and stairways* were to lower limbs (Table 7.3.14).

Table 7.3.14 Queensland workers compensation fall-related claims, by agency, by bodily location, 1992-99

Agency	M	H	N	T	UL	LL	ML	SL	USL	Total
Machinery & (mainly) fixed plant	H	1	1	4	11	3	3	0	1	**24**
	S	0	0	3	2	11	0	0	0	**16**
Power hoist	*H*		*1*	*1*	*5*	*1*	*2*		*1*	*11*
	S			*1*		*1*				*2*
Mobile plant & transport	H	6	2	72	51	104	5	0	1	**241**
	S	1	1	26	14	77	1	0	0	**120**
Tractors agricultural or otherwise	*H*	*1*		*19*	*12*	*47*				*79*
	S	*1*		*6*	*4*	*19*				*30*
Trailers, caravans	*H*	*2*	*2*	*10*	*13*	*11*	*1*			*39*
	S			*3*	*4*	*18*				*25*
Trucks, semi-trailers, lorries	*H*	*2*		*22*	*12*	*21*	*3*		*1*	*61*
	S		*1*	*4*		*14*				*19*
Powered equipment tools and appliances	S				1					**1**
Non-powered hand tools appliances & equipment	H	8	1	56	67	50	5	0	0	**187**
	S	2	2	17	18	49	0	0	0	**88**
Ladders, mobile ramps & stairways	*H*	*3*	*1*	*42*	*54*	*40*	*3*			*143*
	S	*1*	*1*	*5*	*6*	*18*				*31*
Chemicals & chemical products	H	0	0	2	0	0	0	0	0	**2**
	S	0	0	1	0	1	0	0	0	**2**
Materials & substances	H	0	0	0	3	2	0	0	0	**5**
	S	0	0	6	4	16	0	0	0	**26**
Rocks, stones, boulders	*S*			*2*	*1*	*12*				***15***
Environmental agencies	H	4	3	43	45	92	4	0	3	**194**
	S	12	5	158	131	449	5	0	0	**760**
Holes in the ground	*H*	*3*	*2*	*9*	*11*	*17*	*2*			*44*
	S	*1*		*18*	*4*	*90*				*113*
Wet, oily, or icy traffic & ground surfaces	*H*			*1*	*1*	*1*				*3*
	S			*23*	*17*	*31*				*71*
Traffic & ground surfaces	*H*			*1*	*1*	*15*				*17*
	S	*4*	*2*	*57*	*57*	*201*				*321*
Vegetation	*H*			*16*	*15*	*15*	*1*		*2*	*49*
	S			*12*	*12*	*23*	*2*			*49*
Steps and stairways	*H*	*1*		*3*	*4*	*9*	*1*			*18*
	S			*4*	*3*	*10*				*17*
Wet, oily or icy other internal traffic & ground areas	*S*	*2*		*10*	*6*	*13*				*31*
Other internal traffic & ground areas	*H*			*1*		*2*			*1*	*4*
	S	*5*	*2*	*30*	*28*	*67*	*3*			*135*
Animal human & biological agencies	H	62	23	195	267	220	11	1	1	**780**
	S	0	1	10	4	13	0	0	0	**28**
Horses, donkeys, mules	*H*	*59*	*23*	*189*	*258*	*213*	*10*	*1*		*753*
	S		*1*	*2*	*2*	*4*				*9*
Other & unspecified agencies	H	1		9	6	6			4	**26**
	S	2		15	16	38			1	**72**
Total		**99**	**39**	**622**	**641**	**1138**	**35**	**1**	**11**	**2585**

M – Mechanism, H – Height, S – Same level, H – Head, N – Neck, T – Trunk, UL – Upper Limb, LL – Lower Limb, ML – Multiple Locations, SL – Systemic Locations, USL – Unspecified Locations.

7.3.5 Occupation

The occupational group *labourers and related workers* were most commonly injured across all industries for both types of fall. Of these the subcategory *farm hands* (88.1%) were more likely to submit a claim. *Managers and administrators* (who primarily classified as *farmer/grower*) were the second most common occupational group to submit a fall-related claim (Table 7.3.15).

Table 7.3.15 Queensland workers compensation fall-related claims, by occupation, 1992-99

Occupation	Height	Same level	Total	%
Managers and administrators	174	78	**252**	**9.7**
Farmer/ grower	*172*	*75*	*247*	*9.6*
Professionals	2	8	**10**	**0.4**
Para-professionals	5	11	**16**	**0.6**
Tradespersons	26	54	**80**	**3.1**
Shearing personal	*2*	*15*	*17*	*0.7*
Animal trainer	*8*	*2*	*10*	*0.4*
Clerks	2	10	**12**	**0.5**
Salespersons & personal service workers	3	2	**5**	**0.2**
Plant and machine operators & drivers	79	98	**177**	**6.8**
Truck drivers	*28*	*40*	*68*	*2.6*
Plant machine operator	*6*	*10*	*16*	*0.6*
Farm machinery operator	*35*	*37*	*72*	*2.8*
Labourers and related workers	1175	858	**2033**	**78.6**
Packers	*5*	*18*	*23*	*0.9*
Factory hand & labourers	*9*	*13*	*22*	*0.9*
Farm hands	*1094*	*699*	*1793*	*69.4*
Horticulture worker	*5*	*16*	*21*	*0.8*
Attendants	*38*	*62*	*100*	*3.9*
Other miscellaneous labourers	*18*	*24*	*42*	*1.6*
Total	**1466**	**1119**	**2585**	**100.0**

As a result of a height-related fall labourers and related workers most commonly suffered *sprain and strain* injuries (45.3%), *fractures* (36.1%), and *contusions* (15.4%). For managers and administrators *sprains and strains* (35.8%), *fractures* (35.2%) and *contusions* (13.6%) were common injuries (Table 7.3.16).

For falls from a height to labourers and related workers the most common bodily locations injured were the lower limbs (33.4%), upper limbs (31.6%), and trunk (24.6%). For injuries from falls from a height to managers and administrators, upper limb (32.4%), lower limb (27.8%) and the trunk (28.4%) were common body locations injured. For falls on the same level to labourers and related workers, the most common body location injured was lower limb (59.2%), followed by upper limb (16.5%) and trunk (21.6%). For falls on the same level to managers and administrators, lower limb injuries (57.7%) were the most commonly injured body location. (Table 7.3.17)

Table 7.3.16 Queensland workers compensation fall-related claims, by occupation, 1992-99

Occupation	F	FVC	D	SS	ICC	OW	CC	MI	Total
Managers & administrators	81	5	6	107	5	7	27	5	**252**
Farmer/grower	*80*	*4*	*6*	*106*	*5*	*7*	*27*	*3*	*247*
Professionals	4			2		1	2		**10**
Para-professionals	6	1		8		1			**16**
Tradespersons	15	1	2	39	1	5	13	2	**80**
Shearing personal	*1*			*10*	*1*	*1*	*4*		*17*
Animal trainer	*5*		*1*	*3*			*1*		*10*
Clerks	5			4		1	1	1	**12**
Salespersons & personal service workers	2			2				1	**5**
Plant & machine operators & drivers	35	3	2	100		9	17	2	**177**
Truck drivers	*12*	*1*	*1*	*41*		*3*	*6*		*68*
Plant machine operator	*2*			*10*		*2*	*2*		*16*
Farm machinery operator	*16*	*2*	*1*	*39*		*4*	*4*	*2*	*72*
Labourers & related workers	566	37	51	950	20	138	215	20	**2033**
Packers	*5*			*10*		*3*	*5*		*23*
Factory hand & labourers	*7*			*13*		*1*	*1*		*22*
Farm hands	*519*	*35*	*47*	*816*	*20*	*116*	*189*	*19*	*1793*
Horticulture worker	*3*			*15*		*1*	*1*	*1*	*21*
Attendants	*17*		*2*	*52*		*12*	*13*		*100*
Other miscellaneous labourers	*12*	*1*	*1*	*21*		*3*	*4*		*42*
Total	**714**	**47**	**61**	**1212**	**26**	**162**	**275**	**31**	**2585**

M – Mechanism, H – Height, S – Same level, F – Fractures, FVC – Fracture of Vertebral Column, D – Dislocation, SS – Sprains and Strains, ICI – Intracranial Injury, OW – Open Wound, SI – Superficial Injury, CC – Contusion, MI – Multiple Injuries, OT – Other

Table 7.3.17 Queensland workers compensation fall-related claims, by occupation, by bodily location 1992-99

Occupation	H	N	T	UL	LL	ML	SL	US	Total
Managers & administrators	11	8	64	72	93	3	1		**252**
Farmer/grower	10	8	62	72	92	2	1		247
Professionals			1	1	7			1	**10**
Para-professionals		1	3	3	9				**16**
Tradespersons	1		23	14	40	2			**80**
Shearing personal	1		9	1	6				17
Animal trainer			2	3	5				10
Clerks	1		2	4	4	1			**12**
Salespersons & personal service workers			1	1	2	1			**5**
Plant & machine operators & drivers	4	2	52	32	83	1		3	**177**
Truck drivers	3	1	19	16	26			3	68
Plant machine operator		1	5	3	7				16
Farm machinery operator			21	11	39	1			72
Labourers & related workers	82	28	475	514	900	27		7	**2033**
Factory hand and labourers			5	10	7				22
Farm hands	81	26	418	463	775	24		6	1793
Horticulture worker			2	2	16	1			21
Attendants	1	1	27	19	50	1		1	100
Other miscellaneous labourers		1	6	11	24				42
Total	**99**	**39**	**621**	**641**	**1138**	**35**	**1**	**11**	**2585**

M – Mechanism, H – Height, S – Same level, H – Head, N – Neck, T – Trunk, UL – Upper Limb, LL – Lower Limb, ML – Multiple Locations, SL – Systemic Locations, USL – Unspecified Locations.

7.3.6 Nature of injury

Sprains and strains of joints and adjacent muscles (46.9%), *fractures* (27.6%), *contusion crushing injury* (10.6%) and *open wound* (6.2%) were common nature of injuries. Two-thirds (73.0%) of the fracture injuries occurred from a height. *Sprains and strains* (56.2%), and *open wound* (60.5%) injuries were more common following a same level fall. The majority of *fracture of vertebral column* injuries (91.5%) and *multiple injuries* (90.6%) were due to falls from a height. For falls from a height half (49.5%) of the *fractures* occurred in upper limb and one-third (33.1%) to the lower limb. More than two-fifths (43.8%) of the *open wound* injuries occurred in lower limbs. (Table 7.3.18)

For falls on the same level to the lower limb the most common nature of injuries were *sprains and strains* (38.2%), *fractures* (8.2%), *open wound* (5.7%), and *contusion crushing injury* (4.0%). A quarter (25.5%) of *sprains and strains* occurred to the trunk region. For falls on the same level *sprains and strains* were common (62.0%). For falls from a height lower limb *sprains and strains* were common (14.9%) (Table 7.3.18).

Table 7.3.18 Queensland workers compensation fall-related claims, by nature of injury and body location 1992-99

Nature of Injury/Disease	M	H	N	T	UL	LL	ML	UL	Total
Fractures	H	20		70	259	171	1		521
	S	7		27	66	93			193
Fracture of vertebral column	H		8	35					43
	S			4					4
Dislocation	H			1	36	5			42
	S				11	8			19
Sprains and strains	H		19	178	113	215	4	1	530
	S		8	174	65	435			682
Intracranial injury, including concussion	H	24							24
	S	2							2
Open wound	H	14		5	17	28			64
	S	6			27	65			98
Superficial injury	H	1		1	1	2	3		8
	S					5			5
Contusion crushing injury	H	12	3	86	21	57	2		181
	S		1	27	19	45	2		94
Multiple injuries	H	7		1		1	19		28
	S						3		3
Total		**99**	**39**	**621**	**641**	**1138**	**35**	**11**	**2585**

M – Mechanism, H – Height, S – Same level, H – Head, N – Neck, T – Trunk, UL – Upper Limb, LL – Lower Limb, ML – Multiple Locations, SL – Systemic Locations, USL – Unspecified Locations.

7.3.7 Body location

Nearly half of all the bodily injuries (44.0%) were to the *lower limb*. A quarter of injuries were to the *upper limb* (24.8%) and *trunk* (24.0%). The *head* (82.8%), *neck* (76.9%), and *trunk* (60.7%) were more commonly injured due to a falls from a height than a same level fall (Table 7.3.18)

7.3.8 Severity of fall

For same level falls the majority of the injuries were non-severe (88.9%). For height-related falls there was a greater proportion (18.6%) of more severe injuries, including fatalities (Table 7.3.19).

Table 7.3.19 Queensland workers compensation fall-related claims, by severity of injury, 1992-99

Severity of Injury	Height	Same level	Total	%
Fatal	5		5	0.2
Severe	273	123	396	15.3
Non-severe	1188	996	2184	84.5
Total	**1466**	**1119**	**2585**	**100.0**

7.3.9 Length of absence

Nearly a quarter of fall injuries (22.5%) resulted in absence from work beyond 41 days. Two-thirds (69.4%) of claimants absent beyond 41 days had injuries sustained from a height-related fall (Table 7.3.20).

Table 7.3.20 Queensland workers compensation fall-related claims, by days absent from work, 1992-99

Total days absent	Height	Same level	Total	%
<1 Day	221	187	408	15.8
1-5 Days	195	243	438	16.9
6-10 Days	184	206	390	15.1
11-20 Days	190	159	349	13.5
21-40 Days	270	146	416	16.1
41+ Days	406	178	584	22.6
Total	**1466**	**1119**	**2585**	**100.0**

7.3.10 Cost of fall

More than half (52.3%) of the fall-related injury claims submitted across all agricultural industries cost a value exceeding $1,000. Height-related fall claims received higher payments than same level fall claims. The average height-related fall claim cost $2,358, while the average same level fall claim cost $1,587 (Table 7.3.21).

Table 7.3.21 Queensland workers compensation fall-related claims, by compensation cost 1992-99

Cost	Height	Same level	Total	%
$0-$999	598	633	1231	47.6
$1000-$4999	557	324	881	34.1
$10000-$49999	155	83	238	9.2
$5000-$9999	144	75	219	8.5
$50000+	12	4	16	0.6
Total	**1466**	**1119**	**2585**	**100.0**

7.4 Summary

- There were 2,595 claims (371 per year) registered for workers' compensation in the 1992/93-1998/99 financial years in Queensland.
- There were more falls from a height (58.6%) than falls on the same level (43.2%).
- Half (50.1%) of the fall-related injuries were to young adults aged 15-29 years.
- For young adults the claims were predominantly height-related falls (63.4%).
- The number of same level falls increased with age.
- For height-related falls, the most common industy was beef cattle farming (30.1 %).

- For same level falls the common industries were fruit growing (25.1%) and beef cattle farming (16.7%).
- In the beef cattle farming industry the majority of height-related falls occurred to young adults, and were associated with *animal, human and biological agencies* (80.4%).
- For falls on the same level in the fruit growing industry the most common agency was *environmental agencies* (74.0%).
- For falls from a height *animal, human and biological* (96.6%) agency was the most common.
- Half (51.4%) of all height-related fall injuries were associated with to *horses, donkeys, mules* and occurred predominantly to young adults (70.0%).
- For same level falls *environmental agencies* (79.4%) were most commonly associated with injury.
- *Sprains and strains* (46.9%), *fractures* (27.6%), *contusions* (10.6%), and *open wounds* (6.2%) were common results of fall injury.
- *Upper limb* injuries were more common in falls from a height whereas *lower limb* injuries were common in same level falls.
- For falls from a height 40.6% of *sprains and strains* occurred to the lower limbs and 25.2% to upper limbs.
- For height-related falls *fractures* (36.2%) and *contusions* (12.7%) were common.
- For same level falls *sprains and strains* (62.0%) were common.
- For falls from a height 49.5% of *fractures* occurred to the *upper limb* and 33.1% to the *lower limb*.
- *Upper limb fractures* and *head, neck and trunk* injuries were common for falls from a height.
- For height-related falls associated with *horses, donkeys and mules* the most common types of injury were *fractures* (43.7%), *sprains and strains* (27.7%), and *contusions* (13.1%) occurring to the *upper* (34.3%) and *lower* (28.3%) *limb*.
- For same level falls associated with *traffic and ground surfaces* the most common types of injury were *sprains and strains* (64.2%) and *fractures* (15.3%) occurring to the *lower limb* (62.6%).
- *Labourers and related workers* were the most common (78.6%) agricultural occupational group submitting a a fall related injury claim, of which *farm hand* (88.1%) was the dominant subcategory.
- In falls from a height the most common occupational group was *farm hand* (74.6%).

8. Discussion

This report represents the most significant examination of falls in agriculture ever undertaken in Australia. It is apparent from the data examined that fall is a significant problem and that if we wish to reduce the burden of fall, specific strategies and programs need to be developed and implemented.

For this report we defined accidental falls (falls) as an event in which a person slips, trips or stumbles on the same level or from one level to another associated with both stationary and moving objects. The report found that there is a wide range of falls associated with a wide range of activities and that falls on the same level are different from falls from a height. Falls from a height were further classified into two distinct groups; falls from a moving agent (lotic) and falls from a stationary agent (static). It was not always possible distinguish the different types of falls from the data available.

This report uses information about falls injuries from a range of sources, including ABS deaths register, coroners, hospital inpatient statistics, emergency department presentation and workers compensation information. The discussion is broken down into the following sections to discuss the available data; literature review, fall-related fatalities, fall-related injuries requiring hospitalisation, fall-related injuries presenting to emergency departments, and fall-related injuries receiving workers' compensation.

8.1 Literature review

The literature on falls is extensive and continues to grow. Fall related injuries are a major health burden in many western countries and Australian research has acknowledged this burden. Falls in older people and children were identified as two of the four priority areas in the National Injury Prevention Plan (Department of Health and Aged Care, 2001b).

Although falls at work has been identified as a major issue in the construction industry, this has not been the case in agriculture. A study examining fall fatalities by industry found that agriculture had the second highest number of deaths (NOHSC, 2000), although the percentage within the industry (10.3%) was small.

Predominantly literature on fall related injuries on farm were epidemiological and as such describe mechanism of injury but no further detail. Fall-related fatalities on farms ranged from 5% of fatalities to 10%, however this result may not reflect the true extent of the problem as classification of a fall was often missing and as such falls from machinery, animals or structure may be classified differently.

Farm-related falls in Australia has not been well examined, with most studies reporting on the size of the problem, with little detail around the event. A report of fatalities in agriculture between 1989-1992 (Franklin et al, 2000) covered falls in more detail and information from this study has been utilised in the current report. Other studies have examined fall-related injuries to emergency departments (Day et al, 1997), hospital admissions (Harper, 1997), EDs and hospital admissions (Franklin et al, 1999; Morton and Van Rooijen, 1998), and workers' compensation claims (Cole and Foley, 1995; Fragar and Franklin, 2000). However there is scant detail on the fall event and this report focuses on the size of the problem.

Future studies are required to examine circumstances surrounding falls in greater detail. Height-related falls were more likely to be more severe than same level falls. There was very little information about preventing falls in agriculture in the literature. Although outside the scope of this report, it is possible that fall prevention measures being used in other industries could be successfully adapted to agriculture. Often industry develops its own solution to a problem, and an example of this is the industry-wide use of grain truck tarps that can be rolled from the ground to prevent falls from trucks.

8.2 Fall-related fatalities

For this report we used two different data sources, the first was ABS information from their "Death Register" for the years 1990-2000 and the second was information from the study by Franklin et al (2000).

Using the ABS information provided many challenges. Firstly farm related cases are not easy to identify and thus occupation was used as a proxy. Problems with using occupation are:

1. Only cases where occupation was recorded as "farmer", "farm manager" or "agricultural labourer" were selected. Other individuals who may be visiting or working on the farm would be excluded.
2. Female occupational status is not well coded and as such fatalities to females may have been missed.
3. People who are not in the workforce (or not seen to be in the workforce) are also missed, this is a particular problem for older people still actively working (65 years and over) and younger people (less than 15 years).

Another potential problem that became apparent was that the number of falls deaths changed significantly in 1999 when the coding was changed from ICD9 to ICD10. The study was unable to establish if this change was due to changes in the coding, criteria that were used to include/exclude cases, or reduction in the number of deaths. It is unlikely that the reduction was due to a reduction in deaths as the change was significant and there were no programs operating in Australia that could have had this impact.

Recommendation A: Further work needs to be undertaken to explore ABS Death Register information, in particular focusing on the change form ICD9 to ICD10 and how it can be used for surveillance purposes.

ABS Deaths Register information does however provide a proxy for surveillance of farmers, farm managers, and agricultural labourer and related worker fatality. In particular it highlighted the increasing number of fall-related fatalities as individuals aged.

The data collected for the report by Franklin et al (2000) is more robust and includes all people fatally injured on farms, as the information was sought directly from coroners' and individual case files explored in depth for the analysis. That this information is over a decade old is a concern as there are no guarantee that what was found still holds true. However, because other studies continue to report similar injuries in similar numbers (Fragar and Franklin, 2000), we may assume that little has changed over time.

The number of fall related deaths indicated by ABS data and information collected by Franklin et al (2000) was not similar with an average of 41 and 10 deaths respectively per annum. The data captured by the two databases is slightly different and as such the meaning of the information differs This is predominantly due to the definitions used and amount of information available about each fatality. The age group stratification in the two series was considerably different; the ABS information has an increasing number of fatalities as age increases, where as the 1989-1992 information is more evenly distributed.

As mentioned previously there was a significant drop in the number of fatalities from 1998 to 1999 in the ABS deaths register for farmers, farm managers and agricultural labourers and related workers and this was reflected across all states. It appears that this may be due to the ICD9 classification "E887 Fracture, cause unspecified" being coded into another category. This code was not matched with an ICD10 code in the report and it was also the largest category of fall fatalities.

The ABS information did not provide much detail about the fatality associated with the fall and changes in coding make analysis of the time series information difficult. Having only two occupation groups present, no children, and small numbers of female cases limit the usefulness of the data for prevention purposes.

The study examining fatalities on farms between 1989 and 1992 found 42 deaths on farms directly related to a fall and a further 25 cases where the main mechanism of death was not a fall. The majority of these further 25 deaths may have been prevented if they did not fall. Fall-related deaths occurred across a range of agricultural industries. Common agents from which people fell included windmills, tractors, ladders and horses, however there were nineteen different agencies involved in fatal incidents. Predominantly what this study shows is that fatal falls occur in a range of settings and that prevention measures need to be able to take into account the various locations.

There has been some research undertaken to determine how to prevent fall injuries utilising devices such as hip protectors (Meunier 1993), slip resistant floors (Bledy et al 1993) and exercise programs (National

Ageing Research Institute, 2000), however nobody has examined these prevention activities in the farming environment. With the National Coroners' Information System (NCIS) available for all states and territories it would now be appropriate to examine this information for falls in agriculture by known prevention strategies.

Recommendation B: The National Coroners' Information System should be used to examine falls on farms and determine if known prevention strategies would work in an agricultural setting.

Thanks to the NCIS, data on farm-related fatalities is accessible online following closure of the case by the coroner for all states and territories. Under this system a lag time between the fatal event and access to the data still exists, however NCIS should be able to provide an ongoing source of data which can be used to monitor fatalities due to falls in agriculture. The information should then be provided to Farmsafe Australia (FSA) for use in the prevention of falls on farms.

Recommendation C: Information from the National Coroners Information System should be collected on a regular basis and the information coded against the Farm Injury Optimal Data Set to help with monitoring and direction of prevention programs and strategies.

8.3 Fall-related injuries requiring hospitalisation

Falls was the second major leading cause of farm injury hospitalisation following transport in adults (15-79 yrs) and children (<15 years) in Victoria from 1993/94-1995/96 (Day *et al*., 1997). In Western Australia from 1991/92-1998/99, falls was the second major leading cause of farm injury hospitalisation across all ages following agricultural machinery; in children it was the second major leading cause following transport (Franklin and Fragar 2002).

NSW hospital admissions are in the order of 1.6 million people per annum, of these about 7% are related to injury, of which over a quarter are associated with a fall. Moller (1998) estimated that each year fall-related injuries cost NSW a billion dollars which is nearly twice the cost of road trauma.

In NSW farm-related injuries are coded using the place of occurrence classification. Like all data sets that are collected for other purposes there are limitations in our ability to interpret this information. Understanding of what constitutes a farm and its boundaries (such as farm house and yard which should be excluded) is often difficult from the information available to the coder. There was no information available about whether the person was working at the time of the incident.

There was also a change in classification from ICD9 to ICD10 for in the financial year 1998/99, unlike the ABS deaths register this had no effect on the number of injuries in the first year of introduction. However, for the last two years there appears to be a downward trend unrelated to prevention activity.

On average 174 people per annum were hospitalised from fall-related injuries on farms between 1 July and 30 June 2000. Nearly half of these were from falls from a height, with nearly a quarter being unspecified. Falls from height were predominantly from one level to another, ladders and building or other structure. Falls on the same level were primarily coded as *fall on same level from slipping, tripping, or stumbling*. There was a increase in the number of farm-related fall injuries in the 1990/91 financial year which appears to be due to a large number of unspecified falls, but is reflected across all fall categories.

Males predominated, however compared to other studies (Franklin et al, 2000; Franklin and Fragar, 2002) this was slightly lower. As was seen in the ABS death register information the number of injuries from falls increases with age, with a quarter being hospitalisation of people over 70 years of age.

Recommendation D: Work should be undertaken to reduce the number of fall fatalities and hospitalisation of farmers, farm workers and those living on farms over the age of 65 years.

Specific common falls identified were middle aged people falling from ladders, older persons falling from stairs or steps, children falling from a height (from buildings or from one level to another). It would be useful to examine further detail of fall-related injuries to children.

Strategies aimed at reducing ladder related injuries are important particularly for middle aged people. The US has invented a ladder with articulated feet, where the hight can be changed to level out the ladder on uneven ground. Further examination of ladder related injuries may also provide additional detail such how or why the ladder fell, how high the person was on the ladder, what activities were being undertaken at the time, direction of movement, role of protective equipment.

There were a large number of injuries (74.5%) in generic groups, i.e. *other fall from one level to another*, *falls on same level from slipping, tripping, or stumbling* and *unspecified*. This suggests that information collected by the hospital about the fall event is inadequate.

Recommendation E: Further work should be undertaken to examine falls on farm resulting in hospitalisation, in particular focusing on the circumstances surrounding the fall.

Potter-Forbes and Aisbett (2003) recently estimated that the average direct cost of a hospitalised fall in NSW was $3,851 per person. If this is multiplied by the average number of people hospitalised per year due to a fall on a farm (174), the annual direct cost of falls on farm is calculated to be around $670,000.

The average length of stay in hospital found in this study was 5.8 days. Fractures were the most common type of injury with fractures of the neck and trunk requiring longer hospitalisation on average longer than any other type of injury (15.5 days). In 1999-2000 there were 146,371 farms in Australia, of which 29.8% were in NSW. If we assume a consistent rate of injury through out Australia (ie 4 per 1,000 farms per annum) then every year there would be about 580 fall related injuries on farm requiring hospitalisation and costing about $2.2 million to the health system in Australia per annum.

Hospital data is restrictive when examining all types of falls that occur on farm, in particular falls from machinery, motorcycles (including 4 wheeled) and horses are coded to a specific agent and no mechanism information is available. Emergency department data and worker compensation data indicate a significant number of fall related injuries associated with these agents. Thus hospital data is an underestimation of the total number of falls.

8.4 Fall-related injuries presenting to emergency departments

Emergency Department (ED) datasets in Australia are very useful for examining farm-related injury as EDs usually collect a greater number of injuries than hospital or workers' compensation information. There are a number of studies (Coleman and Wetherspoon, 1994; Robson, 1994; Harper, 1997; Ashby and Day, 1995; Franklin et al, 2000b) that have used ED information to examine injuries occurring on farms. These studies found that between 12% and 20% of farm injury cases presenting to the ED are related to a fall. In Australia there is not currently a reliable source of ED information collected on a regular basis.

For this report we used a range of ED collections, which were accumulated during the 1990's. Thus the information can not be used to compare groups as some of the information collected was at selective hospitals (eg children's hospitals) and is therefore not representative of all EDs. However the ED information provides valuable insight into circumstances surrounding the injury event through the one line text description provided. For the analysis we used three main categories:

- Falls from a height – lotic
  these were falls from moving objects such as vehicles and animals.
- Falls from a height – static
  these were falls from non moving objets such as structures or stationary machinery.
- Falls on the same level.

There were a number of agents involved in fall events, however many of the agents were common to a particular type of fall. For example horse related falls were predominantly from the horse while it was

moving, bike related falls were also from the bike while the bike was moving. Truck and tractor related falls from a height occurred both while the vehicle was stationary and moving. Working or playing around animals also contributed to falls on the same level, many of these associated with the person colliding with the animal or vice versa. There were a large number of falls occurring to people on the same level, however there was very little information about the surface type.

Recommendation F: For same level falls examination of the surface, type of footwear, activity, speed of person by injury type, age and gender would provide information for prevention activities.

Using these three above categories enabled exploration of the falls in more homogenous categories. There were more male injuries than females injuries, however in the lotic falls group there were more females than males, this was reflective of females falling during recreation activities (ie off horses).

There were particular patterns of injuries that resulted form the fall events. For falls from a height fractures was the most common injury, where as sprain/strain and cut/laceration were common for same level falls. There were also some differences between lotic and static falls, although fractures was the most common injury for both, and a person involved in a lotic fall was more likely to sustain a fracture than any other type of injury. There was also subtle difference in the body locations injured. The extremities (upper and lower limbs) were the most commonly injury body parts but upper limbs were more often injured in falls from a height. The head and trunk were also more often injured in lotic falls.

Predominantly people in fall related cases were not wearing safety devices (79.0%), however in one-third of lotic fall injuries people were wearing a safety device, such as a hard hat (most likely a helmet).

Recommendation G: When exploring falls in agriculture, the categories of *lotic* and *static* height-related falls and same level falls should be used to analyse the information because of the difference in these types of falls.

8.5 Fall-related injuries that receive workers compensation

Workers compensation information is collected in Australia by work health authorities for people who are employed. That fact that employers are often not included may exclude a significant number of injuries. In Australian agriculture about half of those working in agriculture are self employed or employers and as such may not be covered under the workers compensation system. This number however is decreasing (ABS, 2003). Worker compensation data contains information about the nature and circumstances of injury, the number of working days lost and the cost to the system.

There were more height-related fall injury claims than same level injury claims in the workers' compensation information. While males submitted more claims, there was a greater proportion of females submitting claims in the same level falls category. Analysis of the worker compensation information suggested that there was a slight tendency for younger workers to be injured, but this is more likely to be reflective of the employment structure and thus exposure, as there are less older employees in agriculture.

Recommendation H: There should be a fall prevention program developed for farm employees. This prevention program should target people entering the workplace and younger workers.

The majority of height-related fall claims were submitted by employees in the grain, sheep and beef cattle farming industries, which is unsurprising given the number of agricultural establishments producing these commodities. One third of same level fall injuries were submitted by employees in the horticulture and fruit growing industries, suggesting that ground conditions may play an important part in falls on the same level.

The grouped agencies involved in height-related falls were *animal, human and biological agencies* (which would include primarily horses), *non-powered hand tools appliances and equipment, mobile plant and transport*, and *environmental agencies*. For same level falls the majority of injuries were due to interaction with *environmental agencies* (such as traffic ground surfaces and holes). The agencies are reflective of

working conditions (ie exposure) and reflect the type of falls sustained ie those who work at a height are more likely to fall from a height and vice versa.

Similar types of injuries are sustained in the worker compensation information for both height and same level falls, and also in the hospital and emergency department information (ie fractures and sprain/strain). Again more fractures were sustained for fall from a height and more sprain strain were sustained from fall on the same level. The upper and lower limbs were also more likely to be injured than other bodily location; however there were a greater proportion of trunk injuries in workers compensation claims than those seen in hospital and ED data.

Queensland workers compensation data was used to further analyse worker compensation information, particularly by industry. Common agents associated with height-related falls were horses, ladders and machinery, while common agents for same level falls were traffic and ground surfaces and holes in the ground. The prime agents associated with falls varied by industry, however some industry-wide issues requiring further assessment are falls on or from machinery, ladders, traffic and ground surfaces, horses and holes in the ground.

Recommendation I: Further work is required to find preventative measures for falls on or from machinery, ladders, traffic and ground surfaces, horses and holes in the ground.

There were very few fatal falls (5) in the workers compensation data set over the study period and as such worker compensation information would not be a good tool for monitoring farm-related fatalities due to falls.

Overall a large number of fall injuries resulted in a substantial period off work with 22.6% of claimants requiring more than 41 days (8 weeks) off work. For height-related falls a quarter (27.7%) of claimants required more than 40 days off work. This is also reflected in the average cost of $2,358 per claimant to the workers compensation system for a height-related fall compared to $1,587 for a same level fall. The average number of falls identified in the NOSI data was about 500 height-related and 400 same level falls. If the average cost of a claim is multiplied by the average number of claimants in Australia, the cost to the workers compensation system due to falls in agriculture is $1.8 million ($1,179,000 for height-related falls and $634,800 for same level falls).

8.6 Roundup

Falls in agriculture is a significant problem with an average of 42 deaths per annum, about 580 hospitalisations (at a cost of $2.2 million to the health system), and about 900 workers compensation claims (costing $1.8 million) resulting from fall injury. Unfortunately this study is only a starting point for the reduction of fall related injuries on farms.

There were some gaps which need to be addressed in future studies such as whether fall prevention programs and safety devices can successfully be used in agriculture. There was limited information available in the data used for this study on safety equipment. As safety equipment is the lowest strategy in the hierarchy of control, other strategies that prevent falls on farm need to be investigated.

Recommendation J: Use of fall arrest devices and safety equipment in other industries which could be utilised by farmers for common situations such as work on ladders, windmills or roofs needs to be investigated.

There are a number of areas identified where further work needs to be undertaken. Farmsafe Australia is well poised with their Managing Farm Safety Course for farm managers and other prevention programs to incorporate falls into their program of work. To prevent these injuries from occurring investment from government and agricultural industries and will be required to ensure a positive, sustainable and coordinated approach.

Recommendation K: Farmsafe Australia should add falls prevention to their key priority areas.

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Glossary

AAHU	Australian Agricultural Health Unit
ABS	Australian Bureau of Statistics
ACAHS	Australian Centre for Agricultural Health and Safety
ACT	Australian Capital Territory
ANZIC	Australia and New Zealand Industry Classification
FSA	Farmsafe Australia
ha	hectare
ICD9	International Classification of Diseases 9th Revision
ICD10	International Classification of Diseases 10th Revision
LD_{50}	Lethal Dose 50
NEC	Not Elsewhere Classified
nec	Not Elsewhere Classified
NOHSC	National Occupational Health & Safety Commission
Other rural areas	Are the remaining SLA's in the rural zone that are not 'Large Rural Centres' (ie population resides in urban centre of population of 25,000 or more) or 'Small Rural Centres' (ie rural zones containing urban centre population of 10,000 to 24,999
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RIRDC	Rural Industries Research & Development Corporation
SA	South Australia
SLA	Statistical Local Area
Tas	Tasmania
Vic	Victoria
WA	Western Australia
Yrs	Years
*****	In tables, unless otherwise stated, the star indicates number less than 3, to protect individuals from identification.

Appendix 1

ICD 9CM

INCLUDES

E880	Fall on or from stairs or steps
E880.0	Escalator
E880.9	Other stairs or steps
E881	Fall on or from ladders or scaffolding
E881.0	Fall from ladder
E881.1	Fall from scaffolding
E882	Fall from or out of building or other structure. **Includes**: fall from balcony, bridge, building, flagpole, tower, turret, viaduct, wall, window and fall through roof. **Excludes**: collapse of a building or structure (E916), fall or jump from burning building (E890.8, E891.8)
E883	Fall into hole or other opening in surface. **Includes**: fall into cavity, dock, hole, pit, quarry, shaft, swimming pool, tank and well. **Excludes**: fall into water NOS (E910.9) that resulting in drowing or submersion without mention of injury (910.0, E910.1, E910.2, E910.3, E910.4, E910.8, E910.9)
E883.0	Accident from diving or jumping into water (swimming pool). **Includes:** strike or hit against a) bottom when jumping or diving into water, b) wall or board of swimming pool, c) water surface. Excludes: diving with insufficient air supply (E913.2), effects of air pressure from diving (E902.2).
E883.1	Accidental fall into well
E883.2	Accidental fall into storm drain or manhole
E883.9	Fall into other hole or other opening in surface
E884	Other fall from one level to another
E884.0	Fall from playground equipment. **Excludes**: recreational machinery (E919.8)
E884.1	Fall from cliff
E884.2	Fall from chair or bed
E884.9	Other fall from one level to another. **Includes**: fall from embankment, haystack, stationary vehicle and tree.
E885	Fall on same level from slipping, tripping, or stumbling. Fall on moving sidewalk
E886	Fall on same level from collision, pushing, or shoving, by or with other person. **Excludes**: crushed or pushed by a crowed or human stampede (E917.1)
E886.0	In sports. Includes: tackles in sports. **Excludes**: kicked, stepped on, struck by object, in sports (E917.0)
E886.9	Other and unspecified. **Includes**: fall from collision of pedestrian (conveyance) with another pedestrian (conveyance)
E887	Fracture, cause unspecified
E888	Other and unspecified fall . Accidental fall NOS. Fall from bumping against object. Fall on same level NOS

EXCLUDES

Falls (in or from):

Transport vehicle

E800.0	Railway accident involving collision with rolling stock
E801	Railway accident involving collision with other object
E803	Railway accident involving explosion, fire, or burning
E804	Fall in, on, or from railway train
E805	Hit by rolling stock
E806	Other specified railway accident
E807	Railway accident of unspecified nature
E810	Motor vehicle traffic accident involving collision with train
E811	Motor vehicle traffic accident involving re-entrant collision with another motor vehicle.
E812	Other motor vehicle traffic accident involving collision with motor vehicle
E814	Motor vehicle traffic accident involving collision with pedestrian
E815	Other motor vehicle traffic accident involving collision on the highway
E816	Motor vehicle traffic accident due to loss of control, without collision on the highway
E817	Non collision motor vehicle traffic accident while boarding or alighting
E818	Other non collision motor vehicle traffic accident
E819	Motor vehicle traffic accident of unspecified nature
E820	Non traffic accident involving motor-driven snow vehicle
E821	Non traffic accident involving other off-road motor vehicle
E822	Other motor vehicle non traffic accident involving collision with moving object
E823	Other motor vehicle non traffic accident involving collision with stationary object
E824	Other motor vehicle non traffic accident while boarding and alighting
E825	Other motor vehicle non traffic accident of other and unspecified nature
E826	Pedal cycle accident
E827	Animal-drawn vehicle accident
E828	Accident involving animal being ridden
E829	Other road vehicle accidents
E830	Accident to watercraft causing submersion
E831	Accident to watercraft causing other injury
E832	Other accidental submersion or drowning in water transport accident.
E833	Fall on stairs or ladders in water transport

E834 Other fall from one level to another in water transport
E835 Other and unspecified fall in water transport
E836 Machinery accident in water transport
E837 Explosion, fire, or burning in watercraft
E838 Other and unspecified water transport accident
E840 Accident to powered aircraft at task off or landing
E841 Accident to powered aircraft, other and unspecified
E842 Accident to unpowered aircraft
E843 Fall in, on. Or from aircraft
E844 Other specified ait transport accidents
E845 Accident involving spacecraft

Vehicle not elsewhere classifiable

E846 Accidents involving powered vehicles used solely within the buildings and premises of industrial or commercial establishment
E847 Accidents involving cable cars not running on rails
E848 Accidents involving other vehicles, not elsewhere classifiable

Into fire

E890.0 Explosion caused by conflagration
E890.1 Fumes from combustion of polyvinylchloride (PVC) and similar material in conflagration
E890.2 Other smoke and fumes from conflagration
E890.3 Burning caused by conflagration
E890.8 Other accidents resulting from conflagration - Collapse of, fall from, hit by object falling from, or jump from burning private building
E890.9 Unspecified accident resulting from conflagration in private dwelling
E891 Conflagration in other and unspecified building or structure
E891.0 Explosion caused by conflagration
E891.1 Fumes from combustion of polyvinylchloride (PVC) and similar material in conflagration
E891.2 Other smoke and fumes from conflagration carbon monoxide, fumes NOS, and smoke NOS from conflagration in building or structure
E891.3 Burning caused by conflagration
E891.8 Other accident resulting from conflagration- Collapse of, fall from, hit by object falling from or jump from burning building or structure
E891.9 Unspecified accident resulting from conflagration of other and unspecified building or structure
E892 Conflagration not in building or structure
E893 Accident caused by ignition of clothing
E893.0 From controlled fire in private dwelling
E893.1 From controlled fire in other building or structure
E893.2 From controlled fire not in building or structure
E893.8 From other specified sources
E893.9 Unspecified source
E894 Ignition of highly inflammable material
E895 Accident caused by controlled fire in private dwelling
E896 Accident caused by controlled fire in other and unspecified building or structure
E897 Accident caused by controlled fire not in building or structure
E898 Accident caused by other specified fire and flames
E898.0 Burning bedclothes
E898.1 Other
E899 Accident caused by unspecified fire
E902.2 due to diving

Into water (with submersion or drowning)

E910.0 While water-skiing
E910.1 While engaged in other sport or recreational activity with diving equipment
E910.2 While engaged in other sport or recreational activity without diving equipment
E910.3 While swimming or diving for purposes other than recreation or sport
E910.4 In bathtub
E910.8 Other accidental drowning or submersion
E910.9 unspecified accidental drowning or submersion
E913.2 due to lack of air-in closed place
E916 struck accidentally by falling object)
E917.0 kicked or stepped on during game (football), knocked down while boxing, struck by hit or thrown ball, struck by hockey stick or puck
E917.1 caused by a crowed, by collective fear or panic-crushed, pushed or stepped on by crowed or human stampede

Machinery (in operation)

E919.0 Agricultural machines. **Includes**: Animal-powered agricultural machine, combine, derrick, hay, farm machinery, farm tractor, harvester, hay mover or rake, reaper and thresher. **Excludes**: that in transport under own power on the highway, that being towed by another vehicle on the highway, that involved in accident.
E919.1 Mining and earth-drilling machinery
E919.2 Lifting machines and appliances
E919.3 Metalworking machines

E919.4 Woodworking and forming machines
E919.5 Prime movers, except electrical motors
E919.6 Transmission machinery
E919.7 Earth moving, scraping, and other excavating machines
E919.8 Other specified machinery
E919.9 Unspecified machinery

On edged, pointed, or sharp object

E920 1 Other powered hand tools
E920.2 Powered household appliances and implements
E920.3 Knives, swords, and daggers
E920.4 Other hand tools and implements
E920.8 Other specified cutting and piercing instruments or objects
E920.9 Unspecified cutting and piercing instruments or object

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ICD-10

INCLUDES

W00 Fall on same level involving ice and snow. **Excludes**: fall with mention of: ice-skates and skis (W02) and stairs and steps (W10)
W01 Fall on same level from slipping, tripping and stumbling. Excludes fall involving ice or snow (W00)
W02 Fall involving ice-skates, skis, roller-skates or skateboards.
W03 Other fall on same level due to collision with, or pushing by, another person. **Including** fall due to collision of pedestrian (conveyance) with another pedestrian (conveyance) and excluding crushed or pushed by crowd or human stampede (W52) and fall involving ice or snow (W00)
W04 Fall while being carried or supported by other persons. **Including** accidentally dropped while being carried
W05 Fall involving wheelchair
W06. Fall involving bed
W07 Fall involving chair
W08 Fall involving other furniture
W09 Fall involving playground equipment. Excluding fall involving recreational machinery (W31)
W10 Fall on and from stairs and steps. Including fall (on) (from): escalator, incline, involving ice or snow on stairs and steps and ramp
W11 Fall on and from ladder
W12 Fall on and from scaffolding
W13 Fall from, out of or through building or structure. **Including** fall from, out of or through: balcony, bridge, building, flag-pole, floor, railing roof tower, turret, viaduct, wall and window. **Excluding** collapse of a building or structure (W20) and fall or jump from burning building (X00)
W14 Fall from tree
W15 Fall from cliff
W16 Diving or jumping into water causing injury other than drowning or submersion. Including striking or hitting: Against bottom when jumping or diving into shallow water. Wall or diving board of swimming-pool. Water surface. Excluding accidental drowning and submersion. W65, W66, W67, W68, W69, W70, W73, W74
W17 Other fall from one level to another. Including fall from or into cavity, dock, haystack, hole, pit, quarry, shaft, tank and well.
W18 Other fall on same level. Including fall from bumping against object, from or off toilet and on same level NOS
W19 Unspecified fall. Including accidental fall NOS

EXCLUDES

Fall (in) (from):

Animal

V80 Animal-rider or occupant of animal-drawn vehicle injured in transport accident

Transport vehicle-

V01 Pedestrian injured in collision with pedal cycle
V99 Unspecified transport accident
W20 Struck by thrown, projected or falling object

Machinery (in operation)

W28 Contact with powered lawnmower excluding exposure to electric current
W29 Contact with other powered hand tools and household machinery including blender, powered can-opener, chain-saw, do-it-yourself tool, garden tool, hedge-trimmer, knife, sewing-machine, spin-drier and washing machine.
W30 Contact with agricultural machinery including animal-powered farm machine, combine harvester, derrick, hay, farm machinery NOS, reaper, thresher excluding contact with agricultural machinery in transport under own power or being towed by a vehicle and exposure to electric current.
W31 Contact with other and unspecified machinery including machine NOS and recreational machinery and excluding contact with machinery in transport under own power or being towed by a vehicle and exposure to electric current.
W52 Crushed, pushed or stepped on by crowd or human stampede

Into water (with drowning or submersion)

W65 Drowning and submersion while in bath-tub
W66 Drowning and submersion following fall into bath-tub

W67 Drowning and submersion while in swimming-pool
W68 Drowning and submersion following fall in swimming pool
W69 Drowning and submersion while in natural water including lake, open sea, river and stream
W70 Drowning and submersion following fall into natural water
W73 Other specified drowning and submersion including quenching tank and reservoir
W74 Unspecified drowning and submersion including drowning NOS and fall into water NOS

Into fire

X00 Exposure to uncontrolled fire in building or structure
X01 Exposure to uncontrolled fire, not in building or structure including forest fire
X02 Exposure to controlled fire in building or structure including fireplace or stove
X03 Exposure to controlled fire, not in building or structure including camp fire
X04 Exposure to ignition of highly flammable materia including ignition of gasoline, kerosene and petrol
X08 Exposure to other specified smoke, fire and flames
X09 Exposure to unspecified smoke, fire and flames including burning NOS and incineration NOS

Intentional self-harm

X80 Intentional self-harm by jumping from a high place including intentional fall from one level to another
X81 Intentional self-harm by jumping or lying before moving object

Assault

Y01 Assault by pushing from high place
Y02 Assault by pushing or placing victim before moving object