

Epidemiology of Farm Injuries in New South Wales

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Abstract

Injuries to people living and working on farms in New South Wales continue to be a significant burden on the health system, Workers' Compensation system, agricultural industries and farming families. Strategies to reduce the number and severity of injuries suffered by farmers and people working on farms rely on accurate information. Unfortunately there is no one dataset available to describe the circumstances surrounding farm injuries and the size of this burden in Australia. Hence, a number of different data sources are required to provide a picture of farm injuries. To date, there has been very little critical examination of what value each of these datasets provides to describing farm injuries.

This Thesis aimed to:

- Undertake surveillance of injuries occurring to people on farms or during agricultural production in NSW using data from an Emergency Department, NSW Hospital Separations information, NSW Workers' Compensation Claims, and ABS Deaths data.
- Critically examine the utility of Emergency Department, Hospital, Workers' Compensation, and ABS Deaths Data for the surveillance of farm injuries in NSW.
- Critically examine data classification systems used in Emergency Department, Hospital, Workers' Compensation, and ABS Deaths data collections to describe the breadth of farm injuries in NSW.
- Define the priority areas for farm injury prevention initiatives in NSW based on the information obtained from the examination of the data from Emergency Department, Hospital, Workers' Compensation, and ABS Deaths.
- Evaluate the effectiveness of the NSW Rollover Protective Structure (ROPS) rebate scheme and examine the utility of the data currently available in NSW to measure the performance of the program.

Four datasets, Tamworth Emergency Department, Hospital Separations, Workers' Compensation and the Australian Bureau of Statistics (ABS) Deaths data were used to provide information on the surveillance of farm injuries, describe the breadth of classifications used to describe farm injuries, and define priorities for the prevention of farm injuries.

There were 384 farm-related injuries which presented to the Emergency Department at the Tamworth Base Hospital between 1 September 1997 and 31 August 1998. Emergency Department data collected in this study used the Farm Injury Optimal Dataset (FIOD) for classification, which allowed for a comprehensive picture of the circumstances surrounding the injury event. The three most common external causes of injury were related to horses, motorcycles, and animals. Commonly people were working at the time of injury. Children represented 21% of the people injured. The average number of injuries per 100 farms per annum was 34.7.

An examination of hospital discharge data for NSW was undertaken for the period 1 July 1992 to 30 June 2000 where the location of the injury was a farm. Classification of cases in this dataset conformed to the International Classification of Disease (ICD) versions 9 and 10. There were 14,490 people who were injured on a farm during the study period. The three most common external causes of injury were motorcycles, animals being ridden and agricultural machinery. Children represented 17% of all farm injury cases. The rate per 1,000 farms ranged from 19 to 42 per annum.

An examination of Workers' Compensation claims for agricultural industries in NSW between 1 July 1992 and 30 June 2001 was undertaken. The 'Type of Occurrence' classification system was used to code the claims. There were 24,332 claims of which the majority were males (82%). The incidence of injury / disease in agriculture per annum varied from 37 per 1,000 workers to 73 per 1,000 workers. The rate per 1,000 agricultural establishments varied from 54 to 76. The average cost of a claim was \$10,880 and the average time lost per claims was 9.2 weeks. There were 81 deaths and 3,158 permanent disabilities. The three most common agents were sheep / goats (5%), ferrous and non-ferrous metals (5%), crates / cartons / boxes / etc (5%).

Using ABS deaths data to examine the deaths of people working and living on farms was limited to males whose occupation was recorded as 'farmer and farm manager' and 'agricultural labourer and related worker'. There were 952 deaths over the period 1 January 1991 and 31 December 2000. The information provided a consistent series of cases over time. Areas where prevention should be directed included motor vehicle accidents; falls; agricultural machinery; other machinery; firearms; poisoning; and drowning.

Using any one of the datasets alone to examine people injured on farms not only underestimates the number of people injured, but also misses particular types of agents involved in farm injuries. Each of the datasets used in this Thesis provides a different perspective of farm injury in NSW. By examining the information together, there are a number of areas which are consistently represented in each dataset such as falls and agricultural machinery. While no one dataset provided all the information that would be useful for the prevention of injuries, the available information does provide direction for the development of prevention strategies.

The overall weakness of the information provided is that it misses a number of risk factors that contribute to farm injuries such as fatigue and training. The lack of appropriate denominator information also makes it difficult to directly compare the datasets and estimate the size of the problem. There are a number of additional coding categories that could be included in each dataset that would provide a better understanding of the different groups at risk of sustaining an injury on a farm or during agricultural work. These coding categories include activity at time of injury, admission to hospital, and occupation.

An example of the use of data to determine the effectiveness of a farm injury prevention program is the 'NSW Rollover Protective Structure (ROPS) Rebate Scheme' evaluation. Tractor rollover deaths have been identified as an issue for prevention by Farmsafe Australia; however, such deaths were not identified in any of the datasets used in this Thesis due to coding limitations in the ABS data. In this Thesis information about the evaluation of the 'NSW ROPS Rebate Scheme' is presented. The scheme was successful in fitting 10,449 ROPS to tractors and the following lessons were learnt: when providing a rebate, the administration (i.e. sending the cheque) needs to be done well; advertising is important and should be co-ordinated, increase the awareness of the risk(s) the intervention is aiming to prevent and effectiveness of subsequent solution (s); the program should ensure there is an increased awareness of the outcome the intervention is aiming to prevent; if regulation is part of the program, enforcement needs to be undertaken; and should address any barriers to uptake.

The information provided in this Thesis highlights the substantial burden that farm injury places on the agricultural and rural sector of NSW. While there is no one data source that can describe the circumstances and the burden of farm injuries, the currently available datasets do

provide an insight into the circumstances of farm injuries and the burden these injuries place on health, Workers' Compensation, agricultural industries and farming families.

Dedication & Acknowledgements

Thousands of farmers every year are injured in preventable accidents, many requiring time off work and some losing their lives, causing stress and concern for loved ones and the community. To examine the causes of farm injuries and provide strategies that will in the future lead to fewer people being injured and dying is a noble cause worth studying. To all those touched by the tragedy of injury and death from farm accidents I hope this study goes a little way in reducing your angst and a long way in ensuring we are not doomed to repeat the mistakes of the past.

In the process of undertaking a PhD there are a large number of people who play both small and large roles in helping you to achieve the degree. While there are a number of specific people I would like to thank there are also a number of people who will not be mentioned below, who without their support, insight or understanding it would not have been possible to finish my Thesis.

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Statement of Involvement

The studies described in this Thesis, and much of the analysis presented here, were based on three studies conducted while the author was a member of the Australian Centre for Agricultural Health and Safety. The author planned each study, led the study teams, and was the key participant in all aspects of the studies, but all team members made an important contribution to the successful outcome of the studies.

The author wrote all the content of this Thesis and conducted all analyses presented here. All figures were produced by the author.

Data for the Emergency Department study was collected by Dr John Davies and data for the ROPS Evaluation was collected by Kerri-Lynn Stark, both under the supervision of the author. Coding of raw data was conducted by all team members, including the author. Checking, corrections and analysis of data for the original reports was undertaken by the author.

Publications arising from the Thesis

Reports:

Franklin R, Thomas P, Fragar L (2005). The Health and Safety of New South Wales Farmers, Farm Families and Farm Workers. Canberra. *Rural Industries Research and Development Corporation*.

Franklin R (2005). Evaluation of the New South Wales Rollover Protective Structure Rebate Scheme 2000-2004. Moree. *Australian Centre for Agricultural Health and Safety*

Published Articles

Franklin R, Fragar L, Page AN (2000). The National Farm Injury Data Collection: data to inform farm injury prevention programs. *Australasian Epidemiologist* 7(1) 18-24

Franklin RC, Davies JN (2001). Farm-related injury presenting to an Australian Base hospital. *Australian Journal of Rural Health* 11(6) 292-302

Franklin R, Crosby J (2002) Farm-related injury in New South Wales: information for prevention. *New South Wales Public Health Bulletin* 13(5):99-102

Davies J, Franklin R (2006) Injuries resulting from horse riding and motorcycle incidents on farms. *Journal of Occupational Health and Safety – Australia and New Zealand* 22(1) 51-59

Franklin RC, Stark K, Fragar L (2006). Intervention Strategies for the retro-fitment of Rollover Protective Structures (ROPS) and fleet characteristic, farm tractors. *Safety Science* 44(9) 771-783

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Glossary

AAHU	Australian Agricultural Health Unit now called ACAHS
ABS	Australian Bureau of Statistics
ACAHS	Australian Centre for Agricultural Health and Safety
Accident	The use of the word accident is controversial and the source of considerable debate in the discipline of injury prevention ¹ . Some advocates recommend the use of such phrases as ‘incident’ or ‘injury event’. For the purposes of this Thesis ‘Accident’ is used in the natural parlance where the source is obvious.
ANOVA	Analysis of Variance
ANZSIC	Australia and New Zealand Standard Industry Classification ²
Apr	April
ASCC	Australian Safety and Compensation Council (formerly the National Occupational Health and Safety Commission)
ASCO	Australian Standard Classification of Occupations ³
ASIC	Australian Standard Industry Classification
Aug	August
ATV	All Terrain Vehicle. In this Thesis the term ATV and 4-wheeled motorcycle are used interchangeably.
av.	Average
COMS	California Occupational Mortality System
Dec	December
e-codes	External Cause Codes
ED	Emergency Department
EVAO	Estimated Value of Agricultural Output
Farm injuries	Injuries sustained by people while on a farm or in the course of agricultural production
Feb	February
FIOD	Farm Injury Optimal Dataset
FSA	Farmsafe Australia
Hierarchy of Control	is a five level guide to the effectiveness of an intervention. The order is as follows: <ol style="list-style-type: none">1. Eliminate the hazard (risk)

2. Substitute for a lesser hazard (risk)
3. Engineer out the hazard (risk)
4. Design safer work procedures (management)
5. Use personal protective equipment (PPE)

Hospital Separations Data are one tool which can be used to measure incidence and prevalence of serious diseases and injury

ICD International Classification of Diseases

ICE International Collaboration Effort

Jan January

Jul July

Jun June

Labour force All persons aged 15 years and older who are not members of Australian permanent defence forces or foreign defence force personnel stationed in Australia, diplomatic personnel of overseas governments, and overseas residents in Australia ⁴. It should be noted that labour force is usually broken down into employed and job seekers (which is further broken down into those in the labour force (unemployed and part-time workers (less than 10 hours & looking for work) and not in the labour force (discouraged job seekers, attending educational institution and wanted to work but not available)) ⁵.

LOS Length of Stay

Mar March

National Occupational Health and Safety Commission is now called the Australian Safety and Compensation Council.

NCIS National Coroners Information System

NEC Not Elsewhere Classified

NHPA National Health Priority Areas

Nov November

NSW New South Wales

Oct October

OHS Occupational Health and Safety

OSHA Occupational Safety and Health Administration

PHP Personal Hearing Protection

PPE Personal Protective Equipment

PTO	Power Take Off
Risk factor	A measurable characteristic associated with a higher probability of occurring ⁶
RLSSA	Royal Life Saving Society Australia
ROPS	Rollover Protective Structure
SLA	Statistical Local Area
Sep	September
Separation is defined	“...as the process by which an episode of care for an admitted patient ceases. A separation may be formal or statistical. Formal separation: the process by which a hospital records the cessation of treatment and/or care and/or accommodation of a patient. Statistical separation: the administrative process by which a hospital records the cessation of an episode of care for a patient within the one hospital stay...” p387 ⁷
TBH	Tamworth Base Hospital
US	United States of America
WorkCover	The Work Health Authority responsible for workers health and safety and in NSW the compensation of work related injuries and death.
Workers’ Compensation	– Refers to the insurance scheme in Australia where by the employer pays a statutory body to cover worker related injuries and diseases that an employee may suffer while undertaking work. In this Thesis Workers’ Compensation claims refers to those claims made against the NSW Workers’ Compensation insurance scheme.