



Government of **Western Australia**
Department of **Health**

Incidence and costs of injury in Western Australia 2012

**Report prepared for the
Chronic Disease Prevention Directorate
Department of Health WA**

Hendrie D, Miller TR, Randall S, Brameld K, Moorin RE

Acknowledgements

This report was funded by the Chronic Disease Prevention Directorate in the Public Health Division at the Department of Health WA. The authors would like to thank the Data Linkage Unit at the Department of Health WA, in particular Alex Godfrey and Peter Cosgrove, and those responsible for the collection and maintenance of the WA Hospital Morbidity Data System, the Emergency Department Data Collection and the Register of Deaths. Thanks also to Kristie Robinson from the Insurance Commission of WA for her guidance in using the personal injury claims data for the Motor Injury Insurance Scheme, to Jag Atrie from the Epidemiology Branch at the Department of Health WA for providing access to the Rates Calculator, and to Jan Lewis, Adjunct Associate Professor at the School of Public Health at Curtin University, for help in preparing the report.

Expert Review Team:

- Associate Professor Ian Li, School of Population Health, UWA
- Dr Laura Miller, Epidemiologist, Epidemiology Branch
- Denise Sullivan, Director, Chronic Disease Prevention
- Dr Erica Davison, Principal Policy Officer, Chronic Disease Prevention
- Russ Milner, Senior Policy Officer, Chronic Disease Prevention.

Table of contents

List of tables	iii
List of figures	iv
Foreword	v
Executive summary	vi
1. Introduction	1
2. Methodology	2
2.1 Introduction	2
2.2 Injury incidence data	2
2.3 Definition of injury events	3
2.3.1 Defining an ‘injury’	3
2.3.2 Grouping records into episodes of care	4
2.3.3 Grouping episodes of care into a single injury event	4
2.3.4 Sequelae of a previous injury	5
2.3.5 Categories of injury severity	6
2.4 Costing injuries	6
2.4.1 General approach	6
2.4.2 Hospital costs	6
2.4.3 Emergency department costs	6
2.4.4 Costs derived from the Insurance Commission of WA	7
2.4.5 Loss of paid productivity	9
2.4.6 Quality of life loss	9
2.5 Variable definitions	10
2.5.1 Severity	10
2.5.2 Aboriginality	10
2.5.3 Socioeconomic status	10
2.5.4 Remoteness index	10
2.5.5 Health region	10
2.5.6 Alcohol aetiological fraction	10
2.5.7 Mechanism of injury	11
2.5.8 Intent of injury	11
2.5.9 Injury diagnosis groups	11
2.5.10 Body region and nature of injury	11
2.6 Data analysis	11
2.7 Strengths and limitations	11
3. Incidence and costs of injury, 2012	14
3.1 Introduction	14
3.2 Incidence and costs by injury severity and sex	14

3.3	Incidence and costs by age group and sex	15
3.4	Incidence and costs by Aboriginality	17
3.5	Incidence and costs by socioeconomic status and severity	17
3.6	Incidence and costs by accessibility/remoteness of residence and severity	18
3.7	Incidence and costs by health region and severity	19
3.8	Incidence and costs by intent and mechanism of injury and severity	20
3.9	Incidence and costs by intent, mechanism and severity – fatalities and hospitalisations	21
3.10	Injuries and costs by alcohol-attributable status	24
4.	Costs of injury by cost category, 2012	25
4.1	Introduction	25
4.2	Costs of Injury by cost category	25
5.	Injury trends and costs, 2003 to 2012	28
5.1	Introduction	28
5.2	Trend in incidence and costs by severity	28
5.3	Trend in incidence and costs by age group – fatalities and hospitalisations	29
5.4	Trend in incidence and costs by Aboriginality – fatalities and hospitalisations	31
5.5	Trend in incidence and costs by accessibility/remoteness – fatalities and hospitalisations	32
5.6	Trend in incidence and costs by health region – fatalities and hospitalisations	32
5.7	Trend in incidence and costs by intent – fatalities and hospitalisations	34
5.8	Trend in incidence and costs by mechanism – fatalities and hospitalisations	34
5.9	Trend in incidence and costs by mechanism and age group – fatalities and hospitalisations	36
5.10	Trend in incidence and costs by alcohol-attributable status – fatalities and hospitalisations	39
6.	Incidence and costs of injury by diagnosis group	40
6.1	Introduction	40
6.2	Injury costs by diagnosis group and severity – fatalities and hospitalisations	43
7.	Discussion	43
	References	46

Appendices

Incidence and costs of injury in health regions	51
Appendix 1: North Metropolitan Health Region	52
Appendix 2: South Metropolitan Health Region	58
Appendix 3: Goldfields Health Region	64
Appendix 4: Great Southern Health Region	71
Appendix 5: Kimberley Health Region	77
Appendix 6: Midwest Health Region	83
Appendix 7: Southwest Health Region	89
Appendix 8: Wheatbelt Health Region	95
Appendix 9: Pilbara Health Region	101

List of Tables

Table 2.1	Categories and cut-off points used to define an injury event	5
Table 3.1	Incidence and costs of injury events by severity and sex, 2012	15
Table 3.2	Incidence and costs of injury events by age group and sex, 2012	16
Table 3.3	Incidence and costs of injury events by Aboriginality and severity, 2012	17
Table 3.4	Incidence and costs of injury events by socioeconomic status and severity, 2012	18
Table 3.5	Incidence and costs of injury events by accessibility/remoteness and severity, 2012	19
Table 3.6	Incidence and costs of injury events by health region and severity, 2012	20
Table 3.7	Incidence and cost of injury events by intent of injury and severity, fatalities and hospitalisations, 2012	21
Table 3.8	Incidence and costs of injury events by intent and mechanism, fatalities and hospitalisations, 2012	22
Table 3.9	Incidence and costs of injury events by intent, mechanism and age group, fatalities and hospitalisations, 2012	23
Table 3.10	Incidence and costs of injury by alcohol-attributable status, 2012	24
Table 4.1	Costs of injury by cost component, 2012	25
Table 4.2	Costs of injury by health region and cost category, 2012	26
Table 4.3	Costs of injury by intent and mechanism of injury and cost category, fatalities and hospitalisations, 2012	27
Table 5.1	Trend in incidence and costs of injury by severity, all severity levels, 2003-2012	28
Table 5.2	Trend in incidence and costs of injury by severity, fatalities and hospitalisations, 2003-2012	29
Table 5.3	Trend in incidence and costs by age group, fatalities and hospitalisations, 2003 and 2012	30
Table 5.4	Trend in incidence and costs of injury by age group, fatalities and hospitalisations, males, 2003 and 2012	30
Table 5.5	Trend in incidence and costs of injury by age group, fatalities and hospitalisations, females, 2003 and 2012	31
Table 5.6	Trend in incidence and costs of injury by Aboriginality, fatalities and hospitalisations, 2003 and 2012	31
Table 5.7	Trend in incidence and costs of injury by ARIA, fatalities and hospitalisations, 2003 and 2012	32
Table 5.8	Trend in incidence and costs of injury by health region, fatalities and hospitalisations, 2003 and 2012	33
Table 5.9	Trend in incidence and costs of injury by intent, fatalities and hospitalisations, 2003 and 2012	34
Table 5.10	Trend in incidence and costs of injury by mechanism, fatalities and hospitalisations, 2003 and 2012	35
Table 5.11	Trend in incidence and costs of injury by mechanism and age group, fatalities and hospitalisations, 2003 and 2012	36
Table 5.12	Trend in incidence and costs of injury by alcohol-attributable status, fatalities and hospitalisations, 2003 and 2012	39
Table 6.1	Incidence and costs of injury by diagnosis group and severity, fatalities and hospitalisations, 2012	41
Table 6.2	Trend in incidence and mean costs of injury by diagnosis group, fatalities and hospitalisations, 2003 and 2012	42

List of Figures

Figure 2.1	Records in the injury cost dataset	3
Figure 2.2	Example of an injury	4
Figure 2.3	Readmissions for fractures to the torso	5
Figure 2.4	Lapsed time from date of accident as recorded on ICWA record to a hospital admission or emergency department presentation	7

Foreword

Message from the Minister for Health

Every day in Western Australia our health services treat individuals who have been injured. A visit to any of the emergency departments across our hospitals will give a glimpse of the daily toll injuries take on the lives of individuals, their families and the people and systems that provide their care.

In 2012 there were 227,000 injury events with an associated total lifetime cost of \$9.6 billion. The figures are staggering. Even more deeply disturbing are the hidden human stories behind the statistics; the hardship and pain, the courage and perseverance of individuals and their families.

This report builds on the findings of a 2003 study and provides a more comprehensive estimate of the frequency and costs of different types of injuries. It sets out in stark detail the human and financial costs of injury for this State. It provides compelling evidence of human frailty and for concerted action to protect and prevent the harms it quantifies.

This Government is committed to the prevention of injury and community safety. Injury remains a serious public health problem in Western Australia and nationally. It is also a problem that can be prevented through removal of the causes or people's exposure to them.

The *Incidence and Costs of Injury in Western Australia 2012* is an important and useful resource for governments and communities, providing the most up-to-date and complete information to help inform priorities and planning in our endeavours to address the high social and financial costs of injury.



John Day
MINISTER FOR HEALTH;
CULTURE AND THE ARTS

Executive summary

This report provides estimates of the incidence and costs of injury in Western Australia in 2012 with comparison made primarily with equivalent data for 2003. The incidence of injuries and corresponding costs are stratified across multiple dimensions including by sociodemographic factors, regions, types of injury and alcohol involvement. The study builds on a previous cost-of-injury report for WA and will inform government and non-government programs, policies and services to address this important public health problem.

Data were drawn from linked administrative health data and personal injury claims data for the Motor Injury Insurance Scheme administered by the Insurance Commission of WA. Incidence counts were based on injury events, with episodes of care relating to a specific injury combined into a single event. Injury costs included were health sector costs, costs relating to longer term care needs, loss of paid productivity and quality of life loss. The study excluded costs like property damage, workplace disruption, fire services, and criminal justice that result from injury incidents but are not injury costs. Costs were calculated using an incidence-based approach computed by assessing the lifetime costs of all injuries in a given year. Methods for allocating costs to injury events included direct mapping of unit costs drawn from relevant sources and cost modelling using regression analysis. All costs are expressed in 2014 Australian dollars. The study's limitations, notably the assumption that costs modelled from the Motor Injury Insurance Scheme equalled costs for injuries with similar diagnoses and different causes, are detailed in the report.

Injury events were grouped as follows: (i) injury events resulting in death; (ii) injury events resulting in hospitalisation with survival to discharge; and (iii) injury events receiving treatment at an emergency department not resulting in hospitalisation or death.

Key findings of the study were as follows:

Incidence and costs by sociodemographic factors

- In 2012, the number of injury events in WA was 227,000 or 93 injuries per 1,000 population. The total costs were \$9.6 billion.
- Health sector costs accounted for 12.3% of total costs, long term care costs for 3.2%, loss of paid productivity for 19.8%, and loss of quality of life for 64.7%.
- Fatal injuries comprised 0.6% of injury events, non-fatal injuries requiring hospitalisation 22.1%, and those only requiring emergency department presentations 77.3%. However, fatalities accounted for 61% of the total costs of injury.
- Males had a higher rate of injury events than females, and accounted for 63% of all injury costs.
- The injury rate was highest in the 85 years and above age group, with high rates also in the 10-14, 15-19 and 20-24 year age groups. Mean cost of injury increased with age, from around \$11,000 per injury event for younger people to over \$200,000 for the 85 years and above age group.
- Aboriginal people had more than double the rate of fatal injuries and more than triple the rate of non-fatal hospitalisations compared to non-Aboriginal people. Compared with a share of 3.6% of total population in WA, Aboriginal people accounted for 7.7% of total injury costs.
- Those in the most disadvantaged socioeconomic quintile had 2.3 times as many fatalities, and 1.6 times as many non-fatal hospitalisations and emergency presentations when compared to the least disadvantaged socioeconomic quintile. Total costs in the most disadvantaged quintile were 1.8 times higher than in the least disadvantaged quintile.

- Rates of injury were higher in non-metropolitan regions, with the Kimberley, Wheatbelt and Goldfields health regions having rates more than double those in the metropolitan region. Mean costs per injury event were generally lower in non-metropolitan regions.

Incidence and costs by intent and mechanism

- Intentional self-harm accounted for 24.2% of fatal injuries, 6.3% of non-fatal hospitalisations, and \$1.6 billion in costs.
- Falls and transport injuries were the most common unintentional injuries. Falls accounted for 32.5% of fatal injuries, 32.5% of non-fatal hospitalisations, and \$2.2 billion in costs. Transport injuries accounted for 13.6% of fatalities, 11.5% of non-fatal hospitalisations and \$1.1 billion in costs.

Incidence and costs by alcohol-attributable status

- Alcohol was involved in 17.5% of fatalities, 11.8% of non-fatal hospitalisations, and 32% of emergency department presentations. The overall cost of injuries involving alcohol was \$1.9 billion.

Trends in incidence and costs of injury

- Emergency department data were not included in the trend analyses as data were not available for all emergency departments outside of the metropolitan area prior to 2008. All comparisons reported in this section compare injury incidence and costs between 2003 and 2012.
- The age-standardised rate of fatal injury events remained stable, while the rate of non-fatal injury hospitalisations increased, along with the total cost of injury events. The mean cost per injury event declined over the period.
- The age-standardised rate of injury events increased most for people in the 65 years and above age group with the share of total costs for this age group increasing from 34.8% to 36.5%.
- Compared to 2003, the rate of fatal injury events in Aboriginal people decreased, while the hospitalisation rate remained stable. In contrast, the rate of injury events remained constant for non-Aboriginal people while their hospitalisation rate increased. The difference in mean cost of injury between Aboriginal and non-Aboriginal people was reduced.
- Age-standardised rates of falls and self-harm injury events increased over the period, while the trend for most other mechanisms of injury remained relatively constant. For falls, the most notable increase was in the 65 years and above age group. For self-harm injuries, the rate increased most in the 15-24 year age group. Mean costs decreased for all mechanisms of injury other than poisoning and self-harm.

Incidence and costs by diagnosis group

- Superficial injury/open wounds and upper extremity injuries were the most commonly occurring injury types, with injuries to internal organs and burns occurring least frequently. Mean costs per injury event were highest for hip fractures and skull/brain injuries, both exceeding \$300,000. Mean costs per injury events decreased over time for all diagnosis groups other than skull/brain injuries.

Cost estimates reported in this study for 2003 are higher than reported for the same year in the previous cost-of-injury report. A major reason for this difference was the use in this study of a higher willingness-to-pay value of statistical life as recommended by the Office of Best Practice Regulation. Furthermore, using the linked health data to calculate injury events and applying more advanced techniques in allocating costs to injury events makes comparison of the costs of injury in the two studies inappropriate.

These new estimates of the public health impact of injuries can improve injury prevention and planning, policy analysis, evaluation and advocacy. High quality data are important to provide an accurate reflection of how injuries affect society and the potential to reduce injuries cost-effectively. In comparing the incidence and costs of injury across multiple dimensions, this study provides information to policymakers, health professionals and other injury prevention stakeholders to identify areas where further prevention and care are most needed. Priority areas requiring targeted preventive interventions include injuries shown to have high incidence, high costs per injury event or a combination of both. In addition to the share in total burden of injury, other policy criteria may be required to direct preventive policy towards injuries, such as individual injury severity, or towards disadvantaged groups, to improve injury outcomes and reduce inequitable differences in the burden of injury.

1. Introduction

Injuries are a leading cause of the burden of death and disability, internationally and in Australia. The Global Burden of Disease (GBD) 2013 study showed injuries accounting for 10.1% of the global burden of disease (1), consistent with an earlier estimate of 9.8% in 1990 (2). The corresponding contribution of injury in the burden of death and disability in Australia is 7.4% (1).

Injuries remain one of the most serious public health problems in Western Australia, ranking fourth as a cause of death, fourth as a specific cause of hospitalisation, second as a cause of potential years of life lost and fifth as a cause of disease burden (3). Leading causes of injury deaths and hospitalisations include injury from falls, interpersonal violence, suicide, transport, poisoning, burns and scalds, and drowning (4).

Recognition of injury prevention and control as one of nine national Health Priority Areas by the Australian Government resulted in the development of several national injury plans, including the National Injury Prevention and Safety Promotion Plan: 2004-2014, the National Aboriginal and Torres Strait Islander Safety Promotion Strategy, the National Falls Prevention for Older People Plan: 2004 Onwards and the National Road Safety Strategy 2011-2020 (5, 6). In WA, the Western Australian Health Promotion Strategic Framework 2012-2016 has identified the creation of safer communities as one of six strategic directions, the plan identifying several priority areas to reduce the occurrence of injuries (6).

Notwithstanding national and state efforts to reduce the incidence and severity of injuries, injury remains a common and costly affliction, with fatalities due to injuries occurring in all age groups and life years lost due to injuries exceeding those from many other causes. Moreover, injuries are more likely than many other conditions to have lasting effects that cause permanent losses in functional capacity and reduced quality of life and loss of productivity.

Quantifying the costs associated with injuries is important. Cost estimates reduce different types of injury to a common metric, thus enabling the relative size of various problems to be gauged and health priorities to be set. Measuring the benefits of interventions in monetary terms also helps planners and evaluators estimate the 'net cost' of a safety investment (that is, the total cost of the investment minus the benefits accrued), and as such may inform resource allocation. Moreover, cost as a measure of the burden of injury is easy to understand and can help to highlight the significance of the problem (7, 8).

Only three studies have produced detailed estimates of the cost of injury in Australia, with the latest one presenting costs of injury for Western Australia in 2003 (9-11). These reports provided cost-of-injury estimates that helped draw recognition of injury as a major public health issue. However, these cost estimates are outdated and may no longer portray accurately the burden injuries place on society. Moreover, improved administrative datasets, and the availability of linked health data connecting information across datasets for the same person, allow population-based study of health care usage for injury events and better assessment of longer term outcomes and their costs.

This report builds on the previous cost-of-injury report for WA and describes the overall burden of injury in Western Australia. Burden is defined to include incidence and costs, the latter including health sector costs, costs relating to longer term care needs, loss of paid productivity (or economic loss) and quality of life loss. The study covers injury events resulting in an emergency department presentation, hospital admission or a fatality, thus omitting less severe injuries treated by a general practitioner or other primary health care provider. The incidence of injuries and corresponding costs are stratified across multiple dimensions including by sociodemographic factors, regions, types of injury and alcohol involvement. Incidence and cost data are provided for 2012, and compared primarily with corresponding data for 2003. Differences in the costs of injury in 2003 presented in this report and the earlier one reflect methodological differences, with improved data and more current and advanced techniques adopted in this report.

This study is a cost-of-illness analysis, specifically calculating the cost of injury in WA. Cost-of-illness studies can be either prevalence- or incidence-based (12). Prevalence-based estimates are cross-sectional estimates of costs that occur during a specified time period, typically a year, regardless of the date of onset of the illness. In contrast, incidence-based estimates measure lifetime costs of an illness from onset to conclusion for cases occurring within the period of study, usually a year (12). This study, as in the previous study, employs an incidence-based approach by quantifying the present value of lifetime costs that result from injuries occurring in a single year.

The report has been organised into chapters. Chapter 2 describes the methodology used in this study including a description of the data sources, definitions, analytical methods and strengths and limitations. Chapter 3 provides estimates of the incidence of injuries and corresponding costs in the year 2012, stratified by sociodemographic factors, regions, types of injury and alcohol involvement. Chapter 4 shows the composition of costs by cost component including to the health sector, other sectors, loss of productivity and quality of life loss. Chapter 5 compares the incidence of injuries and costs for the years 2003 and 2012 stratified across multiple dimensions. Chapter 6 presents the incidence of injuries and costs by broad diagnosis group. Chapter 7 provides an overview of the results and discusses implications for future injury prevention and research. The Appendices provide incidence and cost estimates in 2012 for each health region.

2. Methodology

2.1 Introduction

This chapter outlines the research methodology used to measure the costs of injury in Western Australia. The next three sections discuss the data sources used to determine the incidence of injuries in WA, how injury events were defined and methods adopted to allocate cost components to injury events. In the following section, data analysis methods are described. In the final two sections, variable definitions are presented and strengths and limitations discussed.

2.2 Injury incidence data

Data were drawn from three core data collections from the Department of Health WA including the hospital morbidity data collection, the emergency department data collection and death registrations. Data were also obtained from the administrative personal injury claims data for the Motor Injury Insurance Scheme administered by the Insurance Commission WA (ICWA). The core health data collections and the injury claims data were linked by the Western Australian Data Linkage System (WADLS) after ethics clearance through the Department of Health WA Human Research Ethics Committee (HREC), the WA Aboriginal Health Ethics Committee (WAAHEC) and the Curtin University HREC. The WADLS is a validated, continuing, dynamic data linkage system that creates links between state-level health-related datasets and other data collections (13).

A de-identified extraction of all hospital morbidity records, emergency department records, death records and injury claims records belonging to all people who were injured between 1 January 2003 and 31 December 2012 was performed. Sociodemographic, diagnostic and external cause data from each data collection was included in the extraction with additional crash-related data obtained from the injury claims dataset.

A case was defined as any person who was injured or had an ICWA injury claims record indicating a road crash from 2003 to 2012. For the health and mortality datasets, injuries were classified using the International Classification of Diseases 10th Edition (ICD-10), Australian Modification diagnosis codes. Records were identified as being injury-based if the primary diagnosis was an injury. This included:

- Hospital records with primary diagnosis field as an injury
- Emergency presentation records with primary diagnosis field as an injury
- Emergency presentation records with major diagnostic category listed as 21 (*Injuries, poisonings and toxic effects of drugs*) or 22 (*Burns*)
- A mortality record with coded cause of death field as an injury.

The following ICD codes were used to identify an injury: S00-S99, T00-T79, T89, T90-T99, V00-Y39. Injuries relating to complications of medical and surgical care were excluded (T80-T88, Y62-Y99). Including the injury claims data used in modelling costs, the number of records in the final injury cost dataset was 13,243,569, with records relating to 2,591,141 episodes of care and 2,454,144 injuries (Figure 2.1).

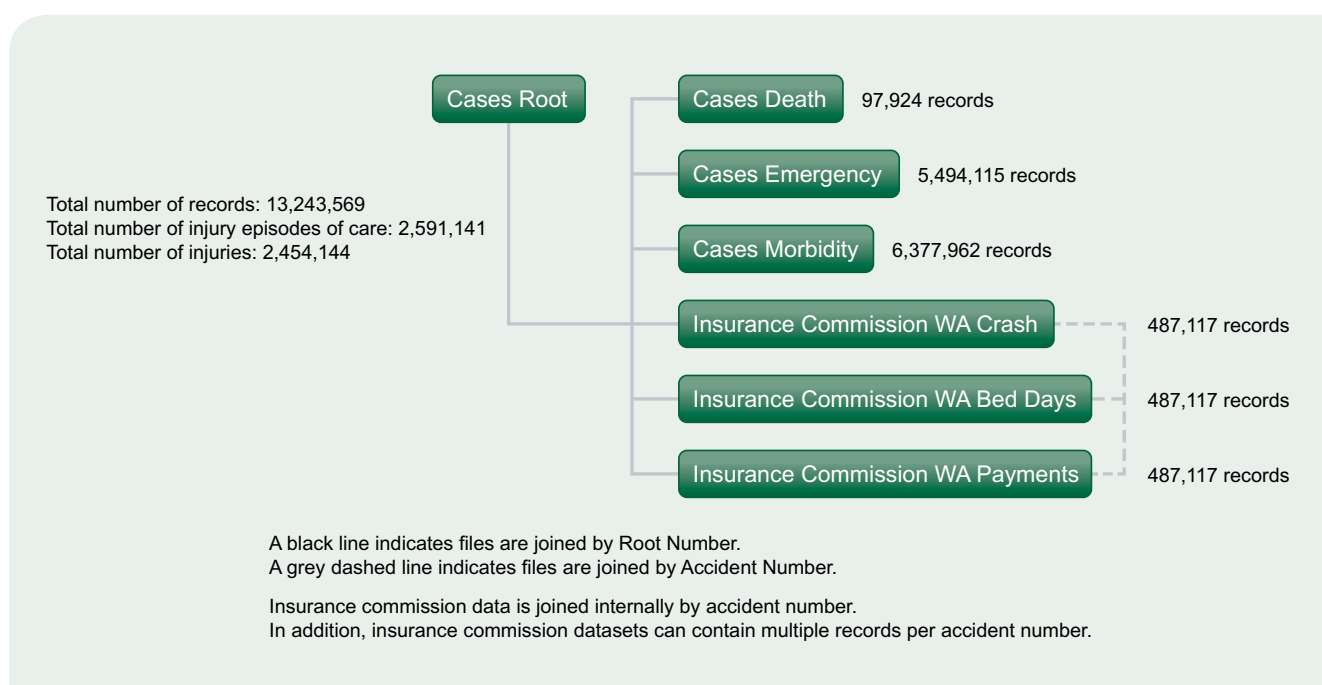


Figure 2.1: Records in the injury cost dataset

2.3 Definition of injury events

2.3.1 Defining an ‘injury’

Rather than explore the costs of injury-based discrete health events, the study examined the costs of an **injury**. An injury may result in a patient presenting multiple times to a health service; each presentation may result in numerous health events being registered (for instance, an emergency presentation followed by a hospital admission).

An injury was defined as a collection of **episodes of care**; with an **episode of care** defined as a collection of temporally contiguous emergency, hospital and mortality records.

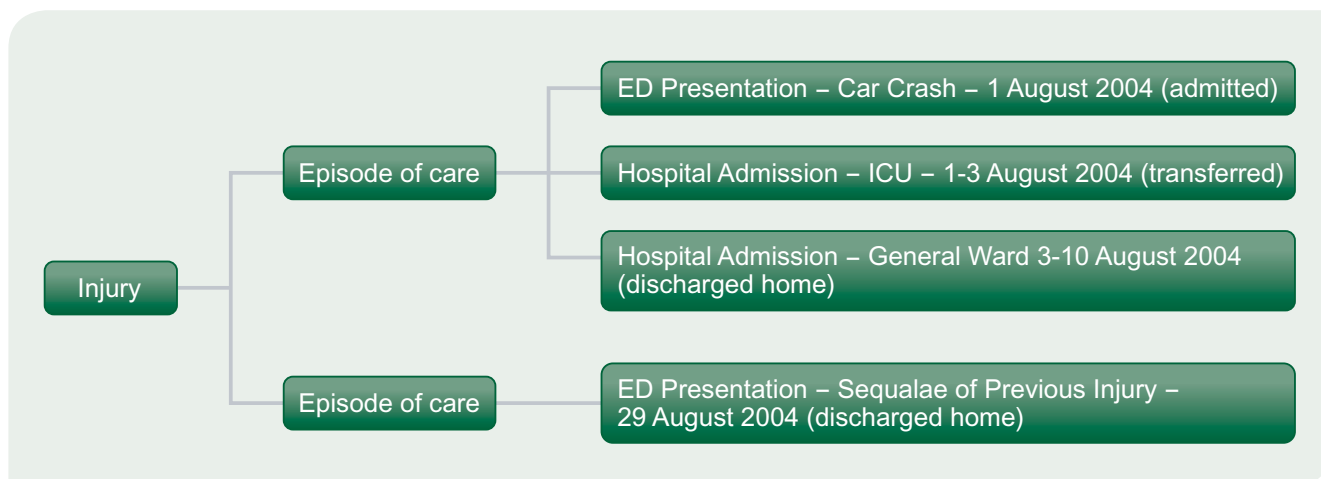


Figure 2.2: **Example of an injury**

2.3.2 Grouping records into episodes of care

Hospital separation records with a mode of separation marked as a **transfer to another hospital** or a **transfer to another ward** were joined together with a second hospital separation record where the separation month and year of the first record matched the admission month and year of the second record (admission/separation day was not made available for this study). There was no limit on the number of hospital records which could be joined together in this way.

Emergency presentation records with a disposal code marked as an admission to hospital were joined with a hospital separation record marked as an admission from an emergency department, where the emergency presentation month and year were the same as the hospital admission month and year.

Finally, mortality records were joined to any hospital admission or emergency presentation where the patient was recorded as deceased.

2.3.3 Grouping episodes of care into a single injury event

Episodes of care with the same injury diagnosis category are more likely to relate to the same underlying injury (rather than a completely separate injury) when there is little temporal difference between them (14).

To identify when two episodes of care belonged to the same injury, a temporal cut-off point was used. Where two episodes of care occurred within a certain time frame, and both were for the same broad injury category, they were marked as belonging to the same injury. The cut-off used varied depending on the type of injury.

The particular cut-off values were determined by examining the time until readmissions for particular injury categories. By graphing these values it was possible to identify a large number of readmissions occurring within a specific period before the readmission rate dropped to consistently low levels. For example in the case of a fracture to the torso (Figure 2.3), readmission rates were high in the same month, and in the next month, with the rates low and steady following this. In this case, a reasonable assumption was that all readmissions within the same month and the next month were likely due to the original injury rather than a second independent injury. (Note each bar in the diagram represents one month.) Cut-off points for the different injury categories ranged from the same month to five months following the injury (Table 2.1). Calendar months rather than days were used to group episodes of care into injury events as the admissions data were released by month and year.

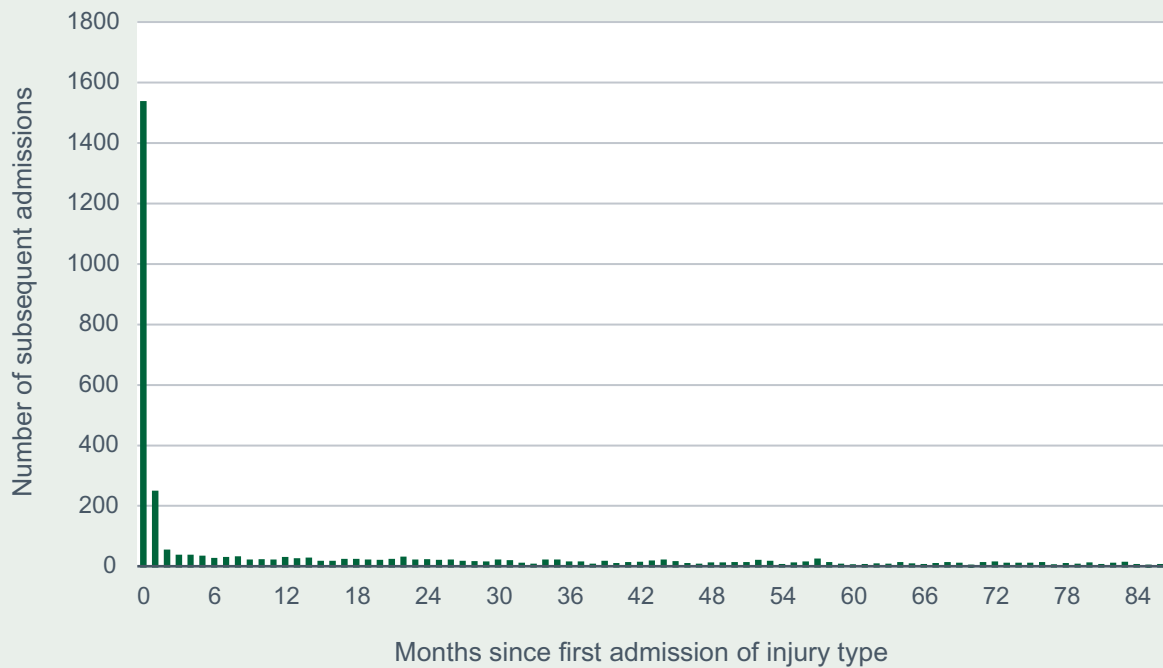


Figure 2.3: Readmissions for fractures to the torso

Table 2.1: Categories and cut-off points used to define an injury event

Injury category	Cut-off points
Extremities – Fracture	Same month + next month
Extremities – No Fracture	Same month only
Head and Neck – Fracture	Same month + next month
Head and Neck – No Fracture	Same month + next month
Spine and Upper Back – Fracture	Same month + next four months
Spine and Upper Back – No Fracture	Same month + next month
Torso – Fracture	Same month + next month
Torso – No Fracture	Same month + next month
Unclassifiable – No Fracture	Same month
Unspecified – No Fracture	Same month + next month
Not categorised – No Fracture	Same month + next two months

2.3.4 Sequelae of a previous injury

Where episodes of care contained only injury diagnoses marked as sequelae of a previous injury, these were attached to the previous injury-based episode of care, regardless of the time difference (i.e. ignoring the cut-off points established above). Where no previous injury based episode of care existed, these sequelae episodes were ignored.

The ICD codes identifying sequelae were T78, T89 and T90-T99.

2.3.5 Categories of injury severity

Injury events were grouped into three mutually exclusive categories reflecting injury severity: (i) injury events resulting in death including deaths occurring within and outside a health care setting; (ii) injury events resulting in hospitalisation with survival to discharge; and (iii) injury events receiving treatment at an emergency department not resulting in hospitalisation or death.

2.4 Costing injuries

2.4.1 General approach

An incidence-based approach, which assesses the lifetime cost of all injuries in a given year, was used to measure the costs of injury in WA. Incidence-based costs measure the potential savings from prevention. In contrast, prevalence-based costs total all injury-related costs occurring in a given year, regardless of when the injuries occurred (12).

Costs were calculated using a comprehensive cost method (known also as willingness-to-pay costs), which includes health sector costs, costs relating to longer term care needs, loss of paid productivity (or economic loss) and quality of life loss. Loss of unpaid productivity is included as part of quality of life loss (15). Consistent with international practice, resource costs including property damage, workplace disruption, legal and investigation, and correctional, police and fire services were not included (16, 17). The rationale for their exclusion is that these costs can be classified as a cost of the normal law enforcement system, which would have to be paid for irrespective of the occurrence of the injury events.

Costs were expressed in 2014 Australian dollars. Unit costs in earlier years were inflated to 2014 values by applying appropriate price indices (18). Costs in future years such as longer term care needs, loss of paid productivity and quality of life loss were discounted to present values for 2014 by applying a 5% discount factor as is the requirement by the Pharmaceutical Benefits Advisory Committee and the Medical Services Advisory Committee for listings on the Pharmaceutical Benefits Schedule and Medicare Benefits Schedule respectively (19, 20).

Methods for allocating costs to injury events included direct mapping of unit costs to injury events and cost modelling using regression analysis. For some cost components, different methods were used in allocating costs to injury events for the different levels of injury severity.

2.4.2 Hospital costs

The hospital cost for an injury was the sum of the costs for all hospital separations caused by the injury. Hospital separation costs were based on the Australian Refined Diagnosis Related Groups (AR-DRGs) code on each record. Codes were mapped to unit costs for each AR-DRG code using the AR-DRG version specified on records for the year (21-31).

2.4.3 Emergency department costs

The emergency department cost for an injury was the sum of the costs for each emergency presentation caused by the injury. Each emergency department presentation for a specific year was given a fixed cost based on the average cost per presentation (22-31). The reason for applying a single unit cost to all records in a year, rather than adjusting for case complexity, was because records from the emergency department data collection did not include a code to indicate the Urgency Related Group (URG).

2.4.4 Costs derived from the Insurance Commission of WA

Injury claims data obtained from ICWA included payments to claimants for the following cost components: allied health, medical services, ambulance, aids, equipment and modifications, long term care, loss of paid productivity and loss of amenities. These payments were used to model costs for non-fatal injury events. Injury claims data used in modelling costs was included only for those claimants whose claims were finalised or could be assumed to be finalised given the time that had lapsed from the date of the crash.

Where insurance records linked up with an injury event recorded in the hospital morbidity data collection or emergency department data collection, the cost components in the personal injury claims data were directly attached to the injury event record.

Where an injury event did not have an insurance record (for instance, because the injury was not caused by a motor vehicle crash), these cost components were estimated using regression models developed from the injury claims data for similar types of injuries. This enabled these cost components to be estimated for all injuries in WA.

Joining insurance records to injuries

While the linking of insurance records to the health data indicated which insurance records belonged to which person, an additional process was required to determine whether a particular hospital admission, emergency presentation or mortality record was associated with a particular motor vehicle crash documented in the ICWA system.

The frequency of health events occurring after an individual had a recorded crash date within the ICWA system was examined, which showed a large increase of emergency presentations and hospital admissions occurring within the first month after the crash date (Figure 2.4). As such, insurance records were joined to an injury event where that injury event took place within one month of the crash recorded within the ICWA system.

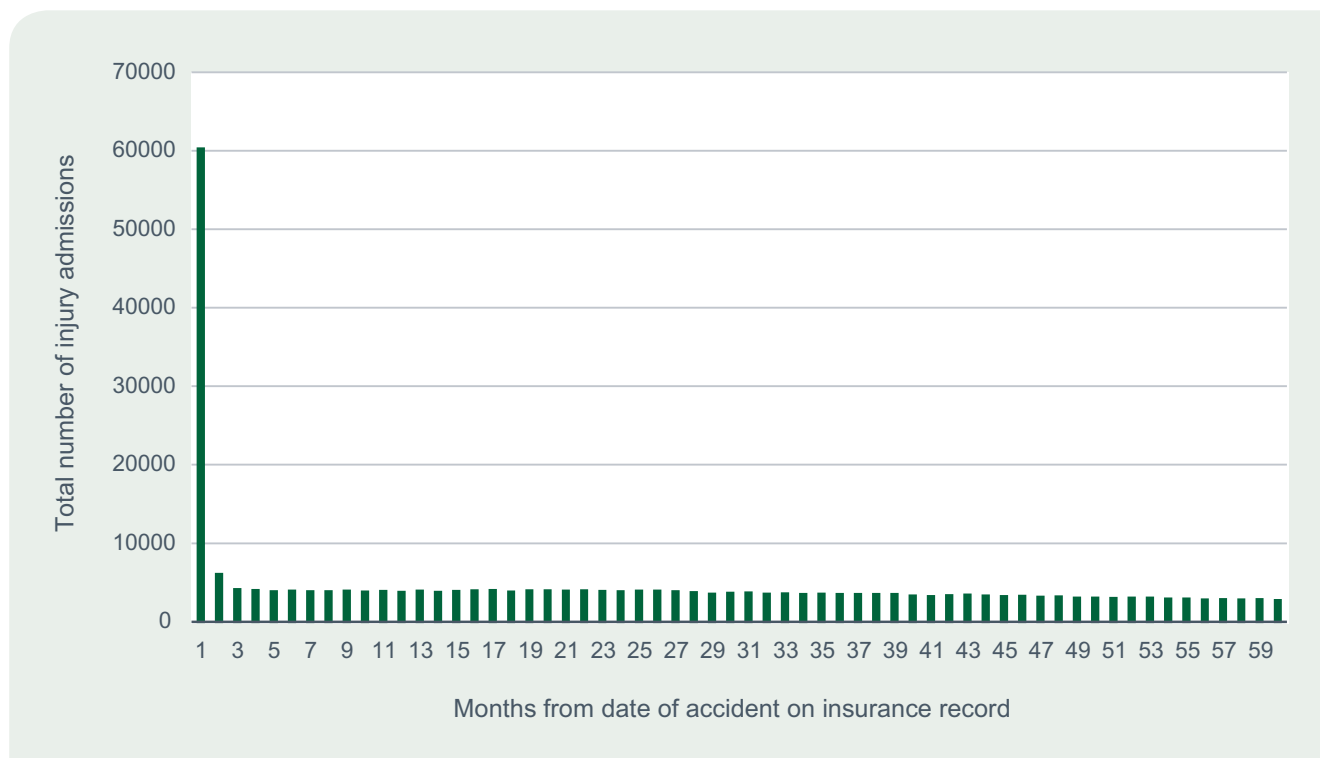


Figure 2.4: Lapsed time from date of accident as recorded on ICWA record to a hospital admission or emergency department presentation

Estimating costs using insurance data

Using insurance claims linked to health events (hospital admissions and emergency department presentations), statistical models were developed which predicted the cost components listed above, using explanatory variables from the hospital admissions and emergency presentation records. These models were then applied to hospital admission and emergency presentation records which did not have an insurance claim, providing direct estimates of the additional cost components.

Each cost component (listed above) was modelled separately. In addition, those injuries resulting in a hospital admission were modelled separately to those involving only an emergency presentation.

Generalised linear modelling was used to estimate costs (32-34). Several varieties of this model were tested, using different link functions (log, identity, inverse) and distributions (gamma, negative binomial, Poisson). In addition, two-part models were also tested; these models use a logistic regression to account for a zero versus a positive value; the positive value is then fitted with an appropriate regression model (32, 35).

Sex, broad age category (<18, 18-65, 65+), nature of injury (e.g. open wound, fracture, etc.), body region of injury, length of stay and exposure time (survival time) were all tested as possible variables within the model. A small number of outlying insurance payment values were also removed. Values were considered outliers when they were both very large and were disconnected from the general distribution of costs (i.e. 30% larger than the next largest value). No more than 20 values (of approximately 370,000) were considered outliers for any particular cost.

Models were compared for goodness of fit using the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). In addition, the data was split into a 'training set' and a 'validation set', with the model fitted on the training set and used to predict responses in the validation set, with the Pearson correlation between predicted and actual values used as a further measure of goodness of fit (36, 37).

The final chosen model used sex, age category, nature of injury, body region of injury and exposure time within a two-part model, using logistic regression for the first part, and a generalised linear model for the second, with a gamma distribution and a log-link function. A two-part model was selected because a substantial proportion of cases had zero costs for some components, and two-part models take account of this by distinguishing between a binary indicator, used to model the probability of any costs, and a conditional regression model for the positive costs (38). Zero costs reflected cases in the insurance records not having incurred costs for a particular component. Generalised linear models have been shown to perform well in the estimation of population means of healthcare costs (39), with the gamma model with a log link potentially providing more robust estimators (40).

For a given cost y and set of predictors x , the structure of the two-part model was as follows:

$$E(y|x) = \text{Prob}(y>0|x) \cdot E(y|y>0,x)$$

That is, the estimated cost was modelled as the probability of a non-zero cost given the predictors, multiplied by the estimated cost given the predictors, assuming a non-zero cost.

$\text{Prob}(y>0|x)$ was modelled using a standard logit regression:

$$\text{logit}(\text{Prob}(y>0|x)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

where X_1 was a categorical coding for sex, X_2 a categorical coding for nature of injury, X_3 a categorical coding for body region of injury, and X_4 the log of exposure time.

$E(y|y > 0,x)$ was modelled using a generalised linear model with gamma distribution and a log-link function, with the linear predictors as above.

The chosen model was further validated by comparing predictive to actual values for each dependent variable, using bootstrapping to generate confidence intervals (37). Actual values fell within predictive confidence intervals consistently.

Actual or modelled costs from the injury claims data were used to estimate the costs of allied health, medical services, ambulance, aids, equipment and modifications, and long term care for injury events resulting in hospitalisation and those receiving treatment at an emergency department. Ambulance costs for injury events resulting in death were calculated based on the proportion of deaths that occurred in hospital as reported in the hospital morbidity data collection multiplied by the cost of urgent or life threatening ambulance trips for all callouts in the metropolitan region (41). Other costs including for allied health, medical services, aids, equipment and modifications, and long term care were not included for injury events resulting in deaths.

Actual or modelled costs from the injury claims data were also used to estimate loss of paid productivity for injury events resulting in hospitalisation and those receiving treatment at an emergency department and to estimate quality of life loss for injury events receiving treatment at an emergency department (see below).

2.4.5 Loss of paid productivity

Loss of paid productivity was calculated differently for injury events resulting in death and those resulting in hospitalisation or treatment at an emergency department.

Where the injury event resulted in death, the present value of loss of earnings was calculated by single ages and sex based on average weekly earnings, life expectancy and the productivity growth rate (17, 42-44). The present value of lost earnings represents loss of paid productivity for the death of an 'average' person at each age.

Where the injury event did not result in death, loss of paid productivity for each injury event was derived from estimates modelled from ICWA's injury claims data.

2.4.6 Quality of life loss

Quality of life loss was calculated differently depending on the severity of the injury event.

For injury events resulting in treatment at an emergency department only, quality of life loss for each injury event was derived from actual or modelled costs from the injury claims data using loss of amenities as a proxy for quality of life loss.

Where the injury event resulted in a hospitalisation not resulting in death, quality of life loss was modelled from the Global Burden of Disease study 2013 based on disability weights (45). A disability weight is a weight factor reflecting the severity of a disease or injury on a scale from 0 (perfect health) to 1 (equivalent to death). Years lost to disability (YLD) for non-fatal cases are calculated by multiplying the disability weight by duration of disability (46). Injury events classified by ICD-10 diagnosis codes were mapped to Global Burden of Disease nature of injury codes using an adapted version of a crosswalk from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2006-2016 (47). Disability weights for injury in the short term and long term, and the probability of long-term outcomes, were obtained from the online Burden Calculator (a software tool for estimating the population burden of injuries), and these weights and probabilities used to estimate health loss measured in DALYs (44, 45). Health loss measured in DALYs was monetised based on the value of a statistical life of \$4.2m as recommended by the Office of Best Practice Regulation, adjusted to exclude the after-tax value of loss of paid productivity and taking account of the age- and gender-adjusted present value of life expectancy for people surviving to that age relative to the present value of life expectancy for the population (44, 48, 49). The latter adjustment adjusts for the present value of length of time over which quality of life is lost.

Quality of life loss for fatalities was valued using the estimate of the value of statistical life recommended by the Office of Best Practice Regulation, computed net of the after-tax value of loss of paid productivity (12, 48).

2.5 Variable definitions

2.5.1 Severity

Injuries resulting in death were defined as the most severe. Those injuries involving hospitalisation but not death are defined as **'hospitalisations'** in terms of severity (regardless of whether they also presented to an emergency department). Those injuries **only** involving an emergency department presentation are regarded as the least severe, and are defined as **'emergency department presentations'** within the report.

2.5.2 Aboriginality

An individual was defined as Aboriginal if they were marked as Aboriginal or Torres Strait Islander on **any** record within the hospital, emergency and mortality data collections.

2.5.3 Socioeconomic status

The Index of Relative Socioeconomic disadvantage, one of the Australian Bureau of Statistics' Socio-Economic Indexes for Areas (SEIFA) indexes, was used to identify socioeconomic status. This index ranks areas in Australia as a whole and also for each State/Territory according to relative socioeconomic disadvantage. SEIFA deciles for Western Australia were provided on hospital, mortality and emergency records provided by the Department of Health WA. Where these were not available for a particular injury, other records available for that individual were examined for an appropriate SEIFA decile. These deciles were grouped into quintiles for the report.

2.5.4 Remoteness index

Remoteness is reported using the Accessibility/Remoteness Index of Australia (ARIA) which relies on road distance as a surrogate for remoteness and on the population size of a service centre as a surrogate for the availability of services. This index was provided on hospital, mortality and emergency records by the WA Data Linkage Unit. The Remoteness Index is a five point measure, where 1 = Major Cities, 2 = Inner Regional Australia, 3 = Outer Regional Australia, 4 = Remote Australia and 5 = Very Remote Australia. Where the Remoteness Index was not provided, the postcode of the individual was used to determine remoteness.

2.5.5 Health region

Health services in Western Australia are organised into nine regions: North Metropolitan, South Metropolitan, Goldfields, Great Southern, Kimberley, Midwest, Pilbara, South West and the Wheatbelt. Health region was calculated based on the postcode of the individual thus reflecting place of residence of the injured person rather than place of occurrence of the injury event.

2.5.6 Alcohol aetiological fraction

Alcohol aetiological fractions express the extent to which alcohol contributes to a health outcome. For injuries with only emergency department records, a set figure of 0.32 based on the population alcohol aetiological fraction for injury-related admissions to metropolitan emergency department was used (50). The population alcohol aetiological fraction indicates the proportion of a disease or injury that could be prevented if exposure to alcohol was eliminated (50). For injuries with hospital or mortality records, aetiological fractions based on broad external cause categories (from ICD codes) were used (51). Age, sex, Aboriginality, geographic region and broad external cause were used to identify the appropriate alcohol fraction.

2.5.7 Mechanism of injury

The mechanism categories (e.g. road injury, drowning, poisoning, etc.) were defined using the GBD Injury Expert Group External Cause broad categories (52). Available diagnosis codes from hospital, emergency and mortality records were used to determine the appropriate categories.

2.5.8 Intent of injury

Intent of injury (e.g. intentional or unintentional) was also defined using the GBD Injury Expert Group External Cause categories (52). Primary diagnosis codes from hospital, emergency and mortality records were used to determine the appropriate categories.

2.5.9 Injury diagnosis groups

Injuries were classified into injury diagnosis groups (e.g. skull/brain injury, facial fracture/eye injury, spine/vertebra, etc.) using a concise injury burden grouping that has been shown to predict disability outcomes as well as injury classification systems with many more health states (53, 54).

2.5.10 Body region and nature of injury

Categorisation of injury based on body region (e.g. head and neck, spine and upper back, torso, etc.) and nature of injury (e.g. fracture, dislocation, internal organ injury, etc.) was used for modelling injury claims data. Categories were taken from the ICD-10 Injury Mortality Diagnosis Matrix, a framework designed to organise injury diagnoses into meaningful groupings based on body region and nature of injury (55).

Categorisation used primary diagnosis from hospital, emergency and mortality records. If no body region was specified using these categories, additional diagnosis fields from hospital records were also searched.

2.6 Data analysis

Data were collated using Python 2.7 and analysed using Stata 12 and the Rates Calculator developed by the Epidemiology Branch at the Department of Health WA. Data were classified across multiple dimensions including by sociodemographic factors, regions, types of injury and alcohol involvement.

For 2012, the most recent year in the dataset, frequencies and rates per 1,000 population were calculated using incidence data for injury events and the Estimated Resident Population developed by the Australian Bureau of Statistics, which was downloaded from the Rates Calculator. Estimates for the Aboriginal population of WA were derived by the Epidemiology Branch and obtained from the Rates Calculator (3). Total costs and mean costs were calculated, with a breakdown into component costs presented in some instances.

To reflect change over time, incidence of injury events and cost data for 2012 was compared with 2003. Only hospitalisation and mortality data were included in this analysis as data for emergency presentations are not available for all hospitals prior to 2008 (56). Age-standardised rates were calculated using the Rates Calculator based on the direct method and the 2001 Australian Standard Population (3). Total costs and mean costs were calculated, with costs for both years expressed in 2014 Australian dollars. Mean costs rather than median costs are recommended in economic analysis as they permit a budgetary assessment of total costs, which is the statistic of interest for health care policy decisions (57).

2.7 Strengths and limitations

A major strength of the present study was the use of linked administrative hospital morbidity, emergency department and mortality data to obtain statewide population data on the incidence of these injuries in WA. Using linked health data allowed better estimates of injury events to be derived by enabling injury-based discrete health events likely to be for the same injury to be joined into a single incident cases.

Cost data was drawn from a variety of sources, with direct mapping of unit costs to injury events possible for several cost components including hospitalisations, emergency department presentations, loss of paid productivity for fatalities, and quality of life loss for injury events resulting in hospitalisation and death. Additionally, linking the health data to injury claims data from ICWA allowed the cost of other components to be directly mapped when an injury event record linked with an insurance record. Where an injury event did not link with an insurance record, the cost of other components was modelled using the injury claims data for similar types of injuries.

Another strength of the study was the adoption of a comprehensive cost approach, which included health sector costs, resources required for long term care needs, loss of productivity and quality of life loss. Injury cost models do not always adopt this wider perspective, with some studies covering health sector costs only thus providing a more limited understanding of the burden of injuries to society (58, 59).

However, the study has several limitations. Excluding cases with relatively minor injuries who were fully treated by a general practitioner or other primary health care provider underestimates the incidence and costs of injury in WA. Also, in regard to injury incidence, in combining discrete health events into injury events, assumptions had to be made about which health events related to the same injury event and these assumptions may under- or over-estimate incident cases.

With the health administrative data not collected specifically for research, reliability issues can arise in the data collection process that might not be expected in research studies. In this study, using the GBD Injury Expert Group External Cause categories to define mechanism and intent of injury (52), one in eight injury events were classified in the undetermined intent category. Intent of injury provides useful information to interpret the nature of the problem and develop injury prevention programs.

The cost estimates presented in this study are also subject to several limitations. First, as emergency department data did not include a code to indicate the Urgency Related Group, all presentations for a specific year were allocated a set cost based on the average cost per presentation. In 2013-14, unit costs for a emergency department presentation for an admitted Triage 1 case was \$2,198 compared with \$265 for a non-admitted Triage 5 case (60).

Second, the use of insurance claims data from the Motor Injury Insurance Scheme to attribute costs to some cost components assumes similar resource use and costs for injuries sustained in motor vehicle crashes and injuries with similar diagnoses and different causes. No evidence was found to support or refute this assumption. This limitation was necessary as cost data for these components was not available for injuries sustained by other mechanisms. Although the model estimating costs could not control for mechanism of injury, factors adjusted for in the model included demographic factors and the nature and body region of injury. Also in attributing costs to fatalities, the unit cost of an ambulance trip was based on the unit cost of an urgent or life-threatening ambulance trip in the metropolitan region rather than the unit cost of injury-related trips throughout WA.

Third, ICWA's injury claims data represent payments to motor vehicle occupants who have been injured in a crash. Personal injury insurers have policies to determine eligibility for compensation, permissible claims, reasonable payment levels and thresholds values (61). These policies determine payment to claimants, but payments may not represent actual costs of the injury event. Moreover, out-of-pocket payments by claimants are excluded. However, for injured cases not compensated by motor vehicle personal injury insurance, some costs compensated by ICWA to claimants would be paid out-of-pocket.

Fourth, quality of life loss for injury events resulting in hospitalisation was measured using disability weights, which reflect an average health state weight rather than a direct measure of each individual's health state post-injury (62). Additionally, DALYs were calculated based on estimates of the the average short term duration of the disabling event and the proportion of cases likely to have permanent disability (45).

Fifth, quality of life loss measured in DALYs was converted to monetary values based on the value of a statistical life year. While monetising loss (or gain) of health measured in quality adjusted life years (QALYs) or DALYs is common practice, much debate exists in regard to applying a uniform value to a QALY/DALY in all situations given evidence supporting the value of a QALY/DALY being context specific (63-66).

Sixth, consistent with international practice (16, 17), resource costs relating to property damage, workplace disruption, legal and investigation, and correctional, police and fire services were excluded. To the extent that dealing with injury events increase the cost to government of law enforcement, excluding these costs will underestimate the cost of injury reported in this study.

Finally, analysis of the cost of injury presented in this report was defined by the scope of the project. Additional analyses could have included a sensitivity analysis to test the sensitivity of cost estimates to changes in the value of key parameters, and the cost of injury was not presented by injury severity as measured by one of the internationally recognised injury severity scoring systems such as the Abbreviated Injury Scale (AIS) or the ICD-based Injury Severity Score (ICISS) (67).

3. Incidence and costs of injury, 2012

3.1 Introduction

This section reports on the overall burden of injury in Western Australia. Burden includes both incidence and costs, with costs calculated using an incidence-based approach which quantifies the present value of lifetime costs resulting from all injuries occurring in the year 2012. Costs for this year have been inflated to represent 2014 Australian dollars.

The section is structured as follows. Sections 3.2 to 3.5 describe the number and cost of injury events by severity and sociodemographic characteristics including sex, age group, Aboriginality and socioeconomic status. The next two sections present the number and cost of injury events by severity and area-based measures, specifically the Accessibility/Remoteness Index (ARIA) and health regions. Following this, Section 3.8 discusses the number and cost of injury events by severity and intent and mechanism of injury. The final section addresses the extent to which prior alcohol use contributes to the burden of injury.

3.2 Incidence and costs by injury severity and sex

Incidence counts, rates and costs are presented for three mutually-exclusive categories that reflect severity of injury: (i) injury events resulting in death occurring within and outside a health care setting; (ii) injury events resulting in hospitalisation and not resulting in death; and (iii) injury events receiving treatment at an emergency department not resulting in hospitalisation or death.

In 2012, approximately 227,000 injury events occurred, the equivalent of 93 injury events per 1,000 population (Table 3.1). Fatal injury events accounted for 0.6% of the total, hospitalised injury events accounted for 22.1%, and emergency department presentations for injury accounted for 77.3%. Total lifetime costs associated with these injury events was \$9.6 billion, with the cost of fatalities accounting for 61% of total costs. Mean cost per injury event was approximately \$42,000, ranging from \$4.2m for fatalities to \$11,500 for emergency department presentations.

Males had a higher rate of injury events than females across all severity levels, and accounted for 63% of all injury costs. In addition to a higher incidence rate, mean cost per injury event was higher for males than females for injuries resulting in a fatality or hospitalisation.

Table 3.1: Incidence and costs of injury events by severity and sex, 2012

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal ^b	1,400	0.6	5,839	4,170,852
Hospitalisation ^c	50,128	20.6	1,746	34,834
ED attendance ^d	175,177	71.9	2,009	11,469
Total^e	226,705	93.0	9,595	42,322
Male				
Fatal	852	0.7	3,714	4,358,831
Hospitalisation	29,027	23.6	1,107	38,127
ED attendance	105,554	85.7	1,217	11,532
Total	135,433	110.0	6,038	44,581
Female				
Fatal	547	0.5	2,120	3,876,468
Hospitalisation	21,093	17.5	639	30,298
ED attendance	69,548	57.7	791	11,371
Total	91,188	75.6	3,550	38,934

a. Rate per 1,000 population.

b. Includes 1 fatal case of unknown gender.

c. Includes 8 hospital admitted cases of unknown gender.

d. Includes 75 emergency department cases of unknown gender.

e. Includes 84 cases of unknown gender.

3.3 Incidence and costs by age group and sex

The rate of injury events was greater for males than females in all age groups up until 65-74 years (Table 3.2). For the two older age groups (75-84 and 85+), rates were higher in females. The rate in males reached a peak in those aged 15-19 years, then declined, reaching its lowest rate in those aged 65-74 years and then increased again in the two older age groups. The rate in females peaked in the 1-4 year age group and declined until ages 55-64 years, then showing a marked increase in those aged 75-84 and 85 years and above.

The mean costs were higher for males for all age groups. Strikingly higher mean costs for males were noted in the <1 age group and, to a lesser extent, in the 20-24 year age group. In the 20-24 year age group the injury rate for males was nearly twice that of females and the total cost of those injuries 3.4 times higher, suggesting that not only did males in this age group have more injury events but the injuries were more severe. Also contributing to higher mean costs for males is a higher loss of paid productivity by age for similar injuries. This results from the gender pay gap between women's and men's average weekly full-time equivalent earnings (68).

The trend for higher mean costs for males continued in the 85 year and above age group where despite greater total costs for females (reflecting a higher incidence rate), the mean cost for males was still \$49,160 higher. This again may indicate that male injuries were more severe. Mean costs for males and females over age 75 years were over \$99,000, more than double the mean cost overall.

Table 3.2: Incidence and costs of injury events by age group and sex, 2012

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	1,277	75.0	1,091	67.8	2,370	71.6
1-4	10,685	161.5	8,164	128.9	18,861	145.7
5-9	9,139	116.4	6,808	90.0	15,954	103.5
10-14	12,595	163.7	7,948	107.3	20,555	136.1
15-19	14,938	183.9	7,627	100.2	22,569	143.4
20-24	15,692	166.0	7,777	88.6	23,481	128.8
25-34	24,177	122.6	12,368	68.4	36,560	96.7
35-44	16,823	94.1	10,121	58.5	26,953	76.6
45-54	11,988	72.1	8,548	52.1	20,541	62.2
55-64	8,081	59.8	6,604	49.0	14,688	54.4
65-74	4,757	55.8	4,721	55.1	9,480	55.5
75-84	3,250	77.4	4,866	94.9	8,116	87.0
≥85	2,027	159.3	4,542	192.3	6,569	180.7
Total	135,429	110.0	91,185	75.6	226,705^b	93.0^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	23	18,241	9	8,265	32	13,641
1-4	129	12,111	88	10,727	217	11,513
5-9	101	11,018	74	10,838	175	10,945
10-14	145	11,506	91	11,456	236	11,491
15-19	372	24,925	162	21,242	534	23,678
20-24	671	42,781	197	25,355	869	37,000
25-34	1,166	48,238	397	32,105	1,569	42,904
35-44	931	55,328	344	33,985	1,275	47,305
45-54	690	57,559	347	40,622	1,037	50,498
55-64	497	61,546	268	40,513	765	52,079
65-74	311	65,336	198	41,896	509	53,652
75-84	498	153,212	485	99,580	982	121,056
≥85	497	245,427	891	196,267	1,389	211,437
Total	6,038	44,581	3,550	38,934	9,595^b	42,322^b

a. Rate per 1,000 population.

b. Includes cases with missing age or sex.

3.4 Incidence and costs by Aboriginality

The rates of injury events for Aboriginal people were higher for all severity levels (Table 3.3). The rate ratios for Aboriginal and non-Aboriginal people were 1.6:1, 2.6:1 and 2.5:1 for fatalities, hospital admissions and emergency department presentations respectively. Higher incidence rates may be influenced by the majority of Aboriginal people living in regional and remote areas (see Section 3.6) (69) and being from areas of more socioeconomic disadvantage (see Section 3.5) (70). Both factors were found to be associated with higher injury rates. These rates, and those presented in Tables 3.5 and 3.6, are not age standardised rates. Age-adjusted rates are presented in the chapter on trends (Chapter 5).

Mean costs across severity levels were similar, with comparable ratios of 1.1:1, 1.0:1 and 0.9:1 respectively.

Higher injury rates for Aboriginal people were reflected in a share of total injury costs of 7.7% compared with a share of the total population in WA of 3.6% (71).

Table 3.3: **Incidence and costs of injury events by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	93	1.0	1,307	0.6	1,400	0.6
Hospitalisation	4,582	51.3	45,546	19.4	50,128	20.6
ED attendance	15,310	171.3	159,867	68.1	175,177	71.9
Total	19,985	223.6	206,720	88.0	226,705	93.0
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	424	4,554,332	5,416	4,143,566	5,839	4,170,852
Hospitalisation	157	34,364	1,589	34,882	1,746	34,834
ED attendance	161	10,534	1,848	11,559	2,009	11,469
Total	742	37,142	8,852	42,822	9,595	42,322

a. Rate per 1,000 population. Age-adjusted rates are presented in Table 5.6.

3.5 Incidence and costs by socioeconomic status and severity

Socioeconomic status has been measured using the Socio-Economic Indexes for Areas (SEIFA) index of relative socioeconomic disadvantage, with incidence and cost data reported in quintiles ordered from lowest to highest (Table 3.4).

The areas of highest socioeconomic disadvantage had the highest injury event rates across all levels of severity. The rates tended to decrease as disadvantage decreases. The rate ratios for fatalities in the most disadvantaged compared to the least disadvantaged was 2.3:1. For hospitalisations and emergency department presentations the comparable rate ratio was 1.6:1.

The higher rates of injury events in the most disadvantaged areas were reflected in total costs, with costs decreasing as disadvantage decreases. The rate ratios for total and mean cost in the most disadvantaged compared to the least disadvantaged groups were 1.8:1 and 1.2:1 respectively.

Table 3.4: **Incidence and costs of injury events by socioeconomic status and severity, 2012**

SEIFA ^b	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a		
1	409	0.9	12,511	27.3	42,803	93.4	55,723	121.5	2,603	46,706
2	272	0.6	10,342	21.6	35,494	74.2	46,108	96.4	1,880	40,768
3	257	0.5	9,486	19.4	33,434	68.5	43,177	88.4	1,792	41,501
4	237	0.5	8,958	17.7	32,183	63.6	41,378	81.7	1,695	40,975
5	198	0.4	8,288	16.4	28,260	55.8	36,746	72.5	1,430	38,920
Total^c	1,400	0.6	50,128	20.6	175,177	71.9	226,705	93.0	9,595	42,322

a. Rate per 1,000 population.

b. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

c. Includes 27 fatalities, 543 hospital admitted cases and 3,003 emergency department cases with missing SEIFA.

3.6 Incidence and costs by accessibility/remoteness of residence and severity

The incidence and costs of injury events by accessibility is reported using the Accessibility/Remoteness Index of Australia (ARIA), with the five categories as follows: 1 = Major Cities, 2 = Inner Regional Australia, 3 = Outer Regional Australia, 4 = Remote Australia, 5 = Very Remote Australia (Table 3.5).

Fatality rates were relatively stable across all levels of remoteness while the hospitalisation rate increased steadily with remoteness. This may be partly explained by the comparative lack of primary care facilities in regional and remote areas and the lack of community-based support for people with injuries (72). Another contributory factor could be the higher incidence rate of serious injury in the agriculture industry (73). Emergency department presentations also showed a marked increase with remoteness. However, the emergency department attendance rate in very remote areas (Category 5) showed a marked drop to less than the attendance rate for inner regional areas (Category 2). This may be explained by the difficulty of people in such remote areas in actually reaching the hospital and that they only seek to do so in the case of severe injury. Less severe injuries may possibly be managed at home.

Major cities (Category 1) accounted for 68% of the total costs and had the highest mean costs. Remote areas (Category 4) with their high emergency department presentations had the lowest mean costs.

Table 3.5: **Incidence and costs of injury events by accessibility/remoteness and severity, 2012**

ARIA ^b	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a		
1	979	0.5	35,946	19.2	108,211	57.9	145,136	77.7	6,523	44,946
2	144	0.7	4,507	20.6	21,690	99.0	26,341	120.2	1,005	38,140
3	141	0.8	4,155	22.5	20,852	112.8	25,148	136.0	967	38,436
4	57	0.6	2,645	26.1	13,321	131.6	16,023	158.2	488	30,440
5	37	0.6	1,811	27.9	6,156	94.7	8,004	123.2	301	37,587
Total^c	1,400	0.6	50,128	20.6	175,177	71.9	226,705	93.0	9,595	42,322

a. Rate per 1,000 population. Age-adjusted rates are presented in Table 5.7.

b. ARIA coding: 1=Major Cities; 2=Inner Regional; 3=Outer Regional; 4=Remote; 5=Very Remote.

c. Includes 42 fatalities, 1,064 hospital admitted cases and 4,947 emergency department cases with missing ARIA.

3.7 Incidence and costs by health region and severity

The fatality rates across health regions were generally uniform with the exception of the Kimberley and the Wheatbelt where the fatality rate was appreciably higher (Table 3.6). The Kimberley also had the highest rate of hospitalisation, followed by the Wheatbelt and then the Midwest while the lowest hospitalisation rate was in the Great Southern.

The highest rate of emergency department presentations was in the Wheatbelt, Kimberley and then the Goldfields whereas the lowest rates were in the metropolitan area.

The highest total and mean costs for injury events by region were in the metropolitan area whereas the lowest were in the Great Southern.

Table 3.6: **Incidence and costs of injury events by health region and severity, 2012**

Health region	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a		
North Metro	487	0.5	19,220	19.1	56,442	56.2	76,149	75.8	3,302	43,357
South Metro	504	0.6	17,169	19.0	52,465	58.0	70,138	77.6	3,290	46,914
Goldfields	44	0.7	1,216	20.0	7,952	130.8	9,212	151.6	333	36,183
Great Southern	25	0.4	922	15.9	6,039	103.9	6,986	120.2	199	28,531
Kimberley	36	0.9	1,738	45.6	5,843	153.3	7,617	199.8	285	37,463
Midwest	36	0.5	1,688	25.5	6,918	104.3	8,642	130.3	281	32,479
Pilbara	29	0.5	1,228	19.1	6,299	98.2	7,556	117.8	250	33,042
Southwest	91	0.6	3,035	18.4	14,649	88.9	17,775	107.9	650	36,595
Wheatbelt	96	1.2	2,546	33.0	12,123	157.2	14,765	191.5	616	41,732
Total^b	1,400	0.6	50,128	20.6	175,177	71.9	226,705	93.0	9,595	42,322

a. Rate per 1,000 population. Age-adjusted rates are presented in Table 5.8.

b. Includes 52 fatalities, 1,366 hospital admitted cases and 6,447 emergency department cases with missing health region.

3.8 Incidence and costs by intent and mechanism of injury and severity

Injury events can be classified on the basis of the imputed intent of the people involved (74). An injury event can be unintentional, meaning it was not inflicted by deliberate means, or intentional, meaning it was caused by an act carried out on purpose by the injured person or by another person with the goal of injuring or killing.

Emergency department data are not included in this section as most hospitals outside of the metropolitan area do not record diagnosis codes on emergency department records.

The majority of fatal injury events and hospitalisations were unintentional (Table 3.7). The rate of hospitalisations for self-harm injuries was similar to the rate of hospitalisations for injuries purposefully inflicted by others.

In terms of severity levels, just under 10% of intentional self-harm injury events were fatal, compared to 2% of unintentional injury events and 1% of intentional interpersonal injury events. Given their higher incidence rate, unintentional injury events accounted for the highest total cost. However, the mean cost of intentional self-harm injury events was considerably higher than for unintentional injury events and intentional inter-personal events, a result of the high fatality rate.

Table 3.7: **Incidence and cost of injury events by intent of injury and severity, fatalities and hospitalisations, 2012**

Intent	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	896	0.4	36,677	15.0	37,573	15.4	5,004	133,184
Intentional self-harm	339	0.1	3,163	1.3	3,502	1.4	1,579	450,838
Intentional inter-personal	30	0.0	3,146	1.3	3,176	1.3	251	78,983
Undetermined	99	0.1	6,278	2.6	6,377	2.6	567	88,879
Total^b	1,400	0.6	50,128	20.6	51,528	21.1	7,585	147,209

a. Rate per 1,000 population.

b. Includes 36 fatalities and 864 hospital admitted cases with missing intent.

3.9 Incidence and costs by intent, mechanism and severity – fatalities and hospitalisations

Injury events can be further classified by the mechanism or cause of injury (74), which can be determined from the ICD-10 external cause of injury code. In this study, injury events have been grouped based on the GBD Injury Expert Group External Cause broad categories (Table 3.8) (52). Falls and transport injuries were the most common categories for both fatalities and hospitalisations. The 'other' category was high for hospitalisations. Included in this latter category are injuries caused by cuts/pierces, machinery, forces of nature, overexertion and being struck by/or against incidents.

The total costs of injury events were highest for falls, followed by self-harm injuries and then transport injuries. The mean cost of injury events involving drowning was considerably higher than any other injury event, a result of the high proportion of drownings being fatal. Mean costs were also high for self-harm injury events and poisonings, again related to high fatality rates.

Table 3.8: Incidence and costs of injury events by intent and mechanism, fatalities and hospitalisations, 2012

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	191	0.1	5,765	2.4	5,956	2.4	1,175	197,351
Fall	455	0.2	16,306	6.7	16,761	6.9	2,252	134,379
Drowning	35	0.0	93	0.0	128	0.1	163	1,272,144
Fires, burns and scalds	10	0.0	784	0.3	794	0.3	111	140,379
Poisoning	102	0.0	1,323	0.5	1,425	0.6	497	348,448
Other	103	0.0	12,406	5.1	12,509	5.1	806	64,398
Intentional								
Self-harm	339	0.1	3,163	1.3	3,502	1.4	1,579	450,838
Violence	30	0.0	3,146	1.3	3,176	1.3	251	78,983
Undetermined intent								
Undetermined	99	0.0	6,278	2.6	6,377	2.6	567	88,879
Total^b	1,400	0.6	50,128	20.6	51,528	21.1	7,585	147,209

a. Rate per 1,000 population.

b. Includes 36 fatalities and 864 hospital admitted cases with missing mechanism.

The rate of injury by mechanism varies by age group (Table 3.9). Falls are the most common category of injury across all age groups except the 15-24 year age group where they are replaced by transport injuries. Falls are most common in the elderly (≥ 65 years) and in the very young (< 5 years). Poisoning is the second most common category of injury in the under 5 year age group and transport injury events are the second most common category in all other age groups apart from the 15-24 year age group. Self-harm injuries and violence are most common in the 15-24 year age group followed by those aged 25-64 years.

Falls, drowning and burns are responsible for the highest costs in the 0-4 year age group, falls and transport injuries in the 5-14 year age group, transport injuries and self-harm injuries in the 15-24 year age group, self-harm and transport injuries in the 25-64 year age group and falls in the over 65 year age group.

Table 3.9: Incidence and costs of injury events by intent, mechanism and age group, fatalities and hospitalisations, 2012

Year	Age group ^b									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	116	0.7	553	1.8	1,527	4.5	3,225	2.4	535	1.8
Fall	1,154	7.1	1,862	6.1	1,039	3.1	4,329	3.3	8,377	27.9
Drowning	47	0.3	13	0.0	22	0.1	38	0.0	8	0.0
Burns	178	1.1	113	0.4	134	0.4	307	0.2	62	0.2
Poisoning	304	1.9	57	0.2	187	0.6	695	0.5	182	0.6
Other	895	5.5	1,285	4.2	2,240	6.6	6,514	4.9	1,575	5.2
Intentional										
Self-harm	0	0.0	122	0.4	1,091	3.2	2,133	1.6	155	0.5
Violence	23	0.1	51	0.2	943	2.8	2,107	1.6	52	0.2
Undetermined intent										
Undetermined	182	1.1	258	0.8	1,226	3.6	3,949	3.0	762	2.5
Total^c	2,946	18.1	4,344	14.2	8,505	25.0	23,696	17.8	12,036	40.0
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	16	11.7	29	18.7	292	30.9	702	19.6	137	4.9
Fall	22	16.5	44	28.9	50	5.2	334	9.3	1,801	65.0
Drowning	22	15.9	9	5.9	55	5.9	66	1.8	11	0.4
Burns	22	16.2	10	6.4	13	1.4	56	1.6	11	0.4
Poisoning	5	4.0	2	1.0	39	4.1	425	11.9	26	0.9
Other	36	26.3	39	25.3	107	11.3	366	10.2	258	9.3
Intentional										
Self-harm	0	0	10	6.7	272	28.8	1,111	31.1	180	6.5
Violence	1	0.5	6	3.6	51	5.5	181	5.0	12	0.4
Undetermined intent										
Undetermined	12	8.6	5	3.0	51	5.4	264	7.4	235	8.5
Total^c	136	100.0	154	100.0	945	100.0	3,576	100.0	2,770	100.0

a. Rate per 1,000 population.

b. Excludes cases for whom age was missing.

c. Includes 900 cases with missing mechanism.

3.10 Injuries and costs by alcohol-attributable status

Whether alcohol is a contributing factor to the cause of an injury is not recorded within health datasets. Previous research has developed alcohol aetiological fractions, which express the probability that alcohol was a contributing factor to a particular injury, based on demographic and injury characteristics. These fractions were applied to hospitalisations (51) but for emergency department records a set figure of 0.32 was used (50). These fractions were summed, (and the proportion of costs they represented were summed) to determine overall incidence and costs for injuries attributable to prior alcohol use.

Prior use of alcohol was the cause of 17.5% of fatalities, 11.8% of hospitalisations and 32% of emergency department presentations. The mean cost of alcohol-attributable injuries was less than of non-alcohol related injuries, due to their lower severity (higher rate of emergency presentations). The overall cost of injuries in 2012 caused by alcohol was \$1.9 billion.

Table 3.10 Incidence and costs of injury by alcohol-attributable status, 2012

Alcohol status	Incidence by severity and alcohol-attributable status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol	n	% alcohol	n	% alcohol	n	% alcohol		
Alcohol	245	17.5	5,911	11.8	56,057	32.0	62,213	27.4	1,946	31,282
Non-alcohol	1,155	82.5	44,217	88.2	119,120	68.0	164,492	72.6	7,649	46,501
Total	1,400	100.0	50,128	100.0	175,177	100.0	226,705	100.0	9,595	42,322

4. Costs of injury by cost category, 2012

4.1 Introduction

Injury costs fall into four categories: health sector costs, costs relating to longer-term care needs, loss of paid productivity and quality of life loss. Analysing the composition of costs provides an indication of the distribution of the burden of injury by sector. Health sector costs are largely borne by the government, resource costs (health sector costs plus longer term care costs) by the government and individuals and their families, loss of paid productivity by employers and to a lesser extent the government from loss of tax revenue and individuals from loss of income, and quality of life loss by individuals and their families.

This chapter examines costs of injury by cost category for WA overall, by health region and by intent and mechanism of injury.

4.2 Costs of injury by cost category

Of total costs of injury in WA of \$9.6 billion, resource costs accounted for 15.5%, loss of paid productivity for 19.8% and quality of life loss for 64.7% (Table 4.1). Resource costs included health sector costs of 12.3% and costs of long term care needs of 3.2%.

Table 4.1: **Costs of injury by cost component, 2012**

Cost component	Total costs		Mean cost
	\$m	%	\$
Hospital	463	4.8	2,044
Emergency department	137	1.4	605
Other medical	515	5.4	2,270
Ambulance	63	0.7	279
Long term care including aids and appliances	307	3.2	1,355
Sub-total: Resource costs	1,486	15.5	6,553
Loss of paid productivity	1,897	19.8	8,370
Quality of life loss	6,213	64.7	27,399
Sub-total: Loss of productivity quality of life loss	8,109	84.5	35,768
Total	9,595	100.0	42,322

Some differences existed between health regions in the composition of the costs of injury by category (Table 4.2). The share of health system costs varied from 10.6% to 15.3% with a similar range for total resource costs of 14.1% to 19.6%. Excluding quality of life loss, the share of other costs varied from 31.1% to 42.1%.

Table 4.2: **Costs of injury by health region and cost category, 2012**

Health region	Costs							
	Health system ^a		Total resources ^b		Total excluding QoL loss ^c		Total ^d	
	\$m	%	\$m	%	\$m	%	\$m	%
North Metro	416	12.6	522	15.8	1,161	35.2	3,302	100.0
South Metro	381	11.6	485	14.7	1,088	33.1	3,290	100.0
Goldfields	40	12.0	49	14.7	126	37.8	333	100.0
Great Southern	21	10.6	39	19.6	81	40.7	199	100.0
Kimberley	40	14.0	47	16.5	120	42.1	285	100.0
Midwest	43	15.3	52	18.5	112	39.9	281	100.0
Pilbara	36	14.4	43	17.2	108	43.2	250	100.0
Southwest	85	13.1	115	17.7	240	36.9	650	100.0
Wheatbelt	71	11.5	87	14.1	196	31.8	616	100.0
Total^e	1,178	12.3	1,485	15.5	3,382	35.2	9,595	100.0

QoL = Quality of life

- a. Includes cost of hospital admissions, emergency department presentations, other medical visits and resources, and ambulance transport.
- b. Includes health system costs and the costs of long term care including aids and appliances. Costs of long term care can be separately identified by subtracting health system costs from total resource costs.
- c. Loss of paid productivity can be calculated by subtracting total resources from total excluding QoL loss.
- d. QoL loss can be calculated by subtracting total costs from total excluding QoL loss.
- e. Includes costs for cases with missing health region.

Costs of injury by cost category varied widely by intent and mechanism of injury (Table 4.3). For example, resource costs including health sector costs and those relating to longer-term care needs comprised 0.6%, 2.4% and 2.5% for drowning, poisoning, and self-harm injuries respectively. In contrast, resource costs accounted for 14.9% and 15.5% of total costs for falls and injuries resulting from interpersonal violence respectively. An underlying driver of differences in the relative share of resource costs by injury mechanism was differences in fatality rates. For mechanisms of injury with a higher fatality rate, loss of paid productivity and quality of loss dominate total costs (given their high absolute values compared with resource costs). Also impacting on the share of cost categories in total costs is the age profile of injured people, with the present value of loss of earnings peaking in the population in their mid-20s and quality of life loss for similar injuries higher for younger people.

Table 4.3: **Costs of injury by intent and mechanism of injury and cost category, fatalities and hospitalisations, 2012**

	Costs							
	Health system ^a		Total resources ^b		Total excluding QoL loss ^c		Total ^d	
	\$m	%	\$m	%	\$m	%	\$m	%
Unintentional injuries								
Transport	95	8.1	128	10.9	360	30.6	1,175	100.0
Fall	273	12.1	335	14.9	459	20.4	2,252	100.0
Drowning	1	0.6	1	0.6	35	21.5	163	100.0
Fires, burns and scalds	10	9.0	11	9.9	19	17.1	111	100.0
Poisoning	11	2.2	12	2.4	108	21.7	497	100.0
Other	133	16.5	163	20.2	306	38.0	806	100.0
Intentional injuries								
Self-harm	37	2.3	39	2.5	328	20.8	1,578	100.0
Violence	33	13.1	39	15.5	98	39.0	251	100.0
Undetermined intent								
Undetermined	68	12.0	81	14.3	169	29.8	567	100.0
Total^e	673	8.9	822	10.8	1,909	25.2	7,585	100.0

QoL = Quality of life

- Includes cost of hospital admissions, emergency department presentations, other medical visits and resources, and ambulance transport.
- Includes health system costs and the costs of long-term care including aids and appliances. Costs of long-term care can be separately identified by subtracting health system costs from total resource costs.
- Loss of paid productivity can be calculated by subtracting total resources from total excluding QoL loss.
- QoL loss can be calculated by subtracting total costs from total excluding QoL loss.
- Includes costs for cases with missing mechanism of injury.

5. Injury trends and costs, 2003 to 2012

5.1 Introduction

This section investigates the differences in age-standardised injury rates and costs over time. Section 5.2 provides overall rates and costs for all years 2003 to 2012. Sections 5.3 to 5.10 investigate the difference between injury rates and costs between 2003 and 2012, stratified across multiple dimensions – these tables are generally similar to those found in Chapter 3.

To enable comparability, all costs have been inflated to 2014 prices, and all rates are based on the 2001 Australian population (3).

The Emergency Department Data Collection first began in Western Australia in 2000/01, but this did not include all emergency departments until 2008. Prior to this, the number of presentations per year prior to that date will be incomplete – for this reason, emergency presentations have been excluded from most tables in this chapter.

5.2 Trend in incidence and costs by severity

The age-standardised rate for fatalities due to injury events from 2003 to 2012 has remained fairly constant (Table 5.1). In contrast, the hospitalisation rate has increased, as has the emergency department presentation rate, the latter partly explained by data becoming available from more hospitals through until 2008.

Excluding emergency department presentations, the total cost of injury events increased from \$6.2 billion in 2003 to \$7.6 billion in 2012, likely due both to increased hospitalisation rates and an increased population, but the rate of increase has declined in more recent years (Table 5.2). The mean cost of injury events has been declining largely due to the decreasing proportion of fatal injuries.

Table 5.1: **Trend in incidence and costs of injury by severity, all severity levels, 2003-2012**

Year	Incidence								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a		
2003	1,076	0.6	33,370	17.3	100,539	51.4	134,985	69.3	8,357	61,912
2004	1,028	0.5	34,285	17.6	109,497	55.4	144,810	73.5	8,290	57,248
2005	1,063	0.5	34,594	17.4	123,173	61.5	158,830	79.4	8,634	54,361
2006	1,163	0.6	36,290	17.8	135,148	66.3	172,601	84.7	9,224	53,444
2007	1,288	0.6	36,672	17.5	135,841	64.9	173,801	83.0	9,727	55,968
2008	1,311	0.6	39,323	18.2	152,223	70.4	192,857	89.2	10,135	52,550
2009	1,278	0.6	42,209	18.9	156,024	70.0	199,511	89.4	9,869	49,466
2010	1,408	0.6	44,634	19.5	160,643	70.6	206,685	90.7	10,270	49,689
2011	1,306	0.6	48,407	20.5	171,439	73.6	221,152	94.6	9,763	44,146
2012	1,400	0.6	50,128	20.5	175,177	72.6	226,705	93.7	9,595	42,322

a. ASR = age standardised rate per 1,000 population.

Table 5.2: Trend in incidence and costs of injury by severity, fatalities and hospitalisations, 2003-2012

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	ASR ^a	n	ASR ^a	n	ASR ^a		
2003	1,076	0.6	33,370	17.3	34,446	17.9	6,188	179,630
2004	1,028	0.5	34,285	17.6	35,312	18.1	5,992	169,695
2005	1,063	0.5	34,594	17.4	35,656	17.9	6,111	171,389
2006	1,163	0.6	36,290	17.8	37,453	18.4	6,582	175,741
2007	1,288	0.6	36,672	17.5	37,960	18.1	7,170	188,879
2008	1,311	0.6	39,323	18.2	40,634	18.8	7,384	181,713
2009	1,278	0.6	42,209	18.9	43,487	19.4	7,224	166,127
2010	1,408	0.6	44,634	19.5	46,041	20.1	7,780	168,972
2011	1,306	0.6	48,407	20.5	49,713	21.1	7,392	148,692
2012	1,400	0.6	50,128	20.5	51,528	21.1	7,585	147,209

a. ASR = age standardised rate per 1,000 population.

5.3 Trend in incidence and costs by age group – fatalities and hospitalisations

The overall incidence rate has shown a small increase during the period 2003 to 2012 (Table 5.3). It has not changed in the 0-14 year age group but has shown a small increase in those aged 15-24 and 25-64 years and a larger increase in those aged 65 years and over. This trend was consistent for males and females. Rates in males were higher than in females other than for the 65 year and above age group where they were higher in females (Tables 5.4 and 5.5).

The mean cost per injury event has decreased from \$179,630 to \$147,209 over the period – this decrease was found across all age groups. Mean cost increased with age group reaching \$230,169 in the 65 and over age group. Total costs declined for those aged 0-14 and 15-24 years but increased across the other age groups.

Table 5.3: Trend in incidence and costs by age group, fatalities and hospitalisations, 2003 and 2012

Year	Age groups									
	0-14		15-24		25-64		≥65		Total	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
2003	6,163	15.4	6,137	22.0	14,946	14.2	7,200	32.4	34,446	17.6
2012	7,290	15.6	8,505	25.0	23,696	17.8	12,036	40.0	51,528 ^b	21.1 ^b
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	417	67,609	971	158,240	2,644	176,882	2,156	299,455	6,187	179,630
2012	289	39,696	945	111,093	3,576	150,901	2,770	230,169	7,585 ^b	147,209 ^b

a. Rate per 1,000 population.

b. Includes case for whom age was missing.

Table 5.4: Trend in incidence and costs of injury by age group, fatalities and hospitalisations, males, 2003 and 2012

Year	Age groups									
	0-14		15-24		25-64		≥65		Total	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
2003	3,913	19.0	4,371	30.5	9,545	18.0	2,248	22.4	20,077	20.5
2012	4,429	18.6	5,873	33.4	15,201	22.4	4,375	31.3	29,878 ^b	24.3 ^b
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	245	62,683	742	169,795	1,969	206,295	850	378,007	3,806	189,585
2012	187	42,319	730	124,240	2,633	173,197	1,266	289,260	4,815 ^b	161,332 ^b

a. Rate per 1,000 population.

b. Includes case for whom age was missing.

Table 5.5: Trend in incidence and costs of injury by age group, fatalities and hospitalisations, females, 2003 and 2012

Year	Age groups									
	0-14		15-24		25-64		≥65		Total	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
2003	2,247	11.5	1,766	13.0	5,397	10.4	4,952	40.7	14,362	14.8
2012	2,858	12.5	2,629	16.0	8,492	13.0	7,661	47.7	21,640	17.9
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	171	76,218	229	129,641	674	124,931	1,306	263,795	2,381	165,769
2012	102	35,655	215	81,775	938	110,434	1,505	196,423	2,759	127,518

a. Rate per 1,000 population.

5.4 Trend in incidence and costs by Aboriginality – fatalities and hospitalisations

The fatality rate for Aboriginal people has decreased slightly while the hospitalisation rate has remained steady (Table 5.6). This differed from the non-Aboriginal population, where the fatality rate was stable, but hospitalisations increased. Total costs increased for both the Aboriginal and non-Aboriginal population, however the mean cost of injury for Aboriginal people increased while for non-Aboriginal people it decreased.

Total costs for injury events involving Aboriginal people remained constant at 7.6% of the total injury costs across both years. The difference in mean cost between Aboriginal and non-Aboriginal people has been reduced.

Table 5.6: Trend in incidence and costs of injury by Aboriginality, fatalities and hospitalisations, 2003 and 2012

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	ASR ^a	n	ASR ^a	n	ASR ^a		
Aboriginal								
2003	68	1.7	3,892	56.9	3,960	58.6	473	119,401
2012	93	1.4	4,582	56.4	4,675	57.7	581	124,280
Non-Aboriginal								
2003	1,008	0.6	29,478	15.9	30,486	16.5	5,715	187,454
2012	1,307	0.6	45,546	19.3	46,853	19.8	7,004	149,496

a. ASR = age standardised rate per 1,000 population.

5.5 Trend in incidence and costs by accessibility/remoteness – fatalities and hospitalisations

The injury rate increased in the most accessible areas and remote areas and decreased in the other areas, particularly very remote areas (Table 5.7).

The mean cost of injuries dropped in all ARIA categories other than outer regional areas and the total cost increased in all categories apart from very remote areas.

Table 5.7: **Trend in incidence and costs of injury by ARIA, fatalities and hospitalisations, 2003 and 2012**

Year	ARIA									
	Major cities		Inner regional		Outer regional		Remote		Very remote	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003 ^b	21,287	14.9	4,225	23.2	4,184	24.3	2,224	26.3	2,053	32.7
2012 ^c	36,925	20.0	4,651	19.4	4,296	22.7	2,702	29.0	1,848	24.1
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003 ^b	4,041	189,812	739	174,871	656	156,735	342	153,587	322	156,700
2012 ^c	5,231	141,670	767	164,965	756	175,960	350	129,586	235	127,314

a. ASR = age standardised rate per 1,000 population.

b. Excludes 473 missing cases.

c. Excludes 1,106 missing cases.

5.6 Trend in incidence and costs by health region – fatalities and hospitalisations

Most health regions have shown an increase in the rate of injury events but decreases have occurred in the Goldfields, Great Southern, Kimberley and Pilbara. Total costs increased in all regions other than the Great Southern and the Kimberley and the mean cost decreased in all regions other than the Goldfields, the South West and the Wheatbelt (Table 5.8).

Table 5.8: **Trend in incidence and costs of injury by health region, fatalities and hospitalisations, 2003 and 2012**

Year	Health region									
	North Metro		South Metro		Goldfields		Great Southern		Kimberley	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003	11,680	14.8	11,272	16.2	1,405	26.0	974	18.2	1,625	47.5
2012	19,707	19.5	17,673	19.2	1,260	21.8	947	16.1	1,774	46.2
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	2,310	197,809	2,054	182,261	172	122,689	203	208,720	248	152,606
2012	2,614	132,627	2,677	151,501	252	199,801	140	147,837	221	124,774
Year	Health region									
	Midwest		Pilbara		Southwest		Wheatbelt		Total	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003	1,349	23.2	1,045	24.3	2,273	17.7	2,240	31.5	34,446 ^b	17.9
2012	1,724	26.8	1,257	21.9	3,126	19.2	2,642	35.4	51,528 ^c	21.1
Year	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	204	150,953	161	153,776	336	147,893	368	164,424	6,188 ^b	179,630
2012	212	122,727	184	146,461	490	156,709	493	186,526	7,585 ^c	147,209

a. ASR = age standardised rate per 1,000 population.

b. Includes 583 missing cases.

c. Includes 1,418 missing cases.

5.7 Trend in incidence and costs by intent – fatalities and hospitalisations

The rates of unintentional injuries, self-harm, and injuries of undetermined intent increased from 2003 to 2012 (Table 5.9). Rates of interpersonal violence remained steady. Total costs increased for all types of intent but the mean cost decreased for all categories other than self-harm.

Table 5.9: **Trend in incidence and costs of injury by intent, fatalities and hospitalisations, 2003 and 2012**

Year	Health region									
	Unintentional		Intentional self-harm		Intentional inter-personal		Undetermined		Total	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003	25,015	13.0	2,456	1.2	2,521	1.3	3,401	1.7	34,446 ^b	17.9 ^b
2012	37,573	15.4	3,502	1.4	3,176	1.3	6,377	2.6	51,528 ^c	21.1 ^c
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	4,269	170,666	1,042	424,174	217	86,013	444	130,697	6,188 ^b	179,630 ^b
2012	5,004	133,184	1,579	450,838	251	78,983	567	88,879	7,585 ^c	147,209 ^c

a. ASR = age standardised rate per 1,000 population.

b. Includes 1,053 missing cases.

c. Includes 900 missing cases.

5.8 Trend in incidence and costs by mechanism – fatalities and hospitalisations

When trends in injury events were examined by mechanism, notable increases had occurred in falls, other unintentional (which includes cuts/pierces, machinery, forces of nature, overexertion and struck by/against incidents), intentional self-harm and undetermined (Table 5.10). Trends in transport injuries and injuries from drowning, fires, burns and scalds, poisoning and interpersonal violence have remained relatively constant.

Total costs increased for falls, drowning, poisoning, intentional self-harm, intentional interpersonal and undetermined but decreased for transport, fires, burns and scalds and other unintentional. Mean costs decreased for all mechanisms of injury other than poisoning and intentional self-harm.

Table 5.10: **Trend in incidence and costs of injury by mechanism, fatalities and hospitalisations, 2003 and 2012**

Year	Mechanism									
	Transport		Fall		Drowning		Fires, burns and scalds		Poisoning	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003	4,579	2.3	10,320	5.5	89	.05	567	.29	897	.47
2012	5,956	2.4	16,761	6.9	128	.05	794	.33	1,425	.58
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
	2003	1,323	288,882	1,592	154,311	138	1,550,581	125	221,333	262
2012	1,175	197,351	2,252	134,379	163	1,272,144	111	140,379	497	348,448
Year	Mechanism									
	Other unintentional		Intentional self-harm		Intentional inter-personal		Undetermined		Total	
	Incidence									
	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a	n	ASR ^a
2003	8,563	4.4	2,456	1.2	2,521	1.3	3,401	1.7	34,446 ^b	17.9 ^b
2012	12,509	5.1	3,502	1.4	3,176	1.3	6,377	2.6	51,528 ^c	21.1 ^c
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
	2003	828	96,745	1,042	424,174	217	86,013	444	130,697	6,188 ^b
2012	806	64,398	1,579	450,838	251	78,983	567	88,879	7,585 ^c	147,209 ^c

a. ASR = age standardised rate per 1,000 population.

b. Includes 1,053 missing cases.

c. Includes 900 missing cases.

5.9 Trend in incidence and costs by mechanism and age group – fatalities and hospitalisations

The injury rate of transport injury events increased in those aged 25-64 years, declined in those aged 0-14 years and otherwise remained stable (Table 5.11). In general, total and mean costs decreased other than in the 25-64 year age group where the total cost increased.

The rate of falls increased in all age groups, most noticeably in the 65 year and above age group. Mean costs decreased in all age groups but total costs rose in the 25-64 and 65 year and above age group and declined in the 0-14 year age group.

The numbers of drownings were small and there was little overall change in incidence rates. The total cost of drowning increased in the 15-24 and 25-64 year age group but decreased in the other age groups, although the total cost across all groups increased. The mean cost decreased in all groups other than the 15-24 year age group where the number of drownings had doubled. The mean cost of drowning reached \$2.5m in the 15-24 year age group.

The rates of fires, burns and scalds remained fairly constant over the period as did the total cost in all age groups other than those age 65 years and over where it decreased. Mean costs decreased in all age groups.

The rates of poisoning either remained constant or showed very small increases across the time period. The total costs increased in all age groups while the mean cost increased in the 0-14 and 25-64 year age groups and decreased in those aged 15-24 and 65 years and over. The mean cost of poisoning was over \$600,000 in those aged 25-64 years.

The rate of self-harm remained fairly constant in most age groups but showed a small increase in those aged 15-24 years. The total cost of self-harm rose in all age groups but the mean cost fell in those aged 0-14 and 15-24 years, increased in those aged 25-64 and 65 years and over and reached over one million dollars in the latter age group.

Rates of interpersonal violence remained fairly constant across all age groups. The total cost rose for all age groups and the mean cost rose in the 0-14 and 25-64 year age group but fell in the 15-24 and 65 year and above age groups.

Table 5.11: Trend in incidence and costs of injury by mechanism and age group, fatalities and hospitalisations, 2003 and 2012

Transport										
Year	Age groups									
	0-14		15-24		25-64		≥65		Total	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
2003	907	2.3	1,280	4.6	2,024	1.9	368	1.7	4,579	2.3
2012	669	1.4	1,527	4.5	3,225	2.4	535	1.8	5,956	2.4
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	126	139,249	433	338,158	623	307,604	141	383,312	1,323	288,882
2012	45	66,623	292	191,309	702	217,663	137	255,624	1,175	197,351

Table 5.11 cont.

Falls											
Year	Age groups										
	0-14		15-24		25-64		≥65		Total		
	Incidence										
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	
2003	2,311	5.8	606	2.2	2,533	2.4	4,870	21.9	10,320	5.3	
2012	3,016	6.4	1,039	3.1	4,329	3.3	8,377	27.9	16,761	6.9	
Year	Costs										
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	
	2003	74	32,067	50	82,391	227	89,594	1,242	254,930	1,592	154,311
	2012	67	22,187	50	47,733	334	77,189	1,802	215,072	2,252	134,379
Drowning											
Year	Age groups										
	0-14		15-24		25-64		≥65		Total		
	Incidence										
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	
2003	38	0.1	11	0.0	30	0.0	10	0.0	89	0.0	
2012	60	0.1	22	0.1	38	0.0	8	0.0	128	0.1	
Year	Costs										
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	
	2003	34	887,147	18	1,643,050	60	2,001,776	26	2,616,331	138	1,550,581
	2012	31	511,483	55	2,513,817	66	1,727,593	11	1,399,124	163	1,272,144
Fires, burns and scalds											
Year	Age groups										
	0-14		15-24		25-64		≥65		Total		
	Incidence										
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	
2003	225	0.6	92	0.3	223	0.2	27	0.1	567	0.3	
2012	291	0.6	134	0.4	307	0.2	62	0.2	794	0.3	
Year	Costs										
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	
	2003	32	142,374	14	148,147	53	236,154	27	1,006,291	125	221,333
	2012	32	109,486	13	95,822	56	182,774	11	171,750	111	140,379

Table 5.11 cont.

Poisoning											
Year	Age groups										
	0-14		15-24		25-64		≥65		Total		
	Incidence										
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	
2003	310	0.8	124	0.4	367	0.3	96	0.4	897	0.5	
2012	361	0.8	187	0.6	695	0.5	182	0.6	1,425	0.6	
Year	Costs										
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	
	2003	4	14,054	38	308,971	196	533,561	24	244,895	262	292,080
	2012	7	19,440	39	207,114	425	611,298	26	142,514	497	348,448
Self-harm											
Year	Age groups										
	0-14		15-24		25-64		≥65		Total		
	Incidence										
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	
2003	61	0.2	663	2.4	1,641	1.6	91	0.4	2,456	1.3	
2012	122	0.3	1,091	3.2	2,133	1.6	155	0.5	3,502 ^b	1.4	
Year	Costs										
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	
	2003	5	88,461	193	290,555	740	450,659	104	1,145,134	1,042	424,174
	2012	10	84,513	272	249,544	1,111	520,937	180	1,161,522	1,574	449,517

Table 5.11 cont.

Interpersonal violence										
Year	Age groups									
	0-14		15-24		25-64		≥65		Total	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
2003	119	0.3	752	2.7	1,617	1.5	33	0.1	2,521	1.3
2012	74	0.2	943	2.8	2,107	1.6	52	0.2	3,176	1.3
Year	Costs									
	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$	Total \$m	Mean \$
2003	4	14,054	38	308,971	196	533,561	24	244,895	262	292,080
2012	7	19,440	39	207,114	425	611,298	26	142,514	497	348,448

a. Rate per 1,000 population.

b. Includes 1 case with missing age.

5.10 Trend in incidence and costs by alcohol-attributable status – fatalities and hospitalisations

The percentage of injury events resulting in hospitalisation or death which could be attributed to alcohol decreased from 12.4% in 2003 to 11.9% in 2012. Injury events which could be attributed to alcohol cost more than those which did not involve alcohol. The mean cost for both alcohol and non-alcohol related injuries declined from 2003 to 2012 (Table 5.12).

Table 5.12: Trend in incidence and costs of injury by alcohol-attributable status, fatalities and hospitalisations, 2003 and 2012

Year	Alcohol attributable				Non-alcohol attributable			
	n	%	Total costs \$m	Mean cost \$	n	%	Total costs \$m	Mean cost \$
2003	4,262	12.4	1,014	237,963	30,184	87.6	5,174	171,415
2012	6,156	11.9	1,303	211,694	45,372	88.1	6,282	138,455

6. Incidence and costs of injury by diagnosis group

6.1 Introduction

Injury events were grouped into diagnosis groups using a classification system that combines body region and nature of injury into 13 categories (53). These categories have been shown to predict disability outcomes as well as diagnosis classifications that map to more detailed groupings such as the injury health states published by the 1990 and 2010 GBD studies and the EUROCCOST classification system (54).

This chapter presents injury incidence and mean costs by diagnosis group and severity and shows the trend between 2003 and 2012. Incidence and costs of injury by diagnosis group are of interest to several parties involved in the treatment and longer term care of people with different types of injuries including medical specialists, rehabilitation services, support services, community organisations and carers. Moreover, patterns of injury incidence and corresponding costs by diagnosis can assist in prevention efforts, for example to establish potential cost savings that could be achieved through competing interventions.

Emergency department data are not included in this chapter as most hospitals outside of the metropolitan area do not record diagnosis codes on emergency department records.

6.2 Injury costs by diagnosis group and severity – fatalities and hospitalisations

Diagnosis groups recording the highest number of injury events were superficial injury/open wounds and upper extremity injuries. Injuries to internal organs and burns occurred least frequently (Table 6.1).

Mean costs per injury event were highest for hip fractures and skull/brain injuries, both exceeding \$300,000. Relatively high mean costs exceeding \$100,000 per injury event were also recorded for spine/vertebrae injuries, internal organ injuries and burns. Other diagnosis groups had substantially lower mean costs per injury event.

High mean costs per injury event partly reflected higher fatality rates. For example, the fatality rate for hip fractures, a diagnosis group dominated by the elderly, and skull/brain injuries were 6.9% and 5.1% respectively. The fatality rate for internal organ injuries and spine/vertebrae injuries were also relatively high at 2.1% and 1.8% respectively.

Also influencing mean costs per injury event were higher than average costs for injury events resulting in hospitalisation but not death. Injury events of this level of severity for which mean costs exceeded or were close to \$100,000 included skull/brain injuries, burns and spine/vertebrae injuries.

Table 6.1: Incidence and costs of injury by diagnosis group and severity, fatalities and hospitalisations, 2012

Diagnosis group	Fatal		Hospitalisation		Total	
	n	Mean cost \$	n	Mean cost \$	n	Mean cost \$
Skull/brain injury	103	3,971,083	1,927	104,073	2,030	300,281
Facial fracture/eye injury	0	0	1,704	34,994	1,704	34,994
Spine/vertebrae	34	3,720,208	1,903	94,933	1,937	158,567
Internal organ injury	23	4,267,229	1,080	41,073	1,103	129,198
Upper extremity fracture	28	3,723,899	7,338	32,457	7,366	46,489
Upper extremity/ other injury	<5	4,362,755	3,819	33,004	3,821	35,270
Hip fracture	130	3,718,058	1,761	61,370	1,891	312,755
Lower extremity fracture	46	3,756,808	4,174	42,792	4,220	83,276
Lower extremity/other injury	11	3,673,956	3,582	24,162	3,593	35,336
Superficial injury/open wounds	57	3,713,240	11,745	16,211	11,802	34,066
Burns	6	4,227,775	954	100,934	960	126,726
Poisonings	27	4,157,385	4,929	16,857	4,956	39,415
Other injury	68	3,932,333	4,443	31,551	4,511	90,352
Total^a	1,400	4,170,852	50,128	34,834	51,528	147,209

a. Includes 865 fatalities and 769 hospital admitted cases with missing broad diagnosis group.

Increases in the number of injury events varied widely by diagnosis group (Table 6.2). Lower extremity injuries not involving a fracture and spine/vertebrae injuries recorded the highest increases followed by upper extremity injuries not involving a fracture and the superficial injury/open wound group. The lowest increases were recorded for skull/brain injuries and hip fractures.

Mean costs per injury events decreased for all diagnosis groups other than skull/brain injuries, for which the mean cost remained more or less constant at around \$300,000. Decreases were highest for upper and lower extremity injuries not involving a fracture and internal organ injuries.

Table 6.2: Trend in incidence and mean costs of injury by diagnosis group, fatalities and hospitalisations, 2003 and 2012

Diagnosis	2003		2012	
	n	Mean cost (\$)	n	Mean cost (\$)
Skull/brain injury	1,683	296,445	2,030	300,281
Facial fracture/eye injury	1,293	44,419	1,704	34,994
Spine/vertebrae	1,037	219,146	1,937	158,567
Internal organ injury	668	220,004	1,103	129,198
Upper extremity fracture	5,586	59,935	7,366	46,489
Upper extremity/ other injury	2,147	63,971	3,821	35,270
Hip fracture	1,479	381,236	1,891	312,755
Lower extremity fracture	3,108	99,947	4,220	83,276
Lower extremity/other injury	1,821	56,135	3,593	35,336
Superficial injury/open wounds	7,041	49,855	11,802	34,066
Burns	666	143,567	960	126,726
Poisonings	3,741	47,247	4,956	39,415
Other injury	2,786	97,702	4,511	90,352
Total	34,446^a	179,630^a	51,528^b	147,209^b

a. Includes 659 fatalities and 731 hospital admitted cases with missing broad diagnosis group.

b. Includes 865 fatalities and 769 hospital admitted cases with missing broad diagnosis group.

7. Discussion

This report provides estimates of the incidence and costs of injury in Western Australia using linked administrative health data and personal injury claims data for the Motor Injury Insurance Scheme. Incidence counts were based on injury events, with episodes of care relating to a specific injury combined into a single event. Injury costs included were health sector costs, costs relating to longer term care needs, loss of paid productivity and quality of life loss. The study excluded costs like property damage, workplace disruption, fire services, and criminal justice that result from injury incidents but are not injury costs. Costs were calculated using an incidence-based approach computed by assessing the lifetime costs of all injuries in a given year. The study's limitations, notably the assumption that costs modelled from the Motor Injury Insurance Scheme equalled costs for injuries with similar diagnoses and different causes, are detailed in the methods section.

Injury events were grouped as follows: (i) injury events resulting in death; (ii) injury events resulting in hospitalisation with survival to discharge; and (iii) injury events receiving treatment at an emergency department not resulting in hospitalisation or death.

Key findings of the study were as follows:

Incidence and costs by sociodemographic factors

- In 2012, the number of injury events in WA was 227,000 or 93 injuries per 1,000 population. The total costs were \$9.6 billion.
- Health sector costs accounted for 12.3% of total costs, long term care costs for 3.2%, loss of paid productivity for 19.8%, and loss of quality of life for 64.7%.
- Fatal injuries comprised 0.6% of injury events, non-fatal injuries requiring hospitalisation 22.1%, and those only requiring emergency department presentations 77.3%. However, fatalities accounted for 61% of the total costs of injury.
- Males had a higher rate of injury events than females, and accounted for 63% of all injury costs.
- The injury rate was highest in the 85 years and above age group, with high rates also in the 10-14, 15-19 and 20-24 year age groups. Mean cost of injury increased with age, from around \$11,000 per injury event for younger people to over \$200,000 for the 85 years and above age group.
- Aboriginal people had more than double the rate of fatal injuries and more than triple the rate of non-fatal hospitalisations compared to non-Aboriginal people. Compared with a share of 3.6% of total population in WA, Aboriginal people accounted for 7.7% of total injury costs.
- Those in the most disadvantaged socioeconomic quintile had 2.3 times as many fatalities, and 1.6 times as many non-fatal hospitalisations and emergency presentations when compared to the least disadvantaged socioeconomic quintile. Total costs in the most disadvantaged quintile were 1.8 times higher than in the least disadvantaged quintile.
- Rates of injury were higher in non-metropolitan regions, with the Kimberley, Wheatbelt and Goldfields health regions having rates more than double those in the metropolitan region. Mean costs per injury event were generally lower in non-metropolitan regions.

Incidence and costs by intent and mechanism

- Intentional self-harm accounted for 24.2% of fatal injuries, 6.3% of non-fatal hospitalisations, and \$1.6 billion in costs.
- Falls and transport injuries were the most common unintentional injuries. Falls accounted for 32.5% of fatal injuries, 32.5% of non-fatal hospitalisations, and \$2.2 billion in costs. Transport injuries accounted for 13.6% of fatalities, 11.5% of non-fatal hospitalisations and \$1.1 billion in costs.

Incidence and costs by alcohol-attributable status

- Alcohol was involved in 17.5% of fatalities, 11.8% of non-fatal hospitalisations, and 32% of emergency department presentations. The overall cost of injuries involving alcohol was \$1.9 billion.

Trends in incidence and costs of injury

- Emergency department data are not included in the trend analyses as data were not available for all emergency departments outside of the metropolitan area prior to 2008. All comparisons reported in this section compare injury incidence and costs between 2003 and 2012.
- The age-standardised rate of fatal injury events remained stable, while the rate of non-fatal injury hospitalisations increased, along with the total cost of injury events. The mean cost per injury event declined over the period.
- The age-standardised rate of injury events increased most for people in the 65 years and above age group with the share of total costs for this age group increasing from 34.8% to 36.5%.
- Compared to 2003, the rate of fatal injury events in Aboriginal people decreased, while the hospitalisation rate remained stable. In contrast, the rate of injury events remained constant for non-Aboriginal people while their hospitalisation rate increased. The difference in mean cost of injury between Aboriginal and non-Aboriginal people was reduced.
- Age-standardised rates of falls and self-harm injury events increased over the period, while the trend for most other mechanisms of injury remained relatively constant. For falls, the most notable increase was in the 65 years and above age group. For self-harm injuries, the rate increased most in the 15-24 year age group. Mean costs decreased for all mechanisms of injury other than poisoning and self-harm.

Incidence and costs by diagnosis group

- Superficial injury/open wounds and upper extremity injuries were the most commonly occurring injury types, with injuries to internal organs and burns occurring least frequently. Mean costs per injury event were highest for hip fractures and skull/brain injuries, both exceeding \$300,000. Mean costs per injury events decreased over time for all diagnosis groups other than skull/brain injuries.

Cost estimates in this study for 2003 are higher than reported in the previous cost-of-injury report. The previous report, which excluded emergency department presentations, estimated the costs of injury in 2003 as \$4.5 billion (adjusted from \$2.9 billion to reflect 2014 dollar values (75)) compared to an equivalent figure for fatal and hospitalised injury events of \$6.2 billion in this study. A major reason for this difference is the use in this study of a willingness-to-pay value of statistical life of \$4.2m as recommended by the Office of Best Practice Regulation (48). In the previous report a value of statistical life of \$2.2m (adjusted from \$1.4m to reflect 2014 dollar values (75)) was adopted based on a mixed human capital and compensation payment approach used by the Bureau of Transport Economics to calculate the cost of road crashes in Australia (76). Furthermore, using the linked health data to calculate injury events in this study and applying more advanced techniques in allocating costs to injury events makes comparison of the total costs of injury in this study with the previous study inappropriate. However, some findings are similar. For instance, in both studies, metropolitan regions accounted for 65-70% of the total costs of injury and the three mechanisms of injury accounting for the highest total costs were falls, transport injuries and self-harm injuries.

Cost-of-illness estimates using comprehensive information on the burden of injuries include the physical, mental and social loss of wellbeing resulting from injury events and can be regarded as a summary measure of population health. Estimating the magnitude of the burden of injury can be used to assess the relative burden of injuries compared with other preventable health problems within a population and for determining the appropriate level of investment for specific injury prevention activities (77). In comparing the incidence and costs of injury across multiple dimensions, this study provides information to policy makers, health professionals and other injury prevention stakeholders to identify areas where further prevention and care are most needed. Moreover, when injury problem areas have been identified, cost-of-illness studies provide an estimate for determining savings that can be achieved through successful intervention programs and can be used in cost-effectiveness analyses for intervention efforts (17).

This study has highlighted the significance of the priorities for injury prevention identified in the Western Australian Health Promotion Strategic Framework 2012-2016, with several priority areas identified in the framework shown to have high incidence, high costs per injury event or a combination of both. By examining patterns and trends in the incidence and costs of injury across multiple dimensions this study has also put specific injury problems into perspective and facilitated more targeted preventive interventions.

References

1. Institute for Health Metrics and Evaluation. Global Health Data Exchange: Global Burden of Disease Study 2013 (GBD 2013) Data Downloads Seattle, WA: IHME; [cited 2016 Feb 22]. Available from: <http://ghdx.healthdata.org/global-burden-disease-study-2013-gbd-2013-data-downloads>.
2. Murray C, Vos T, Lozano R, Naghavi M, Flaxman A, Michaud C, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380:2197-223.
3. Ballestas T, Xiao J, McEvoy S, Somerford P. The Epidemiology of injury in Western Australia, 2000-2008. Perth: Department of Health WA, 2011.
4. Department of Health WA. Injury prevention in Western Australia: A review of statewide activity Perth: Chronic Disease Prevention Directorate, Department of Health WA, 2015.
5. Commonwealth Department of Health and Family Services and Australian Institute of Health and Welfare. National Health Priority Areas report: injury prevention and control 1997. Canberra DHFS and AIHW, 1998.
6. Department of Health WA. WA Health Promotion Strategic Framework 2012-2016. Perth: Chronic Disease Prevention Directorate, Department of Health, WA, 2012.
7. Hendrie D, Miller T. Assessing the burden of injuries: competing measures. *Injury Control and Safety Promotion*. 2004;11(3):193-99.
8. Miller T, Romano E, Spicer R. The cost of childhood injuries and the value of prevention. *The Future of Children*. 2000;10(1):137-63.
9. Hendrie D. The cost of injury in Western Australia during 2003: an overview of total and health system costs. Perth: Western Australian Government, 2005.
10. Watson W, Ozanne-Smith J. The cost of injury to Victoria. Melbourne: Monash University Accident Research Centre, 1997.
11. Moller J. The cost of injury. *Injury Issues Monitor*. 1999;15(4).
12. Miller T, Pindus N, Douglass J, Rossman S. Databook on nonfatal injury: incidence, costs and consequences. Washington D.C.: The Urban Institute Press, 1995.
13. Holman C, Bass A, Rouse I, Hobbs M. Population-based linkage of health records in Western Australia: development of a health services research linked database. *Australian and New Zealand Journal of Public Health*. 1999;23(5):453-9.
14. Lestina D, Miller T, Smith G. Creating injury episodes using medical claims data. *Journal of Trauma*. 1998; 45(3):565-69.
15. Gold M, Siegel J, Russell L, Weinstein M. Cost-effectiveness in health and medicine. New York: Oxford University Press; 1996.
16. O’Dea D, Wren J. New Zealand estimates of the total social and economic cost of injuries. Wellington: New Zealand. Injury Prevention Strategy. 2012. Available at: www.acc.co.nz/PRD_EXT_CSMP/groups/external_ip/documents/guide/wpc133825.pdf
17. Finkelstein E, Corso P, Miller T. The incidence and economic burden of injuries in the United States New York: Oxford University Press; 2006.
18. Australian Institute of Health and Welfare. Health expenditure 2013-14. Canberra: AIHW, 2015.

19. Pharmaceutical Benefits Advisory Committee. Guidelines for preparing submissions to the Pharmaceutical Benefits Advisory Committee: Section D - Economic evaluation. Canberra: Department of Health, 2015.
20. Parkinson B, De Abreu Loutenco R. Discounting in economic evaluations in health care: a brief review. Sydney: Centre for Health Economics Research and Evaluation (CHERE) 2015 [cited 2016 Feb 22]. Available from: http://www.crest.uts.edu.au/pdfs/FactSheet_Discounting.pdf.
21. Commonwealth Department of Health. National Hospital Cost Data Collection: Round 14 (2009-10) National public cost weight tables - version 6.0x and version 5.2 2011. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/Round_14-cost-reports.
22. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 7 (2002-03) AR-DRGv4.2. Canberra: Commonwealth Department of Health and Ageing, 2003.
23. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 8 (2003-04) AR-DRGv4.2. Canberra: Commonwealth Department of Health and Ageing, 2005.
24. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 9 (2004-05) AR-DRGv5.0. Canberra: Commonwealth Department of Health and Ageing, 2006.
25. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 10 (2005-06) AR-DRGv5.0. Canberra: Commonwealth Department of Health and Ageing, 2007.
26. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 11 (2006-07) AR-DRGv5.1. Canberra: Commonwealth Department of Health and Ageing, 2008.
27. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 12 (2007-08) AR-DRGv5.1. Canberra: Commonwealth Department of Health and Ageing, 2009.
28. Commonwealth Department of Health and Ageing. National Hospital Cost Data Collection: Cost report Round 13 (2008-09) AR-DRGv5.2. Canberra: Commonwealth Department of Health and Ageing, 2010.
29. Independent Hospital Pricing Authority. National Hospital Cost Data Collection: Cost report Round 15 (2010-11) AR-DRGv6.0. Canberra: Commonwealth Department of Health and Ageing, 2013.
30. Independent Hospital Pricing Authority. National Hospital Cost Data Collection: Cost report Round 16 (2011-12) AR-DRGv6.0. Sydney: IHPA, 2014.
31. Independent Hospital Pricing Authority. National Hospital Cost Data Collection: Cost report Round 17 (2012-13) AR-DRGv6.0. Sydney: IHPA, 2015.
32. Mihaylova B, Briggs A, O'Hagan A, Thompson S. Review of statistical methods for analysing healthcare resources and costs. *Health Economics*. 2011;20:897-916.
33. Dodd S, Bassi A, Bodger K, Williamson P. A comparison of multivariable regression models to analyse cost data. *Journal of Evaluation in Clinical Practice*. 2006;12(1):76-86.
34. Glick H, Doshi J, Sonnad S, Polsky D. *Economic evaluation in clinical trials*. Oxford: Oxford University Press; 2007.

35. Gregori D, Petrinco M, Bo S, Desideri A, Merletti F, Pagano E. Regression models for analyzing costs and their determinants in health care: an introductory review. *International Journal for Quality in Health Care* 2011;23(3):331-41.
36. Maydeu-Olivares A, Garcia-Forero C. Goodness-of-fit testing. *International Encyclopedia of Education*. 2010;7:190-6.
37. Briggs A, O'Brien B, Blackhouse G. Thinking outside the box: recent advances in the analysis and presentation of uncertainty in cost-effectiveness studies. *Annual Review of Public Health*. 2002;23:377-401.
38. Jones A. Health econometrics. In: Culyer A, Newhouse J, editors. *Handbook of health economics*. Amsterdam: Elsevier; 2000.
39. Malehi A, Pourmotahari F, Angali K. Statistical models for the analysis of skewed healthcare cost data: a simulation study. *Health Economics Review*.5(11). Available from: <https://thehealtheconomicreview.springeropen.com/articles/10.1186/s13561-015-0045-7>
40. Manning W, Basu A, Mullahy J. Generalized modeling approaches to risk adjustment of skewed outcomes data. *Journal of Health Economics*. 2005;24(3):465-88.
41. St John Ambulance WA. Metro Ambulance Fees. Available from: <http://www.stjohnambulance.com.au/st-john/ambulance-and-health-services/metro-ambulance-service/metro-ambulance-fees>.
42. Australian Bureau of Statistics. Employee earnings and hours, Australia, May 2014. Canberra: ABS, 2015.
43. Productivity Commission. PC Productivity Update. Melbourne: Productivity Commission, 2015.
44. Australian Bureau of Statistics. Life tables, states, territories and Australia, 2012-2014. Canberra: ABS, 2015.
45. Bhalla K, Harrison J. Burden calculator: a simple and open analytical tool for estimating the population burden of injury. *Injury Prevention*. 2015;2015-041816:1-4.
46. World Health Organization. Disability weights, discounting and age weighting of DALYs: Health statistics and information systems; [cited 2016 Feb 25]. Available from: http://www.who.int/healthinfo/global_burden_disease/daly_disability_weight/en/.
47. Ministry of Health and Accident Compensation Corporation. Injury-related health loss: a report from New Zealand Burden of Diseases, Injuries and Risk Factors Study 1990-2013. Wellington: Ministry of Health, 2013.
48. Office of Best Practice Regulation. Best Practice Regulation Guidance Note: Value of statistical life. Canberra: Department of Prime Minister and Cabinet, 2014.
49. Australian Bureau of Statistics. Household income and wealth, Australia, 2013-14. Canberra: ABS, 2015.
50. Chikritzhs T, Evans M, Gardner C, Liang W, Pascal R, Stockwell T, et al. Australian alcohol aetiological fractions for injuries treated in emergency departments. Perth: National Drug Research Institute, 2011.
51. Xiao J, Rowe T, Somerford P, Draper G, Martin J. Impact of alcohol on the population of Western Australia. Perth: Epidemiology Branch, Department of Health WA, 2008.
52. Global Burden of Disease Expert Group. External cause categories [cited 2016 Feb 15]. Available from: https://docs.google.com/spreadsheets/d/1n0yy5DcCgBeTt483Yg4sNmU1xfC_P4xsC1s50RXs4lk/pub.

53. Meerding W, Looman C, Essink-Bot M, Toet H, Mulder S, van Beeck E. Distribution and determinants of health and work status in a comprehensive population of injury patients. *Journal of Trauma*. 2004;56(1):150-61.
54. Gabbe B, Simpson P, Lyons R, Polinder S, Rivara F, Ameratunga S, et al. How well do principal diagnosis classifications predict disability 12 months post injury? *Injury Prevention*. 2015;21:e120-e6.
55. Fingerhut L, Warner M. The ICD-10 injury mortality diagnosis matrix. *Injury Prevention*. 2006;12:24-9.
56. Information Management and Reporting Directorate. Emergency Department Data Collection, Data Dictionary, version 1.0. Perth: Health Department WA, 2007.
57. McGhan W, Al M, Doshi J, Kamae I, Marx S, Rindress D. The ISPOR Good Practices for Quality Improvement of Cost-Effectiveness Research Task Force Report. *Value in Health*. 2009;12(8):1086-99.
58. Polinder S, Meerding W, van Baar M, Toet H, Mulder S, van Beeck E, et al. Cost estimation of injury-related hospital admissions in 10 European countries. *Journal of Trauma*. 2005;59(6):1283-91.
59. Meerding W, Mulder S, van Beeck E. Incidence and costs of injuries in The Netherlands. *European Journal of Public Health*. 2006;16(3):271-7.
60. Independent Hospital Pricing Authority. National Public Hospitals Cost report 2013-14 Round 18 Sydney: IHPA, 2016.
61. Insurance Commission of Western Australia. A guide for people injured in a motor vehicle crash. Accessed Nov 2016, available at: https://www.icwa.wa.gov.au/data/assets/pdf_file/0016/880/ctp_guide.pdf
62. Australian Institute of Health and Welfare. The burden of disease and injury in Australia – summary report. Canberra: AIHW, 1999.
63. Mortimer D, Segal L. Is the value of a life or life-year saved context specific? Further evidence from a discrete choice experiment. *Cost Effectiveness and Resource Allocation*. 2008;6:8.
64. Haninger K, Hammitt J. Diminishing willingness to pay per quality-adjusted life year: valuing acute foodborne illness *Risk Analysis* 2011;31(9):1363-80.
65. Johannesson M, Johannsson P. Is the valuation of a QALY gained independent of age? Some empirical evidence. *Journal of Health Economics*. 1997;16(5):589-99.
66. Hammitt J. Valuing changes in mortality risk: lives saved versus life years saved. *Review of Environmental Economics and Policy*. 2007;1(2):228-40.
67. Henley G, Harrison J. Injury severity scaling: a comparison of methods for measurement of injury severity. Canberra: AIHW, 2009.
68. Workplace Gender Equality Agency. Gender pay gap statistics. Sydney: Workplace Gender Equality Agency, 2016.
69. Australian Bureau of Statistics. Population characteristics, Aboriginal and Torres Strait Islander Peoples. Canberra: ABS, 2006.
70. Australian Institute of Health and Welfare. Australia's health 2014. Canberra: AIHW, 2014.
71. Australian Bureau of Statistics. Estimates of Aboriginal and Torres Strait Islander Australians, June 2011. Canberra: ABS, 2013.
72. Australian Institute of Health and Welfare. Medical workforce 2012. Canberra: AIHW, 2014.

73. Safe Work Australia. Key work health and safety statistics, Australia. Canberra: Safe Work Australia, 2014.
74. Baker S, O'Neill B, Ginsburg M, Guohua L. The injury fact book, 2nd edn New York: Oxford University Press; 1992.
75. Australian Bureau of Statistics. Average weekly earnings, Australia, Nov 2015 Canberra: ABS; 2016 [cited Feb 25 2016]. Available from: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6302.0Nov%202015?OpenDocument>.
76. Bureau of Transport Economics. Road crash costs in Australia. Canberra: BTE, 2000.
77. Corso P, Finkelstein E, Miller T, Fiebelkorn I, Zaloshnja E. Incidence and lifetime costs of injuries in the United States. Injury Prevention. 2006;12:212-8.

Appendices

Incidence and costs of injury in health regions

Appendix 1	North Metropolitan Health Region	52
Appendix 2	South Metropolitan Health Region	58
Appendix 3	Goldfields Health Region	64
Appendix 4	Great Southern Health Region	71
Appendix 5	Kimberley Health Region	77
Appendix 6	Midwest Health Region	83
Appendix 7	Southwest Health Region	89
Appendix 8	Wheatbelt Health Region	95
Appendix 9	Pilbara Health Region	101

Appendix 1 – North Metropolitan Health Region

**Table A1.1 North Metropolitan Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	487	0.5	2,003	4,112,320
Hospitalisation ^b	19,220	19.1	611	31,788
ED attendance ^c	56,442	56.2	688	12,188
Total^d	76,149	75.8	3,302	43,357
Male				
Fatal	274	0.5	1,185	4,324,321
Hospitalisation	10,942	21.8	371	33,936
ED attendance	33,680	67.1	411	12,204
Total	44,896	89.4	1,967	43,817
Female				
Fatal	213	0.4	818	3,839,606
Hospitalisation	8,274	16.5	240	28,946
ED attendance	22,733	45.3	276	12,162
Total	31,220	62.1	1,334	42,723

a. Rate per 1,000 population.

b. Includes 4 hospital admitted cases of unknown gender.

c. Includes 29 emergency department attendances of unknown gender.

d. Includes 33 cases of unknown gender.

**Table A1.2 North Metropolitan Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	452	67.9	393	61.6	846	64.9
1-4	3,802	142.9	2,950	115.6	6,760	129.7
5-9	3,181	100.3	2,428	81.4	5,610	91.2
10-14	4,546	146.9	2,931	97.8	7,482	122.8
15-19	4,903	144.8	2,399	74.7	7,303	110.7
20-24	5,096	129.8	2,537	67.6	7,634	99.4
25-34	7,865	95.4	3,882	50.0	11,755	73.4
35-44	5,357	72.7	3,213	44.0	8,573	58.4
45-54	3,861	57.4	2,882	42.1	6,746	49.7
55-64	2,519	46.6	2,244	40.4	4,763	43.5
65-74	1,496	44.3	1,590	45.3	3,088	44.9
75-84	1,069	64.0	1,875	89.3	2,944	78.1
≥85	748	142.2	1,894	184.7	2,642	170.3
Total	44,895	89.4	31,218	62.1	76,149^b	75.8^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	12	26,694	3	8,313	15	18,134
1-4	46	11,974	39	13,294	85	12,553
5-9	34	10,841	26	10,764	61	10,814
10-14	53	11,744	39	13,239	92	12,332
15-19	104	21,302	47	19,495	151	20,706
20-24	187	36,639	55	21,709	242	31,674
25-34	387	49,246	121	31,256	509	43,280
35-44	299	55,838	104	32,241	403	46,995
45-54	230	59,480	150	51,991	380	56,258
55-64	153	60,557	97	43,027	249	52,298
65-74	91	60,632	58	36,571	149	48,211
75-84	169	158,009	194	103,204	362	123,104
≥85	197	263,733	401	211,981	599	226,633
Total	1,967	43,817	1,334	42,723	3,302^b	43,357^b

a. Rate per 1,000 population.

b. Includes 36 cases with unknown age or gender.

**Table A1.3 North Metropolitan Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	10	0.6	477	0.5	487	0.5
Hospitalisation	697	42.9	18,523	18.7	19,220	19.1
ED attendance	1746	107.4	54,696	55.3	56,442	56.2
Total	2453	150.8	73,696	74.6	76,149	75.8
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	43	4,358,983	4,107,149	1,959	2,003	4,112,320
Hospitalisation	23	33,278	31,733	588	611	31,789
ED attendance	20	11,255	12,218	668	688	12,188
Total	86	35,237	43,628	3,215	3,302	43,357

a. Rate per 1,000 population.

**Table A1.4 North Metropolitan Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	97	0.9	2,883	25.3	7,769	68.3	10,749	94.5	591	55,015
2	86	0.5	3,567	21.5	9,189	55.5	12,842	77.5	574	44,706
3	99	0.5	3,950	19.0	11,392	54.9	15,441	74.4	672	43,515
4	103	0.5	3,896	17.4	12,516	55.9	16,515	73.8	705	42,708
5	102	0.3	4,921	16.7	15,573	53.0	20,596	70.1	759	36,842
Total^c	487	0.5	19,220	19.1	56,442	56.2	76,149	75.8	3,302	43,357

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

c. Includes 3 hospital admissions and 3 emergency department cases with unknown SEIFA.

**Table A1.5 North Metropolitan Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	313	0.3	14,299	14.2	14,612	14.5	1,727	118,168
Intentional self-harm	122	0.1	1,331	1.3	1,453	1.4	565	388,580
Intentional inter-personal	10	0.0	929	0.9	939	0.9	84	89,556
Undetermined	33	0.0	2,403	2.4	2,436	2.4	191	78,405
Total^b	487	0.5	19,220	19.1	19,707	19.6	2,566	132,015

a. Rate per 1,000 population.

b. Includes 9 fatalities and 258 hospitalisations with unknown intent.

**Table A1.6 North Metropolitan Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	50	0.0	1,975	2.0	2,025	2.0	300	148,233
Fall	170	0.2	6,829	6.8	6,999	7.0	852	121,775
Drowning	7	0.0	43	0.0	50	0.0	31	623,152
Fires, burns and scalds	<5	0.0	213	0.2	216	0.2	32	149,448
Poisoning	50	0.0	541	0.5	591	0.6	241	408,211
Other	33	0.0	4,698	4.7	4,731	4.7	270	56,966
Intentional								
Self-harm	122	0.1	1,331	1.3	1,453	1.4	565	388,580
Violence	10	0.0	929	0.9	939	0.9	84	89,556
Undetermined intent								
Undetermined	33	0.0	2,403	2.4	2,436	2.4	191	78,405
Total^b	487	0.5	19,220	19.1	19,707	19.6	2,566	132,015

a. Rate per 1,000 population.

b. Includes 9 fatalities and 258 hospital admitted cases with unknown mechanism.

**Table A1.7 North Metropolitan Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	39	0.6	165	1.3	509	3.6	1,104	2.0	208	1.7
Fall	512	7.9	760	6.2	408	2.9	1,697	3.1	3,622	29.7
Drowning	25	0.4	6	0.0	<5	0.0	13	0.0	<5	0.0
Burns	55	0.8	18	0.1	35	0.2	83	0.2	25	0.2
Poisoning	116	1.8	19	0.2	77	0.5	305	0.6	74	0.6
Other	363	5.6	505	4.1	831	5.8	2,436	4.4	596	4.9
Intentional										
Self-harm	0	0.0	60	0.5	466	3.3	868	1.6	58	0.5
Violence	<5	0.0	13	0.1	301	2.1	606	1.1	17	0.1
Undetermined intent										
Undetermined	63	1.0	85	0.7	447	3.1	1,542	2.8	299	2.4
Total^b	1,185	18.2	1,635	13.4	3,095	21.7	8,756	15.9	5,035	41.2
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	5	9.0	8	15.1	52	22.0	183	15.4	52	4.8
Fall	9	15.3	17	33.9	20	8.4	101	8.5	705	65.6
Drowning	13	21.6	0	0.1	5	2.2	13	1.1	0	0.0
Burns	6	10.5	1	2.8	3	1.4	12	1.0	9	0.8
Poisoning	2	4.1	0	0.5	26	11.1	195	16.4	17	1.6
Other	17	29.7	13	25.2	32	13.4	123	10.4	84	7.8
Intentional										
Self-harm	0	0.0	9	18.9	61	25.6	415	35.0	74	6.9
Violence	0	0.1	0	0.7	22	9.1	62	5.2	0	0.0
Undetermined intent										
Undetermined	5	9.4	1	2.4	16	6.7	73	6.2	95	8.8
Total^b	59	100	50	100	237	100	1,188	100	1,075	100

a. Rate per 1,000 population.

b. Includes 268 cases with unknown mechanism.

**Table A1.8 North Metropolitan Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	81	16.6	2,172	11.3	18,052	32.0	20,305	26.7	648	31,913
Non-alcohol	406	83.4	17,048	88.7	38,390	68.0	55,844	73.3	2,654	47,497
Total	487	100.0	19,220	100.0	56,442	100.0	76,149	100.0	3,302	43,357

Appendix 2 – South Metropolitan Health Region

**Table A2.1 South Metropolitan Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Fatal	504	0.6	2,075	4,117,507
Hospitalisation ^b	17,169	19.0	602	35,078
ED attendance ^c	52,465	58.0	613	11,683
Total^d	70,138	77.6	3,290	46,914
Male				
Fatal	305	0.7	1,306	4,282,882
Hospitalisation	9,899	21.9	377	38,057
ED attendance	31,311	69.2	371	11,865
Total	41,515	91.7	2,054	49,488
Female				
Fatal	199	0.4	769	3,864,042
Hospitalisation	7,268	16.1	225	31,005
ED attendance	21,133	46.8	241	11,412
Total	28,600	63.4	1,235	43,198

a. Rate per 1,000 population.

b. Includes 2 hospital admitted cases of unknown gender.

c. Includes 21 emergency department cases of unknown gender.

d. Includes 23 cases of unknown gender.

**Table A2.2 South Metropolitan Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	383	61.8	347	58.8	730	60.4
1-4	3,417	137.8	2,586	109.6	6,004	124.1
5-9	2,749	97.0	2,173	79.5	4,924	88.4
10-14	3,915	141.3	2,432	92.0	6,351	117.3
15-19	4,628	149.6	2,374	81.9	7,003	116.9
20-24	4,802	127.6	2,367	66.8	7,177	98.2
25-34	7,047	96.4	3,454	51.0	10,503	74.6
35-44	5,126	80.6	2,967	47.1	8,095	63.9
45-54	3,588	61.4	2,734	45.7	6,323	53.4
55-64	2,461	51.0	2,108	42.0	4,570	46.4
65-74	1,513	47.0	1,617	49.4	3,130	48.2
75-84	1,152	69.7	1,757	85.1	2,909	78.2
≥85	733	145.6	1,683	178.9	2,416	167.3
Total	41,515	91.7	28,600	63.4	70,138^b	77.6^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	8	20,029	3	7,716	10	14,176
1-4	35	10,115	22	8,496	57	9,417
5-9	26	9,537	23	10,423	49	9,928
10-14	49	12,414	23	9,655	72	11,364
15-19	128	27,700	58	24,570	187	26,636
20-24	192	39,906	55	23,209	247	34,388
25-34	371	52,662	141	40,931	513	48,799
35-44	298	58,176	102	34,299	400	49,416
45-54	226	62,936	118	43,083	344	54,342
55-64	182	74,040	94	44,640	276	60,464
65-74	125	82,529	90	55,827	215	68,734
75-84	204	176,805	162	92,175	366	125,690
≥85	212	288,844	344	204,488	556	230,081
Total	2,054	49,488	1,235	43,198	3,290^b	46,914^b

a. Rate per 1,000 population.

b. Includes 23 cases with unknown gender and 3 cases with unknown age.

**Table A2.3 South Metropolitan Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	15	0.8	489	0.6	504	0.6
Hospitalisation	813	42.5	16,356	18.5	17,169	19.0
ED attendance	2,352	123.1	50,113	56.6	52,465	58.0
Total	3,180	166.4	66,958	75.7	70,138	77.6
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	66	4,424,398	2,009	4,108,093	2,075	4,117,507
Hospitalisation	26	32,264	576	35,217	602	35,078
ED attendance	26	10,885	587	11,721	613	11,683
Total	118	37,169	3,172	47,377	3,290	46,914

a. Rate per 1,000 population.

**Table A2.4 South Metropolitan Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	157	0.8	4,538	23.8	13,429	70.4	18,124	95.1	945	52,151
2	105	0.6	3,839	20.9	11,515	62.6	15,459	84.0	689	44,543
3	85	0.5	3,072	18.8	9,631	58.9	12,788	78.2	576	45,034
4	88	0.5	3,165	16.4	10,257	53.3	13,510	70.2	607	44,949
5	69	0.4	2,555	14.7	7,622	44.0	10,246	59.1	473	46,192
Total^c	504	0.6	17,169	19.0	52,465	58.0	70,138	77.6	3,290	46,914

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

c. Includes 11 emergency department cases with unknown SEIFA.

**Table A2.5 South Metropolitan Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	326	0.4	12,631	14.0	12,957	14.3	1,774	136,879
Intentional self-harm	119	0.1	1,064	1.2	1,183	1.3	557	470,716
Intentional inter-personal	7	0.0	863	1.0	870	1.0	66	75,371
Undetermined	43	0.0	2,377	3.0	2,420	2.7	232	95,992
Total^b	504	0.6	17,169	19.0	17,673	19.6	2,677	151,501

a. Rate per 1,000 population.

b. Includes 9 fatalities and 234 hospitalisations with unknown intent.

**Table A2.6 South Metropolitan Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	57	0.1	1,847	2.0	1,904	2.1	358	187,994
Fall	193	0.2	5,795	6.4	5,988	6.6	924	154,263
Drowning	<5	0.0	27	0.0	30	0.0	13	431,038
Fires, burns and scalds	<5	0.0	261	0.3	264	0.3	35	131,304
Poisoning	32	0.0	476	0.5	508	0.6	155	304,228
Other	38	0.0	4,225	4.7	4,263	4.7	290	67,965
Intentional								
Self-harm	119	0.1	1,064	1.2	1,183	1.3	557	470,716
Violence	7	0.0	863	1.0	870	1.0	66	75,371
Undetermined intent								
Undetermined	43	0.0	2,377	2.6	2,420	2.7	232	95,992
Total^b	504	0.6	17,169	19.0	17,673	19.6	2,677	151,501

a. Rate per 1,000 population.

b. Includes 9 fatalities and 234 hospital admitted cases with unknown mechanism.

**Table A2.7 South Metropolitan Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	28	0.5	154	1.4	487	3.7	1,042	2.2	193	1.7
Fall	391	6.5	602	5.5	352	2.6	1,382	2.9	3,261	28.0
Drowning	12	0.2	<5	0.0	<5	0.0	8	0.0	<5	0.0
Burns	54	0.9	38	0.3	47	0.4	102	0.2	23	0.2
Poisoning	102	1.7	26	0.2	81	0.6	228	0.5	71	0.6
Other	317	5.2	432	3.9	771	5.8	2,148	4.4	595	5.1
Intentional										
Self-harm	0	0.0	35	0.3	359	2.7	723	1.5	66	0.6
Violence	8	0.1	16	0.1	273	2.1	552	1.1	21	0.2
Undetermined intent										
Undetermined	61	1.0	92	0.8	475	3.6	1,476	3.0	316	2.7
Total^b	988	16.3	1,406	12.8	2,877	21.6	7,773	16.1	4,629	39.7
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	5	15.9	4	9.9	87	29.6	223	18.4	39	3.6
Fall	8	25.7	15	41.3	17	5.8	126	10.4	757	68.8
Drowning	0	0.2	0	0.1	0	0.0	9	0.7	4	0.1
Burns	6	18.2	4	10.1	4	1.4	20	1.7	1	0.1
Poisoning	2	5.9	0	1.1	7	2.4	139	11.3	8	0.8
Other	9	30.5	11	29.7	41	14.0	123	10.1	105	9.5
Intentional										
Self-harm	0	0.0	1	1.6	102	34.9	397	32.6	57	5.2
Violence	0	0.9	0	1.1	15	5.2	45	3.7	4	0.4
Undetermined intent										
Undetermined	1	2.2	2	4.5	17	5.9	113	9.3	100	9.0
Total^b	31	100	37	100	293	100	1,215	100	1,101	100

a. Rate per 1,000 population.

b. Includes 243 cases with unknown mechanism.

**Table A2.8 South Metropolitan Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	87	17.3	1,903	11.1	16,781	32.0	18,771	26.8	649	34,591
Non-alcohol	417	82.7	15,266	88.9	35,684	68.0	51,367	73.2	2641	51,385
Total	504	100.0	17,169	100.0	52,465	100.0	70,138	100.0	3,290	46,914

Appendix 3 – Goldfields Health Region

**Table A3.1 Goldfields Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal ^b	44	0.7	195	4,428,393
Hospitalisation ^c	1,216	20.0	57	46,793
ED attendance ^c	7,952	130.8	82	10,257
Total^d	9,212	151.6	333	36,183
Male				
Fatal	33	1.0	148	4,497,236
Hospitalisation	731	22.7	40	54,352
ED attendance	4,884	151.4	50	10,296
Total	5,648	175.1	238	42,214
Female				
Fatal	10	0.4	41	4,139,930
Hospitalisation	485	17.0	17	35,399
ED attendance	3,067	107.5	31	10,195
Total	3,562	124.9	90	25,221

a. Rate per 1,000 population.

b. Includes 1 fatality of unknown gender.

c. Includes 1 emergency department cases of unknown gender.

d. Includes 2 cases of unknown gender.

**Table A3.2 Goldfields Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	53	111.2	44	93.9	97	102.6
1-4	464	243.4	353	188.3	817	216.1
5-9	373	168.8	258	117.3	631	143.1
10-14	486	232.1	321	152.7	807	192.3
15-19	665	337.4	409	220.2	1,074	280.6
20-24	738	283.7	376	176.8	1,114	235.6
25-34	1,079	186.7	590	125.4	1,671	159.4
35-44	708	140.3	470	109.5	1,178	126.1
45-54	544	117.7	303	76.5	847	98.7
55-64	297	93.1	195	76.2	492	85.6
65-74	136	83.8	104	74.7	240	79.6
75-84	77	128.5	76	108.7	153	117.9
≥85	26	191.2	63	220.3	89	210.9
Total	5,648	175.1	3,562	124.9	9,212^b	151.6^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	0	7,663	0	9,679	1	8,577
1-4	17	35,961	7	19,900	24	29,021
5-9	3	7,145	2	7,160	5	7,151
10-14	10	19,777	2	7,343	12	14,831
15-19	23	35,286	5	11,035	28	26,050
20-24	32	43,800	14	37,654	46	41,726
25-34	43	40,044	18	30,761	66	39,742
35-44	44	62,418	13	27,884	57	48,640
45-54	16	29,474	9	29,944	25	29,642
55-64	21	71,785	7	36,825	29	57,929
65-74	9	66,272	2	20,925	11	46,622
75-84	8	106,667	1	17,237	10	62,244
≥85	11	433,232	9	135,159	20	222,236
Total	238	42,214	90	25,221	333^b	36,183^b

a. Rate per 1,000 population.

b. Includes 2 cases with unknown age and 2 cases with unknown gender.

**Table A3.3 Goldfields Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	9	1.3	35	0.6	44	0.7
Hospitalisation	317	45.9	899	16.7	1,216	20.0
ED attendance	1,287	186.2	6,665	123.7	7,952	130.8
Total	1,613	233.3	7,599	141.1	9,212	151.6
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	41	4,544,839	154	4,398,450	195	4,428,393
Hospitalisation	13	39,499	44	49,365	57	46,793
ED attendance	13	10,274	68	10,254	82	10,257
Total	67	41,319	267	35,092	333	36,183

a. Rate per 1,000 population.

**Table A3.4 Goldfields Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	11	0.7	427	26.1	2,408	147.1	2,846	173.8	92	32,298
2	13	0.8	281	17.1	2,107	127.9	2,401	145.8	94	39,345
3	11	0.8	269	19.4	1,782	128.5	2,062	148.7	79	38,338
4	7	0.7	196	19.0	1,208	117.1	1,411	136.8	52	36,661
5	<5	0.5	43	11.5	446	118.8	491	130.8	16	32,854
Total^c	44	0.7	1,216	20.0	7,952	130.8	9,212	151.6	333	36,183

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

c. Includes one emergency department cases with unknown SEIFA.

**Table A3.5 Goldfields Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	23	0.4	859	14.1	882	14.5	146	165,662
Intentional self-harm	10	0.2	86	1.4	96	1.6	46	477,022
Intentional inter-personal	<5	0.0	120	2.0	123	2.0	19	157,071
Undetermined	<5	0.1	118	1.9	122	2.0	20	167,933
Total^b	44	0.7	1,216	20.0	1,260	20.7	252	199,801

a. Rate per 1,000 population.

b. Includes 4 fatalities and 33 hospitalisations with unknown intent.

**Table A3.6 Goldfields Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	9	0.1	197	3.2	206	3.4	53	255,493
Fall	<5	0.1	285	4.7	289	4.8	30	102,671
Drowning	<5	0.0	<5	0.0	5	0.1	14	2,856,511
Fires, burns and scalds	<5	0.0	38	0.6	39	0.6	8	195,635
Poisoning	<5	0.0	26	0.4	28	0.5	10	353,931
Other	<5	0.1	311	5.1	315	5.2	32	101,548
Intentional								
Self-harm	10	0.2	86	1.4	96	1.6	46	477,022
Violence	<5	0.0	120	2.0	123	2.0	19	157,071
Undetermined intent								
Undetermined	<5	0.1	118	1.9	122	2.0	20	167,933
Total^b	44	0.7	1,216	20.0	1,260	20.7	252	199,801

a. Rate per 1,000 population.

b. Includes 4 fatalities and 33 hospitalisations with unknown mechanism.

Table A3.7 Goldfields Health Region
Incidence and costs of injury by intent, mechanism and age group, fatalities and hospitalisations, 2012

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	<5	0.8	26	3.0	61	7.1	105	3.1	10	2.1
Fall	24	5.1	40	4.6	21	2.5	110	3.2	94	19.9
Drowning	<5	0.2	<5	0.1	<5	0.2	<5	0.0	0	0.0
Burns	9	1.9	8	0.9	7	0.8	14	0.4	<5	0.2
Poisoning	11	2.3	<5	0.1	<5	0.1	12	0.4	<5	0.6
Other	29	6.1	27	3.1	57	6.7	180	5.3	22	4.6
Intentional										
Self-harm	0	0.0	<5	0.2	34	4.0	57	1.7	<5	0.6
Violence	<5	0.6	0	0.0	43	5.0	76	2.2	<5	0.2
Undetermined intent										
Undetermined	12	2.5	<5	0.5	18	2.1	79	2.3	9	1.9
Total^b	95	20.1	115	13.4	249	29.1	647	18.9	154	32.5
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	0.4	5	60.0	18	34.1	25	19.2	4	10.2
Fall	1	3.0	2	25.0	0	0.9	9	6.9	17	45.7
Drowning	4	22.2	0	0.1	5	9.5	5	3.7	0	0.0
Burns	5	25.5	1	8.0	1	1.1	1	0.9	0	0.2
Poisoning	0	0.5	0	0.9	0	0.0	10	7.3	0	0.2
Other	5	26.4	0	4.8	3	5.5	19	14.6	4	11.0
Intentional										
Self-harm	0	0.0	0	0.2	10	18.8	28	21.4	7	19.6
Violence	0	0.5	0	0.0	6	10.9	13	10.1	0	0.1
Undetermined intent										
Undetermined	4	21.4	0	0.5	0	0.7	11	8.4	5	12.5
Total^b	20	100	9	100	53	100	132	100	38	100

a. Rate per 1,000 population.

b. Includes 37 cases with unknown mechanism.

**Table A3.8 Goldfields Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	9	20.0	169	13.9	2,544	32.0	2,722	29.5	74	27,186
Non-alcohol	35	80.0	1,047	86.1	5,408	68.0	6,490	70.5	259	39,895
Total	44	100.0	1,216	100.0	7,952	100.0	9,212	100.0	333	36,183

Appendix 4 – Great Southern Health Region

**Table A4.1 Great Southern Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	25	0.4	106	4,244,249
Hospitalisation	922	15.9	34	36,763
ED attendance ^b	6,039	103.9	59	9,822
Total^b	6,986	120.2	199	28,531
Male				
Fatal	14	0.5	63	4,477,433
Hospitalisation	542	18.9	21	39,562
ED attendance	3,723	129.6	36	9,801
Total	4,279	149.0	121	28,188
Female				
Fatal	11	0.4	43	3,947,468
Hospitalisation	380	12.9	12	32,772
ED attendance	2,312	78.8	23	9,851
Total	2,703	92.0	79	29,097

a. Rate per 1,000 population.

b. Includes 4 cases of unknown gender.

**Table A4.2 Great Southern Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	35	94.4	26	70.1	61	82.3
1-4	321	216.5	203	136.9	525	177.0
5-9	333	166.4	201	101.5	535	134.4
10-14	421	199.1	284	140.6	705	170.5
15-19	604	312.8	251	143.9	855	232.7
20-24	414	263.7	164	121.1	578	197.7
25-34	564	186.6	289	90.4	855	137.4
35-44	453	125.3	265	69.0	718	96.3
45-54	386	94.7	263	61.2	649	77.5
55-64	316	82.0	223	57.7	539	69.9
65-74	205	73.7	162	58.0	367	65.8
75-84	126	85.4	202	118.3	328	103.1
≥85	101	234.3	170	232.9	271	233.4
Total	4,279	149.0	2,703	92.0	6,986^b	120.2^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	0	8,901	0	5,892	0	7,619
1-4	2	7,436	2	7,752	4	7,569
5-9	2	6,626	1	7,266	4	6,877
10-14	3	6,828	2	6,295	5	6,613
15-19	11	18,181	2	8,913	13	15,460
20-24	9	20,819	2	14,038	11	18,895
25-34	39	69,936	4	15,121	44	51,273
35-44	7	15,831	17	63,240	24	33,329
45-54	17	43,983	13	47,753	30	45,511
55-64	10	31,181	9	38,589	18	34,246
65-74	6	27,498	2	11,907	8	20,616
75-84	5	41,399	7	36,057	12	38,109
≥85	9	88,478	18	103,711	27	98,034
Total	121	28,188	79	29,097	199^b	28,531^b

a. Rate per 1,000 population.

b. Includes 4 cases with unknown gender.

**Table A4.3 Great Southern Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	0	0.0	25	0.5	25	0.4
Hospitalisation	56	21.4	866	15.6	922	15.9
ED attendance	422	161.5	5,617	101.2	6,039	103.9
Total	478	182.9	6,508	117.3	6,986	120.2
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	0	-	106	4,244,249	106	4,244,249
Hospitalisation	4	64,280	30	34,984	34	36,763
ED attendance	4	10,142	55	9,798	59	9,822
Total	8	16,485	191	29,415	199	28,531

a. Rate per 1,000 population.

**Table A4.4 Great Southern Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	12	0.7	277	15.8	1,803	103.1	2,092	119.6	77	36,845
2	6	0.3	292	15.2	1,962	102.2	2,260	117.7	57	25,094
3	<5	0.3	198	15.6	1,398	110.2	1,600	126.1	39	24,344
4	<5	0.3	104	13.9	607	81.2	713	95.3	18	25,604
5	<5	0.8	51	40.8	268	214.5	320	256.1	8	25,973
Total^c	25	0.4	922	15.9	6,039	103.9	6,986	120.2	199	28,531

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

c. Includes 1 emergency department cases with unknown SEIFA.

**Table A4.5 Great Southern Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	16	0.3	709	12.2	725	12.5	94	130,229
Intentional self-harm	5	0.1	40	0.7	45	0.8	23	508,349
Intentional inter-personal	0	0.0	34	0.6	34	0.6	1	34,283
Undetermined	<5	0.1	106	1.8	109	1.9	17	153,634
Total^b	25	0.4	922	15.9	947	16.3	140	147,837

a. Rate per 1,000 population.

b. Includes 1 fatality and 33 hospitalisations with unknown intent.

**Table A4.6 Great Southern Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	5	0.1	124	2.1	129	2.2	28	219,071
Fall	8	0.1	303	5.2	311	5.4	41	131,769
Drowning	0	0.0	<5	0.0	<5	0.0	0	6,316
Fires, burns and scalds	<5	0.0	23	0.4	24	0.4	6	257,065
Poisoning	<5	0.0	31	0.5	32	0.6	6	173,657
Other	<5	0.0	227	3.9	228	3.9	13	58,959
Intentional								
Self-harm	5	0.1	40	0.7	45	0.8	23	508,349
Violence	0	0.0	34	0.6	34	0.6	1	34,283
Undetermined intent								
Undetermined	<5	0.1	106	1.9	109	1.9	17	153,634
Total^b	25	0.4	922	15.9	947	16.3	140	147,837

a. Rate per 1,000 population.

b. Includes 1 fatality and 33 hospitalisations with unknown mechanism.

**Table A4.7 Great Southern Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	<5	0.5	15	1.8	26	3.9	68	2.3	18	1.8
Fall	22	5.9	39	4.8	18	2.7	67	2.3	165	16.6
Drowning	<5	0.3	0	0.0	0	0.0	0	0.0	0	0.0
Burns	7	1.9	0	0.0	<5	0.3	13	0.4	<5	0.2
Poisoning	7	1.9	<5	0.2	4	0.6	13	0.4	6	0.6
Other	11	3.0	24	3.0	38	5.8	109	3.7	46	4.6
Intentional										
Self-harm	0	0.0	<5	0.1	9	1.4	32	1.1	<5	0.3
Violence	<5	0.3	0	0.0	8	1.2	25	0.8	0	0.0
Undetermined intent										
Undetermined	<5	1.1	8	1.0	18	2.7	64	2.2	15	1.5
Total^b	57	15.4	89	11.0	124	18.8	409	13.7	268	27.0
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	2.6	0	17.3	1	8.1	27	31.1	1	1.3
Fall	0	33.5	1	42.4	1	7.0	8	9.6	31	75.8
Drowning	0	0.5	0	0.0	0	0.0	0	0.0	0	0.0
Burns	1	41.9	0	0.0	0	1.6	5	6.2	0	0.2
Poisoning	0	5.0	0	1.2	0	0.5	5	6.2	0	0.3
Other	0	6.3	0	31.4	8	74.9	4	4.2	1	2.7
Intentional										
Self-harm	0	0.0	0	1.0	0	1.4	19	22.1	4	9.4
Violence	0	6.2	0	0.0	0	1.8	1	1.0	0	0.0
Undetermined intent										
Undetermined	0	2.7	0	6.7	0	4.5	12	14.2	4	9.8
Total^b	1	100	2	100	11	100	85	100	41	100

a. Rate per 1,000 population.

b. Includes 34 cases with unknown mechanism.

**Table A4.8 Great Southern Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	<5	16.0	91	9.9	1,931	32.0	2,026	29.0	42	20,634
Non-alcohol	21	86.0	831	90.1	4,108	68.0	4,960	71.0	157	31,628
Total	25	100.0	922	100.0	6,039	100.0	6,986	100.0	199	28,531

Appendix 5 – Kimberley Health Region

**Table A5.1 Kimberley Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	36	0.9	164	4,556,597
Hospitalisation	1,738	45.6	57	32,975
ED attendance ^b	5,843	153.3	64	10,955
Total^b	7,617	199.8	285	37,463
Male				
Fatal	28	1.4	130	4,649,492
Hospitalisation	967	48.1	33	34,547
ED attendance	3,329	165.6	36	10,857
Total	4,324	215.1	200	46,192
Female				
Fatal	8	0.4	34	4,231,467
Hospitalisation	771	42.8	24	31,004
ED attendance	2,513	139.4	28	11,084
Total	3,292	182.7	86	26,005

a. Rate per 1,000 population.

b. Includes 1 case of unknown gender.

**Table A5.2 Kimberley Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	51	167.4	42	138.4	93	153.0
1-4	304	249.5	206	169.7	510	209.7
5-9	304	184.4	181	115.8	485	151.0
10-14	245	179.1	190	132.8	436	155.8
15-19	364	318.7	256	243.1	620	282.5
20-24	516	312.9	379	261.4	895	288.8
25-34	963	236.6	792	223.7	1,755	230.6
35-44	729	229.3	655	235.8	1,384	232.3
45-54	469	177.8	367	160.1	836	169.6
55-64	268	144.5	142	91.7	410	120.4
65-74	84	115.7	49	85.5	133	102.4
75-84	25	106.8	25	120.8	50	113.4
≥85	<5	30.8	8	115.9	10	74.6
Total	4,324	215.1	3,292	182.7	7,617^b	199.8^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	0	8,880	0	8,500	1	8,708
1-4	3	9,747	2	10,694	5	10,129
5-9	7	23,740	4	22,457	11	23,261
10-14	3	10,774	2	8,631	4	9,844
15-19	10	26,832	12	45,193	21	34,413
20-24	24	45,637	6	14,759	29	32,561
25-34	52	54,307	18	22,644	70	40,018
35-44	35	48,173	23	35,339	58	42,099
45-54	36	77,187	11	31,015	48	56,918
55-64	21	77,874	3	17,961	23	57,123
65-74	1	11,158	1	19,732	2	14,317
75-84	8	308,202	4	160,552	12	234,377
≥85	0	8,932	0	23,406	0	20,512
Total	200	46,192	86	26,005	285^b	37,463^b

a. Rate per 1,000 population.

b. Includes 1 case with unknown gender.

**Table A5.3 Kimberley Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	24	1.4	12	0.6	36	0.9
Hospitalisation	1,286	74.5	452	21.7	1,738	45.6
ED attendance	3,536	204.9	2,307	110.6	5,843	153.3
Total	4,846	280.9	2,771	132.8	7,617	199.8
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	111	4,622,445	53	4,424,902	164	4,556,597
Hospitalisation	42	32,893	15	33,209	57	32,975
ED attendance	39	10,888	26	11,057	64	10,955
Total	192	39,566	94	33,785	285	37,463

a. Rate per 1,000 population.

**Table A5.4 Kimberley Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	26	1.2	1,315	62.0	3,801	179.2	5,142	242.4	203	39,464
2	<5	0.6	201	37.8	757	142.2	961	180.5	29	30,696
3	<5	0.6	103	19.8	541	104.0	647	124.3	3	34,957
4	<5	0.5	45	20.4	236	107.2	282	128.1	9	30,344
5	<5	0.7	74	17.7	508	121.5	585	139.9	22	37,198
Total^c	36	0.9	1,738	45.6	5,843	153.3	7,617	199.8	285	37,463

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

**Table A5.5 Kimberley Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	11	0.3	962	25.2	973	25.5	84	86,550
Intentional self-harm	16	0.4	75	2.0	91	2.4	77	842,145
Intentional inter-personal	<5	0.0	464	12.2	465	12.2	17	37,913
Undetermined	6	0.2	193	5.1	199	5.2	33	164,093
Total^b	36	0.9	1,738	45.6	1,774	46.5	221	124,774

a. Rate per 1,000 population.

b. Includes 2 fatalities and 44 hospitalisations with unknown intent.

**Table A5.6 Kimberley Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	<5	0.1	183	4.8	187	4.9	29	154,653
Fall	<5	0.1	302	7.9	304	8.0	17	57,348
Drowning	<5	0.1	<5	0.1	5	0.1	10	1,911,643
Fires, burns and scalds	<5	0.0	47	1.2	48	1.3	8	163,769
Poisoning	<5	0.0	19	0.5	20	0.5	6	304,605
Other	<5	0.0	408	10.7	409	10.7	14	35,082
Intentional								
Self-harm	16	0.4	75	2.0	91	2.4	77	842,145
Violence	<5	0.0	464	12.2	465	12.2	17	37,913
Undetermined intent								
Undetermined	6	0.2	44	1.2	46	1.2	33	164,093
Total^b	36	0.9	1,738	45.6	1,774	46.5	221	124,774

a. Rate per 1,000 population.

b. Includes 2 fatalities and 44 hospital admitted cases with unknown mechanism.

**Table A5.7 Kimberley Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	5	1.6	36	6.0	31	5.9	114	5.2	<5	0.5
Fall	33	10.9	49	8.2	30	5.7	160	7.3	32	17.1
Drowning	<5	0.7	<5	0.2	<5	0.2	<5	0.0	0	0.0
Burns	15	4.9	11	1.8	<5	0.2	20	0.9	<5	0.5
Poisoning	6	2.0	<5	0.2	<5	0.2	9	0.4	<5	1.6
Other	24	7.9	55	9.1	88	16.6	223	10.2	19	10.1
Intentional										
Self-harm	0	0.0	<5	0.7	31	5.9	55	2.5	<5	0.5
Violence	<5	0.7	9	1.5	107	20.2	342	15.6	5	2.7
Undetermined intent										
Undetermined	12	3.9	10	1.7	37	7.0	136	6.2	<5	2.1
Total^b	105	34.5	179	29.8	330	62.3	1,087	49.6	73	39.0
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	7.0	4	31.5	1	2.2	24	15.5	0	0.2
Fall	1	20.3	1	8.2	1	3.9	10	6.3	5	35.8
Drowning	0	0.6	5	40.3	0	0.0	5	3.2	0	0.0
Burns	1	38.2	1	7.6	0	0.2	6	3.6	0	0.6
Poisoning	0	4.6	0	0.7	0	0.0	6	3.7	0	0.3
Other	0	12.8	1	5.4	2	6.3	7	4.4	4	31.4
Intentional										
Self-harm	0	0.0	0	0.3	25	66.7	52	33.0	0	0.1
Violence	0	0.5	0	1.5	2	5.6	15	9.7	0	1.2
Undetermined intent										
Undetermined	0	14.6	1	4.3	6	14.9	26	16.6	0	1.2
Total^b	3	100	11	100	37	100	157	100	13	100

a. Rate per 1,000 population.

b. Includes 46 cases with unknown mechanism or age.

**Table A5.8 Kimberley Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	8	22.2	351	20.2	1,869	32.0	2,228	29.2	69	30,837
Non-alcohol	28	77.8	1,387	79.8	3,974	68.0	5,389	70.8	216	40,082
Total	36	100.0	1,738	100.0	5,843	100.0	7,617	100.0	285	37,463

Appendix 6 – Midwest Health Region

**Table A6.1 Midwest Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	36	0.5	152	4,214,891
Hospitalisation	1,688	25.5	60	35,453
ED attendance ^b	6,918	104.3	69	9,989
Total^b	8,642	130.3	281	32,479
Male				
Fatal	22	0.6	100	4,452,153
Hospitalisation	994	29.1	39	39,600
ED attendance	4,222	123.8	42	9,967
Total	5,238	153.5	179	34,248
Female				
Fatal	14	0.4	54	3,842,051
Hospitalisation	694	21.5	20	29,514
ED attendance	2,695	83.7	27	10,022
Total	3,403	105.7	101	29,762

a. Rate per 1,000 population.

b. Includes 1 case of unknown gender.

**Table A6.2 Midwest Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	50	106.8	43	95.6	93	101.3
1-4	370	197.6	319	177.3	689	187.7
5-9	376	168.8	262	112.3	638	139.9
10-14	532	223.0	254	109.3	786	166.9
15-19	681	321.7	337	164.1	1,018	244.1
20-24	569	278.4	267	143.8	836	214.3
25-34	770	172.4	512	121.8	1,282	147.8
35-44	710	143.2	426	92.8	1,137	119.1
45-54	461	92.9	308	67.7	769	80.8
55-64	309	72.5	244	63.0	553	68.0
65-74	217	79.7	186	77.0	403	78.4
75-84	144	110.4	139	109.1	283	109.8
≥85	49	149.8	106	219.5	155	191.4
Total	5,238	153.5	3,403	105.7	8,642^b	130.3^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	0	6,072	0	8,931	1	7,394
1-4	3	8,158	3	8,748	6	8,431
5-9	3	7,986	2	6,771	5	7,487
10-14	5	8,651	2	7,970	7	8,431
15-19	19	28,173	4	10,593	23	22,354
20-24	9	16,372	4	16,021	14	16,260
25-34	39	50,071	17	32,321	55	42,982
35-44	32	45,759	12	28,199	45	39,149
45-54	18	38,636	6	18,280	23	30,483
55-64	26	85,068	8	32,790	34	62,002
65-74	11	52,195	7	35,075	18	44,294
75-84	13	89,324	28	204,106	41	145,701
≥85	1	12,897	9	88,437	10	64,557
Total	179	34,248	101	29,762	281^b	32,479^b

a. Rate per 1,000 population.

b. Includes 1 case with unknown gender.

**Table A6.3 Midwest Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	6	0.7	30	0.5	36	0.5
Hospitalisation	420	48.8	1,268	22.0	1,688	25.5
ED attendance	1,707	198.2	5,211	90.3	6,918	104.3
Total	2,133	247.6	6,509	112.8	8,642	130.3

Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	28	4,621,513	124	4,133,567	152	4,214,891
Hospitalisation	13	30,825	47	36,986	59	35,453
ED attendance	17	9,939	52	10,005	69	9,989
Total	58	27,023	223	34,267	281	32,479

a. Rate per 1,000 population.

**Table A6.4 Midwest Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	17	0.7	754	30.5	3,108	125.5	3,879	156.7	133	34,310
2	11	0.6	420	24.3	1,799	103.9	2,230	128.8	76	33,863
3	<5	0.2	253	23.8	914	86.0	1,169	110.0	27	23,350
4	<5	0.4	217	19.7	843	76.6	1,064	96.7	33	31,111
5	<5	0.8	44	16.8	254	96.8	300	114.3	12	38,933
Total^c	36	0.5	1,688	25.5	6,918	104.3	8,642	130.3	281	32,479

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

c. Includes one emergency department case with unknown SEIFA.

**Table A6.5 Midwest Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	22	0.3	1,215	18.2	1,237	18.7	137	110,519
Intentional self-harm	8	0.1	93	1.4	101	1.5	39	387,583
Intentional inter-personal	<5	0.0	148	2.2	149	2.2	10	67,054
Undetermined	<5	0.0	188	2.8	190	2.9	12	64,475
Total^b	36	0.5	1,688	25.5	1,724	26.0	212	122,727

a. Rate per 1,000 population.

b. Includes 3 fatalities and 44 hospitalisations with unknown intent.

**Table A6.6 Midwest Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	9	0.1	213	3.2	222	3.3	53	239,384
Fall	9	0.1	496	7.5	505	7.6	49	96,498
Drowning	0	0.0	<5	0.1	<5	0.1	0	13,145
Fires, burns and scalds	<5	0.0	39	0.6	40	0.6	7	180,555
Poisoning	<5	0.0	42	0.6	44	0.7	10	222,253
Other	<5	0.0	421	6.3	422	6.4	18	42,142
Intentional								
Self-harm	8	0.1	93	1.4	101	1.5	39	387,583
Violence	<5	0.0	148	2.2	149	2.2	10	67,054
Undetermined intent								
Undetermined	<5	0.0	188	2.8	190	2.9	12	64,475
Total^b	36	0.5	1,688	25.5	1,724	26.0	212	122,727

a. Rate per 1,000 population.

b. Includes 3 fatalities and 44 hospitalisations with unknown mechanism.

**Table A6.7 Midwest Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	7	1.5	27	2.9	49	6.1	131	3.7	8	3.7
Fall	32	7.0	57	6.2	41	5.1	153	4.3	222	4.3
Drowning	<5	0.4	0	0.0	0	0.0	<5	0.0	<5	0.0
Burns	8	1.7	7	0.8	9	1.1	12	0.3	<5	0.3
Poisoning	14	3.1	<5	0.1	<5	0.1	21	0.6	7	0.6
Other	26	5.7	39	4.2	72	8.9	235	6.6	50	6.6
Intentional										
Self-harm	0	0.0	6	0.6	24	3.0	67	1.9	<5	1.9
Violence	<5	0.4	<5	0.1	42	5.2	102	2.8	<5	2.8
Undetermined intent										
Undetermined	<5	0.4	12	1.3	43	5.3	110	3.1	23	3.1
Total^b	94	20.5	150	16.2	291	36.1	854	23.8	335	39.3
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	9.6	1	16.6	6	31.6	42	35.0	4	6.0
Fall	1	27.9	1	32.3	2	8.1	6	5.1	39	60.0
Drowning	0	0.6	0	0.0	0	0.0	0	0.0	0	0.0
Burns	1	29.4	1	15.7	1	3.9	5	4.0	0	0.5
Poisoning	0	5.9	0	0.3	0	0.1	10	7.9	0	0.1
Other	1	25.1	1	28.6	2	10.7	8	6.5	6	9.5
Intentional										
Self-harm	0	0.0	0	1.5	5	26.2	34	28.1	0	0.2
Violence	0	0.7	0	0.6	1	6.8	9	7.1	0	0.0
Undetermined intent										
Undetermined	0	0.5	0	4.5	1	5.3	3	2.6	8	12.1
Total^b	2	100	4	100	20	100	120	100	65	100

a. Rate per 1,000 population.

b. Includes 47 cases with unknown mechanism.

**Table A6.8 Midwest Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	7	19.4	218	12.9	2,213	32.0	2,438	28.2	62	25,431
Non-alcohol	29	80.6	1,470	87.1	4,705	68.0	6,204	71.8	219	35,294
Total	36	100.0	1,688	100.0	6,919	100.0	8,642	100.0	281	32,479

Appendix 7 – Southwest Health Region

**Table A7.1 Southwest Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	91	0.6	369	4,055,826
Hospitalisation ^b	3,035	18.4	121	39,800
ED attendance ^c	14,649	88.9	161	10,964
Total^d	17,775	107.9	650	36,595
Male				
Fatal	51	0.6	216	4,239,597
Hospitalisation	1,750	21.4	84	47,806
ED attendance	8,847	108.2	97	10,988
Total	10,648	130.2	397	37,292
Female				
Fatal	40	0.5	153	3,821,519
Hospitalisation	1,283	15.5	37	28,906
ED attendance	5,798	69.9	63	10,922
Total	7,121	85.8	253	35,567

a. Rate per 1,000 population.

b. Includes 2 cases of unknown gender.

c. Includes 4 cases of unknown gender.

d. Includes 6 cases of unknown gender.

**Table A7.2 Southwest Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	95	81.9	78	70.9	173	76.5
1-4	782	168.6	650	147.6	1,432	158.4
5-9	733	127.6	596	103.0	1,330	115.4
10-14	1,076	181.5	697	121.7	1,774	152.2
15-19	1,313	235.1	661	129.6	1,974	184.7
20-24	1,047	230.8	490	113.7	1,538	173.9
25-34	1,699	166.8	844	83.2	2,543	125.1
35-44	1,389	123.2	793	66.2	2,184	93.9
45-54	1,005	86.8	666	56.1	1,672	71.3
55-64	667	64.9	530	51.3	1,197	58.1
65-74	380	56.2	397	58.5	777	57.3
75-84	290	92.1	398	103.9	688	98.6
≥85	172	182.4	321	199.3	493	193.0
Total	10,648	130.2	7,121	85.8	17,775^b	107.9^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	1	7,208	1	8,573	1	7,823
1-4	11	13,527	6	8,650	16	11,313
5-9	6	8,738	5	8,968	12	8,859
10-14	11	10,374	6	8,110	17	9,502
15-19	25	18,964	12	17,773	37	18,565
20-24	43	40,635	7	14,389	50	32,255
25-34	78	45,802	24	28,632	102	40,103
35-44	54	38,812	30	37,209	83	38,206
45-54	42	41,989	20	30,575	63	37,424
55-64	27	40,910	22	40,995	49	40,947
65-74	23	60,336	13	32,818	36	46,276
75-84	37	129,046	48	119,364	85	123,445
≥85	39	228,206	61	189,682	100	203,122
Total	397	37,292	253	35,567	650^b	36,595^b

a. Rate per 1,000 population.

b. Includes cases with unknown gender.

**Table A7.3 Southwest Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	<5	0.5	89	0.6	91	0.6
Hospitalisation	107	25.2	2,928	18.2	3,035	18.4
ED attendance	557	131.2	14,092	87.8	14,649	88.9
Total	666	156.9	17,109	106.6	17,775	107.9
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	10	4,935,511	359	4,036,058	369	4,055,826
Hospitalisation	5	47,143	116	39,532	121	39,800
ED attendance	6	10,231	155	10,993	161	10,964
Total	21	30,952	630	36,815	650	36,595

a. Rate per 1,000 population.

**Table A7.4 Southwest Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	27	0.6	878	21.0	3,730	89.2	4,635	110.8	180	38,836
2	19	0.5	700	17.9	3,213	82.2	3,932	100.6	139	35,252
3	11	0.3	627	15.1	3,269	78.9	3,907	94.3	103	26,404
4	24	0.7	628	19.5	3,237	100.4	3,889	120.6	172	44,121
5	10	1.0	202	19.9	1,200	118.3	1,412	139.2	57	40,452
Total	91	0.6	3,035	18.4	14,649	88.9	17,775	107.9	650	36,595

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

**Table A7.5 Southwest Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	66	0.4	2,267	13.8	2,333	14.2	361	154,800
Intentional self-harm	17	0.1	227	1.4	244	1.5	78	318,416
Intentional inter-personal	<5	0.0	110	0.7	112	0.7	12	105,903
Undetermined	<5	0.0	345	2.1	349	2.1	29	81,864
Total^b	91	0.6	3,035	18.4	3,126	19.0	490	156,709

a. Rate per 1,000 population.

b. Includes 2 fatalities and 86 hospitalisations with unknown intent.

**Table A7.6 Southwest Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	16	0.1	387	2.3	403	2.4	105	261,498
Fall	35	0.2	909	5.5	944	5.7	162	171,517
Drowning	<5	0.0	<5	0.0	<5	0.0	4	1,108,164
Fires, burns and scalds	0	0.0	53	0.3	53	0.3	5	89,033
Poisoning	<5	0.0	70	0.4	73	0.4	16	219,555
Other	11	0.1	845	5.1	856	5.2	69	80,226
Intentional								
Self-harm	17	0.1	227	1.4	244	1.5	78	318,416
Violence	<5	0.0	110	0.7	112	0.7	12	105,903
Undetermined intent								
Undetermined	<5	0.0	345	2.1	349	2.1	29	81,864
Total^b	91	0.6	3,035	18.4	3,126	19.0	490	156,709

a. Rate per 1,000 population.

b. Includes 2 fatalities and 86 hospitalisations with unknown intent.

Table A7.7 Southwest Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	11	1.0	60	2.6	99	5.1	193	2.2	40	1.7
Fall	54	4.8	145	6.3	51	2.6	235	2.7	459	19.9
Drowning	<5	0.1	<5	0.0	0	0.0	<5	0.0	0	0.0
Burns	10	0.9	10	0.4	7	0.4	22	0.3	<5	0.2
Poisoning	21	1.9	<5	0.1	9	0.5	36	0.4	<5	0.2
Other	64	5.7	98	4.2	147	7.5	441	5.0	106	4.6
Intentional										
Self-harm	0	0.0	8	0.3	75	3.8	152	1.7	9	0.4
Violence	<5	0.1	<5	0.1	35	1.8	70	0.8	<5	0.1
Undetermined intent										
Undetermined	9	0.8	16	0.7	84	4.3	185	2.1	55	2.4
Total^b	175	15.5	348	15.0	521	26.7	1,376	15.7	706	30.6
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	2.6	2	19.7	35	66.9	49	23.4	20	9.3
Fall	1	14.8	3	38.0	2	4.6	24	11.4	131	62.4
Drowning	4	49.2	0	0.1	0	0.0	0	0.0	0	0.0
Burns	1	10.2	1	10.1	1	2.1	2	0.8	0	0.1
Poisoning	0	4.0	1	7.7	0	0.2	15	7.1	0	0.0
Other	1	15.4	2	18.7	5	9.0	41	19.4	20	9.7
Intentional										
Self-harm	0	0.0	0	1.3	5	10.6	61	28.9	11	5.3
Violence	0	0.3	0	1.1	1	1.7	7	3.3	4	1.8
Undetermined intent										
Undetermined	0	2.9	0	2.7	2	4.5	10	4.7	16	7.5
Total^b	9	100.0	8	100.0	52	100.0	211	100.0	210	100.0

a. Rate per 1,000 population.

b. Includes 88 cases with unknown mechanism.

**Table A7.8 Southwest Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	15	16.5	322	10.6	4,688	32.0	5,024	28.2	130	25,876
Non-alcohol	76	83.5	1,470	89.4	9,961	68.0	12,751	71.7	520	40,781
Total	91	100.0	3,035	100.0	14,649	100.0	17,775	100.0	650	36,595

Appendix 8 – Wheatbelt Health Region

**Table A8.1 Wheatbelt Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	96	1.2	397	4,132,397
Hospitalisation	2,546	33.0	96	37,742
ED attendance ^b	12,123	157.2	123	10,177
Total^b	14,765	191.5	616	41,732
Male				
Fatal	61	1.5	261	4,271,332
Hospitalisation	1,511	38.0	62	41,196
ED attendance	7,346	184.7	75	10,163
Total	8,918	224.3	397	44,567
Female				
Fatal	35	0.9	136	3,890,254
Hospitalisation	1,035	27.7	34	32,699
ED attendance	4,771	127.9	49	10,195
Total	5,841	156.4	219	37,432

a. Rate per 1,000 population.

b. Includes 6 cases of unknown gender.

**Table A8.2 Wheatbelt Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	82	154.7	49	100.9	131	129.0
1-4	675	318.3	505	260.0	1,182	290.9
5-9	685	260.3	452	169.6	1,137	214.6
10-14	902	334.9	559	220.5	1,461	279.5
15-19	1,084	503.2	572	300.6	1,657	408.4
20-24	785	379.6	391	236.1	1,177	316.1
25-34	1,168	272.6	657	159.8	1,825	217.3
35-44	1,039	206.2	662	130.6	1,702	168.4
45-54	860	141.9	557	99.4	1,417	121.5
55-64	723	123.7	519	98.7	1,243	112.0
65-74	452	112.7	367	102.6	819	108.0
75-84	296	159.7	284	157.7	580	158.7
≥85	167	347.2	267	360.8	434	355.4
Total	8,918	224.3	5,841	156.4	14,765^b	191.5^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	1	7,949	0	6,431	1	7,381
1-4	10	14,578	4	8,009	14	11,767
5-9	14	20,876	4	9,207	18	16,237
10-14	8	8,922	5	8,484	13	8,754
15-19	31	28,674	10	17,715	41	24,881
20-24	44	56,002	28	71,669	72	61,182
25-34	37	31,254	23	35,207	60	32,678
35-44	71	68,438	14	21,211	85	50,032
45-54	41	47,205	13	23,027	53	37,701
55-64	33	45,456	17	32,393	50	39,975
65-74	35	77,594	18	48,153	53	64,401
75-84	45	153,354	34	119,821	79	136,935
≥85	28	167,844	49	182,437	77	176,822
Total	397	44,567	219	37,432	616^b	41,732^b

a. Rate per 1,000 population.

b. Includes 6 cases with unknown gender.

**Table A8.3 Wheatbelt Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	8	1.8	88	1.2	96	1.2
Hospitalisation	268	61.9	2,278	31.3	2,546	33.0
ED attendance	1,429	330.1	10,694	146.9	12,123	157.2
Total	1,705	393.9	13,060	179.4	14,765	191.5
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	39	4,863,925	358	4,065,894	397	4,132,397
Hospitalisation	7	27,500	89	38,947	96	37,742
ED attendance	14	9,488	110	10,269	123	10,177
Total	60	35,096	556	42,599	616	41,732

a. Rate per 1,000 population.

**Table A8.4 Wheatbelt Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA ^a	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^b	n	Rate ^b	n	Rate ^b	n	Rate ^b		
1	53	2.1	1,102	44.4	5,536	223.1	6,691	269.6	313	46,710
2	16	0.8	588	28.4	2,927	141.6	3,531	170.8	121	34,330
3	20	1.1	498	28.3	2,102	119.6	2,620	149.0	119	45,399
4	6	0.5	292	25.3	1,131	98.1	1,429	123.9	52	36,703
5	<5	0.4	66	26.2	427	169.4	494	195.9	11	22,326
Total	96	1.2	2,546	33.0	12,123	157.2	14,765	191.5	616	41,732

a. SEIFA coding: 1=most disadvantaged; 5=least disadvantaged.

b. Rate per 1,000 population.

**Table A8.5 Wheatbelt Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	67	0.9	1,940	25.2	2,007	26.0	354	176,307
Intentional self-harm	20	0.3	134	1.7	154	2.0	88	572,778
Intentional inter-personal	<5	0.0	120	1.6	123	1.6	16	128,954
Undetermined	<5	0.0	270	3.5	272	3.5	16	60,631
Total^b	96	1.2	2,546	33.0	2,642	34.3	493	186,526

a. Rate per 1,000 population.

b. Includes 4 fatalities and 82 hospitalisations with unknown intent.

**Table A8.6 Wheatbelt Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	23	0.3	398	5.2	421	5.5	131	311,404
Fall	28	0.4	802	10.4	830	10.8	131	157,559
Drowning	<5	0.0	<5	0.0	5	0.1	9	1,892,546
Fires, burns and scalds	0	0.0	65	0.8	65	0.8	5	78,229
Poisoning	5	0.1	63	0.8	68	0.9	24	354,566
Other	9	0.1	609	7.9	618	8.0	53	86,272
Intentional								
Self-harm	20	0.3	134	1.7	154	2.0	88	572,778
Violence	<5	0.0	120	1.6	123	1.6	16	128,954
Undetermined intent								
Undetermined	<5	0.0	270	3.5	272	3.5	16	60,631
Total^b	96	1.2	2,546	33.0	2,642	34.3	493	186,526

a. Rate per 1,000 population.

b. Includes 4 fatalities and 82 hospital admitted cases with unknown mechanism.

Table A8.7 Wheatbelt Health Region
Incidence and costs of injury by intent, mechanism and age group, fatalities and hospitalisations, 2012

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	9	1.8	42	4.0	128	16.5	212	5.1	30	2.4
Fall	44	8.7	115	10.9	47	6.0	218	5.3	406	32.6
Drowning	<5	0.6	<5	0.1	0	0.0	<5	0.0	0	0.0
Burns	14	2.8	12	1.1	14	1.8	23	0.6	<5	0.2
Poisoning	16	3.2	<5	0.2	<5	0.5	34	0.8	12	1.0
Other	32	6.3	73	6.9	105	13.5	301	7.3	107	8.6
Intentional										
Self-harm	0	0.0	<5	0.2	45	5.8	96	2.3	11	0.9
Violence	<5	0.2	<5	0.2	27	3.5	91	2.2	<5	0.2
Undetermined intent										
Undetermined	7	1.4	18	1.7	39	5.0	173	4.2	35	2.8
Total^b	129	25.4	270	25.7	419	53.8	1,184	28.7	640	51.4
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	4	58.3	1	7.4	49	55.7	65	35.5	12	5.9
Fall	1	12.3	3	17.3	2	2.1	16	8.7	110	54.9
Drowning	0	0.2	5	28.2	0	0.0	5	2.7	0	0.0
Burns	1	15.1	1	5.9	1	1.4	2	0.9	0	0.0
Poisoning	0	4.0	0	0.1	0	0.1	24	12.9	0	0.1
Other	1	8.2	6	37.8	5	5.5	13	7.2	29	14.4
Intentional										
Self-harm	0	0.0	0	0.1	24	27.6	38	20.9	26	13.0
Violence	0	0.1	0	0.1	1	0.8	11	6.3	4	1.9
Undetermined intent										
Undetermined	0	1.5	0	2.9	6	6.6	6	3.1	4	2.2
Total^b	8	100	16	100	87	100	182	100	199	100

a. Rate per 1,000 population.

b. Includes 86 cases with unknown mechanism.

**Table A8.8 Wheatbelt Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	17	17.7	281	11.0	3,877	32.0	4,175	28.3	128	30,659
Non-alcohol	79	82.3	2,265	89.0	8,246	68.0	10,590	71.7	488	46,055
Total	96	100.0	2,546	100.0	12,129	100.0	14,765	100.0	616	41,732

Appendix 9 – Pilbara Health Region

**Table A9.1 Pilbara Health Region
Incidence and costs of injury by severity and sex, 2012**

Injury severity	Incidence n	Rate ^a	Total costs \$m	Mean cost \$
Total				
Fatal	29	0.5	133	4,593,784
Hospitalisation	1,228	19.1	51	41,435
ED attendance ^b	6,299	98.2	66	10,409
Total^b	7,556	117.8	250	33,042
Male				
Fatal	19	0.5	91	4,779,632
Hospitalisation	760	19.0	35	46,064
ED attendance	3,842	96.3	40	10,367
Total	4,621	115.8	166	35,848
Female				
Fatal	10	0.4	42	4,240,674
Hospitalisation	468	19.3	16	33,918
ED attendance	2,452	101.1	26	10,472
Total	2,930	120.8	84	28,655

a. Rate per 1,000 population.

b. Includes 5 cases of unknown gender.

**Table A9.2 Pilbara Health Region
Incidence and costs of injury by age group and sex, 2012**

Age group years	Incidence					
	Male		Female		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
<1	56	117.9	51	119.0	108	119.5
1-4	424	223.3	305	177.9	729	201.7
5-9	334	165.0	200	103.3	536	135.3
10-14	389	232.8	236	150.6	626	193.3
15-19	452	292.2	244	189.7	696	245.7
20-24	548	173.6	320	153.4	868	165.6
25-34	1,034	105.6	712	124.3	1,747	112.6
35-44	663	78.8	431	99.8	1,094	85.9
45-54	406	61.6	267	85.1	673	69.2
55-64	219	62.9	119	77.1	338	67.3
65-74	71	101.7	28	75.5	99	92.6
75-84	15	131.6	15	150.0	30	140.2
≥85	10	217.4	<5	50.0	12	139.5
Total	4,621	115.8	2,930	120.8	7,556^b	117.8^b
Age group years	Costs					
	Male		Female		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
<1	1	10,349	1	10,143	1	10,254
1-4	3	6,788	2	8,084	5	7,330
5-9	4	10,660	2	8,561	5	9,884
10-14	3	8,163	10	43,240	13	21,393
15-19	12	25,920	12	47,357	23	33,435
20-24	24	44,284	10	30,543	34	39,218
25-34	33	31,614	15	21,476	48	27,470
35-44	43	64,707	18	41,287	61	55,481
45-54	35	86,804	4	16,733	40	59,005
55-64	4	18,507	6	48,416	10	29,037
65-74	1	8,802	0	14,826	1	10,506
75-84	4	256,756	4	261,548	8	259,152
≥85	0	11,420	0	38,329	0	15,905
Total	166	35,848	84	28,655	250^b	33,042^b

a. Rate per 1,000 population.

b. Includes 5 cases with unknown gender.

**Table A9.3 Pilbara Health Region
Incidence and costs of injury by Aboriginality and severity, 2012**

Injury severity	Incidence					
	Aboriginal		Non-Aboriginal		Total	
	n	Rate ^a	n	Rate ^a	n	Rate ^a
Fatal	16	1.6	13	0.2	29	0.5
Hospitalisation	553	55.2	675	12.5	1,228	19.1
ED attendance	2,083	207.8	4,216	77.9	6,299	98.2
Total	2,652	264.5	4,904	90.6	7,556	117.8
Injury severity	Costs					
	Aboriginal		Non-Aboriginal		Total	
	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$	Total costs \$m	Mean cost \$
Fatal	71	4,462,437	62	4,755,442	133	4,593,784
Hospitalisation	23	41,118	28	41,694	51	41,435
ED attendance	22	10,431	44	10,398	66	10,409
Total	116	43,690	134	27,285	250	33,042

a. Rate per 1,000 population.

**Table A9.4 Pilbara Health Region
Incidence and costs of injury by socioeconomic status and severity, 2012**

SEIFA	Incidence								Total costs \$m	Mean cost \$
	Fatal		Hospitalisation		ED attendance		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a		
1	<5	0.8	196	38.2	708	138.0	908	176.9	33	36,472
2	8	0.9	213	24.7	1,083	125.6	1,304	151.2	58	44,319
3	13	0.8	306	19.2	1,605	100.5	1,924	120.5	92	47,927
4	<5	0.1	287	17.6	1,480	90.7	1,768	108.3	30	17,085
5	<5	0.2	226	12.5	1,423	78.6	1,652	91.2	36	21,999
Total	29	0.5	1,228	19.1	6,299	98.2	7,556	117.8	250	33,042

a. Rate per 1,000 population.

**Table A9.5 Pilbara Health Region
Incidence and cost of injury by intent of injury and severity,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional	10	0.2	767	12.0	777	12.1	82	105,446
Intentional self-harm	14	0.2	67	1.0	81	1.3	68	836,482
Intentional inter-personal	<5	0.0	210	3.3	213	3.3	20	95,969
Undetermined	<5	0.0	154	2.4	155	2.4	8	56,955
Total^b	29	0.5	1,228	19.1	1,257	19.6	184	146,461

a. Rate per 1,000 population.

b. Includes 1 fatality and 30 hospitalisations with unknown intent.

**Table A9.6 Pilbara Health Region
Incidence and costs of injury by intent and mechanism,
fatalities and hospitalisations, 2012**

Year	Incidence						Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		Total			
	n	Rate ^a	n	Rate ^a	n	Rate ^a		
Unintentional								
Transport	<5	0.1	192	3.0	196	3.1	32	161,770
Fall	<5	0.0	238	3.7	240	3.7	16	64,637
Drowning	0	0.0	<5	0.0	<5	0.0	0	7,129
Fires, burns and scalds	0	0.0	26	0.4	26	0.4	4	163,180
Poisoning	<5	0.0	30	0.5	33	0.5	15	463,037
Other	<5	0.0	280	4.4	281	4.4	15	54,027
Intentional								
Self-harm	14	0.2	67	1.0	81	1.3	68	836,482
Violence	<5	0.0	210	3.3	213	3.3	20	95,969
Undetermined intent								
Undetermined	1	0.0	154	2.4	155	2.4	8	56,955
Total^b	29	0.5	1,228	19.1	1,257	19.6	184	146,461

a. Rate per 1,000 population.

b. Includes 1 fatality and 30 hospital admitted cases with unknown mechanism.

**Table A9.7 Pilbara Health Region
Incidence and costs of injury by intent, mechanism and age group,
fatalities and hospitalisations, 2012**

Year	Age group									
	0-4		5-14		15-24		25-64		≥65	
	Incidence									
	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a	n	Rate ^a
Unintentional										
Transport	5	1.1	24	3.3	65	8.0	98	2.3	<5	2.9
Fall	27	6.0	52	7.2	23	2.8	117	2.7	21	15.3
Drowning	0	0.0	0	0.0	<5	0.1	0	0.0	0	0.0
Burns	5	1.1	7	1.0	<5	0.5	10	0.2	0	0.0
Poisoning	8	1.8	<5	0.3	<5	0.2	20	0.5	<5	0.7
Other	27	6.0	21	2.9	46	5.7	178	4.1	9	6.6
Intentional										
Self-harm	0	0.0	<5	0.6	34	4.2	43	1.0	0	0.0
Violence	<5	0.4	6	0.8	49	6.1	155	3.6	<5	0.7
Undetermined intent										
Undetermined	8	1.8	10	1.4	40	5.0	97	2.3	0	0.0
Total^b	86	19.0	128	17.8	270	33.4	733	17.0	40	29.2
Year	Costs									
	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%	Total \$m	%
Unintentional										
Transport	0	4.0	5	40.0	13	29.6	10	8.6	4	44.8
Fall	1	34.6	1	10.1	1	2.2	8	7.0	4	52.3
Drowning	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Burns	0	22.9	1	5.1	1	2.0	2	1.9	0	0.0
Poisoning	0	3.9	0	0.2	0	0.1	15	12.8	0	0.1
Other	0	19.6	1	6.4	1	3.1	12	10.6	0	1.7
Intentional										
Self-harm	0	0.0	0	0.4	24	56.3	43	36.8	0	0.0
Violence	0	2.0	4	35.8	2	4.0	14	12.0	0	0.5
Undetermined intent										
Undetermined	0	10.8	0	1.8	1	2.5	7	6.2	0	0.0
Total^b	2	100	13	100	43	100	118	100	8	100

a. Rate per 1,000 population.

b. Includes 31 cases with unknown mechanism.

**Table A9.8 Pilbara Health Region
Incidence and costs of injury by alcohol-related status, 2012**

Alcohol-related status	Incidence by severity and alcohol-related status								Total costs \$m	Mean cost \$
	Fatalities		Hospitalisations		ED presentations		Total			
	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related	n	% alcohol-related		
Alcohol	5	17.2	203	16.5	2,014	32.0	2,222	29.4	55	24,752
Non-alcohol	24	82.8	1,025	83.5	4,285	68.0	5,334	70.6	195	36,558
Total	29	100.0	1,228	100.0	6,299	100.0	7,556	100.0	250	33,042

This page has been left blank intentionally.

This document can be made available
in alternative formats on request for
a person with disability.

Produced by Chronic Disease Prevention Directorate
© Department of Health 2016

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the *Copyright Act 1968*, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

health.wa.gov.au