

# Underlying causes and effects of injury in Australian Aboriginal populations: a rapid review

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## Abbreviations

<b>ABS</b>	Australian Bureau of Statistics
<b>AIHW</b>	Australian Institute of Health and Welfare
<b>ED</b>	Emergency Department
<b>DALYs</b>	A measure that combines years of life lost due to premature mortality and years lost due to disability
<b>QLD</b>	Queensland
<b>NATSIHS</b>	National Aboriginal and Torres Strait Islanders Health survey
<b>NSW</b>	New South Wales
<b>NT</b>	Northern Territory
<b>RTA</b>	Roads and Traffic Authority of New South Wales
<b>SA</b>	South Australia
<b>SES</b>	Socioeconomic status
<b>WA</b>	Western Australia
<b>YLD</b>	Years of life lost due to disability
<b>YLL</b>	Years of life lost due to premature mortality

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## Executive Summary

### *Epidemiology of injury in Aboriginal people in NSW*

- In NSW, the rate of injury related death per 100,000 population was higher in Aboriginal males (92.6) compared to non-Aboriginal males (55.4), a rate ratio of 1.67. Injury death rates per 100,000 population were also higher in Aboriginal females (32.8) compared to non-Aboriginal females (22.5), a rate ratio of 1.46.
- The majority of deaths due to injury among Aboriginal people involved males (70%). The leading cause of death from injury in Aboriginal males, using age-standardised rates per 100,000 population, was self harm (23.81) followed by transport crashes (15.65), poisoning (12.8), interpersonal violence (7.3), falls (6.37) and drowning (3.76). In Aboriginal females, the leading causes were poisoning (8.35), followed by transport crashes (7.02), self harm (4.51), interpersonal violence (3.2) and falls (1.08). The Aboriginal to non-Aboriginal rate ratio was highest for interpersonal violence (4.15) in both males and females.
- The leading causes of hospitalisations from injury and poisoning for Aboriginal males were falls (23.8%), followed by interpersonal violence (18.0%) and transport crashes (13.6%), cutting and piercing (6.7%) and self-harm (6.2%). For females, the leading causes of hospitalisations from injury and poisoning were falls (24.5%) followed by interpersonal violence (19.6%), self-harm (17.0%) and transport crashes (8.8%).
- Overall age-standardised rates of injury and poisoning hospitalisations were significantly higher for Aboriginal people compared to non-Aboriginal people, with rates being 46% higher for Aboriginal males and 58% for Aboriginal females. The disparity between Aboriginal and non-Aboriginal people were highest for violence in both males (4 times higher) and females (13 times higher); and self harm in both Aboriginal males and females (nearly 3 times higher).
- During the same period, the age specific rates of injury related hospitalisations in Aboriginal people in NSW peaked for those in aged in the late 20s but remained high between ages of 15 and 44 years. Those aged 10-14 years old accounted for the highest number of Aboriginal males injured in transport crashes, 40% of which were pedestrians or cyclists. The rates of poisoning related hospitalisations were highest in Aboriginal children aged 0-4 years and the rates of burns related hospitalisations were highest in Aboriginal people aged 0-9 years.
- Around 20% of injury-related hospitalisations in Aboriginal people were attributable to alcohol, compared to 15% in non-Aboriginal people. This proportion was highest for hospitalisation due to violence where 50% of cases were attributable to alcohol.
- Aboriginal Injury hospitalisation rate in remote/very remote areas is about double that in metropolitan areas. The disparity between Aboriginal and non-Aboriginal rates also seems to increase with remoteness.
- Between 1 July 1999 and 30 June 2009, hospitalisation rates in Aboriginal people increased by approximately 40% over the ten year period. This increase may be due to changes in reporting of Aboriginal status. The highest increase (two fold) was observed in violence-related hospitalisations.
- Injury death and hospitalisations rates in Aboriginal people in NSW were generally lower than national rates.

### *The burden and impact of injury in Aboriginal people in NSW*

- National data on the burden of injury, taking into account mortality and years lost due to disability, show that suicide, transport crashes and violence contributed to

more than two-thirds of the injury burden in Indigenous Australians and to most of the indigenous health gap due to injury.

- While it is recognised that the effects of injury on Aboriginal peoples are significant there is very little research on the impact of injury on Aboriginal people in terms of quality of life, financial cost, time out of school, work, home and community life.
- The 2004-2005 National Aboriginal and Torres Strait Islander Health Survey showed that 15% of Aboriginal respondents reported long term conditions/disability as a direct result of an injury or accident compared to 11% in the non-indigenous population (a rate ratio of 1.4).
- Studies carried out in NSW found that injury has detrimental effects on individuals, families and Aboriginal communities. These effects include increased stress, increased financial pressure, reduction in self-esteem, increased feelings of frustration and anger which in turns lead to alcohol abuse, depression, feelings of hopelessness and self-harm. These effects tended to have a 'ripple' effect throughout the families and communities of the injured person.

#### *Underlying risk factors for injury in Aboriginal people in NSW*

- There are very few robust studies that have examined the risk factors for injury in Aboriginal people in Australia.
- Factors that have been identified and that are common to various types of injury include alcohol abuse, socioeconomic disadvantage (low income, high unemployment and low literacy), remoteness as well as historical factors, namely the impact of colonisation and dispossession.
- Additional risk factors, specific to transport crashes in Aboriginal people, include low seat belt use, speeding, low licensing levels, and limited access to roadworthy vehicles and adequate road infrastructure, particularly in remote areas.
- Additional risk factors, specific to violence in Aboriginal people, include being a lone parent, having a severe or profound disability, experience of physical violence, lived in an area with neighbourhood problems, exposure to social stressors (family break up, financial pressure, etc), interracial tension, family feuds and overzealous policing.
- Additional risk factors, specific to suicide, include stressors such as the death of someone close, unemployment issues, financial and legal problems as well the lack of access to appropriate counselling and other health care services.

#### *Target points for injury prevention and recommendations:*

- **Self harm:** Aboriginal males and females, from late teens into the 40s, should be the target of suicide prevention efforts as while the hospitalisation rates in females are higher (69%) than Aboriginal males, death rates from self-harm are 3 to 4 times higher in Aboriginal males, due to males using more lethal methods of self harm. The increase of hospitalisation rates for self harm in NSW, particularly in Aboriginal women points to the urgency of prevention efforts in this area.
- **Road crashes:** Aboriginal males in particular, should be the target of road safety programs in NSW as their hospitalisation rates were double those in females. Hospitalisation rates for transport in Aboriginal males increased with increasing remoteness indicating the importance of targeting these areas in terms of road safety strategies.
- **Violence:** This is the injury type with the largest gap between Aboriginal and non-Aboriginal people in NSW. The large gap in Aboriginal women highlights their

vulnerability to violence and indicates that they should be a priority for targeted interventions.

- **Injury in Aboriginal children:** While the burden of injury, particularly mortality, is higher in young and middle aged adults, hospitalisation data in NSW show high levels of injury, due to transport crashes, poisoning and burns in children.
- Common risk factors for various types of injury point to the urgent need to address the social and economic disadvantage and to improve the social, emotional and cultural well-being of Aboriginal people.
- The complexity of these issues should not deter efforts in addressing some direct risk factors of injury in Aboriginal people such as alcohol abuse, low seat belt use, low licensing levels as well as limited access to counselling and other health care services.
- Information on Aboriginal status needs to be included in state police licensing and crash data in order to gain a better understanding of the role of key behavioural, vehicle and environmental risk factors for traffic crashes in Aboriginal people.
- There is also a need for more research to identify risk factors of various types of injury and to explore the interplay between these factors. There is particularly a need for rigorous studies including case control, longitudinal as well as in-depth multidisciplinary studies. More research is also needed to examine the economic and social impact of injury on Aboriginal communities.

## Introduction

### *Background*

The NSW Department of Health is establishing a four year program to provide grants to fund and evaluate demonstration projects that aim to prevent injury among Aboriginal people, as part of the NSW implementation plan for the National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes. The aim of the demonstration grant scheme is to fund, run and evaluate promising intervention research projects that will reduce injury in Aboriginal populations in NSW.

The Sax Institute will consult with a Reference Group and Aboriginal communities to set priorities for funding intervention research into Aboriginal injury prevention. The following decisions need to be made by the Reference Group and communities in consultation:

1. Are there particular causes of injury or types of injury that the funded intervention projects should (or should not) address?
2. Are there particular types of intervention approaches that the projects should (or should not) consider?
3. How should the funded intervention research project be conducted?

### *Purpose and structure of this report*

This report is one of the three reviews subsequently commissioned to meet these objectives. It focuses primarily on the underlying causes and effects of injury in Australian Aboriginal population and attempts to answer the following questions:

- What kinds of injuries have the most effect on Aboriginal communities in terms of mortality and morbidity burden?
- How do the effects of injury differ for major Aboriginal population sub-groups?
- What are the underlying major risk factors for injury amongst Aboriginal populations?
- What are the best target points for injury prevention interventions to reduce the burden of injury in the NSW Aboriginal community?

## Methods

### Search terms

Key search terms were sourced from those commonly utilised in key databases (e.g., Medline) and applied as follows:

- ["Aboriginal" OR "Indigenous" OR "Torres Strait" Oceanic Ancestry Group"] AND
- ["Injury" OR "Wounds and injuries" OR "Violence" OR "Assault" OR " Road Traffic injuries" OR " Poisoning" OR "Burns" OR " Drowning" OR "Falls" OR " Self – harm"].
- AND
- "Australia" OR each of the states separately

### On-line Databases

- AEI-ATSI : Australian Education Index, ATSI subset.
- AFPD : Australian Federal Police Digest.
- AGIS Plus Text: Attorney General's Information Service.
- AGIS-ATSI.
- AIATSI: Indigenous Studies Bibliography.
- APA-FT : Australian Public Affairs Full Text.
- APAIS-Health.
- ATRI : Australian Transport Index.
- ATSIhealth.
- AustLII : Australasian Legal Information Institute.
- Australian Indigenous HealthInfoNet.
- CINAHL.
- CINCH: Australian Criminology Database.
- Cochrane Library.
- Health & Society Database (H&S).
- Health issues in Criminal Justice (CINCH-Health).
- Medline.
- New South Wales Parliamentary & Information Resources.
- PAIS : Public Affairs Information Service.
- ParInfoWeb.
- PsycInfo.
- RURAL : Rural and remote health database.
- Scirus.
- Social Services Abstracts.
- Social Work Abstracts.

In addition, Google was utilised to search for additional grey literature. Several known organisations with key grey literature were also individually searched including AIHW: Australian Institute for Health and Welfare, CARRS-Q: Centre for Accident Research and Road Safety – Queensland and National Institute of Injury Studies.

### *Quality of evidence*

A first level of assessment was to grade the quality of the evaluation method applied to assess the effectiveness of the intervention. The following guidelines were applied:

- GRADE A: Randomised controlled trials (key features: randomised, control group).
- GRADE B: Cohort or case-control designs (which take into account important confounders, are not seriously flawed with respect to selection bias or lack comparability of cases with controls).
- GRADE C: Before / after with statistical testing but no control or unexposed group or descriptive qualitative comparisons to control group but no statistical testing; time series or cross-sectional but with no statistical testing or no control or unexposed group; cohort or case-control designs with important limitations with respect to confounding, bias, sample size or inappropriate statistical analysis.
- GRADE D: Descriptive only (e.g., before / after with no significance testing), experiential, case studies.

## Epidemiology of Injury in Aboriginal people in NSW

The information on injury deaths and hospitalisations in Aboriginal people in NSW is based on NSW Department of Health data gathered from HOIST and provided to the reviewers by the Sax Institute (NSW Health Department, 2010). National data on injury in Aboriginal people is also discussed for comparison purposes.

### *Deaths due to injury in Aboriginal people in NSW*

The majority of deaths due to injury between 2000 and 2007 among Aboriginal people involved males (70%), similar to the proportion of deaths due to injury in non-Aboriginal people (68%). However, the rates of injury related death per 100,000 population was higher in Aboriginal males (92.6) compared to non-Aboriginal males (55.4), a rate ratio of 1.67. Injury death rates per 100,000 population were also higher in Aboriginal females (32.8) compared to non-Aboriginal females (22.5), a rate ratio of 1.46.

The age distribution of injury deaths in Aboriginal people was similar for males and females with just over 30% of deaths involving people aged 25 to 34 years and over half involving those aged 25 to 44 years. Over the period 2004-2006, death rates from injury were higher for Aboriginal people than for non-Aboriginal people for all age groups except 10-14 years. Injury accounted for 12% of deaths in Aboriginal people compared with 5.2% of deaths in non-Aboriginal people.

Between 2000 and 2007, the leading cause of death from injury in Aboriginal males, using age-standardised rates per 100,000 population, was self harm (23.81) followed by transport crashes (15.65), poisoning (12.8), interpersonal violence (7.3), falls (6.37) and drowning (3.76). Death rates were higher in Aboriginal males compared to non-Aboriginal males for all types of injury. The Aboriginal to non-Aboriginal rate ratio was highest for interpersonal violence (4.15), followed by poisoning (2.27), drowning (1.99), self harm (1.43) and transport (1.29).

During the same period, the leading cause of death from injury in Aboriginal females (standardised rates per 100,000 population), was poisoning (8.35), followed by transport crashes (7.02), self harm (4.51), interpersonal violence (3.2) and falls (1.08). Death rates were higher in Aboriginal females compared to non-Aboriginal females for all types of injury except falls. The Aboriginal to non-Aboriginal rate ratio was highest for interpersonal violence (4.14), followed by poisoning (3.48), drowning and transport (1.74) and self harm (1.07).

National Aboriginal fatal injury figures were similar to those found in NSW (Helps and Harrison, 2004). Similar to NSW, national fatal injury rates for Aboriginal people were higher than the rates for non-Aboriginal people for almost all age groups. Age distribution varied according to the type of injury. Intentional self-harm peaked from late teenage to early middle age. In contrast, falls were the most common cause of death in old age. Rates differed between the sexes, with the overall injury death rate in males 2.7 times higher than in females. The ratio of male to female death rate was highest (5.3) for 'Intentional self-harm' and lowest (0.7) for 'Fire, burns and scalds'.

National figures also showed that in Aboriginal males, age standardised death rates per 100,000 were highest for intentional self-harm (37.1), transport crashes (33.3) and interpersonal violence (13.0). Injury from fire (rate ratio 4.3) and interpersonal violence (rate ratio 3.9) were the injury types that differed most from the rates from non-Aboriginal males. In Aboriginal females, age standardised rates per 100,000 were highest for transport crashes (12.2), interpersonal violence (8.6) and intentional self-harm (7.0). Injury from fire (rate ratio: 12) and poisoning (rate ratio: 7.0) were the injury types that differed most from the rates from non-Aboriginal females. The death rates and Aboriginal to non-Aboriginal rate ratio for various types of injury in NSW were generally lower than national rates both in males and females.

### *Hospitalisations due to injury in Aboriginal people in NSW*

Between 1 July 2003 and 30 June 2009, the leading causes of hospitalisations from injury and poisoning for Aboriginal males were falls (23.8%), followed by interpersonal violence (18.0%) and 12 transport crashes (13.6%), cutting and piercing (6.7%) and self-harm (6.2%). For females, the leading causes of hospitalisations from injury and poisoning were falls (24.5%) followed by interpersonal violence (19.6%), self-harm (17.0%) and transport crashes (8.8%).

Between 1 July 2003 and 30 June 2009, overall standardized rates of injury and poisoning hospitalisations were significantly higher for Aboriginal people compared to non-Aboriginal people, with rates being 46% higher for Aboriginal males and 58% for Aboriginal females.

During the same period, the age specific rates of injury related hospitalisations in non-Aboriginal people followed a similar pattern for males and females with a peak in rates for 15-19 years old and a sharp decrease in the oldest age groups. In Aboriginal people, the rates peaked in the late 20s, but remained high between ages of 15 and 44 years. Aboriginal rates were higher than non-Aboriginal rates for all age groups except those aged 35-29 years in both females and males and 10-14 years in females. Hospitalisation rates in Aboriginal people were significantly higher, being more than double those in non-Aboriginal people, in those aged 30-44 years old for both males and females.

Between 1 July 1999 and 30 June 2009, hospitalisation rates in Aboriginal people increased by approximately 40% over the ten year period. This increase may be due to changes in reporting of Aboriginal status. The rates among non-Aboriginal people remained constant over the same period.

Between 1 July 1998 and 30 June 2007, around 20% of injury-related hospitalisations in Aboriginal people were attributable to alcohol, compared to 15% in non-Aboriginal people.

While the majority of injuries in Aboriginal people occur in metropolitan and inner regional areas, injury hospitalisation rates in Aboriginal people increased with increasing remoteness. Aboriginal injury hospitalisation rates in remote/very remote areas is about double that in metropolitan areas. The disparity between Aboriginal and non-Aboriginal rates also seems to increase with remoteness, particularly in females where rate ratio in metropolitan areas was 1.26 compared to 1.73 in remote/very remote areas.

### Hospitalisations due to Interpersonal violence

Between 1 July 2003 and 30 June 2009, age-standardised rates for violence in Aboriginal people were higher than non-Aboriginal people for both males (4 times higher) and females (13 times higher). These are the highest Aboriginal to non-Aboriginal rate ratios of any injury mechanism.

More than half of violence related hospitalisations among Aboriginal people were due to assault by bodily force, accounting for 55% for males and 62% for females. Among Aboriginal people, 40% of violence related hospitalisations involved women compared to 19% in non-Aboriginal people.

The rates of violence related hospitalisations were consistently high in Aboriginal people aged 15-54 years. For both Aboriginal males and females, the rates for those aged 20-39 years were one of the highest of any injury mechanism. In Aboriginal males the highest rate was in those aged 35-39 years (1182.1 per 100,000) and in Aboriginal females, the highest rate was in those aged 25-29 years (878.3 per 100,000).

Despite a number of fluctuations, as with non-Aboriginal people, the rates of violence related hospitalisations remained stable between 1 July 1999 and 30 June 2009.

For Aboriginal males the number of violence related hospitalisations were highest in urban areas and decreased with increasing remoteness. For Aboriginal females, counts were highest in inner and outer regional areas. However, hospitalisation rates for violence increased with remoteness and were highest in remote areas for both males and females.

Between 1 July 1998 and 30 June 2007, around half of violence related hospitalisations in Aboriginal people were attributable to alcohol. This is the highest proportion of alcohol related hospitalisations for any injury mechanism.

#### Hospitalisations due to falls

Between 1 July 2003 and 30 June 2009, standardised hospitalisation rates for fall related injuries were highest of all injury mechanisms across gender and Aboriginality. For females the rates were very similar between Aboriginal and non-Aboriginal people, while for males the rate was significantly higher in the Aboriginal group.

Falls on the same level were the main cause of hospitalisations due to falls in Aboriginal people (37%) and predominately affected those aged 65 years or over. Second to this category were falls involving playground equipment which affected 9% of Aboriginal people compared to 4% of falls among non-Aboriginal people. Most of these cases were among those aged 5-9 years.

The highest rates of hospitalised falls were among those aged 65 and over in Aboriginal females and those aged 60-64 in Aboriginal males. However, the largest proportion of hospitalised falls for Aboriginal people was in the 5-14 age group for both males and females.

There appeared to be a greater increase in rates of falls-related hospitalisations among Aboriginal people (52%) compared to non-Aboriginal people (19%) between 1 July 1999 and 30 June 2009.

Rates of hospitalisation for falls were lower in Metropolitan areas for Aboriginal people compared to non-Aboriginal people; the opposite was true in other areas. Generally, the rate in Aboriginal people increased slightly with increasing remoteness.

Between 1 July 1998 and 30 June 2007, approximately 16-20% of fall related hospitalisations among Aboriginal people were due to alcohol, higher than in non-Aboriginal people.

#### Hospitalisations due to transport injuries

Between 1 July 2003 and 30 June 2009, standardised rates of transport related hospitalisations for Aboriginal people were higher than non-Aboriginal people for both males and females, albeit not significantly. The rates of hospitalisations for transport crashes in males were more than twice as high as that in Aboriginal females.

Among Aboriginal males, the highest proportion of hospitalised transport crashes (30.8%) were occupants of two or three wheeled vehicles. Among Aboriginal females, the highest proportion were those injured as occupant of car, pick up or van (47.6%). This similar to data reported for non-Aboriginal people. However, Aboriginal people are more likely to be injured as pedestrians or cyclists (28.5% in males and 24.5% in females) compared to non-Aboriginal people (21.5% in males and 16.6% in females).

While the highest rates of transport related hospitalisations occurred among 15-19 year old for both males and females, the highest number of Aboriginal males injured were children aged 10-14 years of age, 40% of whom were pedestrians or cyclists.

Despite a number of fluctuations, as with non-Aboriginal people, the rates of hospitalised transport crashes remained stable between 1 July 1999 and 30 June 2009.

The rates of transport related hospitalisations in Aboriginal males increased with increasing remoteness. Similar patterns were not observed in females.

Between 1 July 1998 and 30 June 2007, approximately, one fifth of transport related hospitalisations in Aboriginal people were attributed to alcohol.

#### Hospitalisations due to self-harm

Between 1 July 2003 and 30 June 2009, standardised rates of self harm hospitalisations for Aboriginal people were significantly higher than non-Aboriginal people for both males and females (rate ratio of 2.6). Aboriginal females' rates of hospitalisations for self-harm were around 60% higher than those in Aboriginal males. However, death rates from self-harm are 3 to 4 times higher in Aboriginal males than Aboriginal females. This is thought to be attributable to the use of more lethal methods of self harm.

Intentional poisoning, mainly by benzodiazepines and antidepressants, was the highest cause of hospitalisations for self harm in Aboriginal females (76%) and Aboriginal males (65%). Self harm by means of sharp objects, often wounding forearm or wrist, also contributed to a sizable proportion of hospitalisations (25% in males and 20% in females).

The highest number of hospitalisations for poisoning occurred in the age group 20-24 years for Aboriginal males and 15-19 years for Aboriginal females, although the number of hospitalisations remained high from the late teens into the 40s for both sexes.

Between 1 July 1999 and 30 June 2009, there was an increase in self harm hospitalisation rates among Aboriginal people, particularly in females. Rates of self harm hospitalisations rates for Aboriginal women in the period 1 July 2004 to 30 June 2007 were approximately double the rates in 1999-2000 which might indicate a real increase during this time period. The rates of self harm hospitalisation in Aboriginal people increase with increasing remoteness, particularly in females.

#### Hospitalisations due to poisonings

Between 1 July 2003 and 30 June 2009, standardised rates of poisoning related hospitalisations for Aboriginal people were more than twice as high as in non-Aboriginal people in both males and females.

The greatest proportion of poisoning related hospitalisations in Aboriginal people was related to the use of benzodiazepines (11% in males and 16% in females). Psychostimulants and antidepressants were the second most frequent causes in males and females respectively followed by 4-aminophol derivatives, including paracetamol. It is important to note that the most common substances used for poisoning are similar to those used for self harm which raises questions about misclassification between these two types of injury.

The rates of hospitalised poisoning were highest in Aboriginal people aged 0-4 years. For Aboriginal children, the most frequent substance used was benzodiazepines followed by household chemicals, medicines and other chemicals.

Hospital rates for poisonings have increased in the Aboriginal population but remained constant for the non-Aboriginal population. This is likely to be partly accounted for by an improvement in the recording of Aboriginality in hospital data.

The rate of hospitalisations for poisoning increases by remoteness for Aboriginal females but decreases for Aboriginal males.

#### Hospitalisations due to burns

Between 1 July 2003 and 30 June 2009, standardised rates of hospitalised burns for Aboriginal people were higher than in non-Aboriginal people in both males (rate ratio: 2) and females (rate ratio: 1.7).

The most common cause of burns related hospitalisations in Aboriginal people was exposure to hot food, fluids and vapours (41% in males and 56% in females).

The rates of burns related hospitalisations were highest in Aboriginal people aged 0-9 years. While the rates in the non-Aboriginal population declined with age, they plateaued between the age of 10 and 49 in the Aboriginal population.

Despite some fluctuations, as with non-Aboriginal people, the rates of hospitalised burns remained stable between 1 July 1999 and 30 June 2009.

The rate of hospitalisations for burns increases by remoteness for Aboriginal males but not in Aboriginal females.

#### Data issues and comparison with national data on hospitalised injury in Aboriginal people

It is important to note that previous reports have pointed to substantial under-reporting of Indigenous status in data collections in NSW hospitals due to issues related to identification of Indigenous people presenting to hospitals (Harrison et al, 2001; NSW Health Department, 2000). A more recent report found that efforts to address these issues have improved the identification of Indigenous people in public hospitals in NSW to an acceptable level since 2005 (Australian Institute of Health and Welfare, 2010). The report found that an estimated 88% of Indigenous patients were correctly identified in NSW public hospital admission records in 2007–08, compared to 89% nationally. However, some of the data on injury hospitalisations presented in this reports cover years prior to 2005, which suggest that caution is needed when interpreting hospitalisation rates of injury in Aboriginal people, particularly when examining trends over time.

In addition, previous research pointed to the reluctance of Aboriginal people to report and seek treatment for an injury which might underestimate Aboriginal injury rates (Mid North Coast Aboriginal Health Partnership, 2001). The reasons behind the reluctance to seek treatment include fear of rejection and/or judgment, an underestimation of injury severity, higher pain threshold, geographical isolation, and a preference for community clinics.

Data from the Northern Territory, South Australia, Western Australia and Queensland, where identification of Aboriginal people was always more reliable than in NSW (Helps & Harrison, 2006), show slightly different findings to those in NSW. In 2000-2002, data from Northern Territory, South Australia, Western Australia and Queensland, show that assault was the most common reason for a hospital stay for Aboriginal people, followed by falls, transport, self-harm, burns and poisoning by pharmaceuticals. This is slightly different to NSW where falls was the most common cause of hospitalisation followed by transport and self harm. Also unlike NSW, more Indigenous females in the other states were affected by violence than Indigenous males. On the other hand, similar to NSW, more Indigenous males were injured as a result of transport crashes than Indigenous females.

In other states, the rate ratios of Indigenous to non-Indigenous hospitalisations for assault for females was (46) and for males (10) were much higher than those found in NSW. The rate for female Indigenous self-harm in the other states was nearly double the rate for non-Indigenous females, and the rate for Indigenous males was over twice that for non-Indigenous males; similar to NSW findings.

It is also important to note that injury hospitalisations attributable to alcohol were based on aetiological fractions predetermined in previous studies (Begg et al, 2007). While these fractions were specific to diagnosis (in this case different injury types), sex and age, they were not determined or adjusted according to Aboriginality which raises concerns about using them in this context. In other words, aetiological fractions used were determined based on previous research in populations with characteristics that are different to those in the Aboriginal population.

#### Injury among Aboriginal people in custody

The 2009 NSW Inmate Health Survey shows that 17.3% of respondents reported having sustained an injury within the preceding three months that required them to see a doctor or nurse or to go to hospital; and that this proportion remained stable since 1996 (Indig et al, 2010) . While it is difficult to compare this proportion to that reported in the general population of NSW due to the difference in the definition of injury and the recall period, it appears that the prevalence of injury among inmates is higher than that in the community (ABS, 2003). This issue is important for Aboriginal people as they make up 22 % of people in full-time custody, but represent only 2% of the general population. In addition, nearly half (47%) of those in Juvenile Justice Centres are Aboriginal or Torres Strait Islander peoples (Indig et al, 2010).

Overall, the 2009 NSW Inmate Health Survey indicated that Aboriginal inmates were less likely to report an injury that required treatment than their non-Aboriginal counterparts (14% in Aboriginal males and 9.4% in Aboriginal females compared to 18.8% and 20.7% in non-Aboriginal males and non-Aboriginal females respectively).

The survey also revealed that while the reporting of past head injuries resulting in a loss of consciousness, mainly due to being hit by object or person, was equally high among both Aboriginal and non-Aboriginal inmates, 31.7% of Aboriginal males reported that they had sustained internal head bleeding following their most severe head injury compared to 21.6% in non-Aboriginal men. Similarly, 50% of Aboriginal women reported unresolved sequelae from their most severe head injury compared to 33.3% of non-Aboriginal women.

## Impact of Injury on Aboriginal people

While it is recognised that the effects of injury on Aboriginal peoples are significant and include decreased workplace productivity, increased burden on caregivers for people with disabilities, loss of cultural knowledge and wisdom, and continuation of the cycle of grief among families, friends and communities (National Public Health Partnership, 2004), there is very little research on the impact of injury on Aboriginal people in terms of quality of life, financial cost, time out of school, work, home and community life. Two major reports, *The Burden of Injury in Indigenous Australians* (Vos et al, 2007) and the 2004-2005 National Aboriginal and Torres Strait Islander Health Survey (Australian Bureau of Statistics, 2006) provide some information on the impact of injury on Aboriginal people in relation to disability.

### *The burden of injury in Indigenous Australians*

The study by Vos et al (2007) measured the burden of disease and injury in Aboriginal and Torres Strait Islander people, using disability-adjusted life years (DALYs) which combines years of life lost (YLL) due to premature mortality and years lost due to disability (YLD), with time as the common metric to quantify healthy life lost due to fatal or non-fatal diseases, injuries and selected risk factors.

The study found that intentional and unintentional injuries were the third leading broad cause of the disease burden for Indigenous Australians, causing 12.9% of the total burden compared to 7.0% of the disease burden in the total Australian population. Suicide (28%), road crashes (24%), and violence (16%) contributed more than two-thirds of the Indigenous Australian injury burden. Overall, injury burden was much higher in males with the exception of violence which was almost equally distributed between the sexes. Overall, the injury burden rate (per 1000 population) was three times higher in Indigenous Australians compared with the total Australian population, with violence 8.6 times the total Australian rate. This ratio was 3.2 for suicide and 2.8 for road crashes.

A further analysis of the burden of disease and injury to examine the Indigenous health gap (Vos et al, 2009), found that if Indigenous Australians in 2003 had experienced the same rate of injury as the total Australian population, a total of 8331 DALYs would have been avoided, equivalent to 67% of the total burden of injury (12,384 DALYs) or 9% of the total burden of disease (95976 DALYs) estimated for Indigenous Australians. The study also found that suicide contributed to 29% of the indigenous health gap due to injury while transport and violence contributed to 24% and 20% of health gap respectively. Suicide explained almost half of the health gap from injuries in young males (Vos et al, 2009).

### *National Aboriginal and Torres Strait Islander Health Survey*

The 2004-2005 National Aboriginal and Torres Strait Islander Health Survey showed that 15% of Aboriginal respondents reported long term condition/disability as a direct result of an injury or accident compared to 11% in the non-indigenous population (a rate ratio of 1.4) (Australian Bureau of Statistics, 2006). Aboriginal males were more likely reported long term condition/disability as a direct result of an injury (19%) compared to females (11%). The figures for non-Aboriginal males and females were 13% and 9% respectively.

Among Aboriginal respondents, those aged 35-54 years were most likely (24%) to report long term condition/disability as a direct result of an injury; this compares to 16% for the same age group in non-Aboriginal population (Australian Bureau of Statistics, 2006).

### *Other studies that examined the impact of injury on Aboriginal communities*

The Mid North Coast Aboriginal injury surveillance project used qualitative methodology (focus groups, semi-structured interviews and event-narratives) to examine the effect of injury on Aboriginal people (Mid North Coast Aboriginal Health Partnership, 2001). Some of the responses to the question "What sort of effect do you think these injuries have on the people injured, their families and communities?" were as follows:

- Missing out on school and work.
- Loss of income and the associated stress.
- Added pressure to provide more care and support by family and friends.
- Lasting effects like hiding away, denial and depression.
- Increased alcohol consumption.
- Lowers peoples self esteem. Many people deny cause of injury because of shame and stigma.
- Difficult to get around because of injury and lack of transport.
- Injury resulting in death has a huge impact on the community for years.

Another study- Shoalhaven Aboriginal Injury Surveillance and Prevention (Royal & Westley-Wise, 2001), which used similar methodology highlighted the social, emotional and economic impacts of injury on individuals, their families and communities. When asked "What sort of effect do you think these injuries have on the people injured, their families and communities" responses were as follows:

- Increased stress. This was the most commonly reported consequence of injury. Many respondents suggested a link between experiencing a debilitating injury and a reduction in self-esteem and confidence in one's own abilities and increased feelings of frustration and anger with their situation. This tended to have a 'ripple' effect throughout the families and communities of the injured individual. The loss of role and identity within the family and community, as a result of severe injury, was often seen as a precursor to the onset of more serious psycho-emotional problems for the individual such as depression, feelings of hopelessness, self-harm and suicidal ideation.
- Increased Financial Pressure. This was most likely to result from unforeseen medical and treatment costs, reduced ability to perform work duties and hence a perceived decrease in future employment opportunities.
- Increased Use of Alcohol and Non-Prescription Drugs. Various reasons were given for this common response, including boredom, more leisure time, pain reduction, and emotional stress associated with injury.

The findings of the Blacktown Aboriginal injury surveillance and prevention project also highlighted similar issues in terms of the impact of injuries, particularly those associated with violence and self harm, on individuals, families and communities (Western Sydney Area Health Service, 2003).

A study that examined violence related traumatic brain injury, a condition that can cause long-term physical disability as well as changes in cognition, personality and behaviour that are detrimental to the quality of life and interpersonal relationship, found significant disparities between Aboriginal and non-Aboriginal people (Jamieson et al. 2008). The findings indicate that hospitalisation for traumatic brain injury due to assault among Indigenous Australians in four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) was 21 times higher than that among non-Indigenous Australians in the 6-year period 1 July 1999 to 30 June 2005 after adjustment for differences in age, sex and residential location. This difference was even greater in females with Indigenous females experiencing 69 times the rate of brain injury due to assault experienced by non-Indigenous females.

Another study conducted by the Aboriginal Justice Advisory Council (2003) in NSW found that among Aboriginal women in custody, 69% of those surveyed said they had been abused as children; over 73% revealed that they were victims of abuse as adults and, out of these women, 79% were physically assaulted in family or domestic violence. In addition, 61% of the women said that as adults they did not tell anyone of the abuse, and 58% disclosed that they were still in need of support and counselling for the abuse. At least 80% of the Aboriginal women surveyed in custody felt that their experience of abuse was an indirect cause of their offending. The impact of child abuse and violence on individuals and Aboriginal communities were also highlighted in the Aboriginal & Torres Strait Islander Social Justice Commissioner's social justice report (2007). It is important to acknowledge here that there is a much larger body of literature on child abuse and domestic violence that focuses mainly on justice issues (either social justice or policing and legal aspects). The boundaries between child abuse and physical injury due to violence are often blurred and the issue, particularly that related to the impact of child abuse in Aboriginal communities, needs further exploration.

## Underlying Risk factors for injury in Aboriginal people

There are very few robust studies that have examined the risk factors for injury in Aboriginal people in Australia. Most studies which examined risk factors for injury in Aboriginal people were based on the analysis of administrative datasets (mortality, hospitalisation, police crash data, and population surveys). Other studies tend to hypothesize the likely underlying factors of injury in Aboriginal people. These issues have been raised by other researchers who reviewed available evidence on the risk factors of injury in Aboriginal people in Australia. Memmot et al (2001) undertook a national review of the extent and nature of Aboriginal violence in Australia, and noted that the literature tends to be top-heavy with theory and discussion, and lacks empirical evidence on the causes and impact of violence. Similarly, Moller et al (2003), who undertook a review of indigenous injury prevention at the national level, also highlighted the lack of rigorous studies to identify risk factors of injury in Aboriginal people and to explore the interplay between these factors.

Factors that have been identified and that are common to various types of injury include alcohol abuse, low socioeconomic status (low income, high unemployment and low literacy), remoteness as well as historical factors, namely the impact of colonisation and dispossession.

### Alcohol use

The 2004 National Aboriginal and Torres Straight Islanders Health survey (NATSIHS) shows that Indigenous peoples aged 18 years and over were more likely than non-Indigenous people to abstain from drinking alcohol (Australian Bureau of Statistics, 2006). However, of those who did consume alcohol in the week prior to the survey, one in six Indigenous adults (16%) reported long-term (or chronic) risky/high risk alcohol consumption, up from 13% in 2001. In non-remote areas, the proportion of Indigenous adults who drank at chronic risky or high risk levels increased from 12% in 2001 to 17% in 2004–05.

The survey also showed that Indigenous men were more likely than Indigenous women to drink at long-term risky/high risk levels (19% compared with 14%). While rates of risky/high risk drinking were similar for Indigenous people in remote and non-remote areas, people in remote areas were nearly three times as likely as those in non-remote areas to report never having consumed alcohol (18% compared with 6%).

Analysis of injury related hospitalisations in NSW between 1998 and 2007, showed that nearly half of violence related hospitalisations and about one fifth of transport and falls related hospitalisations were attributable to alcohol use (NSW Health Department, 2010). While there are limitations to the methodology used to determine alcohol attributable hospitalisations in this context, other studies have indicated similar findings.

An analysis of serious and fatal crashes reported to the Northern Territory (NT) showed that in 2007, 30% of crashes in Aboriginal people were alcohol related compared to only 10.4% in non-Aboriginal people (Boufous et al, 2009). An analysis of fatal motor vehicle crashes in coroners reports in the NT between 2003 and 2006 also revealed that 78.6% of Aboriginal people fatally injured in a motor vehicle crash used alcohol compared to 41.1% in non-Aboriginal fatalities (Boufous et al, 2009).

Another study which examined suicides in coroners' reports in the top end of the NT between 1991 and 1998 found that 60% of Aboriginal males and 45% of non-Aboriginal males had a history of alcohol abuse prior to suicide. The proportion in Aboriginal women (29%) was similar to that in non-Aboriginal women (28%) (Parker R & Ben-Tovim, 2002). The study also found that stressors such as the death of someone close, unemployment issues and financial and legal problems to be important factors leading to suicide in Aboriginal people.

A study of homicides in Australia spanning 11 years (from July 1989) by the Australian Institute of Criminology, found that many of the incidents resulted from some form of domestic altercation and that alcohol played a major role—just over four out of five Indigenous homicides involved either the victim or the offender, or both, drinking at the time of the incident (Mouzos, 2001). In contrast, less than one in four non-Indigenous homicides involved both the victim and offender drinking alcohol at the time of the incident.

Snowball & Weatherburn (2008) conducted a multivariate analysis of factors that contribute to whether an Aboriginal respondent had experienced physical violence at least once in the 12 months preceding the 2002 National Aboriginal and Torres Strait Islander Survey. The authors found high-risk alcohol consumption to have the highest odds ratio (odds ratio: 2.23) among all predictors considered.

### *Socioeconomic Status (SES)*

Many of the studies reviewed argued that the ongoing social and economic disadvantage in Aboriginal people is directly linked to the high incidence of injury related morbidity and mortality in their communities. For instance, it is argued that the lower rate of seatbelt use, found in Aboriginal people (Boufous et al 2009; Helps et al, 2008), is directly related the lower socioeconomic status of Indigenous communities which result in lower rates of vehicle ownership, overcrowding and therefore reduced seatbelt use (Styles and Emonston, 2006; Harrison et al, 2008).

According to Clapham et al (2008), the persisting low level of seatbelt use among Indigenous vehicle occupants indicates that mainstream education programs that have been successful in improving usage rates among non-Indigenous road users appear not to reach their Indigenous counterparts. The authors suggest that a combination of low levels of education, high unemployment and overall low resources in Indigenous communities is behind the low uptake of road safety promotion messages, particularly in relation to seatbelt use. The authors also argue that low SES among Aboriginal people results in high level of unlicensed driving which is not only a risk factor for road injury but also in the over-representation of Indigenous people in the criminal justice system. They also contend that low levels of literacy along with the high cost of driving lessons and poor access to roadworthy vehicle or driver eligible to supervise compulsory practice driving for learners are barriers to licencing for indigenous people.

These factors were confirmed in a study that investigated Aboriginal driver licencing Issues in NSW (Road and Traffic Authority, 2008). The study which used both quantitative (300 face to face interviews) as well as qualitative (15 focus groups) found unlicensed driving to be prevalent in the Aboriginal community and that that 29% of those who have never held a licence had driven on NSW roads in the past 12 months. The study identified low literacy as a key barrier to licencing in Aboriginal people; and found many in the Aboriginal community were unable to maintain a licence once they have obtained one, mainly due to financial hardship. Other barriers include access to reliable vehicles as a learner and to —feeling uncomfortable|| in RTA Motor Registry Offices often because of a lack of Aboriginal staff or their being the only Aboriginal person present.

Hunter (2001) used the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) to conduct an exploratory multivariate analysis of the correlates of Indigenous self-reported involvement in various offences, including assault. He found a higher risk of self-reported involvement in assault among younger males who lived in rural areas, were unemployed, failed to complete year 12 and lived in a crowded household. A similar analysis of the 2002 National Aboriginal and Torres Strait Islander Survey that examined predictors of whether a respondent had experienced physical violence at least once in the 12 months preceding the survey (Snowball & Weatherburn, 2008), found that indigenous people who were under the

age of 35 years, lone parents, had a severe or profound disability, lived in an area with neighbourhood problems, exposed to social stressors, were unemployed or working within a Community Development Employment Projects scheme to be more likely to have experienced physical violence at least once in the 12 months preceding the survey.

Previous studies have found that those with lower socioeconomic status have higher levels of mortality and morbidity resulting from injury, particularly traffic crashes and violence related injury, than those with higher socioeconomic status (Chen et al, 2009; Poulos et al, 2007; Cubbin 2000). Many available socioeconomic indicators show that Aboriginal people in Australia are at great disadvantage compared to the rest of the population. ABS estimates of household income, adjusted or equivalised to recognise the impact of different household compositions and different household sizes shows great disparity between Indigenous and non-Indigenous Australian (ABS, 2008). The 2006 Census showed that the mean equivalised gross household income for Indigenous persons was \$460 per week, which amounted to 62% of the rate for non-Indigenous Australians (\$740 per week); and that the median weekly gross individual income for Indigenous peoples was \$278, which represented 59% of the median weekly gross individual income for non-Indigenous peoples (\$473) (ABS, 2008).

In addition, while the unemployment rate for Indigenous people continues to improve, at 16% in 2006, the rate was three times the national average (ABS, 2008). The 2006 census also shows that Aboriginal people were twice as likely to work part time (75% compared with 39%) than non-Aboriginal people; more likely to report working in a low skilled occupation (78% compared with 60%); and one third as likely to report having a non-school qualification (13% compared with 37%).

A report by the Australian Institute of Health and Welfare also shows that although there have been continued improvements in the educational attainment of Indigenous Australians in recent years, levels of attainment remain below those of non-Indigenous Australians (Australian Institute of Health and Welfare, 2008). Non-Indigenous people were twice as likely as Indigenous peoples to have a non-school qualification in 2006 (53% compared with 26%). Non-Indigenous people were more than four times as likely to have a Bachelor Degree or above (21% compared with 5%) and twice as likely to have an Advanced Diploma or Diploma (9% compared with 4%). The report also indicated that the likelihood of engaging in health risk behaviours, including alcohol abuse, decreased with higher levels of schooling (Australian Institute of Health and Welfare, 2008).

### Remoteness

Using the Australian Standard Geographical Classification Remoteness Structure, the 2006 Census shows that almost one third of the estimated Indigenous population resided in Major Cities (32%); 21% lived in Inner Regional areas; 22% in Outer Regional areas; 10% in Remote areas and 16% in Very Remote areas. In contrast, with the non-Indigenous population there was a much higher concentration in Major Cities (69%) with less than 2% living in Remote and Very Remote areas (ABS, 2006). The Census also shows that for Indigenous persons, income levels generally decline with increased geographic remoteness. In major cities the average equivalised incomes for Indigenous persons was 69% of the corresponding income for non-Indigenous persons. This declined to approximately 40% in remote areas.

NSW hospital data shows that the rates of most injury types increase with increasing remoteness (NSW Health Department, 2010). Similar results were found nationally, particularly in relation to violence (Berry et al, 2009). The 2002 National Aboriginal and Torres Strait Islander Social Survey (ABS, 2004) shows that Indigenous people in remote areas were three times as likely as those in non-remote areas to report family violence (41% compared with 14%), assault (41% compared with 12%) or sexual assault (17% compared with 5%) as a neighbourhood/community problem. They were also more likely to report witnessing violence

(30% compared with 10%) and abuse or violent crime (17% compared with 9%) as life stressors experienced in the last 12 months.

Clapham et al (2008) indicated that the high proportion of Indigenous people either killed or seriously injured as result of a road crash in remote areas is mainly due to environmental factors associated with driving on high-speed, unsurfaced roads and longer distances travelled. Cercarelli et al (2000), who conducted a series of interviews with leaders of Aboriginal communities in a remote area of Western Australia to examine road safety problems, found road conditions to be the most frequently cited road safety problem. The lack of seat belt use by children in vehicles was also considered to be a problem by about half of those interviewed. Other road safety issues such drink driving and speeding was not identified by community leaders which point to the need to raise awareness about these road safety issues in remote areas.

A study of transport crashes in remote areas of North Queensland found very low levels of licensing among Aboriginal people living in these areas and called for the expansion of the Queensland Aboriginal Peoples and Torres Strait Islander Peoples Driver Licensing Program to meet the needs of remote and Indigenous communities (Sheehan et al, 2008). Similarly, a survey investigating Aboriginal driver licencing issues in NSW found low levels of licencing among Aboriginal people in remote areas where only 30% reporting that they held a current licence compared to 62% among Aboriginal living in regional areas (Road and Traffic Authority of NSW, 2008).

Remoteness also impacts on Aboriginal people's access to appropriate health care services and increase their risk of disability and death as a result of an injury (Moller et al 2003; Clapham et al 2008, Ivers et al, 2008). The 2001 Community Housing Infrastructure Needs Survey of more than 1,200 Indigenous communities around the country found that 78% were located at a minimum distance of 50 km or more from a hospital (Australian Institute of Health and Welfare). This proportion was highest in the Northern Territory (88%) and lowest in NSW (13%).

Lack of access to culturally adequate counselling services is also a significant factor. The study by Parker R & Ben-Tovim (2002) that examined suicides in the top end of the Northern Territory found 60% of Aboriginal and non-Aboriginal cases may have given some sign of mental illness prior to their suicide without the benefit of effective intervention.

### *Colonisation and dispossession*

Past policies related to colonisation of Australia and dispossession of Indigenous people from their lands has led to a cycle of disadvantage, poor education, high unemployment, separation of families and over-crowded living conditions that had a detrimental effect on the emotional, spiritual, cultural and social wellbeing of indigenous people (National Public Health Partnership, 2004). Many of literature indicate that these past policies have contributed to the high levels of injury in aboriginal people. The effects of colonisation including loss of land, language and culture as well as the erosion of cultural and spiritual identity are particularly relevant to injury as a result of violence and self-harm in Aboriginal communities (Clapham, 2006).

A WHO report on violence (2002), highlighted the significance of the issue in Aboriginal people in Australia and alluded to past stringent racial laws and discrimination as well as the rapid social changes following the lifting of these policies in the 70s. According the report this gave rise to instability in community and family life and led to high rates of crime, alcohol dependence and substance violence, accidents and homicide.

Memmot et al (2001) who reviewed research on violence in indigenous communities in Australia argued that Aboriginal social structures were broken down by various policies

including state policies of removing Aboriginal people and those of mixed descent to reserves and missions; the dormitory system, under which Aboriginal women and children were taken away from their communities and used as a source of cheap farm labour and the political and disciplinary disempowerment of elders by mission and reserve managers. The author contends that the Indigenous communities most affected by violence are those with a long history of functioning as removal centres or missions 'where maximum dysfunctional cultural change has occurred'. Other factors highlighted by the report, that are indirectly related to past policies, include poverty, unemployment, breakup of the family (as a result of suicide, incarceration of a family member, death of family member, infant mortality, etc), interracial tension, family feuds and overzealous policing.

Multivariate analyses of data from the National Aboriginal and Torres Strait Islander Survey to examine risk factors of violence in aboriginal, both as a perpetrator and a victim (Hunter, 2001; Snowball & Weatherburn, 2008), found that being taken from one's natural family significantly increases Indigenous violence related arrest rates as well as experience of violence as a victim. The negative effects of misconceived interventions that led to the 'stolen generation' are related to the traumatic disruption to family life and the loss of culturally appropriate parenting (Snowball & Weatherburn, 2008),.

In a review of available literature on suicide in indigenous people in a number of countries, including Australia, Leenaars (2006) noted the effect of colonisation as common factor in indigenous suicide around the world. The author also identified other risk factors, some of which are also related to the impact of colonisation, including poverty, childhood separation and loss, alcohol abuse and dependence, history of personal or familial health problems, past sexual or physical abuse.

O'Loughlin (2009), in a review which examined the impact of colonisation on Aboriginal people in Australia, discussed the effects of what he called "intergenerational trauma" resulting from past actions associated with colonisation. These effects include school phobia, agoraphobia, and self-mutilation in children as well as alcohol and drug addiction, domestic violence, suicidality and sexual abuse in adults. The author proposes restorative educational interventions for young Indigenous children that seek to engage them with ancestral memory, cultural narratives, and a sense of purpose so that healing from historically transmitted trauma may be initiated.

## Summary and target points for injury prevention interventions

The high rate of death and hospitalisation due to injury in the Indigenous population compared with the non-Indigenous population in NSW is consistent with data recorded nationally. However, the differences between Aboriginal and non-Aboriginal rates seem to be lower in NSW which could partly be due to historical underreporting of indigenous status in NSW data collections. Death and hospitalisation rates were higher in Aboriginal males compared to non-Aboriginal males for all types of injury. Self harm, interpersonal violence, transport crashes, falls and poisoning were the most common causes of death and hospitalisation in Aboriginal people in NSW. While information on the burden of injury, taking into account premature mortality and years lost due to disability, is not available for NSW, national data shows that suicide, transport crashes and violence contributed to more than two-thirds of the injury burden amongst Indigenous Australians and to most of the indigenous health gap due to injury.

### Self harm

Both Aboriginal males and females should be the target of suicide prevention efforts as while the hospitalisation rates in females are higher (69%) than Aboriginal males, death rates from self-harm are 3 to 4 times higher in Aboriginal males than Aboriginal females, due to males using more lethal methods of self harm. High rates of self harm were observed from late teens into the 40s for both males and females. Hospitalisation rates for self harm in Aboriginal people increase with increasing remoteness, particularly in females suggesting that remote areas should be a target of interventions. Hospitalisation rates for self harm, particularly in Aboriginal women are increasing in NSW indicating the urgency of prevention efforts in this area.

### Road crashes

Aboriginal males in particular, should be the target of road safety programs in NSW as their hospitalisation rates were double those in females. As with the rest of the population age specific hospitalisation rates for transport crashes peaked at 15-19 years but remained relatively high for those aged in their 30s and 40s before decreasing. Of particular note are males aged 10-14 years, who accounted for the highest number of Aboriginal males injured, 40% of which were pedestrians or cyclists. Hospitalisation rates for transport in Aboriginal males increased with increasing remoteness indicating the importance of targeting these areas in terms of road safety strategies.

### Violence

Violence is the injury type with the largest gap between Aboriginal and non-Aboriginal people in NSW. Hospitalisations rates for violence in Aboriginal people were higher than non-Aboriginal people: 4 times higher in males and 13 times higher in females. The large gap for Aboriginal women highlights their vulnerability to violence and indicates that they should be a priority for targeted interventions, considering that violence and in women, as the primary care givers for children, has a direct influence on their wellbeing and the future of Aboriginal communities. While hospitalisation rates for violence were highest in those aged 20-39, the highest of any injury mechanism, they remained consistently high in Aboriginal males and females aged 15-54 years. Hospitalisation rates for violence increased with remoteness and were highest in remote areas for both males and females.

### Injury in Aboriginal children

While the burden of injury, particularly mortality, is higher in young and middle aged adults, hospitalisation data in NSW show high levels of injury, due to transport crashes, poisoning and burns in children. Those aged 10-14 years old accounted for the highest number of Aboriginal

males injured in transport crashes, 40% of which were pedestrians or cyclists. The rates of poisoning related hospitalisations were highest in Aboriginal children aged 0-4 years and the rates of burns related hospitalisations were highest in Aboriginal children aged 0-9 years. While the literature points to the low use of seat belt as a key risk factor for road injury in Aboriginal children, very little is known about the risk factors for other mechanisms of child injury.

#### Injury among Aboriginal people in custody

Aboriginal people are over-represented in the prison population in NSW where head injuries are highly prevalent. Recent survey data shows that Aboriginal people are more likely to report severe head injury associated with internal bleeding and to report unresolved sequelae as a result of these injuries. It is important, to develop appropriate programs to prevent injury in Aboriginal inmates and to early detect and manage head injuries in order to reduce their impact on the future wellbeing of inmates.

#### Underlying Risk factors for injury in Aboriginal people

While there is a lack of rigorous research into the risk factors of injury in Aboriginal people in NSW, in addition to age and gender factors mentioned above, available evidence indicate that factors that are common to various types of injury include alcohol use, low socioeconomic status (low income, high unemployment and low literacy), remoteness as well as historical factors, namely the impact of colonisation and dispossession. Efforts aimed at improving the socioeconomic status of Aboriginal people through the provision of appropriate education and social services, and employment opportunities need to be pursued. More innovative strategies, to restore Aboriginal people self esteem and pride in their culture that had been destroyed by past misguided policies need to be developed.

In addition to addressing these structural issues, specific risk factors need to be tackled in injury prevention efforts. Reducing alcohol dependency and abuse in Aboriginal people remains a priority as it is one of the most significant predictors of all types of injury in Aboriginal people. Other risk factors, specific to transport crashes, such as seat belt use, speeding, licencing and access to roadworthy vehicles and better roads, particularly in remote areas, need to be the target of road safety strategies in indigenous people. Other areas of targeted intervention include improving access to appropriate support and counselling services to prevent suicide and violence and to other health care services, particularly in remote areas, to reduce the risk of disability and death as a result of injury.

There are many examples of local level community based activity that target a broad range of risk and protective factors for injury as well as other health and social issues and which build community capacity (eg men's and women's groups, youth activity projects, family violence initiatives, community development projects). In general however, these programs have been poorly resourced and their broad community benefits poorly recognised.

#### Research and data on injury in Aboriginal people

Data on Aboriginal injury mortality and morbidity in NSW used in this report is likely to underestimate the problem in the state as there is substantial under-reporting of Indigenous status in data collections in NSW, particularly hospitalisation data, compared to other states and territories. While the identification of Aboriginal people in hospital data seems to have improved since 2005 (Australian Institute of Health and Welfare, 2010), there is a need for more efforts to further improve identification of Aboriginal people in relevant data collections and to address issues underlying the relatively low reporting of injury by aboriginal people (access to culturally appropriate services, etc) in order to gain a better picture of the burden of injury in Aboriginal people in NSW.

The impact of many key behavioural, vehicle and environmental risk factors for traffic crashes in Aboriginal people (alcohol, seatbelt use, speeding, vehicle types, etc) is unknown for NSW because Aboriginal status is not included in the state police crash dataset. NSW has recently begun collecting information about Indigenous status at the point of licensing which will go some way to addressing the data shortage but this is a voluntary question and is unlikely to provide reliable data in the short-term. Ensuring accurate collection of information on Indigenous status in road crash data, either by collection via licensing data or by linkage to other data sources, is an essential step to development of appropriate interventions.

There is also a need for more research, in NSW and across the country, to identify risk factors of various types of injury and to explore the interplay between these factors. There is particularly a need for rigorous studies including case control, longitudinal as well as in-depth multidisciplinary studies. More research is also needed to examine the economic and social impact of injury on Aboriginal communities in terms of quality of life, financial cost, time out of school, work, home and community life.

## Conclusions

Much remains unclear about the impact and risk factors of injury in Aboriginal people in NSW, but enough is known, particularly from hospital and mortality data, to indicate that it is an important public health and social issue for the State. Suicide, violence and transport crashes are issues of particular concern that need to be given priority for prevention. Of concern are also the high levels of injury due to poisoning and burns in Aboriginal children.

While the full impact of injury on Indigenous people still need to be assessed, it is clear that death and disability resulting from injury impact on individuals and their families, and often have profound effects on Aboriginal communities. It is also clear that the effects of injury compound the socioeconomic disadvantage that many Aboriginal people face.

Despite the paucity of research into risk factors of injury in Aboriginal people in NSW, national studies point to a number of underlying risk factors that include socioeconomic disadvantage, remoteness, limited access to health services as well the impact of previous policies of colonisation and dispossession. This highlights the urgent need to address the social and economic disadvantage and to improve the social, emotional and cultural well-being of Aboriginal people. The complexity of these issues should not deter from addressing some direct risk factors of injury in Aboriginal people such as alcohol abuse, low seat belt use, low licencing levels as well as limited access to counselling and other health care services in order to reduce the burden of injury and poisoning in Aboriginal people in NSW.

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## Appendix 1: Tabulation of relevant papers

Authors	Title	Publication	Methods	Findings	Level & quality of evidence	Summary
Australian Bureau of Statistics (2006)	National Aboriginal and Torres Strait Islander Social Survey	Australian Bureau of Statistics	National survey of 10,439 Indigenous persons (or about one in 45 of the total Indigenous population).	<p>Finding relevant to this report include:</p> <p>Indigenous peoples aged 18 years and over were more likely than non-Indigenous people to abstain from drinking alcohol (Australian Bureau of Statistics, 2006).</p> <p>However, of those who did consume alcohol in the week prior to the survey, one in six Indigenous adults (16%) reported long-term (or chronic) risky/high risk alcohol consumption, up from 13% in 2001. In non-remote areas, the proportion of Indigenous adults who drank at chronic risky or high risk levels increased from 12% in 2001 to 17% in 2004–05.</p> <p>Indigenous men were more likely than Indigenous women to drink at long-term risky/high risk levels (19% compared with 14%).</p> <p>While rates of risky/high risk drinking were similar for Indigenous people in remote and non-remote areas, people in remote areas were nearly three times as likely as those in non-remote areas to report never having consumed alcohol (18% compared with 6%).</p> <p>15% of Aboriginal respondents reported long term condition as a direct result of an injury or accident compared to 11% in the non-Indigenous population (a rate ratio of 1.4)</p> <p>Aboriginal males were more likely reported long term condition/disability as a direct result of an injury (19%) compared to females (11%). The figures for non-Aboriginal males and females were 13% and 9% respectively.</p> <p>Among Aboriginal respondents, those aged 35-54 years were most likely (24%) to report long term condition/disability as a direct result of an injury; this compares to 16% for the same age group in non-Aboriginal population.</p>	GRADE D: Descriptive	<p>Indigenous adults were less likely to consume alcohol than non-Indigenous adults. However, of those who did consume alcohol in the week prior to the survey, Indigenous adults were more likely to report long-term (or chronic) risky/high risk alcohol consumption.</p> <p>Aboriginal respondents were more likely to report a long term condition as a direct result of an injury or accident compared to non-Indigenous respondents.</p>

Berry et al (2009)	Hospital admissions of Indigenous and non-Indigenous Australians due to interpersonal violence, July 1999 to June 2004	Australian and New Zealand Journal of Public Health, 33: 215 – 222, 2009.	<p>A descriptive analysis of the NHMD to compare the incidence of injury-related hospitalisations and injury profiles for inter-personal violence for Indigenous and non-Indigenous populations.</p> <p>Data from NT, WA, SA and Qld 01/07/99 to 30/06/2004.</p> <p>Injury separations obtained using ICD-10-AM Ch 19 principal diagnosis codes in range S00-T75, T79, T89. Excluded separations in which mode of admission was inward transfer from another acute care hospital.</p> <p>Injury separations defined as due to interpersonal violence if contained first reported code X85-Y09, Y35-Y36, Y87.1, Y89.0, Y89.1). Excluded separations in which interpersonal violence appeared as additional external cause, i.e principal diagnosis wasn't injury.</p> <p>Hospitalisation rates calculated using average 5 years of case numbers divided by ABS population in 2001, and expressed as rate per 100,000 population. Age-, gender- and mechanism-specific rates were calculated.</p> <p>Poisson regression was used to model trends in interpersonal violence hospitalisations across remoteness areas for 2000/01 to 2003/04. Controlled for confounding due to different geographical distribution of Indigenous and non-Indigenous populations.</p>	<p>Age standardised rate ratio for hospitalisations due to interpersonal violence for Indigenous compared with non-Indigenous: SRR = 16.9, 95% CI 16.6-17.3.</p> <p>Hospitalisation rate per 100,000 population for interpersonal violence for Indigenous men = 1,383, 95% CI 1,350-1,415); Indigenous women = 1,439, 95% CI 1,409-1,470); (Indigenous women = 54% of cases).</p> <p>Indigenous males aged 35-39 years had highest age-specific rate hospitalisations for interpersonal injury = 2,932 per 100,000 compared with 187 per 100,000 for non-Indigenous males (15.7 times higher, 95% CI= 14.7-16.8).</p> <p>Indigenous females aged 30-34 years had highest age-specific rate hospitalisations for interpersonal injury = 3,549 per 100,000 population compared with 57.0 per 100,000 for non-Indigenous female (62.2 times higher, 95% CI 57.2-67.8).</p> <p>Age-specific rates hospitalisations for interpersonal injury for Indigenous children compared with non-Indigenous children: 178 vs 21.8 per 100,000 at age 0-4 years; 61.5 vs 7.27 per 100,000 at age 5-9 years, and 152 vs 25.0 per 100,000 at age 10-14 years.</p> <p>Age-standardised hospitalisation rates increased with remoteness of usual residence for Indigenous males and females. For Indigenous males, incidence relative to major cities was 3.42 (95% CI 3.13-3.73) in remote areas and 2.96 (95% CI 2.72-3.21) in very remote areas. For Indigenous females, incidence relative to major cities was 6.14 (95% CI 5.61-6.72) in remote areas and 5.20 (95% CI 4.77-5.66) in very remote areas.</p>	GRADE D: Descriptive	<p>Interpersonal violence accounts for 35% of Indigenous injury hospitalisations and 13% of Indigenous injury deaths.</p> <p>For Indigenous populations, the age-specific rates of hospitalisation for interpersonal injury were lowest in children and the elderly, and highest in men and women. In particular, women aged 30-34 experienced the highest levels of interpersonal violence.</p> <p>Across all age groups and for both males and females, interpersonal violence was most commonly perpetrated by a family member or intimate partner.</p> <p>About half excess morbidity from interpersonal violence due to factors associated with remote living</p>
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Boufous et al (2009)	Trends in traffic casualties in the Northern Territory, 1997-2008.	Report to the Northern Territory Government	Analysis of police crash data on road-related casualties in Northern Territory between 1997 and 2007. Road-related casualties examined in this study refer to both fatalities and injuries that occurred on a public road and that were reported to the NT police.	<p>Indigenous road traffic fatality rates remained stable in comparison to a significant decline in non-Indigenous rates from 24.7 in 1997 to 17.4 in 2007 (p= 0.01)</p> <p>While varying over the study period, the Indigenous road fatality rate was on average double that in the non-Indigenous population.</p> <p>The proportion of alcohol related casualty crashes decreased significantly among the Indigenous population from 45.6% in 1997 to 30.1% in 2008.</p> <p>There was a significant decrease in the proportion of alcohol related crashes among the non-Indigenous population from 13.5% in 1997 to 10.4% in 2007.</p> <p>On average, the proportion of alcohol related crashes among the Indigenous population was three times higher than that in non-Indigenous population during the study period.</p> <p>The proportion of speed related road casualties increased, albeit not significantly, during the study period for Indigenous (from 19.5% in 1997 to 27% in 2007) and non-Indigenous populations (from 7.6% in 1997 to 8.6% in 2007).</p> <p>On average, the proportion of speed related crashes involving the indigenous population was more than double that of non-Indigenous population over the period.</p> <p>The proportion not wearing a seatbelt at the time of the crash was much higher (over 4 times on average ) for Indigenous people than for non-Indigenous people</p> <p>There was no significant change in the proportion of road casualties not wearing a seatbelt among both Indigenous and non-Indigenous people over the study period.</p>	GRADE D: Descriptive.	<p>There was no significant improvement in the already high rate of Indigenous road fatalities, double that of non-Indigenous.</p> <p>Indigenous road traffic casualties were more than twice more likely to speed, three time more likely to use alcohol and four times more likely not to use a seatbelt at the time of the crash than non-Indigenous casualties in the Northern Territory.</p>
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Boufous et al (2010)	Review of coroners' reports of motor vehicle fatalities in the Northern Territory	Report to the Northern Territory Government	Analysis of Coroners reports to examine the circumstances of motor vehicle crashes that occurred in the Northern Territory between 2003 and 2006.	<p>Nearly half (48%) of all crash fatalities were Indigenous people</p> <p>Half of non-Indigenous deaths were vehicle drivers, 30% were vehicle passengers, 10% were motorcyclists and only 6% were pedestrians. In contrast, 38% of Indigenous fatalities were pedestrians, 34% were vehicle passengers and 24% vehicle drivers.</p> <p>More than half of all people who died due to road traffic injury were under the influence of alcohol at the time of the crash (77% among Indigenous fatalities and 41% among non-Indigenous fatalities). About three-quarters of those who were under the influence of alcohol had a reading of 0.15% Blood Alcohol Concentration (BAC) or higher (77.6% among Indigenous fatalities and 63% among non-Indigenous fatalities).</p> <p>Nearly 70% of Indigenous vehicle occupants who died in a crash were not wearing a seatbelt compared to fewer than 35% in non-Indigenous vehicle occupants.</p> <p>Where data was available, speed was a contributing factor in 43% of all fatalities.</p> <p>Overall, 22% of fatalities died in crashes where at least one of the vehicles involved had a defect. Where data was available, 55% of fatalities died in a crash where at least one vehicle had a defect (74% for Indigenous fatalities and 43% for non-Indigenous fatalities).</p> <p>Almost 40% of Indigenous fatalities were pedestrians, compared to only 6% among non-Indigenous fatalities</p> <p>Just over 80% of Indigenous pedestrian deaths occurred at night with about 50% occurring in areas without street lights.</p>	GRADE D: Descriptive	Indigenous people were found to be grossly overrepresented in road related fatalities in the NT, particularly for deaths as pedestrians, Factors contributing to Indigenous deaths as a result of traffic crashes include alcohol, speeding, vehicle defects and lack of seatbelt use.
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Cercarelli et al (2000)	Road safety issues in remote Aboriginal communities in Western Australia	Accident Analysis and Prevention; 32: 845-848	Interviews with the Chairpersons of the 13 largest communities of the Fitzroy Valley region (remote areas in the Kimberley region of WA)  Respondents were asked what they considered were the major road safety problems in their community	The most frequently cited problem was the condition of the roads  Only three responses referred specifically to road crash risk factors such as alcohol and speeding.  Six Chairpersons reported that children never wore seat belts, and four reported that the children only wore them some of the time. Three did not know.  Chairpersons were equally divided as to whether drinking and driving caused crashes in their community: six replied yes and six replied no.  Eight replied that speeding was not a problem, four replied that it was a problem, and one did not know.  Respondents were asked whether travelling in the back of a utility or truck caused injuries in their community. Ten responded no but three thought that this type of travel did cause injuries.  When asked whether the Chairpersons considered –sleeping on the road   to be a problem around their community, six responded yes, six responded no and one did not know.	GRADE D: Descriptive	While the statistical evidence shows that Aboriginal people have an elevated risk of injury in road crashes, these interviews have shown that road safety is not a salient problem in these communities.  Agencies introducing road safety countermeasures will need to take this into account, as the first stage in a program to reduce road injuries may need to include an awareness raising component.
Clapham (2006)	Injury profiles of indigenous and non-indigenous people in New South Wales	Medical Journal of Australia; 184, 217-220	An analysis of the injury profiles of Indigenous and non-Indigenous population in NSW using NSW Health data from HOIST database.  Hospitalisation data 01/07/1999 to 30/06/2003; mortality data 01/01/1999 to 31/12/2002.  Hospitalisation and death rates due to injury by age, sex and injury mechanism are reported, as well as rate ratios for comparison between Indigenous and non-Indigenous	Death:  Rates of death from injury were higher for all age groups in Indigenous population compared with non-Indigenous population, except for people > 65 years. Standardised mortality ratio for Indigenous population = 1.81 (95% CI, 1.60-2.04).  The greatest differential in rates of death from injury between Indigenous and non-Indigenous people was in children aged 0-14 years and people aged 25-44 years; both groups were more than twice as likely to die as a result of injury as non-Indigenous (0-14 years RR = 2.53; 95% CI, 1.76-3.64; 25-44 years	GRADE D: Descriptive	Greatest differences in Indigenous and non-Indigenous populations were in hospitalisations from intentional injury, with Indigenous people being five times as likely to be hospitalised for interpersonal violence.  Of concern are the high rates of death among children 0-14 years and adults aged 25-44 years, and the significantly greater risk of death or hospitalisation as a result of interpersonal violence or poisoning .

			<p>populations.</p> <p>ICD-10 codes for injury (Chapters 19 and 20).</p> <p>Injury mortality and hospitalisation rates calculated using population data from ABS 2001 census of population and housing.</p> <p>Age-, sex- and injury-specific mortality and hospitalisation rates were calculated.</p> <p>Standardised mortality and morbidity rates calculated using direct standardisation approach using NSW 2002 population as standard.</p>	<p>RR = 2.28; 95% CI, 1.92–2.72).</p> <p>Indigenous people compared with non-Indigenous people were more than four times as likely to die from interpersonal violence (RR = 4.39; 95% CI, 3.07-6.27), and twice as likely to die from poisoning (RR = 2.00; 95% CI, 1.43-2.80).</p> <p>Men vs women: Death rates for Indigenous men were twice that Indigenous women (71.89 per 100,000 population vs 33.62).</p> <p>Self-harm and transport-related deaths accounted for over half injury-related deaths in Indigenous people.</p> <p>Injury:</p> <p>For Indigenous population, the injury hospitalisation rates were higher for 15-24 years, 25-44 years and 45-64 years; lower for 65+ years; and similar for 0-14 years when compared with non-Indigenous population. Standardised morbidity ratio for Indigenous population = 1.32 (95% CI, 1.30-1.35).</p> <p>The greatest differential in rates of injury between Indigenous and non-Indigenous people was in the 25–44 age group. People aged 25-44 years were twice as likely to be hospitalised for injury as non-Indigenous (RR = 2.09; 95% CI, 2.03–2.14).</p> <p>Indigenous people compared with non-Indigenous people were five times as likely to be hospitalised for interpersonal violence (RR = 5.19; 95% CI, 4.98–5.40), and nearly twice as likely to be hospitalised for poisoning (RR, 1.90; 95% CI, 1.75-2.07).</p> <p>Men vs. women: Hospitalisation rates from injury for Indigenous males were 67% higher than for Indigenous females. o</p>		
Harrison et al (2008)	Injury of Aboriginal and Torres Strait Islander people due to transport,	Australian Institute of Health and Welfare.	Report into injury of Aboriginal and Torres Strait Islander people due to transport, 2001-2002 to 2005-2006, in NT, WA, SA and Qld.	<p><b>All transport injury:</b></p> <p>Of all external causes of injury, transport accounted for 28% Indigenous deaths compared with 24% non-Indigenous deaths; and 9% Indigenous serious injuries compared</p>	GRADE D: Descriptive	Indigenous three times as likely to die from land transport injury than non-Indigenous, and 1.4 times as likely to suffer serious injury. Indigenous males were twice as

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2001-02 to 2005-06

Mortality data from ABS mortality unit record data collection; date of death 01/07/2001 to 30/06/2006. Records with ICD-10 Transport Accident code (V01-V99) in which transport reported as main cause of death or multiple cause of death (S00-T98)

Serious injury data from the national hospital separations data from AIHW NHMD, 01/07/2001 to 30/06/2006. Records with ICD-10-AM Transport Accident code V01-V99 and injury recorded as principal diagnosis (S00-T98).

with 12% non-Indigenous serious injuries.

Indigenous age-standardised rate of fatal injuries due to transport was 2.9 times higher than non-Indigenous (30 compared with 10 per 100,000 of population). Indigenous age-standardised rate of serious injuries due to transport was 1.4 times higher than non-Indigenous (346 compared with 256 per 100,000 of population).

Mode of transport: Car occupants comprised 55% fatal injuries for both Indigenous and non-Indigenous; pedestrians comprised 34% Indigenous compared with 12% non-Indigenous; motorcyclists comprised 2% Indigenous compared with 14% non-Indigenous.

Car occupants comprised 47% serious injuries for Indigenous compared with 33% for non-Indigenous; pedestrians comprised 16% Indigenous compared with 6% non-Indigenous; motorcyclists comprised 9% Indigenous compared with 26% non-Indigenous.

Gender: 66% Indigenous fatalities were male compared with 58% non-Indigenous; 70% Indigenous serious injuries were male compared with 71% non-Indigenous.

**Land transport:**

Indigenous age-standardised rate of fatal injuries due to transport was 3.0 times higher than non-Indigenous. Indigenous age-standardised rate of serious injuries due to transport was 1.4 times higher than non-Indigenous.

Gender: 2.7 times more fatalities and 30% more serious injuries among Indigenous males compared with non-Indigenous males; 4.1 times more fatalities and 50% more serious injuries among Indigenous females compared with non-Indigenous females. For Indigenous persons, the rate ratio of male to female deaths was 2.0:1.0, and 2.1:1.0 for serious injury.

likely as Indigenous females to die or be seriously injured in a land transport accident.

A higher proportion of car passengers relative to drivers were killed or hospitalised among Indigenous persons, whereas the inverse was observed for non-Indigenous persons. This suggests that a higher average number of passengers per vehicle compared with non-Indigenous persons, resulting in more persons injured per crash. Indigenous persons are more likely than non-Indigenous persons to have difficulty getting to places due to lack of access to a motor vehicle or public transport, and this is worse in remote or very remote areas.

For non-indigenous, fatal and serious injuries peak in early adulthood and then decline until 60+, whereas for Indigenous they rise in early adulthood and remain high.

				<p>Age-standardised rates fatal injury and serious injury for Indigenous males were both twice those for Indigenous females (fatality rates: 39.2 per 100,000 for men and 19.8 per 100,000 for women; serious injury rates: 469.8 per 100,000 and 220.8 per 100,000).</p> <p>Age: for non-Indigenous, fatal and serious injury rates highest for 15-19 and 20-24 years and then declined until 60+ age group. For Indigenous, fatal and serious injury rates rose in early adulthood and remained elevated through middle age. Indigenous children 0-4 years had 3.1 times more fatalities and 2.5 times more hospitalisations compared with non-Indigenous children.</p> <p>Mode of transport: Age-standardised incidence car occupant deaths 2.8 times higher for Indigenous compared with non-Indigenous (16 compared to 6 per 100,000), and 2.1 times higher for hospitalisations (177 compared with 84 per 100,000).</p> <p>Remoteness: In all areas apart from outer regional Australia, the fatality rates for non-Indigenous persons were 1.9-2.5 times those of non-Indigenous. 75% fatalities and 74% serious injuries for Indigenous people occurred in outer regional, remote or very remote areas.</p>		
Helps et al (2004)	Reported injury mortality of Aboriginal and Torres Strait Islander peoples in Australia, 1997-2000	Australian Institute of Health and Welfare	<p>Analysis of reported Aboriginal and Torres Strait Islander injury mortality data between 1997-2000.</p> <p>The report focus on jurisdictions in which ascertainment of Aboriginal and Torres Strait Islander status is thought to be relatively good (Western Australia, South Australia, Queensland and the Northern Territory).</p>	<p>Injury Death Rates for Aboriginal and Torres Strait Islander Australians are almost uniformly much higher than for Other Australians.</p> <p>This pattern is seen for males and females, at all ages, and for nearly all major types of External cause of injury. Types of External cause for which Aboriginal and Torres Strait Islander rates are highest in relation to rates for other Australians include interpersonal violence (Fatal assault) and Burns.</p> <p>Male rates are higher than female rates. for both Aboriginal and Torres Strait Islander and other Australians. Overall injury death rate in males 2.7 times higher than in females. The ratio of male to female death rate was</p>	GRADE D: Descriptive	<p>Injury death rates for Aboriginal and Torres Strait Islander Australians is 2.8 times higher than for the rest of the population in Region A. Even after adjusting for remoteness, the rate in Aboriginal and Torres Strait Islander Australians remains twice higher than for the rest of the population.</p> <p>Age standardised death rates per 100,000 were highest for intentional self-harm (37.1), transport crashes (33.3) and interpersonal violence (13.0).</p> <p>Injury from fire and interpersonal</p>

				<p>highest (5.3) for ‘_Intentional self-harm’ and lowest (0.7) for ‘_Fire, burns and scalds’</p> <p>When allowance is made for the difference in age distribution (by direct standardisation), the rate for Aboriginal and Torres Strait Islander Australians is 2.8 times higher than for the rest of the population in Region A.</p> <p>Adjustment of injury mortality rates to take account of different remoteness distributions of these sub-populations (by direct standardisation) reduced the excess rate of death due to External causes for Aboriginal and Torres Strait Islander persons living in Region A from an age-adjusted rate ratio of 2.8, to an age and remoteness adjusted ratio of 1.9.</p> <p>Age distribution varied according to the type of injury. Intentional self-harm peaked from late teenage to early middle age. In contrast, falls were the most common cause of death in old age</p> <p>Age standardised death rates per 100,000 were highest for intentional self-harm (37.1), transport crashes (33.3) and interpersonal violence (13.0).</p> <p>Injury from fire (rate ratio 4.3) and interpersonal violence (rate ratio 3.9) were the injury types that differed most from the rates from non-Aboriginal males.</p> <p>In Aboriginal females, age standardised rates per 100,000 were highest for transport crashes (12.2), interpersonal violence (8.6) and intentional self-harm (7.0). Injury from fire (rate ratio: 12) and poisoning (rate ratio: 7.0) were the injury types that differed most from the rates from non-Aboriginal females.</p>		<p>violence (were the injury types that differed most from the rates from non-Aboriginal males.</p> <p>Injury from fire and poisoning were the injury types that differed most from the rates from non-Aboriginal females.</p>
Helps et al (2006)	Hospitalised injury of Australia’s Aboriginal and Torres Strait	Australian Institute of Health and Welfare	Analysis of Australian hospital separations due to injury in Indigenous population for aggregated data collection periods 2000-01 and 2001-02.	Reason for hospital stay: Assault 36% (1421.4 per 100,00 population; Indigenous to non-Indigenous rate ratio, RR=16.6) Falls 16% (730.7 per 100,000; RR=1.3)	GRADE D: Descriptive	The most common reason for a hospital stay for Indigenous person was assault, falls, transport, self-harm, burns and poisoning. Length of hospital stay was highest for

Islander People 2000-02.	<p>Focus given to region A (NT, SA, WA and Qld) owing to better quality of Indigenous ascertainment (Data for region B reported in Appendix)</p> <p>Data from AIHW NHMD; coded to 2<sup>nd</sup> edition ICD-10-AM (data for SA for 2001-02 mapped to 3<sup>rd</sup> edition and then backward mapped to 2<sup>nd</sup>, but not reach complete equivalence). Data from 01/07/2000 to 30/06/2002. Principal diagnosis ICD-10-AM range S00-T75 and T79, excluding complications due to surgical and medical care, cases where no external cause reported and cases transferred from another hospital (except when reporting average length hospital stay).</p>	<p>Transport 9.7% (342.2 per 100,000, RR=1.4)  Self-harm 6% (232.4 per 100,000, RR=2.0)  Burns 3% (113.2 per 100,000, RR=3.7)  Poisoning by pharmaceutical 2% (70.9 per 100,000, RR=1.6).</p> <p>Indigenous were hospitalised for injury at twice rate for non-Indigenous.</p> <p>Gender:</p> <p>Rate ratio of Indigenous to non-Indigenous assault was 45.8:1 for females (vs 10:1 for males). Rate of Indigenous to non-Indigenous self harm for females nearly 2:1 (vs. over 2:1 for males). Rate of Indigenous to non-Indigenous injuries due to fires, burns and scalds for females 4:1 (vs 3.5:1 for males).</p> <p>The largest difference in bed day rates was for assault. The bed day rates for Indigenous women were nearly 55 times that of non-Indigenous women (3,916.6 per 100,000 vs 71.1 per 100,00 for non-Indigenous, RR=54.7). Hospitalisation for assault made up nearly 44% of all injuries for Indigenous women vs 2.3% for non-Indigenous.</p> <p>Age:</p> <p>Assault – highest for 15-44 years for Indigenous females and males; assault rate significantly higher for Indigenous females vs Indigenous males in 25-29 years and 30-34 years.</p> <p>Falls – 41.4% of all falls in 0-14 years age group; same general pattern for all Indigenous and non-Indigenous up until young adulthood, then fluctuated in middle-age; rates for Indigenous males higher than non-Indigenous males for 25-64 years; from 30+ rates rose for Indigenous male and female but dropped for non-Indigenous male and female.</p> <p>Transport – rate transport injury higher for Indigenous males and females than for non-Indigenous males and females from teens to late thirties; rates for Indigenous males</p>	<p>burns, followed by transport, falls, assault, self-harm, poisoning by pharmaceuticals.</p> <p>More Indigenous females were affected by assault and self-harm than Indigenous males; more Indigenous males were injured in transport accidents than Indigenous females.</p> <p>The difference in burden of injury due to assault is particularly stark for Indigenous women. Compared with non-Indigenous women the bed day rate is nearly 55 times higher.</p> <p>Rates of injury increased with increasing remoteness; rates were higher for Indigenous vs non-Indigenous, and for males vs females.</p>
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remained much higher for all age groups from late 20s onwards. Greatest difference in transport injury for Indigenous males 45-49 years and Indigenous females 35-39 years.

Self-harm – rates much higher for Indigenous males and females compared with non-Indigenous for 20-24 years through to 45-49 years, and continuing through to 55-59 years for females. Rates significantly higher for Indigenous males vs Indigenous females 30-34 years; rates significantly higher for Indigenous females vs Indigenous males 15-19 years and 40-44 years.

Burns – rates markedly higher in early childhood for Indigenous children and from adulthood to older age than in non-Indigenous. In Indigenous, rates highest for 0-4 years, and higher for boys than girls.

Poisoning – rates highest in 0-4 years for both Indigenous and non-Indigenous. Rates for Indigenous females higher than Indigenous males 19-36 years.

Urban/rural:

Rates of injury for male and female Indigenous rose with remoteness, except for very remote, which had lower rates than for remote zone. Rates were significantly higher for Indigenous vs non-Indigenous in all zones. Indigenous males had significantly higher rates vs non-Indigenous males and females in all zones; and also vs Indigenous females in all zones apart from very remote. Indigenous females had significantly higher rates in remote and very remote vs non-Indigenous males and females, and significantly higher rates vs non-Indigenous female in outer regional and major cities.

Location injury occurred:

Injuries occurred at home in 21.7% of cases (17.6 for men and 27.0 for

women); street or highway in 7.8% (8.9 for men and 6.3 for women); sport or athletics area in 3.0% (4.8 for men and 0.8 for women)

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				<p>and school in 1.5% (1.5% for men and 1.6% for women).</p> <p>Length of hospital stay</p> <p>Length of hospital stay was highest for burns (ALOS=9.6 days), followed by transport (ALOS=5.3 days), falls (ALOS=3.5 days), assault (ALOS=2.8 days), self-harm (ALOS=2.5 days), poisoning by pharmaceuticals (ALOS=2.0 days).</p> <p>Indigenous vs non-Indigenous had lower Average LOS (RR=0.80) but rate of hospitalisation for injury was higher (RR=2.1).</p>		
Hunter (2001)	Factors underlying Indigenous arrest rates.	NSW Bureau of Crime Statistics and Research	<p>Analysis of the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS).</p> <p>Exploratory multivariate analysis of the correlates of Indigenous self-reported involvement in various offences, including assault.</p>	<p>The six major factors underlying the high rates of Indigenous arrest include (in order of magnitude): sex, labour force status, alcohol consumption, whether a person had been physically attacked or verbally threatened, various age factors, and the respective education variables:</p> <ul style="list-style-type: none"> <li>• Males are 13.1 percentage points more likely to be arrested than females;</li> <li>• Having a job (especially a job not related to the Community Development Employment Projects (CDEP) scheme) appears to lower arrest rates;</li> <li>• Alcohol consumption is one of the largest single factors underlying overall Indigenous arrest rates (12.8 percentage points more likely to be arrested);</li> <li>• Having been physically attacked or verbally threatened increases arrest by a similar amount to the alcohol consumption (10.9 percentage points);</li> <li>• The probability of arrest peaks among 18 to 24 year-olds and then declines, being lowest among Indigenous people aged 45 years and over; and</li> <li>• With a few notable exceptions, education variables behave as predicted by criminological theory with the arrest rates declining as the level of schooling increases.</li> </ul>	GRADE D: Descriptive	<p>The study indicate the importance of socio-economic factors (education, employment) that contribute to Aboriginal people involvement in various offences, including those related to violence</p> <p>The study also confirms the suspicion that there is a cycle of violence and abuse in Indigenous communities which is probably related to alcohol consumption.</p>

				<p>Other factors examined also had a significant impact on Indigenous arrest rates, including:</p> <ul style="list-style-type: none"> <li>• Family environment and other social factors. For example, being taken from one's natural family significantly increases Indigenous arrest rates (5.1 percentage points);</li> <li>• The adequacy and availability of police services also had a significant impact, albeit relatively small compared with that in other studies.</li> </ul> <p>The top six factors underlying the various categories of arrests (drinking related, assaults, theft and outstanding warrants) are basically the same as those identified above. However, alcohol consumption and being a victim of physical attack or verbal threat are particularly important factors underlying arrests on drinking related and assault charges.</p>		
Jamieson et al (2008)	Hospitalised head injury due to assault among Indigenous and non-Indigenous Australians, July 1999–June 2005.	Medical Journal of Australia; 188:576-579.	Secondary analysis of routinely collected hospital morbidity data for 42 874 inpatients at public and private hospitals in Queensland, Western Australia, South Australia and the Northern Territory for the 6-year period 1 July 1999 – 30 June 2005.	<p>The rate among the Indigenous population was 854.8 per 100 000, 21 times that among the non-Indigenous population.</p> <p>Most Indigenous (88%) and non-Indigenous (83%) victims of head injury due to assault were aged between 15 and 44 years.</p> <p>The peak incidence among the Indigenous population was in the 30–34-year age group, whereas that among the non-Indigenous population was in the 20–24-year age group.</p> <p>Indigenous females experienced 69 times the injury rate experienced by non-Indigenous females.</p>	GRADE D: Descriptive.	<p>Indigenous people, particularly women, were disproportionately represented among those hospitalised for head injury due to assault.</p> <p>Head injury imposes a substantial burden of care on individuals and communities.</p>
Memmot et al (2001)	Violence in Indigenous communities.	Attorney General's Department	<p>Review of literature on Violence in Indigenous people (risk factors and interventions)</p> <p>Consultation with key stakeholders</p>	<p>Risk factors of violence in Indigenous people were divided in this review into:</p> <p>Underlying factors of violence (mainly the impact of colonial expansion on personal, family and community disintegration in many</p>	GRADE D: Descriptive	Literature on risk factors of violence in Indigenous communities in Australia tends to be top-heavy with theory and discussion, and lacks any depth of systematic

				<p>Aboriginal societies)</p> <p>Situational factors including, Interracial tension, overzealous policing, interfamily feuds, poverty, unemployment, boredom, a lack of available counseling programs and recreational activities, break up of the family, loss of job/income</p> <p>Precipitating causes including: alcohol, Jealousy, Payments of debts, Payback</p>		<p>reporting of empirical evidence on violence.</p> <p>While underlying issues relate to the past and cannot be changed, their contemporary impacts and consequences may be addressed in a number of ways through the provision of land, housing, health services, education, employment as well as processes of empowerment.</p> <p>Situational factors are such that they are best tackled at the local level by a community council, cooperative or other Indigenous agency.</p> <p>Precipitating factors are best tackled at the individual or one-on-one level. Relatives and friends of perpetrators and victims need to provide support and back up, advise on appropriate action to avoid, minimise or resolve conflict.</p>
Mid North Coast Aboriginal Health Partnership (2001)	Mid North Coast Aboriginal injury surveillance project report: pride, respect and responsibility.	Mid North Coast Area Health Service, 2001	<p><b>Quantitative</b></p> <p>National Minimum Data set for Injury Surveillance was collected for all cases of injury among Aboriginal people and non-Aboriginal people treated at the following Emergency Departments over a 12 month period (1 July 1999 to 30 June 2001): Kempsey District Hospital, Manning Base Hospital, Coffs Harbour Base Hospital.</p> <p><b>Qualitative</b></p> <p>5 focus groups with Aboriginal community members</p> <p>20 semi-structured interviews with members of local Aboriginal community networks which were based within the</p>	<p>The study recorded a combined total of 12,212 injuries in the NSW Mid North Coast over a 12 month period from 1 July 1999 to 30 June 2000. Of these 797 were recorded as Aboriginal and requiring treatment as hospital patients.</p> <p>The project found that Aboriginal injury based on the information recorded in routine data systems were double that of the non-Aboriginal population. However, when under-identification estimates were corrected the results showed a significant increase of six-fold in injury rates for Aboriginal people residing on the Mid North Coast.</p> <p>A number of factors contributed to the underestimation of Aboriginal injury in the area. These include reluctance to seek treatment at an ED for fear of rejection and/or judgement, an</p>	GRADE D: Descriptive	<p>The study showed that injury is a major public health issue for Aboriginal communities in Mid North Coast of NSW.</p> <p>The study highlighted the magnitude and the reasons behind the under-reporting of Aboriginal people in health data. It also identified risk factors of injury and the significant impact of injury on Aboriginal communities in the Mid North Coast of NSW.</p>

			<p>Mid North Coast area.</p> <p>40 detailed case studies conducted with Aboriginal people who had recently sustained injuries, requiring assessment and/or treatment at one of the accident and emergency sites.</p>	<p>underestimation of injury severity, higher pain threshold, geographical isolation, and a preference for community clinics.</p> <p>Poor environmental management, inadequate access to services and facilities, and a clear lack of societal opportunity in relation to employment and social activity were found to be the main underlying factors to injury.</p> <p>The study found an overwhelming correlation between alcohol and violence, falls and transport related trauma.</p> <p>Effects of injury on Aboriginal people include: missing out on school and work, loss of income and the associated stress, added pressure to provide more care and support by family and friends, lasting effects like hiding away, denial and depression, increased alcohol consumption, lowers peoples self esteem and that injury resulting in death has a huge impact on the community for years.</p>	
Mouzos (2001)	Indigenous and Non-Indigenous Homicides in Australia: A Comparative Analysis.	Australian Institute of criminology	Retrospective analysis of the Homicide Monitoring Program (Australian Institute of Criminology) between 1 July 1989 and 30 June 2000.	<p>A total of 3,450 homicide incidents were recorded for the period 1 July 1989 to 30 June 2000, involving 3,723 victims and 3,783 offenders.</p> <p>Indigenous persons accounted for 15.1% of all homicide victims and 15.7% of all homicide offenders in Australia. Yet Indigenous Australians account for only about two per cent of the Australian population</p> <p>Indigenous persons in the Northern Territory, Western Australia and Queensland all have higher rates of involvement in homicide than the rest of the country.</p> <p>While a greater proportion of both Indigenous and non-Indigenous victims are killed with a knife or some other sharp instrument, significantly fewer Indigenous victims are killed with a firearm—only 5.7 per cent compared to 20.8 per cent of non-Indigenous victims.</p>	GRADE D: Descriptive.

				<p>Sixty-one per cent of Indigenous homicides occurred between family members (38% intimates; 23% other family), whereas only 33 per cent of non- Indigenous homicides occurred between family members.</p> <p>Alcohol played a major role—just over four out of five Indigenous homicides involved either the victim or the offender, or both, drinking at the time of the incident</p>		
Parker & Ben-Tovim (2002)	Study of factors affecting suicide in Aboriginal and 'other' populations in the Top End of the Northern Territory through an audit of coronial records	Australian and New Zealand Journal of Psychiatry; 36:404-410	Coronial determinations of suicide in the NT for the years 1991-1998 were examined using a structured coding instrument.	<p>The mean age of the Aboriginal males who suicided was 27.4 years while the mean age of Aboriginal females who suicided was 24.1 years. The mean age of 'other' male and female's who suicided was 37.7 years and 43 years respectively.</p> <p>Hanging was prominent as a suicide method in Top End Aboriginal. Males (71 vs 30 in others) and females (37% vs 33) compared to Australia as a whole.</p> <p>All of the Aboriginal females had experienced one or more stresses prior to their suicide. Of the remaining groups, approximately 85 per cent of each group had one or more identified stresses. The most common stresses across all the groups were relationship breakdown, trouble with family and friends and medical illness.</p> <p>60% of Aboriginal males and 45% of non-Aboriginal males had a history of alcohol abuse prior to suicide. The proportion in Aboriginal women (29%) was similar to that in non-Aboriginal women (28%)</p> <p>60% of the total cases may have given some sign of mental illness prior to their suicide without the benefit of effective intervention.</p>	GRADE D: Descriptive.	<p>There are some important differences in the factors attributed to suicide in the Aboriginal and other populations in the Top End.</p> <p>Hanging was a prominent method of suicide among Aboriginal people. Aboriginal males in particular who committed suicide were more likely to have a history of alcohol abuse prior to suicide that their non-Aboriginal counterpart.</p> <p>The fact that 60% of cases have given some sign of mental illness prior to their suicide without the benefit of effective intervention raise issues about access to appropriate counselling and other health care services.</p>
Roads & Traffic Authority of NSW (2008)	An Investigation of Aboriginal Driver Licencing Issues	Roads & Traffic Authority of NSW	Qualitative: Fifteen mini-group discussion sessions amongst the Aboriginal Community in NSW and a presentation/workshop with Aboriginal Program Advisors and Liaison Officers. Communities from a total of twelve urban, regional and	Unlicensed driving is prevalent in the Aboriginal Community, particularly in remote areas. For many it is a necessity as they have limited access to licenced drivers, are unable to obtain or maintain a licence themselves, and have limited access to public transport. Yet they have busy lives that require them to	GRADE D: Descriptive.	Unlicensed driving is a major problem for Aboriginals people in NSW, particularly in remote areas. Barriers to licencing include low literacy, high costs of getting and maintaining a licence and reluctance to go to RTA Motor

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remote locations were included (Mt Druitt; Campbelltown; Kempsey; Karuah; Shoalhaven; Griffith; Toronto; Wellington; Tabulum; Wallaga Lake; Balranald; and Wilcannia).

Quantitative: Face to face interviews (N=300), conducted across fourteen (14) urban, regional and remote locations. The initial intention was to visit the twelve (12) locations used in the qualitative phase, however, due to difficulties achieving desired numbers in some remote locations, an additional two (2) locations were added (Wreck Bay and Baryugil).

be mobile;

30% of Aboriginal people in remote areas where held a current licence compared to 62% among Aboriginal living in regional areas.

29% of those who have never held a licence had driven on NSW roads in the past 12 months, with 40% of these respondents driving on a weekly basis. Further, 46% of those respondents who were past licence holders (ie, they no longer have a valid licence) were driving on a daily basis;

Many in the Aboriginal Community find it difficult to maintain a licence once they have obtained one. Just under three quarters (74%) of past licence holders and 43% of current licence holders indicated their licence had been suspended or cancelled at some point.

A significant proportion of the Aboriginal Community (40%) have outstanding debt with the State Debt Recovery Office (SDRO), whilst others suggest they have limited financial capacity and the costs of licencing and registration are beyond them. In the qualitative study many suggested they struggled to afford their licence renewal and therefore opted for a single year renewal.

42% of respondents owned a vehicle, with 72% of owners having a vehicle that was 6 or more years old. Two in ten (19%) vehicles were unregistered.

As learners, 25% of current licence holders had problems accessing a registered vehicle, 23% couldn't afford a driving instructor', 15% sometimes couldn't afford the petrol money to go driving as a learner', and 15% found the log book requirements difficult.

Literacy problems were the other key issue that emerged. In the qualitative study most group sessions identified literacy as a key barrier to the Aboriginal Community gaining a licence.

Registries.

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				<p>Many participants referred to feeling uncomfortable in RTA Motor Registries often because of a lack of Aboriginal staff or their being the only Aboriginal person in the Motor Registry; their lack of confidence in their own reading and writing abilities; and/or that they may have been identified as someone with debt problems or someone who had failed the CBDKT previously.</p>		
Royal & Westley-Wise (2001)	Shoalhaven Aboriginal Injury Surveillance and Prevention Project: phase 1 report.	Illawarra Area Health Service	<p>Data examined in the study include:</p> <p>Routine hospital separation data (1996/97-1997/98) and Emergency Department presentation data (1996-1998) for Shoalhaven residents.</p> <p>Case notes of indigenous people attending Shoalhaven District Memorial Hospital's Emergency Department for injuries in 1999;</p> <p>In-depth interviews and focus group discussions with members of Shoalhaven indigenous communities in 2000.</p>	<p>Over the two-year period 1996/97-1997/98, 150 hospital separations for injury were recorded among indigenous Shoalhaven residents.</p> <p>Males accounted for 65% of these admissions, and over half of these were among males aged 15-29 years. In contrast, for females injuries were most common in the age groups 0-4 years and 40-44 years.</p> <p>In 1996/97-1997/98 injury hospitalisation rates among indigenous people in the Shoalhaven were about 15% higher for males and 18% higher for females, than in the general Shoalhaven population.</p> <p>In 1996/97-1997/98, the most common causes of injury-related hospital separations among indigenous Shoalhaven residents were: falls (19%), transport accidents (10%), self-harm (14%), misadventure during or due to medical care (11%), and interpersonal violence (10%) (Table 3). While among indigenous males, falls and transport accidents predominated the most common cause of injury-related hospitalisation among indigenous females was self-harm, followed by interpersonal violence.</p> <p>The ED case notes review found that, of the 405 indigenous people recorded as presenting to the SDMH ED for an injury in 1999, just over half had an open wound/ cut (26%) or a sprain/ strain (25%) as their main injury. The next most common types of injury leading to ED presentation in 1999 were fractures (7%), concussion/ intracranial (i.e. head) injury (7%), and poisonings (excluding</p>	GRADE D: Descriptive	<p>Injury hospitalisation rates among indigenous people in</p> <p>The Shoalhaven were about 15% higher for males and 18% higher for females, than in the general Shoalhaven population.</p> <p>The main causes of hospitalisation in the area are similar to those found in Aboriginal people in NSW (falls, transport crashes, self harm and violence)</p> <p>The main effects of injury include added stress, financial pressure and increased use of alcohol and drug abuse.</p> <p>Priority areas for prevention include: positive development of individual, community and cultural identity;</p> <p>Improved access to health and community services; and better indigenous injury surveillance.</p>

				<p>bites) (5%) (Table 5).</p> <p>While nearly twice as many males and females presented to the ED with an injury in 1999, males and females experienced a similar pattern of types of injury.</p> <p>Responses from the focus group discussions and interviews emphasised the common involvement of alcohol and other drugs, directly and indirectly, in both intentional (e.g. assault) and unintentional (e.g. falls) injuries.</p> <p>Common themes which emerged about the underlying causal factors concerned low self-esteem and a 'normalisation' of drug and alcohol abuse and interpersonal violence within communities.</p> <p>Respondents highlighted added stress, financial pressure and increased Alcohol and drug use as the major effects of injury in their communities.</p> <p>When asked How injuries among indigenous people in the Shoalhaven can be reduced, respondents cited Culturally Appropriate Health Promotion Campaigns, Positive Indigenous Family Systems, Focus on Children, Adolescents and Young Adults and Positive Alternatives to Drug and Alcohol Use.</p> <p>When asked about factors contributing to injury respondents highlighted reluctance to access treatment, low self-esteem, normalisation of drug and alcohol abuse and Interpersonal Violence and unsafe physical environment.</p>		
Snowball Weatherburn (2008)	Theories of Indigenous Violence: A Preliminary Empirical Assessment.	The Australian and New Zealand Journal of Criminology; 2: 216-235	Logistic regression analysis of data from the 2002 NATSISS survey. The dependent variable was whether the respondent had experienced threatened or physical violence at least once in the 12 months preceding the survey	<p>Among predictors of violence among indigenous people, high-risk alcohol consumption has the highest odds ratio (odds ratio: 2.23). Other significant factors include being a member of the stolen generation (odds ratio: 1.71), being a lone parent (odds ratio: 1.39)</p> <p>Neighbourhood problems (odds ratio: 1.61), substance abuse (odds ratio: 1.49), having a severe or profound disability (odds ratio:</p>	GRADE D: Descriptive	<p>The fact that high-risk alcohol consumption remains such a strong predictor of violence in Aboriginal people, even in the presence of controls for a large range of other relevant factors, suggests that policies to reduce alcohol abuse have a critical role to play in reducing Indigenous violence.</p> <p>The strong positive relationship</p>

				1.31), living in a household with someone who has been charged with an offence (odds ratio: 1.15), social stress (odds ratio: 1.94), financial stress (odds ratio: 1.69) and unemployment (odds ratio: 1.21).		between violence and financial stress suggests that measures designed to alleviate financial stress can also be expected to reduce Indigenous violence.
Vos et al (2007)	The burden of disease and injury in Aboriginal and Torres Strait Islander peoples 2003.:	School of Population Health, The University of Queensland	The study measured the burden of disease and injury in Aboriginal and Torres Strait Islander people in 2003, using disability-adjusted life years (DALYs) which combines years of life lost (YLL) due to premature mortality and years lost due to disability (YLD), with time as the common metric to quantify healthy life lost due to fatal or non-fatal diseases, injuries and selected risk factors. National population health datasets and Indigenous-specific epidemiological studies were used to generate estimates.	Findings relevant to this report include: Together, intentional and unintentional injuries were the third leading broad cause of Indigenous Australian disease burden, causing 12.9% of total burden (5.6% and 7.3% respectively) In comparison, injuries were responsible for 7.0% of the disease burden in the total Australian population. Suicide, Road traffic accidents, and homicide & violence contributed to more than two-thirds of the Indigenous Australian injury burden. Overall, the injury burden rate was three times higher in Indigenous Australians compared with the total Australian population; with homicide & violence 8.6 times the total Australian rate.	GRADE D: Descriptive.	Injury is a leading cause of the disease burden for Indigenous Australians. The injury burden in Indigenous Australian was three time higher than that in the non-Indigenous population. Suicide, Road traffic accidents, and homicide & violence contributed to more than two-thirds of the Indigenous Australian injury burden. This disparity was highest for violence –related injuries.
Vos et al (2009)	The Burden of disease and injury in Aboriginal and Torres Strait Islander Peoples: the Indigenous health gap.	International Journal of Epidemiology; 38:470–477	The study applied the burden of disease approach to national population health datasets and Indigenous-specific epidemiological studies. The main outcome measure is the Indigenous health gap, i.e. the difference between current rates of Disability-Adjusted Life Years (DALYs) by age, sex and cause for Indigenous Australians and DALY rates if the same level of mortality and disability as in the total Australian population had applied.	Findings relevant to this report include: If Indigenous Australians in 2003 had experienced the same rate of injury as the total Australian population, a total of 8331 DALYs would have been avoided, equivalent to 67% of the total burden of injury (12,384 DALYs) or 9% of the total burden of disease (95976 DALYs) estimated for Indigenous Australians. Suicide contributed to 29% of the indigenous health gap due to injury while transport and violence contributed to 24% and 20% of health gap respectively. Suicide explained almost half of the health gap from injuries in young males (Vos et al, 2009).	GRADE D: Descriptive	If Indigenous Australians in 2003 had experienced the same rate of injury as the total Australian population, their injury burden would have been reduced by 67%. Suicide, transport accidents and violence contributed to most of the gap, in terms of injury burden, between Indigenous and non-Indigenous Australians.