

Aboriginal Injury Prevention Projects

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May 2010

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Suggested Citation:

Teresa Senserrick, Reece Hinchcliff, Rebecca Ivers, Soufiane, Boufous, Alexandra Martiniuk, Kathleen Clapham. Aboriginal Injury Prevention Projects: An *Evidence Check* rapid review brokered by the Sax Institute (<http://www.saxinstitute.org.au>) for NSW Health; 2010.

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Glossary and Abbreviations

ACSPRI	Australian Consortium for Social and Political Research, Inc
ABS	Australian Bureau of Statistics
ATC	Australian Transport Council
ATSB	Australian Transport Safety Bureau
AIHW	Australian Institute of Health and Welfare
CIHR	Canadian Institutes of Health Research
ED	Emergency Department
Indigenous	Australian Aboriginal and Torres Strait Islander people/populations
indigenous	First people/populations in other countries
NHMRC	National Health and Medical Research Council of Australia
No.	Number
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
RTA	Roads and Traffic Authority of New South Wales
SA	South Australia
SES	Socioeconomic status
WA	Western Australia

Acknowledgements

We gratefully acknowledge the following support from additional personnel at The George Institute: Jagnoor for her exceptional efforts with the extensive database search for relevant evaluations; Stephanie Blows for assisting with assessment with several of the identified references; and Maria Ali for final formatting and editing of the report.

Executive Summary

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. NSW Health has engaged the Sax Institute to assist in designing and implementing this project. The Sax Institute will consult with a Reference Group and Aboriginal communities to set priorities, with the following decisions to be made:

This is one of three reviews subsequently commissioned to inform the program. It reviews peer-review and grey literature evaluations of the effectiveness of Australian Indigenous initiatives published 1995-2010 to answer the following questions with specific terms of reference provided:

- What are the most effective strategies/projects/programs that have been implemented for the prevention of injury amongst Aboriginal populations?
- What types and causes of injury have successfully been addressed by these strategies?
- What types and causes of injury have not been successfully addressed (or addressed at all) by these strategies?
- What are elements that contribute to success or failure in such strategies?

Methods

An extensive search of peer-review and grey literature was conducted sourced via on-line databases and search engines, as well as review of citations in key references. Over 40 databases were searched, with resulting citations collated utilising EndNote X3 and duplicates deleted. Each reference was scanned to identify studies that included evaluations of direct injury outcomes meeting the terms of reference. Each study meeting the criteria was assessed and rated for evaluation quality and, due to a lack of range in quality, was also rated according to the Promise Matrix in terms of how promising the initiative was based on an interaction between potential effectiveness and likely population impact. Details on NSW Health programs that did not meet the inclusion criteria were tabulated separately for assessment.

Main Findings

Approximately 600 references were identified and screened for relevance. Only then references were found to meet the inclusion criteria. None utilised a research design and evaluation method commensurate with the highest level of evidence of effectiveness, although some presented very promising or most promising outcomes. Most were community based, primarily in remote and isolated communities. None took place in New South Wales and there was generally a lack of diversity in the range of settings (i.e., inclusion of urban or suburban settings), therefore, their generalisability is somewhat unknown, but deemed possible with sufficient community engagement and involvement to adapt to local communities issues and preferences.

The most common initiative identified was alcohol restrictions or wider alcohol management plans, mostly at the community level but also one at the state level. A state-wide road safety policy and a community-based patrol initiative were also identified, as well as a restriction from leaded petrol and one multi-strategy initiative with several programs initiated throughout a community. Most studied only one time period following the initiative, and in some cases the initiative changed after the evaluation. Injury reduction benefits were variously found in the short term and long term, including in the

month after implementation (multi-strategy initiative), at six months (alcohol initiatives), 12 months (alcohol initiative), two years (multi-strategy initiative), 3-5 years (alcohol initiatives) and 10-16 years (alcohol initiatives and community patrol).

Types of injuries specifically targeted in the evaluated programs were road traffic injuries and assault. Other programs did not target reduction of any one specific type of injury (e.g., alcohol reform) but reported a collective drop in injuries that included road traffic injuries, assault, poisoning, suicide, drowning and falls. Only one evaluation focused on an at-risk group (young males and petrol sniffing). Other outcomes evaluated were more generalised across communities – and typically a remote community was the setting, apart from state-wide initiatives, with no evaluation of urban programs identified.

The separate review of NSW Health programs found that they were insufficiently evaluated to determine likely benefits. This indicated that more comprehensive evaluation strategies are required for the identification of best-practice Indigenous injury preventions programs in the NSW Health context.

Recommendations

Based on these few evaluations, identified 'best bets' for injury prevention projects were:

- Initiatives that will lead to state-wide policy reform on injury prevention issues prominent for Indigenous communities, including:
 - prevention of overcrowding of motor vehicle safety; and
 - increases in alcohol tax reductions or measures to ensure they are not reduced.
- Multi-faceted strategies to address alcohol-related injuries at the State and/or community level.
- Initiatives to engage communities to introduce alcohol restrictions/management plans.
- Initiatives that are sustainable.
- Initiatives that include community engagement and consultation in development and implementations.
- Initiatives that have or can achieve a high level of acceptability and support for harm reduction strategies within the intervention population.
- Initiatives based on community-owned models for injury prevention.
- Initiatives to ensure on-going injury information systems.

Additional factors contributing to potential success included:

- involvement of Indigenous people in developing and implementing initiatives, particularly those resident or with close ties to the intervention community;
- supporting restrictions and policy changes with educational information campaigns and alcohol treatment and rehabilitation services;
- a high level of support for harm reduction strategies within the intervention population;
- on-going injury information systems.

While no failures per se were included in these publications, the following concerns were raised regarding the potential for greater success and sustainability of the findings in the long-term:

- under-resourcing;
- short time frames for implementation;
- incomplete implementation of initiatives;
- short time frames for evaluation;

- need to address acceptability (particularly regarding government roles); and
- difficulties accessing quality, relevant data.

Given the paucity of evaluations meeting the terms of reference, several other issues were discussed from the wider literature and the following recommendations made in relation to assessing the suitability of applications for funding:

- Culturally relevant practices should be implemented, requiring strong community consultation. To help assess this, an item could be included in the application process to demonstrate how the research meets the key values of spirit and integrity, reciprocity, respect, equality, survival and protection, and responsibility, for example. Reporting of findings back to the community is especially important.
- Indigenous individuals or groups should be involved in the development and dissemination of the intervention as well as evaluation, where practicable.
- Programs that include community control, respect, acceptability and ownership could be prioritised.
- Programs that include strong partnerships, especially with government, could be prioritised.
- Multi-faceted interventions are more likely to be successful particularly in addressing intentional injuries and therefore could be prioritised, where possible, particularly those that concurrently address:
 - social and economic disadvantage;
 - family violence;
 - criminal offending behaviour; and/or
 - alcohol and substance misuse.
- Programs that target at-risk groups, including by age, gender and particularly including urban/suburban programs could be considered despite a lack of Indigenous-specific successful evaluations due to the immense need.
 - The benefits of such programs could be demonstrated with non-Indigenous at-risk groups, including other indigenous populations, and include a feasibility phase where Indigenous consultation and engagement takes place to adapt the program to the target group.
- Given the higher Indigenous resident population in urban areas and failure to identify adequately evaluated initiatives in this setting, urban injury prevention initiatives could be promoted by the funding scheme and prioritised.
- Projects that target early intervention and/or interim measures that are known to be effective in preventing or reducing injury in the long term could be considered, including:
 - projects that improve the quality of injury data, consistency of definitions and data variables recorded, and access to such data collections;
 - projects that increase understanding of underlying factors related to injury so that intervention initiatives can be better targeted and components prioritised;
 - initiatives to build capacity within Indigenous communities, including training, education and other initiatives that improve the skills base, ensure sufficient numbers and reduced attrition of key personnel;
 - initiatives that can demonstrate and promote effective policy to reduce injury to relevant policymakers or aim to increase compliance with existing effective injury prevention policies;

- road safety interventions to decrease unlicensed driving and regulatory offences among Indigenous drivers;
 - suicide prevention programs that target increased wellbeing for at-risk individuals (potentially at the family, school or community level) particularly those addressing alcohol or substance misuse and/or to ensure Indigenous individuals have direct access to the same range and quality of services available to the wider Australian population;
 - assault, including child sexual assault, interventions to increase reporting;
 - initiatives to reduce alcohol and substance misuse; and
 - initiatives to improve housing conditions that can contribute to injury reductions.
- It is possible also that new evaluations showing success of injury prevention strategies or interventions other than those identified and recommended in this rapid review will become available during the course of the funding scheme. New initiatives may also be proposed based on previous lessons learned but not yet adequately evaluated. If applicants are able to credibly document this support, then those applications are worthy of consideration. Therefore, previous research supporting the feasibility and potential effectiveness of the initiative could be considered as an item to include in the application process.
 - The funding scheme could promote high quality research evaluations to ensure that any outcomes showing effectiveness are reliable; however, a combination of high quality quantitative and supportive qualitative research is likely to yield optimal learning. Application items on methodology could therefore request sufficient details to assess the quality of the research design and the strength of statistical approaches to be employed.
 - Funding distribution could include a combination of high priority smaller projects together with large, multi-faceted initiatives for optimal learning. Applications could include an item on the extent of the problem to help ascertain greatest urgency or need among submissions.

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.

NSW Health has engaged the Sax Institute to assist in designing and implementing this project including the necessary preparation for designing and implementing an effective program that funds interventional research and evaluation in injury prevention for Aboriginal people. The program aims to build on existing knowledge about what is known in terms of effective interventions to prevent and reduce injury.

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?

This is one of three reviews subsequently commissioned to meet these objectives.

Purpose and structure of this report

The stated purpose of this review was to:

- review documented past and present injury prevention programs conducted in Aboriginal communities for evidence of effective interventions; and
- provide recommendations on types of injury prevention projects that could be funded by the scheme.

Two key question areas were provided, together with requirements on scope:

Question 1

- What are the most effective strategies/projects/programs that have been implemented for the prevention of injury amongst Aboriginal populations?
 - i. Injury is defined broadly as all external cause injury, including intentional and well as non-intentional injury; and poisoning.
 - ii. The review should include the broad range of preventive programs/approaches from targeted programs within specific communities to more over-arching programs.
 - iii. The review should include intervention studies focussed on a single outcome and those addressing multiple outcomes.
 - iv. Descriptive before and after studies, controlled comparison studies, and systematic reviews are to be included
 - v. The review should include programs that use different interventional strategies and resources

- vi. The review should be restricted to interventions within Australian Aboriginal communities and mainstream studies that specific applicability to Australian Aboriginal populations.
- vii. The review should describe the outcomes that were achieved in terms of the intervention outcomes and the level of change achieved by the intervention
- viii. The review should focus on both intermediate and longer-term outcomes
- ix. The review should comment on the reliability of the evidence in the reviewed research including any methodological issues, and the applicability of the reviewed research to the NSW context.
- x. The review should include a 1-page summary of best bets for injury prevention projects in terms of effectiveness.
- xi. The reviewer will be provided with a collation of reports of projects that have been conducted within Area Health Services in NSW.

Question 2

- What types and causes of injury have successfully been addressed by these strategies?
- What types and causes of injury have not been successfully addressed (or addressed at all) by these strategies?
- What are elements that contribute to success or failure in such strategies?
 - i. Effectiveness of a program/approach includes the following dimensions: the extent to which intermediate and longer-term outcomes were achieved; feasibility of the program/approach; and sustainability of the program/approach. Note that the acceptability of the programs/approaches within the relevant Aboriginal communities are addressed in a separate review and are not included here but may be mentioned if relevant to the successful outcome of a program/approach.
 - ii. It is possible that within a program that did not achieve overall aims and outcomes, there may be elements of the program that were identified as being effective. These are also of interest and should be identified.
 - iii. In assessing the effectiveness of programs, the review should use as its framework the relevance and applicability to the NSW Aboriginal health context in relation to injury.
 - iv. The review should include information on how elements that contribute to success and/or failure vary for major Aboriginal populations subgroups such as:
 - parents and very young children, children, adolescents and young adults, adults, and older adults;
 - remote, urban and regional communities;
 - men and women.

Additional stated requirements were that the review should:

- identify areas where there is strong evidence in relation to the review questions; where there is equivocal or conflicting evidence; and where there are gaps in the evidence;
- provide a comprehensive coverage of research in the peer review literature including academic databases (e.g. Cochrane, Medline, PsycINFO);
- provide a comprehensive review of the grey literature including government reports, agency reports, reports from educational bodies such as universities and TAFE/vocational education providers;
- focus on evidence from Australia;

- focus on literature published between 1995 and 2010;
- provide commentary on applicability in remote, urban and regional communities in terms of each of the research questions; and
- tabulate relevant references (including study methods, findings, levels of evidence, quality of evidence, recommendations or implications arising from the evidence and summary of evidence).

The following chapter, Chapter 2, introduces the topic of the report by exploring the burden of injury among Indigenous Australians. Additional details on methods are provided in Chapter 3, with tabulated relevant references presented in Chapter 4. The first question set regarding effective strategies/projects/programs is reviewed in Chapter 5 and the second set, regarding types of injuries effectively and not effectively addressed and contributing factors is reviewed in Chapter 6. It is important to emphasise that the conclusions in Chapters 5 and 6 focus only on the evidence identified by the provided terms of reference, summarised in Table 2, Chapter 4. However, due to the paucity of evaluations identified via these terms, it was necessary to draw on wider literature to provide more useful recommendations. Therefore, Chapter 7 provides a summary discussion based on this wider literature and provides additional recommendations on the types of injury prevention projects that could be funded by the scheme.

Introduction

Burden of injury among Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander people represent a small proportion of the Australian population, yet experience a disproportionate burden of illness, disease and injury (Aboriginal & Torres Strait Islander Social Justice Commissioner, 2005; Oxfam Australia, 2007). The estimated Indigenous resident population of Australia in June 2006 was 517,200 or just 2.5% of the total population (Australian Bureau of Statistics, 2007). However, injury-related deaths among Indigenous people are almost three times that of non-Indigenous people, and injury hospitalisations are twice as common (Helps & Harrison, 2004; Ivers et al, 2008). Further, these estimates are based on reported injuries, yet many injuries to Indigenous people are not reported in formal data collections (Clapham, 2007) and therefore these estimates are likely to underestimate the true extent of the injury burden.

In Australia, there have been limited reliable and validated data collections on injury among Aboriginal and Torres Strait Islander peoples (also referred to collectively as "Indigenous" people in this report) for many years. Until very recently, the only States and Territories considered to have acceptable data in terms of accurately identifying Indigenous status were the Northern Territory (public hospitals only), Western Australia, South Australia and Queensland (AIHW, 2010; Harrison & Berry, 2008). In February 2010, the Australian Institute of Health and Welfare (AIHW) released an updated review of this issue which concluded that New South Wales and Victoria could now be included, with accurate identification in 88% and 84% respectively.

The most recent comparison of injury mortality and morbidity among Indigenous Australians by the AIHW was conducted in 2008 based on data from 2001-02, 2005-06 when acceptable data was only available from the NT, WA, SA and QLD (Harrison & Berry, 2008). It was estimated that these regions represented 60% of the Australian Indigenous population (and 38% of the total population), and 75% of all national hospital separations reported for Indigenous people (and 39% for the total population) (AIHW, 2005). The findings from this analysis are summarised in Table 1.

As shown, unintentional injuries contribute to the greatest proportion of injury deaths and serious injuries, with transportation crashes the leading cause of death and falls the leading cause of serious injury among Indigenous Australians. For intentional injury, suicide is the leading cause of death and assault the leading cause of serious injury.

By counts (percentage), suicide accounts for the greatest proportion of injury deaths in any category (intentional or unintentional), whereas by rates it is transportation. By both counts and rates, assault contributed greatest to serious injuries. These findings point to transportation, suicide, assault and falls as key areas to target in injury prevention initiatives.

This is confirmed when comparing these findings to those for non-Indigenous people in this population. The pattern of leading causes was similar, with the exception of intentional causes of serious injuries, which were low overall, including for assault – the leading cause for Indigenous people. Rather, much of the difference related to variations in scope. On a population basis, Indigenous people had 2.9 times the rate of fatalities due to transport crashes and 1.4 times the rate of serious injury than non-Indigenous people. For suicide the difference was 2.1 times the rate of fatality and 2.0 serious injury. For falls 1.6 times the rate of fatality and 1.4 times the rate of serious injury. The comparisons are most striking for assault, however, with an 8.6 times greater fatality rate and 16.9 times serious injury rate.

These findings are commensurate with a 2007 analysis of Australian-wide estimates of Indigenous injury during 2003 based on Australian Bureau of Statistics (ABS) definitions for Indigenous status (Vos et al, 2007). A New South Wales evaluation has also found higher rates of injury-related hospitalisation and death in the Indigenous compared to non-

Indigenous population consistent with these findings (Clapham, Stevenson et al, 2006). For example, the evaluation of 1999-2003 NSW Health data found Indigenous people aged 25-44 years were twice as likely to be hospitalised and in particular were five times as likely to be hospitalised due to interpersonal violence (Clapham, Stevenson et al, 2006).

Therefore, there is considerable need for injury prevention initiatives in Australia to include targeted programs for Aboriginal and Torres Strait Islander people. The effectiveness of such programs and which injuries have been targeted are the particular focus of this report. In particular, two issues are of interest:

1. What are the most effective strategies/ projects/programs that have been implemented for the prevention of injury amongst Aboriginal populations?
2. What types and causes of injury have successfully and not successfully been addressed by these strategies and what are the elements that contribute to this success or failure?

Table 1. Fatal and serious injury due to external causes of injury and poisoning among Indigenous Australian in the NT, WA, SA and QLD, 2001-02 to 2005-06 (Harrison & Berry, 2008)

External cause of injury	Fatally injured*						Seriously injured† (b)					
	Indigenous			Non-Indigenous			Indigenous			Non-Indigenous		
	Count	Per cent	Rate‡	Count	Per cent	Rate‡	Count	Per cent	Rate‡	Count	Per cent	Rate‡
Unintentional												
Transportation	348	28.5	29.5	3,530	24.2	10.1	4,991 (c)	8.4	346.2	89,247	11.9	256.1
Drowning & immersion	42	3.4	3.3	388	2.7	1.1	69	0.1	2.9	835	0.1	2.4
Poisoning, pharmaceuticals	41	3.4	3.3	881	6.1	2.5	979	1.6	69.0	13,856	1.8	40.1
Poisoning, other substances	16	1.3	1.3	143	1.0	0.4	390	0.7	26.7	6,180	0.8	17.9
Falls	60	4.9	13.0	2,701	18.6	7.9	8,999	15.1	814.3	204,812	27.3	594.8
Fires/burns/scalds	23	1.9	2.7	157	1.1	0.5	1,380	2.3	98.5	10,565	1.4	30.5
Other unintentional (d)	176	14.4	16.4	1,577	10.8	4.6	14,206	23.8	1,023.7	215,551	28.7	619.1
Intentional												
Self inflicted	361	29.5	25.5	4,219	29.0	12.1	3,179	5.3	237.6	41,260	5.5	118.0
Assault	125	10.2	9.5	369	2.5	1.1	18,683	31.3	1,444.5	29,805	4.0	85.5
Undetermined intent	13	1.1	1.1	178	1.2	0.5	682	1.1	53.1	4,087	0.5	11.7
Complications of surg & med care												
No external cause	18	1.5	4.1	417	2.9	1.2	6,072	10.2	738.2	133,346	17.8	383.8
Total	1,223	100.0	109.8	14,560	100.0	42.0	59,731	100.0	4,863.9	750,105	100.0	2,161.5

Note:

(b) The number of persons seriously injured is estimated by omitting inward transfers from one hospital to another.

(c) In total, there were 106,412 admissions (5,760 Indigenous and 100,652 non-Indigenous) to hospital for transport injury for an estimated 94,882 people (5,026 Indigenous and 89,856 non-Indigenous), of whom 644 persons (35 Indigenous) died while in hospital (0.7%). These deaths are represented in the national mortality data collection and thus are omitted from the seriously injured counts in Table 3.1 and throughout the report.

(d) Other unintentional injury was not included in the ranking, as it comprised a heterogeneous group of injury types that did not fit within the other specified injury groupings.

* Cases are five-year totals for 2001-02 to 2005-06, for which an 'external cause' was coded as the Underlying Cause of Death, with ICD-10 External Causes codes aggregated as in (Henley et al. 2007).

† Cases are five-year totals for 2001-02 to 2005-06, for which the Principal Diagnosis was coded to ICD-10-AM S00-T98 and the first reported ICD-10-AM External Cause codes were aggregated as in (Berry & Harrison 2007).

‡ Rates are averages of annual rates over the five years 2001-02 to 2005-06, expressed as per 100,000 population, and adjusted by direct standardisation to the Australian population in June 2001.

Methods

An extensive search of peer-review and grey literature was conducted sourced via on-line databases and search engines, as well as review of citations in key references. All documents meeting the following search criteria that were able to be sourced (including via document delivery requests) within the short timeframe of the review were considered for inclusion in the key findings table and/or discussion.

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"] AND
- ["intervention" OR "evaluation" OR "program"] AND
- ["Injury" OR "Violence" OR "Assault" OR " Road Traffic injuries" OR " Poisoning" OR " Burns" OR " Drowning" OR" Falls" OR " Self – harm"].

When categories were applied to databases, the following potentially relevant categories were searched:

- Aboriginal Studies.
- Architecture, Design and Planning.
- Behavioral & Social Sciences in Health.
- Exercise and Sports Science.
- Gender and Cultural Studies.
- Indigenous Health Studies.
- Medical Humanities.
- Medicine.
- Peace and Conflict Studies.
- Psychology.
- Public Health.
- Social Work.
- Socio-Legal Studies.
- Sociology and Social Policy.
- Transport/Logistics.
- Work and Organisational Studies.

On-line Databases

A search of the popular nominated peer-review databases (Cochrane, Medline, PsycINFO) failed to locate sufficient references. Therefore the following databases were systematically searched for both peer-review and grey literature, applying the search terms described above:

- AGELINE.
- AGIS-ATSIS.
- AIATSIS: Indigenous Studies. Bibliography.
- AIM Management and training.
- All EBM Reviews (Cochrane DSR, ACP Journal Club, DARE, CCTR, CLEED, CLCMR, & CLHTA).
- APAIS-Health.
- ATSI health.
- Attorney General's Information Service.
- Australasian Legal Information Institute.
- Australian Education Index: ATSIS.
- Australian Federal Police Digest.
- Australian Indigenous HealthInfoNet.
- Australian Public Affairs Full Text
- Australian Transport Index.
- bpress legal repository.
- Campbell- Human services research, Centre for the study of prevention of
- Cochrane Library
- Communication & Mass Media.
- Dissertation & Theses Full Text.
- EBM Reviews: Database of Abstracts of Reviews of Effectiveness.
- Expanded Academic Index ASAP.
- Finding Australian Government reports.
- Health & Society Database.
- Health issues in Criminal Justice.
- Legaltrac.
- Medline.
- NSW Parliamentary & Information Resources.
- Public Affairs Information Service.
- ParlinfoWeb.
- Peace Research Abstracts.
- PsycINFO.
- Rural and remote health database.
- Scirus.

- violence.
- Campbell- World bank, International centre for prevention of crime.
- Capital Monitor's University Intranet
- CINAHL.
- CINCH: Australian Criminology Database
- Social Services Abstracts.
- Social Work Abstracts.
- University of Sydney Theses.
- Web of Science.
- WORKLIT.

In addition, Google was utilised to search for additional grey literature. Several known organisations with key grey literature were also individually searched. These were:

- AIHW: Australian Institute for Health and Welfare.
- CARRS-Q: Centre for Accident Research and Road Safety – Queensland.

Results were collated utilising EndNote X3 and duplicates deleted.

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.

The Promise Matrix

As high quality "Grade A" studies were known to be rare for evaluations of Indigenous injury prevention programs, a second level of assessment of intervention effectiveness was applied, namely an adaptation of the Gill et al (2005) "Promise Matrix". The original matrix is presented in Figure 1.

As the quality of evidence, as described in the section above, was likely to show little variation and tend toward low grade quality, alternative guidelines were applied to assign high and low certainty of effectiveness grading. Also, as indicated in the footnotes to the table, a formula including an approximation of the population size is typically used when applying the promise matrix to assign the level of promise to potential population impact. As this is not possible for the vast majority of Indigenous program evaluations, alternative guidelines were also applied to assign high and low levels. The guidelines were as follows:

- LOW POPULATION IMPACT: not many people affected by problem; intervention is for example 1:1 (e.g., one parole officer to one individual); intervention is very expensive; community doesn't like or doesn't use the intervention.
- HIGH POPULATION IMPACT: many people affected by problem; intervention reaches many (e.g., legislation to affect entire region or school program for all grades); intervention is cheap, easy to distribute or self-propagating; communities/individuals like the intervention.

- LOW CERTAINTY OF EFFECTIVENESS: few studies have evaluated effectiveness of the intervention; or studies have evaluated the intervention and shown poor effectiveness; or studies have shown variable effectiveness but the studies themselves were poorly conducted (e.g., a poor GRADE on levels of evidence); or intervention might have been shown to be effective but in a very different population.
- HIGH CERTAINTY OF EFFECTIVENESS: studies have evaluated the effectiveness and shown strong objective outcomes (e.g., routinely collected data showing decrease in poor outcomes for example); research has been replicated and continues to show good outcomes after the intervention; studies showing good outcomes were rigorous (i.e., good GRADE on levels of evidence – large populations, accurate data analyses, strong measurement, few biases, take into account potential confounding variables).

Certainty of effectiveness* (Risk)	Potential population impact^ (return)		
	Low	Moderate	High
Quite high	Promising	Very promising	Most promising
Medium	Less promising	Promising	Very promising
Quite low	Least promising	Less promising	Promising

* The confidence from the evidence that the intervention will produce a benefit under ideal conditions

^ Efficacy X (population reach x uptake)

Figure 1: The Promise Matrix

Results

The terms of reference for the rapid review resulted in approximately 600 potentially relevant references being identified and screened for relevance. These included publications in peer-reviewed journals, as well as grey literature, such as government reports. Each reference was examined to assess relevance and scanned to identify further potentially relevant sources of information. Following this lengthy review process, 11 references were identified for which evaluation design details were provided and direct injury reduction outcomes evaluated in Australian Aboriginal populations. Table 2 summarises the main details of these evaluations, grouped by themes.

Some references on injury prevention programs targeting Australian Aboriginal populations needed to be excluded from the results presented in this chapter due to a lack of information on the effects of these interventions on direct, quantifiable injury outcomes (such as emergency department presentations). Further, several programs cited as successful were only detailed in secondary sources, where the details of the methodology could not be determined or examined for research quality and therefore these were likewise excluded from Table 2. While intermediate affects (such as changes to community perceptions of injury-related issues following the implementation of educational programs, i.e., early interventions) may have utility for program and policy development in this field, they did not meet the inclusion criteria for this chapter, which focuses on interventions evaluated for direct injury reductions among Australian Aboriginal populations. These are nonetheless relevant when considering initiatives that are worthy of funding and therefore are among those reported on in the Discussion (Chapter 7).

In addition, several NSW Health programs were identified but were inadequately evaluated to include in the main findings table. These are summarised in a complementary table following the main findings.

While the objective of this approach was to provide a comprehensive review of all relevant references, due to the range of injury topics addressed in the literature, the considerable number and variety of relevant information sources, and delays in document deliveries from publications sources to which the authors did not previously have access (e.g., conference proceedings), it is possible some potentially relevant references were not obtained. Furthermore, as has been previously identified (Clapham 2004), information concerning Aboriginal health programs is often not published or not published in accessible documents, and in general unsuccessful programs are rarely published, increasing the difficulty of conducting a thorough, comprehensive review. Therefore, while providing an extensive review of published Aboriginal injury prevention interventions, it is possible that a limited number of intervention evaluations fulfilling the inclusion criteria are not discussed in this rapid review.

Evaluations of Injury Prevention Initiatives in Aboriginal and Torres Strait Islander Populations

The following table, Table 2, summarises details of all relevant references identified in the literature that reported on evaluations of injury prevention initiatives in Aboriginal and Torres Strait Islander populations, grouped by main intervention themes. The content of these is explored further in Chapters 5 and 6.

NSW Health Initiatives

Details of seven further references concerning NSW Health injury prevention programs in NSW Aboriginal communities are summarised in Table 3. As shown, limited information regarding evaluation design and injury reduction outcomes was available for most of the programs. Nonetheless, available details highlight existing NSW strategies and indicate program features that may be relevant for the design and implementation of future NSW Indigenous injury prevention programs.

Table 2. Summary of Evaluations of Injury Reduction Programs in Aboriginal and Torres Strait Islander Populations

Authors	Title	Publication	Intervention	Design	N	Setting	Findings	Level of Evidence (Grades)	Quality of Evidence (Promise Matrix)	Summary of evidence
Motor Vehicle Legislation										
Hawkes (2005)	Open Load Space Project	Australasian Road Safety Research Policing and Education Conference proceedings	State-wide legislation introducing in 2001 making it illegal to ride in the open load space of utility vehicles without rollover cages	Descriptive pre-post	State-wide (Western Australia)	Western Australia (2001-2005)	Compared to estimate of 4-8 fatalities per year prior to legislation, there were 2 fatalities per year post-legislation	D	Promising	Results show reduced fatalities of passengers travelling in open load spaces of utilities since policy introduced; however, no statistical analysis or control was included, to establish a causal relationship. As Indigenous people are over-represented in such crashes and the potential to reach the population could be high, this policy shows some promise in reducing road traffic injuries.
Restriction From Leaded Petrol										
Burns et al (1996)	An evaluation of unleaded petrol as a harm reduction strategy for petrol sniffers in an Aboriginal community	Journal of Toxicology: Clinical Toxicology	Exclusive use of unleaded petrol, as opposed to leaded, petrol, to reduce neurotoxic effects of sniffing tetraethyl lead; introduced mid 1989	i) Control pre-post evaluation of hospital records ii) Retrospective analysis of Hematological indices of exposure to lead	i) Two communities intervention, comparison (leaded petrol only) ii) 82 males (58 in intervention community approx. 31% male population)	i) Maningrida (intervention) plus other community. Arnhem Land NT, 1987-1992 ii) Maningrida plus sniffers admitted to Royal Darwin Hospital 1992-1993	i) Prior to intervention averaged 8 emergency evacuations to hospital per year: 1991-1992 none vs. 13 in comparison community (prior probability no evacuations: 0.000034). ii) Median blood levels of lead arid hydro-carbon for controls, intervention sniffers, ex-sniffers, non-sniffers: 5.06, 1.87, 1.24, 0.17 [mu]M/L. Significantly lower [delta]-aminolevulinic acid dehydratase activity, and free erythrocyte protoporphyrin for intervention vs. control sniffers, and no differences intervention sniffers vs. ex-sniffers	C	Very promising	Elimination of lead petrol was concluded to significantly decrease emergency evacuations to hospital and to reduce blood lead levels in petrol sniffers similar to that of ex-sniffers. Given the high potential to reach the population, this initiative is most promising.

Community Night Patrols										
Elek (2007)	Community Patrols in Alice Springs: Keeping People Safe	Indigenous Law Bulletin	3 Indigenous community night patrollers, 5 nights per week, aiming to diffuse and prevent violence in community, introduced 1990	Descriptive pre-post	Community wide (approx 25,000)	Community wide (approx 25,000)	Reported 20% reduction in assaults compared to pre-1990 levels	D	Promising	A reduction in assaults was reported in relation to a national award in 1993, with such awards also received in 1999 and 2002 suggesting some level of sustainability. However, no statistical analysis or control was reported and a 2006 review found the program was under-resourced. The initiative has promise although substantial resources would be needed to reach a high proportion of the population and to sustain the program
Community Justice Group										
Chantrill (1998)	The Kowanyama Aboriginal Community Justice Group and the struggle for legal pluralism in Australia	Journal of Legal Pluralism and Unofficial Law	Local justice group formed during 1993 based on principles of community participation and local knowledge of law and justice issues in a preventative framework drawing on local Aboriginal conceptions of authority and behaviour control as a framework for local justice administration	Descriptive pre-post	Community wide	Kowanyama Aboriginal Community, Queensland, 1993-1995, 1997	Youth offences fell from pre-intervention rates of 40-50 per month to: - nil in March-November 1994 - 2 in December 1994-March 1995 - 3 in January 1997-July 1997 Police reported among adults, a: - 68% decrease in assault - 83% decrease in domestic violence applications - perceived substantial improvement in short-term (1995), moderate thereafter (to 1997)	D	Promising	A reduction in violence-related crime including assaults and domestic violence was found, however, no statistical analysis or control was reported. The initiative has promise although substantial resources would be needed to reach a high proportion of the population and to sustain the program.
Alcohol and Substance Misuse Initiatives										
Chikritzhs et al (2005)	Living with Alcohol Program	Addiction	Combination of education, alcohol supply reduction, treatment and rehabilitation services implemented from 1992	Control pre-post evaluation mortality data	State-wide, two States	Northern Territory intervention, Western Australia control, 1985-2002	NT death rates for acute alcohol-attributable conditions (e.g. road traffic injury, assault, suicide, drowning and falls), were 32.6% lower on average than they had been before the program was implemented	C	Very promising	Strong statistical analyses, accounting for several potential confounders, demonstrated a significant reduction in injuries. Potential reach in the population is also high such that the likelihood of the initiative being effective is most promising.

Gray et al (2000)	Tennant Creek liquor licensing restrictions	Australia New Zealand Journal of Public Health	Alcohol supply restrictions: opening hours by outlet type, size of container, large glass containers, third party sales, alcohol content by time of day and alcohol content by container size, plus requirements for food availability (see 5.3.4).	Pre-post	Town population (unknown)	Tennant Creek, Northern Territory (August 1994-1998)	In the six months following the introduction of the supply restrictions, injury-related hospital admissions reduced from 88 to 71, and assaults reduced from 95 to 67, during the six months of the intervention. However, these outcomes increased post-trial, to earlier rates	C	Promising	Supply restrictions were associated with reduced injury-related outcomes but no statistical analysis or control was used. Nonetheless the potential to reach the population is high and therefore potential effectiveness is very promising.
Kinnane et al (2009)	Alcohol restrictions in Fitzroy Crossing	Report to The Drug and Alcohol Office, Western Australia	Supply restrictions: sale of packaged liquor with ethanol >2.7% at 20°C to any person other than a lodger (as defined in Section 3 of the Liquor Licensing Act) introduced October 2007	Descriptive pre-post	Town population of 3500 (88% Indigenous)	Fitzroy Crossing, Kimberly Region of Western Australia (October 2007 - September 2008)	36% reduction in average no. of alcohol related ED presentations - 20% increase in alcohol-related domestic violence believed due to less intoxicated victims being better able to lodge complaints - local women's shelter reported 25% decrease in attendance and fewer traumatic injuries	D	Promising	Results indicate that the intervention was effective in reducing alcohol-related injury although no statistical analysis or control was used. Nonetheless the potential to reach the population is high and therefore potential effectiveness is promising.
Margolis et al (2008)	The impact of supply reduction through alcohol management plans on serious injury in remote Indigenous communities in remote Australia	Alcohol & Alcoholism	Restrictions on the selling of takeaway alcohol, all wine, and the selling of beer and spirits over 5.5% alcohol content in licensed premises introduced Dec 2002 or Oct, Dec 2003 in various communities.	Pre-post emergency retrievals by the Royal Flying Doctor Service	2,500	Four remote communities in Cape York, Queensland 1995-2005	On average, over the four communities, there was a significant reduction in injury retrieval rates at 2 years (quantified as 51.9%) and also 10 years	C	Very promising	Statistical analyses demonstrated significant reductions in injuries although the researchers were unable to identify a comparable community for a control. The high potential to reach the population suggests the potential effectiveness of the program is very promising.
Senior et al. (2009)	Alice Springs Alcohol Management Plan	Menzies School of Health Research Report	Alcohol supply restrictions, education and harm reduction programs; including restrictions on opening hours, alcohol content by time of day, alcohol content by container size, total takeaway sale by time of say, drinking locations (see 5.4.1)	Pre-post and process evaluation	City population (approx. 27,000)	Alice Springs (October 2006 - September 2008)	- Alcohol-related separations fell significantly from 16.2% to 14.1% in year following introduction and remained at this level (14.5%) in following year. - While absolute no. of assaults rose between 2003-2006, those classified as serious was stable at 2.4%, falling significantly in 2007 after introduction to 1.7% and staying at this level in	C	Very promising	Statistical analyses demonstrated significant decreases in alcohol-related hospitalisations and indications of reduced alcohol-related assaults. Authors suggested that, as most of the health effect of alcohol misuse reflects drinking over many years, this short-term effect likely understated true benefits.

							2008. - Alcohol-related assaults rose 5% in 2007, but fell 5% in 2008. Non- alcohol-related assaults rose 1% in 2007 and 2% in 2008. - 2007 rise in alcohol-related assaults offset by 6% drop in 'alcohol unknown' assaults, suggesting improved data on alcohol involvement and potentially no change in alcohol-related assaults. Decreases in 2008, along with rise in non-alcohol related assaults suggest true fall.			Other limitations included a lack of implementation of some aspects of the plan and difficulties accessing relevant data and quality data. With high potential to reach the population this initiative is very promising.
Stockwell et al (2001)	Living with Alcohol Program		Combination of education, alcohol supply reduction, treatment and rehabilitation services implemented from 1992	Control pre-post evaluation hospital, mortality and road crash data	State-wide	Northern Territory (alcohol compared to non-alcohol controls), 1980-1996	Reductions in estimated alcohol-caused deaths from acute conditions (road deaths 34.5%, other 23.4%) and in road crash injuries requiring hospital treatment (28.3%).	C	Very promising	Strong statistical analyses with a control demonstrated significant reductions in injury-related deaths and hospitalisation crashes. Potential reach in the population is also high such that the likelihood of the initiative being effective is very promising.
Multiple Community Injury Control Strategies										
Shannon et al (2001)	Injury Prevention in Indigenous Communities: Results of a Two-Year Community Development Project	Health Promotion Journal of Australia	Multiple strategies to reduce injury (inc. via domestic violence, public intoxication and broken glass); including revised public bar opening hours, football team anti-violence agreement, clean up glass on streets, resurfacing child playground, less alcohol in glass implemented during Apr 1997-Apr 1999 (see 5.4.3)	Pre-post analysis of community medical clinic injury records	Town population (unknown)	Woorabinda, Queensland (April 1997 - April 1999)	- Bayesian change-point analysis identified a 62.4% probability that a shift in the observed series of monthly injury frequencies occurred immediately after the introduction of the program - Decrease of approximately 30% in the number of injuries occurring per month after the implementation of the program	C	Very promising	Strong statistical analyses demonstrated significant immediate reductions in injuries and continued reductions over two years. Potential reach in the population is also high such that the likelihood of the initiative being effective is very promising.

Table 3: Summary of NSW Health Injury Reduction Programs in NSW Aboriginal Populations

Authors	Title	Publication	Intervention	Design	N	Setting	Findings	Level of Evidence (Grades)	Quality of Evidence (Promise Matrix)	Summary
Education Projects										
NSW Health (2010)	Education Centre Against Violence Capacity Building Projects	http://www.ecav.health.nsw.gov.au/ecav/Aboriginal/projectsactivities.htm	i) 'Weaving the Net': consultative, educational and community development modules to increase capacity in Aboriginal communities to respond to child abuse. Key outcome to develop pool of accredited workers and community members to facilitate community education and long-term community development programs. ii) Competency-based training for Aboriginal family health workers/ health professionals on family/domestic violence, sexual assault and child abuse. Two courses: Certificate 1V Aboriginal Family Health (Family Violence, Sexual Assault & Child Protection) , and Competent responses for Aboriginal Family Health (family/domestic violence, sexual assault and child protection),	No evaluation	N/A	Program available in NSW	N/A	N/A	N/A	N/A
NSW Health (2009)	'Yarning Up About Safety' Protective Behaviours Program, including Aboriginal Peer Education Women's Health Program	North Coast Area Health Service, NSW Health	i) Culturally sensitive protective behaviours program run in Aboriginal preschools to ensure essential protective behaviour measures are reinforced with children and families. ii) Six-week course incorporating protective behaviour issues in a broad range of women's health issues. Aims to increase participants' awareness of sexual abuse, family violence, child abuse and neglect, and how to engage support services.	No evaluation	N/A	Coffs Harbour, Kempsey (Regional NSW)	N/A	N/A	N/A	N/A
Regan (2007)	'Shake a Leg' Program	www.outbackdivision.org.au/client_images/292935	School based program for primary and secondary schools delivered by Aboriginal Health Workers to all children with an	No evaluation	N/A	Bourke, Kempsey, La Parouse	N/A	N/A	N/A	N/A

Authors	Title	Publication	Intervention	Design	N	Setting	Findings	Level of Evidence (Grades)	Quality of Evidence (Promise Matrix)	Summary
		doc	Aboriginal perspective. Utilises existing resources, some specific to Aboriginal people, others mainstream, delivered in culturally sensitive way. Delivered in 40 minute sessions, 1 session per week for 10 weeks. Key topics include nutrition, oral health, otitis media, physical activity, identity, drugs and alcohol. Aims to improve health and practices of children, families and community.			(Regional and Urban NSW)				
Walsh et al (2009)	'All Children Being Safe' Greenhill Project / NSW Tackling Violence Project	North Coast Area Health Service, NSW Health	Training of Aboriginal staff to provide culturally sensitive educational intervention to primary school children aged 5-8 with non-threatening means of maintaining their personal safety in situations involving family violence and sexual abuse	Descriptive	i) Greenhill Project (n=17) ii) Unknown	Greenhill, Grafton, Maclean, Tingha, Huskisson, Dubbo, Hastings / Maclean, Kempsey (Regional NSW)	i) Pilot results from Greenhill Primary School: 95.2% remembered the stories; 100% identified two unsafe feelings with 29.4% identifying more than three unsafe feelings; 100% of children identified three safe places and three safe people with whom to talk. ii) Results from Kempsey West Primary School: 65% of students rated the program as 'excellent'.	D	Promising	Children provided positive feedback, indicating cultural applicability within regional Aboriginal communities. Inexpensive and widely transferable project. While delivered promising recall outcomes, further evaluation required to verify impact on injury reduction.
Multiple Community Injury Control Strategies										
Clapham et al (2008)	Blacktown Aboriginal Safety Promotion Program	Report prepared for NSW Health and Roads and Traffic Authority of NSW	Interventions to identify and address key injury-related issues affecting Aboriginal population of Blacktown, such as injuries due to unsafe homes and road traffic injuries, including safety promotion training and 3 local programs: (i) 'Home Safe Home' (HSH), (ii) 'Keeping Aboriginal Youth Safe' (KAYS) and	Descriptive	i) 22 homes ii) 105 Aboriginal youth iii) 12 of 15 local licensed venues	Blacktown (Urban NSW)	i) Improvements made, safety kits delivered and used and 3 tenants re-housed, enhancing local organisation networks. ii) 6 training	D	Promising	Promising implementations but no pre-implementation information available and no evaluation of impact on injuries. Process evaluation highlights potential value of this broad, multi-faceted approach to injury prevention in Aboriginal communities via engaging and empowering local communities.

Authors	Title	Publication	Intervention	Design	N	Setting	Findings	Level of Evidence (Grades)	Quality of Evidence (Promise Matrix)	Summary
			(iii) 'Ngarra: Safety in the Local Environment Project'.				programs implemented, with 10 participants obtaining a learner driver permit and 3 a provisional licence. iii) 12 audits conducted, 2 awards presented for the safest licensed venue via audit and via people's choice			
Royal (2001) McCloud (2003)	Shoalhaven Aboriginal Safe Communities Partnership	http://www.communitybuilders.nsw.gov.au/sync/bc6_healthy_safe_aboriginal_communities.pdf	On the basis of the Aboriginal Injury Surveillance and Prevention Project (2001), the Aboriginal Safe Communities Partnership aimed to become the first Indigenous Safe Community in Australia by implementing various injury reduction programs.	Descriptive i) review of hospital and ED data ii) interviews, informal discussion and focus groups with individuals in the community	i) 161 hospital and 886 ED records described ii) 90 formal interviews and 3 focus groups of 5-8 people per group reported among other unknown	Shoalhaven (Regional NSW)	Several priority areas were identified with a series of interventions implemented to address each of these. The priority areas included: child safety across all environments, safe home sand communities, reduced levels and impact of interpersonal violence, development of positive options to drug and alcohol use, development of respect for self, community and culture.	D	Promising	Promising knowledge and awareness raising and engaging communities, no evaluation of impact on injuries. Several principles found to determine effectiveness of large-scale Aboriginal injury prevention projects: <ul style="list-style-type: none"> • delivering programs in appropriate context and manner, in terms of cultural, physical, and social environments; • structuring activities in ways that encourage positive self-esteem and confidence in individuals, families, communities and at cultural level; • promoting community control and ownership of injury prevention programs, building on existing strong Indigenous community leadership and decision making; • working in genuine partnership and coordination across sectors and between agencies, enabling full use of community, regional, national and other available expertise and resources; and • using measurable indicators of success and ongoing evaluation.

Authors	Title	Publication	Intervention	Design	N	Setting	Findings	Level of Evidence (Grades)	Quality of Evidence (Promise Matrix)	Summary
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While these may be applicable to other Aboriginal communities, further evaluation of effects of wider project and individual components on injury rates needed.

Therapeutic Programs

Brown (2010)	Marrung Tiddas	Hunter New England NSW Health	Therapeutic program for Aboriginal women who have experienced or whose family has been affected by sexual assault. Aims to increase trust and provide access to sexual assault, and other health services, and educate older participants regarding long-term impacts of trauma. Involvement of gatekeepers within community reduces isolation of victims of sexual assault and increases access to crisis and long-term interventions. Won Building Partnerships for Health Category at 2009 HNEH Achievement Awards.	No evaluation	N/A	Taree (Regional NSW)	N/A	N/A	N/A	N/A
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Effective Injury Prevention Initiatives Implemented Among Aboriginal Populations

This chapter address the first question of interest: what are the most effective strategies/projects/programs that have been implemented for the prevention of injury amongst Aboriginal populations? Eleven references were identified that concerned effective initiatives implemented for the prevention of injury among Aboriginal populations. These include various state-wide and community-wide single and multi-faceted initiatives, including the introduction of new policy, alcohol management plans, community street patrols and a justice group targeting several crime-related injury-related issues, and limiting the supply of leaded petrol to reduce poisoning outcomes. On the basis of the available literature, each project identified as having effectively reduced injury among Aboriginal populations, as summarised in Table 2 in the previous chapter, is detailed further here by type of initiative.

Statewide policy reform

Motor vehicle legislation

Road trauma exerts a considerable impact on Aboriginal populations throughout Australia (Macaulay et al, 2003). Furthermore, the considerable reduction in road trauma in Australia since the introduction of legislation mandating seat belt use and limiting blood alcohol concentration demonstrates the value of employing legislative approaches to encourage road trauma reductions. While there exist ethical and political challenges in only applying legislation to specific ethnic and cultural groups, including Aboriginal populations, the development and implementation of state-wide legislation with the potential to reduce road trauma among Aboriginal populations in particular represents an effective injury prevention strategy.

Injuries to passengers of utility vehicles are a significant issue in Australia. For example, approximately 292 utility passengers were injured and 11 killed each year in Western Australia between 1987 and 1997, with many of these casualties attributable to travel in the open load space (Hawkes 2005). The Western Australian Office of Road Safety estimated that 4-8 lives were lost each year between 1987 and 1997 through crashes involving passengers in the open load space of utility vehicles, with an additional 120 hospitalisations (Hawkes, 2005).

In order to address this issue, state-wide legislation was introduced in Western Australian during January 2001 that made it illegal to ride in the open load space of vehicles without rollover cages (Hawkes, 2005). Four years later, the Department of Planning and Infrastructure ceased authorising the fitting of rollover cages, and from 2006 (beyond the timeframe of the research), a blanket prohibition was introduced on all travel in open load spaces. As a greater proportion of Aboriginal Western Australian residents are injured in such crashes than non-Indigenous residents, a central aim of these legislative requirements was to reduce road trauma amongst the Indigenous Western Australian population (Hawkes, 2005). Due to this focus on the Aboriginal population, in 2002 the Office of Road Safety undertook significant consultation with Aboriginal communities and road safety stakeholders concerning the most pressing issues in Aboriginal road safety, including riding in open load spaces (Hawkes, 2005). An Indigenous-focused campaign to promote awareness of the dangers of riding in the rear of utilities and trucks and the ban on open load space travel was also developed.

Hawkes (2005) provides an evaluation of the mandatory use of rollover cages between 2001 and 2004 finding that, compared to previously determined levels of 4-8 fatalities per year, following introduction of the legislation fatalities reduced to 2 per year. No information regarding the effects of rollover legislation on hospitalisations is provided. While there is also a lack of information provided regarding the specific effect of the legislation on Indigenous road trauma, the paper implicitly suggests that a positive outcome was

produced given the higher engagement in this form of travel and higher crash involvement by Indigenous people. As the research was only descriptive, however, with no statistical analysis or control used, whether the reduction was due to the legislation or other factors cannot be determined. Nonetheless stronger legislation was subsequently introduced, that is, restricting all travel in open load spaces of utilities (irrespective of the presence of rollover cages), which is more likely to prevent injuries.

State-wide multi-faceted initiatives

Alcohol management program, Northern Territory

More one in three people in the Northern Territory (NT) are estimated to be of Indigenous origin (ABS, 2006). Although alcohol is a significant issue for non-Aboriginal people in the NT, approximately 82% of Indigenous drinkers consume alcohol at risky or high risk levels (Chikritzhs et al, 2005). In response to this issue, a comprehensive program to reduce serious alcohol related harm in the NT known as the Living With Alcohol (LWA) program was introduced in 1992 with funding from a special NT tax (Levy) on beverages with greater than 3% alcohol content by volume (Chikritzhs et al, 2005; Stockwell et al, 2001). The Levy was removed in 1997 but the LWA program continued to receive Federal Government funding until 2002. The program involved a range of strategies including education, increased controls on alcohol availability and expanded treatment and rehabilitation services.

Two of the identified studies evaluated this program: Stockwell et al (2001) and Chikritzhs et al (2005). Stockwell et al (2005) examined hospital, mortality and road crash data for indicators of alcohol-related harm from 1980 to mid-1996. Data from the same source for which alcohol was unlikely to be involved was used to control for potential confounders. Alcohol aetiological fractions for major alcohol-related causes of death were estimated accounting for the high-risk level of alcohol use in the NT. Multiple linear regression and auto-regressive integrated moving average (ARIMA) time-series analyses were employed to compare trends in the alcohol related to non-alcohol related (control) harm indicators. The authors found reductions in estimated alcohol-caused deaths from acute conditions (road deaths 34.5%, other 23.4%) and in road crash injuries requiring hospital treatment (28.3%). In addition there were substantial reductions in per capita alcohol consumption and self-reported hazardous and harmful consumption via surveys. These reductions were evident immediately from the outset of the introduction of LWA and were largely sustained throughout the 4 years studied.

Chikritzhs et al (2005) further examined trends in age standardised rates of 'acute' (e.g., road trauma) and 'chronic' (e.g., liver cirrhosis) alcohol-attributable deaths in the NT before, during and after the combined implementation of the LWA program and Levy, and before and during the full length of the LWA program through to 2002. A similar analysis was conducted but with data from a separate State (Western Australia) as a control, employing ARIMA time series analyses and including internal and external control series and adjustments for possible confounders. Separate estimates were made for Indigenous and non-Indigenous NT residents. The authors found that when combined, the Levy and the LWA program were associated with significant declines in acute alcohol-attributable deaths in the NT as well as Indigenous deaths between 1992 and 1997. During the operation of the LWA program, which continued for several years after the Levy had ceased, the authors also found a significant decline in the mean annual death rate from acute alcohol-attributable conditions for both Indigenous (22.4%) and non-Indigenous (38.0%) NT residents.

Combined, the authors of the studies concluded that the combined impact of the LWA program Levy and the programs and services funded by the Levy, reduced the burden of alcohol-attributable injury to the NT in the short term and may have contributed to a reduction in chronic illness in the longer term. The results presented a strong argument for the effectiveness of combining alcohol taxes with comprehensive programs and services

designed to reduce alcohol-related harm, and the need to distinguish between the acute and chronic effects of alcohol in population level studies.

Community-wide single initiatives

Indigenous night patrols, Tangentyere NT

Indigenous community patrols act as prevention and acute intervention services, aiming to resolve disputes and intervene in situations of conflict before harm is produced (Elek, 2007). They are Indigenous initiatives, empowering people to provide conflict resolution services within their own communities (Elek, 2007). The activities undertaken by a night patrol service may include relocating a person to a safe environment, diffusing violent situations, diverting intoxicated people away from contact with the criminal justice system and providing advice. They are intermediaries to police, with either group calling upon the other when needed. Such patrols are becoming increasingly common throughout Australia (Blagg & Valuri, 2004).

One such patrol was the Tangentyere Night Patrol, consisting of three Indigenous patrollers that operated five nights each week in camps around Alice Springs in a vehicle fitted with communication, equipment and first aid supplies (Elek, 2007). Operating since 1990, the patrol was associated with a 20% reduction in assaults and 10% reduction in criminal damage between 1990 and 1993, although the level of evidence for these findings was of poor quality and the true effectiveness of the program is unclear. A 2006 review reported night patrol assistance with 5474 of 9396 encounters, 68% of which involved taking a client home or to a safe place as early intervention strategy to avoid violence (Elek 2007). Yet despite these positive results, including national awards for the program in 1993, 1999 and 2002, the 2006 review found the program was under-resourced. This suggests a lack of sustainability without continued efforts. The current website for this initiative reports that it is now coordinated by subsequently formed local government Shires (Tangentyere Council, 2008a). From 2007, the initiative was expanded to include community day patrols and youth patrols (Tangentyere Council, 2008b).

Much of the success of the program was attributed to the involvement of local Indigenous patrollers, either residents of the community or with strong links to the community, based a relationship of trust and respect and "cultural expertise, not coercive powers" (p. 25, Elek, 2007). This not only assists the community but also provides support to police and helps reduce their workload.

Community Justice Group, Kowanyama QLD

During 1993, extensive community consultation was conducted by local Indigenous consultants within the Kowanyama Aboriginal Community "on whether the community wanted a local justice body, who might sit on such a body, and who possessed appropriate authority, were fair minded and respected within the community" (p. 33, Chantrill, 1998); funded by the Queensland Corrective Services Commission. As part of this process, the principles of community participation and local knowledge of law and justice issues in a preventative framework drawing on local Aboriginal conceptions of authority and behaviour control as a framework for local justice administration were advocated. Several workshops were held to ensure that "community members would be the decision makers in determining whether and in what ways the community might take more responsibility and control of law and justice issues" (p. 33, Chantrill, 1998) and further to clarify the aims and objectives of the justice group. These were identified as, to (p. 33-34, Chantrill, 1998):

- help the Kowanyama community deal more effectively with its problems of social control;

- address the issues of law and order in a way that the community understands to be right and in accordance with its own customs, laws and understandings about justice;
- consult with magistrates about punishments and sanctions considered appropriate by Kowanyama people;
- recommend, and if appropriate carry out certain kinds of community punishments for offenders;
- take action to prevent law and order problems in the community;
- work closely with Council to put appropriate by-laws in place and help Council make Kowanyama a more peaceful place;
- hear social and justice complaints from the community;
- provide recommendations to government departments on justice matters;
- identify social and justice issues in the community;
- gain recognition from the government and judiciary for the role of the justice group;
- provide avenues for consultation with the community about justice issues by government and the judiciary;
- be fair, just and impartial when carrying out its roles;
- provide advice to the Children's Court and the Department of Family services about juvenile justice matters; and
- provide advice and assistance to the Kowanyama Community Development Officer (Justice) in setting up programs and supervising offenders.

Examination of local crime statistics (1993-1995, 1997) before and after the initiative was fully functional (1994) showed the following comparisons to a pre-initiative crime rate of youth offences of 40-50 per month to 0-3 over the 4, 7 and 8 month periods examined, although the level of evidence for these findings was of poor quality such that other potential influences are unknown.

Kowanyama Police also reported that among adults there was a 68% decrease in assaults and 83% decrease in domestic violence applications, although additional inconsistent results were found for other non-jury crimes (Chantrill, 1998).

Achievements were publically recognised at the local, State and national level, including a 1995 Australian Violence Prevention Award and Certificate of Merit from the Australia Heads of Government, with community engagement, development and involvement in the initiative considered a key feature of its success (Chantrill, 1998).

Leaded petrol restriction, Maningrida NT

Petrol sniffing is a common problem amongst Australian Aboriginal (and other indigenous) populations, causing a variety of neurological abnormalities, including behavioral changes, movement disorders as well as pyramidal signs and convulsions (Brady 1992). Several studies in the 1980s determined that it is the lead additives in petrol that are the major contributor to these outcomes (Goldings & Stewart, 1982; Kaelan et al, 1982; Keenlyside, 1984). These negative health outcomes fall within the broad definition of injury in relation to poisoning.

During 1989, Maningrida, an isolated Aboriginal community in the Arnhem Land region of the Northern Territory, began to use unleaded petrol exclusively in an attempt to reduce lead toxicity impacts among petrol sniffers in their community. This essentially eliminated tetraethyl lead from petrol, the main additive in Australian leaded petrol (Berry et al, 1993). In their evaluation of the program, Burns et al (1996) examined hospitalisation records for 1987-1992 for Maningrida and another Arnhem Land community with only access to leaded petrol. They found that this measure resulted in a significant decrease in

emergency evacuations to hospital and reduced blood lead level poisons in unleaded petrol sniffers relative to leaded petrol sniffers.

As public petrol supplies in Australia are now almost exclusively offer unleaded versus full leaded petrol, this initiative is essentially in place throughout all communities.

Alcohol restrictions, Tennant Creek NT

As with many other towns in the Northern Territory, Tennant Creek has both a significant Indigenous population, as well as substantial problems associated with excessive alcohol consumption (Gray et al, 2000). In March 1996, the Northern Territory Liquor Commission amended the licences of Tennant Creek hotels and takeaway outlets to include several restrictions, with the aim of curbing the town's alcohol-related problems. The restrictions were comprised of the following components:

- Takeaway outlets from hotels and liquor stores to be closed on Thursdays.
- Sales of all wines in casks >2 litres volume prohibited.
- Sales of all wines in casks <2 litres restricted to one transaction per person per day.
- No wine to be sold in glass containers over one litre volume.
- No third party sales to taxi drivers.
- Hotel front bars to be closed on Thursdays.
- Lounge bars not to open before noon on Thursdays and Fridays.
- Lounge bars to make food available.
- On week days other than Thursdays, takeaway sales limited to between noon and 9 pm.
- In front bars, wine only to be sold with substantial meals.
- In front bars, light beer to be the only alcoholic beverage sold between 10am and noon.
- Takeaway sales of fortified wines restricted to containers of <1,125mL.

Two years later, the Commission evaluated the impacts of the restrictions, with the results presented by Gray et al (2000).

The authors found that the restrictions were associated with significant declines in hospital admissions for acute alcohol-related diagnostic related groups and persons taken into police custody. Furthermore, the majority of town residents were found to be in favour of retaining or strengthening the existing restrictions. The authors conclude that while such restrictions do not provide a simple answer to the problems associated with excessive alcohol consumption, they can be an effective part of a broad public health strategy to deal with such problems. On the basis of these findings, the NT Liquor Commission chose to retain the restrictions.

Alcohol restrictions, Fitzroy Valley WA

The town of Fitzroy Crossing is located in the Fitzroy Valley in the Kimberley region of Western Australia. The Fitzroy Valley has a population of approximately 3500 people, of whom the majority are Aboriginal (Kinnane et al, 2009). In response to serious ongoing problems associated with alcohol misuse, on October 2 2007, the Director of Liquor Licensing announced that the sale of packaged liquor exceeding a concentration of ethanol of 2.7% at 20°C was to be prohibited to any person, other than a lodger (as defined in Section 3 of the Act). On 19 May 2008, the Director of Liquor Licensing extended the restriction indefinitely with an annual review to test its ongoing effectiveness.

Kinnane et al (2009) provide an analysis of the health and social impacts of the restrictions in the 12-month period following introduction of the restrictions. Police reported a 23% increase in reported domestic violence for the 12 months post-restriction, but a decrease in the level of severity of resulting harm. The authors explain that the police attributed

increased reporting of domestic violence to witnesses being less intoxicated and more able to make complaints and follow through as credible witnesses in court. This explanation was supported by hospital data that showed a decrease in the number of presentations and the level of severity of injury for people admitted to hospital or attending the emergency department relative to pre-restriction injury data. Furthermore, the Women's refuge recorded a 25% decrease in the number of women seeking support. Hospital staff also reported a 36% reduction in the average number of alcohol-related emergency department presentations and a substantial decrease in unconscious persons being brought to the hospital for treatment.

The authors concluded that while the issue of alcohol restrictions in the Fitzroy Valley continues to be a contentious one for many community members, 12 months after the implementation of the restriction the quantitative and qualitative data revealed considerable health and social benefits for the residents of the Fitzroy Valley, including injury reductions. However, a range of negative social consequences produced by the restrictions were also noted, including an impact on some local businesses who have seen a downturn in business of between 18% and 25% based on people choosing to shop in other towns, in part tied to obtaining full-strength alcohol at these other locations. Nonetheless, the authors state that the majority of residents accepted the need for some form of on-going restriction due to the reduced intoxication, increased safety, positive health gains, increased cultural activities and increased engagement with training and community development achieved.

Community-wide multi-faceted initiatives

Alcohol management plan, Alice Springs NT

The town of Alice Springs has an estimated population of 26,194, with the Indigenous component of this population being 20.4% (ABS, 2009). Alcohol misuse and related negative social impacts are widely acknowledged to be a particular issue in Alice Springs (Senior et al, 2009). In response to this problem, the Alice Springs Alcohol Management Plan was implemented in 2006, aiming to reduce alcohol consumption among town residents. The management plan involved a combination of supply restrictions, education and harm reduction programs. Key restrictions comprised:

- Takeaway alcohol available only on Monday to Friday from 2.00pm-9.00pm, Saturday and public holidays from 10.00am-9.00pm, and on Sundays takeaways attached to pubs and clubs only from 12:00pm-9.00pm.
- In pubs, alcohol with content over 3% must not be sold before 11.30am from Monday to Friday.
- Takeaway sale of all wine products restricted to container size of no larger than one litre for fortified wine and no larger than two litres for other wine products.
- Sale of fortified wine and cask wine for consumption off premises is restricted to one item of either product per person per day and is only permitted to be sold during the last three scheduled trading hours of each day.
- From 1 August 2007 public areas in Alice Springs became off-limits for drinking alcohol.

Senior et al (2009) provided an analysis of the various impacts of the restrictions, finding that alcohol-related hospital separations as a proportion of total separations fell from 16.2% prior to introduction of the plan to under 14.5% in the two years following. Further findings included that while the absolute number of assaults rose between 2003 and 2006, the proportion of assaults classified as serious assaults were relatively stable at around 2.4%. This proportion fell in 2007 after the plan was introduced to 1.7% and stayed at this lower level in 2008. The proportion of total assaults where alcohol was known to be involved rose

by 5% in 2007, but fell again by 5% in 2008. The proportion of assaults in which no alcohol was involved rose by 1% in 2007 and a further 2% in 2008.

The authors note that the 2007 rise in assaults with known involvement of alcohol was offset by a fall of 6% in the proportion of assaults for which alcohol involvement was unknown. This suggests better information on the involvement of alcohol in 2007, but no real change in the proportion of alcohol related assaults. However, the fall in the proportion of alcohol-related assaults in 2008, along with the rise in the proportion of non-alcohol related assaults suggests a real fall in alcohol related assaults.

In their qualitative analysis of the management plan, the authors found that while the alcohol restrictions in Alice Springs seemed to be unpopular and further efforts in this direction were unlikely to be supported by the community, the underlying cause of their discontent was a perception that restrictions have been imposed without adequate consultation. They indicated that there was strong cultural resistance among the non-Indigenous population in Alice Springs to acknowledge that alcohol is a problem that affects both Indigenous and non-Indigenous people in the community, with this perception adversely affecting the non-Indigenous community's willingness to engage in strategies to address the problem of alcohol in the community.

The authors concluded that the current alcohol restrictions should be maintained in their current form and that extensive community consultation, education and social marketing be conducted before implementing any stronger measures. It was further noted that the current set of restrictions provided a good platform for the implementation of broader range of measures associated with the alcohol management plan, to be implemented in wide consultation with the community.

Alcohol management plan, Cape York QLD

In 2002, the Queensland State Government established the *Meeting Challenges, Making Choices* (MCMC) program in response to the Cape York Justice Study into alcohol, substance misuse, and violence in Indigenous Communities (Margolis et al, 2007). Alcohol supply restrictions and enforcement were the alcohol management interventions chosen by the MCMC Committee. A series of Community Justice Groups to function as statutory bodies consisting of Indigenous Elders and others were established in remote Indigenous communities and tasked with developing alcohol management plans for their communities in partnership with government agencies. While these involved a range of components, restrictions on alcohol supply were the main facet (Margolis et al, 2007).

In their paper, Margolis et al (2007) evaluated the impact of these alcohol management plans on the rates of serious injuries in four selected remote Aboriginal and Torres Strait Islander communities in the Cape York region of Australia. Statistical analysis was based on one-sided analysis of variance for repeated measurements over a 10-year evaluation period. Using emergency department retrieval rates as a proxy for alcohol-related violence, the authors found that on average over the four communities there was a significant reduction of 51.9% in injury retrieval rates following the introduction of an alcohol management plan. As such, the authors concluded that the introduction of the plan has brought substantial change of social importance to the lives of the Indigenous people living in these communities, and should therefore be considered in other similar communities.

Multiple injury control strategies, Woorabinda QLD

Woorabinda is 160 km inland from Rockhampton with a population of approximately 1,000 at the time of evaluation (Shannon et al, 2001). In response to the high injury rates in the town, the 'Community-owned injury control strategies in Woorabinda' project was implemented by the University of Queensland, funded by Queensland Health (Shannon et al, 2001). Shannon et al (2001) noted that the community desired action that would help to empower them to take control and improve the wellbeing of the community. As such,

there was significant consultation, or 'yarning' with town residents, prior to the implementation of particular program components, which were not specifically listed in the main evaluation but include alcohol management plans in the form of reduced public bar opening hours, and the use of glass in public bars and other licensed premises. Clapham (2007) cites key objectives as addressing alcohol and violence, particularly including domestic violence, the safety of mothers and children, youth and the environment and identifies the following components:

- rubber flooring in hotels to prevent head injuries from fights and falls;
- improved policing at hotels and in domestic violence incidents; and
- establishment of a men's group and counselling service; and structural solutions such as road speed bumps.

In addition, the National Public Health Partnership's 2004 Aboriginal and Torres Strait Islander safety promotion strategy also includes details of an agreement by a local rugby league team (18-35 year old males) previously banned from the sport for three years due to violence on and off field, to suspend any member reported for family violence, or alcohol and drug use during the competition in exchange for funding through the initiative. They also agreed that "players would reduce violence on field, take an injury prevention attitude to the sport, and contribute to community activities" (p. 12, NPHP, 2004). Following this they reported exemplary behaviour by the team, including helping to clean up broken glass in the community, deemed responsible for the majority of emergency department visits in the community, and helping to install falls prevention surfacing in the local children's playground. They also report that a local publican agreed to provide alcohol in cans or plastic only to reduce the presence of glass in the community.

In their evaluation of the project after two years, Shannon et al (2001) found a 62.4% probability that a shift in the observed series of monthly injury frequencies occurred immediately after the introduction of the program, and a decrease of approximately 30% in the number of injuries occurring per month after the implementation of the program. The authors conclude that effective injury prevention programs can be established by Indigenous communities in a manner consistent with contemporary best practice models of injury control, and that the model should be replicated in other Indigenous communities.

Moreover, Clapham (2007) reports major factors in the success of the program included a high level of community support for harm reduction strategies, a community-owned model for Indigenous injury prevention, and the implementation of an on-going injury information system.

Overall conclusions

Quality and scope of the evaluations

While a range of injury prevention strategies was evaluated, the quality of the evaluations was generally low in terms of ability to rely on the results as effective or to ascertain replicability, however, several were very or most promising. Predominantly descriptive pre-post assessments or pre-post statistical analyses, sometimes compared to a control population, were utilised. That is, no Level A or B quality evaluations such as randomised control trials or other well controlled experimental designs were identified, although these can be challenging due to small dispersed populations (see section 7.8). In general, potential confounders were rarely considered and were unable to be accounted for, and limited information was provided to determine the generalisability of the findings. Many of the interventions were community based, primarily in remote and isolated communities, and it cannot be assumed that what works in one community will be replicable and similarly effective in all Aboriginal and Torres Strait Islander communities, even those within a similar region (e.g., Clapham, 2007; Memmott et al, 2001).

None of the evaluated initiatives demonstrating injury reduction outcomes occurred within NSW and there was a lack of diversity in the range of settings (i.e., urban, suburban, regional, rural and remote), therefore, their applicability to NSW Indigenous populations (or those in other States) is somewhat unknown. However, as generally there was widespread adoption of the initiatives in the study communities, it was anticipated that these could be sufficiently adapted for NSW communities through community consultation and engagement in the initiative development and implementation (see section 7.1).

Most of the evaluations studied only one time period following introduction of the initiative or the initiative changed after the evaluation (e.g., motor vehicle legislation strengthened, Hawkes, 2005; restriction from access to leaded petrol extended via only unleaded access throughout Australia, Burns et al, 1996). Alcohol restrictions that showed benefits in the short term included reduced injury hospital/ED visits immediately after implementation (Shannon et al, 2001), at six months into the initiative (Gray et al, 2000) and at 12 months (Kinnane et al, 2009; Senior et al, 2009), and also reduced assault/domestic violence at 12 months (Chantrill, 1998; Kinnane et al, 2009; Senior et al, 2009).

Those demonstrating success in the long-term included the multiple community strategies to address a range of injuries in Woorabinda (Shannon et al, 2001), which not only showed immediate effects in the month after introduction, but also continued to show declines in injury each month through the two year follow up (Shannon et al, 2001). Alcohol restrictions also showed reduced injury emergency retrievals by the Royal Flying Doctor Service at 3-5 years (Margolis et al, 2008) and the community justice group was associated with reduced youth crime, assaults and domestic violence over a similar period (3-4 years; Chantrill, 1998). The NT Living With Alcohol programs was evaluated on two occasions several years after the program commenced (at 4-5 years and at 10-11 years) both demonstrating reductions in a range of injuries (road traffic injury, assault, suicide, drowning and falls).

A variation to this was the Indigenous community night patrol initiative, which seemed to be sustained over several years (1990-2006) then was reported to have lacked resources and was potentially in decline (Elek, 2007); an issue that is common for Indigenous community-based initiatives (see also 7.1). Nonetheless, it was likely this resulted in several years of sustained injury reductions that would not have been achieved otherwise and recent announcements on the initiative website seem to indicate that coordination of the program was transferred to later formed local government Shires and expanded to include day patrols and youth patrols (Tangentyere Council, 2008a, 2008b).

The limited available information regarding NSW Health Aboriginal injury reduction programs also highlighted the primary role of community engagement in the development of culturally sensitive intervention designs. More detail on these programs and comprehensive evaluation of the injury reduction outcomes of these and future NSW Health programs would assist in identification of best-practice interventions in the NSW context.

Best bets for injury prevention projects

Based on the evaluations identified via the terms of reference, the following represent the best bets for injury prevention projects based on effectiveness:

- Initiatives that will lead to state-wide policy reform on injury prevention issues prominent for Indigenous communities, including:
 - prevention of overcrowding of motor vehicle safety; and
 - increases in alcohol tax reductions or measures to ensure they are not reduced.
- Multi-faceted strategies to address alcohol-related injuries at the State and/or community level.

- Initiatives to engage communities to introduce alcohol restrictions/management plans.
- Initiatives that are sustainable.
- Initiatives that include community engagement and consultation in development and implementation.
- Initiatives that have or can achieve a high level of acceptability and support for harm reduction strategies within the intervention population.
- Initiatives based on community-owned models for injury prevention.
- Initiatives to ensure on-going injury information systems.

Types of Injuries Effectively and Not Effectively Addressed and Contributing Factors

This chapter reviews the findings regarding the second question set of interest:

- What types and causes of injury have successfully been addressed by these strategies?
- What types and causes of injury have not been successfully addressed (or addressed at all) by these strategies?
- What are elements that contribute to success or failure in such strategies?

What types of injuries have been successfully addressed?

Road traffic injuries

A subset of road traffic injuries, namely those among passengers riding in the open load space of utility vehicles appeared to be reduced in the long-term (four years) after introduction of a state-wide policy that only allowed such travel if a rollover cage was fitted to the vehicle (Hawkes, 2005).

Road traffic injuries were also likely to be included among the injuries reduced due to state-wide and community alcohol restrictions and management plans, although unspecified in most studies, but were specifically mentioned as included among fatality reductions in the multi-faceted alcohol reduction initiative Living With Alcohol in the Northern Territory in the 10 year analysis (Chikritzhs et al, 2005).

Assault

Assaults appeared to be reduced via Indigenous community night patrols (Elek, 2007) and formation of a community justice group (Chantrill, 1998) at 3-5 years post-implementation, and were likely to be a key cause of injuries reduced through state-wide and community alcohol restrictions and management plans. Specifically, assaults were significantly reduced due to alcohol restrictions in Tenant Creek at six months (Gray et al, 2000) and domestic violence in particular appeared to reduce in Fitzroy Valley at 12 months following alcohol restrictions (Kinnane et al, 2009). Assaults were specified as among the fatalities reduced in the NT multi-faceted alcohol reduction initiative over a 10 year period (Chikritzhs et al, 2005).

Poisoning

Poisoning due to petrol sniffing was reduced when restricting supplies to leaded petrol only when assessed at three years' post-implementation (Burns et al, 1996) and was specified among the injury-related fatalities reduced in the NT multi-faceted alcohol reduction initiative over the 10 year period studied (Chikritzhs et al, 2005).

Suicide, drowning and falls

No initiative specifically focused on preventing suicide, drowning or falls was identified, however, these could have been included among the injury hospitalisations/ED presentations examined in alcohol-related initiatives, and were specified as causes included in the reduced fatalities found following the 10 year analysis of the NT multi-faceted alcohol reduction initiative (Chikritzhs et al, 2005).

Age and gender

Two initiatives referred to youth as a specific age group as a target for the injury reduction outcomes; namely, the restriction on leaded petrol due to youth representing most sniffers in the community (Burns et al, 1996) and the community justice group initiative that included youth crime prevention as one of several objectives (Chantrill, 1998). The community justice group initiative reported some specific benefits for youth in terms of crime prevention, however, the unleaded petrol initiative evaluation did not examine results specifically by age, but rather reported the age of participants in the intervention community as ranging from 13 to 32 years. The evaluation also restricted participants to males, with males more likely to be sniffers and only one female patient appearing in hospital records in the comparison community (and therefore excluded).

Analysis of hospital admissions as part of the evaluation of alcohol restrictions in Tennant Creek were limited to 18-35 year-olds as these were reported to be "most likely to consume large amounts of alcohol" (p. 40, Gray et al, 2000). While hospital admissions for this age group increased over the four year period studied, alcohol-related hospitalisations significantly decreased as well as admissions of males in this age group.

No study other than that of petrol sniffers specifically targeted or focused on gender, however, following the alcohol restrictions in Fitzroy Valley the local women's refuge reported a 25% reduction in women seeking support and "far fewer" presenting with traumatic injuries at the 12-month follow up (p. 20, Kinnane et al, 2009).

Urban, regional, rural and remote

While the state-wide alcohol initiatives and policy regarding rollover cages on utility vehicles applied to all areas, as use of utilities was reported to be higher in "regional areas" (Hawkes, 2005), the impact of this initiative is therefore likely to have been greater outside of urban centres.

The community-based alcohol restrictions and management plans were mostly introduced in isolated remote communities where effectiveness was less likely to be compromised by close proximity to non-restricted communities where restrictions could be breached. Due to this reason, they are unlikely to be effective in more urban settings unless able to be applied to broader geographical areas encompassing all readily accessible alcohol outlets.

Nonetheless, this highlights an area of great need, that is, research evaluation of programs in urban settings, as the same health disparities apply to urban Indigenous populations and larger populations reside in major cities and towns than in remote communities (Clapham, 2007).

What types and causes of injury have not been successfully addressed?

No published evaluations reporting unsuccessful program outcomes were identified. This is not to say that all program evaluations have shown success, but rather unsuccessful or 'null finding' studies far less commonly appear in public releases, likely in part due to a lack of submissions for publication but possibly also a lack of acceptance for publication. Given the overall poor quality of the evaluations in this field, it is also possible that publishers are unlikely to success such studies as it would be difficult to determine whether there was indeed no effect or if the study design was inadequate to detect differences.

What elements contribute to success or failure?

Authors of the research suggested the following elements contributed to success of the initiative:

- involvement of Indigenous people in developing and implementing initiatives, particularly those resident or with close ties to the intervention community (Chantrill, 1998; Elek, 2007; Shannon et al, 2001);
- supporting restrictions and policy changes with educational information campaigns (Chikritzhs et al, 2005) and alcohol treatment and rehabilitation services (Chikritzhs et al, 2005);
- a high level of support for harm reduction strategies within the intervention population (Clapham, 2007);
- community-owned models for injury prevention (Chantrill, 1998; Clapham, 2007); and
- on-going injury information systems (Clapham, 2007).

While no failures per se were reported, the following concerns were raised regarding the potential for greater success and sustainability of the findings in the long-term:

- under-resourcing (Elek, 2007);
- short time frames for implementation (Senior et al, 2009);
- incomplete implementation of initiatives (Senior et al, 2009);
- short time frames for evaluation (Senior et al, 2009);
- need to address acceptability (Senior et al, 2009);
 - specifically including perceptions government (in the form of liquor licensing boards) was imposing measures *on* communities rather than *with* communities (i.e., alcohol restrictions) (Gray et al, 2000; Kinnane et al, 2009); and
- difficulties accessing quality, relevant data (Senior et al, 2009);

Discussion

The findings of the review of injury prevention initiatives for Aboriginal and Torres Strait Islander people conclude that successful methods have been the introduction of state-wide and community-wide policies (e.g., respectively, open load space rollover protection and restrictions on alcohol quantity/strength), involving Indigenous people in community interventions (e.g., Indigenous community patrols and a community justice group to reduce assaults/crime) and multi-faceted community-based programs (e.g., combined education, limit on alcohol supply and rehabilitation services). The injuries best targeted have been those arising from alcohol, petrol sniffing and road traffic injury.

However, with the exception of community-based alcohol restrictions (predominantly on take way alcohol) these results have been identified in single studies only and therefore their generalisability to other Indigenous communities is largely unknown based on these studies alone. The lack of quality evaluations and focus on injury reduction outcomes only in Australian settings during 1995-2010 presents a limited view of the potential to reduce injury among Indigenous Australians. Further, these limited studies fail to highlight key issues identified in wider research.

A 2004 extensive review of over 300 injury prevention programs for Indigenous Australians found that much was being done but that relatively few initiatives were specifically developed as 'injury prevention programs' and although including 'best practice' elements few were formally evaluated (Clapham, 2004; Moller et al, 2004). While some programs could be seen to target injury directly (night patrols, sobering up shelters, women's shelters and drowning prevention programs), those that included injury prevention or 'safety' as a secondary outcome were many, including (Clapham, 2007):

- cultural programs such as men's and women's camps;
- housing maintenance programs;
- community or school education and awareness programs;
- education resources and web development;
- arts, theatre and music;
- legal, advocacy and counselling approaches;
- family support, including supported plays; and
- broad community development programs encompassing a range of health and social activities and outcomes.

We believe the Reference Group needs to consider lessons learned from such Indigenous health and injury programs when make decisions about the scope of interventions projects that should be funded as part of the NSW implementation plan for the 'Closing the Gap' initiative. Therefore, the following sections summarise general lessons learned from this wider literature, including intermediate measures to injury prevention, also primarily from Australian research, but which included reviews that draw on research in international indigenous settings. Due to the extensive number of references identified, the content here is largely drawn from recently published detailed and/or comprehensive reviews. Research from New South Wales is also highlighted where available.

Indigenous participation and cultural awareness

A key issue in implemented initiatives in Indigenous communities is a failure to consider the cultural appropriateness of the initiative or to involve members of the Indigenous community. Although well intentioned, researchers often do not realise unseen, unstated but very influential hidden community values and intentions. Cajete (2000: 287) cautions that, "Western and native science traditions are very different in terms of the ways in which people come to know, the ways in which knowledge or understanding is shared, how knowledge is transferred from one generation to another, and how knowledge is handled

legally, economically, and spiritually." A recent symposium of Indigenous researchers and communities from Australia, Canada and New Zealand revealed the primary desire of participants was not how to better translate "Western" knowledge and practices into Indigenous settings but instead to secure recognition for existing Indigenous practices and synergise these with "Western" thoughts (Canadian Institutes of Health Research, 2005). Accordingly, research in other health fields has demonstrated that there is more success in terms of health outcomes when Indigenous, culturally relevant health practices are implemented (e.g., a chronic disease screening program for Aboriginal Australians, Weeramanthri et al, 2002; the Kahnawake Schools Diabetes Prevention Project in Canada, Macauley et al, 1997; and the Maori SIDS Prevention project in New Zealand, Tipene-Leach et al, 2000).

The National Health and Medical Research Council of Australia (NHMRC) in particular has specified in their *Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Research* six key values that should be addressed when conducting research with Indigenous populations:

- Spirit and Integrity.
- Reciprocity.
- Respect.
- Equality.
- Survival and Protection.
- Responsibility.

Reciprocity has particularly been an issue of concern with previous research. A lack of returning to present findings and unfulfilled promises of program sustainability has contributed to Indigenous people becoming wary of the motives of researchers (e.g., Aboriginal Child Sexual Assault Taskforce, 2006; Canadian Institutes of Health Research, 2005).

Road safety

A key contributor to road traffic injury among Indigenous Australians is a high level of unlicensed driving, particularly compounded by lack of understanding of and access to licensing procedures in remote and very areas, where Indigenous populations are significant (ABS, 2006). Research has clearly demonstrated associations between unlicensed driving and increased injury risk, including NSW research (Blows et al, 2005; Lam, 2003). A study of underage drivers in crashes reported to NSW police found 84% of the underage drivers were injured or killed in the crash (Lam, 2003). Of note, unlicensed driving and regulatory driving offence also account for the majority of Indigenous people in custody in several Australian states (Clapham et al, 2005; Edmonston et al, 2003).

Indigenous populations experience several barriers to licensing that are far less common among non-Indigenous Australians (Clapham et al, 2008; Edmonston et al, 2003; Somssich, 2009). These include lack of a birth certificate, different names on different identification documents, not having a fixed residential address or not having original documents due to change of residence. Low levels of literacy, lack of self esteem, feelings of intimidation and fear of racism are also common. The high cost of driving lessons and poor access to a roadworthy vehicle or a driver eligible to supervise compulsory practice driving hours for learners (which are particularly high in several states: e.g., 100-120 hours in Queensland, NSW and Victoria), present additional barriers.

Several programs targeting reduce road injury among Indigenous people have therefore focused on increasing access to driver education, training and licensing for remote communities, including a rare urban-based initiative targeting youth to provide access to a vehicle and supervisor for learner practice driving (Clapham et al, 2008). These have demonstrated success in increasing licensure among Indigenous drivers in descriptive

before and after studies (Clapham et al, 2005; Edmonston et al, 2003), however, evaluations have not extended to crash and injury measures (and therefore did not qualify to be included in Table 2). This is in part due to inadequate resourcing, but also as crashes are relatively rare events and therefore adequate evaluations require either very large sample sizes or very long time periods to demonstrate significant reductions; neither of which are plausible among Indigenous populations at present.

Moreover, there are serious shortcomings in data availability to research road safety issues particular to Aboriginal and Torres Strait Islanders. This is particularly due to a lack of inclusion of Indigenous status in routinely collected databases, such as driver licensing records, and use of different definitions when it is applied, increasing the difficulty of cross-agency and cross-jurisdiction comparisons. We recommend recording Indigenous status at the time of licensing rather than at the time of a road traffic offence or crash when there the risk of bias and profiling is heightened. As of 1 January 2010, NSW has become the first jurisdiction to record Indigenous status at the time of licensing, which will allow improved evaluation in the future.

'Best practice', increasingly recognised and applied in Australia at the national and state level (National Road Safety Action Plans 2005-2006, 2007-2008 and 2009-2010 – see ATC, 2009; New South Wales, RTA, 2009; Victoria, VicRoads, 2008; and Western Australia, Corben et al, 2008), is to situation road injury prevention programs with a broader 'Safe System' approach to road safety. The Safe System approach aims to eliminate all road fatalities and serious injuries in the long-term, while reducing these in the short-term via known effective interventions. The focus therefore is injury reduction, rather than crashes per se. The core elements of the Safe System are *safe road users*, *safe roads* and *safe vehicles*, requiring *safe speeds*, as well as *safe management systems*, with initiatives needed in all areas to maximise injury reductions. This requires cooperation between diverse groups such as transport agencies, urban planners, environmental agencies, industry, local government and regional development bodies and police. Programs are unlikely to be effective unless the Indigenous community plays a key role in the development and implementation of strategies and initiatives addressing Indigenous road injury. A model for this role, vital at all levels-national, regional, and local - is provided in the Agreement on Aboriginal and Torres Strait Islander Health, which facilitates joint planning between governments and Indigenous organisations in the area of Indigenous health. Cooperation between governments, sectors, and Indigenous communities will need to be supported by adequate funding for comprehensive road safety strategies and improvements to the road safety workforce.

Suicide

No evaluations of programs specifically targeting suicide prevention or reduction among Aboriginal and Torres Strait Islander people were identified. However, a systematic and comprehensive review among Indigenous communities in Queensland conducted in 1999 revealed that almost all suicides were associated with alcohol or substance misuse, often following interpersonal conflicts, within families with a previous history of suicide and lifestyles of risk, predominantly among young males and predominantly by hanging (Hunter et al, 1999).

The authors also provided a substantial list of recommendations without prioritising or substantiating each point with research but based on their clinical experience. Nonetheless, as suicide represented such a significant proportion of Indigenous fatalities, the leading cause by number, and as the only available review focused on Indigenous Australians, we list these recommendations verbatim here for consideration:

Health promotion and universal prevention—whole of community approaches

- support for community development initiatives, particularly those fostering family wellbeing and an optimal childhood developmental environment;

- culturally appropriate school-based and community organisation-based programs to foster the development of emotional coping skills;
- support for developing a robust evidence base for such interventions including the transfer of the requisite evaluation skills to Indigenous communities and organisations;
- fostering intersectoral cooperation and collaboration such that communities have access to best practice, evidence-based, multidisciplinary programs and expertise;
- support for community to community dialogue and exchange of experiences, knowledge and skills relating to community-level responses to Indigenous self-harm;
- support for appropriate and acceptable health promotion and prevention initiatives aimed at reducing population level alcohol consumption;
- avoidance of negative stereotypes of Indigenous peoples and of Indigenous suicide in the mainstream media; and
- empowering communities through access to information including:
 - collection of accurate, reliable and relevant material at a community level which is available in a timely fashion for service and community planning;
 - collection of accurate information relating to Indigenous suicide at National, State and regional levels, and mechanisms for making this available in a timely manner to health and social workers and researchers engaged in and with Indigenous communities;
 - development of Indigenous expertise at all levels to collect, analyse and utilise the above information with adequate resources and support to sustain these activities; and
 - development of social indicator systems relevant to the area of community risk.

Selective prevention—groups at elevated risk

- facilitating discussion and dissemination of information regarding the potential negative impact of particular constructions of Indigenous suicide through Indigenous organisations and to Aboriginal and Torres Strait Islander communities;
- development and implementation of strategies to influence media reporting and portrayals of violence and self-harm;
- development of a strategy to address and counter current beliefs and understandings which present suicide as a reasonable and normative response to experienced pressures and emotional pain, and understandings which promote the notion that an individual is being encouraged or compelled to take their own life by others who have died in this way;
- support for health promotion and prevention initiatives aimed at Indigenous drinkers to prevent or reduce binge drinking;
- family support programs for those families impacted by lifestyles of risk, particularly those with a cross-generational history of coping problems and high-risk behaviour patterns; and
- statutory and resource support for communities to develop local strategies to address alcohol misuse.

Indicated prevention and early intervention—individuals at elevated risk

- appropriate and adequately resourced community-based crisis response strategies capable of responding to instances of threatened or actual self-harm;
- adequate community-based capacity to respond to the immediate needs of individuals and families affected by a recent suicide;

- support for the development of appropriate approaches to counselling in communities;
- appropriate mainstream support for the above activities; and
- ensuring that primary care practitioners working with Indigenous patients are trained in the primary care management of alcohol-related problems and have the knowledge and skills necessary to manage self-harmful behaviours.

Standard treatments

- direct access for Indigenous Australians to the same range and quality of emergency and mental health services (adult and child) as is available to the wider Australian population;
- ensuring that these services are functionally accessible, that is, appropriately adapted to the cultural needs of Aboriginal and Torres Strait Islander people;
- developing appropriate programs for the effective management of Aboriginal and Torres Strait Islander people with dual diagnoses (coexisting mental health and substance misuse disorders); and
- support for the development of alternative treatment approaches, including appropriated therapies (such as narrative therapy) and Indigenous therapies (Hunter & Garvey, 1998).

Assault

Assault is labelled in many ways, including interpersonal, family and domestic violence, and includes physical, emotional, psychological, social, sexual, verbal and/or economic abuse and assault (Keel, 2004; Memmott et al, 2002). A 2006 review in NSW (Aboriginal Child Sexual Assault Taskforce, 2006) reported that the rate of victimisation for assault, sexual assault and child sexual assault was three times higher for Aboriginal people than the total population and for domestic violence-related assault it was six times higher. Under-reporting found generally was considered to be even greater within Aboriginal communities, especially among women (Keel, 2004), suggesting even these rates were grossly under-estimated (Aboriginal Child Sexual Assault Taskforce, 2006). Earlier estimates by Blagg et al (2000) found that Indigenous women were particularly at risk of assault, reported at 12 times the incidence among non-Indigenous women.

Several factors have been identified as associated with family violence in Indigenous communities (Blagg, 1999; Keel, 2004):

- marginalisation and dispossession;
- loss of land and traditional culture;
- breakdown of community kinship systems and Aboriginal law;
- entrenched poverty;
- racism;
- alcohol and drug misuse;
- the effects of institutionalisation and removal policies and;
- the “redundancy” of the traditional Aboriginal male role and status, compensated for by an aggressive assertion of male rights over women and children.

Especially given this history, Keel (2004) asserts that many Aboriginal women in need of assistance due to violence do not access non-Aboriginal services as they perceive them to have played a role “in the destruction of Indigenous communities, in terms of imprisoning their men, in removing their children, and in alienating them from their lands and communities” (p. 9). Alternatively, she asserts that both Indigenous women and men favour strategies that aim to change the behaviour of violent men while concurrently trying to maintain family and community relationships. Features of such initiatives (Blagg, 2000; Keel, 2004), include interventions that:

- are tailored to meet the needs of specific localities;

- are based on community development principles of empowerment;
- are linked to initiatives on health, alcohol misuse and similar problems in a holistic manner;
- employ local people where feasible;
- respect traditional law and customs where appropriate;
- employ a multidisciplinary approach;
- focus on partnerships between agencies and community groups; and
- add value to existing community structures where possible.

An extensive 2001 review of violence in Indigenous communities found that the majority of published research was based on theory and description and was unsupported by research evaluations (Memmott et al, 2001). The authors called for more sophisticated explanatory and causal models of Indigenous violence and reiterated the need for improved empirical data and increased support, including funding of prevention initiatives. They identified several factors and specific strategies to address violence:

- underlying issues related to the past can be addressed via provision of land, housing, health services, education, employment and processes of empowerment, as well as increasing understanding among non-Indigenous people of the historical dispossession of Aboriginal people;
- situational factors to be addressed proactively at the local level including provision of (with community consultation) women's and children's shelters, sobering up facilities, alcohol awareness and reduction programs, initiatives to foster community discussion of and community-directed solutions to alcohol management, with all requiring sufficient and trained staff, government resourcing and empowering of community councils to be self-governing; and
- precipitating factors to be addressed at the individual level to avoid, minimize or resolve conflict, particularly when violence becomes imminent or prevalent, including counselling and support services for perpetrators and recipients of violence, as well as their relatives and friends.

The 2004 review by Keel (2004) found, while all Australian jurisdictions besides the ACT had a domestic/family violence policy, including some Indigenous specific policies, government and community responses to these were often inadequate. Memmott et al (2001) also highlighted a lack of coordination or fragmentation between State and Commonwealth goals and programs. Notably, many of the recommended measures to address violence as well as other injury prevention measures are included in two existing NSW policies, the *Aboriginal Safety Promotion Strategy* (NSW Health, 2003) and *Two Ways Together Partnerships: A New Way of Doing Business with Aboriginal People* (Aboriginal Affairs NSW, 2003), but these currently do not appear to be adequately implemented or acted upon.

Child sexual abuse

In 2006, the Aboriginal Child Sexual Assault Taskforce conducted an extensive investigation into child sexual assault in Aboriginal communities in NSW, including service provider policies and practices, which also included extensive consultation with Aboriginal communities and literature review. They found child sexual assault to be a key, underlying factor in the high levels of violence, substance misuse, criminally offending behaviour and mental health issues in many Aboriginal communities. Increased incidence of child sexual assault was associated with: substance misuse; social and economic disadvantage; exposure to pornography and a sexualised society; the 'normalisation' of violence or intergenerational cycle of violence; the presence of family violence; unresolved trauma and grief; breakdown of family and community structures; lack of community engagement with the issue; lack of support for community-driven solutions; and inadequate responses from service providers. While females were 2.5 times more likely to

have reported sexual assault, this did not account for unreported incidences, considered to be high.

The review found that under-reporting of sexual abuse is common due to many factors, including: fear, shame and guilt; lack of understanding that what is happening is sexual assault; threats from the perpetrator; pressure from family; confusion about their relationship with the perpetrator; fear of not being believed; actual experiences of not being believed and disclosures not being acted upon; having no-one to tell; and/or not knowing who to tell. They also found participants believed these issues were further compounded for Aboriginal children due to: complex extended family and community networks; geographic isolation; community-wide mistrust of the service system; and poor responses by current service providers.

Similar to road traffic injury, the field also suffered from a lack of valid and reliable data, including: inconsistent recording of Aboriginality; use of different key definitions across NSW agencies; agencies recording data across different time periods; information being lost due to ambiguous categories used to collect data; and therefore inability to make accurate cross agency comparisons.

The Taskforce found no policies specifically addressing child sexual assault existed as the local, NSW statewide or national level, which were urgently required including economic strategies to ensure sustainability. They recommended multi-agency service responses should be effectively coordinated and provided in a holistic way, with increased cultural awareness and understanding, especially of Aboriginal families and communities as interlinked networks, and with a unified framework across agencies, including consistent definitions of child sexual assault and standardised data recording. Effective coordination would require not only champions and advocates at the agencies' highest levels, but also within Aboriginal communities. They recommended that child sexual assault should be addressed concurrently with social and economic disadvantage, and more research was needed to understand the inter-relations with family violence and criminally offending behaviour to also address these in parallel. More research was also needed to develop an effective sex offender treatment program. (Notably the New South Wales Government responded to the report addressing the recommendations, including developing child-specific policy (NSW Government, 2006.)

Alcohol and substance use

It is noteworthy that, while alcohol and substance use have been identified as involved in a higher proportion of injuries for Indigenous Australians than for non-Aboriginal Australians, the prevalence of use is actually lower among Indigenous Australians; rather those that do use are more likely to misuse to harmful levels (Gray et al, 2002). Accordingly, alcohol and substance use was identified as an underlying factor in all of the key injury types identified among Indigenous populations (despite not being a pre-requisite to all injuries). The relationship between alcohol-use and injury in particular is well-established (Borges, Cherpitel et al. 2006) and therefore any initiative to reduce misuse among Indigenous populations is likely to contribute to reductions in injuries, even if injury reduction is not a directly measurable outcome.

For example, in the evaluation of the Fitzroy Valley alcohol restrictions, Kinnane et al (2009) reported substantial benefits to children that may well reduce their risk of injuries although these were not examined. This included: perceived reduction in child neglect and increased attention to child health, including leaving children with grandparents when going out to drink or travelling to purchase alcohol, keeping them away from potential harm. Low birth weight is also associated with high alcohol consumption during pregnancy and Community Health staff reported that they perceived an increase in birth weights, as well as a reduction in children failing to thrive and presentations by alcohol-affected teenagers. Mother and fathers more commonly attend clinics with their children, which was rare prior to the restrictions. Moreover the town is quieter without drunken outbursts every night, so children are gaining more sleep. School attendance has also increased.

Generally parents report now spending more of their income on their children, including school lunches. Given poor education is a key factor of low socioeconomic status (SES), with low SES as well as fatigue having established associations to increased injury risk (particularly road traffic and violence-related injuries; Carskadon, Chen et al, 2009; Cubbin et al, 2000; Pack et al, 1995; Poulos et al, 2007), these intermediate benefits can be seen as important achievements towards injury reductions. This also applies to older community members who also report gaining more sleep and less harassment on the street by drunken individuals.

Improved housing

While no identified evaluation focused on falls nor injuries in the home, it is known that home is a location for a considerable proportion of injuries at all ages and particularly for children, including falls, burns, poisoning and drowning, including in New South Wales (Boufous & Finch, 2005; Chong & Mitchell, 2009; Lam et al, 1999; Marshall et al, 2005; Ozanne-Smith et al, 2001). Poor housing conditions can increase the risk of injury due to causes such as fire, electrical shock, gas leak and falls and other injuries due to poor structure (Clapham, 2008; NSW Health, 2010). Research has shown that making improvements to housing issues that affect health, such as repairs to toilets, washing facilities, electrics and hot water supply, are also associated with reductions in injury (Pholeros et al 1993). A rare urban-based Indigenous initiative, the Blacktown Aboriginal Safety Promotion project, includes increasing awareness of safety in the home among its objectives, conducting audits and providing home safety kits for families (Clapham et al, 2007).

A recent report by NSW Health (2010) reported on a considerable program of improvements to Aboriginal housing conditions and availability across New South Wales. Not only were they able to demonstrate the improvements to health due to this initiative, including reduced hospitalisations (which may well have included injury hospitalisations, but this was not evaluated; Maine & Standen, 2009; NSW Health, 2010), but the program became a "bridge of goodwill" (p. 5, NSW Health, 2010) to attract support projects by other public health units including fire and electrical safety education and general injury prevention programs.

Age, gender and urban populations

It is noteworthy that few programs have been identified that specifically target at-risk groups, which was also found in 2004 (Clapham, 2004; Moller et al, 2004). Most programs identified in the 2004 review targeted communities, families or a range of individuals, but few focused on infants, children, youth or elders, nor people with physical disabilities or mental health concerns (Clapham, 2007). Moreover, most funding for such programs supported rural and remote areas of Western Australia and the Northern Territory, despite similar health profiles and larger populations in major cities, urban and suburban areas (Clapham, 2007). Challenges in urban areas are likely to differ to remote communities, therefore, evaluations of injury prevention initiatives more targeted to urban issues are particularly needed.

This is not to say targeted programs do not exist, but that these have not yet been formally evaluated. For example, the Working Against Youth Suicide (WAYS) initiative in the South Australia Mid-North Health region aims to reduce suicide among young, including via development of school curricula, programs and activities that support the maintenance of positive mental health and enhance individual protective factors among young people (Reynolds & Conroy, 1999). Likewise, Safe Koori Kids, an urban-based program in South West Sydney, targets Aboriginal child and youth injury prevention (Clapham, Khavarpour et al, 2006; Khavarpour et al, 2006). The aims of the project are to: explore the incidence and impact of intentional and unintentional injury on children and youth in South West Sydney; identify factors that contribute to injury; develop and evaluate initiatives in Indigenous communities aimed at increasing resiliency in at risk children, youth and

families; and make recommendations for changes to policy and practice across a range of government portfolios and non-government organisations.

Other targeted programs exist but their main objectives do not specifically focus on injury reduction. For example, the stated aims and objectives of the Jaru Pirrjirdi project in the Northern Territory, an initiative that takes young people out of the remote township and into the bush for outdoor activities, describe the program as “a youth development and leadership project that aims to create strong, empowered, skilled and dedicated young leaders for the community of Yuendumu. It aims to create meaningful and positive futures for young adults aged 17-30 by providing a challenging and progressive framework through which young people can move forward” (p. 1, Yapa-Kurlangu Yimi, 2006). However, the program particularly values achieving reductions in substance use among its participants, which as addressed in section 7.5 above, is likely to result in injury reductions. A newsletter on the program (Yapa-Kurlangu Yimi, 2006) reported that many participants of the program two years earlier were now successfully working in community organisations. Local community ownership of the program was credited as a key factor in its success.

Likewise the Keeping Aboriginal Youth Safe (KAYS) component of the Blacktown Aboriginal Safety Promotion project targets urban youth to provide them with driver education and help them achieve the 120 hours (formerly 50 hours) of supervised driving practice as a learner driver required to obtain a provisional driver licence (Clapham et al, 2007). This can help reduce road traffic injuries due to skill development and reduced likelihood of unlicensed driving. The program commenced in September 2005 and by the end of 2007, 105 youth had enrolled in the driver education program, 45 had completed a ‘stage one’ level of the program, 10 had gained a learner permit and three a provisional licence.

Resourcing and determining effectiveness

The diverse range of injury issues and injury programs in Indigenous populations, together with lack of evaluations and the diversity of Australian Indigenous communities, makes the likely effectiveness of proposed initiatives difficult to ascertain (Clapham, 2007). A common factor in the lack of demonstrated success of Indigenous community programs is a lack of sufficient funding to resource the program in a sustainable way (Clapham, 2007). In addition, there is often a lack of resources to evaluate the initiative to be able to demonstrate effectiveness and therefore be able to use such findings to attract funding in the future. In particular, many initiatives lack process evaluations to determine if all components were implemented or implemented as intended, including whether implementation was culturally appropriate; key issues to determining true success or lack of success (Clapham, 2007).

Key factors that emerged as contributor to successful initiatives in the 2004 extensive review of Indigenous community programs were:

- adequate funding and resources;
- community control and respect for community protocols;
- community acceptability and involvement;
- strong partnerships;
- functioning organisations and good project management;
- skilled and committed personnel; and
- understanding of the underlying factors related to injury.

Factors associated with lack of success were:

- lack of information to set priorities;
- lack of support structures;
- lack of funding, including vertical rather than integrated funding;

- an inadequate skill base;
- distance;
- organisational and family issues; and
- competing interests created by multiple projects operating in one community at the same time.

This last point is of particular note to the Reference Group, which should contribute to decisions made in regard to whether to fund a high number of small projects or fewer large initiatives. Likely there are key issues (particularly those currently lacking effective evaluation) that can be addressed by small contained projects, yet significant impacts on injury are likely from large, multi-faceted initiatives, so a combination of both small and large initiatives is likely to yield the best outcomes of the funding program.

In addition, it is worth noting the need for on-going resources and partnerships. Most programs that demonstrated sustainability, such as the multiple strategy initiative in the Woorabinda community (Shannon et al, 2001), included a government funder and/or partner, and it is likely that on-going federal and state funding commitments will be a key factor in determining success of the funding program.

Previous research has shown that training workshops for Aboriginal health and community workers also have considerable ability to build capacity within Indigenous communities to develop local safety promotion programs (The George Institute for International Health, 2008). A two-day workshop conducted in Bourke NSW resulted in raising the profile of safety in several organisations in Bourke and contributed to increased confidence and capacity such that two safety projects were subsequently implemented successfully (*Safety in the Local Environment and Safety Issues in Vulnerable Groups*). These workshops and projects resulted in increase knowledge and understanding, the development of partnerships and commitment to joint action on local safety issues, as well as important policy development. A key recommendation of this initiative also focused on sustainability via incorporating future programs into the core activities of the community organisations and funding a dedicated project coordinator within one of these organisations.

A further issue is the quality of the evaluation design, that is, as categorised as A through D in the present report. While of the highest research quality, experimental designs such as randomised control studies essentially may not be commensurate with Aboriginal and Torres Strait Islander culture and practices, and there is increasing uneasiness among health professionals, researchers and Indigenous service providers towards these approaches, with qualitative methods, process evaluation and more participatory approaches increasingly deemed as important and valid contributions to the field (Berends & Roberts, 2004; Clapham, 2007; Siggers & Gray, 1998). Therefore there is a role for these in understanding Indigenous-specific injury issues, but in terms of the value of a given program, stronger research methods are still needed to know if a program is truly effective. More innovative approaches are needed to increase the quality of study designs so reliance on findings of effectiveness can be increased, which is a key issue in achieving further success in attracting additional support to adapt and roll out programs identified as effective in one setting or community to other populations. For example, by using routinely collected records, evaluations can be less intrusive methods and evaluations could employ stronger statistical methods, such as interrupted time series analyses.

Conclusions and Recommendations

The above literature highlights additional issues that the Reference Group should consider rather than rely solely on the few studies identified by the rapid review terms of reference. This includes issues that apply in general to intervention research with Indigenous communities but also specific to particular injury types and in particular residential settings (i.e., urban areas).

Based on the additional research discussed in this chapter, additional to the 'best bets' identified earlier, we make the following recommendations to the Reference Group in assessing the suitability of applications for funding:

- Culturally relevant practices should be implemented, requiring strong community consultation. To help assess this, an item could be included in the application process to demonstrate how the research meets the key values of spirit and integrity, reciprocity, respect, equality, survival and protection, and responsibility, for example. Reporting of findings back to the community is especially important.
- Indigenous individuals or groups should be involved in the development and dissemination of the intervention as well as evaluation, where practicable.
- Programs that include community control, respect, acceptability and ownership could be prioritised.
- Programs that include strong partnerships, especially with government, could be prioritised.
- Multi-faceted interventions are more likely to be successful particularly in addressing intentional injuries and therefore could be prioritised, where possible, particularly those that concurrently address:
 - social and economic disadvantage;
 - family violence;
 - criminal offending behaviour; and/or
 - alcohol and substance misuse.
- Programs that target at-risk groups, including by age, gender and particularly including urban/suburban programs could be considered despite a lack of Indigenous-specific successful evaluations due to the immense need.
 - The benefits of such programs could be demonstrated with non-Indigenous at-risk groups, including other indigenous populations, and include a feasibility phase where Indigenous consultation and engagement takes place to adapt the program to the target group.
- Given the higher Indigenous resident population in urban areas and failure to identify adequately evaluated initiatives in this setting, urban injury prevention initiatives could be promoted by the funding scheme and prioritised.
- Projects that target early intervention and/or interim measures that are known to be effective in preventing or reducing injury in the long term could be considered, including:
 - projects that improve the quality of injury data, consistency of definitions and data variables recorded, and access to such data collections;
 - projects that increase understanding of underlying factors related to injury so that intervention initiatives can be better targeted and components prioritised;
 - initiatives to build capacity within Indigenous communities, including training, education and other initiatives that improve the skills base, ensure sufficient numbers and reduced attrition of key personnel;
 - initiatives that can demonstrate and promote effective policy to reduce injury to relevant policymakers or aim to increase compliance with existing effective injury prevention policies;
 - road safety interventions to decrease unlicensed driving and regulatory offences among Indigenous drivers;

- suicide prevention programs that target increased wellbeing for at-risk individuals (potentially at the family, school or community level) particularly those addressing alcohol or substance misuse and/or to ensure Indigenous individuals have direct access to the same range and quality of services available to the wider Australian population;
 - assault, including child sexual assault, interventions to increase reporting;
 - initiatives to reduce alcohol and substance misuse; and
 - initiatives to improve housing conditions that can contribute to injury reductions.
- It is possible also that new evaluations showing success of injury prevention strategies or interventions other than those identified and recommended in this rapid review will become available during the course of the funding scheme. New initiatives may also be proposed based on previous lessons learned but not yet adequately evaluated. If applicants are able to credibly document this support, then those applications are worthy of consideration. Therefore, previous research supporting the feasibility and potential effectiveness of the initiative could be considered as an item to include in the application process.
 - The funding scheme could promote high quality research evaluations to ensure that any outcomes showing effectiveness are reliable; however, a combination of high quality quantitative and supportive qualitative research is likely to yield optimal learning. Application items on methodology could therefore request sufficient details to assess the quality of the research design and the strength of statistical approaches to be employed.
 - Funding distribution could include a combination of high priority smaller projects together with large, multi-faceted initiatives for optimal learning. Applications could include an item on the extent of the problem to help ascertain greatest urgency or need among submissions.

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