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Childhood injury prevention: Strategic directions for coordination in New South Wales

Prepared for the NSW Child Death Review Team by the Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong (December 2016)

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Foreword

The NSW Child Death Review Team has a strong interest in injury prevention. In NSW each year, over 40 percent of deaths of children and young people aged between one and 17 years are injury-related. While most injury does not – thankfully – result in death, the burden of injury is a significant public policy issue. Hospitalisations related to injury are 250 fold higher than for deaths, and the cost to the health system is more than $200 million per annum nationally (Mitchell R, Curtis K, et al: 10 Year Review, University of Sydney 2017).

In 2015, and following impetus built by a state-wide forum on childhood injury prevention, we commissioned the Centre for Health Service Development at the Australian Health Services Research Institute, University of Wollongong to map prevention structures and activities related to childhood mortality and morbidity.

That report – '*A scan of childhood injury and disease prevention infrastructure in NSW*' – was tabled in Parliament in October 2015. The scan confirmed there was a need for stronger leadership and coordination to deliver further improvements in childhood injury and disease prevention in NSW.

The report that follows builds on that earlier work by addressing a number of critical questions about effective approaches to coordination of injury prevention initiatives. Drawing on comparable systems nationally and internationally, as well as expert stakeholder interviews throughout 2016, the report identifies strategic directions for coordination of initiatives in NSW. Key themes are the need for effective policy leadership; strong data and information systems; research and knowledge translation networks; and coalitions, collaborations and partnerships.

The report presents considerable evidence that childhood injury prevention is the responsibility of a number of agencies in NSW, and needs a whole of government response. The recommendation made in the report – that the CDRT refer the report to the NSW Ministry of Health for discussion about the way forward for childhood injury prevention – implicitly acknowledges that NSW Health has been a leading agency in coordination of data and information access and promoting research on childhood injury. The recommendation does not suggest that NSW Health alone should lead NSW in this endeavour. In a response to a draft of this report (see Appendix 7), the Secretary for NSW Health has noted the need for coordinated work across government and non-government stakeholders. I appreciate the Secretary's view that NSW Health will have an important contribution to make to this work.

I commend this report to all government and non-government agencies with an interest in preventing childhood injury. It should encourage discussion - and I trust action - from policy makers to respond positively to the need for effective coordination and collaboration in this critical area.

Finally, I wish to thank the authors – Kathleen Clapham, Cristina Thompson and Darcy Morris – for their thorough and insightful analysis.

Professor John McMillan AO
Convenor, Child Death Review Team
Acting NSW Ombudsman

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List of abbreviations / acronyms

ABS	Australian Bureau of Statistics
ACYP	Advocate for Children and Young People (NSW)
AIHW	Australian Institute of Health and Welfare
ARC	Australian Research Council
CDC	Centers for Disease Control (US)
CDR	Child Death Review
CDRT	Child Death Review Team
CHeReL	Centre for Health Record Linkage
CChIPS	Center for Child Injury Prevention Studies (Canada)
CHOP	Children's Hospital of Philadelphia
CIHR	Canadian Institutes for Health Research
CIRP	Center for Injury Research and Policy (Canada)
CSAP	Child Safety Action Plan
ECSA	European Child Safety Alliance
ED	Emergency Department
ICCWA	Injury Control Council of Western Australia
MUARC	Monash University Accident Research Centre
NeuRA	Neuroscience Research Australia
NGO	Non-Government Organisation
NHMRC	National Health and Medical Research Council
NISU	National Injury Surveillance Unit
QISU	Queensland Injury Surveillance Unit
TACTICS	Tools to Address Childhood Trauma, Injury and Children's Safety
VISU	Victorian Injury Surveillance Unit
WHO	World Health Organisation

Executive summary

This report has been commissioned by the Office of the NSW Ombudsman on behalf of the NSW Child Death Review Team (CDRT). The scale and impact of childhood injury within Australia is significant. The extent of childhood injury in NSW was outlined in a report recently released by the Bureau of Health Information (2016) detailing the utilisation and experiences of children and young people in NSW hospitals. It found the leading causes of Emergency Department (ED) visits among the 0-17 year age group in 2014-15 were injury, poisoning and other external causes (32 percent of all visits).

A scan of childhood injury and disease prevention infrastructure in NSW was completed in 2015 (Phase one). The scan confirmed that there is a need for stronger leadership and coordination to deliver further improvements in childhood injury and disease prevention in NSW. This report explores strategic options for coordination in childhood injury prevention (Phase two of this project).

The findings are a synthesis of issues identified through a rapid review of the literature and a series of expert stakeholder interviews. The literature review specifically focused on coordination mechanisms used within Australia and in several other countries where examples of advances in childhood injury prevention efforts were evident. This literature review was supplemented by a focused stakeholder consultation. Stakeholders were predominantly located across Australia but included several representatives from other countries perceived as leaders in the coordination of childhood injury prevention.

The key components of a coordinated approach to childhood injury prevention include:

- Policy leadership
- Data and information systems
- Research and knowledge translation networks
- Coalitions, collaborations and partnerships

In many countries, leadership and coordination along with sustained infrastructure support have resulted in significant gains in combatting injury. The level of policy leadership in childhood injury prevention varies across Australian states and territories with injury prevention considered a shared responsibility between all jurisdictions. Ultimately as preventing unintentional injuries cuts across the responsibility of a number of government departments, one department must take the lead and coordinate activities to ensure that effort is not duplicated or, worse still, not undertaken. The Centers for Disease Control in the United States (US) and the non-government organisation, Parachute Canada, provide two examples of policy leadership in childhood injury prevention in these respective countries.

Effective childhood injury prevention efforts must be data driven and evidence based. Strengthening surveillance systems, particularly through the more effective use of existing datasets has been successfully demonstrated internationally. Within Australia, the International Classification of Diseases (ICD) is adopted nationally for admitted patient care. In most Emergency Department (ED) systems the only mandatory code to capture will be the principal

diagnosis. Injury data items such as cause of injury, location and type of injury are included in the national minimum data set and it is possible to collect these if the ED has the capacity to capture multiple ICD codes. However these items are not mandatory, and it appears Western Australia and Victoria are the only two states currently collecting them as part of their ED minimum data set. The former NSW Kids and Families provided a funding grant in 2015 for a stocktake of existing population-based data collections that are capable of providing information on injury mortality or morbidity in NSW involving children and young people aged ≤25 years. This provides a valuable resource for planning future improvements in childhood injury surveillance in NSW. The unique access that the NSW CDRT has to data and information through the Death Review System presents an opportunity for enhanced analysis and reporting by the Team through appropriate data linkage. Swedish population registries and the Welsh Secure Anonymised Information Linkage (SAIL) initiative provide useful international examples of how effective coordination of data and the use of data linkage can inform research, policy and practice.

The most effective strategies to support research coordination centre on clear government priorities based on existing evidence and supported by adequate funding and mechanisms to facilitate research dissemination and translation. Networks and collaboratives are useful in bringing researchers together. There is merit in enhancing effective research networks to support greater collaboration in the advancement and translation of knowledge in childhood injury prevention. Lessons can also be learned from the research coordination efforts of the Center for Child Injury Prevention Studies (CChIPS), Children's Hospital of Philadelphia (CHOP) Research Institute and closer to home from the Monash University Accident Research Centre (MUARC).

The very broad range of stakeholders involved in action to prevent injury to children makes coalitions, collaborations and partnerships an essential component of the way most organisations and individuals work in this field. Coalitions can extend from data collection to research to implementation partnerships, formal partnerships, informal linking with other organisations and broad networks. The European Child Safety Alliance provides a comprehensive example of what can be achieved in childhood injury prevention through an international alliance. Within Australia examples of coordinated coalitions include the Australian Injury Prevention Network and the NSW Paediatric Injury Prevention and Management Research Reference Group (which arose from the NSW Paediatric Injury Prevention and Management Research Forum).

A number of significant barriers exist to establishing coordination of injury prevention at a national, state and territory level including:

- Injury is a complex category: with multiple mechanisms, causes, contributing factors.
- Lack of clear and consistent leadership from government
- Funding challenges
- Data availability and access
- Working in silos
- Research challenges

- Community attitudes.

The NSW Child Death Review Teams can contribute to an improved understanding of childhood injury prevention. The number of serious injuries experienced by children each year is far greater than the annual number of child deaths. The burden of childhood injury is significant as are the social and economic consequences.

The legislative remit prescribes the role of the CDRT in NSW, for example a focus on 0-17 year olds. The CDRT is in a unique position to integrate the insights it gains from the review of child deaths (particularly for vulnerable populations) to inform understanding of both intentional and unintentional childhood injury prevention priorities and vulnerable groups. Incorporating projects that study the broader population of serious injury will enhance the CDRT capacity to identify factors and trends that lead to deaths in a small subset of such children. While it is not suggested that the CDRT take the lead agency role in NSW for childhood injury prevention there is a lost opportunity by not widening the brief of the team to include serious injury and fostering greater collaboration with injury researchers and practitioners. Such a decision would also be dependent on available resources.

The report concludes with a discussion of the implications of these findings for NSW. However decisions about what is feasible at a state level cannot be made without the input of appropriate representatives of government.

The key strategic observations are listed below; these provide a common starting point for future discussions:

- Strong partnerships amongst key stakeholders and robust inter-agency and cross-organisational relationships provide the foundation for effective coordination.
- Coordination of childhood injury prevention is complex and not achieved through a single initiative but through action on multiple fronts (for example leadership resulting in clear policy direction, robust data from effective surveillance systems used to underpin evidence-based approaches, support for high quality research and knowledge translation and collaborative mechanisms to bring people together that are funded, supported and sustained over time).
- There is no magic bullet that generates policy leadership; this comes from political will and is articulated by committed policy officers through strategic frameworks and plans that identify priorities for action and set the agenda for change. As preventing unintentional injuries cuts across the responsibility of a number of government departments, one department must take the lead and coordinate activities to ensure that effort is not duplicated or, worse still, not undertaken.
- Effective child injury prevention efforts must be data driven and evidence based. Strengthening surveillance systems, particularly through the more effective use of existing datasets has been successfully demonstrated internationally as has the use of state or national “action indicators” to monitor progress in childhood injury prevention efforts. There are opportunities to increase the use of data linkage to better target injury prevention interventions for the most vulnerable populations. The NSW Ministry of Health

is already leading the way in the coordination of data and information access on injuries involving children and young people.

- The most effective strategies to support research coordination centre on clear government priorities supported by adequate funding and mechanisms to facilitate research dissemination and translation. Networks and collaboratives are useful in bringing researchers together.
- There need to be clear mechanisms to bring people together that are funded, supported and sustained over time. The Australian Injury Prevention Network and the NSW Paediatric Injury Prevention and Management Research Reference Group provide examples of mechanisms to foster research collaborations.
- The CDRT has a unique insight into factors that might mitigate serious injury through its annual review of child deaths in NSW. Child death review findings, supplemented by projects addressing the broader childhood population with serious injury, can and do inform prevention strategies. There is scope for the CDRT to strengthen their involvement in childhood injury prevention; what form that takes will be guided by the views of the CDRT and its legislative remit.

It is recommended that this report be referred to the NSW Ministry of Health for initial discussion with the CDRT, about the way forward for childhood injury prevention.

1 Introduction

The NSW Child Death Review Team (CDRT) is established under Part 5A of the *Community Services (Complaints, Reviews and Monitoring) Act 1993.* The purpose of the Team is to prevent and reduce the deaths of children in NSW.

The CDRT has been associated with the Office of the NSW Ombudsman since 2011. The NSW Ombudsman is the Convenor of the Team, and Ombudsman staff provide administration and support to the Team, including research and reviews.

Legislation requires the Team to:

a. Maintain a register of child deaths in NSW;

b. Classify deaths in the register according to cause, demographic criteria and other relevant factors, and to identify trends and patterns in relation to those deaths;

c. Undertake research that aims to help prevent or reduce the likelihood of child deaths, and to identify areas requiring further research; and

d. Make recommendations as to legislation, policies, practices and services for implementation by government and non-government agencies and the community to prevent or reduce the likelihood of child deaths.

1.1 Background

The CDRT has an interest in childhood injury prevention in the context of its work to help prevent or reduce the likelihood of child deaths. In 2012, the (former) NSW Commission for Children and Young People released a scoping paper on childhood injury in NSW. The paper made one finding, that:

> *…with the exception of child death, which is only one outcome of injury there are currently no structures, policy settings and/or agreed approaches to prevent childhood injury in NSW.*

In 2015, the NSW Ombudsman on behalf of the CDRT commissioned the Centre for Health Service Development (University of Wollongong) to undertake a scan of childhood injury and disease prevention infrastructure in NSW. This was a first step in considering options for bolstering childhood injury and disease prevention activities in the state. The scan confirmed that there is a need for stronger leadership and coordination to deliver further improvements in childhood injury and disease prevention in NSW.

As an initial scan, the report (Thompson et al 2015) did not intend to capture all initiatives and activities in the childhood injury prevention field. It provided a useful foundation to assist the CDRT and injury prevention advocates in the ongoing debate about how to deliver further improvements to the safety and wellbeing of children.

A key finding of the report identified the unique position of the CDRT (through its responsibility to review the death of every child in NSW) to investigate whether a more coordinated approach to childhood injury and disease prevention in NSW is required.

The report recommended that a broader study would allow several important questions to be answered:

1. What can be learned from international best practice in coordinating and leading an integrated approach to childhood injury and disease prevention?
2. How do other states and territories manage childhood injury and disease prevention?
3. Can consensus be achieved on the key priorities and corresponding actions necessary to strengthen coordinated action for the diverse activity that exists within the childhood injury and disease prevention field?
4. What scope is there for implementing the recommendations arising from the NSW Paediatric Injury Prevention and Management Research Forum of August 2014?
5. How are vulnerable populations and communities most effectively engaged in injury and disease prevention?
6. How does the work of the CDRT relate to and support childhood injury prevention efforts in NSW?

This 'second stage' project aimed to address questions **1, 2, 3 and 6**, specifically in relation to coordination of childhood injury prevention.

1.2 Scale and impact of childhood injury

In a recent systematic review, Mytton et al (2012) note "unintentional child injuries are now a major cause of death and disability across the world".

In 2008, the seminal publication *World Report on Child Injury Prevention* provided a clear picture of the state of childhood injury from an international perspective. It found that, globally, injury is a significant cause of death and morbidity among children from the age of one, and increases to become the leading cause of death among children aged 10 to 19 years. The World Health Organization estimated that, in 2004, around 830,000 children under the age of 18 years died as a result of an unintentional injury. In addition to these fatal deaths, tens of millions more children sustain injuries that are serious enough to require hospital treatment and sometimes result in disability (WHO and UNICEF 2008).

More recently, the *Global Burden of Disease 2013 Study* examined levels and trends in the fatal and nonfatal burden of diseases and injuries among children and adolescents between 1990 and 2013 in 188 countries. The leading causes of death among children and adolescents in 2013 fell into four main categories: neonatal, congenital, infectious diseases, and injuries. Road injuries were the leading cause of death among adolescents globally (Global Burden of Disease Pediatrics Collaboration et al 2016).

In Australia, over 130,000 children and young people (aged 0 to 24 years) were hospitalised as a result of an injury in 2011–12, with boys outnumbering girls by 2 to 1. Large variation in patterns and rates of injury in childhood by age group and developmental stage were also noted (AIHW: Pointer 2014). National reports identify the main causes of fatal burden (the burden from dying 'prematurely' as measured by years of life lost) among children and

adolescents aged 1–14 were injuries, cancer and infant and congenital conditions. Among young adults (aged 15–24), injuries were the main cause of fatal burden, with cancer second, at a much lower proportion. The largest disease groups in terms of disability-adjusted life years in the younger age groups (from childhood into working age) were mental and substance use disorders and injuries (AIHW 2016). Childhood injury costs Australia an estimated 1.5 billion dollars annually (Richards and Leeds 2012).

Injury has been recognised as a significant health issue for Aboriginal and Torres Strait Islander people of all ages with much higher rates of injury for specific causes than other Australians. National reports (AIHW: Pointer 2016) advise that there were 18,537 Indigenous children and young people (0 to 24 years) hospitalised due to injury and poisoning in the two-year period examined (2011-12 to 2012-13). Falls were the most common specific cause of injury (24 percent) and the leading cause of hospitalisation for Indigenous people aged 15-24 years was assault. It was found that rates of injury among Indigenous children and young people generally increased with increasing remoteness of usual residence (AIHW: Pointer 2016).

The extent of childhood injury in NSW was outlined in a report recently released by the Bureau of Health Information (2016) detailing the utilisation and experiences of children and young people in NSW hospitals. It found the leading causes of ED visits among the 0-17 year age group in 2014-15 were injury, poisoning and other external causes (32 percent of all visits). Further, from 1 July 2009 to 30 June 2010, more than 23,000 children and young people (aged 0-17 years) in NSW were hospitalised as a result of an injury. The most commonly reported cause of hospitalised injury was falls (39 percent of cases), and these often involved playground equipment. Transport injuries were also common (14 percent) (AIHW 2012).

1.3 Project scope

The NSW CDRT commissioned this second phase of the project to identify strategic options for coordination of childhood injury prevention in NSW.

The study focuses on children aged 0-17 years and predominantly unintentional injury. It considers three key areas:

- Research coordination – are there opportunities to coordinate research on childhood injury prevention, and who should lead that?
- Data coordination – are there opportunities to link and analyse relevant data sets to inform childhood injury prevention initiatives, and who should lead that?
- Stakeholder initiatives – are there opportunities for organisations with a role in childhood injury prevention to coordinate activities and messages?

1.4 Report structure

This report draws on the evidence collected and identifies opportunities for change in NSW with the potential to lead to improved coordination of efforts to reduce childhood injury across the state.

This report comprises three sections:

- **Section 1** outlines the background to the project and scope of work.

- **Section 2** briefly details the project methodology.
- **Section 3** summarises the major findings from the literature review and key stakeholder consultation about the key components of a coordinated approach to childhood injury prevention, with examples of effective practice, barriers to change and the implications for NSW. The contribution of child death review teams in childhood injury prevention is discussed. The section concludes with a recommendation for further consideration.

Extensive supplementary information is included in the Appendices arising from the literature review and consultation process. This information provides the evidence for the major findings and recommendation.

In this report, direct quotes are presented in italics and indented; quotes from interview participants are in a blue typeface to distinguish them from quotes from other sources (black typeface).

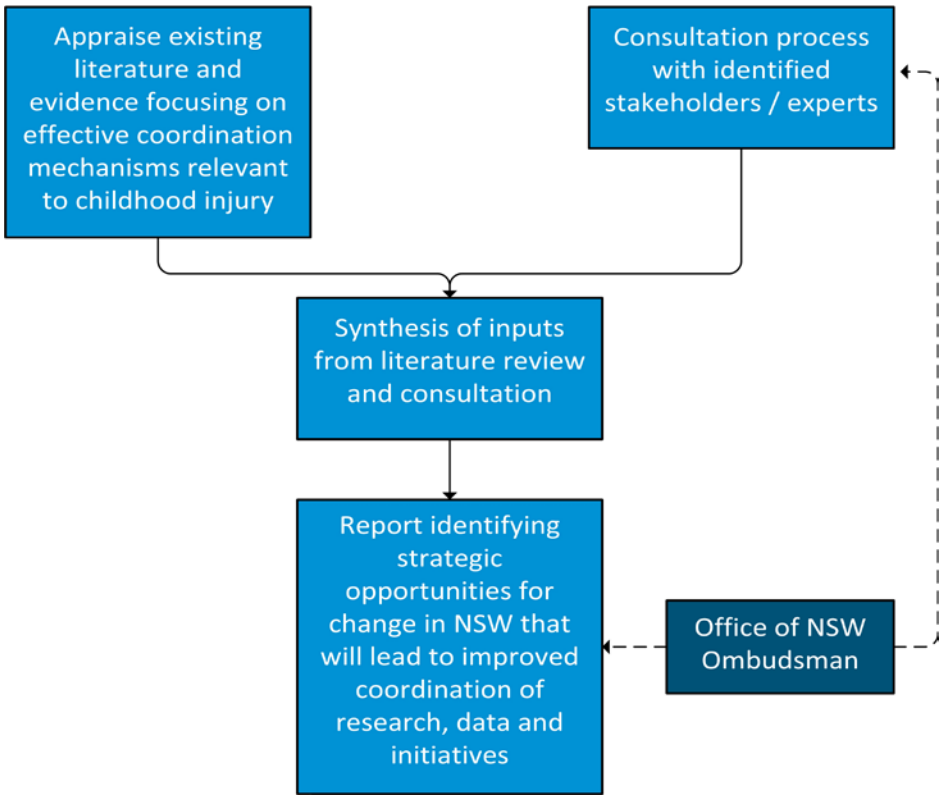
2 Methods

The research design comprised the following core components:

- **A targeted review of practice and academic literature** focused on effective coordination mechanisms relevant to childhood injury prevention within Australia and in selected international locations. A narrative review was completed that aimed to objectively report what is broadly known about the topic by retrieving and synthesising relevant information; and generating an overview of the topic to provide context and place the information into perspective.
- **Semi-structured interviews** with 28 key stakeholders predominantly located across Australia but including representatives from other countries perceived as leaders in the childhood injury prevention field. These interviews were completed by telephone or face to face meetings and explored stakeholders' views about approaches to childhood injury prevention coordination and factors influencing their sustainability.
- **A final report** drawn from the evidence that identified strategic opportunities that may support improved coordination of research, data and initiatives in NSW.

A diagrammatic representation of the project methods is provided below in Figure 1. An ethics application was submitted to the University of Wollongong/Illawarra Shoalhaven Local Health District Human Research Ethics Committee and approval for the research proposal was received on 10 May 2016. A detailed description of the methods is provided in Appendix 1 and Appendix 2 is comprised of the interview guidelines.

Figure 1 Methods and sequence of research activities



3 Key components of a coordinated approach to childhood injury prevention

This section of the report presents findings from the synthesis of information sourced through the literature review and consultation process (supporting evidence is included in Appendices 3 and 4). The key components discussed below were consistently identified as essential for a coordinated approach to childhood injury prevention. Rarely did one country, state or province demonstrate success in all areas, however exemplary approaches were identified for each component with several examples of these included to illustrate effective coordination strategies.

The key components of a coordinated approach to childhood injury prevention include:

1. Policy leadership
2. Data and information systems
3. Research and knowledge translation networks and,
4. Coalitions, collaborations and partnerships.

3.1 Policy leadership

In many countries, leadership and coordination along with sustained infrastructure support have resulted in significant gains in combatting injury (Yanchar et al 2012).

The international state of childhood injury prevention and control was described in detail in the seminal publication *World Report on Child Injury Prevention* (WHO 2008). The main messages from the report were:

- Child injuries are a major public health issue
- Injuries directly affect child survival
- Children are more susceptible to injuries
- Child injuries can be prevented
- The cost of doing nothing is unacceptable
- Few countries have good data on child injuries
- Research on child injuries is too limited
- There are too few practitioners in child injury prevention
- Child injury is the responsibility of many sectors
- Child injury prevention is underfunded
- Awareness needs to be created and maintained.

International experience has identified three structural measures that are instrumental to reducing child deaths and serious injuries:

- Clear leadership nationally and locally – as preventing unintentional injuries cuts across the responsibility of a number of government departments, one department must take the lead

and coordinate activities to ensure that effort is not duplicated or, worse still, not undertaken.

- Coordination of activities between agencies and departments again at national and local levels.
- Improved communication and partnership working between all the parties who can make a difference to the safety of children and young people (Children in Wales 2008, p.4).

The level of policy leadership in childhood injury prevention varies across Australian states and territories with injury prevention considered a shared responsibility between all jurisdictions. The federal Department of Health has a leading role however a range of other government departments also contribute to child injury prevention in accordance with their departmental focus. The complexity of injury can pose challenges in determining which agency should take the lead on injury prevention and how various departments contribute in a coordinated way at federal, state and local government levels. The importance of childhood injury prevention warrants it being addressed across agencies in a cohesive and sustained way.

A "whole of government" approach is one mechanism that supports coordinated efforts to address complex or "wicked problems" at the national level. A "whole of government" approach is defined as follows:

> *Whole of government denotes public service agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues. Approaches can be formal and informal. They can focus on policy development, program management and service delivery (Management Advisory Committee 2004).*

Whole of government initiatives can result from formal "top-down" decisions requiring a cross-portfolio approach, alternatively, many initiatives begin at the local level where people from different agencies work together to achieve shared goals for one community. A multi-agency Child Injury Prevention Implementation Group could function at a national or state level and report progress on implementation of agreed strategies to appropriate Ministers.

There is currently no nationally coordinated approach to childhood injury prevention within Australia. While there are several national strategies and frameworks that address specific aspects of childhood injury the expiry of the National Injury Prevention and Safety Promotion Plan (2004 – 2014) and the failure to properly resource the National Aboriginal and Torres Strait Islander Safety Promotion Strategy (2004) has reduced the visibility of childhood injury issues at the national level.

To achieve large gains in child safety, Harvey and colleagues (2009) emphasise that childhood injury prevention needs to be integrated into mainstream child and adolescent health initiatives and broader child and adolescent health promotion strategies. The countries that have achieved the greatest gains have implemented a combination of multisectoral strategies to reduce the risk of new injuries occurring, to reduce the severity of injuries that do occur, and to reduce the frequency and severity of injury-related disability. There are valuable lessons to be learned from other areas about implementing successful multisectoral interventions,

generating political will, addressing human resource constraints, adapting effective interventions and improving data that must be shared and compared with similar lessons learned in the context of child injury prevention (Harvey et al 2009). There are also arguments that injury needs to be integrated into other agendas, for example, incorporating childhood injury prevention within the agenda of non-communicable diseases (Krug 2015) or through greater collaboration and coordination between the environmental and health sectors to address childhood injury prevention (Stone and Morris 2010).

Throughout Australia, state and territory governments take primary responsibility in this area. State governments develop policy on injury prevention and strategic frameworks or plans, with several identifying childhood injury as a priory area in these respective plans. Specific government departments or units, usually health departments, frequently take a key role, however other departments are also often involved (for example departments of education, transport, those focused on children and families, or sport and recreation), reflecting the breadth of issues injury prevention covers and demonstrating the inter-sectoral nature required of an adequate response to address injury prevention. Arguably one government department should be responsible for injury (Pless 2009). Although this does not always have to be the health department (e.g. the Accident Compensation Corporation takes this role in New Zealand), a coordination and "oversight" role by health is necessary as other ministries lack the overview capacity of the health ministry, and hence the capacity to coordinate action. Non-Government Organisations (NGOs) often take a primary role in injury prevention, including not only advocacy but active contributions to policy development, for example Parachute Canada (Parachute 2015) and the Royal Society for the Prevention of Accidents in the UK (ROSPA 2016a, 2016b). Governments can make the work of these NGOs easier by providing them with more generous funding and by creating a focus for child safety in a national centre (Pless 2009).

Policy leadership is clearly needed in Australia. As noted in the scan of childhood injury and prevention infrastructure in NSW provided to the NSW Parliament (Thompson et al 2015), and as advocated by the Public Health Association of Australia (2013), new national injury prevention plans should be developed, implemented and resourced. From both the Australian and international experience, the critical role of Ministries of Health is clear. Several presentations at a European meeting of government experts on injury prevention and safety promotion discuss the importance of this role for infrastructure and capacity building for effective injury prevention (European Commission 2012). The potential role of Ministries of Health in injury prevention is described by Rogmans (2008) as 'catalytic; coordinating; leadership, and; facilitator'. The varied roles of a lead agency are described as follows:

- Continuous monitoring
- Priority setting / targets
- Identifying appropriate policies / actions
- Partnership development
- Building capacity for injury prevention
- Developing supportive tools
- National publicity and targeted communications
- Keeping abreast of new developments

- Quantifying impact vs consumption of resources (Rogmans 2008).

The commitment of top political leaders has been found to be critical to ensuring establishment of injury as a priority issue within government policy and the allocation of requisite resources (MacKay and Vincenten 2012). Government plays an important role "in facilitating coordination and communication of prevention efforts and dissemination of information on effective evidence-based strategies to ensure that stakeholders at all levels are well informed" (MacKay and Vincenten 2012, p.70). Conversely, Rothman et al (2016) found that common barriers to enacting child and youth related injury prevention were competing policy priorities and insufficient managerial / political support / will. The issue of other public health problems shifting the priority, and consequently resources, away from injury prevention and control has previously been reported in the literature (for example, see Rivara 2002).

Legislation is one of the most effective methods for injury control (Macpherson et al 2015). For instance, when comparing injury prevention policies of different states in the US, it appears that states with a greater policy presence regarding injury prevention had lower rates of death from injury, and counties located in strong policy states had lower rates of death from injury than counties in moderate or weak policy states (Kaufman and Wiebe 2016). Advocacy is also required to strengthen community support for legislation based on good research evidence (Macpherson 2015).

Higher traction occurs when: child injury is identified as a national priority issue; there are "current" strategic plans and frameworks that specify objectives and actions to reduce child injury; these plans and frameworks align with broader state plans / strategies relating to child health; and there is corresponding infrastructure, resources and capacity underpinning child injury prevention efforts (MacKay and Vincenten 2012).

There needs to be a clear point of leadership at the national and state or territory level for childhood injury prevention. Irrespective of which government entity provides the leadership they will need to work collaboratively with a range of other departments e.g. health, transport, social services, education etc. The evidence arising from the literature review and stakeholder consultation suggest that this role most commonly falls to the health department, and may occur through a designated position(s); outsourcing to a large NGO or a formal partnership or inter-agency agreement to provide a "whole of government" response. The facilitating role must operate within the government policy framework and requires sustained resourcing, which might be acquired through contributions from multiple departments / agencies.

3.1.1 Stakeholder views

An important change which has had a widespread impact on those working as researchers or practitioners in the injury prevention field, has been a shift in recent years in where childhood injury prevention sits within governments' policy agendas. The section below presents the views of stakeholders on changes in the health and transport government portfolio areas and their implications.

An important trend in health policy environments, at both national and state and territory levels, is the shift to evidence-based approaches and a more strategic role for government. In

the past state and territory governments were far more operational; injury prevention, for example, was previously one of a number of health promotion programs run and directed by government. The shift in recent years to a more strategic role for government has led to different arrangements being put in place from state to state and this has varied from localities where injury prevention and other health promotion programs have been outsourced to the non-government sector, to localities where injury prevention and public health programs more broadly were not prioritised by government and received relatively little support.

One of the most important developments in road safety policy, impacting on child and youth safety, is the increasing importance of serious injury and developing a particular focus on novice drivers. Road safety measures have had an enormous impact over many decades in reducing road deaths, including child deaths. In NSW some of the key policy changes identified by stakeholders have been around the increasing focus on child restraints, child seats and tightening up of the graduated licensing scheme.

However, according to some stakeholders, the progress which Australia has made in reducing road fatalities has not transferred to reducing serious road injury, and there is a plateauing in the reductions in fatalities of young drivers, which is evident in the international comparisons for rates of serious injury:

> *We've dropped down to sixteenth place out of twenty-seventh in the latest comparison that was done, so being in the top five down to sixteenth place, we're not doing so well and actually when you look at children and child injuries, that's one of the groups where we're not performing so well with.*

Within NSW, there is an opportunity for injury prevention to be incorporated within a broader health and policy agenda, which includes a focus on vulnerable groups, including lower socioeconomic groups and Aboriginal children. There are prospects for linkages between related areas of policy such as intentional self-harm, mental health and adolescent health.

Those working outside of government identified the importance of aligning their work with current policy, for example, by finding a "policy hook" on which to hang a particular issue or interest:

> *Look at your current policy framework and where it makes more sense for you to try to have this particular strategy parked, so it might be a standalone piece of work, or you might be integrating it into existing policy hooks, if you will, policy areas where action is going to happen, where you think it makes most sense to place it.*

This usually involves 'reframing' the injury issue, or looking at it through another lens, to better fit the current policy thinking. This was the approach taken in Europe where child injury gained more funding and attention by aligning with an environmental health approach to public health.

Resourcing is essential to keep childhood injury prevention projects going, to keep people focused and to provide momentum for ongoing work. As one stakeholder put it:

> *Nothing brings everybody together like money.*

The ideal model for many stakeholders is having a central agency that provides specific funding for applied policy or practice and collaborative injury prevention projects, such as that provided by the Queensland Injury Prevention Council prior to its demise in 2012-13. Funding strategies included the provision of small and large project grants, funding dedicated injury prevention positions in research environments, and funding to bring people together to work on specific topics.

Other stakeholders supported the idea of improved intergovernmental links and pooled funding arrangements that help to avoid the silos that develop "when funding is doled out to in-governments... (as) they don't like to share it or coordinate or do things". Partnerships with research agencies were also regarded as important to assist with evaluation and monitoring, although this needs to be "one step removed from government". A good strategy from one jurisdiction was the decision made by government some time ago to invest the royalties from mining and state lotteries towards health-related activities. A Road Trauma Trust Account in Western Australia (WA) reinvests money from speeding fines and tickets into a trust account which can be distributed to prevention programs.

It was recognised that it is not straightforward to have an agreed lead agency or lead group across all areas of childhood injury prevention, in the way that the state road agency accepts the lead in the area of child passenger safety. At a more operational level, strategies for coordination include government providing funding for regional centres to help establish leadership. In the absence of health promotion agencies, one way of providing coordination is by having a paid coordinator. This was an important strategy for the Safe Communities model trial which occurred in NSW over a decade ago:

> *So the Department of Health and the [former] Roads and Traffic Authority sponsored three coordinators in these three trial communities, so they jointly both put in money to, and they funded the evaluation of it. But I think it was a two or three year program and, of course, it's not long enough to show outcomes.*

Another strategy for coordination and leadership is to involve public health which often plays a coordinating role and brings people together, setting the agenda and keeping communication open, rather than being the agency which delivers services. Having a good understanding of local stakeholders and being able to deal with local rivalries is also important so that people do not feel excluded, overlooked or being used. An important part of any of these strategies around leadership and coordination is to ensure that there is a long term vision and support to allow programs to develop and flourish.

Strategies around planning include: having a funded action plan; having injury prevention on the health agenda; undertaking an initial environmental scan; and prioritising.

Having a plan is an essential initial strategy:

> *What would be most effective is having a coordinated plan, having a state-based strategy with a funded action plan, with funding behind it and with some kind of committee structure that includes NGOs and then a funded research strategy that*

goes alongside the action plan. So, really coordinate. But it does require planning – strategies and action plans and funding – significant funding put into those.

However the plan on its own is clearly insufficient for coordination. The frustration of many working in the injury field over the past decade is the lack of national leadership or carriage of the national injury plans at any level of government:

Unless you have senior buy-in from the government then what you're doing is falling on deaf ears and it may not necessarily come to anything, so I think having injury prevention on the health agenda is really important, and I get the sense that it's fallen off the health agenda.

Although the scope of childhood injury prevention across all injury types can be very great, some stakeholders emphasised the importance of setting priorities for action and balancing priority versus the ability to be able to do anything worthwhile, to really make a difference. Coming up with an initial list of priority areas is a good starting point. To be effective, it is also important to ensure that child injury is tackled using multiple strategies which support each other, for example, legislation, policy, regulation, education, awareness and behaviour change.

Several countries, for example Israel and the United States, have developed a Child Safety Action Plan. The processes and strategies involved in achieving that plan included identifying key jurisdictional stakeholders, bringing them together, identifying gaps and looking at how they might move forward to address those gaps. Another important initial strategy was undertaking an environmental scan to see what is already in place.

Stakeholders were able to identify a range of strategies to improve policy leadership. However, while there is scope to do more in the space of child injury prevention from a health perspective, there is still little clarity or certainty about the coordination and leadership of the childhood injury prevention area in NSW.

3.1.2 Barriers

Within the semi-structured interviews with key informants it became evident that a number of significant barriers exist to establishing coordination of childhood injury prevention. Two particular barriers were identified that are relevant to policy leadership.

3.1.2.1 Complexity of injury

There is an ongoing difficulty about who should take the lead on injury prevention in general, as it is seen as an issue that needs to be shared across agencies in terms of responsibilities, yet one agency needs to take the lead. It was noted that there could be a single coordinator who helps identify the priorities and determine who the appropriate agency to lead that is. Because of this, injury prevention generally is seen to have "fallen through the cracks."

Injury is further seen to be fragmented as there are so many different types of injury, and the approach to childhood injury differs by mechanism. This makes it difficult to generalise and it is also what makes injury prevention more complex to coordinate. There is also a very sharp division between those working in the areas of intentional versus non-intentional injuries,

although many of the risk factors are similar. There are few opportunities for sharing of insights and working more collaboratively in the development of more effective strategies.

3.1.2.2 Lack of leadership and government related challenges

Governance structures are one of the main barriers to both coordinated approaches and implementation. Stakeholders expressed concern about the lack of a national commitment to injury prevention, with no centralised agency with injury as their responsibility and therefore no driving force to look at injury prevention for all of Australia.

With the devolution of the National Injury Prevention Plans to the states and territories (refer to Section 3.1), there has been a considerable confusion amongst those working in injury prevention across Australia about best how to move forward and advance the field. A variety of models and approaches currently exist across government agencies in the states and territories, but there are rarely clear policy frameworks or clear strategies to direct action:

> *Some disappeared altogether and it's actually very difficult to find out who within a Department of Health at State level is responsible for injury prevention overall, let alone kids. Some devolved to Chid Youth Death Teams in different States and Territories, so it is actually quite a confused picture and I wouldn't be able to tell you where in each State and Territory responsibility for child injury prevention lies.*

Stakeholders frequently mentioned the need for government to develop strategies to advance injury prevention efforts. However it was noted that the impetus for coordination or leadership from state government levels seems to wax and wane, resulting in an attitude of, "here we go again" because this limits their ability to make the sort of inroads into injury prevention they believe possible. In some states, notably Queensland, a strong informal network of agencies collaborating and working together on common goals (the Consumer Product Injury Research Advisory Group) has operated following the dissolution of the central policy agency (the Queensland Injury Prevention Council).

In the absence of government leadership it is difficult for injury stakeholders to collaborate and catalyse meaningful change to an extent which could make a big difference. A lack of communication and understanding between organisations operating at the state level and organisation on a local level is also a limiting factor.

There was a perception expressed by many stakeholders that frequent changes in policy personnel in key government departments, and the limited number of personnel with a background knowledge in injury prevention, has made it difficult for those working outside of government in research, health service or program delivery, to either align themselves or influence current policy thinking.

There is an issue of fragmented efforts from different agencies, each of which has their own interests in particular types of injury, rather than a coordinated approach that looks at the major child injury issues and has a structured agenda to move forward. The fact that each issue within the space of injury has a different set of stakeholders was frequently mentioned.

There was a broad agreement amongst those interviewed that unless injury policy or research is actually integrated into practice, it is of limited value. The complexity of implementation, for child injury prevention, needs to be acknowledged in the processes that are required for that to be enacted.

3.1.3 Implications for NSW

Within NSW there is no one government department that has responsibility for the coordination of childhood injury prevention efforts state-wide. There are however a range of state government departments and offices that have a significant interest in injury prevention and safety promotion including NSW Health, Department of Family and Community Services, Department of Education, NSW Police Force, Sport and Recreation, Transport for NSW (particularly the Centre for Road Safety), NSW State Emergency Service, Fire and Rescue NSW, WorkCover NSW, the Department of Fair Trading, the Office of the Advocate for Children and Young People and the Office of the NSW Ombudsman.

Historically within NSW policy leadership in childhood injury prevention has come from NSW Health. There are a wide range of frameworks and policies that address childhood injury prevention that are relevant in NSW (Thompson et al 2015), particularly the state-wide strategic health plan, *Healthy, Safe and Well: A Strategic Health Plan for Children, Young People and Families 2014-24.* This plan directly references child injury in one of its five strategic directions, 'Addressing risk and harm'. The *NSW Strategic Plan for Children and Young People 2016 – 2019* (NSW Advocate for Children and Young People, 2016) references safety and wellbeing of children and young people as key objectives for the NSW Government.

In the 2014/2015 reporting year, from 1 November NSW Kids and Families was dissolved with a transfer of functions to a new Office of Kids and Families within the Ministry of Health (as reported in the *NSW Health Annual Report 2014-15*, p. 10). There are several other components of the Ministry that also have significant expertise to contribute to injury prevention policy development.

However, while there is scope to do more in the space of injury prevention from a health perspective, there is still little clarity or certainty about the coordination and leadership of the child injury prevention area.

Example of effective policy leadership – Centers for Disease Control and Prevention (United States)

The leading national public health institute of the United States is the Centers for Disease Control and Prevention (CDC), a federal agency under the Department of Health and Human Services. Specifically, within the CDC, the National Center for Injury Prevention and Control (NCIPC) takes a lead role in childhood injury prevention. In 1986, Congress passed the Injury Prevention Act and in 1992 funded the NCIPC, which works with other federal agencies and funds research for injury prevention.

In 2012, the NCIPC's Division of Unintentional Injury Prevention, in consultation with over 60 partners, developed the *National Action Plan for Child Injury Prevention* (NAP). The goal of the NAP is to guide actions fundamental to reducing the burden of childhood injuries in the US as well as providing a national platform for organising and implementing child injury prevention activities in the future. The NAP provides a strategic framework for action including:

> *…Strengthening the collection and interpretation of data and surveillance, promoting research, enhancing communications, improving education and training, advancing health systems and health care and strengthening policy. Elements of the plan can inform actions by cause of injury and be used by government agencies, non-governmental organizations, the private sector, not-for-profit organizations, health care providers, and others to facilitate, support, and advance child injury prevention efforts (Centers for Disease Control and Prevention 2012).*

The *National Action Plan for Child Injury Prevention* is based on a public health approach and structured across six domains: data and surveillance, research, communication, education and training, health systems and health care and policy. Each domain has several goals and supporting actions. Examples are provided from the three domains most relevant to this report: data and surveillance, research and health care policy. Systematic surveillance is essential for accurate needs assessment and effective priority setting. The plan calls for improved data standardisation to facilitate comparisons across geography and time; improved access to data and information for those designing and implementing interventions and greater use of linked data systems (including police, hospital and ED data), to improve treatment decisions (Centers for Disease Control and Prevention 2012, p.11).

The plan also argues for additional research that is foundational, evaluative and translational with better coordination of research efforts identified as a means of minimising waste and maximising return. Research that reduces risk for vulnerable populations is supported. Examples of actions include:

> *…creating a national child injury research agenda, developing a national clearinghouse of child injury research, identifying key indicators related to child injury disparity, and increasing the number of child injury researchers through injury research training grants (Centers for Disease Control and Prevention 2012, p.11).*

The NAP states that it "informs policy makers about the value of adopting and implementing evidence-based policies". There is a systems-based or population-based approach to policy

which is seen as "an effective tool for governments and nongovernmental organizations to change systems with the goal of improving child safety". A range of actions are recommended to support effective policy development and the capacity of states to implement "policy-oriented solutions that reduce childhood injuries". The successful implementation of the plan is reliant on: "bold actions, effective leadership and strong partnerships" (Centers for Disease Control and Prevention 2012, p.13).

The CDC also has a leadership and coordination role in addressing child abuse and neglect (Whitaker et al 2005). Similarly, the CDC also has a primary role in violence prevention (Hammond et al 2006).

Example of effective policy leadership –Parachute (Canada)

A major development in terms of leadership and coordination in Canada was the establishment of the NGO Parachute in July 2012. This national charity serves as an umbrella organisation for child and youth injury prevention.

Parachute was established by merging four former national injury prevention charities / NGOs (Safe Communities Canada, Safe Kids Canada, SMARTRISK and ThinkFirst Canada). The entity was formed based on recommendations by the Injury Alliance Collaborative Study Project to take a leadership role in injury prevention research and a knowledge broker role for injury in Canada, as well as increasing engagement of stakeholders and funding for initiatives (Groff 2010). The Public Health Agency of Canada is among their many sponsors and contributors. Parachute is now a strong leader in injury prevention, with a member network of 6,000 organisations, communities and individuals (Parachute 2015).

Parachute works with all levels of government as well as families and communities in childhood injury prevention. The organisation is actively engaged in dialogue on public policy to make injury prevention a Canadian priority and has developed a public policy toolkit to support development, implementation and evaluation of public policy in Canada. Parachute provides leadership and has clear priorities and coordinates a wide range of programs across Canada to reduce injury risks.

In 2010, the Canadian Injury Indicators Development Team brought together injury researchers, policy makers, and practitioners to develop injury indicators in the following areas:

> *…overall health services implications, motor vehicle occupant, sports, recreation, and leisure, violence, and trauma care, quality, and outcomes (Pike et al 2010, p.154).*

Using a modified-Delphi approach, the team ultimately developed a set of 34 child and youth injury-related indicators to reflect and monitor identified prevention priorities to be used for injury surveillance in Canada (Pike et al 2010).

Building on this work, in 2016 Parachute launched the *Canadian Atlas of Child and Youth Injury Prevention* which provides access to injury information and data based on ten national child and youth injury indicators. The Atlas comprises a visual Injury Data Dashboard, Injury Research

Insights and the Injury Data Online Tool, iDOT©, which provides the intentional and unintentional causes of death for Canadians aged 0-19 for the years 2006-2011. The Dashboard and iDOT are both based on several existing datasets: mortality data from Statistics Canada (CANSIM), hospitalisation data from the Canadian Institute of Health Information (CIHI), drowning data from the Lifesaving Society, and transportation data from each province / territory (Parachute 2016a). It presents a set of indicators comparable across institutions and organisations to monitor injury. Canadian child safety report cards are being developed to inform Canadians about current injury prevention practices in each province in relation to sports-related injuries, water-related injuries, motor vehicle collisions and falls. These child safety report cards will enable international comparisons with reports produced by the European Child Safety Alliance (CIHR Team in Child & Youth Injury Prevention 2016).

Parachute has developed Horizon as a dynamic online knowledge exchange hub that provides "reliable solutions" for researchers, policy makers, practitioners and communities. These include evidence-based tools, access to data about child injury in Canada, a child injury prevention education course, and a series of "how-to" videos. Parachute Canada is active in knowledge translation and regularly issues injury prevention reports and resources. A recent example is the report *Unintentional Injury Trends for Canadian Children* which highlights the burden of injury on Canadian children aged 0-14 using mortality and hospitalisation data (Parachute 2016b).

3.2 Data and information systems

Effective child injury prevention efforts must be data driven and evidence based. Strengthening surveillance systems, particularly through the more effective use of existing datasets (such as trauma and ED information systems) has been successfully demonstrated internationally.

Injury surveillance refers to ongoing, systematic collection, analysis and interpretation of relevant injury data, and its critical role in effective injury control has long been recognised (Vimpani 1989). However, at an international level, lack of data and ineffective use of information has been seen to contribute to a weak global response to childhood injury (Alonge and Hyder 2014). Data collection needs to align with national and international recommendations (for example, the Australian National Data Standards for Injury Surveillance and WHO's core minimum data set for injury surveillance) in relation to data items required to achieve quality surveillance data. At a local level, Towner and colleagues (1998) argue that support for the development of local data initiatives is essential and advisory groups are needed to develop data systems where data of sufficient detail and quality are collected to identify injury mechanisms and to monitor trends over time. They also report that good local data on childhood injury can help to stimulate injury prevention and tailor it to local circumstances. A recent Canadian study by Rothman et al (2016) found a key enabler to enacting child and youth related injury prevention included the availability of surveillance and research.

State or national "action indicators" used to monitor progress in childhood injury prevention efforts have been widely adopted in other countries. It has been argued that injury indicators allow for a more accurate idea of needs in relation to injury prevention and policy, however, there are no perfect indicators (Lyons et al 2005). MacKay and colleagues (2010) advocate the use of "action indicators" in injury prevention, to inform decision-makers, prioritise funding and measure progress. These indicators signal the effectiveness of injury prevention systems (policies, practices, research) and justify and direct the appropriate allocation of resources. They refer to measures of the components of the system that affect the prevalence of risk factors, as opposed to measures of incidence or outcome (deaths and hospitalisations) that are usually measured through surveillance systems or routinely collected data. The authors provide a framework for the appropriate use of action indicators and the European Child Safety Alliance (ECSA) Child Safety Action Plan (CSAP) project provides an example of the process of selecting and operationalising these indicators. New Zealand has investigated the application of standardised assessment of injury prevention performance through using the ECSA Child Safety Report Card methodology which may also be applied to Australia to determine the current national status of child injury prevention (Bland et al 2011).

Within Australia the level of coordination of childhood injury data varies between states and territories. Key agencies in the field are the National injury Surveillance Unit (a collaborating unit of the AIHW, located within the Research Centre for Injury Studies at Flinders University, South Australia), the Victorian Injury Surveillance Unit (VISU) and the Queensland Injury Surveillance Unit (QISU). Injury data items such as intent, external cause, location and major injury are included in the national minimum data set and it is possible to collect these using additional existing ICD codes. However these items are not mandatory; Western Australia and

Victoria are examples of two states currently collecting them as part of their ED minimum data set.

The Victorian Injury Surveillance Unit (VISU) is funded on a three-year cycle by the Victorian Department of Health and Human Services. VISU holds three data sources – hospital admissions, ED presentations and deaths. In addition to producing regular research outputs such as eBulletins, VISU runs a data request service which is available to industry, local government or the public. VISU analyses, interprets and disseminates data on injury deaths, hospital admissions and ED presentations in the state of Victoria. VISU also works closely with Kidsafe and the director of VISU is traditionally on the Board of Kidsafe. This provides a model of working from the data source to analysis and research to implementation of findings.

The work of the Queensland Injury Surveillance Unit (QISU), funded by Queensland Health, provides another example of coordination of childhood injury data at a state level. Detailed injury data is currently collected by QISU from 15 Queensland hospitals. Funded by Queensland Health, QISU has been has been collecting injury surveillance data from participating hospital EDs across Queensland since 1988. It uses this data to inform public discussion, research, policy development, legislative change and coronial inquiries at state, national and international levels and to advocate for change.

For prevention activities based on the data to be appropriate and effective, evaluation of the quality of injury surveillance data is also needed (Horan and Mallonee 2003). This point is supported by a recent study in Queensland (Watson et al 2015) in which a significant level of under-reporting of road crash injuries to police was found. Such results have implications for road safety research and policy including prioritisation of funding and resources; targeting interventions and estimating the burden of road crash injury.

Data linkage is another key area with potential to improve injury surveillance (Mitchell et al 2008, 2014, 2015). There are disparate data collections currently used for injury surveillance by each government agency with very little collaboration occurring and it appears that no single data collection can provide detailed information for optimal injury surveillance across the injury continuum or across the injury spectrum (Mitchell et al 2014). This increases the importance of data linkage. A recent national project acknowledged significant recent investment in data linkage infrastructure in Australia but found that the financial and administrative burden on researchers related to the process makes national record linkage studies unviable (Mitchell et al 2015). To increase viability of national data linkage research (including injury-related research), the authors state that application and Human Research and Ethics Committee approval processes need to be streamlined and duplication removed.

There are opportunities to increase the use of data linkage to better target injury prevention interventions for the most vulnerable populations. However this needs to be done in a collaborative way with organisations that are grounded in the community so there is an ongoing connection between the data and information about injury and how this information can be used to develop more effective solutions.

The importance of using existing information systems to contribute to injury surveillance, particularly in data linkage, is clear (Horan and Mallonee 2003, Mitchell et al 2008, 2014). A

cross-country comparison of victimisation-related injury admission in children and adolescents in England and Western Australia demonstrated how routinely available hospital administrative data was used to develop an injury-related measure (in this instance victimisation-related injury) to facilitate regional comparisons of injury incidence (Gonzalez-Izquierdo et al 2013).

The Office of the NSW Ombudsman has previously conducted a stocktake of childhood injury prevention datasets (Thompson et al 2015). A large number of data sources for childhood injury is available in NSW and the potential to link data and use information from data collections to support injury prevention efforts has been demonstrated.

The former NSW Kids and Families provided a single funding grant in 2015 for a stocktake of existing population-based data collections that are capable of providing information on injury mortality or morbidity in NSW involving children and young people aged ≤25 years (Mitchell and Testa 2015). This provides a valuable resource for planning future improvements in childhood injury surveillance in NSW.

3.2.1 Stakeholder views

Three main trends in the use of data for childhood injury prevention were identified from the stakeholder interviews: the increasing focus on large datasets and data linkage; the importance of surveillance including national injury surveillance; and trends in reporting on road injury.

Across the injury field generally, as in other areas of health research, there has been an increasing interest in large databases (including administrative data) and data linkage has become much more feasible.

There has been a particular trend towards large projects funded by several partners, such as the Victorian road safety projects led by the Monash University Accident Research Centre (MUARC). From the stakeholder interviews it appears that there has been little specific focus on linked data for the purposes of child injury prevention in Australia, with perhaps the exception of young driver safety.

In NSW, the Centre for Road Safety has good data on fatalities and serious injuries on the roads, and the core data reports have information on 0 to 18 year olds and relevant risk factors. The Centre for Road Safety has developed a number of large data linkage projects, having negotiated access through various Human Research Ethics Committees.

Stakeholders consistently raised the importance of surveillance in childhood injury prevention. Various surveillance strategies were discussed including the use of routine administrative datasets as well as the advantages of integrating injury surveillance units with research institutes:

> *I definitely think that should be part of an academic institution. It's a pretty central sort of unit because, on the one hand, you've got the - working with the department, working with the original data custodians, and at the department, as well, and we work with a whole range of stakeholders from consumer organisations, local governments and, so, that's a pretty central role.*

Strategies to support effective surveillance of childhood injury include improving the collection of ED data specific to childhood injury, through providing more detail in the coded data and ensuring data items relevant to injury surveillance are included as part of the national minimum data set:

> *A priority for action is ideally having a more systematic way that we can know what's going on in terms of child injury presentations to emergency departments, this would be incredibly valuable, but that's a long project over a long length of time to get something like that up and running but getting some ground work towards that would be good.*

Some researchers were supplementing injury questions in hospital data by analysing free text narrative but this was very time consuming.

Another issue identified by stakeholders was about improving the timeliness and quality of hospital data reporting. There is a long lead time between the collection and release of national data which reduces the ability of governments, organisations, practitioners and researchers to respond effectively.

Data linkage was perceived as an important strategy in enabling a targeted focus for childhood injury prevention on vulnerable or at risk families. The WA Health Department is conducting a comprehensive study on the costs of injury in the state using data linkage. Opportunities to link child data to support injury prevention efforts in NSW are occurring through the Centre for Health Record Linkage (CHeReL). One stakeholder reported that the NSW Ministry of Health through the Centre for Epidemiology and Evidence has amended legislation to facilitate ethical approval for analysis and reporting of linked data:

> *Actually having something that's really solidly focused on a more detailed child injury type report and linking together relevant datasets would be really useful and then they could potentially house those linked datasets so that researchers could request access to these more specific academic type studies on whatever areas of interest we have.*

Other issues that emerged were the importance of consistent data definitions and items; quality and completeness of the data; and collection processes across states and territories to facilitate comparisons. For example, Indigenous status is not always collected in the health and transport systems. Datasets that are not of high quality will restrict opportunities for data linkage. The AIHW was seen as a data linkage authority, and because of its direct association with NISU (who have a track record of producing high quality publications), they are well positioned in combination to develop annual national child injury reports. While information is reported on the "headline indicators" for children and youth, there needs to be a more detailed child injury report linking together relevant datasets. These linked datasets could be accessible to researchers where appropriate.

Stakeholders strongly supported improved sharing of data and saw open access data policies as an effective strategy:

> *…that's where it comes into, those opportunities certainly fall within being able to access health data, transport data, primarily, but the ability to have true data linkage and data sharing and the processes, whereby the data custodians maintain the needed rigour in maintaining the data security, I guess, but still making it available.*

There were some international examples of where this was working well despite the tensions that have been observed between data custodians and researchers.

Several stakeholders expressed the view that the CDRT may be well placed to take a coordinating role in data collation:

> *I think the CDRT is really well placed to take this coordinating role because – firstly they have the potential to – well, for fatalities – how do you say it? They have a legal framework with which to collect the data and if they could extend that to injury and in the same way – and I think they're perfectly positioned also because they're outside of any of the other organisations.*

3.2.2 Barriers

There are many specific concerns around how to achieve better injury data and surveillance to support childhood injury prevention. There are barriers such as the difficulty in getting new variables on data within existing systems. Gaining access to data was an important issue across all stakeholder groups, and some of the key barriers to access include data security and concerns about privacy. While confidentiality within data is recognised as a legitimate issue, it was also expressed that some data custodians are overly "territorial" about access to data without due acknowledgment to the greater good in being able to access it.

There is a sense that there needs to be bureaucratic ownership of data, both to identify where the need is as well as to help identify effectiveness. There is a concern that it can take a long time to access data, especially when data is held by different government departments and the right person needs to be identified or the right permissions need to be granted to access it.

The challenges to data linkage include the very long timeframes for gaining permission and to link national data. There are also issues with linking police data with hospital data because not all information is always recorded in either dataset which makes it hard to rely on the data available. It was also reported that properly linking data is highly technical and requires specialists which are often hard to find. Data linkage was identified as one of the key areas in which ongoing capacity building is needed. It was also noted that data can be analysed and recommendations made by whoever requested it, but what happens with the information to actually form that into action is an uncertainty. An organisation to oversee the whole process from data collection, analysis right through to implementation, is seen as advantageous.

3.2.3 Implications for NSW

The NSW Ministry of Health has a range of initiatives in train to improve the quality and availability of data and information relevant to childhood injury prevention. It supported the development of the Kids and Families Data Warehouse. This is a secure and integrated system for approximately 23 community health data collections with the aim of streamlining reporting

and improving monitoring and evaluation. The data warehouse is still in the early stages of development (NSW Health, Office of Kids and Families 2016b).

The Bureau of Health Information provides independent reports about the performance of the NSW public healthcare system. Included in their range of reports are publications relevant to childhood injury prevention. For instance, a recent report (Bureau of Health Information 2016) examines how children and young people use and experience health services in NSW, finding injury, poisoning and other external causes to be the leading causes of ED visits among the 0-17 year age group in 2014-15.

The capacity for using information from existing state data collections to support injury prevention efforts has also been demonstrated in another recent study, with specific reference to the NSW Public Health Real-time Emergency Department Surveillance System data and road safety (Mitchell and Bambach 2015).

Another key organisation in NSW that can contribute data to support childhood injury prevention is the Centre for Health Record Linkage (CHeReL), which links multiple sources of data and maintains a record linkage system that protects privacy. One example of a childhood injury prevention project using data linked by CHeReL is the “Drive Study”, which examined risk factors for young driver injury (Ivers et al 2006). There is potential for CHeReL to be utilised further in terms of childhood injury prevention data collection and collation, it is already used for Centre for Road Safety studies. The establishment of national and state-based data linkage centres in Australia has greatly advanced capacity for injury research (Mitchell et al 2014). There is considerable expertise within NSW in the use of data linkage to support childhood injury prevention efforts.

Previous reference has been made to the former NSW Kids and Families single funding grant provided in 2015 for a stocktake of existing population-based data collections that record information on injuries involving children and young people in NSW. This project identified and described three mortality-specific and 13 morbidity and / or mortality population-based data collections that are able to provide information on injuries involving children and young people in NSW (Mitchell and Testa 2015).

None of the data collections examined in the NSW Kids and Families funded stocktake were ideal to conduct injury surveillance of children and young people in NSW. Each data collection had both strengths and weaknesses across the 12 characteristics reviewed. There was particular variation in their ability to be used to conduct timely data analysis and information dissemination, in their use of uniform classification systems for key data variables, and in access to data in the collection for potential data users. The stocktake may inform future discussion about childhood injury surveillance and has also provided information that could assist in the development of a suite of performance monitoring measures to monitor childhood injury reduction strategies in NSW (Injury Reference Group 2016).

Two additional data collections are listed below:

- Secure Analytics for Population Health Research and Intelligence (SAPHaRI) is the NSW Ministry of Health population health data warehouse, analysis and reporting system, administered by the Centre for Epidemiology and Evidence, NSW Ministry of Health.
- The Study of Environment on Aboriginal Resilience and Child Health (SEARCH) is Australia's largest long-term study of the health and wellbeing of urban Aboriginal Children, and has a NSW-focus.

Finally, the unique access that the CDRT has to data and information through the Death Review System presents an opportunity for enhanced analysis and reporting through appropriate data linkage.

Example of coordination of data and information systems – Swedish Initiative for Research on Microdata in the Social and Medical Sciences (SIMSAM)

Sweden is a prime example of a nation that has had success in childhood injury prevention. In 2001, UNICEF reported the Swedish childhood injury mortality rate had been among the lowest recorded internationally for a number of years. Similarly, De Leon et al (2007) also report that child injury fatality rates in Sweden are among the lowest in the world. This is illustrated by the significant reduction in child injury mortality over time, and the progress in Sweden. Child injury mortality decreased from 13.0 deaths per 100,000 in 1966–1981 to 5.2 in 1982–2001 (Jansson et al 2006). Nonetheless, disparities in injury risks to younger Swedes have been identified, with children in lower socio-economic status families having higher risks of injuries leading to hospitalisation (Nyberg et al 2012). More recent literature also indicates that, internationally, incidents of child injuries and child mortality in Sweden remain low today (Carlsson et al 2016).

Bergman and Rivara (1991, p.69) explain the factors that account for Sweden's success, which include Swedish social features and a sustained and extended injury prevention campaign.

> *…contributing societal characteristics are a small, relatively homogeneous, health conscious, law-abiding population that values children. Key factors in the campaign have been support of trauma surveillance systems and injury prevention research, ensuring safer environments and products through legislation and regulation, and a broad-based safety education campaign using coalitions of existing groups.*

Another distinguishing feature of Sweden's approach has been the priority accorded to establishing comprehensive population based registries. Sweden has invested over many years in collecting data for various disease and population groups with over 90 registries in place. In 2008 the Swedish Research Council launched the research initiative "Swedish Initiative for Research on Microdata in the Social and Medical Sciences" (SIMSAM) – which includes individual level data in registers and databases. Research on childhood and its influence on lifelong health and welfare is facilitated by individual-level longitudinal data from the cradle to the grave and data on the family and other social contexts that the person is part of during different periods of life. The Umea SIMSAM Lab data resource covers the entire Swedish population during the period 1960 to 2010 (Lindgren et al 2016).

These data provide rich sources for researchers to analyse issues pertinent to childhood injury prevention. For example data was used from the Swedish population registry of cause of death and inpatient hospital registry to review mortality patterns in injured children in Sweden over a 14 year period. A major finding was that mortality patterns in injured children in Sweden have changed from being dominated by unintentional injuries to a more equal distribution between unintentional and intentional injuries as well as between sexes and the overall rate has declined further (Bäckström et al 2017).

Example of coordination of data and information systems – Secure Anonymised Information Linkage (SAIL) Databank – Wales

Academics from Swansea and Cardiff Universities are recognised as national and international leaders in the field of injury prevention. Data and information is coordinated through a range of mechanisms. For example the All Wales Injury Surveillance System (AWISS) is a key resource to support the reduction of injuries in Wales. AWISS is a population-based, multisource injury surveillance system which collects and analyses data on injury risk factors, severity, outcomes and costs. It is funded by Public Health Wales (AWISS, no date).

The Swansea University Medical School (with core funding from Health and Care Research Wales of the Welsh Government) has developed SAIL which stands for the Secure Anonymised Information Linkage Databank. This is a Wales-wide research resource that functions as an anonymous data linkage system that securely integrates various sources of routinely-collected data about the population of Wales.

It was established in 2006 to improve data linkage capacity and has progressively expanded the types of datasets and geographical coverage within the databank. Datasets are accessed from the Office for National Statistics, NHS Wales Informatics Service, Public Health Wales, Welsh Cancer Intelligence and Surveillance Unit, the Congenital Anomaly Register and Information Service and GP practices signed up to SAIL, contributing to the primary care GP dataset (Swansea University 2016).

SAIL is engaged in research in diverse areas including injury and children and young people's health and collaborates with a broad range of research groups both within Wales, the wider UK and internationally. SAIL actively works to disseminate research findings through publications and other research translation activities.

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3.3 Research and knowledge translation networks

The importance of high quality research and wider implementation of evidence-based approaches in childhood injury prevention has been recognised in the UK (Towner and Ward 1998). There is a diverse group of institutions throughout the UK contributing to childhood injury prevention research. For example University College London's Institute of Child Health, the Royal College of Paediatrics and Child Health and the Child Accident Prevention Trust. The Injury Observatory Britain and Ireland has been established through collaboration between a number of public health and academic institutions and provides data, information and evidence to support injury prevention practitioners (Injury Observatory Britain and Ireland no date). Over time the UK Government intends that all publicly funded research outputs should be open access. The University of Exeter hosts the repository *Open Research Exeter* which provides an example of how immediate online availability of research publications can be provided (University of Exeter no date).

The CDC began funding Injury Control Research Centers (ICRCs) throughout the US in 1987 to investigate ways to prevent injuries and disabilities. ICRCs conduct interdisciplinary research in the three core phases of injury control: prevention, acute care, and rehabilitation. They also serve as training and information centres for the public (Centers for Disease Control and Prevention 2016). Eleven ICRCs are currently funded, with most having some level of involvement in childhood injury prevention. However, the Center for Injury Research and Policy (CIRP) (at The Research Institute at Nationwide Children's Hospital) is the only centre solely focused on injuries to children and adolescents (Nationwide Children's Hospital no date).

Various other research organisations exist across the US that conduct work in child injury prevention, for example:

- The Children's Hospital of Philadelphia (CHOP) Research Institute is home to the Center for Injury Research and Prevention as well as the Center for Child Injury Prevention Studies (CChIPS), a multi-site National Science Foundation Industry/University Cooperative Research Center. This research group within a clinical setting has strong partnerships with industry and is a good example of coordination between research, government and health and industry.
- The Harborview Injury Prevention and Research Center (2016) is affiliated with the University of Washington and Harborview Medical Centre in Seattle. In partnership with the Harborview Injury Prevention and Research Center, county and state health departments and others have created programs for promoting healthy lifestyles, booster seats and water safety that have become models for reducing obesity and preventable injury.
- The Centre for Child Health, Behavior and Development at the Seattle Children's Hospital houses a multidisciplinary team of research scientists working in a range of areas related to child health. They undertake studies related to child injury, for example "Concussion and Injury Surveillance in Youth Soccer Players" (Seattle Children's no date).

The Canadian Institutes of Health Research (CIHR) led a strategic initiative called *Listening for Direction on Injury Prevention*, and have since awarded numerous "Strategic Team" grants in Applied Injury Research. Along with partners The Alberta Centre for Child, Family and Community Research and the Public Health Agency of Canada, the CIHR funded the CIHR Team

in Child & Youth Injury Prevention from 2010. This group released *The CIHR Team in Child & Youth Injury Prevention End of Grant Report: 2010 – 2016.* Their research program is based on a public health approach; working through partnerships with researchers and stakeholders and focusing on child and youth injury by developmental stages to target relevant causes of injury within these groups. There are several well established research centres at provincial level including the British Columbia Injury Research and Prevention Unit, the Injury Prevention Centre in Alberta and the Ontario Injury Prevention Resource Centre.

The Australian Government National Health and Medical Research Council (NHMRC) is a major source of research funding. In 2014 research aimed at preventing injuries and improving treatments received a $26.1 million funding investment through the NHMRC grants (National Health and Medical Research Council 2014). In announcing this funding injury was confirmed as one of the Australian Government's nine National Health Priority Areas – these are also priority research areas for the NHMRC. A review of grants data from 2014 – 2016 shows that while projects were funded that addressed children very few included an emphasis on childhood injury prevention (National Health and Medical Research Council 2016).

The national health priority areas that Australian governments have chosen for focused attention has included injury prevention and control as far back as 1996 (Australian Institute of Health and Welfare and Commonwealth Department of Health and Family Services 1997). A challenge for research coordination has been maintaining the focus on child injury as opposed to child health. The complexity of injury also impacts this focus because of the diverse injury types and causal factors. Similar to many research fields a balance needs to be struck between investigator driven and priority driven research priorities.

Various Australian research centres have a focus on childhood injury prevention within their broader research agendas. Leading examples include the Monash Injury Research Institute, the George Institute for Global Health at the University of Sydney, Flinders University's Research Centre for Injury Studies and Neuroscience Research Australia (NeuRA) at the University of New South Wales. A number of research centres across Australia focus on specific injury types, such as road-related injury (e.g. Monash University Accident Research Centre, Centre for Accident Research and Road Safety – Queensland) or sports injury (e.g. Australian Centre for Research into Injury in Sport and its Prevention).

3.3.1 Stakeholder views

The stakeholders interviewed were involved in a large range of research studies addressing childhood injury, these included: Aboriginal childhood injury, product safety, burns injury, playground safety, drowning prevention, farm safety, road safety and young drivers, graduate licensing, and studies at the local, state, national and international levels. Most of the studies involved collaborations both with other researchers and with a range of other government and industry partners. The studies employed a variety of methodologies including the analysis of large datasets and data linkage, large community based interventions, qualitative studies, evaluation and government commissioned projects.

Some of the key trends and concerns mentioned by those working in research mirror those of the international scene: concerns about funding and support for injury research, and the increasing importance of research impact including knowledge exchange.

The researchers interviewed did not see that there was a need for "coordination" of research as it implied direction from above, and were more likely to prefer to talk about research "collaboration" or "research partnerships" or "research networks":

> *I think coordinating research is a bit – I suppose it depends what you mean by coordination. I suppose that's everything really… I think there's definitely opportunities for a stronger network of researchers and to have some sort of – I don't know – mechanism for better communication between researchers but coordinating research, if it means by defining what research should be done I think that's always a bit limiting.*

Some researchers questioned the need for researchers working in different areas to come together at all:

> *Well, I mean there's so many good people at the moment doing research really. And do they need to come under an umbrella?*

Stakeholders also provided examples of failed attempts at coordination:

> *Theoretically, it's a good thing. I haven't seen it work very successfully and there have been other attempts in other areas, and it hasn't been hugely successful, sort of various levels of success, I would say.*

Other researchers viewed coordination in a more positive light:

> *Certainly it makes sense to coordinate because then you can have a more strategic approach and a more resourceful approach, a more efficient approach, so it certainly makes sense to be more coordinated. There are benefits of it going through a research organisation versus a government department, but both are dependent very much on ongoing and sustained funding.*

There was a consistent view emphasised about the importance of building on the research that is already being done and widespread support for more effective coordination of the dissemination of research:

> *There's a lot of good research and how does that information get out? Well, when the forums are established you hear, you come face to face with the people actually doing it, you see the published work, there's various clearinghouses that you can access, but if we had a sustainable coordinating unit then understanding that research or knowing about that research wouldn't be based on luck or promotion, it can be systematically disseminated.*

Several stakeholders suggested some form of coordinating body such as a "Federal Child Injury Prevention Council" or a board like structure, similar to the US National Transportation Safety Board:

> *If there was the equivalent of a federal injury prevention council …or a State Injury Prevention Council… with good representation of people from the states that were*

respected and objective people that know what is going on in the states plus representation from some of those key agencies like Kidsafe and the Australian Competition and Consumer Commission and that kind of thing, I think they would be the ideally placed group to set the agenda. And if there was an agenda… that was based on evidence and based on work that's been done and was really clearly set up… researchers would acknowledge that there's going to be particular priority areas in different years… I think that would be great having somewhere like that, that potentially sets the agenda but also provides some seed funding to get things off the ground…

The transportation research board in the US has a national research agenda, and various groups, interest groups within that organisation, from around the world, really, not just in the US, have worked together on coming up with priority research themes…

The multisectoral nature of injury was seen as a factor influencing the structure of a coordinating agency:

It would need to be something like a federal health department or a federal – I don't know and that's the difficulty with injury, I mean, it does fall between the cracks… Health deal with the outcomes of it but the other agencies are also responsible for the regulation of whatever their area is of safety. It might be products, it might be playgrounds, it might be schools, whatever, it needs to be shared across agencies in terms of responsibilities but one of them does need to take the lead and I think that's the difficulty that we keep on coming up with in injury.

The importance of child injury being seen as a priority and being championed by persons of influence were also raised:

I think having it on the agenda of National Health and Medical Research Council and Australian Research Council, having it as a priority area where they focus funding maybe targeted calls for work in child injury would be fabulous.

Researchers working in the area of product safety stressed the growing importance of extending their existing research networks to include industry partners. Another area where there have been technical advances is that of the design aspects of child playgrounds. Here, injury prevention linking with those in the area of physical exercise, local government and urban design, may be an important future research direction. Road safety researchers, like the policy makers in that area, stressed the increasing focus on serious road injury

Several other strategies were discussed as possible mechanisms to facilitate research coordination. For example several stakeholders supported the idea of child injury research collaboration, preferably established under the NHMRC Centres for Research Excellence program. Another suggested strategy was to establish a clearinghouse or build on an existing information repository; to facilitate practitioner access to current evidence and information about childhood injury prevention.

A register of injury prevention interests was suggested as this might raise awareness of what research is occurring and provide scope for better and broader collaboration. A comparison was drawn with a clinical trial register with the capacity for injury researchers to register research in progress. The Australian Injury Prevention Network provides a good basis on which to build research collaboration but was perceived as underutilised for this purpose. The network has a website which might facilitate a clearinghouse function as well. Several stakeholders identified the importance of a research champion at a high political level capable of influencing government and non-government stakeholders and attracting funding.

3.3.2 Barriers

For the most part, stakeholders did not find it useful to talk about a "coordinated" approach to childhood injury prevention research. This was in part because they noted that it is not always easy to find linkages between what various researchers are doing.

Several barriers to coordinated and collaborative research were identified including lengthy and complicated ethical processes, particularly in multi-state projects. Another barrier is the lack of information sharing that goes on, because people are so busy in their day-to-day work it becomes very hard to have effective sharing of lessons learnt and adopting these. Government departments are sometimes unaware of what has happened previously. There is a lack of sharing, both within departments as well as across departments, and the ability for grassroots efforts to actually share their lessons learnt is often lost, which was interpreted as a barrier to more effective use of research in prevention.

There is also a question of how much information people can keep across, which is seen as a significant challenge. A suggestion was made for a clearinghouse for injury prevention research to be established to give different groups access and keep up-to-date with what is happening within the field. This would allow access to information that is pre-digested in a format that can be quickly read. There is also the sense that there is less investment in the space of injury across the board and it was mentioned that there seems to be less up and coming researchers within the field.

There is a sense that funding for research, with the cost of the burden of injury, is very imbalanced. It is known that injury is such a high burden on children, however funding from bodies such as the NHMRC has rarely extended to projects related to childhood injury. A number of injury researchers and advocates have been working towards aligning injury prevention more generally with the prevention of other non-communicable diseases, which have had a great deal more policy and funding attention.

Lack of secure funding is a significant and ongoing barrier to coordination. As stated elsewhere there has been a disinvestment in prevention by Australian governments over the past few years. Long term investment was universally seen as necessary for making sustainable and meaningful change and reducing or preventing serious injury or child death; however most injury prevention research and activity is government funded, and long term funding has not been forthcoming.

In addition, the competitive nature of funding between different agencies was mentioned as being an issue that limits coordination and collaboration. It appears that organisations and individuals may not share ideas if they have to compete for funds.

Some stakeholders compared the lack of progress in childhood injury prevention with the relatively greater progress in other health fields, such as cardiovascular disease and cancer which have been more coordinated and more effective in getting their messages across. These examples are seen as having very strong and effective fundraising activities which allows some buffer when government funding is unavailable, whereas injury has always been highly reliant on government funding. It was mentioned that even if there is a coordinating body, unless they are generating funding for research, messaging and activities, then nothing is going to happen.

3.3.3 Implications for NSW

The most effective strategies to support research coordination centre on clear government priorities supported by adequate funding and mechanisms to facilitate research dissemination and translation. Gallagher and colleagues (2013) highlighted the need for research experts in the injury field to build relationships with decision makers, which they argue is crucial to effective advocacy and translating research in policy. Networks and collaboratives are useful in bringing researchers together.

There is merit in enhancing effective research networks to support greater collaboration in the advancement and translation of knowledge in childhood injury prevention. The NSW Paediatric Injury Prevention and Management Research Forum was held in 2014. The forum brought together injury prevention advocates, researchers and clinicians to consider the future of childhood injury prevention. It was a joint initiative of the former NSW Kids and Families and the Sydney Children's Hospitals Network Population Health Research Collaborative and aimed to inform priorities for research, facilitate communication between stakeholders, and promote translational research to guide policy and practice. The forum identified the need for coordination and leadership of the diverse range of agencies and initiatives in the field of childhood injury prevention (NSW Kids and Families 2014).

Following on from the 2014 forum, the Paediatric Injury Prevention and Management Research Reference Group was established. The group, then co-chaired by NSW Kids and Families and the Sydney Children's Hospitals Network, became a forum for discussion about research and related issues. The group also had an interest in broader initiatives, including data linkage and other state and national injury research. Subsequent to this, NSW Kids and Families provided seed funding for research projects. These projects provide examples of the breadth and depth of work that can be undertaken with relatively modest funding investments (refer to Appendix 6 for a list of these projects). These projects engaged multiple researchers with a collaborative approach taken to not only the conduct of the research but also the dissemination of research findings. They encompassed diverse issues for example: guideline development for policy and practice; analysis of the unwarranted clinical variation following hospitalised injury in young people; and investigation of the impact of the Brighter Futures program on unintentional injuries in vulnerable children.

This group continued to meet on a biannual basis until the end of 2016 and provides a strong model for future efforts in collaboration, through exchange of information and discussion of

injury research, data, policy and prevention efforts. The NSW Ministry of Health coordinated meetings. A diverse range of experts consistently attended including clinicians, researchers, NGO representatives and government officers.

There are a range of other research bodies based in NSW with involvement in childhood injury research, for example: Transport and Road Safety Research, University of NSW; The George Institute for Global Health; Australian Institute of Health Innovation, Macquarie University; National Centre for Immunisation Research and Surveillance; Children's Medical Research Institute and Kids Research Institute, Westmead Children's Hospital; and Institute of Early Childhood, Macquarie University.

Example of coordination of research and knowledge translation networks – Center for Child Injury Prevention Studies, Children's Hospital of Philadelphia (CHOP) Research Institute

The Children's Hospital of Philadelphia (CHOP) Research Institute in the USA is a research group based within the clinical setting and exemplifies good coordination between research, government and health and industry. The CHOP Research Institute has multiple research programs and centres which are supported by both federal and private research funding. The Institute is home to the Center for Injury Research and Prevention (CIRP) which adopts a multidisciplinary approach to the prevention or promotion of recovery from childhood injury. Within CIRP is the Center for Child Injury Prevention Studies (CChIPS) which is a multi-site National Science Foundation Industry / University Cooperative Research Center.

CChIPS addresses children's injuries from before the injury (prevention) to after the injury (healing). The Center works to:

- translate rigorous scientific research to usable, age-appropriate tools and practical steps for families, professionals, and policymakers;
- ask and answer important questions from an interdisciplinary perspective; and
- engage with a broad range of organisations from universities and government entities to non-profit groups, foundations, and corporations, to ensure that research results extend to the real world (Center for Child Injury Prevention Studies 2012).

The CChIPS method applies the science of biomechanical epidemiology to the analysis of pediatric injury prevention data. This means that the principles of engineering, behavioural science and epidemiology are integrated into study designs. Research priorities are established each year through the Center's Industry Advisory Board (which consists of industry, non-profit and government members). Projects are assessed for their scientific merit, industry relevance and a strong commitment to saving children's lives (Center for Injury Research and Prevention 2016).

The Center hosts researchers from CHOP, the University of Pennsylvania and the Ohio State University and works closely with industry members with a focus on translational research that has practical application. CChIPS is committed to sharing information about its research in a timely manner; its "Research in Action" blog is a major mechanism for dissemination.

CChIPS collaborates with other Centers within CHOP. For example it is currently working with the Center for Pediatric Traumatic Stress on projects looking to improve communication about traumatic stress post injury between acute and follow-up care settings (Center for Pediatric Traumatic Stress 2016).

Example of coordination of research and knowledge translation networks – Monash University Accident Research Centre

The Monash University Accident Research Centre (MUARC) was established by government in 1987. Based at Monash University in Melbourne, it is a comprehensive injury prevention research centre focused on the prevention of injury as well as the treatment and recovery from injury. The Centre has a strong track record in translating public health research into real world outcomes informing government policy, evaluating public safety programs and shaping the products and direction of industry. The Centre adopts a multidisciplinary, scientific approach with an emphasis on translating research into outcomes (Monash University Accident Research Centre 2016a).

MUARC has partnerships with key international, national and state governments and industry agencies and organisations (it is recognised as a WHO Collaborating Centre for Violence, Injuries and Disabilities). MUARC has established long-term relationships with a number of state government departments such as VicRoads, the Transport Accident Commission, Department of Justice and the Victorian Police, and the Department of Health and Human Services, several contributing to sponsorship of the MUARC's Baseline Research Program. The policy partners provide data and the research questions they want answered and the research is done in partnership. For example, the Baseline Research Program Committee funded a project to design a roadside observation survey after researchers identified a gap in the collection of data on behaviour revealed through roadside observation surveys (Clark 2009).

MUARC has also formed strong partnerships between university researchers, government and industry, and the Victorian Injury Surveillance Unit (VISU). It also works closely with Kidsafe. These relationships have enhanced MUARC's ability to translate research into tangible policy and road safety practice (Monash University Accident Research Centre 2016c).

MUARC hosts the Road Safety Management Leadership Program which aims to support the development of the "next generation of road safety leaders tasked with achieving improvements in road safety performance over the coming decades" (Monash University Accident Research Centre 2016b). The collaborative program is extensive, and includes presenters from MUARC, Centre for Automotive Safety Research, VicRoads, Victoria Police, Australian Road Research Board and Centre for Road Safety in Transport for NSW. The program addresses road safety leadership challenges faced globally.

3.4 Coalitions, collaborations and partnerships

The review of academic and practice literature from Australia and overseas uncovered relatively few examples of where the diverse areas and actions of multiple stakeholders involved in childhood injury prevention are particularly well coordinated. The most notable international examples identified in the literature were also mentioned by the stakeholders interviewed. These models appear to offer well integrated collaborative models of policy, data, research and practice.

- The National Center for Injury Prevention and Control (Centres for Disease Control and Prevention) in the US which is America's leading authority on injury and violence, including child maltreatment and neglect;
- The Canadian charity Parachute serves as an umbrella organisation for child and youth injury prevention;
- The European Child Safety Alliance (ECSA) links over 30 countries across Europe working together to reduce the leading cause of death, disability and inequity to children in every Member State in the region;
- The Children's Hospital of Philadelphia (CHOP) in the US is a research group set within the clinical setting and exemplifies good coordination between research, government and health and industry;
- The National Transportation Safety Bureau in the US is a parliamentary committee which oversees transport safety but sits outside the government transport administration agencies;
- The Accident Compensation Commission (ACC) in New Zealand is responsible for injury prevention across all ages;
- The WHO Safe Communities model operates in locations throughout the world and brings together safety coalitions at a local or regional level.

There are valuable lessons from the New Zealand experience as to how different forms of coalitions, collaborations and partnerships improve coordination of childhood injury prevention efforts. A *Cross-government Injury Prevention Work Plan* was approved by the New Zealand Cabinet to address perceived deficiencies in injury prevention efforts including: fragmentation of effort; gaps in injury prevention activity; workforce capability issues and quality of, access to and dissemination of injury information (Accident Compensation Corporation 2014a). The new approach to injury prevention aims to improve collaboration with stakeholders, better use data to design programmes, and better target programmes' areas of focus (Accident Compensation Corporation 2014d). The initial phase of the Work Plan addresses four key priority areas for Accident Compensation Corporation (ACC) and its partner agencies, one of which is vulnerable children.

Another example comes from Safekids Aotearoa, a service of Starship Children's Health, which was established in the early 1990s by Starship Children's Health Trauma Service to help reduce the high rates of preventable injury to children (Safekids Aotearoa 2016a). Starship is a hospital for children and young people based in Auckland. Through a partnership approach Safekids Aotearoa aims to reduce the incidence and severity of unintentional injuries to children aged 0

to 14 years. They develop injury prevention programs, provide communication tools and advocate for changes in legislation (Safekids Aotearoa 2016b). Safekids is a national service but based in Auckland. They are a member of Safekids Worldwide, a global organisation that works through a network of over 30 countries to prevent unintentional injuries in children (Safe Kids Worldwide 2016). Safekids Aotearoa also has close links with the Safe Communities Foundation NZ (which accredits and supports 25 Safe Communities across the country). Safe Communities Foundation New Zealand is a non-profit organisation working in community-based injury prevention and safety promotion, with a focus on building local partnerships and collaborative relationships. It is jointly funded by the ACC, the Ministry of Health, the Ministry of Justice, and the Health Promotion Agency (Safe Communities Foundation New Zealand no date).

In addition there is the Injury Prevention Network of Aotearoa New Zealand (IPNANZ) that provides a national voice for injury prevention in New Zealand. Previously funded by the Ministry of Health, they bring together individuals and organisations within the injury prevention sector and advocate for the prevention and reduction of intentional and unintentional injury (Injury Prevention Aotearoa 2013). Specifically, Injury Prevention Aotearoa aims to:

- Raise the profile of injury prevention by providing a collective national voice.
- Provide up-to-date information, resources and events to further injury prevention knowledge and best practice.
- Promote and support the development of specific Māori- and Pacific-focused injury prevention initiatives.
- Acknowledge and celebrate achievements within the injury prevention sector.
- Positively influence policy development and legislation relating to the prevention of injury.

A recent evaluation of evidence-based childhood injury prevention policies across Canada has urged continued collaboration between researchers, advocates, and policy-makers to improve childhood injury prevention policies across the country and to employ a multi-sectoral approach to development, implementation and enforcement (Macpherson et al 2015). Within Canada coordination occurs at both a government level through the Public Health Agency of Canada and notably through several influential NGOs. The Canadian Collaborative Centres for Injury Prevention (CCCIP) was established in 1999 to promote collaboration among Canadian injury prevention centres and organisations, to address common issues such as funding, and to provide strategic guidance in advancing injury prevention. The CCCIP is now recognised as “a facilitator of action and a leader in the field of injury prevention” (Pike et al 2015, p.7).

Within the US there is a similar pattern of collaboration to improve coordination of childhood injury prevention by both government and the NGO sector. Prevent Child Injury is a national group of organisations and individuals, including researchers, health professionals, educators, and child advocates working together to prevent injuries to children and adolescents in the US. Prevent Child Injury received start-up funding from the CDC to address the communications initiative of the National Action Plan, promoting coordinated public communication about child injury (Prevent Child Injury no date). The Children’s Safety Network (CSN) is an Education Development Center (EDC) project funded by the Health Resources and Services

Administration's Maternal and Child Health Bureau (US Department of Health and Human Services 2016). The CSN host a Child Safety Collaborative Innovation and Improvement Network, first convening the steering committee in October 2015 (Children's Safety Network 2016a, 2016b). Safe Kids has a network of more than 400 coalitions in the United States and also partners with organisations in 30 other countries to reduce childhood injuries. Their work is in research, programs and initiatives, and public policy (Safe Kids Worldwide 2016).

Europe is the only WHO region world-wide that has taken joint action collectively as countries to address child injury prevention. The European Child Safety Alliance (ECSA), an initiative of the European Consumer Safety Association, was launched in 2000 with the aim of making the lives of children living in Europe safer. Over 30 European countries are working together to reduce the incidence of injury, which is the leading cause of death, disability and inequity to children in every Member State in the region.

Within Australia, examples where childhood injury prevention appears to be particularly well coordinated include:

- Western Australia Health Department (specifically their work with NGOs in childhood injury prevention);
- The Queensland Injury Prevention Council between 2008 and 2012 provided a centralised agency within the state health department and brought together agencies dealing with prevention through to rehabilitation and provided specific funding for child injury prevention; and
- In Victoria, the Monash University Accident Research Centre (MUARC) is a long standing road safety partnership between university researchers, government and industry, and the Victorian Injury Surveillance Unit (VISU) works closely with Kidsafe.

Several state government departments have formed strong partnerships with other agencies or organisations to address childhood injury prevention and promote child safety. For example, Kidsafe is a key organisation providing services, implementing campaigns, producing materials and undertaking advocacy to government and industry. The principal funder of Kidsafe in each state and territory is the health department of the respective state / territory government. There are different approaches to working with NGOs in evidence, from loose coalitions, to more formal partnerships to outsourcing coordination responsibilities to a lead NGO. Where there is close collaboration between government and NGOs focused on child injury prevention there appears to be a higher focus across the state on child injury prevention. Whilst Kidsafe is seen as a facilitator of collaborative initiatives to prevent childhood injury, its federated structure and limited resources suggest it is unsuited to a leadership role.

Coalitions also operate within injury specific areas, most notably road safety and drowning prevention. In the road safety sector there are examples of strong formal partnerships between researchers and policy makers.

The Australian Injury Prevention Network (AIPN) is the peak national body for injury prevention for all ages and all causes in Australia; its advocacy and biennial conference continues to provide an important way of linking and promoting collaboration between injury researchers,

policy makers and practitioners. It provides a good basis on which to build research collaboration but was perceived as underutilised for this purpose. The network has a website which might facilitate a clearinghouse function as well.

3.4.1 Stakeholder views

The majority of stakeholders found it quite difficult to provide a straightforward answer to the question about what they regarded as the most effective strategies for coordinating childhood injury prevention. While some stakeholders provided examples of good models to coordinate childhood injury prevention, the issue of how to coordinate across different child injury issues and multiple sectors is far more complicated.

Some stakeholders thought that none of the current strategies were particularly effective given the level of fragmentation and funding uncertainty which they experienced both in Australia and overseas:

> *There's lots of really interested parties, but there's not actually the funding.*

Others questioned whether coordination was possible in large complex societies, where there appears to be a need for higher and higher levels of overall coordination. Observing the situation in the US, for example, one stakeholder commented on how difficult it is to talk about coordination in a country of 350 million people:

> *While the US has lots of coordinators and coordination efforts, and lots of networks of coordinators, that still doesn't keep the whole thing coordinated and it often seems that a higher level of coordination is what we need here to bring it all together... Every time you get coordination on one plane you cut up the coordination on a different dimension, and thus fragment rather than amass a solution.*

Others drawing on their experience of working within an Australian context also observed that efforts to coordinate or bring people together quite often cut across those individuals, organisations and collaborations, already working in the field, including those with a prior "mandate" to coordinate, and this could result in confusion and duplication of effort. It is important therefore that new solutions that involve improved coordination or collaboration acknowledge and add value to the work already being undertaken.

There has been increasing interest amongst some injury researchers to broaden the scope of injury from the traditional epidemiological focus on identifying trends, risk factors and causal relationships, to considering the broader social, economic and cultural context in which injury occurs. As one of the stakeholders commented:

> *I have started to think of injury as an unintended consequence of the way we organise society rather than something we can abstract out from society and deal with in isolation… even intentional injury to some extent is an unintended consequence of something.*

So in this way of thinking, the question of a coordinated response to injury, therefore, really becomes a question of how to achieve a coordinated society.

The area of 'injury prevention practice' has generally incorporated those working as injury prevention practitioners in health promotion or community health settings in either government or non-government agencies and includes health personnel and paediatricians working in prevention. Injury prevention practice typically involves advocacy, education, knowledge exchange, public awareness and safety campaigns. The key points made about injury prevention practice by the stakeholders were: the benefits of long term funding; the increasing importance of coalitions, collaborations and partnerships, particularly research partnerships; the growing importance of advocacy; and the changes in messaging and communication, including the rapid uptake of social media.

3.4.2 Barriers

There are frequent references in the literature to the barriers which working in silos pose for a complex multi-faceted problem like injury prevention, as the various groups do not know what others are doing and there is the risk of duplication and the failure to take up opportunity for greater synergy and effective programs. For example better links between data, research and practice.

Stakeholders interviewed reinforced this stressing the importance of needing more than an awareness of what others are doing; real coordination requires considerable effort to communicate and collaborate. This can be difficult as the goals of different agencies and organisations are slightly different even if they all wish for the same outcome and people's time is limited. Moreover, because of the pull on resources, people tend to stick to their own key area of interest and this leads to fragmentation of inter-prevention programs and a failure to communicate between programs, which happens at all levels of program delivery.

> *…a research group and a government agency both interested in the same problem it's really difficult to actually really coordinate those actions because you both kind of – even if you're aware of what each group's doing you're working away in your own silo unless you really make a consolidated effort to kind of regularly touch base and actually be involved in each other's work and that's sort of difficult because everyone's busy so you're kind of busy doing your own thing, you haven't really got time to be involved in someone else's.*

It is seen as a barrier to coordination when research groups and government agencies are interested in similar issues yet tend to work in their own silos, even if they are aware of what the other group is doing. A consolidated effort to regularly touch base and actually be involved in each other's work is needed to make the coordinated approach work. In addition to these issues, some stakeholders indicated that a coordinated effort in child injury is not perceived as being of equal benefit to all.

A number of stakeholders mentioned the important challenges which relate to community attitudes. According to some, for more coordination across child injury prevention efforts, including any changes in legislation, having a good community understanding of the issues is very important. There is a perception that there has been a public push against legislation, despite the legislation having led to very important improvements in reducing and preventing child injury. This has important implications for the willingness of other community based

organisations and institutions to engage in coalitions or partnerships focused on childhood injury prevention.

It was also noted that injury prevention does not seem to have the value that other public health campaigns have and does not seem to rate as highly on people's agendas as other health issues. A limiting factor is the level of penetration into the community compared to that of other service providers.

3.4.3 Implications for NSW

The very broad range of stakeholders involved in action to prevent injury to children makes coalitions, collaborations and partnerships an essential component of the way most organisations and individuals work in this field.

Coalitions can extend from data collection to research to implementation partnerships, formal partnerships, informal linking with other organisations and broad networks. There are a variety of funding arrangements for coalitions including joint funding from partners, one-on-one project funding, and government funding for coordinators.

The importance of collaboration with the CDRT and NSW Advocate for Children and Young People in addition to the establishment of a means to learn from child death data and coordinate community safety messages and prevention initiatives has frequently been identified.

There need to be clear mechanisms to bring people together that are funded, supported and sustained over time. Australian and international experience suggests things that work, for example: annual summits/forums to bring experts together and review progress and set the agenda for the year ahead; regional networks that link researchers and service providers; communities of practice mobilised around a particular issue or child injury prevention agenda – these can be virtual; and taskforces etc. or statutory committees that act on behalf of government.

These networks only function when there is a designated and funded facilitator; they are an effective mechanism for coordinating action in the face of an emerging injury issue.

Example of effective collaboration – European Child Safety Alliance

The European Child Safety Alliance (ECSA) was established to collectively address injury across Europe through its 30 member countries. It arose from recognition that Europe is becoming more of a global community and that a coordinated plan of action among Member States to reduce child injury would create synergy and the needed critical mass to move the issue forward. There was a need for consistent public policy, the transfer of good practice between settings and countries, comparable standardised data collection systems and the same level of safety standards for child related products and services (European Child Safety Alliance no date).

Several projects have been implemented to strengthen coordination at both the national and international level, three examples are discussed: PIECES, Child Safety Action Plans and TACTICS.

Policy Investigation in Europe on Child Endangerment and Support (PIECES) is a two year initiative led and coordinated by the ECSA in partnership with experts from several other countries. It is investigating six policy areas in depth that address violence against children. One of the policy areas includes the role of National Child Death Review Committees in informing policy and practice related to violence against children

The Child Safety Action Plan (CSAP) development process was designed to be flexible to allow countries to judge the best fit between their national policy frameworks and identified child safety gaps that require action. The project utilised Child Safety Report Cards which summarised a country's performance with respect to the level of safety provided to children and adolescents through national level policy. They were found to be useful to:

- assess and benchmark progress
- drive actions towards evidence-based good practices
- inform planning by facilitating identification of countries' strengths and weaknesses in relation to child safety
- assist in the identification of critical gaps upon which subsequent strategic planning and action planning could focus
- inform monitoring and evaluation by providing a baseline against which progress can be measured either over time with a country or compared to other participating countries (MacKay and Vincenten 2014a, p.36).

The Child Safety Action Plan (CSAP) provides a European example of choosing and implementing injury indicators. Action indicators measure key areas of action such as leadership, infrastructure and capacity to support child safety and measures of existing policy. Injury indicators can be used to raise awareness, inform decision-makers, prioritise funding, measure progress, create a shared vision, and measure the success of policies and set goals (MacKay et al 2010). The project found that current governance structures at the European and national level do not support multi-sectoral action. This was frequently as result of separate budgets, mandates, planning cycles and "turf struggles". Leadership from within government is

necessary to create a multi-sectoral mechanism (e.g. a cross-ministerial committee, senior level multi-sectoral steering committees) for development of Child Safety Action Plans (MacKay and Vincenten 2014b, p.22). The CSAP approach to planning provides a model for areas of child health (particularly injury prevention) to enable a coordinated, comprehensive and evidence-based approach to planning.

TACTICS (Tools to Address Childhood Trauma, Injury and Children's Safety) was a project undertaken by the ECSA, funded by the European Union in the framework of the Health Programme. It was a large scale, multi-year initiative undertaken from 2011 to 2014, which worked to provide better information, practical tools and resources to support adoption and implementation of evidence-based good practices for the prevention of injury to children and youth in Europe. The project built on the work of earlier projects, in particular the Child Safety Action Plan (CSAP) project (2004-2010). A key component of the project related to the continuing development and implementation of government endorsed national Child Safety Action Plans (CSAPs). These are defined as a policy document endorsed at the highest level of government that describes the broad framework, long-term direction and priorities for prevention and safety promotion for children in a country and the specific short-term activities, organisational responsibilities and resources required to implement those priorities (MacKay et al 2010).

The recommendations made to the European Commission in the final report for the TACTICS project, contain lessons pertinent to the strategic opportunities for improving coordination of research, data and childhood injury prevention initiatives in other countries and states or provinces (see Appendix 5). In summary the recommendations support:

- networking and capacity building activities
- formal national child safety action plans
- committed national leadership to facilitate multi-sectoral work and the health in all policies approach
- political and financial support to enhance current data systems to allow monitoring of injuries, effectiveness of investments and social determinants (MacKay and Vincenten 2014b, pp.16-17).

The extensive experience of the European Child Safety Alliance emphasises the importance of national leadership, the commitment of senior political and government figures, allocation of funding and identification of an organisation that is responsible for national coordination of activities as essential strategies to establish injury prevention as a priority. This coordination extends to injury data, the production of reports and conduct of research studies (MacKay 2015).

This leadership has a "domino effect" as it facilitates the partnerships and service delivery that is needed at regional and local levels; and stimulates research interest and capacity building in child injury prevention. Another key infrastructure element to support child safety included a national programme of child death reviews (via a multidisciplinary team or committee that is able to use data from multiple sources to examine trends and examine patterns and make specific prevention-related recommendations). Countries were also assessed on the availability

of a mechanism to allow early identification of and rapid response to emerging safety hazards (MacKay and Vincenten 2012).

In addition MacKay and Vincenten (2012, p.42) note in their report for the European Child Safety Alliance:

> *For the countries where a historical comparison in sub-area scores was possible, improved scores reflected increased identification of a government department / ministry responsible for national coordination of child safety activities, progress towards national injury prevention strategies with child specific targets and increased funding for programmes, coordination and national steering committees / task forces.*

Example of effective collaboration – Department of Health Western Australia & Injury Control Council of Western Australia

The WA Department of Health has funded and partnered with several NGOs to advance childhood injury prevention, most notably the Injury Control Council of Western Australia (ICCWA), which works across sectors and levels of government to improve coordination and support research.

The role of the WA Department of Health has been described as to: "lead, guide, enable, collaborate" (Sullivan 2015). The Department has a history of funding injury prevention projects and in 2012 it prescribed child injuries as one of six priority areas for the Injury Prevention Sector Development Project.

The WA Department of Health supports collaborative health care planning through the establishment of WA Health Networks (a group of nearly 4,000 consumers, health professionals, carers and policy makers within the state). The Injury and Trauma Health Network was one of the inaugural WA Health Networks and made significant achievements during the seven years it was active, for example the development of the Burn Injury Model of Care. Members of the network included the ICCWA, Kidsafe WA, Royal Life Saving Society WA and Farmsafe WA Alliance. The Injury and Trauma Health Network formally ceased in early 2014. The Child and Youth Health Network are currently developing the Western Australian Youth Health Policy.

The WA Department of Health funds programs and activities in child safety and also invests in partnership and sector development. For example, the partnership established between the Department of Health and ICCWA. The ICCWA is a leading non-government not-for-profit organisation involved in injury prevention and community safety promotion in WA. The ICCWA works in partnership with individuals and organisations at the local, state, national and international levels and targets all levels of government.

In 2014 the ICCWA was funded by the WA Department of Health for three years for the Partnership and Sector Development Program (rebranded to Know Injury). This initiative builds

upon previous ICCWA programs such as the Injury Prevention Sector Development Project and the Injury Prevention Professional Development and Capacity Building Project (Injury Control Council of Western Australia 2015a). Know Injury is coordinated by ICCWA and aims to build the capacity of organisations and individuals working in the injury prevention sector. The Know Injury website provides access to the Regional Network Group, CONNECT.ed and an e-directory of key injury prevention and community safety organisations in WA.

The Regional Network Group consists of a wide range of professionals throughout the state. The objectives of the group are to increase:

- networking and partnership opportunities
- partnership building knowledge and skills
- self-efficacy and confidence in partnership building
- health promotion planning, implementation and evaluation skills
- self-efficacy and confidence in health promotion planning, implementation and evaluation (Injury Control Council of Western Australia 2015b).

Another Know Injury networking project is CONNECT.ed. CONNECT.ed was launched in August 2015 and aims to support WA injury prevention and community safety practitioners (particularly those based in regional locations) and enhance their partnership building skills by increasing their access to networking opportunities. Using the Spark Collaboration platform, CONNECT.ed participants are randomly paired with a peer, whether locally or internationally, bi-monthly for a 15 minute conversation about injury prevention, community safety or other topics of relevance. CONNECT.ed participants are provided with a professional Spark account containing their email address, and optional phone number and Skype name, allowing the paired peers to contact each other and arrange a conversation. CONNECT.ed has a small but growing number of members of the program who are mainly based in WA, but also with participants in New Zealand and Canada (Know Injury no date).

The WA Department of Health also coordinates injury prevention activities through conducting regular stocktakes of WA health promotion programs. These stocktakes gather information on programs and include a brief description and the coordinating agency / organisation. In 2014, the stocktake of current population-wide chronic disease prevention programs in WA identified 38 programs targeted at injury prevention, approximately half of these are directed to child and youth target groups (Chronic Disease Prevention Directorate 2014).

3.5 Role of the Child Death Review Team in childhood injury prevention

The number of serious injuries experienced by children each year is far greater than the annual number of child deaths. The burden of child injury is significant, as are the social and economic consequences. In Australia, over 130,000 children and young people (aged 0 to 24 years) were hospitalised as a result of an injury in 2011–12 (AIHW: Pointer 2014). Childhood injury costs in Australia are estimated at 1.5 billion dollars annually (Richards and Leeds 2012). In NSW hospitals the leading causes of ED visits among the 0-17 year age group in 2014-15 were injury, poisoning and other external causes (32 percent of all visits) (Bureau of Health Information 2016). Childhood injury prevention is an issue that should be high on the NSW government policy agenda.

The need for a more strategic approach to childhood injury prevention was raised in 2012 in a scoping paper on childhood injury by the (former) NSW Commission for Children and Young People who found that:

> *With the exception of child death, which is only one outcome of injury there are currently no structures, policy settings and/or agreed approaches to prevent childhood injury in NSW (NSW Commission for Children and Young People 2012).*

Since 2012, the establishment of the NSW Paediatric Injury Prevention and Management Research Forum in 2014 and subsequent regular meetings of the NSW Paediatric Injury Prevention and Management Research Reference Group have prompted further consideration of this issue.

The CDRT, in its role of reviewing the deaths of children, has some focus on injury prevention, particularly serious injury (e.g. drowning, transport fatalities). This puts the CDRT in a unique position to integrate the insights it gains from the review of child deaths (particularly for vulnerable populations) to inform understanding of both intentional and unintentional childhood injury prevention priorities and vulnerable groups. The degree to which the Team can focus on injury prevention, particularly in relation to the report's key areas of focus – policy, data, research and collaborative action – is a question for further consideration by the CDRT.

This section explores evidence from the international and Australian literature, as well as stakeholder views, and is intended to further inform decision making regarding the potential role of the CDRT in the prevention of serious injury to children.

3.5.1 International experience

International experience confirms the importance of having a robust child death review process. Research shows that standardised approaches can have significant positive outcomes, such as effective injury prevention campaigns and legislative changes that positively influence the lives of children and youth (Canadian Paediatric Society 2016b). Johnston and Covington (2011) provide examples of child death review data being used to catalyse local prevention interventions, while Johnston et al (2011) provide "evidence that a collaborative process improvement model can be used to support Child Death Review (CDR) teams interested in improving their capacity to promote injury prevention through review and recommendation". A range of factors support effective child death review, for example: linking stakeholders involved

in child death review with resources to act upon the death review results; political commitment to catalyse local prevention interventions; and collaborative process improvement to support CDR teams interested in improving their capacity to promote injury prevention through review and recommendation (Johnston and Covington 2011).

Vincent (2014) sees child death review fitting more within a public health or epidemiology framework as opposed to primarily coronial review. Approaches focused on child protection models of review are seen as limiting the prevention potential of CDR.

> *A broader injury framework that includes morbidity and mortality data widens the evidence base, increases the public health potential of CDR and can better inform prevention. In areas where there are only a small number of deaths, there are issues regarding the quality of CDR data, and quality can be strengthened by including serious injury data because recommendations will be based on a larger number of cases (Vincent 2014, p.123).*

Vincent (2014) found that child death review findings have informed prevention strategies across the six countries within her study, despite considerable barriers. While not recommending a universal model for child death review there are a number of features that can support the work of CDRTs including: a standardised data input process and standardised definitions to support aggregation of data at a national or state level, coordination, funding and an evidence-based approach to prevention. Fraser et al (2014) argue that the advantages of a statutory framework are that all aspects of the review processes are standardised.

Strict confidentiality provisions, which are acknowledged as important in protecting the identity of children and professionals, can prevent child death review teams sharing their findings and limit research around prevention efforts and knowledge transfer (Vincent 2014). A possible alternative is outlined by Fraser et al (2014, p.901):

> *Flexibility in a team's approach to child death review can help to improve effectiveness — e.g. teams might combine reviews of similar cases so that recommendations can be based on several child deaths or use a two-tier process consisting of a technical team that reviews cases and a prevention team to create recommendations and promote action.*

Most literature addressed developments in the US and UK. In the US, the approach to child death review differs in each state, with variation in mandatory requirements, funding and the location of the review function. However every state has an agency and a person designated as the state's lead for the CDR program (National Center for Fatality Review and Prevention 2016). Most CDRTs review all deaths up to the age of 18 years and the activities of the CDRT panel are supported by state-based legislation. Federal legislation to support Child Death Review was reintroduced in the US Congress in 2013. Federal government support is evidenced by the recognition of the importance of child death review in the national health objectives for 2020 (Fraser et al 2014, Vincent 2014, US DHHS 2016).

The National Center for the Review and Prevention of Child Deaths is funded federally as a resource and data centre for state and local CDR programs. It is housed within the Michigan

Public Health Institute, and promotes, supports and enhances child death review methodology and activities at the state, community and national levels. A formal child death review process with a comprehensive internet-based system is now in place in the US, representing more than 95 per cent of the US population and child deaths allowing inter-agency cross matching of data for completeness especially for violent deaths. A data dissemination policy is also in place which allows national data or reports to be shared with federal agencies and researchers.

In the US, the movement of CDR toward a prevention model is reflected in the close association with public health. Most teams have a strong focus on secondary prevention and systems improvements. Forty states have advisory boards that make prevention recommendations to state officials and the public (National Center for Fatality Review and Prevention 2016).

The multi-country analyses of child death review (Fraser et al 2014, Vincent 2014) provides an overview of child death review in the UK. The UK *Children Act* (2004) provides the legislative mandate for all local authorities to respond rapidly to unexpected child deaths and to systematically review all childhood deaths of children 0-18 years of age. In England, Child Death Overview Panels review deaths on behalf of their Local Safeguarding Children Boards, which ensures a national, coordinated, mandated and funded system of local review (Vincent 2014).

England has developed national guidelines for a standardised approach with multi-agency involvement including health, social care and law enforcement departments. Child death review assesses the contribution of different factors and uses an ecological analytic framework. The outcomes from the child death review process are quantified at a local, regional, and national level. Locally, a formal approach to individual child deaths has resulted in better diagnostic ability and identification of modifiable factors although lessons from standardised processes for child death review are still to be translated into large-scale policy initiatives (Fraser et al 2014).

However, the recent Wood Report on the review of the role and functions of local safeguarding children boards recommends a recasting of the statutory framework that underpins the model of Local Safeguarding Children's Boards, Serious Case Reviews and Child Death Overview Panels. The report also recommends that Government should discontinue Serious Case Reviews, and establish an independent body at national level to oversee a new national learning framework for inquiries into child deaths and cases where children have experienced serious harm, noting:

> *The framework should be predicated on high quality, published, local learning inquiries; the collection and dissemination of local lessons; the capacity to commission and carry out national serious case inquiries; and a requirement to report to the Secretary of State on issues for government derived from local and national inquiries (Department for Education, UK 2016 p.9)*

A range of issues were identified with the operation of Child Death Overview Panels, including the movement of this function from the Department for Education to the Department of Health and emphasis on the need for child deaths to be reviewed over a population size that gives a sufficient number of deaths to be analysed for patterns, themes and trends of death with

regionalisation encouraged and consideration should be given to establishing a national-regional model for Child Death Overview Panels (Department for Education, UK 2016 p.9 and p.59).

In Wales there is a national funded review system and a national database of all deaths. This process is coordinated through Public Health Wales (Vincent 2014).

3.5.2 Australian context

Each state and territory determines its approach to child death review, which is mandated and funded at a state level. Vincent (2014, p.120) notes:

> *The location of the child death review function varies in Australia. In NSW and Western Australia, it is located in the Ombudsman's office because the Ombudsman has royal commission powers and can secure records from any agency.*

In Australia state and territory based multi-sectoral and multiagency participation in retrospective panel review occurs under the auspice of the Child Death Review Team. The main purposes of retrospective reviews are to learn lessons and prevent future child deaths (Fraser et al 2014). Australia also has a review process, which takes relevant documents and case records into account with the use of key interviews in some states, and a system of state-level collation of reports. These annual reports provide a useful resource for policy makers, researchers and community stakeholders through presenting information about trends in mortality rates in children and particularly causes of death within the respective state or territory.

In some states and territories there are also resources allocated for research and epidemiological investigations resulting in reports produced based on analysis of aggregated state data and / or research activities (Vincent 2014). In South Australia the CDR Committee has a statutory obligation to monitor implementation of its recommendations (Vincent 2014). However, there is no nationally legislated or standardised framework for child death review. As a consequence, processes within Australian states and territories vary considerably, with a lack of national leadership, coordination, planning and policy development.

3.5.3 Stakeholder views

The consultation with key stakeholders generated a range of issues relating to the role of the CDRT in NSW.

3.5.3.1 Potential leadership role of CDRT

The CDRT fulfils a number of the characteristics of a leading agency as identified by stakeholders. Importantly, located within the NSW Ombudsman, the Team has the advantage of being government appointed and therefore works at a high level. Stakeholders noted that although the Ombudsman's recommendations to government from the CDRT report were not binding, the government has to respond to the Ombudsman and thereby holds government accountable.

The positioning of the CDRT within the NSW Ombudsman is also seen to increase opportunities for strong advocacy; the Ombudsman can be an "agent of change" and "bring awareness at a high level". From a research and policy perspective, it adds a voice to the need for funding and commitment to programs:

> *Well, it's actually as an agent of change but by having that sort of role in – at that level, it is also acting as an advocacy role because it's bringing awareness to the people at that level. I suppose that's leadership.*

There have been some successes where the CDRT has been able to monitor what is happening, completing a detailed examination of deaths and causes and what to do about them. Their work in this in the area of Sudden Unexpected Death in Infancy (SUDI) for example was described as "very powerful".

One stakeholder raised the "moral imperative" of the CDRT taking a greater leadership role in childhood injury prevention. The more common argument was that the volume of serious injury in comparison to deaths by injury necessitated a widening of the brief of the CDRT:

> *But it makes sense to me for the CDRT to be able to expand to include serious injury, simply because of the injury pyramid that we know so much about. It's such a tiny proportion, those that actually die compared to those with serious injury, that it makes sense for someone involved, such as the CDRT, to then help dictate where resources should go and when – to identify the burden of injury.*

3.5.3.2 Context

Importantly, the context in which injury prevention occurs, as described throughout this report, is complex, with multiple injury conditions, multiple stakeholders and multiple perspectives. In considering the CDRT's role in leadership or coordination therefore, the relationships with other stakeholders are critical.

Overall, in terms of its leadership potential, the CDRT was viewed very favourably by almost all stakeholders who commented on their role. Some saw them as a possible alternative to the "natural" leadership role of the Ministry of Health.

Comments such as the one below, firstly, acknowledge the importance of the positioning of the CDRT, and secondly, endorse the Team taking up some sort of leadership or coordinating role:

> *I think the CDRT is really well placed to take this coordinating role because they have a legal framework with which to collect the data and if they could extend that on to injury and – in the same way I think they're perfectly positioned also because they're outside of any of the other organisations.*

Neutrality is a key point in favour of CDRT leadership:

> *Absolutely, yeah, because, I think again they're across – I don't think they're specific to one type of injury, they're not seen as being favouring one injury over the other.*

3.5.3.3 Stakeholder knowledge of the CDRT

While all of the stakeholders interviewed were aware of the existence and broad responsibilities of child death review teams, not all had a clear understanding of the role of the NSW CDRT in terms of injury prevention. Some were not aware of the Team's location within the Office of the NSW Ombudsman and only a few had any direct involvement in the CDRT. Some indicated that the CDRT were not the obvious leaders or the 'go to people' for childhood injury prevention, or that they are very aware of their influence on addressing problems:

> *I certainly don't get the feeling that their power to influence programs has been that strong, I think, there's the identifying some priority areas, but not necessarily in the delivery of, or how to address those priority areas… it's possible that they are highly effective and just poorly communicated.*

Others indicated that they would require a better understanding of the current role of the CDRT to consider their capacity for true leadership across child injury prevention. They would also need a better understanding of how they might put leadership into practice:

> *The CDRT is a level of government that's got some gravitas in terms of giving the injury prevention a profile and making it happen, but I don't exactly know the practicalities of what would happen.*

Despite this initial caution, the overall comments about the Team's work were very positive, described as "well-respected" and "in a good position of authority". For example, one stakeholder did not know a lot about them "but I do know their reports are credible and well regarded, and that's a good place to start from".

3.5.3.4 From reviewing deaths to serious injury

Fortunately death from injury in children is a rare occurrence in Australia; the mechanisms which lead to child deaths are relatively narrow. In comparison, serious injury which is reported in ED, hospital or even GP visits is large and complex. Some stakeholders feared that injury prevention driven from a deaths perspective could be quite narrowly focused to, for example, preventing road related deaths, drowning or interpersonal violence. While this was not seen in negative terms, it does not encompass the breadth of serious injury issues.

The expansion of the work of CDRT to include serious injury could address this problem. It was regarded by many as a good solution, because many of the smaller injury prevention organisations would see a point and a purpose to having more collaboration with a Child Death and Serious Injury Review Team. It would for example improve the likelihood of action at the government level to tackle issues such as consumer product injury in children and to broaden the range of stakeholders which they could meaningfully engage in bigger injury problems.

It appears that child injury is an important focus for the Queensland CDRT where the Team is part of the Queensland Family and Children's Commission and Child Commission (formerly Commission for Children and Young People). Here they include injury prevention messages and strategies in their annual reports, although it was noted that the scope of the CDRT has been somewhat narrowed since becoming part of the Commission. The CDRT's counterpart within South Australia, the Child Death and Serious Injury Review Committee, has a statutory

obligation to review cases in which children die or suffer serious injury with a view to identifying legislative or administrative means of preventing similar cases of death or serious injury in the future.

An important pre-requisite for the CDRT to take up leadership in child injury prevention in NSW would be to expand its remit to considering serious injury, and possibly the need to change legislation if it were to review serious injury.

3.5.3.5 Implications of expanding role to include serious injury

Some interviewees raised questions about whether the CDRT has the resources to expand their role and noted the approvals which would be required for the CDRT to move towards looking at serious injury. A number of stakeholders commented positively on the possibility of the CDRT expanding its remit to include serious injury. Some thought this move was credible and workable:

> *It's really important and very valuable and if they could then extend that to serious injury, and they would have the imprimatur of accessing research and analysing and then producing a really solid piece of work which people then use as their evidence, or as their source document, which is what you do in relation to deaths, but at the moment there isn't somewhere where you can go with serious injury.*

The CDRT's role in reporting on linked data requires further consideration. There would be a need for partnerships with universities and research institutes to ensure credible research and particularly to gain ethical approval for research. The view from some researchers was that complex data linkage is a role best left to experts:

> *It would have to be delivered on a regular and timely basis. Like yearly or second yearly, and then be almost like a report done from it as a general - a bit like the Child Death Review Team report now, but it just depends on how much detail and whether you would do special reports, or whether you would be relying on researchers to - you might ask particular researchers to do particular special reports on areas of injury, that could come out of it.*

Stakeholders raised a number of important and useful concerns and cautions which highlight the expectations of leadership in this area. For example, the need to consider the "layers" involved in any change for the CDRT including ensuring that there is a strong capacity, a policy commitment, identifying needs and following through.

One stakeholder raised the issue of the freedom of the CDRT to disseminate information that may be detrimental to government:

> *If something came out in the research findings that was detrimental to the government, are they going to be able to publicly release that information? They've got to have some sort of credibility behind them and I don't know, for me, I see I guess the research end of things sitting outside of the government. They'd have to have some sort of structural change and partner with a university if they wanted to do it themselves I think for their research to be credible.*

At the moment there is limited knowledge across the broader injury prevention stakeholder group about how CDRT reports are currently used, including their use in informing interventions:

> *I think it really comes down to defining what it is that this body is going to do. What has this body done in the past? What's worked, what's not worked and how wet do you want to get your feet?*

By strengthening and coordinating efforts towards childhood injury prevention in NSW there is a greater possibility to drive and encourage the Australian Government Department of Health to consider what is needed at the national level so that states can run their own programs but have a national benchmarking system to compare how they are doing.

> *The space is vacant for leadership, and as long as people are brought on board and brought with that process, identifying who the major agencies are for injury prevention which leads mostly to hospitalisation, if you engage with those organisations I think they'll be very happy that there is a central government body which is interested in all injury prevention. So I think that because of the space at the moment, there's no competition.*

The lack of coordination and resourcing of child injury was noted by many stakeholders who thought that anything that could be done to address child injuries rather than having a gap, is a good thing. Others commented that if the CDRT has the data and is able to do more than it should do so, almost as a moral imperative.

3.5.4 Implications for NSW

The social, economic and health consequences of childhood injury are significant. Childhood injury prevention is an issue that should be high on the NSW government policy agenda. The CDRT, in its role of reviewing the deaths of children is in a unique position to integrate the insights it gains from the review of child deaths (particularly for vulnerable populations) to inform understanding of both intentional and unintentional childhood injury prevention priorities and vulnerable groups.

However, limitations to the Team's capacity to pursue a broader mandate within the current legislative framework are clear.

The NSW Ombudsman is the Convenor of the CDRT in NSW and staff from this office support the CDRT to perform its functions:

- The NSW CDRT reviews the deaths of children in NSW. The purpose of the CDRT is to prevent and reduce child deaths.
- Reviewable child deaths – deaths of children. Since December 2002 the Ombudsman has had responsibility for reviewing the deaths of people with disability in care, and of certain children. A child's death is reviewable if they died as a result of abuse or neglect, or their death occurred in suspicious circumstances; or at the time of their death the child was in care or in detention.

- Role in oversighting the handling of allegations of a child protection nature against employees by designated government and non-government agencies (Thompson et al 2015, p.33).

The legislative remit prescribes the role of the CDRT in NSW, for example a focus on 0 – 17 year olds. The retrospective review of child deaths provides valuable lessons for policy makers, practitioners and researchers, however it is timely to consider extending the focus to serious injury.

While it is not suggested that the CDRT take the lead agency role in NSW for childhood injury prevention there is a lost opportunity by not widening the brief of the team to include serious injury and fostering greater collaboration with injury researchers and practitioners.

The interest in childhood injury prevention has raised several important questions for the CDRT including, in the words of one stakeholder, whether it is a "bridge too far" for the Team.

- What is the Team's vision for leadership in this area?
- Would there be general support for the idea of a leadership role and expanded role in serious injury?
- Would the role be to lead, coordinate and / or engage stakeholders and provide opportunities for collaboration?
- Would a Child Death and Serious Injury Review Team have an opportunity to lobby for funds, or programs?
- What other resources do they have at their disposal?
- What does this means for the other agencies, government or non-government?
- How would they communicate this to agencies currently operating within injury prevention?
- What are the challenges in changing the legislation to allow them to review serious injury?

A crucial decision for the CDRT is whether they have the capacity and resources to expand their current focus. The degree to which the Team can focus on injury prevention, particularly in relation to the report's key areas of focus – policy, data, research and collaborative action – is a question for the Team. The Team could consider whether serious injury might form the focus of a sub-group of the current team or a separate child injury review committee. Such a decision would also be dependent on available resources.

3.6 Conclusion

This report set out to identify strategic options for coordination of childhood injury prevention in NSW. It has synthesised the key lessons and provided examples of good practice in coordination gained from the experience of other countries perceived to be leaders in childhood injury prevention. A detailed review of how other Australian states and territories coordinate policy, data and research efforts in childhood injury prevention has allowed consideration of which coordination mechanisms might work best in NSW. However decisions about what is feasible at a state level cannot be made without the input of appropriate representatives of government.

The major findings arising from this report are summarised briefly below in relation to the four key components of a coordinated approach to childhood injury prevention.

Policy leadership

There is a clear view amongst childhood injury experts that having a plan to facilitate injury prevention efforts is an essential initial strategy. However the plan on its own is clearly insufficient for coordination. To be effective, it is also important to ensure that child injury is tackled using multiple strategies which support each other, for example, legislation, policy, regulation, education, awareness and behaviour change.

Efforts to address childhood injury are seen as fragmented as there are so many different types of injury, and the approach to prevention differs according to mechanism. There are few opportunities within NSW, for those working in this field to share insights or collaborate in developing more effective strategies.

In the absence of government leadership it is difficult for injury stakeholders to collaborate and catalyse meaningful change to an extent which could make a big difference. A lack of communication and understanding between organisations operating at the state level and coordination on a local level is also a limiting factor.

Within NSW there is no one government department that has responsibility for the coordination of childhood injury prevention efforts state-wide. Historically within NSW policy leadership in childhood injury prevention has come from NSW Health. However, while there is scope to do more in the space of injury prevention from a health perspective, there is still little clarity or certainty about the coordination and leadership of the child injury prevention area.

Data and information systems

There is considerable expertise within NSW in the use of data linkage to support childhood injury prevention efforts. The former NSW Kids and Families provided a single funding grant in 2015 for a stocktake of existing population-based data collections that recorded information on injuries involving children and young people in NSW. This stocktake found that none of the data collections examined were ideal to conduct injury surveillance of children and young people in NSW (Mitchell and Testa 2015).

The stocktake may inform future discussion about childhood injury surveillance and has also provided information that could assist in the development of a suite of performance monitoring

measures to monitor childhood injury reduction strategies in NSW (Injury Reference Group 2016).

Research and knowledge translation networks

The most effective strategies to support research coordination centre on clear government priorities supported by adequate funding and mechanisms to facilitate research dissemination and translation.

Networks and collaboratives are also useful in bringing researchers together. There is merit in enhancing effective research networks to support greater collaboration in the advancement and translation of knowledge in childhood injury prevention.

Following on from the 2014 forum, the Paediatric Injury Prevention and Management Research Reference Group was established. This group continued to meet on a biannual basis until the end of 2016 and provides a strong model for future collaboration, through exchange of information and coordination of injury research, data, policy and prevention efforts.

Coalitions, collaborations and partnerships

The very broad range of stakeholders involved in action to prevent injury to children makes coalitions, collaborations and partnerships an essential component of the way most organisations and individuals work in this field.

The key points made about injury prevention practice by the stakeholders were: the benefits of long term funding; the increasing importance of coalitions, collaborations and partnerships, particularly research partnerships; the growing importance of advocacy; and the changes in messaging and communication, including the rapid uptake of social media.

Strategic observations and recommendation

The key strategic observations are listed below; these provide a common starting point for future discussions:

- Strong partnerships amongst key stakeholders and robust inter-agency and cross-organisational relationships provide the foundation for effective coordination.
- Coordination of childhood injury prevention is complex and not achieved through a single initiative but through action on multiple fronts (for example leadership resulting in clear policy direction, robust data from effective surveillance systems used to underpin evidence-based approaches, support for high quality research and knowledge translation and collaborative mechanisms to bring people together that are funded, supported and sustained over time).
- There is no magic bullet that generates policy leadership; this comes from political will and is articulated by committed policy officers through strategic frameworks and plans that identify priorities for action and set the agenda for change. As preventing unintentional injuries cuts across the responsibility of a number of government departments, one department must take the lead and coordinate activities to ensure that effort is not duplicated or, worse still, not undertaken.

- Effective child injury prevention efforts must be data driven and evidence based. Strengthening surveillance systems, particularly through the more effective use of existing datasets has been successfully demonstrated internationally as has the use of state or national “action indicators” to monitor progress in childhood injury prevention efforts. There are opportunities to increase the use of data linkage to better target injury prevention interventions for the most vulnerable populations. The NSW Ministry of Health is already leading the way in the coordination of data and information access on injuries involving children and young people.
- The most effective strategies to support research coordination centre on clear government priorities supported by adequate funding and mechanisms to facilitate research dissemination and translation. Networks and collaboratives are useful in bringing researchers together.
- There need to be clear mechanisms to bring people together that are funded, supported and sustained over time. The Australian Injury Prevention Network provides an example of a mechanism to foster research collaborations.
- The CDRT has a unique insight into factors that might mitigate serious injury through its annual review of child deaths in NSW. Child death review findings can and do inform prevention strategies. There is scope for the CDRT to strengthen their involvement in childhood injury prevention; what form that takes will be guided by the views of the CDRT and its legislative remit.

It is recommended that this report be referred to the NSW Ministry of Health for initial discussion with the CDRT, about the way forward for childhood injury prevention.

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Appendix 1 Methods

1.1 Literature review

A rapid review of the literature was completed specifically focused on coordination mechanisms used within Australia and in selected international locations that are relevant to childhood injury prevention.

It is narrative in structure and was completed to provide an overview of approaches to coordinating childhood injury prevention at the level of a state, province or nation. It provides context to place the information into perspective. The practice literature (or 'grey' literature) provided the most relevant and current examples of effective coordination mechanisms.

1.1.1 Practice literature search

The practice literature search strategy comprised two key activities. The first was a purposive search of Australian government websites to identify current approaches to the coordination of childhood injury prevention both nationally and within each state and territory. The respective Department of Health in each jurisdiction provided the starting point for review. In several instances, where information was incomplete, email or telephone contact was made with government officers to secure additional detail. These website searches were supplemented by Google searches that were restricted to Australia and used the search terms outlined below.

The second strand of the search strategy focused on international organisations and a selected group of countries perceived to be leaders in the coordination of childhood injury prevention efforts. Several of these organisations and countries were identified through the stakeholder consultation process.

Google searches were undertaken of New Zealand, Canada, the United States and the United Kingdom. Sweden, Finland and the Netherlands, were selected as specific European countries for closer investigation as they were among the leading countries in the European Child Safety Alliance's 'Child Safety Report Card 2012' (Kmietowicz 2012).

Search terms included a mix of key words used in various combinations:

- Child
- Childhood
- Injury
- Injury prevention
- Injury coordination
- Safety
- Safety promotion
- Country/region.

A review was completed of the first ten pages of results generated from these search term combinations using Google.

Other supplementary searches were undertaken where necessary. For example “snowballing” from one site could lead to the checking of an additional site. Health departments for each major country/region were also searched using these terms.

The aim was to yield reports on actions taken by governments and key organisations to strengthen coordination of childhood injury prevention at a national, state or provincial level that have not been published in the academic literature. This produced a range of policy documents, reports and webpage entries that were reviewed by several members of the research team (over 170 items).

1.1.2 Academic literature search

A range of search terms/key words were used in the academic literature searches, including:

- Child injury prevention
- Child safety promotion

Used in combination with the terms: “national framework”, “national strategy”, “forum” and “policy leadership”.

A search strategy example appears below:

- (child OR childhood) AND (injury OR "Injury prevention" OR "Injury coordination")
- AND (prevention OR safety OR "safety promotion")
- AND (“national framework” OR "national strategy" OR "policy leadership")

The databases searched included MEDLINE, CINAHL, Google Scholar, Trove and Libraries Australia (to search for Australian theses), and Dissertations Abstracts (to search for overseas theses). In addition the Summon database was used, a specific library search engine, that includes 80% of databases held by the University of Wollongong library.

Systematic methods for searching the literature are necessary but not sufficient to find all the relevant literature, particularly for a topic as broad as child injury prevention coordination mechanisms. Database searching was supplemented with snowball searching by pursuing references of references and tracking citations forward in time. In addition, the journal *Injury Prevention* was hand-searched for articles published from 2014-2016. Additional articles were found searching reference lists, and searching on specific authors. Leads on articles and programs noted by interview participants were also followed up.

1.1.3 Inclusion and exclusion criteria

Literature searching covered the period 2006-2016 and was restricted to English language publications (and was on occasion supplemented by earlier articles where the article was identified though other processes and deemed to be relevant). Exclusions included publications from developing countries (because of the very different nature of their health systems).

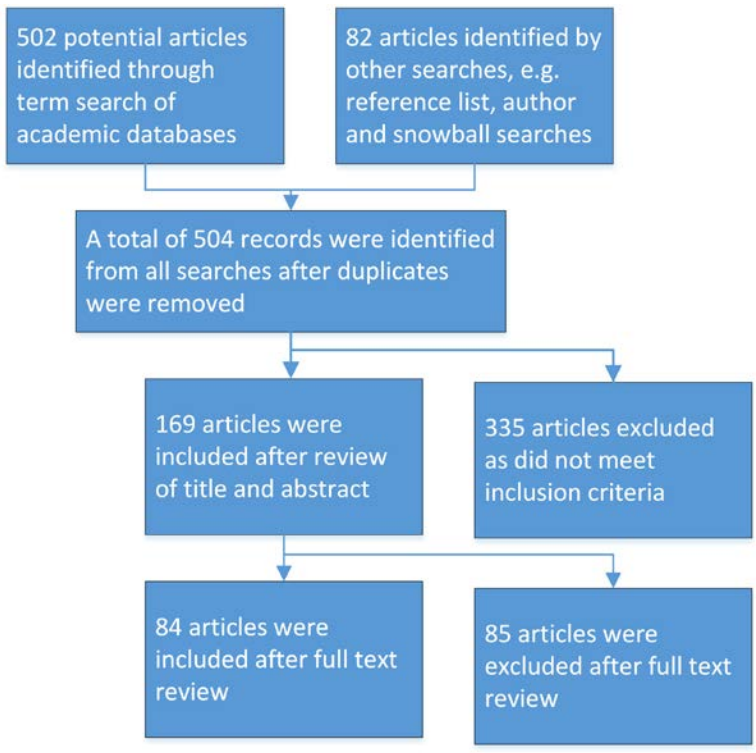
The main inclusion criterion was evidence of effective coordination mechanisms relevant to childhood injury prevention. Articles were included in the review if they addressed the coordination of policy, programs, data collection or research at a regional, state or national level. In particular articles looking at frameworks and/or collaboration in relation to policy development and implementation, coordination between stakeholders and organisations in the development and implementation of injury prevention efforts, collaboration in injury prevention research efforts and research agenda setting, and collaboration in data collection and use. The primary focus was on articles aimed at childhood injury prevention; however, broader injury prevention efforts or frameworks were included (e.g. child and maternal health) if they were found to inform child injury prevention.

Articles that focused on evaluations of singular programs or prevention efforts without a focus on coordination at the broader level or without coordination of or collaboration between multiple stakeholders were excluded from the review.

1.1.4 Literature review process and results

A total of 504 articles were identified from all searches, after removal of duplicates. A brief title and abstract review resulted in 169 items downloaded to EndNote. This initial review of academic literature was completed by one team member, however, where it was unclear if an article should be included or excluded, a second team member, using the agreed inclusion and exclusion criteria, reviewed the abstract. Results were compared and discussed until agreement was reached on the inclusion and exclusion of all articles. This resulted in the inclusion of 84 academic articles after full text review. (The summary review of these articles was assembled in an Excel file, which is available as a separate Supplementary Appendix). Figure 2 provides a PRISMA chart (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) of the academic literature selection process.

Figure 2 PRISMA flow chart



As the focus of the literature review was on policy, frameworks and strategies for coordination of childhood injury prevention and not about interventions, the quality of the evidence was not formally evaluated.

1.1.5 Article review process

An Excel spreadsheet was setup into which article details were entered to allow for thorough analysis. Column headings included reference details, the country of focus in the article, description of article, population, setting, findings and comments. Article findings were organised according to four themes including:

- Strategic approach to policy leadership and coordination of childhood injury prevention
- Stakeholder initiatives – improved collaboration between organisations, including any reference to coordination of interventions/messaging
- Coordination of data/information
- Coordination of research/example of collaborative initiatives.

1.2 Semi-structured interviews

Participants were contacted via email in July 2016 to participate in a semi-structured interview. A convenience sample was selected based on the need to predominantly include the views of key stakeholders in NSW however experts in other jurisdictions were deliberately targeted in order to learn from their experiences. International experts were selected on the basis of reputation and publication records.

Semi-structured interviews were completed over the period July – October 2016 with key informants (24 Australian and four international experts), to explore their views about key strategic opportunities for coordination in childhood injury prevention in NSW. Stakeholders included senior academics and researchers, health department representatives, policy analysts, directors of research institutes and non-government organisations, all with highly relevant and wide ranging expertise in this field. A total of 21 interviews were conducted with 28 participants (i.e. three interviews had more than one participant). The mean length of interviews was 47 minutes. The approximate total duration of all interviews was 16.5 hours. All stakeholders received a Participant Information Sheet and Interview Guide prior to the interview being undertaken (refer to Appendix 2).

Table 1 Organisation types of interview participants

Organisation type	Qld	NSW	ACT	VIC	TAS	SA	WA	NT	Int'l	TOTAL
Government	-	11	-	1	-	-	1	-	2	**15**
NGO	-	1	-	-	-	-	1	-	1	**3**
Research entity	-	5	-	1	-	1	-	-	1	**8**
Network	2	-	-	-	-	-	-	-	-	**2**

A specialist transcription company transcribed interviews under a confidentiality agreement and one researcher initially reviewed all transcriptions. A second researcher imported these transcriptions into the NVivo software application to facilitate data analysis. An initial set of codes informed by the literature review was amended and refined as data analysis progressed, with inclusion of additional codes developed inductively.

In this report, direct quotes are presented in italics and indented; quotes from interview participants are in a blue typeface to distinguish them from quotes from other sources (black typeface).

Appendix 2 Participant information sheet and interview guide

Participant information sheet

Project 'Childhood injury prevention – strategic directions for NSW' project

Funding Body NSW Ombudsman

Chief Investigator Professor Kathleen Clapham
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Introduction

On behalf of the Office of the NSW Ombudsman, we invite you to contribute to the 'Childhood injury prevention – strategic directions for NSW' project. This project aims to identify key strategic opportunities for coordination in childhood injury prevention in NSW and will inform the work of the NSW Ombudsman and the Child Death Review Team.

Please read this Participant Information Sheet in full before deciding whether or not to participate in this research study. If you would like further information regarding any aspect of this project, please contact the Chief Investigator.

Background

In 2015, the NSW Ombudsman on behalf of the Child Death Review Team commissioned the Centre for Health Service Development (CHSD), University of Wollongong, Australia to undertake a scan of childhood injury and disease prevention infrastructure in NSW. The scan confirmed that there is a need for stronger leadership and coordination to deliver further improvements in childhood injury and disease prevention in NSW.

In response to this finding, the CHSD has been engaged to undertake another project, with the overall aim of identifying key strategic opportunities for coordination in childhood injury prevention in NSW. In particular, the project will consider three key areas:

- Research coordination – are there opportunities to coordinate research on childhood injury prevention, and who should lead that?
- Data coordination – are there opportunities to link and analyse relevant datasets to inform childhood injury prevention initiatives, and who should lead that?
- Stakeholder initiatives – are there opportunities for organisations with a role in childhood injury prevention to coordinate activities and messages?

What we would like you to do

You are invited to take part in a semi-structured telephone or Skype interview, which will take approximately 45 minutes. During the interview you will be asked about your views about coordination and leadership strategies relevant to childhood injury prevention. We recognise that individuals will be expressing their own views and not necessarily the views of the organisation that they work for. A list of the interview questions has been provided with this Participant Information Sheet.

Why were you chosen for this research?

You are invited to participate as you have been identified as an individual with highly relevant and wide ranging expertise and interest in childhood injury prevention and/or effective mechanisms of coordination in this field.

Your rights to consent to participate or withdraw from the project
You will be provided with a consent form which you may sign and return, alternatively your consent will be implied if you participate in the telephone interview. Your involvement in this study is voluntary and you are under no obligation to participate. You have every right to withdraw your consent and to discontinue at any time during the interview; this includes requesting the withdrawal of any data/information that you have provided. Refusal to participate or withdrawal of consent and data concerning yourself will not in any way affect your relationship with the NSW Ombudsman or with the University of Wollongong.

What we will do with the data
To ensure that there is an accurate record of what you say we would like to record your interview. If you agree to recording of the interview you can stop the recording at any time during the interview. However, if for any reason, you do not wish the recording of the interview to proceed, the interview will be recorded by the taking of notes.

Data will only be accessible to members of the research team from the Centre for Health Service Development, University of Wollongong. Your privacy rights will be protected. Confidentiality will be maintained at all times. The recordings will remain the property of the Centre for Health Service Development and be retained for five years and then destroyed. Recordings will be stored electronically on a password-protected server and hard copies of any data kept in locked filing cabinets in a building with a robust security system.

All data will be aggregated and thematically analysed. It will be used in combination with a literature review to inform the final report which will be submitted to the Child Death Review Team, Office of the NSW Ombudsman. The report will be either a stand-alone report to be tabled in the NSW Parliament as Stage 2 of the Child Death Review Team's focus on childhood injury prevention or a chapter in the NSW Child Death Review Team Annual Report in 2015 (for publication in 2016). We may also publish in peer-reviewed journals or via conference presentations. No individually identifiable information will be included in any reports, publications or presentations. When especially pertinent, direct quotations may be used from interviews; these quotations will not be attributed to an identifiable individual interview participant.

Possible risks and inconveniences
We do not foresee any potential risks or burdens associated with the interview for you, apart from the estimated 45 minutes of your time taken to participate. The interview will be scheduled at a date and time that is most convenient for you.

Funding and benefits of the project
This project is funded by the NSW Ombudsman. There is no direct benefit to you by taking part in the interview. However, it is anticipated that identifying strategic opportunities for advancing stronger leadership and effective coordination in childhood injury prevention in NSW will ultimately contribute to improvements in services delivered by agencies and organisations working in this field.

Complaints
Ethics approval has been granted from the University of Wollongong Human Research Ethics Committee. If you have any concerns or complaints regarding the way that this project is conducted, you can contact the Complaints Officer, Human Research Ethics Committee, at the University of Wollongong on 02 4221 4457 or email rso-ethics@uow.edu.au and quote the reference number HE16/159.

Thank you in anticipation of your contribution.

Professor Kathleen Clapham
Chief Investigator on behalf of the project team

Interview questions

1. How is childhood injury prevention addressed currently within your organisation / jurisdiction?

2. Have approaches to addressing childhood injury prevention shifted over recent years within your jurisdiction / organisation, or are there plans for change in the near future? If so, can you expand on this please?

3. What have you found to be the most effective strategies to support a coordinated approach to childhood injury prevention amongst government, non-government and other stakeholders in within your jurisdiction / locality?

4. What are the current barriers to a coordinated approach to childhood injury prevention?

5. Can you describe any other mechanisms for coordination of childhood injury prevention that you have come across in other parts of Australia or overseas? If so, can you expand on this please?

6. Are you aware of other locations where coordination of childhood injury prevention appears to be particularly successful? If so, can you expand on this please?

7. Are there opportunities to coordinate research on childhood injury prevention, and who should lead that?

8. Are there opportunities to link and analyse relevant data sets to inform childhood injury prevention initiatives, and who should lead that?

9. Are there opportunities for organisations with a role in childhood injury prevention to coordinate activities and messages (i.e. stakeholder initiatives)?

10. What do you see as the priorities for action to establish leadership and coordination in childhood injury prevention?

Do you have any other comments?

Appendix 3 Findings from the literature – Australian context

3.1 Introduction

The rapid review of the literature explored two fundamental questions:

- How do the Australian Government, states and territories manage childhood injury prevention?
- What can be learned from international best practice in coordinating and leading an integrated approach to childhood injury prevention?

The major findings for each geographic location are summarised under a series of sub-headings:

- Policy leadership (examples of policy leadership in childhood injury prevention)
- Data and information systems (examples of data collections, coordination and use)
- Research and knowledge translation networks (examples of collaborative research partnerships and initiatives)
- Coordination (examples of collaboration, partnerships and coordination of stakeholder initiatives)

The information provided in relation to each Australian entity and international country is provided for illustrative purposes and is not intended to provide information about every available example relevant to coordination of childhood injury prevention efforts.

3.2 Australian Government

Injury prevention is considered a shared responsibility between the Australian Government and the states and territories. A range of government departments contribute to childhood injury prevention in a way that aligns with their departmental focus and legislative remit.

Policy leadership

- Key international frameworks to protect the rights of children are recognised in Australia and underpin policies relevant to childhood injury prevention.
- The expiry of the *National Injury Prevention and Safety Promotion Plan (2004-2014)* has reduced the visibility of childhood injury issues at the national level (Thompson et al 2015).
- Under the auspices of the Council of Australian Governments (COAG) Health Council, its advisory body, the Australian Health Ministers' Advisory Council (2015), issued the report *Healthy, Safe and Thriving: National Strategic Framework for Child and Youth Health.* This document sets a national direction for child and youth health in Australia (from preconception to 24 years of age). It is intended that both government and non-government sectors will use this Framework to guide their work.
- The Framework outlines fives strategic priorities with a series of supporting objectives and actions. Strategic priority one: equip children and young people with the foundations for a healthy life, includes objective 1.4 Children and young people have lower rates of preventable injury and mortality. The priorities include: reduce drownings, reduce motor

vehicle accidents, including driveway run overs, reduce falls and reduce self-harm and suicide (Australian Health Ministers' Advisory Council 2015, p.34).

- Injury prevention initiatives, relevant to the 0 – 17 year old age group, are integrated throughout a range of national strategies, for example: the *National Binge Drinking Strategy* and the *National Suicide Prevention Strategy* (which aims to prevent injury in young Australians).
- The *Australian Water Safety Strategy 2016-2020* was launched by the federal Minister for Health, Aged Care and Sport in conjunction with the Australian Water Safety Council (AWSC) in April 2016 and supports the AWSC's goal of reducing fatal drowning by 50 percent by the year 2020. It outlines priority areas in which Australian peak water safety bodies Royal Life Saving, Surf Life Saving and AUSTSWIM, AWSC Members and Federal, State/Territory and Local Governments must work together to prevent drowning (Australian Water Safety Council 2016). The policy takes a life stages approach; targets high-risk locations and focuses on key drowning challenges.
- The *National Road Safety Strategy 2011-2020* provides strategic directions and targets to improve road safety. It is complemented by comprehensive state and territory road safety strategies. There is currently no reliable national collection of serious injury crash data, largely because of jurisdictional differences in injury definitions and reporting arrangements. As a matter of priority, road transport agencies are working towards the adoption of nationally consistent road crash classification definitions and an improved national serious injury database. This will be essential for effective monitoring of progress towards the serious injury target (National Road Safety Strategy 2015). Several projects are in train and include data linkage approaches at the national level as well as the development of collaborative networks to develop a positive road safety culture, (these are not directed specifically at childhood injury prevention).
- Many other entities contribute to transport safety, for example, the Australian Transport Safety Bureau is an independent Commonwealth statutory agency. Its function is to improve safety and public confidence in the aviation, marine and rail modes of transport. In addition to independently investigating transport accidents and other safety occurrences it also conducts safety data recording, analysis and research and fosters safety awareness, knowledge and action. It does not have a particular focus on childhood injury prevention but does report on transport related accidents where children are injured.

Data and information systems

Injury surveillance can be argued to be the foundation of successful injury prevention (Mitchell et al 2008). The importance of data to formulate policy has been emphasised in the literature, as has the importance of data exchange between agencies, particularly in the area of mortality data and death investigation, as this information is often held by legal and administrative agencies rather than health agencies. The strong influence health information has on research, health care priorities and health policy development (including injury prevention related research and policy) has also been recognised (Ranson 2010).

Injury prevention and control is supported by the Australian Government Department of Health through the National Injury Surveillance Unit (NISU) of the Australian Institute of Health and Welfare (AIHW), the National Coroners Information System and the National Poisons Register

(Australian Government Department of Health 2013). The role of data from the National Coroners Information System in influencing injury prevention initiatives (e.g. blind and curtain cord safety) has been highlighted (Ranson 2010).

The AIHW and the Australian Bureau of Statistics (ABS) are the primary sources of information and data about childhood injury. A range of injury publications describing trends in injury deaths and hospitalisations are available. Examples of recent publications by AIHW include: *A picture of Australia's children 2012* and *Poisoning in children and young people 2012-13*. The latter publication provides information about children and young people aged 0-24 who were hospitalised as a result of poisoning in Australia, this was released in July 2016. The AIHW has also produced publications over many years, relating to children's hospitalisation due to injuries, for example: *Hospitalised injuries in Aboriginal and Torres Strait Islander children and young people: 2011-2013* (AIHW Pointer 2016).

Australia's first National Children's Commissioner was appointed in March 2013. This role is based within the Australian Human Rights Commission and focuses on the rights and interests of children, and the laws, policies and programs that impact on them. The annual *Children's Rights Report 2015* includes a particular focus on family and domestic violence and its impact as a contributing risk factor to intentional self-harm and suicidal behaviour in children and young people (Australian Human Rights Commission, 2015). The *Children's Rights Report 2014* recommended the strengthening and development of surveillance of intentional self-harm involving children and young people aged 0-17 years (Australian Human Rights Commission, 2014). The Commissioner has also noted the efforts of the Australian and New Zealand Child Death Review and Prevention Group to establish a national child death and injury database in collaboration with the AIHW (Australian Human Rights Commission, 2015 p.29; Commission for Children and Young People and Child Guardian, 2013 p.113).

In 2008, Mitchell and colleagues noted of 22 recommendations on injury surveillance put forward in various national policies and strategies on reducing the burden of injury in Australia released in the previous two decades, only three had been completely implemented. To advance national injury surveillance capacity and encourage innovation in the area, they suggest key priority initiatives, grouped into four themes:

- Improving the current injury mortality and morbidity data collection systems;
- Filling the gaps in injury surveillance by extending surveillance beyond the most serious injury outcomes, ensuring that all geographic areas are covered, and maintaining vigilance over data quality;
- Increasing the integration and accessibility of injury data through data warehousing and data linkage; and
- Developing technical expertise in surveillance among researchers and data coders (Mitchell et al 2008).

Research and knowledge translation networks

The Australian Government National Health and Medical Research Council (NHMRC) is a major source of research funding. In 2014 research aimed at preventing injuries and improving treatments received a $26.1 million funding investment through the NHMRC grants (National

Health and Medical Research Council 2014). In announcing this funding injury was confirmed as one of the Australian Government's nine National Health Priority Areas – these are also priority research areas for the NHMRC. A review of grants data from 2014 – 2016 shows that while projects were funded that addressed children very few included an emphasis on childhood injury prevention (National Health and Medical Research Council 2016).

Child Family Community Australia is an information exchange for practitioners, policy makers, service providers and researchers working with children, families and communities. Child Family Community Australia is funded by the Australian Government through the Department of Social Services (Australian Institute of Family Studies 2016a).

Coordination

At a national level, policy coordination is complex. The Department of Prime Minister and Cabinet is responsible for coordinating the Australian Government's regulatory policy priorities across all portfolios and works closely with Regulatory Reform Units in each Australian Government portfolio and with regulatory policy areas in state and territory governments. The reforms are diverse and range from efforts to reduce the regulatory burden through to strengthening consumer safeguards.

A "whole of government" approach is another mechanism that supports coordinated efforts to address a complex or "wicked problem" at the national level. A "whole of government" approach is defined as follows:

> *Whole of government denotes public service agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues. Approaches can be formal and informal. They can focus on policy development, program management and service delivery (Management Advisory Committee 2004).*

Leadership from ministers and agency heads is a critical part of whole of government work. The distinguishing characteristic of this approach is that there is an emphasis on objectives shared across organisational boundaries, as opposed to working solely within an organisation. It encompasses the design and delivery of a wide variety of policies, programs and services that cross organisational boundaries. There are three main types of whole of government activity: between Australian government agencies; between different levels of government; and between the public, private, non-profit and community sectors. Mechanisms that support this approach include the Council of Australian Governments; taskforces; national frameworks; shared Ministerial leadership; use of a Ministerial board; alliances and partnerships with representative groups external to government.

Whole of government initiatives can result from formal "top-down" decisions requiring a cross-portfolio approach, alternatively, many initiatives begin at the local level where people from different agencies work together to achieve shared goals for one community. There is currently no nationally coordinated approach to childhood injury prevention within Australia.

3.2.1 Australian peak bodies and other non-government organisations

Significant work continues to be undertaken by a large number of effective and varied groups. Many of these groups work collaboratively either through loose coalitions or formal partnerships. A large number of organisations are engaged around prevention of childhood injury according to external cause, for example: water safety and sports injury prevention. Several examples are provided from the non-government sector below.

Kidsafe is the leading non-government organisation with branches in each state and territory, dedicated to preventing unintentional childhood injuries and reducing the resulting deaths and disabilities associated with injuries in children under the age of 15 years. In terms of stakeholder initiatives, Kidsafe (The Child Accident Prevention Foundation of Australia) is a key organisation both nationally and in each Australian state and territory. Johnson (2009) explains the organisation's structure and role:

> *Kidsafe organisations across Australia have taken a leadership role in working to reduce preventable and unintentional deaths and injuries since 1979. The Child Accident Prevention Foundation of Australia is its national body and licenses the Kidsafe brand to independently incorporated Kidsafe organisations in each Australian state and territory.*

The Australian Research Alliance for Children and Youth is a national non-profit organisation which focuses on bringing together researchers, policymakers and practitioners, to turn the best evidence on "what works" for child and youth wellbeing into practical, preventative action to benefit all young Australians (Australian Research Alliance for Children and Youth no date).

The KIDS Foundation is a not-for-profit, health promotion charity dedicated to childhood injury prevention and injury recovery. They run a variety of injury prevention and safety education programs and campaigns nationally for children aged four to 16 (KIDS Foundation no date).

The Australian Safe Communities Foundation (ASCF) is a national, not-for-profit organisation. Their mission is to build and maintain a network of communities that are committed to and actively engaged in safety promotion. The ASCF is part of the Pan Pacific Communities Network, which is made up of Australia, New Zealand, Canada and the United States (Pan Pacific Safe Communities Network no date).

There are a range of organisations that focus on a specific aspect of childhood injury prevention, for example, FarmSafe Australia (child safety on farms) and the Royal Life Saving Society Australia (child injury and drowning prevention).

The Australian Injury Prevention Network is the peak national body advocating for injury prevention and safety promotion, for all ages, and all causes of injury prevention and control in Australia. It represents injury prevention and safety promotion researchers and practitioners around Australia. It hosts bi-annual national conferences to promote injury prevention and is engaged in publications, events, advocacy activities and research. The main goal of the Australian Injury Prevention Network is to facilitate the minimisation of injury-related harm throughout Australia for all vulnerable population groups by coordinating the expertise of injury prevention researchers, practitioners, and policy makers.

The Public Health Association of Australia (2013) has taken a strong stance on the future of injury prevention and safety promotion in Australia, led by their Injury Prevention Special Interest Group. Key messages from a policy seeking to ensure a comprehensive program framework for injury prevention and safety promotion efforts in Australia were:

- New National Injury Prevention and Safety Promotion Plan(s) should be developed, implemented and resourced.
- A coordinating group should be established and resourced to monitor the implementation and review of the plans and advise all levels of government on injury prevention action.
- Preventing injuries is cost-effective and can reduce demands on hospitals, general practitioners and other medical services. For example, preventing falls and fall injury promotes independent living for older people, as well as reducing health care demands including transfer to residential aged care facilities.
- Injury prevention is vital and needs to be considered integral to the national preventative health program.
- Injury prevention interventions and efforts need to be informed by quality data, epidemiological research, and evaluation.
- Research funding support from sources such as the NHMRC need to be reflective of the health burden associated with injury, to build the evidence of effective interventions, which in turn supports effective interventions.

There are varied national non-government organisations that disseminate data relevant to childhood injury prevention. For example, the Australian Institute of Family Studies coordinate the broad Longitudinal Study of Children (LSAC) dataset (Growing Up in Australia: The Longitudinal Study of Australian Children) that assists to identify factors in the child's environment that are related to the occurrence of injuries (Australian Institute of Family Studies 2015)http://www.growingupinaustralia.gov.au/pubs/ar/ar2004/highlights.html.

Historically, various initiatives have been established in Australia aimed at strengthening injury surveillance, such as the National Injury Surveillance and Prevention Project (NISPP) by the Child Accident Prevention Foundation of Australia (CAPFA) in the late 1980s (Vimpani 1989).

3.2.2 Queensland

Policy leadership

A children's health strategic framework has been produced by Children's Health Queensland, a state-wide service specialising in the provision of healthcare to children and young people (Children's Health Queensland Hospital and Health Service 2015). Included in the 2015 update of the strategic plan is the articulation of one of its goals, "Reduced preventable injuries through targeted community education".

In addition to the Queensland Department of Health there are several other government departments with an interest in child injury prevention. For example, the Department of Transport and Main Roads has a key role in childhood injury prevention. This Department supports the 'Safe School Travel' program, designed to improve transport safety (all transport

types) for all children as they travel to and from school. The program is a result of wide consultation and a partnership with the State government's School Transport Safety Consultative Committee (comprising students and parents' groups representatives, government agencies and bus operator associations) (Queensland Government Department of Transport and Main Roads 2016).

Data and information systems

Queensland Health funds the Queensland Injury Surveillance Unit (QISU). QISU is seen as an exemplar of leadership and coordination in the collection of childhood injury prevention data (Queensland Injury Surveillance Unit 2009). Data is obtained from 15 hospitals in Queensland, comprising four sample regions: metropolitan, regional, tropical northern coast and remote. A strength of the current Queensland Emergency Department patient management system is the availability and use of an injury surveillance module.

The Queensland Family and Child Commission also have a role in data coordination, as the agency responsible for maintaining a register of all child deaths in Queensland.

Illustrative of the diverse and disparate nature of data and data custodians, a recent study that reviewed seven years of data on drowning in Queensland children and adolescents (0-19 years) sourced data from multiple sources including: Queensland Health Admitted Patients Data Collection (QHAPDC); Emergency Department Information System (EDIS); Surgical and Retrieval Team (SATR); Queensland Injury Surveillance Unit (QISU); Mater Health Services (paediatric and adult); Queensland Ambulance Service (QAS); the National Coronial Information System (NCIS); the Commission for Children and Young People and Child Guardian Child Death Review Unit (CCYPCG); and the Royal Life Saving Society Australia (RLSSA) (Wallis et al 2015).

Research and knowledge translation networks

Several organisations and centres engage in childhood injury and prevention research in Queensland, for example:

- Children's Health Queensland is the specialist state-wide hospital and health service based in Brisbane and includes the Lady Cilento Children's Hospital, Child and Youth Community Health Service, Child and Youth Mental Health Service and state-wide paediatric outreach and telehealth services. It also leads several state-wide services and programs and the Centre for Children's Health and Wellbeing. The organisation considers itself a leader in the translation of research into practice (Children's Health Queensland Hospital and Health Service 2015).
- The Centre for Children's Health Research, co-located with the Lady Cilento Children's Hospital, is Queensland's first fully integrated research facility focused on child and adolescent health research and services. The Centre was formed through a partnership between Queensland Health, through Children's Health Queensland, and leading research organisations that include the Queensland University of Technology, University of Queensland, Translational Research Institute and Queensland Children's Medical Research Institute (Queensland Government Children's Health Queensland 2015).
- The Centre for Accident Research and Road Safety – Queensland (CARRS-Q) is a university research centre that focuses on research, education and outreach activities in road safety. The centre also undertakes research under the theme of 'School and Community Injury

Prevention', which relates to both road safety and more generic injury prevention issues. For example, the project 'Protecting young people from harm and injury: Investigating the utility of a risk and protective framework' is currently in progress and the project 'Boosting the effects of a curriculum based injury prevention program for adolescents through a school connectedness intervention' was completed in 2011 (Centre for Accident Research and Road Safety – Queensland 2016).

- Also working in the field is the Recover Injury Research Centre (formerly Centre of National Research on Disability and Rehabilitation Medicine - CONROD). The centre is a joint initiative of The University of Queensland, Griffith University and the Motor Accident Insurance Commission and undertakes research for better health and lifestyle outcomes after injury, especially injury after a road traffic crash. They also host the 'Children's Accident Response Website', developed specifically for children and their parents that have experienced an accidental trauma (CONROD 2008).

Coordination

The Queensland Child and Youth Clinical Network (QCYCN), established in 2009, is a key coordinating mechanism in the state. This state-wide network drives service improvements in children's and young people's health. It functions as an independent Queensland Health body, funded by the Department's Healthcare Improvement Unit. It is hosted by the Children's Health Queensland Hospital Health Service. Membership comprises a wide range of clinicians from Queensland Health, non-government organisations, research organisations, general practice, and consumers. QCYN hold annual forums to exchange ideas, information and research and to determine future directions for the network to improve the quality of care for children and young people (Queensland Government Children's Health Queensland 2016).

In recognition of the ongoing work of injury prevention researchers and practitioners in Queensland, the Queensland Council for Injury Prevention was formed in 2013 to continue the work undertaken by the former Queensland Injury Prevention Council, and to provide an ongoing opportunity for those working in the area of injury prevention to be a part of the Queensland Injury Prevention Network. It brings together Queensland injury prevention researchers and practitioners. The Network aims to be a guiding body on injury prevention in Queensland provide a collaborative expert forum to discuss injury prevention issues in Queensland, and develop shared agendas for injury prevention research, education, and activity. It is hosted through the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) based at the Queensland University of Technology (Centre for Accident Research and Road Safety – Queensland 2014).

Queensland Health also supports Kidsafe Queensland. The organisation provides services across the state including baby capsule hire and child care restraint installation. It provides a range of educational initiatives to support road, home, playground and school safety (Kidsafe Queensland 2016).

3.2.3 New South Wales

Policy leadership

There are a wide range of frameworks and policies that address childhood injury prevention that are relevant in NSW (Thompson et al 2015).

Particularly important is the state-wide strategic health plan, *Healthy, Safe and Well: A Strategic Health Plan for Children, Young People and Families 2014-24*, which directly addresses child injury in one of its five strategic directions, 'Addressing risk and harm'.

The former Office of Kids and Families, based within NSW Health and in collaboration with healthcare providers and key policy partners worked to: embed evidence-based care; inform and share data and knowledge; connect care between policy makers and healthcare services; inspire innovation; support action and advise and guide government and healthcare providers about improved health outcomes for children, young people and families (NSW Health, Office of Kids and Families 2016a).

Through the Office of the Advocate for Children and Young People, the NSW Government has recently completed the first-ever legislated three year "whole-of-government" Strategic Plan for Children and Young people, with a focus on providing opportunities for young people to thrive and have their voices heard in their communities. *The NSW Strategic Plan for Children and Young People 2016-2019* is aligned with government priorities for children and young people, including the Premier's and State priorities, and other government plans relevant to children and young people. The plan also provides a common set of agreed objectives and indicators against which NSW Government policies and services for children and young people can be aligned. This plan was formulated through wide-ranging consultation with children and young people. One of the six key objectives relates to safety: "children and young people are free from abuse, neglect, violence and serious injury" (Office of the Advocate for Children and Young People 2016).

Across NSW several local government areas have strategic plans to guide their youth strategy (for example the *Singleton Youth Strategy 2015-2019, Lake Macquarie Youth Strategy 2014 – 2019*) or efforts to support children, young people and families (*Berrigan Shire Children, Young People & Families Strategy and Action Plan 2015-2019*).

Data and information systems

The stocktake of data sources for childhood injury in NSW identified and described three mortality-specific and 13 morbidity and / or mortality population-based data collections that are able to provide information on injuries involving children and young people in NSW (Mitchell and Testa 2015). These are listed in Table 2.

Table 2 NSW mortality-specific and injury morbidity and mortality data collections

Sources of Childhood Injury Data in NSW
Cause of Death-Unit Record File
Child Death Review Team Child Deaths Register
National Coronial Information System
Ambulance data collections
Admitted Patient Data Collection

Sources of Childhood Injury Data in NSW
Emergency Department Data Collection
Families and Community Services Key Information and Directory System
Lifetime Care and Support Authority Claims Database
Motor Accidents Insurance Regulation Personal Injury Register
NSW Police Computerised Operational Policing System
Public Health Real-time Emergency Department Data Collection
Sporting Injuries Insurance Scheme Claims Data
Surf Life Saving Australia SurfGuard Database
Transport for NSW CrashLink
Trauma Registry
Workers' Compensation Claims data

Two additional data collections are listed below:

- Secure Analytics for Population Health Research and Intelligence (SAPHaRI) is the NSW Ministry of Health population health data warehouse, analysis and reporting system, administered by the Centre for Epidemiology and Evidence, NSW Ministry of Health.
- The Study of Environment on Aboriginal Resilience and Child Health (SEARCH) is Australia's largest long-term study of the health and wellbeing of urban Aboriginal Children, and has a NSW-focus.

The Bureau of Health Information provides independent reports about the performance of the NSW public healthcare system. Included in their range of reports are publications relevant to childhood injury prevention. For instance, a recent report (Bureau of Health Information 2016) examines how children and young people use and experience health services in NSW, finding injury, poisoning and other external causes to be the leading causes of emergency department visits among the 0-17 year age group in 2014-15.

Another key organisation in NSW that can contribute data to support childhood injury prevention is the Centre for Health Record Linkage (CHeReL), which links multiple sources of data and maintains a record linkage system that protects privacy. One example of a childhood injury prevention project using data linked by CHeReL is the "Drive Study", which examined risk factors for young driver injury (Ivers et al 2006). There is potential for CHeReL to be utilised further in terms of childhood injury prevention data collection and collation, it is already used for Centre for Road Safety studies.

The capacity for using information from existing State data collections to support injury prevention efforts has also been demonstrated in another recent study, with specific reference to the NSW Public Health Real-time Emergency Department Surveillance System data and road safety (Mitchell and Bambach 2015). The establishment of national and state-based data linkage centres in Australia has greatly advanced capacity for injury research (Mitchell et al 2014).

The NSW Ministry of Health has supported the development of the Kids and Families Data Warehouse. It is a secure and integrated system for approximately 23 community health data collections with the aim of streamlining reporting and improving monitoring and evaluation. The data warehouse is still in the early stages of development (NSW Ministry of Health, Office of Kids and Families 2016b).

Research and knowledge translation networks

The NSW Paediatric Injury Prevention and Management Research Forum was held in 2014. The forum brought together injury prevention advocates, researchers and clinicians to consider the future of childhood injury prevention. It was a joint initiative of the former NSW Kids and Families and the Sydney Children's Hospitals Network Population Health Research Collaborative and aimed to inform priorities for research, facilitate communication between stakeholders, and promote translational research to guide policy and practice. The forum identified the need for coordination and leadership of the diverse range of agencies and initiatives in the field of childhood injury prevention (NSW Kids and Families 2014).

Following on from the 2014 forum, the Paediatric Injury Prevention and Management Research Reference Group was established. The group, then co-chaired by NSW Kids and Families and the Sydney Children's Hospitals Network, became a forum for discussion about research and related issues. The group also had an interest in broader initiatives, including data linkage and other state and national injury research. Subsequent to this, NSW Kids and Families provided seed funding for research projects. These projects provide examples of the breadth and depth of work that can be undertaken with relatively modest funding investments (refer to Appendix 6 for a list of these projects). These projects engaged multiple researchers with a collaborative approach taken to not only the conduct of the research but also the dissemination of research findings. They encompassed diverse issues for example: guideline development for policy and practice; analysis of the unwarranted clinical variation following hospitalised injury in young people; and investigation of the impact of the Brighter Futures program on unintentional injuries in vulnerable children.

This group continued to meet on a biannual basis until the end of 2016 and provides a strong model for future efforts in collaboration, through exchange of information and discussion of injury research, data, policy and prevention efforts. The NSW Ministry of Health coordinated meetings. A diverse range of experts consistently attended including clinicians, researchers, NGO representatives and government officers.

There are a range of other research bodies based in NSW with involvement in childhood injury research, for example: Transport and Road Safety Research, University of NSW; The George Institute for Global Health at the University of Sydney; Australian Institute of Health Innovation, Macquarie University; NEURA at the University of New South Wales, the National Centre for Immunisation Research and Surveillance; Children's Medical Research Institute' Kids Research Institute, Westmead Children's Hospital and Institute of Early Childhood, Macquarie University.

Coordination

NSW Health is the main government department addressing childhood injury prevention; this effort occurs through several branches. Throughout NSW several Local Health Districts (LHDs)

have established child health networks, for example the Northern Child Health Network provides support, education and advocacy for health professionals working with children in Hunter New England, Mid North Coast and Northern NSW LHDs.

Other state government departments that have a significant interest in injury prevention and safety promotion include the Department of Family and Community Services, Department of Education, NSW Police Force, Sport and Recreation, Transport for NSW (particularly the Centre for Road Safety), NSW State Emergency Service, Fire and Rescue NSW, WorkCover NSW and the Department of Fair Trading.

The Roads and Maritime Services deliver road safety programs. For example, the Child Seat Restraint Project is a partnership between the Roads and Maritime Services and the Aboriginal Health and Medical Research Council. It receives funding from Transport for NSW as part of the NSW Government's *Aboriginal Road Safety Action Plan 2014-2017* (Transport for NSW 2014). Targeted to Aboriginal communities, the program is delivered by Aboriginal Medical Services and distributes and fits child restraints to improve safety (Transport for NSW 2015). An example of another road safety initiative for Aboriginal children is the *Buckle-Up Safely* program, which includes educational resources, training of health and education workers, provision of low cost seats and free fitting. The program was developed by a collaboration of researchers led by The George Institute and will be delivered in partnership with local community organisations in 12 locations across NSW and effectiveness evaluated (The George Institute 2016).

Kidsafe NSW is the leading non-government organisation in this state with a focus on injuries in children under the age of 15 years. Kidsafe NSW Inc. is located in Kidsafe House, which is in the grounds of The Children's Hospital at Westmead. Other prominent non-government organisations undertaking work in the area have been described previously (Thompson et al 2015).

3.2.4 Victoria

Policy leadership

Injury prevention is a key priority area of the *Victorian Public Health and Wellbeing Plan 2015-2019* (Victorian Government 2015). Within government, the Victorian Department of Health and Human Services has primary responsibility for child injury prevention, as well as managing the medical and public health consequences of injury. In addition to the Department of Health, many other departments and agencies have a role in child injury prevention. Examples of departments / agencies where injury prevention efforts occur, and associated frameworks, strategies and plans, include:

- The Department of Education and Early Childhood Development – for example, a central tenet of the department's *Victorian Early Years Learning and Development Framework* (2011) is child safety.
- Victoria's road safety strategy and action plan *Towards Zero 2016-2020*, aimed at promoting road safety and reducing serious injury, is a partnership between the Transport Accident Commission, VicRoads, Victoria Police, the Department of Justice and Regulation and the Department of Health and Human Services.
- Water safety is within the remit of the Department of Justice and Regulation, with Emergency Services also playing a role in promoting water safety.

Natora et al (2010) advocate for development of a Victorian Injury Prevention Strategy; they note that there is currently no framework or whole-of-government approach to effectively guide or link existing injury prevention effort in Victoria, observing that the 1994 Strategy *Taking Injury Prevention Forward* was successful, but requires revisiting.

Data and information systems

Within the Monash Injury Research Institute (MIRI) is the Victorian Injury Surveillance Unit (VISU), which collects, analyses and interprets Victorian data on injury deaths, hospital admissions and ED presentations (Tessman and Edwards 2016). The VISU is "the state's peak agency for the analysis, interpretation and dissemination of Victorian data on injury deaths, hospital admissions and emergency department presentations for government, health and safety bodies, business and industry, media, research groups and the community" (Victorian Injury Surveillance Unit 2016).

Childhood injury prevention is one area of interest of the VISU and their bi-annual publication "Hazard" has highlighted issues such as prevention of serious fall injury in children, as well as prevention of unintentional injury and asphyxia in children (Congiu et al 2005; Cassell and Clapperton 2007, 2014). VISU provides quarterly reports to the Victorian Department of Health, and VISU data and reports are published for professional and community audiences (Monash Injury Research Institute 2014).

Research and knowledge translation networks

A leader in injury prevention research and data coordination in Victoria is the Monash Injury Research Institute (MIRI) which incorporates the Monash University Accident Research Centre (MUARC) and other key Monash researchers and groups.

MUARC, established by government in 1987, is a comprehensive injury prevention research centre focused on the prevention of injury as well as the treatment and recovery from injury. MUARC has partnerships with key international, national and state governments and industry agencies and organisations (it is recognised as a WHO Collaborating Centre for Violence, Injuries and Disabilities). MUARC has established long-term relationships with a number of state government departments such as VicRoads, the Transport Accident Commission, Department of Justice and the Victorian Police, and the Department of Health and Human Services, several contributing to sponsorship of the MUARCs Baseline Research Program. The policy partners provide data and the research questions they want answered and the research is done in partnership. For example, the Baseline Research Program Committee funded a project to design a roadside observation survey after researchers identified a gap in the collection of data on behaviour revealed through roadside observation surveys (Clark, 2009).

The Australian Collaboration for Research into Injury in Sport and its Prevention, at Federation University, conducts research across a range of sports injury and sports injury prevention projects. The Victorian Department of Health has identified a research gap in sports injury prevention for children and adolescents (Psalios et al 2012).

Coordination

The Victorian Injury Prevention Program leads a diverse range of activities, including the provision of policy advice and the development of strategies, research support, stakeholder liaison, and monitoring and evaluation. The program has links with an extensive range of stakeholders and adopts a collaborative approach in the development and implementation of injury prevention initiatives (Victorian Department of Health and Human Service 2015).

Healthy Together Victoria, established in 2011, is a state-wide prevention initiative aimed at improving people's health. A prominent initiative relating to injury prevention is the Achievement Program, embedded in Healthy Together Victoria. The program includes safe environments as a priority health issue and includes state-wide benchmarks intended to facilitate early childhood services and schools to reduce the risk of injury by promoting safe environments.

Other examples of initiatives include:

- 'Remove the risk', a child poisoning prevention resource
- The National Guidelines for the Safe Restraint of Children Travelling in Motor Vehicles have been developed under the auspices of Neuroscience Research Australia (NeuRA) and Kidsafe
- Victorian Community Road Safety Alliance
- Sports Injury Prevention Taskforce (Victorian Department of Health and Human Service 2015).

Another important organisation involved in childhood injury prevention in Victoria is the Safety Centre based at the Royal Children's Hospital Melbourne. The Centre is involved in education and training and collaborates with other like-minded organisations in the community on injury prevention projects and media campaigns. The Centre also lobbies for legislative reform to improve products, safety standards and environmental design. It provides an extensive range of online resources and a telephone advice line.

The Victorian Safe Communities Network (VSCN) is a forum for practitioners, researchers, government and state-wide agencies working in areas such as community based injury prevention and community safety promotion. Their website includes a comprehensive directory of national and international organisations engaged in injury prevention.

A useful example of the impact of effective coordination is evident from a national project aimed at addressing sports injury prevention, led by Victorian-based researchers (Finch et al 2011). The NoGAPS (National Guidance for Australian Football Partnerships and Safety) project is a multi-agency partnership that engaged seven non-academic partners, including government health promotion and safety agencies; peak sports professional and advocacy bodies and health insurance organisations. It found that engaging stakeholders from the beginning of the project in a research-driven partnership facilitated the development of new and/or stronger links between non-academic partners and the sharing of a common goal (Finch et al 2016). The major outcome of the project is *FootyFirst*, an evidence-based exercise program to prevent lower limb injuries, which is being rolled out nationally by the Australian Football League in 2016 (Donaldson et al 2017).

As seen in other states Kidsafe Victoria is the leading non-government organisation engaged in child safety issues and injury prevention.

3.2.5 South Australia

Policy leadership

At the highest level, *South Australia's Strategic Plan* (2011) provides the government's vision for the state, and contained within it are targets relating to greater safety at work and reduced road injuries and deaths.

South Australia's Health Care Plan 2007-2016 outlines the current approach taken by the South Australian Government to health care generally. In addition, SA Health developed the *Primary Prevention Plan 2011-2016* (SA Health 2011) which focuses on the health of the whole population, including children. Other key documentation relating to South Australian safety initiatives include *Towards Zero Together, South Australia's Road Safety Strategy 2020* and *State Water Safety Plan 2013-2015*.

Data and information systems

The key agency in terms of data collection, collation and coordination is the National Injury Surveillance Unit (NISU), located at Flinders University, South Australia. It is collaborating unit of the AIHW and undertakes national public health surveillance of injury to support injury prevention and control.

SA Health reports on a range of health statistics, for example, surveillance of notifiable conditions; hospitals and other health care services statistics and Aboriginal health outcome statistics.

Research and knowledge translation networks

The Research Centre for Injury Studies at Flinders University is involved in in childhood injury prevention research and data collation in South Australia. The main program of the centre is the National Injury Surveillance Unit (NISU), previously mentioned. The Centre also supports national road transport injury surveillance. It has particular expertise in data linkage capabilities for injury research (Research Centre for Injury Studies 2015). Kidsafe SA is also actively engaged in research to support child injury prevention.

Coordination

Within SA several government departments contribute to child injury prevention. These are listed below:

- The Women's and Children's Health Network (formerly Children, Youth and Women's Health Service) is SA's leading provider of health services for children, young people and women, bringing together the Women's and Children's Hospital and community-based health services in a state-wide health network for children, young people and women in South Australia.
- Department for Education and Child Development created the Office for Child Safety in April 2013 with the deputy chief executive taking lead responsibility for child safety (Department for Education and Child Development no date). The Office is responsible for oversighting child safety, health and wellbeing practices across the Department, SA

Government and the community. There is an equal emphasis on the promotion and the protection of child health, safety and wellbeing.

- The Council for the Care of Children is an independent statutory body which promotes the rights and wellbeing of all children and young people in South Australia. The Council for the Care of Children reports to government on the wellbeing of children and young people in SA, and has developed and published a monitoring framework, *Looking out for young South Australians*. The framework examined the wellbeing of children and young people in South Australia across five dimensions of their lives, one being safety.
- Department of Planning, Transport and Infrastructure (e.g. road safety) and the Royal Automobile Association of South Australia also has a role in road safety.
- South Australia intends to establish the State's first Commissioner for Children and Young People (Madden and Chapman 2015).

SA Health established a Child Health State-wide Clinical Network, as part of a series of eight networks, aimed at coordinating better delivery of services, improving health outcomes for all South Australians and ensuring a strong, sustainable health workforce (SA Health 2007). It appears however, that this network is no longer functioning.

The activities of Kidsafe SA are outlined in the *Kidsafe SA Strategic Plan 2014 – 2017*, their major partner is SA Health. The South Australian Coroner's Office and Women's and Children's Hospital Paediatric Emergency Department have recently been recognised by Kidsafe SA for having made a significant contribution to child injury prevention in South Australia.

3.2.6 Western Australia

Policy leadership

The WA Department of Health has taken the principal role for leadership and coordination of childhood injury prevention in the state, with a strategic framework guiding their prevention agenda, the *Health Promotion Strategic Framework 2012-16* (Department of Health, Western Australia 2012). In 2015, the Department of Health released *Injury Prevention in Western Australia: A review of statewide activity.*

> *The purpose of this report is to provide a resource to highlight priority areas for injury prevention in Western Australia, to report descriptive information on the extent and nature of the injury area, and to provide a snapshot of current injury prevention activity and the stakeholders who participate in the injury field. Relevant legislation for each area of injury is also identified (Department of Health, Western Australia 2015, p.4).*

The Department has funded and partnered with several non-government organisations to advance childhood injury prevention, most notably the Injury Control Council of WA (ICCWA), which works across sectors and levels of government to improve coordination and support research for injury prevention.

Data and information systems

The Public Health Division of WA Department of Health collects, maintains and accesses data from multiple sources to inform childhood injury prevention initiatives. The main statewide

health data collections are listed in *Information about your health data* (Department of Health, Western Australia 2009). The Department has an Epidemiology branch and Data Linkage branch that contribute to the analysis of a wide range of population health data.

Kidsafe WA established the first child injury surveillance system at Princess Margaret Hospital in 1986, and partners with the Princess Margaret Hospital Emergency Department to produce the WA Childhood Injury Surveillance Bulletins and Reports. Kidsafe WA's website notes:

> *The bulletins and reports discuss prevalent childhood injury topics and provide an essential link between the hospital and injury prevention stakeholders (Kidsafe WA 2016).*

This surveillance system also captures data and information relating to child maltreatment identification, early intervention and prevention, particularly for acute injuries (Department of Health, Western Australia no date). Each year a comprehensive annual report is released that provides an analysis of 12 months of data and recommendations to strengthen the collection and use of surveillance data. For example the *WA Childhood Injury Surveillance Bulletin: Annual Report, 2014-2015* recommends that:

> *The WA Childhood Injury Surveillance Reports should continue to be disseminated to key child injury prevention stakeholders across Western Australia to support policy and interventions for child injury prevention. Additionally, this will ensure stakeholders are aware of the current statistics within Western Australia and are therefore able to develop initiatives to reduce the most prevalent injuries currently seen in the state (Mohamed-Isa et al 2015, p.9).*

Research and knowledge translation networks

There are several active research groups investigating childhood injury in WA, several examples of these groups are provided below. The University of Western Australia, School of Population Health and the Centre for Health Services Research have undertaken data linkage studies investigating the effect of community-based prevention interventions on trends of childhood injuries (Hayati et al 2010). The Burn Injury Research Unit based at the University has also undertaken research to improve child health safety.

The Telethon Kids Institute is an independent and not-for-profit medical research institute that has close affiliations with Princess Margaret Hospital for Children and all the major Western Australian universities, particularly the University of Western Australia. The Institute has four research focus areas: Aboriginal health, brain and behaviour, chronic and severe diseases and early environment. While it does not have a specific focus on childhood injury prevention, the Institute has completed studies about child maltreatment-related emergency department presentations in WA and the type of injuries associated with them (O'Donnell et al 2012).

The Collaboration for Evidence, Research and Impact in Public Health (CERIPH) is a key partner in the 'Know Injury' project; it is a multidisciplinary research centre within the School of Public Health, Edith Cowan University. Also based at Edith Cowan University is the Child Health Promotion Research Centre (CHPRC). Injury prevention is one of four major themes of the centre's research projects.

The Centre for Population Health Research at Curtin University has been engaged in research, funded by the WA Department of Health, to examine the cost of injury in WA (Centre for Population Health Research, Faculty of Health Sciences 2013). Curtin Monash Accident Research Centre (C-MARC) was established in 2009. Initially supported by the WA Government, C-MARC is a partnership between Curtin University and Monash University's Accident Research Centre. The Centre focuses on road safety research and injury prevention.

Kidsafe WA is another important agency that receives funding from the Department of Health, contributing to the WA Government's whole-of-state efforts to reduce the incidence of injury. Kidsafe WA has conducted a number of specialised research projects relating to child injury prevention, for example research into parent and coach's perceptions of sports injury risks and management and a comparison of the health benefits between manufactured playgrounds and nature playgrounds within the school environment. Kidsafe WA also issues a *Regional Childhood Injury Snapshot* for the State and each health region in WA which briefly summarise patterns of injuries among 0 – 19 year olds and priorities for prevention (Kidsafe WA no date).

Coordination

The Government of Western Australia, through the Department of Health (particularly the Chronic Disease and Injury Prevention Directorate, Public Health) has a key role in coordination of childhood injury prevention initiatives, research and data collection. The role of WA Health has been described as to: "lead, guide, enable, collaborate" (Sullivan 2015). WA Health has a history of funding injury prevention projects and in 2012 it prescribed child injuries as one of six priority areas for the Injury Prevention Sector Development Project.

The Department of Health supports collaborative health care planning and has established WA Health Networks (a group of nearly 4,000 consumers, health professionals, carers and policy makers within the state). The Injury and Trauma Health Network was one of the inaugural WA Health Networks and made significant achievements during the seven years it was active, for example the development of the Burn Injury Model of Care. Members of the network included the ICCWA, Kidsafe WA, Royal Life Saving Society WA and Farmsafe WA Alliance. The Injury and Trauma Health Network formally ceased in early 2014. The Child and Youth Health Network are currently developing the Western Australian Youth Health Policy.

The Department of Health funds programs and activities in child safety and also invests in partnership and sector development. For example, the Department of Health has an established partnership with the ICCWA. The ICCWA is a leading non-government not-for-profit organisation involved in injury prevention and community safety promotion in WA. The ICCWA works in partnership with individuals and organisations at the local, state, national and international levels and targets all levels of government.

In 2014 the ICCWA was funded by the Department of Health WA for three years for the Partnership and Sector Development Program (rebranded to Know Injury). This initiative builds upon previous ICCWA programs such as the Injury Prevention Sector Development Project and the Injury Prevention Professional Development and Capacity Building Project (Injury Control Council of Western Australia 2015a). Know Injury is coordinated by ICCWA and aims to build the capacity of organisations and individuals working in the injury prevention sector. The Know

Injury website provides access to the Regional Network Group, CONNECT.ed and an e-directory of key injury prevention and community safety organisations in WA.

The Regional Network Group consists of a wide range of professionals throughout the state. The objectives of the group are to increase:

- networking and partnership opportunities
- partnership building knowledge and skills
- self-efficacy and confidence in partnership building
- health promotion planning, implementation and evaluation skills
- self-efficacy and confidence in health promotion planning, implementation and evaluation (Injury Control Council of Western Australia 2015b).

Another Know Injury networking project is CONNECT.ed. CONNECT.ed was launched in August 2015 and aims to support WA injury prevention and community safety practitioners (particularly those based in regional locations) and enhance their partnership building skills by increasing their access to networking opportunities. Using the Spark Collaboration platform, CONNECT.ed participants are randomly paired with a peer, whether locally or internationally, bi-monthly for a 15 minute conversation about injury prevention, community safety or other topics of relevance. CONNECT.ed participants are provided with a professional Spark account containing their email address, and optional phone number and Skype name, allowing the paired peers to contact each other and arrange a conversation. CONNECT.ed has a small but growing number of members of the program who are mainly based in WA, but also with participants in New Zealand and Canada (Know Injury, no date).

The Department of Health also coordinates injury prevention activities through conducting regular stocktakes of WA health promotion programs. These stocktakes gather information on programs and include a brief description and the coordinating agency/organisation. In 2014, the stocktake of current population-wide chronic disease prevention programs in WA identified 38 programs targeted at injury prevention, approximately half of these are directed to child and youth target groups (Chronic Disease Prevention Directorate 2014).

A 2015 review of state-wide injury prevention activity highlighted priority areas for injury prevention and included descriptive information on the extent and nature of the injury area. This review also provided a snapshot of current injury prevention activity and participating stakeholders and identified relevant legislation for each area of injury. Leading injury prevention types included falls prevention in children and poisoning in children (Department of Health, Western Australia 2015).

3.2.7 Tasmania

Policy leadership

In 2005 the Department of Premier and Cabinet released the *Whole of Government Policy Framework for the Early Years* (Jenkins 2005). Subsequently the Tasmanian Early Years Foundation was established by the government through the *Tasmanian Early Years Foundation Act 2005.*

The *Tasmanian Early Years Outcomes Framework* was the starting point for Kids Come First (Jenkins et al 2009). The Kids Come First project was set up by the Tasmanian Government in 2008 to look at health and wellbeing outcomes for children from birth to 18 years. Its purpose was to make information readily available to two main groups of people: those with responsibility for developing policy and directing resources, and those who plan, manage and monitor services. It resulted in the development of a large database drawn from over 20 sources capable of producing comprehensive community profiles to assist with service deliver planning and policy development. It aimed to activate coalitions of people within the community to address significant health promotion needs which included childhood injury.

The Tasmanian Department of Health and Human Services has released a consultation draft of the *Healthy Tasmania Five Year Strategic Plan* which outlines approaches for identifying, managing and evaluating preventive health programs. It also highlights the Government's priority areas for action (DHHS 2015). This plan promotes child health generally but does not have a focus on childhood injury prevention.

Data and information systems

The major data sources are existing administrative datasets that are collected at either the hospital level or State level, for example:

- The Tasmanian Statewide Morbidity Database can provide data on hospitalisation of children due to injury or poisoning
- The DHHS Council of Paediatric Mortality and Morbidity can provide data on child deaths due to injury (29 days–17 years) (Jenkins et al 2009).

In prior years, the Tasmanian Child Health and Wellbeing Survey (TasCHWS), was commissioned by the Department of Health and Human Services to collect the data required to fill a number of existing information gaps (Social Research Centre 2009).

The most recent reports encompassing childhood injury data come from Kidsafe Tasmania and Anglicare Tasmania. The latter organisation has produced the report *The State of Launceston's Children 2014* under the auspice of the Launceston Child Friendly City Working Group. Hospitalisation due to injury is identified as an area for improvement (Anglicare Tasmania; Launceston Child Friendly City Working Group, 2014).

Research and knowledge translation networks

No major research centres with a specific focus on childhood injury prevention were identified in Tasmania. However a range of departments at the University of Tasmania, such as the Menzies Institute for Medical Research, are engaged in research and education about particular aspects of child injury prevention.

Coordination

The Tasmanian Early Years Foundation is a leading agency involved in childhood injury prevention, funded by the Tasmanian Government. In February 2015, the Tasmanian Government made an announcement that the Foundation would be transitioned from a statutory entity to a non-government organisation (Tasmanian Government Department of Premier and Cabinet 2015b).

The Department provides a Child Health and Parenting Service (CHaPS) that comprises primary prevention population health programs, selectively targeted early intervention services and specialised services for 0- 5 year olds. The service supports a network of Child Health Centres across the state that are staffed by Child and Family Health Nurses that offer parent information on many topics including injury prevention.

Other Tasmanian Government departments involved in childhood injury prevention include:

- Education (e.g. swimming and water safety program
- Justice (e.g. Consumer Affairs and Fair Trading – product safety)
- Police, Fire and Emergency Management (e.g. PCYC Child Safety Handbook)
- Department of Primary Industries, Parks, Water and the Environment (e.g. farm safety)
- Department of State Growth (e.g. transport and road safety).

The Road Safety Advisory Council (RSAC) makes recommendations to Government about road safety policy, community, school-based and public education programs, expenditure of the road safety levy and oversees advertising campaigns. The RSAC runs a series of campaigns including several relevant to children, young drivers and parents, for example, *Road Safe Kids* (Road Safety Advisory Council no date).

A Children and Young People's Advisory Council has been established to advise the Commissioner for Children and Young People about what is important to children and young people in Tasmania (Commissioner for Children and Young People Tasmania 2015). The Commissioner for Children and Young People Tasmania (2016) released an *Interim Strategic Plan.* Strategic Priority Three is aimed at "Achieving improved safety and well-being outcomes for disadvantaged and at risk children and young people" and Strategic Priority Four specifies "Advocating for improved data collection and sharing relevant to the wellbeing of children and young people". Actions to support the latter priority include the release of a health and wellbeing report on Tasmania's children twice yearly and the implementation of a data collection framework/process drawing on data currently in the public domain to support evidence-based approach.

For several years the Childhood Injury Prevention Coalition was active in the State and held several forums to support collaborative action for childhood injury prevention. A range of groups were involved for example, Kidsafe; Tasmanian Fire Service; Department of Education; Department of Health and Human Services; and community representatives (Tasmanian Early Years Foundation 2010). It appears this coalition is no longer functioning.

Kidsafe Tasmania has a role in increasing awareness, providing child safety education, advocacy and reviewing the causes and prevention of childhood injuries.

3.2.8 Australian Capital Territory

Policy leadership

Although it does not appear that ACT Health has a specific strategy or policy on childhood injury prevention, there are numerous policies and plans that have some relevance, for instance the *ACT Immunisation Strategy 2012-2016* (ACT Government Health Directorate 2012).

Various other policies are in place that relate to the health and wellbeing of children in the ACT, however they do not have an injury prevention focus. These include the *ACT Children's Plan 2010-2014* and *ACT Young People's Plan 2009-2014* developed by the Office for Children, Youth and Family Support, as well as the *ACT Healthy Children's Initiative 2011-2018*, developed by the Health Improvement Branch of ACT Health and funded by the Australian Government National Partnership Agreement on Preventive Health (ACT Health 2016b). The ACT's current road safety policy is the *ACT Road Safety Action Plan 2016–2020* (ACT Government Justice and Community Safety Directorate 2016).

Data and information systems
No major childhood injury data collections were identified in the ACT. Reporting on outcomes for children in the ACT is presented in the annual publication of *A Picture of ACT's Children and Young People* (ACT Government Community Services Directorate 2015). Data in this report is sourced from a variety of ACT Government and national datasets.

Research and knowledge translation networks
No major research centres specifically examining childhood injury prevention were identified in the ACT, although the Australian National University and University of Canberra include researchers undertaking work in the area of injury prevention more generally.

Coordination
There does not appear to be a specific mechanism for coordination of activities and stakeholders engaged in childhood injury prevention in the ACT.

ACT Health is a key sponsor of Kidsafe ACT. Kidsafe ACT provides services to parents, carers and families (including child restraint installation and hires), conducts research, produces and distributes safety materials and advocates to government and industry.

3.2.9 Northern Territory

Policy leadership
The Northern Territory (NT) Department of Health, particularly through the Centre for Disease Control (CDC), is engaged in childhood injury prevention in the territory. The Department of Health recognise that: "The breadth of issues that 'injury' covers is vast: road safety, water safety, occupational health, assault, domestic violence, suicide, and medical misadventure to name a few" (Northern Territory Department of Health 2016a).

The Child Health Program (of the CDC) is a population based initiative "to promote and protect good health and wellbeing and prevention of injury for children in the Northern Territory" (Northern Territory Department of Health 2016b). Several child health promotion programs are in place. The CDC also supports a Safety and Injury Unit (this is not child specific). The Unit comprises a specialist in public health medicine and an injury prevention coordinator both based in Darwin. The Safety and Injury Unit researches and develops policy on injury prevention (Northern Territory Department of Health 2016c).

As with most states and territories, a range of other government departments contribute to injury prevention, for example, the Department of Children and Families, Department of Sport and Recreation and the Department of Transport.

Data and information systems

Tessman and Edwards (2016) of the CDC have recently commented on state injury surveillance in the NT, which they describe as having been "limited almost entirely to reporting of deaths and hospitalisations". They acknowledge the value of this information, but advocate for extending the scope of surveillance to include data on less serious injuries presenting to the Royal Darwin Hospital ED and their causes, which would "provide valuable knowledge of the epidemiology of childhood injuries [… which] is essential for the effective planning, implementing and evaluation of primary prevention". A CDC project commenced data collection at the Royal Darwin Hospital ED at the beginning of 2016 aiming to enhance the knowledge of paediatric injury in the NT. Considering the NT has the highest percentage of Aboriginal and Torres Strait Islander people in Australia, and that death due to injury is almost three times higher in these peoples, this project has added significance.

Research and knowledge translation networks

Although no major research centres specifically examining childhood injury prevention in the Northern Territory were identified, the Centre for Child Development and Education (at the Menzies School of Health Research) is an example of a research centre aiming to improve early childhood development (including health, education and wellbeing). The Centre for Disease Control within NT Health also contributes to research.

Coordination

Childhood injury prevention is a public health issue that requires a high degree of coordination and collaboration between many different sectors. An important shift has been to move away from accident prevention to a more proactive approach in safety promotion and to address people's perceptions of safety (Northern Territory Department of Health 2016a).

The CDC's Safety and Injury Unit plays an important role in multi-sector partnerships by providing public health, research and evaluation expertise as well as access to and analysis of injury data. In addition, the unit provides an important coordinating role. Over the past years the unit has been involved in:

- Membership of the National Injury Prevention Working Group
- Membership of the NT Road Safety Task force
- Membership of the NT Water Safety Advisory Council
- Development of a Safe Community project in Palmerston.

Kidsafe NT was established in 2003 and is the territory's lead non-government organisation dedicated to the prevention of unintentional childhood accident and injuries. The Child Health team (NT Department of Health) has a partnership role with Kidsafe NT to ensure the provision of a range of services that promote child safety. The program:

- liaises and provides professional input into community based activities related to child safety; and
- assists with promotional activities that are designed to prevent unintended childhood injuries and reduce the resulting deaths, hospitalisations and disabilities associated with childhood accidents in children under the age of 15 years (Northern Territory Department of Health 2016b).

An example of a local effort in the NT focused on addressing childhood health and wellbeing including injury, accidents and safety issues is the Palmerston Safe Kids Network. Network members represent organisations that provide injury and safety related services and programs to children and their families living in the city of Palmerston. The activities of the network include sharing information about programs and initiatives, discussing identified gaps and need, accessing sector / professional development and lobbying, advocating and influencing policy.

Appendix 4 Findings from the literature – International context

4.1 International overview

The international state of childhood injury prevention and control was described in detail in the seminal publication *World Report on Child Injury Prevention* (WHO 2008). The main messages from the report were:

- Child injuries are a major public health issue
- Injuries directly affect child survival
- Children are more susceptible to injuries
- Child injuries can be prevented
- The cost of doing nothing is unacceptable
- Few countries have good data on child injuries
- Research on child injuries is too limited
- There are too few practitioners in child injury prevention
- Child injury is the responsibility of many sectors
- Child injury prevention is underfunded
- Awareness needs to be created and maintained.

The report urged governments and other stakeholders to consider the following seven recommendations when developing childhood injury prevention programmes:

1. Integrate child injury into a comprehensive approach to child health and development
2. Develop and implement a child injury prevention policy and a plan of action
3. Implement specific actions to prevent and control child injuries
4. Strengthen health systems to address child injuries
5. Enhance the quality and quantity of data for child injury prevention
6. Define priorities for research, and support research on the causes, consequences, costs and prevention of child injuries
7. Raise awareness of and target investments towards child injury prevention (WHO 2008).

The WHO (2016a) lists a number of international organisations working in the area of childhood injury prevention including:

- United Nations Children's Fund (UNICEF)
- International Society for Child and Adolescent Injury Prevention (ISCAIP)
- International Society for Prevention of Child Abuse and Neglect (ISPCAN)
- SAFE KIDS Worldwide.

The remainder of this section provides examples of approaches to childhood injury prevention from several countries including: New Zealand, Canada, the United States (US), United Kingdom (UK) and European Union (EU). These approaches provide valuable insights for childhood injury prevention in the Australian and NSW context.

4.1.2 New Zealand

Unintentional injury is a major health problem among New Zealand children and consequently the New Zealand government has a long history of supporting injury prevention. New Zealand has the highest injury death rate in the OECD (Bland et al 2011). Unintentional injury is the third-leading cause of death in children under the age of 14. Nine in every 100,000 children living in New Zealand will suffer a fatal unintentional injury and the risk of injury increases as they age. In addition, 852 in every 100,000 New Zealand children are hospitalised due to unintentional injuries (Safekids Aotearoa 2015). Applying the European Child Safety Alliance (ECSA) Child Safety Report Card methodology to assess the national status of child injury prevention, New Zealand received a total score of 33 out of 60, which was similar to the EU average (Bland et al 2011).

Policy leadership

The *New Zealand Injury Prevention Strategy* (NZIPS) was launched in 2003 and focused on six priority areas (Dyson 2003, Accident Compensation Corporation 2014c). The purpose of NZIPS was to establish a framework for the injury prevention activities of government agencies, local government, non-government organisations, communities and individuals. A key focus of NZIPS was to strengthen and enhance the infrastructure that supports injury prevention activity (Accident Compensation Corporation 2014b). The NZIPS governance group was disestablished in December 2013 and replaced by new governance arrangements. A *Cross-government Injury Prevention Work Plan* was approved by Cabinet to address perceived deficiencies in injury prevention efforts including: fragmentation of effort; gaps in injury prevention activity; workforce capability issues and quality of, access to and dissemination of injury information (Accident Compensation Corporation 2014a). The new approach to injury prevention aims to improve collaboration with stakeholders, better use data to design programmes, and better target programmes' areas of focus (Accident Compensation Corporation 2014d). The initial phase of the Work Plan addresses four key priority areas for Accident Compensation Corporation (ACC) and its partner agencies, one of which is vulnerable children.

The *New Zealand Health Strategy 2016* sets the direction of health services to improve the health of people and communities. It comprises two parts: the *New Zealand Health Strategy: Future direction* which provides high level direction to 2026 (Minister of Health 2016a) and the *New Zealand Health Strategy: Roadmap of actions 2016* (Minister of Health 2016b) which is a five year implementation strategy and identifies 27 areas for action. Within the strategy, one of the refreshed guiding principles for the system is 'collaborative health promotion, rehabilitation and disease and injury prevention by all sectors' (Minister of Health 2016b, p.3).

Reeve (2006) identified a divide between the policy perspectives described above, with the ACC focused on micro-level causes (i.e. focused on the immediate environment of the child e.g. individual behaviour) and Ministry of Health focused on macro-level (i.e. structural and material influences outside the child's environment and beyond the control of parents e.g. socio-economic status). These differences between government department's positions are said to

influence the portioning of responsibility for injury as well as the measures supported by each department. Further, the author argues that each causal framework has limitations, and leads to an incomplete representation of causation in childhood unintentional injuries, instead positing the need for a central government policy that encompasses all causes, and research that looks at connections between micro- and macro-level causes.

In 2011, Bland and colleagues found New Zealand had not adopted a number of existing evidence-based safety measures which could reduce child and adolescent injury mortality and morbidity. In addition, specific national targets and strategies were lacking, as was having individuals or departments with mandated responsibility for all aspects of child and adolescent safety. Based on the assessment by Bland et al (2011) recommendations were developed by comparing New Zealand's child unintentional injury mortality and injury prevention policies with those of European countries. Examples of evidence-based injury prevention policy and legislative actions recommended include:

- Updating the national strategy with child- specific targets and timelines, and prioritising vehicle passenger safety, pedestrian safety and water safety (the three leading causes of child unintentional injury mortality in New Zealand) (i.e. policy recommendation).
- Revising legislation to require appropriate use of child passenger restraints, including booster seats (i.e. legislative recommendation) (Shepherd et al 2013).

Data and information systems

Statistics New Zealand is a national office funded by the NZ Government. It has the statutory role of Injury Information Manager under the Accident Compensation Act 2001. In this role, Statistics NZ works with the lead agencies for injury prevention to improve the quality, timeliness, and availability of injury information in New Zealand. It achieves this through The Official Injury Information Programme (Statistics New Zealand no date, a).

A key aim of the Official Injury Information Programme "is to contribute to the prevention of injuries and to improve rehabilitation outcomes by:

- leading and coordinating public sector activities to effectively and efficiently improve injury information in New Zealand
- informing debate, decision making, and research by enabling access to and disseminating injury data
- driving a programme of activity to improve the relevance and reliability of injury data
- developing standards for valid, meaningful, and useful ways of measuring, monitoring, and reporting injury
- leading and coordinating research to build the evidence base and inform future decision making" (Statistics New Zealand 2014).

Statistics New Zealand's summary of injury datasets provides an overview of information collected about injuries in New Zealand that is held in databases produced by different agencies. The agencies and their data collections are presented in Table 3 (Statistics New Zealand, no date b).

Table 3 New Zealand injury datasets

Agency	Dataset
Accident Compensation Corporation	Claims management system
Child and Youth Mortality Review Committee	Mortality Review Database
Civil Aviation Authority	Aviation safety monitoring system
Coronial Services Unit	Coronial information system
Department of Labour and Maritime New Zealand	Data relating to maritime events
Institute of Environmental Science and Research	Chemical injury surveillance system
Ministry of Health	Mortality collection, Alcohol and drug use survey, PHIOnline, National minimum dataset
Ministry of Transport	Crash analysis system
National Poisons Centre	Call database
New Zealand Mountain Safety Council	National incident database, Outdoor education and recreation, Snow sports, Avalanche incident data
Water Safety New Zealand	Drownbase

Research and knowledge translation networks

A key research centre with a focus on injury prevention in New Zealand is the Injury Prevention Research Unit (IPRU), established in 1990 and based in the Department of Preventive and Social Medicine in the Dunedin School of Medicine at the University of Otago. IPRU's goal is to undertake research that contributes to reducing the incidence, severity and adverse consequences of injury in New Zealand (Injury Prevention Research Unit no date).Their National Injury Queries System provides selected injury statistics in a user friendly manner (data is from the New Zealand Health Information Service).

Another research centre active in the field is the University of Auckland's Injury and Trauma Research Group. This group has a multidisciplinary research programme that encompasses road traffic crashes; injuries at home; alcohol-related trauma; optimising the care of children with head injuries, and integrated models of pre-hospital and acute trauma service delivery (University of Auckland no date). Now non-operational, the University of Auckland was also home to the Injury Prevention Research Centre until funding ceased. Also located at the University of Auckland, the Injury Prevention Information Centre (which had a role providing information database management and an enquiry service) continued to function until funding by the Ministry of Health ceased, in June 2011.

Safekids Aotearoa provides evidence-based information to planners and decision-makers to improve child safety. An example of their approach is the publication *Child Unintentional Deaths and Injuries in New Zealand, and Prevention Strategies* (Safekids Aotearoa 2015). Safekids Aotearoa (through the Child Injury Prevention Foundation of New Zealand) supports annual Summer Research Scholarships in child injury prevention (intentional or unintentional). These are targeted at undergraduate students.

Coordination

Safekids Aotearoa, a service of Starship Children's Health, was established in the early 1990s by Starship Children's Health Trauma Service to help reduce the high rates of preventable injury to

children (Safekids Aotearoa 2016a). Starship is a hospital for children and young people based in Auckland. Through a partnership approach Safekids Aotearoa aims: to reduce the incidence and severity of unintentional injuries to children aged 0 to 14 years. They develop injury prevention programs, provide communication tools and advocate for changes in legislation (Safekids Aotearoa 2016b). Safekids is a national service but based in Auckland. They are a member of Safekids Worldwide, a global organisation that works through a network of over 30 countries to prevent unintentional injuries in children (Safe Kids Worldwide 2016).

Safekids Aotearoa also has close links with the Safe Communities Foundation NZ (which accredits and supports 25 Safe Communities across the country). Safe Communities Foundation New Zealand is a non-profit organisation working in community-based injury prevention and safety promotion, with a focus on building local partnerships and collaborative relationships. It is jointly funded by the ACC, the Ministry of Health, the Ministry of Justice, and the Health Promotion Agency (Safe Communities Foundation New Zealand no date).

The Child Safety Foundation New Zealand, a group promoting education, training and other initiatives to make the environment safer for children up to six, was disestablished in 2010 due to cuts in government funding. Other organisations such as Plunket (New Zealand's largest provider of support services for the development, health and wellbeing of children under the age of five) took up some of the initiatives to promote child safety around the home (New Zealand Press Association 2010).

The Injury Prevention Network of Aotearoa New Zealand (IPNANZ) provides a national voice for injury prevention in New Zealand. Previously funded by the Ministry of Health, they bring together individuals and organisations within the injury prevention sector and advocate for the prevention and reduction of intentional and unintentional injury (Injury Prevention Aotearoa 2013). Specifically, Injury Prevention Aotearoa:

- Raise the profile of injury prevention by providing a collective national voice.
- Provide up-to-date information, resources and events to further injury prevention knowledge and best practice.
- Promote and support the development of specific Māori- and Pacific-focused injury prevention initiatives.
- Acknowledge and celebrate achievements within the injury prevention sector.
- Positively influence policy development and legislation relating to the prevention of injury.

4.1.2 Canada

The Government of Canada takes a lead role in child injury prevention nationally through the Public Health Agency of Canada and Health Canada, two organisations within Canada's Health Portfolio. They deliver and support various programs which aim to reduce injuries and promote safety in children.

A report by the Advisor on Healthy Children and Youth in 2007 found that Canada did not have a National Injury Prevention Strategy for Children and Youth. The report recommended Health

Canada and the Public Health Agency of Canada work with stakeholders to develop a comprehensive strategy, outlining the following key elements for inclusion in such a strategy:

- Leadership and coordination, including the development of specific indicators, desired targets, benchmarks, and national standards
- Social marketing, public promotion, advertising, and education to change parent behaviour and educate parents, children and youth
- Knowledge translation research on injury prevention in children and youth - that provides parents and organizations the tools to create safe environments for their children
- National standards for consumer products and equipment use
- Effective data collection, surveillance and information dissemination
- Collaboration among key stakeholders
- Incentives and support for parents (Leitch 2007).

Policy leadership

Under the Child Development Initiative, Health Canada supported the development of resources to enhance the advancement of injury prevention programs and research for children and youth (0 to 19 years). Lovasik et al (1996) detail past legislative measures enacted to prevent unintentional injuries in children and youth nationally and by jurisdiction.

The Canadian Paediatric Society has been active in advocating for policy development. The Society released a position statement on a public health approach to child and youth injury prevention (Yanchar et al 2012). This statement argues the case for prevention and national investment in injury prevention. It advocates for improved collaboration and coordination of efforts (from research to knowledge transfer to practice) and strengthened linkages among federal, provincial/territorial and regional injury prevention partners. Policy leadership is needed through the development of a "pan-Canadian injury prevention strategy that includes leadership, policy coordination, research, surveillance, public education and social marketing; and supporting the development of a national injury prevention body to help implement this strategy and to coordinate injury prevention activities by stakeholders across the country" (Yanchar et al 2012, p.5).

More recently, the Canadian Paediatric Society has urged the federal government to legislate evidence-based policy in a number of "high impact" areas for children and youth, including injury prevention strategies (Canadian Paediatric Society 2016a). In a status report on Canadian public policy and child and youth health, they strongly assert: "Canada needs a national injury prevention strategy which includes outreach, education and safety legislation that is enforced at all government levels" (Canadian Paediatric Society 2016b). In particular, they highlight the need to strengthen legislation on key safety issues including bicycle helmets, booster seats and off-road vehicles.

Data and information systems

The importance of sustaining and advancing injury surveillance systems that encompass outpatient injuries, hospitalised trauma patients and trauma deaths has been identified by the Canadian Paediatric Society (Yanchar et al 2012). The Canadian Hospitals Injury Reporting and

Prevention Program (at the Hospital for Sick Children) was the first injury surveillance system in Canada, launched by Health Canada in 1990, funded by the Public Health Agency of Canada and continues to document the number, types, and circumstances of injuries mainly in children, presenting to the emergency rooms at 15 select hospitals across Canada (Pike et al 2015; Public Health Agency of Canada 2016).

Canada's central statistical office, Statistics Canada, collects data and reports on childhood injury (for example see Oliver and Kohen 2012; Pan et al 2006). The Canadian Institute for Health Information manages the National Trauma Registry Minimum Data Set and Hospital Morbidity Database, which include paediatric injury hospitalisations. The Public Health Agency of Canada houses the Canadian Best Practices Portal which includes Canadian and international information to assist program development for the prevention of unintentional injuries among children and older persons. The portal also includes information about data sources, government and provincial strategies, good practice guidances and systematic reviews of research, for example *Parenting interventions for the prevention of unintentional injuries in childhood* (Kendrick et al 2013) and *Preventing unintentional injuries to children under 15 years in the outdoors: A systematic review of the effectiveness of educational programs* (Pearson et al 2012).

In 2010, the Canadian Injury Indicators Development Team brought together injury researchers, policy makers, and practitioners to develop injury indicators in overall health services implications, motor vehicle occupant, sports, recreation, and leisure, violence, and trauma care, quality, and outcomes. Using a modified-Delphi approach, the team developed a set of 34 child and youth injury-related indicators to reflect and monitor identified prevention priorities to be used for injury surveillance in Canada (Pike et al 2010).

Building on this work, in 2016 Parachute launched the *Canadian Atlas of Child and Youth Injury Prevention* which provides access to injury information and data based on ten national child and youth injury indicators. The Atlas comprises a visual Injury Data Dashboard, Injury Research Insights and the Injury Data Online Tool, iDOT© which provides the intentional and unintentional causes of death for Canadian males and females aged 0-19 for the years 2006-2011. The Dashboard and iDOT are both based on several existing datasets: mortality data from Statistics Canada (CANSIM), hospitalisation data from the Canadian Institute of Health Information (CIHI), drowning data from the Lifesaving Society, and transportation data from each province/territory (Parachute 2016). It presents a set of indicators comparable across institutions and organisations to monitor injury. Canadian child safety report cards are being developed to inform Canadians about current injury prevention practices in each province in relation to sports-related injuries, water-related injuries, motor vehicle collisions and falls. These child safety report cards will enable international comparisons with reports produced by the European Child Safety Alliance (CIHR Team in Child & Youth Injury Prevention 2016).

A recent study that developed and validated an indicator of severe paediatric injury used routinely collected population based administrative data relating to paediatric hospitalisations (the national Discharge Abstract Database) and aggregated trauma registry data from trauma centres (Comprehensive Data Set of the Ontario Trauma Registry). A key finding was that the use of both datasets generated a greater number of diagnoses (with 20 of the included diagnoses common to both datasets). The use of only one dataset may have underestimated

the number of severe injury diagnoses in the paediatric population. Such an indicator can be used for population-based injury surveillance to examine trends over time and potentially to assess the performance of paediatric trauma systems (Pike et al 2017).

Research and knowledge translation networks

The Canadian Institutes of Health Research (CIHR) led a strategic initiative called *Listening for Direction on Injury Prevention*, and have since awarded numerous "Strategic Team" grants in Applied Injury Research. Along with partners The Alberta Centre for Child, Family and Community Research and the Public Health Agency of Canada, the CIHR funded the CIHR Team in Child & Youth Injury Prevention from 2010. This group released *The CIHR Team in Child & Youth Injury Prevention End of Grant Report: 2010 – 2016.* Their research program is based on a public health approach; working through partnerships with researchers and stakeholders and focusing on child and youth injury by developmental stages to target relevant causes of injury within these groups.

Other relevant research centres at a provincial level include:

- The British Columbia Injury Research and Prevention Unit have a program of injury surveillance and research. They have developed the Injury Data Online Tool that provided in-depth statistics on injury in BC (BC Injury Research and Prevention Unit 2016). The unit has strong national partnerships as well as provincial collaborations with a variety of partners such as the BC Injury Prevention Policy Advisory Committee and BC Injury Prevention Leadership and Action Network.
- The Injury Prevention Centre in Alberta (formerly the Alberta Centre for Injury Control and Research): part of the School of Public Health at the University of Alberta, founded in 1998. The centre's four main roles in injury prevention are: knowledge translation, evaluation and surveillance; leadership, coordination and policy development; resources for community-based action; public engagement (Injury Prevention Centre 2015).
- The Ontario Injury Prevention Resource Centre: goals are to: increase the knowledge, skill and confidence of injury prevention practitioners in planning, implementing and evaluating injury prevention initiatives in Ontario; provide training for practitioners; provide communication, information and knowledge exchange services; provide data; engage key stakeholders (Ontario Injury Prevention Resource Centre 2016).

Coordination

The Public Health Agency of Canada provides an overview of the 25 year history of the *Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP)* that was produced by Delsys Research (2015). The Canadian Collaborative Centres for Injury Prevention (CCCIP) was established in 1999 to promote collaboration among Canadian injury prevention centres and organisations, to address common issues such as funding, and to provide strategic guidance in advancing injury prevention. The CCCIP is now recognised as "a facilitator of action and a leader in the field of injury prevention" (Pike et al 2015, p.7).

A major development in terms of leadership and coordination in Canada was the establishment of Parachute in July 2012. This national, charitable organisation was established by merging four former National Injury Prevention Charities / NGOs (Safe Communities Canada, Safe Kids

Canada, SMARTRISK and ThinkFirst Canada). The entity was formed based on recommendations by the Injury Alliance Collaborative Study Project to take a leadership role in injury prevention research and a knowledge broker role for injury in Canada, as well as increasing engagement of stakeholders and funding for initiatives (Groff 2010). The Public Health Agency of Canada is among their many sponsors and contributors. Parachute is now a strong leader in injury prevention, with a member network of 6,000 organisations, communities and individuals (Parachute 2015).

Other examples of non-government organisations engaged in child injury prevention include the Canadian Institute of Child Health and the Sandbox Project. The Canadian Institute of Child Health (founded in 1977) is a national charitable organisation dedicated to improving the health of children and youth in Canada. The Institute funds research; advocates with government through policy recommendations and supports community development initiatives. It has a particular interest in the safety issues and the health impact of environmental conditions on children (Canadian Institute of Child Health 2005). The Sandbox Project (2016) is another national charity aimed at improving the health and wellbeing of Canadian children and youth. The organisation's mission is to "unite and guide the many groups and individuals operating within Canada's child and youth health sector through providing a forum in which diverse stakeholders can work together". It supports collaboration, public education and evidence-based policy development and includes an Injury Prevention Working Group.

A recent evaluation of evidence-based childhood injury prevention policies across Canada has urged continued collaboration between researchers, advocates, and policy-makers to improve childhood injury prevention policies across the country and to employ a multi-sectoral approach to development, implementation and enforcement (Macpherson et al 2015).

4.1.3 United States

The leading national public health institute of the United States is the Centers for Disease Control and Prevention (CDC), a federal agency under the Department of Health and Human Services. Specifically, within the CDC, the National Center for Injury Prevention and Control (NCIPC) takes a lead role in childhood injury prevention. In 1986, Congress passed the Injury Prevention Act and in 1992 funded the NCIPC, which works with other federal agencies and funds research for injury prevention.

Policy leadership

In 2012, the NCIPC's Division of Unintentional Injury Prevention, in consultation with over 60 partners, developed the *National Action Plan for Child Injury Prevention* (NAP). The goal of the NAP is to guide actions fundamental to reducing the burden of childhood injuries in the United States as well as providing a national platform for organising and implementing child injury prevention activities in the future. The NAP provides a plan for:

> *"…Strengthening the collection and interpretation of data and surveillance, promoting research, enhancing communications, improving education and training, advancing health systems and health care and strengthening policy. Elements of the plan can inform actions by cause of injury and be used by government agencies, non-governmental organizations, the private sector, not-for-profit organizations,*

health care providers, and others to facilitate, support, and advance child injury prevention efforts" (Centers for Disease Control and Prevention 2012).

The *National Action Plan for Child Injury Prevention* is structured across six domains: data and surveillance, research, communication, education and training, health systems and health care and policy.

The CDC also has a leadership and coordination role in addressing child abuse and neglect. Whitaker et al (2005) discuss the CDC's rationale for applying a public health approach to child maltreatment, the priority-setting process, and some of CDC's child maltreatment prevention activities. Similarly, the CDC also has a primary role in violence prevention (Hammond et al 2006).

Trust for America's Health and the Robert Wood Johnson Foundation funded the publication *The Facts Hurt: A State-By-State Injury Prevention Policy Report 2015*. The report notes that injuries are the leading cause of death for children and for all Americans between the ages of 1 and 44 (Levi et al 2015, p.3). The report includes a detailed assessment of US investment in injury prevention and State-by-State Injury prevention indicators and scores. It includes detailed recommendations for major causes of injury and concludes that: "Increased resources and workforce are needed for injury prevention; Increased investment is needed for injury prevention research; and partnerships between public health and other sectors much continue to be strengthened" (Levi et al 2015, pp.71-72). Kaufman and Wiebe's (2016) recent study identified promising injury prevention policies (highlighted by the Trust for America's Health and injury experts) and evaluated their association with injury death rates in the US. A state-level analysis and county-level analysis was completed. Counties located in strong policy states had lower rates of death from injury than counties in moderate or weak policy states. These findings support states' continuing efforts to use policy mechanisms to reduce death from injury.

Data and information systems

Within the US there are national entities contributing to the collection and dissemination of childhood injury related data and information and state based initiatives. Several examples are provided to illustrate the scale of this.

The CDC has a core role in data collection and supports a range of initiatives, for example:

- Web-based Injury Statistics Query and Reporting System WISQARS™ – an interactive, online database providing customised injury-related mortality data and nonfatal injury data.
- Ten Leading Causes Charts – Charts are available for the leading causes of injury-related deaths and nonfatal injury in multiple file formats. The charts can be used in slide presentations, web pages, and print documents.
- Inventory of National Injury Data Systems – This inventory describes 44 different federal data systems operated by 16 different agencies and 3 private injury registry systems that provide nationwide injury-related data. Each data system is listed along with the agency or organisation and associated websites.

- State Injury Indicators Query System – A database of 27 injury indicators (fatalities and hospitalisations) for any state.
- Economic Burden of Injury – The Incidence and Economic Burden of Injuries in the United States examines the lifetime costs associated with the injuries that occur in just one year" (New York State Department of Health 2016).

The Consumer Product Safety Commission operates the National Electronic Injury Surveillance System, which collects data on consumer product-related injuries occurring in the United States.

The Connecticut Injury Prevention Center has had a pioneering role in surveillance and the Center's efforts have led to important policy and legislative changes that have improved safety within this State (Allegrante et al 2016).

The Children's Safety Network produces fact sheets that provide a snapshot of data on the injury-related Maternal and Child Health Block Grant National Performance Measures and Health Status Indicators for various states (Children's Safety Network 2016c).

Research and knowledge translation networks

The CDC began funding Injury Control Research Centers (ICRCs) throughout the US in 1987 to investigate ways to prevent injuries and disabilities. ICRCs conduct interdisciplinary research in the three core phases of injury control: prevention, acute care, and rehabilitation. They also serve as training and information centres for the public (Centers for Disease Control and Prevention 2016). Eleven ICRCs are currently funded, with most having some level of involvement in childhood injury prevention. However, the Center for Injury Research and Policy (CIRP) (at The Research Institute at Nationwide Children's Hospital) is the only centre solely focused on injuries to children and adolescents. As stated on their website, "the researchers at the CIRP are dedicated to reducing injury-related pediatric death and disability worldwide" (Nationwide Children's Hospital no date).

Various other research organisations are established across the US that conduct work in child injury prevention, for example:

- The Children's Hospital of Philadelphia (CHOP) Research Institute is home to the Center for Injury Research and Prevention as well as the Center for Child Injury Prevention Studies (CChIPS), multi-site National Science Foundation Industry/University Cooperative Research Center. This research group within a clinical setting has strong partnerships with industry and is a good example of coordination between research, government and health and industry.
- The Harborview Injury Prevention and Research Center (2016) is affiliated with the University of Washington and Harborview Medical Centre in Seattle. In partnership with the Harborview Injury Prevention and Research Center, county and state health departments and others have created programs for promoting healthy lifestyles, booster seats and water safety that have become models for reducing obesity and preventable injury.
- The Centre for Child Health, Behavior and Development at the Seattle Children's Hospital houses a multidisciplinary team of research scientists working in a range of areas related to

child health. They undertake studies related to child injury, for example "Concussion and Injury Surveillance in Youth Soccer Players" (Seattle Children's no date).

Gallagher and colleagues (2013) highlighted the need for research experts in the injury field to build relationships with decision makers, which they argue is crucial to effective advocacy and translating research in policy.

Coordination

A key aim of the *National Action Plan for Child Injury Prevention*, discussed above, was to offer solutions to childhood injury by uniting stakeholders around a common set of goals and strategies, and mobilise efforts to reduce child injury and death.

A number of key organisations, groups and networks operate at a national level to coordinate childhood injury prevention efforts, for example:

- Prevent Child Injury is a national group of organisations and individuals, including researchers, health professionals, educators, and child advocates working together to prevent injuries to children and adolescents in the US. Prevent Child Injury received start-up funding from the CDC to address the communications initiative of the NAP, promoting coordinated public communication about child injury (Prevent Child Injury no date).
- Safe Kids has a network of more than 400 coalitions in the United States and also partners with organisations in 30 other countries to reduce childhood injuries. Their work is in research, programs and initiatives, and public policy (Safe Kids Worldwide 2016).
- The Children's Safety Network (CSN) is an Education Development Center (EDC) project funded by the Health Resources and Services Administration's Maternal and Child Health Bureau (U.S. Department of Health and Human Services). The CSN host a Child Safety Collaborative Innovation and Improvement Network (Children's Safety Network 2016a). They have also recently established a Child Safety Collaborative Innovation and Improvement Network, first convening the steering committee in October 2015 (Children's Safety Network 2016b).
- Safe Communities America is an accreditation program of the National Safety Council and supports the Safe Communities model. This approach works through engaging local partners concerned about safety, using data to identify leading causes of injury and death and responding through a planned, evidence-based strategies with ongoing evaluation (National Safety Council 2016).

At a state-level, much work is also being done. For example, the Florida Department of Health, Injury Prevention Section, guided by the *2014-2016 Florida Injury Prevention State Plan* and *2014-2016 Florida Injury Prevention Operational Plan*, is leading efforts in that state. There is a state-wide campaign to prevent early childhood drowning, an Injury Surveillance Data System, an Injury Prevention Advisory Council and local coalitions are active in Safe Kids Florida (Florida Department of Health no date).

The Northeast region of the US also has a history of working intensively on child injury prevention issues beginning with the strategy of the Statewide Childhood Injury Prevention

Project (SCIPP) at the Massachusetts Department of Public Health in 1979, which later developed into the Northeastern Injury Prevention Network (Philippakis et al 2004).

A study on the implementation of injury prevention programmes in the US developed five indicators of successful implementation: legislative activities, surveillance, monitoring and evaluation, community involvement with the injury program, and the ability to create a permanent place for the program within the state agency (institutionalisation) (Cassady et al 1997).

4.1.4 United Kingdom

More than 800 children in the UK die from injuries annually, and disparities in child injury mortality rates are widening between England, with the lowest rates, and Scotland, Wales and Northern Ireland, which have significantly higher injury mortality rates (Royal College of Paediatrics and Child Health 2013).

Within the United Kingdom (UK), injury prevention work to address child and adolescent injury occurs at the level of the constituent countries: England, Northern Ireland, Scotland and Wales. Outlined below are examples of approaches to childhood injury prevention from these constituent countries. It is not intended to review progress in each country in detail but rather to highlight important examples of policy leadership and coordination of data and research that have advanced childhood injury prevention efforts on a national scale. Cleugh and Maconochie (2005) provide a background on the UK Government's efforts to address childhood injury prevention.

Policy leadership

Child and adolescent injury prevention work is spread across a variety of Government departments in England. For example the Department for Transport tackles road safety while the Department of Communities and Local Government deal with fire safety. The current priority areas for child and adolescent injury prevention and safety promotion in England include road safety, home safety and the reduction of inequalities in injury risk (European Child Safety Alliance no date).

The Department of Health (through Public Health England) and Department for Education provide policy leadership in children's health. The white paper *Healthy Lives, Healthy People: Our strategy for public health in England* emphasises the importance of giving all children a healthy start to life. It identifies road accidents as the leading cause of accidental death and injury of children in the UK. The white paper notes there are strong social and regional variations and therefore a tailored local approach is needed to address this health issue (Secretary of State for Health, Department of Health 2010).

Public Health England is an executive agency of the Department of Health. It works collaboratively with the Child Accident Prevention Trust and the Royal Society for the Prevention of Accidents to support local authorities and their partners to reduce child injuries. Public Health England releases guidances to support local authorities and their partners to take action, for example *Reducing unintentional injuries in and around home among children under five years* (Public Health England 2014).

The National Institute for Health and Care Excellence (NICE) also produces evidence-based guidelines to support prevention of unintentional injuries *(Quality standard 107: Preventing unintentional injury in under 15s* was released in 2016). The standard recommends:

- Developing plans and strategies for young people's health and wellbeing
- Establishing a national injuries surveillance resource
- Incorporating guidance on home safety assessments within relevant national initiatives (with particular emphasis on coordinating prevention activities)
- Developing policies and strategies to prevent unintentional injuries resulting from play and leisure.
- Involving the police in driver education initiatives and activities to reduce traffic speed (NICE 2010).

The guidance includes the following comment about context in relation to recommendations:

> *The prevention of unintentional injuries among children and young people may not be a priority among local organisations. To ensure prevention activities are accorded the importance they deserve, they need to be incorporated into national objectives aiming to improve the population's health (NICE 2010).*

A recommended action is supporting a child and young person injury prevention coordinator that could promote a strategic framework for action and encourage local agencies to work together.

Injury prevention work to address child and adolescent injury in Northern Ireland is led by the Ministries of Health and Transport (European Child Safety Alliance no date).

England and Northern Ireland are represented on the European Child Safety Alliance Steering Committee by an English representative of the Royal Society for the Prevention of Accidents (RoSPA). Scotland is represented by an Edinburgh based member of the Royal Society for the Prevention of Accidents. Wales is represented by a member of Children in Wales (2014), which is a registered charity and national umbrella body for organisations and individuals who work with children, young people and their families in Wales.

Scotland released a *Child Safety Strategy – Preventing Unintentional Injuries to Children and Young People in Scotland* to support the development of the *Child Safety Action Plan for Europe.* One of the key strategic approaches argued that "existing policy opportunities should be used whenever possible to provide a framework for injury prevention" (Child Accident Prevention Trust & the Royal Society for the Prevention of Accidents 2007, p.4).

The report explains the need for a multisectoral approach to injury prevention:

> *The health and wellbeing of children and young people, including the need to keep them free from death and injury, are incorporated into many existing Scottish and UK policies. These policies cover a range of sectors, including health, transport, fire safety, education, child and family welfare, play and sport, regeneration, housing,*

> *environmental health and the environment more generally. This illustrates the breadth of agencies with the responsibility and opportunity to act in this area. (Child Accident Prevention Trust & the Royal Society for the Prevention of Accidents 2007, pp.12-13)*

Stone and Morris (2010) argue for greater collaboration and coordination between the environmental and health sectors to address childhood injury prevention in Scotland (and the UK as a whole) via its environmental health infrastructure, particularly health board departments of public health (including health promotion departments), consultants in communicable disease and environmental health, NSW Scotland and Health Protection Scotland. Scotland's policy initiative on the environment and human health, *Good Places, Better Health*, identifies injury in children up to 8 years of age as one of four child health priorities. Inequalities in injury risk have been established amongst children in Scotland and environmental interventions are seen as a promising approach for reducing socio-economic inequalities in injury risk.

Children in Wales, is the national umbrella body for organisations and individuals who work with children, young people and their families in Wales. This organisation is leading the development of the *Child Safety Strategy for Wale*s, which aims to prevent deaths and reduce unintentional injuries in children and young people. This activity is occurring in partnership with the Collaboration for Accident Prevention and Injury Control and the Child Accident Prevention Trust (Children in Wales 2008).

As far back as 1998, Towner and colleagues reported a need for a single national agency, in each country within the UK, designated to take the policy, implementation, and research lead on injury prevention, a role similar to that taken by the US National Centre for Injury Prevention and Control at the Centers for Disease Control and Prevention.

Data and information systems

Public Health England (no date) supports a web-based "Children and Young People's Health Benchmarking Tool" that allows comparison of data between regions and areas. It displays values and trends for a diverse range of health outcomes, for example, hospital admissions caused by unintentional and deliberate injuries in young people (aged 0 – 4, 0 – 14 years and 15 – 24). It is part of the *Public Health Outcomes Framework* that has been designed to provide a high-level overview of public health outcomes at national and local level, supported by a broad set of indicators (Public Health Policy and Strategy Unit, Public Health England 2016). It is referred to as the "Fingertips" web-site and includes a diverse range of public health profiles. These profiles present data and information for indicators across a range of health and wellbeing themes. Public Health England (2016) through the National Child and Maternal Health Intelligence Network also publishes *Child Health Profiles* that provide a snapshot of children and young people's health by local authority and clinical commissioning group in England. The 2016 Child Health Profiles present data across 32 key health indicators of child health and wellbeing. The profiles also show how the health of the area compares to the national view and other local authorities in England. In addition to reporting on indicators relating to hospital admissions for child injuries they also report children killed or seriously injured in road traffic accidents.

RoSPA collaborates with national health authorities in England, Scotland, Wales and Northern Ireland and wide-ranging data experts to produce the *Big Book of Accident Prevention* which provides data and evidence to support injury prevention. For example the Public Health Agency, Northern Ireland; Department of Health, Social Services and Public Safety, Northern Ireland; and the Northern Ireland Statistics and Research Agency (NISRA) are examples of data sources that RoSPA has drawn on in the production of the *Northern Ireland's Big Book of Accident Prevention.* RoSPA believes this publication showcases how it influences cross departmental approaches to tackling accident prevention in Northern Ireland (RoSPA no date).

England also has a comprehensive system of recording episodes of inpatient care through the Hospital Episodes Statistics (HES) service. Since 2007, this system has recorded a basic dataset of attendances at Emergency Department (ED) services. An analysis of 2010-11 data (experimental statistics) found that the HES Accident & Emergency (A&E) dataset provided data on 74% of all ED attendances in England, including 94% of attendances to major EDs (NHS Information Centre for Health and Social Care). The routine availability of national emergency department data enables a comprehensive examination of relationships between deprivation and injury with attendance for most injury types increasing with deprivation, except for sports injuries which decrease with deprivation (Hughes et al 2014).

Research and knowledge translation networks

The importance of high quality research and wider implementation of evidence-based approaches in childhood injury prevention in the UK was recommended in the late 1990s (Towner and Ward 1998). There is a diverse group of institutions throughout the UK contributing to childhood injury prevention research. For example University College London's Institute of Child Health; the Royal College of Paediatrics and Child Health and the Child Accident Prevention Trust. The Injury Observatory Britain and Ireland has been established through collaboration between a number of public health and academic institutions and provides data, information and evidence to support injury prevention practitioners (Injury Observatory Britain and Ireland no date). Over time the UK Government intends that all publicly funded research outputs should be open access. The University of Exeter hosts the repository *Open Research Exeter* which provides an example of how immediate online availability of research publications can be provided (University of Exeter no date).

Academics from Swansea and Cardiff Universities are recognised as national and international leaders in the field of injury prevention. Data and information is coordinated through a range of mechanisms. For example the All Wales Injury Surveillance System (AWISS) is a key resource to support the reduction of injuries in Wales. AWISS is a population-based, multisource injury surveillance system which collects and analyses data on injury risk factors, severity, outcomes and costs. It is funded by Public Health Wales (AWISS no date).

The Swansea University Medical School (with core funding from Health and Care Research Wales of the Welsh Government) has developed SAIL which stands for the Secure Anonymised Information Linkage Databank. This is a Wales-wide research resource that functions as an anonymous data linkage system that securely integrates various sources of routinely-collected data about the population of Wales.

It was established in 2006 to improve data linkage capacity and has progressively expanded the types of datasets and geographical coverage within the databank. Datasets are accessed from the Office for National Statistics, NHS Wales Informatics Service, Public Health Wales, Welsh Cancer Intelligence and Surveillance Unit, the Congenital Anomaly Register and Information Service and GP practices signed up to SAIL, contributing to the primary care GP dataset (Swansea University 2016).

SAIL is engaged in research in diverse areas including injury and children and young people's health and collaborates with a broad range of research groups both within Wales, the wider UK and internationally. SAIL actively works to disseminate research findings through publications and other research translation activities.

Coordination

In England the Royal College of Paediatrics and Child Health appears active in promoting policy and research initiatives and collaborating with other entities such as Public Health England, Royal College of General Practitioners and Royal College of Nursing to endorse the NICE quality standards and clinical guidelines for preventing unintentional injury among children and young people under 15.

The Royal Society for the Prevention of Accidents (RoSPA) is a British charity that aims to save lives and prevent life-changing injuries which occur as a result of accidents. It is active in advocacy, research, education, providing expert advice to business and influencing legislation. ROSPA collaborates with professional colleges and national health authorities to support injury prevention initiatives. For example in Scotland ROSPA is working with the Royal College of Emergency Medicine (RCEM) and the Centre for Trauma Sciences, Barts and The London to advocate for a nationwide programme to reduce unintentional injuries to under-5s (RoSPA and RCEM no date). It is also engaged in several European projects on injury prevention and has a close association with the European Child Safety Alliance and the European Association for Injury Prevention and Safety Promotion (EuroSafe).

A recent development involving RoSPA is the founding of the National Accident Prevention Strategy Advisory Group (NAPSAG) and 13 other organisations. NAPSAG will work to develop a national strategy to properly prioritise accident prevention within public health (RoSPA 2016a). Organisations working together with RoSPA in the NAPSAG include:

- Association of Directors of Adult Social Services
- Association of Directors of Public Health
- Association of Retirement Housing Managers
- Department of Health
- Faculty of Public Health
- Institute of Health Visiting
- National Housing Federation
- Public Health England
- Royal College of Emergency Medicine

- Royal College of General Practitioners
- Royal College of Paediatrics and Child Health
- Royal Society for Public Health
- Sport England (RoSPA 2016b).

The document *Towards a Child Safety Strategy for Wales* (Children in Wales 2008) emphasises the importance of preventing fatal, serious and disabling injuries. It was based on extensive consultation with practitioners and one of the common themes about coordination that emerged is summarised best by the following quote:

> *While injury prevention is everyone's responsibility, often no one takes lead responsibility for it (Children in Wales 2008, p.3).*

Three structural measures were seen as instrumental to reducing deaths and serious injuries:

- Clear leadership nationally and locally – as preventing unintentional injuries cuts across the responsibility of a number of departments in the Welsh Assembly Government, one department must take the lead and coordinate activities to ensure that effort is not duplicated or, worse still, not undertaken.
- Coordination of activities between agencies and departments again at national and local levels.
- Improved communication and partnership working between all the parties who can make a difference to the safety of children and young people in Wales (Children in Wales 2008, p.4).

The report included wide-ranging recommendations, for example that:

- the Welsh Assembly Government adopt and support a Child Safety Strategy and Child Safety Action Plan (developed to align with the European EuroSafe initiative)
- designate a lead agency
- establish a multi-agency Child Safety Implementation Group to monitor implementation of the action plan to Ministers
- link the Child Safety Strategy and Action Plan into the Child Death Review Board
- coordinate national communication campaigns to promote child safety
- establish local injury prevention coalitions in each local authority area in Wales to assess needs and plan interventions as needed at the local level
- improve the evidence base for effective injury prevention
- understand and reverse social inequality in injury risk; and
- improve injury surveillance (Children in Wales 2008, pp.4-5).

4.1.5 European Union

Injuries are a leading cause of death and disability for children in every Member State in Europe (EuroSafe et al 2015). The WHO *European Report on Child Injury Prevention* reports that in 2004, 42,000 children and adolescents (aged 0-19 years) died from unintentional injuries in the WHO European Region, and millions were hospitalised and received emergency care (Sethi et al 2008a). While childhood injuries cause a high disability and mortality burden in Europe generally, large differences in this burden have been observed between the safest countries in Western Europe (e.g. the Netherlands and UK) and relatively unsafe countries in Eastern Europe (e.g. Latvia and Slovenia) (Polinder et al 2010).

The WHO report also notes, however, that several European countries have successfully developed comprehensive and evidence-based approaches to preventing childhood injury. Action points were recommended to progress sustained and systematic approaches to address the underlying causes of injury:

- Provide leadership in integrating the prevention of injury among children and adolescents into a comprehensive approach to their health and development
- Develop and implement a policy and plan for preventing injury among children that involves other sectors
- Implement evidence-based action to prevent and control injuries among children
- Strengthen health systems to address injuries among children
- Build capacity and exchange best practice
- Enhance the quality and quantity of data for preventing injury among children
- Define priorities for and support research and evaluation on the causes, effects, costs and prevention of injury among children
- Raise awareness and targeted investment for preventing injury among children
- Address inequity in injury among children (Sethi et al 2008a).

The adoption of the *WHO Regional Committee for Europe Resolution (EUR/RC55/R9)* on prevention of injuries in 2005, and the *European Council Recommendation* on injury prevention and safety promotion in 2007 stimulated policy development, surveillance, capacity-building and multi-sectoral collaboration throughout Europe (Sethi et al 2008b).

A report on priorities for action within the EU found that a more cohesive and integrated approach to child safety is required with a lead ministry for child safety nationally, and that in order to ensure harmonised enforcement of injury prevention measures throughout Europe, there is a need for a co-ordinating centre within the EU (Vincenten and Michalsen 2002). In addition, an analysis of national policies to address violence and injury prevention in the WHO European Region found a clear need for greater policy action (Parekh et al 2015). The authors stated that adequate priority has not been given to prevention policies in areas where the most injury related deaths occur. They encouraged multi-sectoral partnerships; collaboration to develop policies; and communication about the burden and preventability of these injuries.

The European Commission is the European Union's executive body and its responsibilities include proposing legislation and setting objectives and priorities for action (European Commission 2016a). Among the projects supported by the European Commission's Public Health Programme is the Child Safety Action Plan (CSAP) supported by the European Child Safety Alliance, it is discussed in more detail in the following section of this report.

EuroSafe (the European Association for Injury Prevention and Safety Promotion) is a key body promoting consistent policies, programmes and infrastructure throughout Europe. EuroSafe has strategic alliances with the European Commission and WHO Europe and its members represent health and safety agencies, research bodies and private sector organisations. These organisations can influence relevant public policies and implement safety related programmes and infrastructures (EuroSafe no date). EuroSafe implemented the Community Action on Adolescents and Injury Risk (AdRisk) programme which responded to the call for an integrated approach to injury risk with this population group (European Network Education and Training in Occupational Safety and Health no date).

Funded by the EU Health Programme, EuroSafe manages the European Injury Data Base. The purpose of the database, hosted by the European Commission, is to facilitate targeted injury prevention policies and programs at EU and national level. Data includes frequency, main causes, circumstances and consequences of non-fatal injuries in the EU and the EU member states (European Commission 2016b). Another example of a data source that multiple European countries contribute to is the Community database on Accidents on the Roads in Europe (CARE) which compiles road traffic injuries information collected by police in all member states (EuroSafe 2013).

European Child Safety Alliance

Europe is the only WHO region world-wide that has taken joint action collectively as countries to address child injury prevention. The European Child Safety Alliance (ECSA), an initiative of the European Consumer Safety Association, was launched in 2000 with the aim of making the lives of children living in Europe safer. Over 30 European countries are working together to reduce the incidence of injury, which is the leading cause of death, disability and inequity to children in every Member State in the region.

TACTICS (Tools to Address Childhood Trauma, Injury and Children's Safety) was a project undertaken by the ECSA, funded by the European Union in the framework of the Health Programme. It was a large scale, multi-year initiative undertaken from 2011 to 2014, which worked to provide better information, practical tools and resources to support adoption and implementation of evidence-based good practices for the prevention of injury to children and youth in Europe. The project built on the work of earlier projects, in particular the Child Safety Action Plan (CSAP) project (2004-2010). A key component of the project related to the continuing development and implementation of government endorsed national Child Safety Action Plans (CSAPs). These are defined as a policy document endorsed at the highest level of government that describes the broad framework, long-term direction and priorities for prevention and safety promotion for children in a country and the specific short-term activities, organisational responsibilities and resources required to implement those priorities (MacKay et al 2010).

The CSAP development process was designed to be flexible to allow countries to judge the best fit between their national policy frameworks and identified child safety gaps that require action. The development process is presented in Figure 3.

Figure 3 Child Safety Action Plan (CSAP) development process

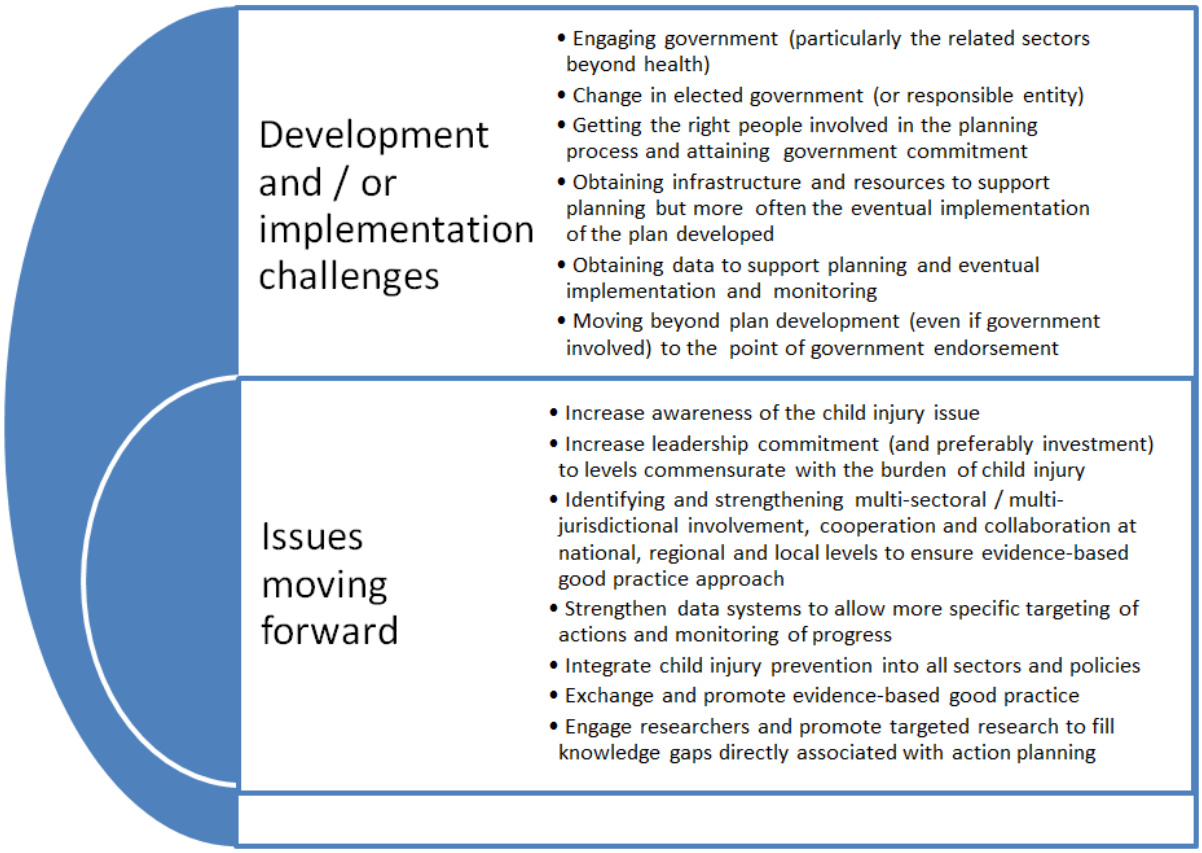
Taken from MacKay M and Vincenten J (2014)

The final project report notes the importance of such plans, highlighting their utility in terms of coordination of effort:

> *For the last decade the European Child Safety Alliance has been urging countries to develop a government endorsed child safety action plan because more effective action and consistency of healthy public policy should result through a strategic approach that identifies priority areas and actions based on evidence-based good practices. In addition while the health care sector manages the outcome of injury, the prevention strategies that have been proven effective often lie in other sectors or require coordination between sectors. A strategic and coordinated effort can also help facilitate a multi-sectoral approach to action – important given that the solutions to child injury often lie outside of the health sector (e.g., transport, education, etc.) or require coordination between sectors- and ensure it receives adequate investment that will lead to meaningful reductions (MacKay and Vincenten 2014a).*

MacKay and Vincenten (2014a) also summarised the challenges encountered during CSAP development and / or implementation and listed the key issues going forward. These are presented in Figure 4.

Figure 4 Child Safety Action Plan challenges and issues



The project also utilised Child Safety Report Cards which summarised a country's performance with respect to the level of safety provided to children and adolescents through national level policy. They were found to be useful to:

- assess and benchmark progress
- drive actions towards evidence-based good practices
- inform planning by facilitating identification of countries' strengths and weaknesses in relation to child safety
- assist in the identification of critical gaps upon which subsequent strategic planning and action planning could focus
- inform monitoring and evaluation by providing a baseline against which progress can be measured either over time with a country or compared to other participating countries (MacKay and Vincenten 2014a, p.36).

The Child Safety Action Plan (CSAP) provides a European example of choosing and implementing injury indicators. Action indicators measure key areas of action such as leadership, infrastructure and capacity to support child safety and measures of existing policy. Injury indicators can be used to raise awareness, inform decision-makers, prioritise funding, measure progress, create a shared vision, measure the success of policies and set goals (MacKay 2010). In conclusion, the CSAP approach to planning provides a model for areas of

child health (particularly injury prevention) to enable a coordinated, comprehensive and evidence-based approach to planning.

The recommendations made to the European Commission in the final report for the TACTICS project, (see 5), contain lessons pertinent to the strategic opportunities for improving coordination of research, data and childhood injury prevention initiatives in other countries and states or provinces. In summary the recommendations support networking and capacity building activities; formal national child safety action plans; committed national leadership to facilitate multi-sectoral work and the health in all policies approach; and political and financial support to enhance current data systems to allow monitoring of injuries, effectiveness of investments and social determinants (MacKay and Vincenten 2014b, pp.16-17). This report identified barriers to multi-sectoral child safety action with the most significant finding that current governance structures, particularly those at the European and national level, do not support multi-sectoral action. This was frequently as result of separate budgets, mandates, planning cycles and "turf struggles". This could be mitigated by leadership from within government to create a multi-sectoral mechanism (e.g. a cross ministerial committee, senior level multi-sectoral steering committees) for development of Child Safety Action Plans (MacKay and Vincenten 2014b, p.22).

The TACTICS project produced a detailed analysis of the *Facilitators and Barriers for the Adoption, Implementation and Monitoring of Interventions for Child Safety* (Scholtes et al 2013). A checklist was developed to address common facilitators and barriers. Subsequent work released by the European Child Safety Alliance described eight "keys to success" for prevention policies and programmes to address both intentional and unintentional child injuries, these include: "Leadership, management and collaboration, resources/funding, capacity, data, prevention strategy, context and setting and visibility" (MacKay 2015).

Examples of effective childhood injury prevention efforts in several European countries are discussed in more detail in the following sections. The countries referred to were among the leading countries according to the 2012 assessment of child safety policies in 31 countries across Europe (MacKay and Vincenten 2012; Kmietowicz 2012). The importance of research was also highlighted in this report, where it was found that the countries that are further ahead in addressing inequities in child injuries are those who have begun to study the issue to better understand the risks and then adopt actions that address the specific risks (MacKay and Vincenten 2012, p.47). It should be noted that despite the high scores of the leading countries on their 2012 Child Safety Report Cards, there was still potential for improvement in all ECSA member countries.

Sweden

Sweden is a prime example of a nation that has had success in childhood injury prevention. In 2001, UNICEF reported the Swedish childhood injury mortality rate had been among the lowest recorded internationally for a number of years. Similarly, De Leon et al (2007) also report that child injury fatality rates in Sweden are among the lowest in the world. Illustrative of the significant reduction in child injury mortality over time, and the progress in Sweden, Jansson et al (2006) report that child injury mortality decreased from 13.0 deaths per 100,000 in 1966–1981 to 5.2 in 1982–2001. Nonetheless, disparities in injury risks to younger Swedes have been noted, with children in lower socio-economic status families having higher risks of injuries

leading to hospitalisation (Nyberg et al 2012). More recent literature also indicates that, internationally, incidents of child injuries and child mortality in Sweden remain low today (Carlsson et al 2016).

Bergman and Rivara (1991) explain the factors that account for Sweden's success, which include Swedish social features and a sustained and extended injury prevention campaign. Specifically, "contributing societal characteristics are a small, relatively homogeneous, health conscious, law-abiding population that values children. Key factors in the campaign have been support of trauma surveillance systems and injury prevention research, ensuring safer environments and products through legislation and regulation, and a broad-based safety education campaign using coalitions of existing groups".

The WHO and UNICEF (2008) also provide an explanation of Sweden's achievements in reducing child injury, as displayed in Figure 5.

Figure 5 How did Sweden achieve its reductions in childhood injuries?

Since the early 1950s, Sweden has seen a reduction in child injuries, championed largely by the paediatrician Dr Ragnar Berfenstam. In 1969 the injury death rate in Sweden for boys and girls under the age of 18 years was 24 per 100,000 and 11 per 100,000 children, respectively. Over the last three decades, Sweden has been able to bring the rates down to 5 per 100,000 for boys and 3 per 100,000 for girls. These dramatic reductions have been achieved using a range of approaches cutting across several sectors, and involving children and the community. The health sector played an important and leading role in the initiation and follow-up on a wide range of actions which included:

- environmental planning: traffic was diverted away from residential areas and towns so that children could walk to school, play and return home without encountering busy streets; Sweden had originated the idea of Safe Communities long before it was taken up by others;
- measures against drowning: much of the early reduction in child injury was attributed to water safety interventions; rates among children aged 0–14 years fell from 8 per 100,000 in 1951 to 1 per 100,000 children in 1985;
- safety measures in the home;
- home visits by health professionals;
- traffic safety measures – such as helmets and child-restraints – taking into account the limited capacity of small children to adopt safe practices in traffic;
- improved product safety and standards;
- improved health care services for children; and
- safety measures at school.

Despite the aforementioned achievements, injury remains the leading cause of child and adolescent death and disability in Sweden.

Injury prevention work to address child and adolescent injury in Sweden is led by the Ministry of Defence and coordinated by the Swedish Civil Contingencies Agency. Sweden is represented

on the European Child Safety Alliance Steering Committee by the Swedish Civil Contingencies Agency (referred to as the MSB). The MSB focuses on the safety of each person as an individual, this includes children.

> *The MSB coordinates Swedish authorities and bodies in their work for child safety and injury prevention. We chair the national Child Safety Council, which produces basic information material, develops educational platforms and websites, scenarios and role-plays, and arranges seminars, lectures, workshops etc. We participate in European networks and development projects for child safety (Swedish Civil Contingencies Agency 2009).*

Carlsson et al (2016) explains that in Sweden, almost 100 per cent of all children aged 0–6 years participate in Child Health Care [CHC] that focuses on the prevention of ill health.

> *For all parents with children of 8 months, there is an additional focus on improving parent's knowledge about precautions that need to be taken at home. This information is given on one occasion and includes information concerning the risks of drowning, scalding, burns, falls, and how to safely store chemicals, medicines and plastic bags. The rationale for this is the children's growing physical mobility (e.g. their ability to crawl and walk) (Carlsson et al 2016, pp.220-224).*

Another distinguishing feature of Sweden's approach has been the priority accorded to establishing comprehensive population based registries. Sweden has invested over many years in collecting data for various disease and population groups with over 90 registries in place. In 2008 the Swedish Research Council launched the research initiative "Swedish Initiative for Research on Microdata in the Social and Medical Sciences" (SIMSAM) – which includes individual level data in registers and databases. Research on childhood and its influence on lifelong health and welfare is facilitated by individual-level longitudinal data from the cradle to the grave and data on the family and other social contexts that the person is part of during different periods of life. The Umea SIMSAM Lab data resource covers the entire Swedish population during the period 1960 to 2010 (Lindgren et al 2016).

These data provide rich sources for researchers to analyse issues pertinent to childhood injury prevention. For example data was used from the Swedish population registry; registry of cause of death and inpatient hospital registry to review mortality patterns in injured children in Sweden over a 14 year period. A major finding was that mortality patterns in injured children in Sweden have changed from being dominated by unintentional injuries to a more equal distribution between unintentional and intentional injuries as well as between sexes and the overall rate has declined further (Bäckström et al 2017).

Since 1989 Karolinska Institute has been the globally orientated WHO Collaborating Center on Community Safety Promotion (WCCCSP) with the launch of the Stockholm Manifesto for Safe Communities. This Centre has certified more than 260 Safe Communities worldwide according to a set of criteria. This WHO affiliation ended in September 2015. The WCCCSP has led the administration and quality control of the International Safe Community Movement (European Safe Community Network no date). At the world Safe Community Conference in Nan Thailand November 2015, an International Safe Community Certifying Center (ISCCC) was established.

The ISCCC is presently awaiting the result of an application to WHO for affiliation status (International Safe Community Certifying Centre 2015).

The Karolinska Institutet was also a participating organisation at a WHO consultative meeting to develop a global Child Injury Prevention strategy (WHO 2005). The Department of Public Health Sciences at Karolinska Institutet is involved in research in the field of injury prevention and safety promotion and has two key research groups: Safety Promotion and Injuries' Social Aetiology and Consequences.

Finland

In Finland, the *National action plan for injury prevention among children and youth* was prepared by the National Institute for Health and Welfare (THL) with extensive national cooperation in 2008–2009 and implementation began in 2010. THL is a research and development institute of the Finnish Ministry of Social Affairs and Health (National Institute for Health and Welfare 2014). Approval of the plan by the Ministry has been seen as crucial, empowering national level activities and promoting a network of cooperation between the different stakeholders (Korpilahti 2015).

The Safety 2016 World Conference was held in Tampere, Finland and the Ministry of Social Affairs and Health has supported the organisation of this event. The conference included a number of sessions on child and adolescent safety and injury prevention. A major achievement arising from the conference is the Tampere Declaration (which was drafted by Finnish and international experts and reviewed by WHO experts and the International Organizing Committee). The aim of the declaration is to encourage and obligate countries to work more effectively towards reducing injuries and improving safety in the world. It calls for strong, coordinated whole-of-government and whole-of-society action to reduce the impact of injuries and violence. The declaration outlines a range of strategies as a "call to action for stronger Injury Prevention and Safety Promotion". Of particular interest is the call to:

> *Strengthen capacity building for injury prevention and safety promotion, including education, training and professional development to facilitate effective research, policy development, provision of care, system organisation and coordination, advocacy and data collection (Safety 2016 World Conference).*

Finland has several other examples of innovative approaches to reducing childhood injury, for example in the areas of national policy development to reduce alcohol related harm to children and youth (Markkula 2013); road safety – initiatives that specify that vehicles taking children to school and day care centres must be equipped with a breath alcohol ignition interlock device (through the work of Trafi the Finnish Transport Safety Agency) and consumer safety education innovation. The latter project has been developed by the Finnish Safety and Chemicals Agency (Tukes) in collaboration with several other agencies and is referred to as "Piki's Room" a safety game aimed at children of day care age (3-6 years). The game, seeks to teach children the right attitudes towards safety, and safe conduct, examples of topic areas include electrical, fire, traffic, elevator and playground safety. It is published on Finland's national broadcasting company's website and is played by around 2000 young children every day (Tukes 2015).

Netherlands

In the Netherlands, the Ministry for Health, Welfare and Sport lead childhood injury prevention efforts. Within the Ministry for Health, Welfare and Sport, the Nutrition, Health Protection and Prevention Department (VGP) is a policy department geared to promoting and protecting public health. One of its policy spearheads is prevention of injury.

Hesemans (2008) describes the injury prevention policy in the Netherlands, noting investment to consist of monitoring, identifying problem owners, and inter-sectoral and interdepartmental collaboration. The results of investment have included decreased injuries, health care cost reductions, higher budget and achievement of a four-star WHO/Euro assessment rating. Injury prevention may have also become a higher political priority, although this is questioned by the author. The Dutch Consumer Safety Institute represents the Netherlands on the European Child Safety Alliance Steering Committee.

The ESCA Child Safety Report Card (2012) found that "the Netherlands has strong leadership, infrastructure and capacity to address child and adolescent safety, however all three could be enhanced further." The report card goes on to emphasise that government leadership is needed to ensure coordinated action across and between sectors to ensure current gaps are addressed and existing infrastructure and capacity are maintained.

Several researchers at Maastricht University have been involved in the EU funded TACTICS project, for instance as project team leaders and working on policy tools to aid uptake of child safety strategies.

Summary

Leadership, infrastructure and capacity are essential to supporting child and adolescent safety prevention and promotion efforts at a national level (MacKay and Vincenten 2012). The extensive experience of the European Child Safety Alliance (as evidenced in the *Child Safety Report Card 2012*, which encompasses the progress of 31 European countries) emphasises the importance of national leadership; the commitment of senior political and government figures; allocation of funding and identification of an organisation that is responsible for national coordination of activities as essential strategies to establish injury prevention as a priority. This coordination extends to injury data, the production of reports and conduct of research studies.

This leadership has a "domino effect" as it facilitates the partnerships and service delivery that is needed at regional and local levels; stimulates research interest and capacity building in child injury prevention. Another key infrastructure element to support child safety identified included a national programme of child death reviews, (via a multidisciplinary team or committee that is able to use data from multiple sources to examine trends and examine patterns and make specific prevention-related recommendations). Countries were also assessed on the availability of a mechanism to allow early identification of and rapid response to emerging safety hazards (MacKay and Vincenten 2012).

In addition MacKay and Vincenten (2012, p.42) note in their report for the European Child Safety Alliance:

> *For the countries where a historical comparison in sub-area scores was possible, improved scores reflected increased identification of a government department / ministry responsible for national coordination of child safety activities, progress towards national injury prevention strategies with child specific targets and increased funding for programmes, coordination and national steering committees / task forces.*

4.2 Contribution of child death review teams in childhood injury prevention

This section provides a brief overview of recent publications that address the contribution of Child Death Review Teams (CDRTs) to childhood injury prevention. In accordance with the structure of the literature review the countries included are: Australia, New Zealand, Canada, United States and United Kingdom. Most literature addressed developments in the United States and United Kingdom.

In two multi-country analyses of child death review, (Fraser et al 2014; Vincent 2014), the authors compare and contrast child death review structures and processes in order to inform policy and practice around prevention. Fraser et al (2014) included Australia, New Zealand, the US and England. Vincent (2014) studied child death review in Australia, New Zealand, the US, Canada, England and Wales. Their respective findings are included in the sub-sections that follow.

One article was reviewed (Johnston and Covington 2011) that focused on CDRTs in general, rather than any specific country. The findings of this article indicate a range of factors that support effective child death review, for example: linking stakeholders involved in child death review with resources to act upon the death review results; political commitment to catalyse local prevention interventions; and collaborative process improvement to support Child Death Review (CDR) teams interested in improving their capacity to promote injury prevention through review and recommendation. Similar findings were reported in the country specific literature reviewed, and these are presented below.

4.2.1 Australia

Each state and territory determines its approach to child death review, which is mandated and funded at a state level. Vincent (2014, p.120) notes:

> *The location of the child death review function varies in Australia. In NSW and Western Australia, it is located in the Ombudsman's office because the Ombudsman has royal commission powers and can secure records from any agency.*

In Australia state and territory based multi-sectoral and multiagency participation in retrospective panel review occurs under the auspice of the Child Death Review team. The main purposes of retrospective reviews are to learn lessons and prevent future child deaths (Fraser et al 2014). Australia also has a review process, which takes relevant documents and case records into account with the use of key interviews in some states, and a system of state-level collation of reports. These annual reports provide a useful resource for policy makers, researchers and community stakeholders through presenting information about trends in

mortality rates in children and particularly causes of death within the respective state or territory.

In some states and territories there are also resources allocated for research and epidemiological investigations resulting in reports produced based on analysis of aggregated state data and/or research activities (Vincent 2014). In South Australia the CDR Committee has a statutory obligation to monitor implementation of its recommendations (Vincent 2014). However, there is no nationally legislated or standardised framework for child death review. As a consequence, processes within Australian states and territories vary considerably, with a lack of national leadership, coordination, planning and policy development.

The responsibility for detailed analysis of all child deaths in Queensland was transferred from the former Commission for Children and Young People and Child Guardian to the Queensland Family and Child Commission in 2014. The Commission is currently considering new ways to promote and increase awareness of child death and injury prevention issues to help ensure the safety of Queensland children (Queensland Family and Child Commission 2015).

With the establishment of the Commission for Children and Young People from 1 March 2013, the Victorian Child Death Review Committee concluded its role; the responsibility for the review of child death inquiries then passed to the new Commission. The Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) reviews all cases of maternal, perinatal and paediatric mortality and morbidity, and advises the Minister and the Department of Health and Human Services on strategies to improve clinical performance and avoid preventable deaths. Researchers can apply to access the Council's data for approved statistical and research purposes (Victoria State Government, health.vic 2015).

In summary CDRTs within Australia do not have a direct role in coordinating childhood injury prevention efforts. They do coordinate a multi-agency and multi-sectoral group for the purposes of child death review and in some states and territories undertake related research activities and/or provide access to data. An important opportunity for impact appears to be through monitoring implementation of recommendations formulated by the CDRT.

4.2.2 New Zealand

New Zealand was the first country to introduce a nationally coordinated system of local review at district health board level in 2001 (Vincent 2014, p.119). In this system, national legislation sets out how the CDR team should operate and local review is supported by a national committee that considers national data and makes national policy recommendations. The Child and Youth Mortality Review Committee (CYMRC) conduct the child death review function in New Zealand. The committee reviews death for a wide age group (up to age of 25 years) and events (illness, incidents and accidents). Neonatal deaths are reviewed by the Perinatal and Maternal Mortality Review Committee.

The multiagency and multi-sectoral CYMRC was established to identify national trends and patterns of events that lead to death, to develop policies and initiatives that can keep children and young people safe and healthy under the national legislative framework (Fraser et al 2014, Vincent 2014). The CYMRC retrospective panel review has an established system and accesses data from multiple sources including the Office of Births, Deaths and Marriages, Ministry of

Health, Child Youth and Family, coronial services, water safety, Ministry of Transport, and a network of local child and youth mortality review groups.

Although there is wide-ranging representation in the review process, involvement of the families of the victims is yet to be incorporated. The current model of child death review facilitates a system-level approach at the local level and descriptive reports with analysis of risk factors at the national level. It is reported that New Zealand is yet to have a standardised process for prospective rapid response investigation of all unexpected deaths (Fraser et al 2014).

4.2.3 Canada

Canada does not have in place national legislation, processes or standardised methods of data collection for child death review. The age range for review (0-19 years) is variable across the provinces (Saskatchewan Prevention Institute 2016, Desapriya et al 2011, Vincent 2014). The approach in each province/territory is different, most provinces have processes to review death of children known to the child welfare system, a small number of provinces have more comprehensive CDR processes and some provinces do not have child death review systems.

The system is funded at the provincial level and the child death review function is located in the coroner's office (Vincent 2014). However, the child death review process in Canada is relatively well resourced and able to support research and production of thematic reports (Vincent 2014). An example was identified in the Canadian literature, relating to child pedestrian fatalities in British Columbia that reveals that most fatalities are highly preventable through modification of behavioural, social, and environmental risk factors (Desapriya et al 2011). This paper illustrates how child death review data can be used to investigate a targeted issue and the complementary role of multiple data sources including from case review and other organisations such as census bureau, insurance providers, client registry data of the provincial Ministries such as Housing and Social Development and Social Innovation etc.

The study states that CDRTs are capable of generating strategic recommendations for prevention of child fatalities and through child death review generate an ecological understanding of injury epidemiology that may not be otherwise available. The study also mentions that CDRTs have the capacity to capture the vulnerability of special population groups including Aboriginal children, environmental risks in residential areas etc. The authors conclude that the multiagency collaborative approach of child death review helps to advance policy and programme interventions designed to reduce preventable child mortality.

4.2.4 United States

In the US, the approach to child death review differs in each state, with variation in mandatory requirements, funding and the location of the review function. However every state has an agency and a person designated as the state's lead for the CDR program (National Center for Fatality Review and Prevention 2016). Most CDRTs review all deaths up to the age of 18 years and the activities of the CDRT panel are supported by state-based legislation. Federal legislation to support Child Death Review was reintroduced in the US Congress in 2013. Federal government support is evidenced by the recognition of the importance of child death review in the national health objectives for 2020 (Fraser et al 2014; Vincent 2014, US DHHS 2016).

The National Center for the Review and Prevention of Child Deaths is funded federally as a resource and data centre for state and local CDR programs. It is housed within the Michigan Public Health Institute and promotes, supports and enhances child death review methodology and activities at the state, community and national levels. A formal child death review process with a comprehensive internet-based system is now in place in the US, representing more than 95 per cent of the US population and child deaths allowing inter-agency cross matching of data for completeness especially for violent deaths. A data dissemination policy is also in place which allows national data or reports to be shared with federal agencies and researchers.

The child death review initiatives resulted in development of an injury prevention framework of education, enforcement, and environmental modifications with changes in legislation, public awareness and safety measures (Fraser et al 2014). In a policy statement, the American Academy of Paediatrics made recommendations supporting child death review activities including standardisation of fatality definition and coding, data collections and use, confidentiality protocols, legal protections, benchmarking of peers, and cross-jurisdictional sharing of data and experience (Christian and Sege 2010).

There are other studies which outline how the process of child death review can facilitate strategic and policy level developments for prevention of childhood deaths and injuries. Local level collaboration, with regards to data and information, can generate and play a catalytic role in the implementation of local community-specific recommendations (Johnston et al 2011) and overall policy changes (Onwuachi-Saunders et al 1999). Trigylidas and colleagues make a similar suggestion for wider data integration by involving other stakeholders to prevent youth suicides (Trigylidas et al 2016). In another study, Purtle et al (2015) express the view that adaptation of the well- established Child Fatality Review Team model can be effective in youth non-fatal violent injury review and prevention. The mechanisms to support this include: inter-agency collaboration; opportunities to identify challenges unique to young people who sustain injuries and formulate appropriate policy; and bring in system level changes.

Analysis of data at county level suggests that child fatality review programs are capable of identifying deaths that could have been prevented by using existing prevention strategies for example, child safety restraints, and pool fencing (Rimsza et al 2002, Keleher and Arledge 2011). In a study by Toblin and colleagues, child death review resulted in development of strategies in the areas of behaviour change, environmental factors, and policy change to prevent potentially serious injury events. The policy change strategies included developing new regulations, enforcing existing regulations more effectively, implementing more effective/stronger regulations, and redesigning existing equipment (Toblin et al 2011). The contribution to child welfare and protection through interstate collaborations and the use of CDRT recommendations as a resource for legislators and policymakers has been identified (Hochstadt 2006). Key informants in a study conducted by Smith et al (2011) noted that a multidisciplinary CDRT provided a collective understanding of each death that would not have been achieved otherwise.

In the US, the movement of CDR toward a prevention model is reflected in the close association with public health. Most teams have a strong focus on secondary prevention and systems improvements. Forty states have advisory boards that make prevention recommendations to state officials and the public (National Center for Fatality Review and Prevention 2016).

4.2.5 United Kingdom

The multi-country analyses of child death review (Fraser et al 2014, Vincent 2014) provide an overview of child death review in the UK. The UK *Children Act* (2004) provides the legislative mandate for all local authorities to respond rapidly to unexpected child deaths and to systematically review all childhood deaths of children 0-18 years of age. In England, Child Death Overview Panels review deaths on behalf of their Local Safeguarding Children Boards, which ensures a national, coordinated, mandated and funded system of local review (Vincent 2014). In Wales there is a national funded review system and a national database of all deaths. This process is coordinated through Public Health Wales (Vincent 2014).

England has developed national guidelines for a standardised approach with multi-agency involvement including health, social care and law enforcement departments. Child death review assesses the contribution of different factors and uses an ecological analytic framework. The outcomes from the child death review process are quantified at a local, regional, and national level. Locally, a formal approach to individual child deaths has resulted in better diagnostic ability and identification of modifiable factors although lessons from standardised processes for child death review are still to be translated into large-scale policy initiatives (Fraser et al 2014).

However the recent Wood Report on the review of the role and functions of local safeguarding children boards recommends a recasting of the statutory framework that underpins the model of Local Safeguarding Childrens Boards, Serious Case Reviews and Child Death Overview Panels. The report also recommends that Government should discontinue Serious Case Reviews, and establish an independent body at national level to oversee a new national learning framework for inquiries into child deaths and cases where children have experienced serious harm, noting:

> *The framework should be predicated on high quality, published, local learning inquiries; the collection and dissemination of local lessons; the capacity to commission and carry out national serious case inquiries; and a requirement to report to the Secretary of State on issues for government derived from local and national inquiries"(Department for Education, UK 2016 p.9)*

A range of issues were identified with the operation of Child Death Overview Panels, including the movement of this function from the Department for Education to the Department of Health and emphasis on the need for child deaths to be reviewed over a population size that gives a sufficient number of deaths to be analysed for patterns, themes and trends of death with regionalisation encourage and consideration should be given to establishing a national-regional model for Child Death Overview Panels (Department for Education, UK 2016 p.9 and p.59).

4.2.6 Summary

Onwuachi-Saunders et al (1999) have highlighted the promise of the process of child death review as a driving force in injury prevention. For example, a recent thematic review of child motor vehicle crash deaths in Wales identified the need for more strategic and targeted interventions for motor vehicle crashes including awareness campaigns, school-based education, targeting alcohol and substance use, licensing regulation modification, and access to comprehensive data by involving relevant stakeholders (Jones and Heatman 2016). Johnston

and Covington (2011) provide examples of child death review data being used to catalyse local prevention interventions, while Johnston et al (2011) provide "evidence that a collaborative process improvement model can be used to support CDR teams interested in improving their capacity to promote injury prevention through review and recommendation".

Vincent (2014) sees child death review fitting more within a public health or epidemiology framework as opposed to primarily coronial review. Approaches focused on child protection models of review are seen as limiting the prevention potential of CDR.

> *A broader injury framework that includes morbidity and mortality data widens the evidence base, increases the public health potential of CDR and can better inform prevention. In areas where there are only a small number of deaths, there are issues regarding the quality of CDR data, and quality can be strengthened by including serious injury data because recommendations will be based on a larger number of cases (Vincent 2014, p.123).*

Vincent (2014) found that child death review findings have informed prevention strategies across the six countries within her study, despite considerable barriers. While not recommending a universal model for child death review there are a number of features that can support the work of CDRTs including: a standardised data input process and standardised definitions to support aggregation of data at a national or state level; coordination; funding and an evidence-based approach to prevention. Fraser et al (2014) argue that the advantages of a statutory framework are that all aspects of the review processes are standardised.

Strict confidentiality provisions, which are acknowledged as important in protecting the identity of children and professionals, can prevent child death review teams sharing their findings and limit research around prevention efforts and knowledge transfer (Vincent 2014). A possible alternative is outlined by Fraser et al (2014, p.901):

> *Flexibility in a team's approach to child death review can help to improve effectiveness — e.g., teams might combine reviews of similar cases so that recommendations can be based on several child deaths or use a two-tier process consisting of a technical team that reviews cases and a prevention team to create recommendations and promote action.*

Appendix 5 Recommendations from the TACTICS project

1. That the European Commission continue to provide support for networking and capacity building activities to support exchange and enhancement of experience and knowledge for child safety experts and related disciplines with respect to:
   - Evidence-based good practices to prevent childhood injuries
   - Adoption, implementation and monitoring of existing injury prevention practices
   - Engaging various government sectors/ministries
   - Balancing activities between the national, regional and local levels
   - Inequities related to child injury
2. That the European Commission continue to encourage and support the development and implementation of national child safety action plans in Member States including:
   - call for formal national action plans in those Member States where one has yet to be developed
   - support for periodic benchmarking activities to assess progress and help maintain awareness of child safety (e.g., Child Safety Report Cards)
   - support detailed investigations for effective implementation of specific prevention strategies of interest to the majority of Member States
3. That the European Commission and Member States provided committed leadership to support mechanisms that facilitate multi-sectoral work and the health in all policies approach including:
   - Establish senior level multi-sectoral (inter-departmental) committees with responsibility for the development, implementation and monitoring of CSAP with clear lines of responsibility at all levels of governance (EU, national, regional and local)
   - Create structures and processes that result in joint work between relevant sectors/ministries with collaborative planning and shared responsibility for budgeting, target setting and staffing of prevention strategies.
   - Support active partnerships with child safety NGO's to maximise effective adoption, implementation and monitoring of child safety good practices.
   - Providing funds for multi-disciplinary applied research projects addressing knowledge gaps related to prevention measures and knowledge transfer related to evidence-based good practices
4. That the European Commission and Member States provide political and financial support to enhance current data systems to allow monitoring of injuries, effectiveness of investments and social determinants including:
   - Improving mortality and morbidity data (hospital or emergency data) to include more detailed coding of injuries to include external cause and location of injury
   - Data on standardised measures of social determinants and exposure to hazards and preventive measures

Appendix 6 NSW Research Grants – Childhood Injury Prevention & Management Round 1

	Leader researcher	Organisation	Title of research project	Funding allocation	Start date	End date
1	Brown et al	Neuroscience Research Australia	The development and piloting of functional assessment tools for staging physical, cognitive and perceptual attributes of children related to the task of riding powered off-road vehicles	66,114	1 July 2015	30 June 2016
2	Mitchell	Macquarie University	A stock take of data sources relevant to childhood injury in NSW	49,971	30 June 2015	30 November 2015
3	Falster et al	University of New South Wales	The impact of the Brighter Futures program on unintentional injuries in vulnerable children	63,630	1 October 2015	30 June 2016
4	Clapham et al	University of Wollongong	Preventing Injury to Aboriginal Children and Young People In NSW: Guidelines for Policy and Practice	69,962	1 July 2015	30 June 2016
5	Adams et al	Sydney Children's Hospital Network	The development of NSW/Australian Child Safety Good Practice.	75,600	1 July 2015	30 June 2016
6	Mitchell et al	Macquarie University	Unwarranted clinical variation following hospitalised injury in young people in NSW: Informing trauma and healthcare practices	69,076	30 June 2015	30 June 2016

NSW GOVERNMENT | Health

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Our ref O17/3-7

Dear Professor McMillan

Childhood Injury Prevention: Strategic directions for coordination in New South Wales

Thank you for your letter of 20 October 2017 inviting my response to the report *Childhood injury prevention: Strategic directions for coordination in New South Wales*. I acknowledge the work of the authors in preparing this report. I appreciate the opportunity to provide comment.

I congratulate the Child Death Review Team on completing this piece of work which draws attention to the crucial need for coordinated work across government and non-government stakeholders to address the rates of childhood injury in NSW. I anticipate that NSW Health will have an important contribution to make to this work.

I look forward to further discussions between the NSW Ministry of Health and your Office regarding the future directions of the coordination of childhood injury prevention work in NSW.

Yours sincerely

Elizabeth Koff
Secretary, NSW Health
6/11/17

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