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Commonwealth Department of  
**Health and  
Family Services**

# Injury Prevention and Control



# National Health Priority Areas Report

## Injury prevention and control

1997

Commonwealth Department of Health and Family Services  
Australian Institute of Health and Welfare

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# Executive summary

This report on injury prevention and control is one of a series of biennial reports to Australian Health Ministers on each of the five National Health Priority Areas (NHPAs). It is part of a process that involves various levels of government and draws on expert advice from non-government sources, with the primary goal of reducing the incidence and impact of injury in Australia.

## Overview of injury in Australia

### Injury profile

Injuries resulted in over 7,000 deaths in 1996 and nearly 400,000 hospitalisations in 1995–96. Direct medical costs attributable to injury were estimated to be \$2,607 million in 1994 alone.

Suicide and transport-related accidents are the major causes of injury mortality while falls are the major cause of hospitalisation due to injury. The pattern of injury varies significantly with age; for example, near-drowning and drowning are major causes of injury and death in early childhood, self harm and road crashes are primary causes of injury in young adulthood, and falls are the most common cause of injury death among the elderly. Males, Indigenous Australians and rural dwelling residents are all at increased risk of injury. In addition, mortality rates are greater for young adults and the elderly than for Australians of other ages.

In 1994, deaths attributed to unintentional injury accounted for 14.7 per cent of all years of potential life lost (YPLL) before the age of 75 years, while suicide accounted for another 8.6 per cent of YPLL. Injury impacts most on the young, resulting in an average 32 YPLL before age 75 compared with nine YPLL for cancer and five YPLL for ischaemic heart disease.

There has been a long-term decline in overall injury mortality in Australia, particularly from road injury. The substantial reduction in the road injury rate since 1970 can be attributed to effective road safety programs.

### Injury as a national health priority

Injury was first recognised as a national health priority in 1986. Subsequently, national goals and targets were devised for reducing the incidence and impact of injury on health, and the NHPAs initiative continues to build on these goals and targets.

The health sector's role in injury is to: plan and implement prevention strategies to reduce the incidence of injury; provide treatment and rehabilitation for those affected by injury; identify priority issues by collecting and analysing relevant data; and promote intersectoral cooperation on injury issues.

## Progress towards national goals and targets

This report documents progress on 20 indicators designed to measure the effect of interventions in injury on the health of Australians. Over the past several years, there has been progress towards national health targets in a number of areas. In particular, there has been a reduction (or a slowing of a previous upward trend) in injury mortality for the total population and for a number of specific causes of death including road transport, falls, and fire, burns and scalds in older people, homicide deaths in females aged 20 to 39 years, and drowning in early childhood. However, there has been little progress towards reducing the high rate of male

## Executive summary

compared with female injury mortality, or the death rate from assault among young children. In addition, current trends indicate that the Year 2000 target for reducing the death rate ratio for Indigenous compared with non-Indigenous populations may not be reached.

## Infrastructure developments

### Prevention

Injury is preventable and primary prevention is the best means of injury control. At the State and Territory level, there have been a number of successful injury prevention programs. Key areas of focus for these efforts have been road crashes, and more recently, scalds and falls in the elderly. A number of States and Territories have developed strategic plans for injury prevention and control.

Within the health sector, the Commonwealth Department of Health and Family Services has prime responsibility for national coordination of injury prevention and control activities. The National Injury Surveillance Unit (NISU) of the Australian Institute of Health and Welfare has also played an active role at the national level.

A number of organisations are involved in prevention activities for specific groups at the national level, including Farmsafe Australia, the Australian Agricultural Health Unit, the Child Accident Prevention Foundation (Kidsafe) and the Australian Sports Commission.

### Trauma care

Ensuring access to optimal trauma care services is an important means of improving health outcomes in the area of injury prevention and control. Guidelines for trauma services, published by the Australian Council on Healthcare Standards (ACHS) with the support of the Commonwealth Department of Health and Family Services, provide practical guidance in the application of ACHS standards and criteria to trauma services, and encourage best practice in trauma care. Overall, there has been considerable improvement in systems for trauma retrieval and management in the States and Territories over the past few years. The majority have established State or Territory-wide trauma plans and trauma management committees. Most have included or are in the process of including rural areas in their trauma plans. Moreover, a number of States and Territories have developed or are developing trauma management data collections and performance indicators, and many have developed state-of-the-art resources and systems which could provide models for other areas.

### Rehabilitation

Increasing access to comprehensive rehabilitation programs is one means of improving injury outcomes. Currently, rehabilitation services are provided by a mix of public (State and Commonwealth funded) services and private services.

The Commonwealth Rehabilitation Service (CRS) is the major national structure delivering vocational rehabilitation services for those who have sustained an injury. An analysis of the composition of the CRS client base suggests that although CRS has an important role in rehabilitation, it is likely that gaps exist in the rehabilitation coverage of injuries occurring outside the road and work-related sectors, even for people of workforce age.

While a systematic review of the diverse range of rehabilitation services provided by State and Territory and private providers is not given in this report, it appears that there are gaps in rehabilitation services for certain groups, particularly children, the elderly injured at home, those outside the workforce with non-compensable injuries, those with less serious brain injury, and those living in rural areas. Lack of coordination of rehabilitation services remains an important problem. Finally, although there has been some work on standards and quality assurance in rehabilitation, there is currently no over-arching benchmark that can be used to define standards of care and levels of outcome across the spectrum of rehabilitation services. Such standards would provide a device for assessing the effectiveness of current rehabilitation services and equity of access to quality care.

### Research funding

The National Health and Medical Research Council (NHMRC) is the principal government research planning and funding body in the health sector. In 1997, \$2.35 million, or 1.6 per cent of NHMRC research expenditure was in the field of injury research. The Strategic Research Development Committee of the NHMRC is currently examining the level and appropriateness of funding for injury research.

In 1993, it was estimated that the total road safety research and development budget in Australia was \$14.4 million (Road Safety Researchers' Forum 1993). Workers' compensation insurance bodies, which are the major source of research funding for the area of occupational health and safety, provided approximately \$5 million in external research funding in 1996–97.

It is clear that most research expenditure occurs in the areas of road and occupational safety. Although other areas of injury account for approximately 40 per cent of deaths and disability due to injury, research funding for those areas is relatively low.

### Barriers and gaps in injury prevention

Although a number of important initiatives have been undertaken in the injury prevention and control area, injury prevention has not received the policy recognition or level of resources received by other significant public health issues. Policy development is fragmented and the lines of responsibility for injury prevention are not clearly defined. There are gaps in the following areas:

- intersectoral links, where there is a paucity of formal structures to facilitate cooperation between sectors on injury prevention;
- delivery infrastructure, where the lack of a coordinated plan of action and appropriately trained personnel limits the systematic development and implementation of programs;
- strategic planning, where there is a need for effective strategies for communicating details of successful projects, linking research and surveillance to practice, and building a mechanism for the continual upgrading of policy;
- training opportunities, infrastructure and capacity; and
- research, where there are gaps in evidence concerning the effectiveness and relative cost-effectiveness of different countermeasures, exacerbated by a lack of appropriately trained researchers and adequate national data collection systems.

### Opportunities and future directions

There is increasing recognition of the opportunities within government to improve the implementation of injury prevention and control initiatives. Such opportunities could include:

- introducing processes to ensure that research, policy and implementation are properly linked;
- using the National Injury Prevention Strategy being developed by the Commonwealth Department of Health and Family Services, in consultation with State and Territory Governments and the National Injury Prevention Advisory Council (NIPAC), in order to address the fragmentation in services noted above;
- improving the level of training and available expertise in injury by establishing a solid base of research expertise in at least two universities and incorporating injury prevention coursework in the curricula of health management, policy promotion and public health courses;
- advancing injury data collection systems by: accelerating the introduction of uniform emergency department surveillance; establishing a National Coroners Information System (NCIS); establishing national sports injury data collections and reporting systems; establishing registers of serious injuries; and developing standardised indicators that permit comparison of an intervention in different settings;
- establishing a series of standard indicators to reflect the burden of different types of injuries and to provide interim outcomes of the impact of major intervention programs;
- establishing a mechanism for intersectoral cooperation, including strategic alliances to address issues in young males, Indigenous peoples, rural and remote areas, interpersonal violence and alcohol misuse;
- implementing known effective prevention strategies and evaluating promising implementation strategies for significant problems;
- increasing the involvement of professional groups including specialist medical colleges and the Australian Injury Prevention Network in the planning and implementation of injury prevention strategies;
- funding injury prevention programs, providing funding for research in the area of injury, and ensuring that mainstream funding arrangements provide incentives for coordinated care responses rather than inappropriate early hospital discharge;
- using legal levers to reduce injury rates (eg the introduction of mandatory safety standards such as the Australian standard for cots);
- continuing to establish and develop intersectoral trauma committees and trauma plans in all States and Territories and improving information sharing between States and Territories of existing state-of-the-art resources and processes in trauma management and data systems;

- exploring the scope for expanding rehabilitation services provided by the Commonwealth to cover on a needs basis, all ages and all causes of injury; and
- developing and implementing a standards, protocols and quality assurance mechanism for rehabilitation services in Australia.

The newly formed NIPAC is well placed to assist in improving intersectoral mechanisms, policy development, training and staffing. It can also provide expert advice concerning funding and levers for change, and will be a valuable source of advice on the mechanisms for determining research priorities in injury. The Strategic Research Development Committee of the NHMRC provides a mechanism for developing a strategic approach to funding identified injury prevention and control research activities. Finally, the NHMRC and the Australian Council on Healthcare Standards provide a means for developing guidelines for protocols and quality assurance across rehabilitation services.



# Introduction

## Background

This report on injury prevention and control is one of a series of biennial reports to Australian Health Ministers on each of the five National Health Priority Areas (NHPAs) — cancer control, injury prevention and control, cardiovascular health, diabetes mellitus and mental health. A report has been released recently on cancer control. Reports on cardiovascular health, diabetes and mental health will be published in 1999.

Although each report targets a group of discrete diseases or conditions, and the recommended strategies for action are often specific in nature, the NHPA initiative recognises the role played by broader population health initiatives in realising improvements to the health status of Australians. Public health strategies and programs that target major risk factors may benefit several priority areas. For example, programs aimed at reducing alcohol consumption not only reduce the incidence of injury but may also have an impact on the other NHPAs. Programs that are designed for particular settings and 'at-risk' groups (for example males aged 15–29 years) can also provide an opportunity to address a range of risk-taking behaviours which might have a beneficial impact on other NHPAs.

This report on injury prevention and control is part of an encompassing NHPA process that involves various levels of government and draws on expert advice from non-government organisations, with the primary goal being to reduce the incidence of, mortality from, and impact of injury on the Australian population.

## The National Health Priority Areas initiative

Based on current international comparisons, the health of Australians is among the best in the world and should continue to improve with continued concerted efforts across the nation. The NHPAs initiative emphasises collaborative action between Commonwealth and State and Territory Governments, the National Health and Medical Research Council (NHMRC), the Australian Institute of Health and Welfare (AIHW), non-government organisations, appropriate experts, clinicians and consumers. It recognises that specific strategies for reducing the burden of illness should be holistic, encompassing the continuum of care from prevention, through to treatment, management and maintenance, and underpinned by evidence based on appropriate research.

By targeting specific areas that impose high social and financial costs on Australian society, collaborative action can achieve significant and cost-effective advances in improving the health status of Australians. The diseases and conditions targeted through the NHPA process were chosen because they are areas where significant gains in the health of Australia's population can be achieved.

## From National Health Goals and Targets to National Health Priority Areas

The World Health Organization (WHO) published the *Global Strategy Health for All by the Year 2000* in 1981. In response to this charter, the *Health for All Australians* report was developed and represented Australia's 'first national attempt to compile goals and targets for improving health and reducing inequalities in health status among population groups' (Health Targets and Implementation Committee 1988). The 20 goals and 65 targets focused on population groups, major causes of sickness and death, and risk factors.

A revised set of targets was published in 1993 in the *Goals and Targets for Australia's Health in the Year 2000 and Beyond* report (Nutbeam et al 1993).

## Introduction

Goals and targets were established in four main areas — reductions in mortality and morbidity, reductions in health risk factors, improvements in health literacy, and the creation of health-supportive environments. However, this framework was not implemented widely.

The *Better Health Outcomes for Australians* report was released in 1994, and refined the National Health Goals and Targets program. The focus of goals and targets was shifted to four major areas for action — cancer control, injury prevention and control, cardiovascular health, and mental health. As a corollary to this, Australian Health Ministers also adopted a national health policy which committed the Commonwealth and State and Territory Governments to develop health goals and targets in the priority health areas and re-orient the process towards population health.

In 1995, it was recognised that there were a number of fundamental shortcomings of the National Health Goals and Targets process, principally, that there were too many indicators (over 140 across the four health priority areas), there was a lack of emphasis on treatment and ongoing management of the disease/condition, and there was no national reporting requirement. In implementing a goals and targets approach, emphasis was placed on health status measures and risk factor reduction. However, no nationally agreed strategies were developed to promote the change required to reach the targets set.

This led to the establishment of the current NHPAs initiative. Health Ministers agreed at their July 1996 meeting that a national report on each priority area be prepared every two years, to give an overview of their impact on the health of Australians. These reports would include a statistical analysis of surveillance data and trends for a set of agreed national indicators. It was also agreed that diabetes mellitus become the fifth NHPA.

The *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997) provided a consolidated report on programs in all the priority areas.

### Development of the report

The National Health Priority Committee (NHPC) developed this report in consultation with the Commonwealth and State and Territory Governments, the AIHW through its National Injury Surveillance Unit (NISU), and with a wide range of those active in the injury prevention and research fields.

### Purpose and structure of the report

This report on injury prevention and control builds on the *First Report on National Health Priority Areas 1996*. The *First Report* provided baseline data and underlying trends in the five NHPAs. This report updates these data and trends, in addition, reporting on progress in the field of injury, and identifying opportunities for improving injury prevention and control.

Chapter 1 provides an overview of injury in Australia, including the current extent and cost of the problem, the main causes of injury, the groups most at risk of injury, long-term trends in injury over time, and comparisons of the rate of injury in Australia with those of other OECD countries.

Chapter 2 summarises the current status of NHPA injury prevention and control indicators for which adequate data were available for reporting in 1997.

Chapter 3 reviews infrastructure and program developments in the field of injury in Australia. In particular, it reports on progress in injury prevention, trauma care, rehabilitation services and research funding.

Chapter 4 looks at issues in injury prevention and control, including groups and areas that are important targets for preventive activity in the future, barriers and gaps in the areas of injury prevention, and interventions available for implementation.

The report concludes with a consideration of possible strategies for improving injury prevention and control in the Australian context, and a blueprint for action which builds on Australia's record in the area of preventive strategies (Chapter 5).



# **Chapter 1**

# **Overview**

Injury is the principal cause of death in people under 45 years of age, a leading cause of mortality, morbidity and permanent disability in Australia, and a major source of health care costs. Injuries cause a range of physical, cognitive and psychological disabilities that seriously affect the quality of life of injured people and their families. However, injury is preventable and there are significant opportunities for reducing the burden of injury by implementing effective prevention strategies.

## **1.1 Injury profile**

### **Extent of the problem**

Injury is a significant source of persisting disability in the community. According to a 1993 survey, approximately 15 per cent of people with a disability in Australia attribute their disabling condition to an injury or accident (ABS 1996).

#### **Deaths**

Injury and poisoning resulted in more than 7,000 deaths in 1996. They are the fourth leading causes of death, accounting for 6 per cent of all deaths in the general population, 47 per cent of deaths in the young (aged 1–44 years) and 70 per cent of deaths in young males (aged 15–29 years).

In 1994, deaths attributed to unintentional injury accounted for 14.7 per cent of all years of potential life lost (YPLL) before the age of 75 years, while suicide accounted for another 8.6 per cent of YPLL. Injury has most impact on the young, resulting in an average 32 YPLL before age 75 compared with nine YPLL for cancer and five YPLL for ischaemic heart disease.

#### **Hospitalisations**

Injury and poisoning accounted for approximately 377,955 hospital inpatient episodes in 1995–96 (excluding those due to medical and surgical misadventure), which represents 7.5 per cent of all hospital episodes. This is higher than the hospitalisation rate for any of the other NHPAs in 1995–96 except cardiovascular health, which accounted for 8 per cent of all hospital episodes. Moreover, 11 per cent of all inpatient episodes for children and young adults (aged 1–44 years) were due to injury. However, the average length of stay for injury-related hospitalisations was lower than that for other NHPAs, with more than one-quarter of all injury hospitalisations being for less than one day (AIHW & DHFS 1997).

#### **Other injuries**

The annual incidence of injury is unknown. Many injuries do not result in death or hospitalisation, and such statistics reflect only a small proportion of the number of

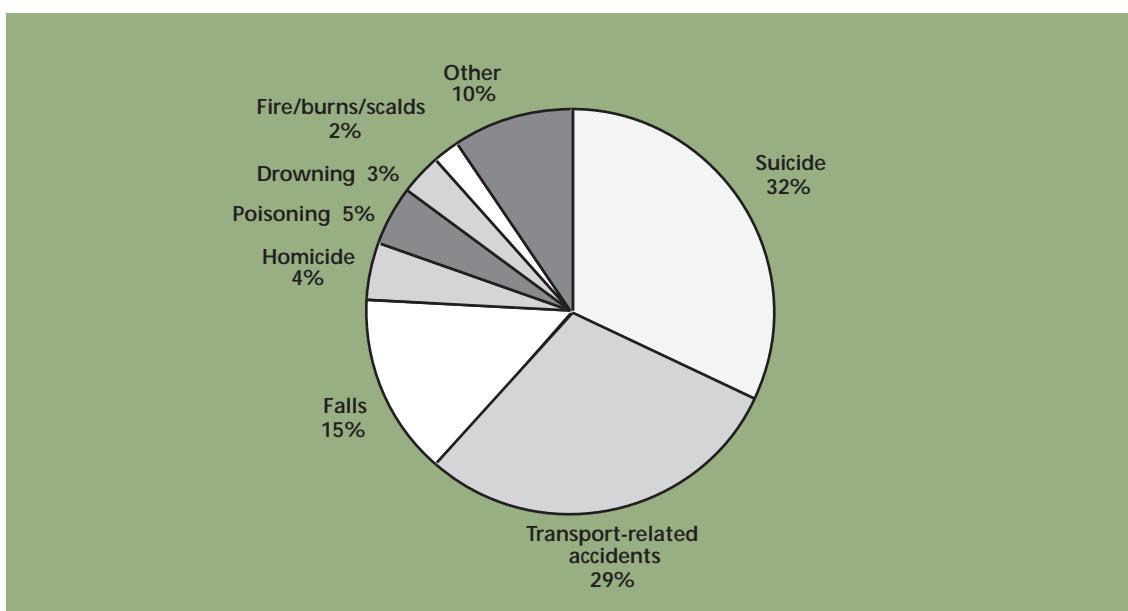
## Overview

injuries occurring each year. For every person admitted to hospital, several people attend emergency departments and several others visit a general practitioner. In addition, a substantial percentage of injured people seek attention from a non-medical health professional only, or do not consult a health professional at all.

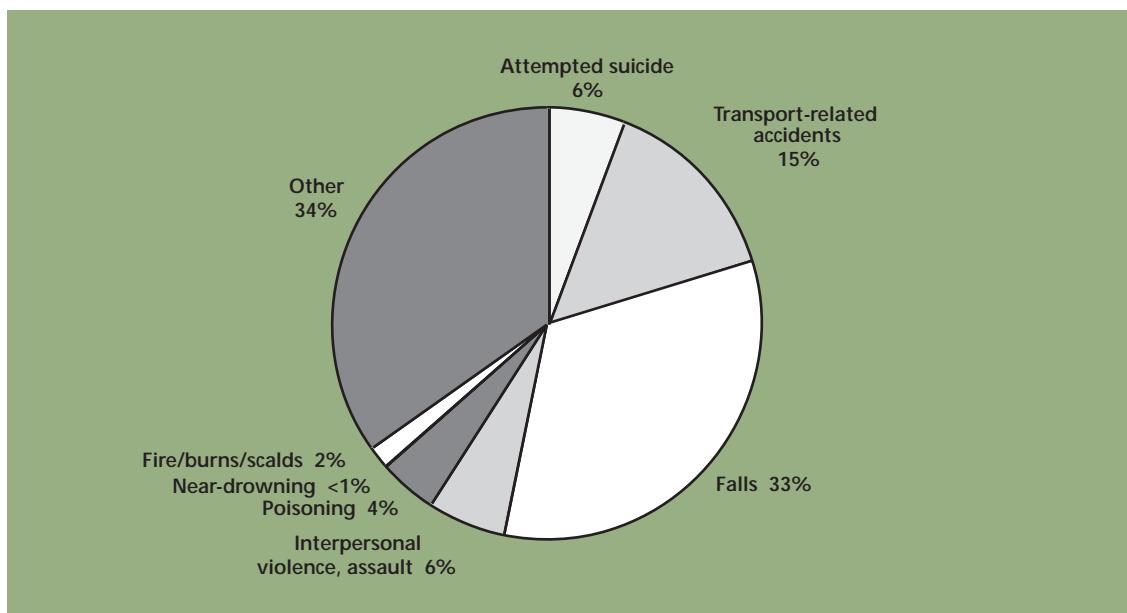
### Major causes of injury

Suicide and transport-related accidents are the primary causes of injury mortality, accounting for 32 per cent and 29 per cent of all injury deaths respectively in 1996. Other major causes of injury deaths include falls, poisoning, homicide, and fire, burns and scalds (see Figure 1.1).

**Figure 1.1 Deaths due to injury and poisoning by external cause, Australia 1996**



**Figure 1.2 Hospital separations due to injury and poisoning by external cause, Australia 1995–96**



The major external causes of injury leading to hospitalisation are falls (33 per cent) and transport-related accidents (15 per cent). Other major causes include intentional self harm, interpersonal violence, poisoning (particularly from pharmaceuticals), and fire, burns and scalds (see Figure 1.2).

The pattern of injury varies significantly with age. Near-drowning and drowning are major causes of injury and death in early childhood (a stage at which a child is unable to swim and unable to recognise the danger of water). Self harm and road crashes are primary causes of injury in young adulthood. Falls are the most common cause of injury death among the elderly. Even apparently minor falls can be fatal, due to a high susceptibility to trauma among the elderly.

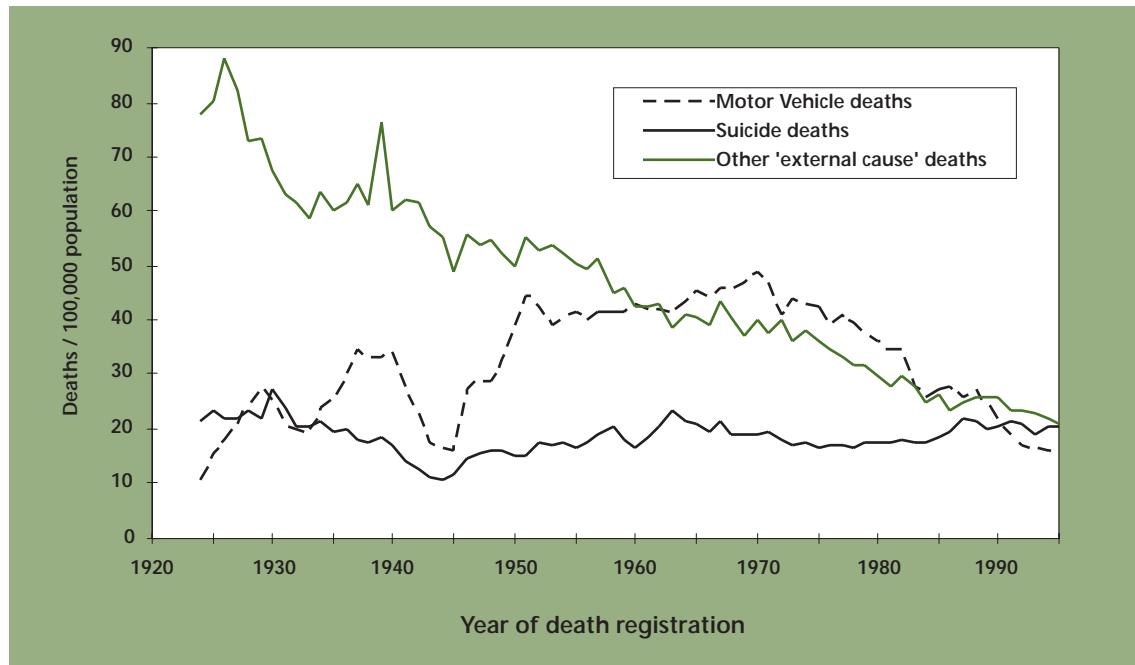
### Long-term trends in injury mortality

There has been a significant decline in the injury mortality rate over the past 25 years. However, since similar declines have occurred for other conditions, injury has continued to account for approximately 5–6 per cent of all deaths.

Figures 1.3a and 1.3b show injury death rates in Australia since 1924 for three major categories of injury: *motor vehicle deaths*, *suicides* and *all other deaths attributed to an external cause*.

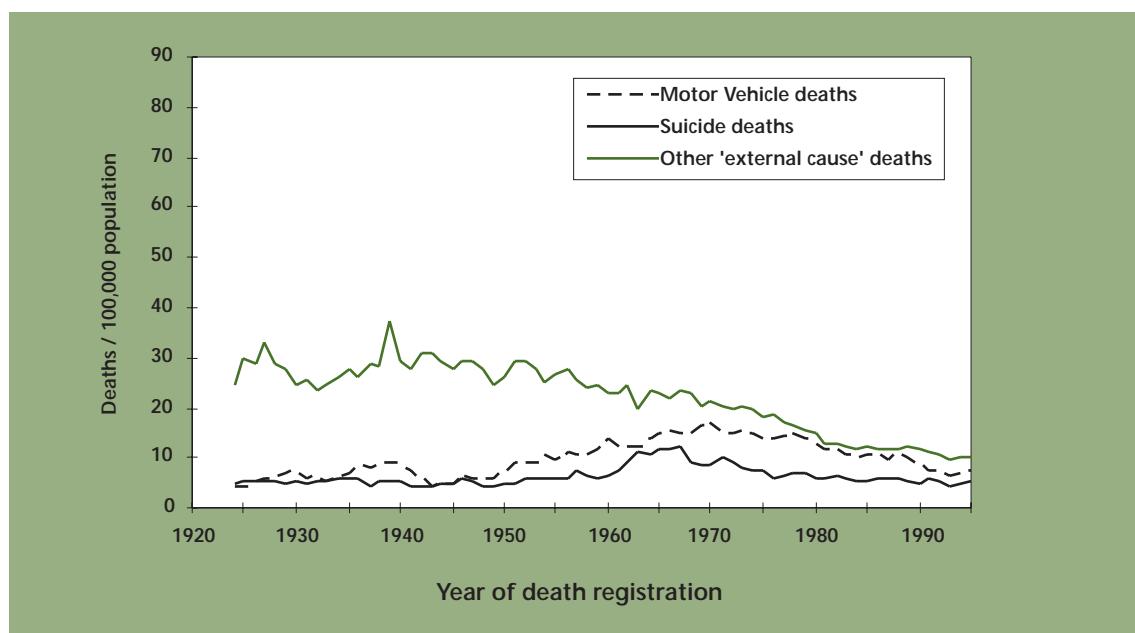
## Overview

**Figure 1.3a Injury mortality in Australia 1924–95 by external cause — males**



Note: Rates are adjusted to the Australian population in 1988.

**Figure 1.3b Injury mortality in Australia 1924–95 by external cause — females**



Note: Rates are adjusted to the Australian population in 1988.

After rising in the early part of the century, the road injury death rate declined rapidly after 1970. This can be attributed to vigorous road safety initiatives including the introduction of compulsory seatbelts, electronic speed measuring, breath testing, speed and red light cameras, higher penalties and educational programs. The Federal Office of Road Safety (FORS) is responsible for the Australian Design Rules program, which has led to safer vehicles (more controllable and more protective in a crash), and the Commonwealth 'Black Spot' funding programs, aimed at creating safer roads.

By contrast, suicide rates in the general population in Australia showed less variation over this period. The male suicide rate fluctuated around 20 per 100,000 population, being highest during the late 1920s, the late 1960s, and since the late 1980s. The female suicide rate remained at approximately 5 per 100,000 population, except for an increase during the 1960s. The increase in male and female rates during the 1960s is largely attributed to poisoning by barbiturates. Social factors may have contributed to an apparent decline in suicide during World War II.

There has been a long-term, steep decline in deaths from 'other causes', for reasons that are complex and not fully understood. The decline began in the 1920s for males and in the 1950s for females. A long-term decline in mortality due to drowning appears to account for approximately one-fifth of the improvement in males. Contributing factors may be an increase in the proportion of people able to swim and changes in patterns of exposure to water.

Limitations in the available data prevent assessment of other factors underlying the decline in mortality rate from the 'other causes' category. However, mechanisation and the rise of the service economy may have reduced the proportion of people (mainly men) engaged in occupations placing them at special risk of fatal injury. Specific injury prevention efforts are likely to be responsible for some improvements, such as the virtual disappearance of deaths due to flammable children's nightwear. The rate of decline in female deaths due to 'other causes' has slowed in recent years. The long-term downward trend for males continued into the 1990s, but the rate of improvement is likely to slow unless remaining injury issues are addressed.

### Cost of injury

Injuries are a significant source of health care costs, accounting for 8 per cent of the total direct costs of all diseases. In 1993–1994 alone, direct medical costs attributable to injury and poisoning were estimated to be \$2,607 million, compared with a total direct cost for cancer of \$1,361 million (Mathers et al 1997).

A significant proportion of the direct health costs of injury are associated with road transport-related accidents. Fire and fire-related injury costs are also high, as are costs attributable to fall-related injuries, particularly among older Australians.

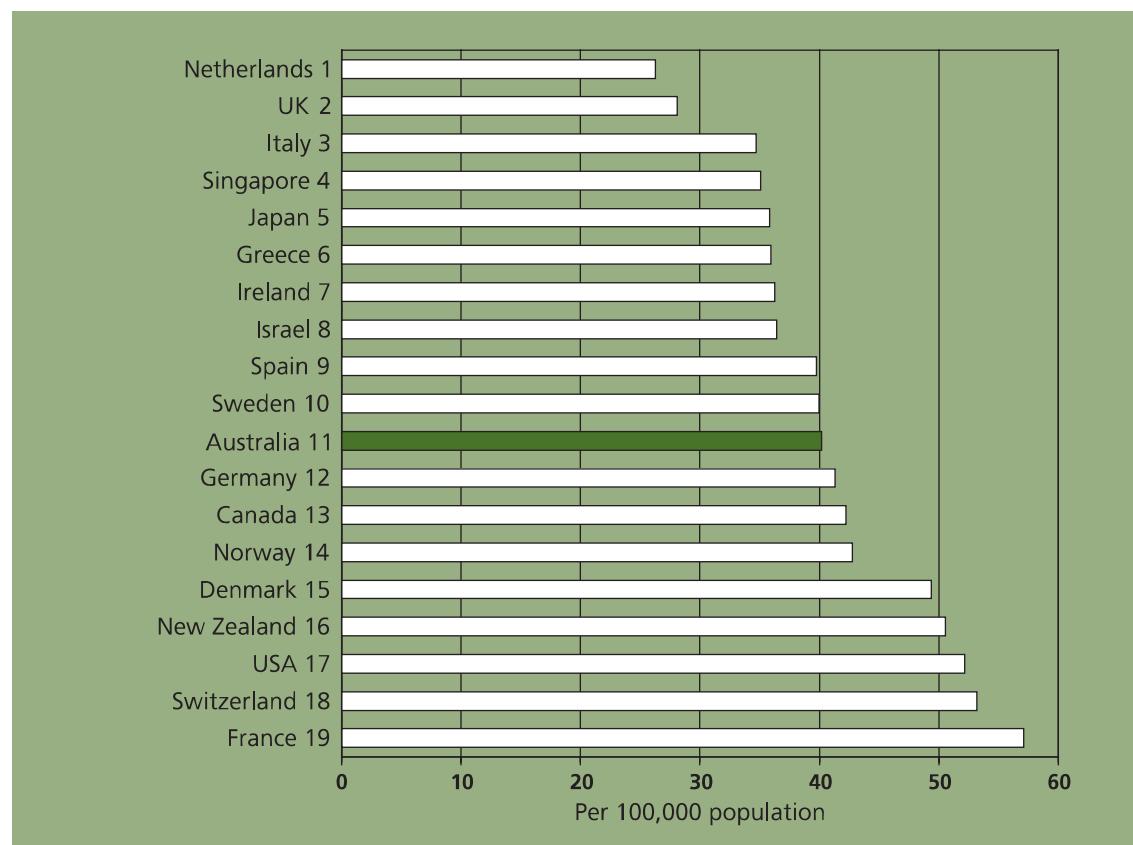
### At-risk groups

Overall injury rates mask substantial differences within the Australian population. For nearly all categories of injury, death and hospitalisation rates for males, particularly young adult males, are higher than those for females. Indigenous peoples experience injury mortality rates several times higher than the overall rates (Anderson, Bhatia & Cunningham 1996). People who reside in remote areas and, to a lesser degree, in rural areas, have higher injury hospitalisation and death rates than do urban residents (Titulaer, Trickett & Bhatia 1997). For example, injury hospitalisation rates for remote residents are double those for people living in metropolitan regions. Finally, the total injury mortality rate is highest in early adult years and in old age.

### Comparison with other OECD countries

International comparisons are made difficult by differences in the way injury-related deaths are recorded. Australia ranks in the middle of other OECD countries in terms of total deaths resulting from injury and poisoning (see Figure 1.4). Over the five-year period 1988–92, Australia ranked eleventh among a total of 19 developed countries. In addition, despite having had one of the highest road fatality rates, whether measured per person, per vehicle or per kilometre travelled, Australia now ranks in the middle of the OECD countries for fatal road accidents.

**Figure 1.4 Age-standardised death rates for injury and poisoning in OECD countries, 1988–92**



*Note:* Rates adjusted to the World Standard Population.

*Source:* AIHW.

The age-adjusted death rate for injury in Australia during 1988–92 was 40.8 per 100,000 persons, which compares favourably with those of a number of countries (eg 57.1 deaths per 100,000 persons in France). However, in view of the injury death rate in countries such as the Netherlands (26.3 per 100,000 persons), there is potential for further lowering the injury mortality rate in Australia.

National statistics on injury hospitalisations in Australia cannot be used to give an indication of trends over time due to technical factors such as changing hospital coverage, possible changes in hospital admission practices, and uncertainty about the quality of external cause coding. These issues are discussed in Appendix 2.

### **Injury as a national health priority**

Although initiatives in road safety were well established in the 1970s, it was not until 1986 that injury was recognised as a national priority for the health sector (Better Health Commission 1986). Subsequently, the report *Goals and Targets for Australia's Health in the Year 2000* confirmed the importance of injury prevention (Nutbeam et al 1993). In 1994, the *Better Health Outcomes for Australians* report further clarified and developed specific goals, targets and strategies for injury control and prevention (DHS 1994). The NHPA process continues to assess the impact of injury on the Australian community and monitor progress towards the set targets.

### **Injury and the role of the health sector**

Effective reduction of the burden of injury on Australian society requires a partnership between all relevant sectors, based on firm policy decisions at appropriate levels of government. The health sector bears many of the direct and indirect costs of injury, although other sectors may have responsibility for implementing the necessary preventive strategies. However, health outcomes in general, and injury prevention in particular, are not the core business of non-health sectors, and consequently they may not identify injury prevention as a priority. The health sector should focus on communicating the importance of injury prevention to other sectors and must establish efficient mechanisms for developing intersectoral prevention strategies.

Broadly, the health sector has five roles to play in injury prevention and control:

- planning and implementing prevention strategies for those aspects of injury that are the direct responsibility of the health sector;
- treating and caring for injured persons and providing rehabilitation services aimed at achieving optimal functioning;
- identifying priority injury issues through injury control research, especially through the collection and analysis of data obtained from hospitals and health practitioners and by working with relevant sectors to develop effective prevention strategies (eg sports and consumer product safety);
- supplementing the injury prevention initiatives of well-established sectors through the provision of information and complementary prevention initiatives (eg road safety, workplace safety); and
- developing intersectoral cooperation on injury issues including cooperative strategies aimed at specific risk groups across a number of injury types, multidisciplinary training, and the development of information systems and evaluation strategies for injury prevention.



# **Chapter 2**

# **Injury prevention and control indicators — current status**

The *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997) documented progress against a subset of 18 NHPA injury indicators. This chapter contains an updated summary of the statistics and trends for each of these injury indicators. In addition, information is now available for persistent spinal cord injury from traumatic causes, and for the death rate of people living in rural and remote areas compared with the general population. Data for the remaining 14 NHPA indicators are not currently available (see Appendices 1 and 2).

## **2.1 Indicator levels and trends**

### **Definitions**

*Injury indicators* are a means of measuring change in health outcomes in the injury area. The National Health Information Management Group Working Party has defined a 'health outcome indicator' as:

*...a statistic or other unit of information which reflects, directly or indirectly, the effect of an intervention, facility, service or system on the health of its target population, or the health of an individual.*

(AIHW & DHFS 1997)

The majority of NHPA injury indicators are based on *mortality* or *hospital separation* statistics. A hospital separation '... occurs when a patient leaves the care of an acute hospital. This includes discharge, transfer or death' (AIHW & DHFS 1997).

*Targets* have been set for many indicators. 'Targets state, for a given population, the amount of change which could reasonably be expected within a given time' (DHSH 1994). The targets used in this report were those published in the *Better Health Outcomes for Australians* report and were based on 'trends data and estimates of achievable gain over and above those being ... realised' at the time of publication of the report (DHSH 1994).

Priorities and targets were set by a working group with wide experience in injury prevention. The choice of priorities was influenced by the frequency and severity of injury, the possibility of effective intervention, and the degree of contribution that could be made by the health sector. Broadly, the targets for injury were of three types: those relating to specific external causes (eg transport-related); those relating to specific risk groups (eg Indigenous peoples); and those relating to trauma management or rehabilitation (eg access to optimal care).

## Injury prevention and control indicators — current status

### Trends

Targets, and progress towards targets for those indicators for which data were available in 1997, are summarised in Table 2.1, followed by a brief summary of injury indicator trends. More detailed information concerning each of the indicators, including data for previous years, is contained in Appendix 1. Appendix 2 outlines the statistical methods used to determine the trends in this report. Indicator numbers correspond to those published in the *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997).

Table 2.1 includes death rates for 1996 and hospital separation data for the financial year 1995/96. Conclusions concerning trends over time are confined to mortality data, as hospital statistics do not at present provide a valid indication of changes in injury rates. These issues are discussed in Appendix 2, together with suggestions for revising and improving the indicators and targets. Trend data are not provided for the two indicators that are reported here for the first time.

**Table 2.1 Assessment of the status of injury targets as at November 1997**

| Number | Indicator   | Year 2000 target                   | Progress towards targets | Comments  |
|--------|---|------------------------------------|--------------------------|---|
| 1.1    | Death rate for injury and poisoning in the total population   | 33.6 deaths per 100,000 population | ✓                        | 1996 death rate of 40.1 per 100,000 population.<br><br>Given the long-term downward trend in death rates the target is likely to be achieved.                       |
| 1.2    | Hospital separation rate for injury and poisoning in the total population   | Set at 20% below the 1991–92 rate  | ?                        | 1995–96 hospital separation rate of 2,078 per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).                     |
| 2.1    | Death rate ratio comparing the injury status of Indigenous and non-Indigenous populations                             | 2.8:1 males<br>3.2:1 females       | ✗<br>✗                   | 1993–95 death rate ratio of 3.4:1 for males and 3.9:1 for females.  |
| 2.2    | Death rate ratio comparing the injury status of males and females   | 2.1:1                              | ✗                        | 1996 male:female death rate ratio was 3.0:1.<br><br>This ratio has slightly increased with no underlying trend observed.  |
| 2.4    | Death rate ratio comparing the injury status among people living in rural and remote areas and the general population | No target set                      | NA                       | 1991–95 death rate ratios range from 0.89:1 for males and 0.94:1 for females in 'capital cities' to 1.9:1 for males and 1.96:1 for females in 'other remote areas'. |

**Table 2.1 Continued**

## Indicator levels and trends

**Table 2.1 Assessment of the status of injury targets as at November 1997 (cont)**

| Number | Indicator  | Year 2000 target  | Progress towards targets | Comments  |
|--------|--|---|--------------------------|---|
| 3.1    | Death rate for road transport-related injury in the total population                 | 10.7 deaths per 100,000 population  | ✓                        | 1996 death rate of 10.8 per 100,000 population.<br><br>Trend analysis suggests that the NHPA target is likely to be achieved, though the decline has slowed lately.   |
| 3.2    | Death rate for road transport-related injury among males aged 15–24 years            | 23.6 deaths per 100,000 males aged 15–24 years  | ✓                        | 1996 death rate of 32.2 per 100,000 males aged 15–24 years.<br><br>The long-term trend suggests that the target is likely to be achieved, though the decline has slowed lately.   |
| 3.3    | Hospital separation rate for road transport-related injury in the total population   | Set at 25% below the 1990 rate  | ?                        | 1995–96 hospital separation rate of 253 per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).   |
| 3.4    | Hospital separation rate for road transport-related injury in males aged 15–24 years | Set at 25% below the 1990 rate  | ?                        | 1995–96 rate of 665 hospital separations per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).  |
| 5.1    | Death rate due to falls among people aged 65 years and over                          | 35.4 deaths per 100,000 aged 65 years and over  | ✓                        | 1995 death rate of 35.9 per 100,000 persons.<br><br>The trend indicates that the target is likely to be achieved.   |
| 5.2    | Hospital separation rate due to falls among people aged 65 years and over.           | Targets have been set to reduce by 10% the rate among males and by 20% the rate among females from the 1991–92 baseline | ?                        | 1995–96 hospital separation rate was 886 per 100,000 males and 1,456 per 100,000 females aged 65–74 years. Rate was 3,059 per 100,000 males and 5,871 per 100,000 females aged 75 years and over.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2). |
| 5.5    | Hospital separation rate for falls among children aged 0–4 and 5–9 years             | A 10% reduction rate has been set for children  | ?                        | 1995–96 hospital separation rate of 578 per 100,000 aged 0–4 years and 777 per 100,000 aged 5–9 years.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).  |

**Table 2.1 Continued**

## Injury prevention and control indicators — current status

**Table 2.1 Assessment of the status of injury targets as at November 1997 (cont)**

| Number | Indicator  | Year 2000 target  | Progress towards targets | Comments   |
|--------|--|---|--------------------------|--|
| 7.1    | Death rate for homicide among people aged 20–39 years  | Status quo males  | ?                        | No underlying trend is evident among males.  |
|        |  | Status quo females (1992 baseline)                                    | ✓                        | 1996 death rate of 1.4 per 100,000 females is 2/3 of the Year 2000 target.   |
| 7.2    | Death rate for homicide among children aged 0–9 years  | 0.5 deaths per 100,000 children aged 0–9 years                        | ✗                        | A slight upward trend. The rate was unusually low in the baseline year.  |
| 9.1    | Death rate for injury resulting from fire, burns or scalds among people aged 55 years and over           | 1.2 deaths per 100,000 persons aged 55 years and over (1992 baseline) | ✓                        | The rate of decline (2.8% annually) will, if maintained, help meet the target.   |
| 9.2    | Hospital separation rate for injury resulting from fire, burns and scalds among children aged 0–4 years. | 20% reduction on 1991–92 baseline rates                               | ?                        | 1995–96 hospital separation rate of 122 per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).  |
| 10.1   | Hospital separation rate due to poisoning among children aged 0–4 years                                  | 20% reduction on 1991–92 baseline rates                               | ?                        | 1995–96 hospital separation rate of 301 per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2).  |
| 11.1   | Death rate for drowning among children aged 0–4 years and in the total population                        | 3.0 deaths per 100,000 children aged 0–4 years (1992 baseline)        | ?                        | Declining trends observed both among children aged 0–4 years and the total population.   |
| 11.2   | Hospital separation rate for near drowning among children aged 0–4 years                                 | No target set for the total population                                | ↓                        |  |
|        |  | 30% reduction on 1991–92 baseline rates                               | ?                        | 1995–96 hospital separation rate of 25.1 per 100,000 population.<br><br>Hospital separation targets need to be reviewed (refer to Appendix 2). |
| 14     | Incidence rate for persisting spinal cord injury from traumatic causes                                   | No target set   | NA                       | Incidence of 1.34 per 100,000 in 1995–96.  |

*Key:*

- |   |   |
|---|---|
| <span style="color: green;">✓</span> target met or likely to be met<br><span style="color: grey;">↓</span> target not set, but a decreasing trend<br><span style="color: black;">NA</span> not applicable | <span style="color: red;">✗</span> target not likely to be met<br><span style="color: grey;">?</span> not possible to determine whether target is likely to be met, or insufficient data to determine the trend |
|---|---|

*Notes:*

- 1 Death data are provided by the ABS by calendar year, while hospital statistics are reported by financial year.
- 2 Statistics for indicators of hospital separation do not at present provide a valid indication of trends over time in injury occurrence. Because of this, the Year 2000 target values for these indicators are stated in terms of per cent reduction from a specified baseline year, not as absolute values.
- 3 Age-adjusted estimates of the occurrence of hospitalised injury in 1995–96 are provided. This is the year for which the best data are available, and the values provide a good indication of relative rates for different external causes of injury. Note that it is not valid to compare these values with previously reported estimates for these indicators.
- 4 These indicators are a priority subset of the indicators listed in the *Better Health Outcomes for Australians* report (DHFS 1994).

### Summary of trends for individual indicators

#### *Total injury deaths (Indicators 1.1 and 2.2)*

- There has been a 4.5 per cent reduction from the 1992 baseline of 42 injury deaths per 100,000 population, despite a rise in 1994. Overall, the age-adjusted injury death rate has fallen by almost one-fifth since 1986. If the overall downward trend is maintained, the Year 2000 target of 33.6 injury deaths per 100,000 should be achieved. However, it may not be achieved if the plateau seen in recent years persists.
- Both male and female injury death rates declined in the period 1986–96. Between 1993 and 1995, the ratio of male to female death rates fell from 2.9:1 to 2.6:1. However, in 1996 the rate ratio increased to 3.0:1, an increase of 15.4 per cent over the 1992 baseline.

#### *Death rate ratio for Indigenous and non-Indigenous populations (Indicator 2.1)*

- The 1993–95 death rate ratio for Indigenous compared with non-Indigenous populations remained high. The death rate for Indigenous males was 3.4 times that for their non-Indigenous counterparts. Similarly, the death rate for Indigenous females was 3.9 times that of non-Indigenous females. Although there has been a small decrease in the ratio, on current indications the Year 2000 targets of death rate ratio of 2.8:1 for males and 3.2:1 for females may not be reached.

#### *Death rate ratios for rural and remote areas (Indicator 2.4)*

- Information on the death rate ratio for those living in rural and remote populations compared with the general population for the period 1991–95 has now become available.
- The death rate ratio increases with increasing remoteness and decreasing population size. For example, the death rate ratio in the most remote (low population, isolated) areas is almost twice that for the general population (1.96 times for females; 1.9 times for males).

#### *Road transport-related deaths (Indicators 3.1 and 3.2)*

- There has been a general downward trend in road transport-related deaths. The 1995 rate of 11.5 deaths per 100,000 and the 1996 rate of 10.8 deaths per 100,000 population indicate that the NHPA target of 10.7 deaths per 100,000 will be met well ahead of the Year 2000.
- Road transport-related accidents accounted for 28 per cent (n=2,058) of all injury-related deaths in 1995, with high rates noted for males aged 15–24 years and 75 years and over.
- Males in the 15–24 years age range accounted for 22 per cent (n=449) of all road deaths in 1995 at a rate of 32.2 deaths per 100,000. Although the 1995 rate was slightly higher than that for 1994, there has been a general downward trend since 1986. If the overall downward trend continues, the Year 2000 target of 23.6 deaths per 100,000 males aged 15–24 years is likely to be achieved. However, the data suggest a levelling off in road fatality rates for young males, which may have an impact on progress towards the target.

## Injury prevention and control indicators — current status

### ***Deaths due to falls among the elderly (Indicator 5.1)***

- The majority of deaths attributed to a fall occur in old age. In 1995, 94 per cent of deaths due to falls among females and 70 per cent of deaths due to falls among males occurred among those aged 65 years or more.
- Deaths due to falls among Australians aged 65 years and over have declined by one-fifth over the past decade. However, a levelling off in death rates has been noted of late.

### ***Death rate from homicide (Indicators 7.1 and 7.2)***

- The target for death rate from homicide for males and females aged 20–39 years is to maintain the rate at the 1992 level of 2.4 per 100,000 females and 3.4 per 100,000 males. The rate for 20–39 year old females has been below the Year 2000 target for the past several years. Due to the nature of the data, a trend line could not be fitted for the homicide rate among males in the 20–39 year age group. Overall, there was a slight upward trend in homicide among 0–9 year olds between 1986 and 1995, despite consecutive declines in 1994 and 1995.

### ***Death rate from fire, burns and scalds in people aged 55 years and over (Indicator 9.1)***

- The Year 2000 target to reduce mortality from burns in persons aged 55 or more years was set at 50 per cent of the 1992 baseline rate of 2.4 deaths per 100,000. The current rate of approximately 1.3 deaths represents a reduction of 44 per cent and it appears that the target will be achieved.
- A total of 133 fire, burns and scalds deaths were registered in 1995, 8 per cent fewer than in 1994. The rates were highest for males and females in old age with 49 deaths (37 per cent) in 1995 at age 55 years or more. Fire, burns and scalds accounted for approximately 3 per cent of all deaths in this age group.
- Male rates were slightly higher than female rates in most age groups. The male age-adjusted rate was about 1.5 times the equivalent female rate.

### ***Death rate from drowning in early childhood (Indicator 11.1)***

- Drowning is the principal cause of death among Australian children under five years of age, accounting for 36 per cent of all injury deaths in this age group. There was a rise in drowning deaths in 1995 but based on long-term trends, the Year 2000 target is likely to be achieved.

### ***Spinal cord injury (Indicator 14)***

- Following the establishment of the Australian Spinal Cord Injury Register, which contains a record of people admitted to specialist spinal units in Australia, it is now possible to report initial data for this NHPA indicator. At this stage, no goal or target has been set for reduction in the incidence of spinal cord injury.
- It is not practical to measure the incidence of spinal cord injuries resulting in death. Nor is it possible to reliably predict in all cases the extent of permanent disability immediately after a spinal injury. Therefore, the 'incidence of persisting spinal cord injury from traumatic causes' (defined as cases in whom neurological deficit is present at the time of discharge) was considered the most appropriate indicator for spinal cord injury.
- The incidence of new cases of persisting spinal cord injury in Australia was 1.34 cases per 100,000 population in 1995–96 (O'Connor & Cripps 1997).

### Hospital separations

- While trends in hospital separations are not reported here, the 1995–96 hospital separation data provide an insight into the relative frequencies of non-fatal external causes of injury and are therefore included in Table 2.1 and discussed in Section 2.2.

### Progress towards targets

There has been progress towards targets (and decreasing death rates) for the following indicators:

- the total population;
- road transport;
- falls in older people;
- fire, burns and scalds in older people;
- homicide among females aged 20–39 years; and
- drowning in early childhood.

On current indications, targets may not be met by the Year 2000 for:

- the ratio of male to female deaths;
- the death rate from homicide among young children; and
- the death rate ratio for Indigenous and non-Indigenous populations.

## 2.2 Other important statistics and trends

There are several important issues that are not directly assessed by the injury NHPA indicators. This section provides further statistical information on injury in children and young males, and presents data on suicide in Australia as it relates to injury.

### Childhood injuries

Since the early 1980s, there has been a clear downward trend in the total number of child injury deaths in all age groups. Overall, there was a 51 per cent decline in the number of deaths among children younger than 15, from 700 in 1979 to 376 in 1995. Children aged 5–9 years showed the greatest reduction. The rate of decline in injury mortality was greater for children than for people over 15 years of age.

The reduction in the overall child injury death rate has been attributed to decreases in mortality from motor vehicle accidents (including those resulting in child motor vehicle occupant deaths, child pedal cycle deaths, and child pedestrian deaths) and from drowning.

Hospitalisation rates for the period 1991–92 to 1995–96 highlight the diversity of causes of childhood injury. However, falls are the leading cause of hospitalisation for all age groups. Injuries due to falls among 0–5 year olds most frequently occur in the home whereas injuries from falls in 5–9 year olds are more commonly associated with playground equipment.

## Injury prevention and control indicators — current status

Numbers of cases of burns and poisoning are particularly high in the 0–5 year age group, whereas injuries sustained from pedal cycling or motor vehicle passenger accidents are significant in the 5–14 year age group. Sports-related strikes by an object or person are common in the 10–14 year age group.

In 1995, 21 of the total of 133 fire, burns and scalds deaths in the general population were among children aged 0–4 years. All but one of these deaths occurred in house fires and one-third of those who died due to a house fire were children younger than 15 years of age (n=32).

### Injury among young males

The burden of injury on young males in Australia is substantial. Each year over 1,600 young males aged 15–29 years die, and more than 60,000 are hospitalised, as a result of injuries. In 1995, 70 per cent of all deaths among males 15–29 years of age were due to injuries. Young deaths also accounted for 48 per cent of YPLL as a result of injury among males.

The single largest cause of injury-related fatalities, emergency department presentations and hospital admissions among young males aged 15–29 years is transport-related accidents. Young males of this age group accounted for almost 50 per cent of all male transport-related hospital separations.

Injury is very much a male phenomenon in the 15–29 year age group. Compared with females, males in this age bracket experience more than four times the death rate and nearly three times the hospitalisation and emergency department presentation rate.

Injury rates in young males are highest in remote areas, high in rural areas and lowest in urban areas. These reflect largely the transport-related and farm occupation-related rates of injury mortality and morbidity in rural areas. Young Indigenous males in all age groups (especially 15–34 years) have markedly higher mortality and hospital separation rates than their non-Indigenous counterparts. Differences in injury patterns between Indigenous and non-Indigenous peoples should be interpreted cautiously, as Indigenous status is ascertained inconsistently in hospital separation data (Moller 1996a).

In April 1995, the NHMRC established a working party to examine unintentional injury in young males aged 15–29 years. This action was taken in response to the identification of injury as a NHPA together with the observation that young males show a much higher rate of injury than any other group with the exception of the frail aged. The report of the Working Party, *Unintentional Injury in Young Males 15–29 Years*, was released in 1997 (NHMRC 1997a). The major findings of this report are discussed in Chapter 4.

### Youth suicide

Suicide is the second most common cause of death in the 15–24 year age group. In 1995, 434 deaths among young Australians aged between 15 and 24 years were attributed to suicide. This is equivalent to 16 deaths per 100,000 young people aged 15–24 years and 32 per cent (n=434) of all injury deaths for this age group. For every youth suicide, there are 10 hospitalisations due to intentional self injury. Hospitalisations due to self harm are more sharply concentrated at early adult ages than are suicide deaths.

## Other important statistics and trends

The rate of suicide in Australia among males aged 15–24 years trebled between 1960 and 1990. Between 1990 and 1995, the male suicide rate for this age group fluctuated and may have declined slightly. However, the rate remains high at 25 suicides per 100,000. No parallel increase has been observed for young females, the rates for 15–24 year old women varying between four and six suicides per 100,000 in the period 1979–95.

Although the suicide rate among young males was almost four times the female rate in 1995, the hospital admission rate due to intentional self harm among females was 1.5 times higher than that for males.

Methods used for completed suicide differ from those resulting in hospitalisation for self harm. Suicide deaths are typically caused by hanging, shooting and poisoning with vehicle exhaust, whereas for both males and females, drug overdose is associated with the majority of hospitalisations for self harm. The fact that more males choose more lethal means of suicide does much to account for the predominance among males of fatal cases of self harm.

The suicide rate for 15–24 year old males is markedly higher than the rate at other ages except the elderly. By contrast, rates for females aged 15–24 are similar to those observed at other ages. The suicide rate among Indigenous young males is higher than that among non-Indigenous young males.

The rate for suicide by hanging has increased five-fold since 1979. In comparison, the rate for suicide by shooting decreased by approximately 50 per cent in the same period. Suicides by 'other and unspecified' methods (such as jumping in front of a moving vehicle or jumping from a height) are increasing.

In 1995, youth suicide rates did not differ greatly between States and Territories. However, suicide rates are higher for young males who normally reside in non-urban areas than for urban residents. Suicide rates are elevated for rural males in general, but the pattern is more pronounced for young males. In rural areas, firearm suicides are common. In the three years between 1990 and 1992, the number of firearm suicides in rural areas ( $n=120$ ) was almost the same as that in urban locations ( $n=121$ ), despite the large difference in the size of the population base for the two areas.

Strategies to address suicide will be reported in detail in the NHPA report on mental health due to be submitted to Health Ministers in 1998.



## **Chapter 3**

# **Infrastructure developments in injury prevention and control**

### **3.1 Prevention**

The *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997) emphasised that injury is preventable and that primary prevention is the best means of injury control.

The following overview of infrastructure and program developments in the area of injury prevention includes: progress at the State and Territory level; the role of national bodies in coordinating broad injury prevention policy and activities; recent injury prevention interventions in Australia and their effectiveness; and progress towards improving trauma-related data.

#### **State and Territory progress**

While the following is not a comprehensive record of injury prevention action by the States and Territories, it does provide an indication of developments and progress towards national goals and targets. Particular emphasis is given to:

- achievements in injury prevention;
- progress towards a strategic plan;
- initiatives involving intersectoral collaboration;
- provision and funding of training in the area of injury;
- injury research and evaluation activities; and
- future plans for achieving significant gains in injury prevention.

#### **New South Wales**

In response to the original National Health and Goals Targets process, NSW Health established the Injury Lead Agency Forum where facilitation of planning and action on each of the targets was accepted as the responsibility of one of nine government or non-government organisations. The Forum has New South Wales Cabinet endorsement, and a State-wide all agency report on current activity is due to be submitted to the New South Wales Premier in 1998. A formal evaluation of the forum process will be undertaken.

NSW Health's Injury Prevention Policy Unit funds the position of coordinator for the Lead Agency Forum. Emerging from its lead agency responsibilities, the Unit has formulated a strategic plan with respect to its three areas of focus: falls in older people; childhood poisoning; and burns and scalds.

## Infrastructure developments in injury prevention and control

Major recent achievements in injury prevention include:

- the completion of two phases of the State-wide scald prevention campaign (the third phase is being conducted through Kidsafe);
- implementation of a smoke alarm promotion program, in partnership with the New South Wales Fire Brigade and local councils, within four Area Health Services where house fire rates are high and smoke alarm installation rates are comparatively low;
- implementation of campaigns promoting smoke alarm installation within Vietnamese and Chinese communities; and
- commencement of a prospective study (identifying cases as they occur), with the Poisons Information Centre, to better identify how children access major household poisons.

Other projects include:

- the production of a resource manual and training seminar for public health workers and those in other sectors, on firearm injuries and the new firearm laws (delivered State-wide);
- support for the development of a State-wide, playground safety advisory service;
- an Aboriginal Injury Surveillance program in Bourke, covering all injuries at multiple treatment centres (medical and community health services);
- participation on the Public Health Committee for the Sydney 2000 Olympic Games; and
- the maintenance of a network of injury prevention workers around the State.

Key training opportunities within the past few years have been an annual inter-sectoral two-day workshop for injury control practitioners conducted with the National Centre for Health Promotion. Major research initiatives have been the evaluation of the scald prevention campaign, the smoke alarm campaign and a falls prevention program on the NSW north coast. Future areas of focus include establishing a workable emergency department-based injury surveillance system and establishing a centre for injury prevention research.

### **Victoria**

The Victorian intersectoral plan for injury prevention *Taking Injury Prevention Forward* was launched in 1994 (Department of Health and Community Services 1994). A number of specific working groups and the Victorian Injury Prevention Committee were established to develop the injury prevention plan and coordinate implementation of injury prevention activities. Recent work has focused on increasing the capacity and commitment of other sectors of injury prevention, for example, through the municipal public health planning process and through jointly funded projects with other sectors. Efforts have also been directed towards establishing injury prevention as part of core business of primary health care providers within the health sector.

Major program achievements include:

- a State-wide scalds prevention campaign and the completion of a process evaluation of that campaign;
- a program at the Royal Children's Hospital addressing injury prevention issues for community groups in languages other than English; and
- an annual State-wide Community Safety Week, which commenced in 1997.

The Victorian Department of Human Services has administered regional injury prevention grants for a variety of community-based initiatives to assist in identifying effective preventive strategies and to increase the capacity of communities to undertake injury prevention. One of the larger projects is a sports injury prevention initiative in the City of Hume. The project focuses on evaluating the impact of club or association safety policies on sports injuries.

The injury control section of the Victorian Department of Human Services is involved in several jointly funded initiatives with other sectors including a State-wide rural safety project and the promotion of sports safety through existing infrastructures. It is also funding an evaluation study of strategies to address falls prevention in older people. The study is examining the combined and individual effects of exercise strategies, home modification, and strategies that address vision. Important legislative changes have also been introduced, including the compulsory installation of smoke alarms, the compulsory erection of swimming pool fences, and changes to domestic animal control.

The Department has identified training in injury prevention and control as a priority. It has been working to establish an injury prevention Chair at Monash University, and has provided assistance to some new injury prevention workers to attend a short course in injury control conducted by the Monash University Accident Research Centre (MUARC). It has also provided seminars and forums on an annual basis for practitioners working at the local level.

Future directions for the injury control section include a greater focus on:

- sport and recreational injuries;
- children's injuries including poisoning prevention; and
- rural safety, through greater collaboration with a growing number of Farm Safety Action Groups.

Other considerations include assisting research that identifies the direct and indirect costs (to all sectors) of different types of injuries and use of this information to identify injury prevention priorities and to engage other sectors.

### Queensland

The approach of Queensland Health to planning and evaluating injury prevention and control is being redeveloped with the Injury Health Outcomes Plan expected to be completed in 1998. Strategic planning of State-wide injury prevention initiatives will be undertaken by an Injury Outcomes Area Team made up of a diverse group of public health staff.

For the past three years, Queensland Health's injury activities have focused on the prevention of burns and scalds in children and on toddler drowning. The latest phase of the Hot Water Burns Like Fire program was a media campaign in August 1997

## Infrastructure developments in injury prevention and control

which was combined with a stronger emphasis on working with manufacturers and industry. The focus on industry will continue in 1998 with the introduction of the Australian Standard for hot water delivery (AS 3500.4).

A comprehensive campaign addressing pool drownings is in progress. Laurie Lawrence has championed the Kids Alive: Do the Five program and created a high profile for toddler drowning within the State. This has produced an environment ready for more targeted strategies. Research aimed at obtaining a clear understanding of the context in which drowning occurs and the potential contribution of different prevention strategies will inform the next phase of the project.

The Safety Action program to reduce alcohol-related violence and injury within the licensed environment has been piloted in Surfers Paradise and successfully replicated in Mackay, Townsville and Cairns. Within nightclubs and licensed venues the program has reduced the incidence of physical assault and increased periods free from drunkenness.

Following the collection and analysis of information about the high rate of injury experienced by Indigenous peoples from NISU and the Cairns Tropical Public Health Unit, a number of Indigenous injury prevention programs have been initiated in the Far North and in Central Queensland. These community-based programs are focusing upon developing culturally appropriate injury prevention strategies which address the specific needs of each community.

### Western Australia

Injury control in Western Australia is currently operating under a decentralised system, with Public Health Units each identifying their own priorities. At the central level, the focus is on providing training, establishing which programs could be undertaken by partners in injury control, and progressing a number of separate intervention projects.

In the area of training, the injury program has produced a resource manual for injury prevention practitioners and has conducted training seminars around the State based on the manual. The Injury Control Council of Western Australia (an intersectoral council committed to injury prevention), and Healthway (a foundation set up to fund health promotion activities), have provided seeding money for model projects such as those addressing exercise as a falls prevention strategy for older people, and bike helmet promotion. These projects provide further training opportunities and increase the capacity of organisations to address injury prevention. With new data on household safety devices available through participation in the Australian Bureau of Statistics Supplementary Labour Force survey in 1996, there has been a focus on the prevention of poisoning, scalds (with action towards legislation for hot water heaters) and burns (with the adoption, in mid-1997, of smoke alarm legislation for new houses, and house renovations requiring council approval).

The Injury Unit of the Western Australian Health Department became a partner in road safety in 1997, being involved in strategic planning in enforcement and other campaigns. It has also undertaken a collaborative research study with the National Centre for Drug Abuse: a case-control study of the relationship between alcohol, drugs and injury.

Developments in surveillance include a monitoring project at the Broome Hospital emergency department to examine the potential of adding alcohol questions to the Injury Minimum Data Set. The data collection has also served to monitor the impact of a trial program, an accord on safe drinking premises, where owners of licensed premises and police and health authorities, work together to reduce the alcohol problem. There are currently no resources to expand this initiative to further sites.

Major future initiatives include the development of a State-wide strategic plan for injury prevention, developing a greater focus on intentional injuries, especially interpersonal violence among young men, and playing a greater role in the road safety area.

### **South Australia**

The South Australian Health Commission's Injury Surveillance and Control Unit has been undertaking injury surveillance, through hospital and mortality data and sentinel emergency department data collection systems, since 1985. Most recently, it has been involved in significant research projects in the areas of falls prevention among older people, and dog attacks. The results of these studies have been published in the *Medical Journal of Australia* (Thompson 1996) and a report, on the involvement of general practitioners in falls prevention initiatives with older people, is currently in press. Major achievements in injury prevention include initiatives in falls prevention in older people, hot water temperature control, and home fire prevention, and the introduction of a playground safety-surface standard.

The Unit has a strong commitment to training injury prevention workers, having an ongoing program of paid apprenticeships of 6–18 months duration for recent university graduates in the health sciences. There have been six such trainees since 1994.

No strategic plan for injury prevention has been developed nor is one intended for the future. Future plans, however, include:

- establishment of a national playground testing network;
- development of a pump-suction safety device for pools and spas;
- development of national standards for safe kerbside dining; and
- development of methods to promote falls prevention through general practitioners.

In addition, South Australia has chosen violence and abuse as a State Health Priority Area. Indicators and targets cover death from child abuse and neglect, and mortality and morbidity from interpersonal violence such as domestic violence, rape, sexual assault and elder abuse.

### **Tasmania**

Broad strategic direction for the development of injury prevention activities is provided by the Tasmanian Health Goals and Targets, in which injury is one of nine priorities. The Tasmanian Injury Coalition was established as an intersectoral planning group to collaboratively address injury priorities within Tasmania. In 1996, the Coalition provided training in approaches to effective injury prevention to a range of stakeholders.

## Infrastructure developments in injury prevention and control

Major achievements by the Department of Community and Health Services in injury surveillance and prevention within the last few years include:

- implementation and evaluation of a hot water scalds prevention campaign targeting children aged 0–4 years. Results indicated a significant reduction of hospitalisations due to burns and scalds in this age group (39 per cent) over the four years from 1990–91 to 1994–95. This result well exceeds the national target of a 20 per cent reduction set for the Year 2000;
- establishment of a strategic alliance with the Department of Transport to develop an injury prevention campaign targeting elderly drivers;
- provision of funding to establish the Tasmanian Resource Centre for Falls in the Elderly, to provide strategic direction and advice on best practice in falls prevention; and
- provision of ongoing support to non-government organisations that provide State-wide injury prevention services, including Kidsafe, the Tasmanian Injury Coalition and the Tasmanian Injury Surveillance and Prevention Program.

Currently, key priority target groups for injury prevention activities are children aged 0–4 years, young people (particularly males aged 15–29 years) and people aged over 70 years.

Future initiatives include the development of strategic priorities for health and wellbeing outcomes for Tasmania. This is to be a key task for the newly established Health and Wellbeing Unit of the Department of Community and Health Services.

### Australian Capital Territory

Injury was identified as a health priority in the 1994 report *Health Goals and Targets for the Year 2000* (ACT Department of Health & Community Care 1994) and by the Health Outcomes Reference Group, which was established in 1995. In 1996, a report on the epidemiology of injury in the Australian Capital Territory was published (Gilbert & Gordon 1996), and following its recommendations, an intersectoral Australian Capital Territory Injury Prevention and Control Taskforce was established.

Using a strategic and evidence-based approach, the taskforce has identified four key areas:

- falls in the elderly;
- sports and recreation injuries;
- workplace injuries; and
- bicycle injuries.

Initially the taskforce is focusing on falls in the elderly, and sports and recreation injuries. Working groups have identified a number of priorities in both areas, including sports injury surveillance and the continuing development of clinical protocols and pathways for the prevention, treatment and management of falls in older people.

A major achievement has been the inclusion of performance indicators for assessing progress in the management and prevention of falls in the elderly, in the Department's 1997–98 contract with the Canberra Hospital. Where staff training has occurred, the number of falls in hospital has decreased. Further work is underway on the prevention of falls in the community. Progress will be measured against performance indicators.

The Canberra Hospital has appointed its first trauma surgeon and will be appointing a Professor of Road Trauma and Emergency Medicine at the Canberra Clinical School (University of Sydney) with funding provided by the National Roads and Motorists Association.

The Injury Prevention and Control Taskforce is using the Department's health outcomes framework, *Outcomes 2000* (ACT Department of Health & Community Care 1997), to develop strategic and coordinated plans with stakeholders in identified areas of focus.

### Northern Territory

Territory Health Services has identified alcohol misuse as the major preventable cause of injury in the Northern Territory. The Northern Territory has the highest alcohol consumption per capita, as well as the highest injury mortality in the country.

A specific injury prevention strategy has not been developed in the Northern Territory. There are currently no injury prevention policy officers or designated injury prevention workers within the health sector, and no local injury prevention training program for health sector workers. While injury is a greater problem in the Northern Territory than elsewhere in the country, and certainly one of the highest priority health issues, focusing attention on alcohol-related harm is seen as the most effective means of preventing injury and addressing the other serious effects of alcohol misuse.

The major effort in injury prevention is the Living With Alcohol program, which is an intersectoral initiative funded by a levy on alcohol sales. This program is based on a responsible drinking and harm minimisation strategy, and supports a range of health promotion, treatment, rehabilitation and research initiatives, as well as initiatives in the hospitality industry and in law enforcement. A specific Living With Alcohol program addresses similar issues in the Aboriginal community, although often in quite different ways.

Recent injury prevention achievements in other sectors have been legislation requiring roll cages to be fitted to open utility and truck trays that are used for passenger transport (falls from open trays are a significant cause of road injury in remote areas), and the introduction of speed cameras.

As a result of the Living With Alcohol program, research activity related to injury is also concerned with alcohol misuse, including the evaluation of the effectiveness of the 'Alcohol-free Thursdays' in Tennant Creek where alcohol sales are restricted on Thursdays (pay and social security days) in response to community pressure. The evaluation of the strategy included an assessment of its effect on local hospital presentations due to injury. There is also a trial currently underway of a system in Alice Springs Hospital to identify and monitor alcohol-related injuries presenting to the emergency department.

### Coordination at national level

#### Commonwealth Department of Health and Family Services

Prime responsibility for national coordination of injury prevention and control activity within the health sector rests with the Commonwealth Department of Health and Family Services. The focus is on supporting the establishment and maintenance of injury prevention infrastructure and capacity.

## Infrastructure developments in injury prevention and control

This includes fostering or taking a lead agency role in intersectoral cooperation and collaboration, provision of funding support for national data collections, analysis and dissemination of these data, and support for training initiatives and relevant research.

In recent years, intersectoral activity has included:

- sponsoring the First National Conference, and the Third International Conference on Injury Prevention and Control in 1995 and 1996 respectively, and the forthcoming Second National Conference to be held in 1998;
- joint funding of bilateral activities, including the Australian Advisory Committee on Road Trauma, and the Australian Sports Injury Prevention Taskforce which has recently produced the National Sports Safety Framework;
- coordination of a national response to standards issues (eg to prevent weakening of domestic hot water standards as part of the mutual recognition process);
- coordination of national support for the World Health Assembly Resolution on Violence as a Public Health Issue; and
- formation of the National Injury Prevention Advisory Council (NIPAC).

Data activity has included:

- funding for the AIHW National Injury Surveillance Unit (NISU), especially to improve data on Indigenous peoples' injury and on emergency department injury presentations; and
- funding for analysis of specific injury issues, including a review of risk-taking behaviours among young men, 'do-it-yourself' injuries, product-related child fall injuries, and a review of countermeasures to reduce near-drowning and spinal injuries.

### AIHW National Injury Surveillance Unit

The AIHW National Injury Surveillance Unit (NISU) has played an active role. It publishes the *Australian Injury Prevention Bulletin* and the *Injury Issues Monitor*, and supports the formal and informal interchange of data and information on injury issues. NISU's move to the new Flinders University Research Centre for Injury Studies will facilitate a broader approach to injury prevention.

### Other organisations

There are a number of other organisations involved in coordinating injury prevention activities at a national level. Kidsafe, the Child Accident Prevention Foundation of Australia, is the peak injury prevention organisation for children. Its work includes the development of injury data collections and demonstration injury prevention programs. Farmsafe Australia has taken national leadership for farm safety and the related issues of rural injury. The Australian Agricultural Health Unit has played a central role in data analysis, developing and evaluating educational and environmental prevention strategies, and contributing to the cooperative structures involving farmers' organisations, occupational health and safety agencies and State and regional health agencies. The Office for Aboriginal and Torres Strait Islander Health Services (OATSIHS), located within the Commonwealth Department of Health and Family Services, has coordinated and funded a number of injury-related programs and research activities targeting Indigenous peoples. The Australian Sports Commission jointly funded the Australian Sports Injury Prevention Taskforce with

the Commonwealth Department of Health and Family Services. The focus of the Taskforce's report, *SportsSafe Australia: A National Sports Safety Framework* (1997) provides a foundation for the future direction of sport and recreational injury prevention in Australia.

## **Effective preventive programs in Australia**

This section describes several major recent preventive interventions in Australia and their evaluated effectiveness. The strategies discussed are not intended to provide a comprehensive coverage of major injury prevention strategies within Australia. Rather, they illustrate a cross-section of approaches and injury areas where preventive programs appear to have resulted in significant gains.

These examples illustrate the scope for successful preventive action if the problem is well understood, appropriate resources are allocated to ensure that the changes are accepted within the community, and policy structures are amenable to change. They also illustrate the scope for coordinated action by the States and Territories. However, implementation of these strategies is currently not consistent across States and Territories and no mechanisms exist to rapidly and efficiently develop nationally consistent approaches.

### **Scalds prevention**

Hot water at 60–70°C (the factory setting for most hot water heaters in Australia) takes less than one second to cause third degree burns to a young child's skin. It is therefore possible to lower the number and severity of tap water scalds by lowering the delivery temperature of the water. In response to evidence of the effectiveness of scalds prevention strategies in the United States, almost all Australian States and Territories have undertaken significant work in the area of scalds prevention over the past few years.

The model of intervention adopted in the United States followed that developed by Katcher (1987) which comprises data collection, education in the form of multi-strategy campaigns directed to decision makers in the industry as well as consumers, and legislation. A 50 per cent reduction in scalds within the first five years of legislation was reported (Katcher 1987; Erdman et al 1991).

Australian understanding of the problem was supported by Injury Surveillance Information System (ISIS) data from a sample of up to 50 hospitals around the country. Combined efforts in advocacy and action on scalds prevention by States and Territories in Australia have resulted in an amendment to the Australian Standard for hot water delivery in the home (AS 3500.4), and currently several States are working towards legislation of the recommended delivery temperature of 50°C in bathrooms. Educational strategies targeting households with existing hot water heaters have been directed primarily at consumers, plumbers and electricians.

Data from NSW Health's admitted patient statistics collection have been examined for the six years before and two years following the new Australian Standard and the affiliated campaign. Major changes in data classification relating to observation and short-stay cases have made interpretation of less serious scalds problematic. Despite this problem, data indicate significant changes in the hospital presentations for serious scalds in children under five years of age in New South Wales. For 1988–94, a yearly average of 171 children aged 0–4 years required at least five days in hospital as a result of a scald. This compares with 109 cases during the first year following

## Infrastructure developments in injury prevention and control

the campaign and the adoption of the new standard, and 90 cases in the second year (personal communication, Injury Prevention Policy Unit, New South Wales). The reduction (of nearly 50 per cent within two years) is dramatic and if it is mirrored in all other States and Territories, there will be over 200 young children saved annually from a serious scalding event, which would have resulted in costly treatment and ongoing rehabilitation, permanent scarring and possible permanent disability.

This example demonstrates the scope of the modification of a clearly identifiable hazard through standards, legislation and education.

### Bicycle helmets

The use of bicycle helmets has been shown conclusively to significantly reduce the incidence and severity of head and brain injuries, as well as serious upper facial injuries among cyclists (National Committee for Injury Prevention and Control 1989; NHMRC 1997a).

Bicycle helmet promotions in Australia began in Victoria during the early 1980s. Compulsory helmet wearing laws were introduced in that State in 1990, and subsequently in other States and Territories. Evaluation of the Victorian experience indicated that the all-ages helmet wearing rates increased from 24 per cent in 1988, to a pre-law level of 31 per cent in 1990, to 76 per cent by 1992 (Cameron et al 1994). There was a concomitant reduction in bicycle-related head injuries; the number killed or hospitalised fell by 48 per cent the first year after the law was introduced and by 78 per cent the second year. For other types of injuries, there was a 23 per cent and 28 per cent reduction in the first and second years respectively in part attributable to a reduction in cycling (Henderson 1995).

Helmet wearing laws were introduced in New South Wales in 1991 and data show a strong relationship between an increase in helmet wearing rates and reductions in head injury rates. Two years post legislation, a 29 per cent reduction in head injuries was observed for riders under 16 years, and a 38 per cent reduction was observed for riders 16 years or over (Roads and Traffic Authority 1994).

The available data indicate that increased helmet wearing has a positive effect on the head injury rate. The challenge lies in maintaining, across all States and Territories, high helmet wearing rates and increasing correct wearing practices (well-fitted, properly strapped helmets) among those under 16 years of age (Henderson 1995).

### Protective eyewear for squash and racquetball players

In sports such as squash and racquetball, the risk of severe eye injury is quite high (Coleman et al 1996). The use of protective eyewear in these sports has led to a dramatic reduction in eye injuries, with one Canadian study reporting a 90 per cent reduction of all sport and recreational eye injuries with the introduction of the mandatory use of protective eyewear for squash and racquetball players (Pashby 1992).

In light of this evidence and in line with standards in the United States and Canada, sports governing bodies plan to make the use of eyewear mandatory for all squash and racquetball players in Australia (NHMRC 1997a). Currently, eyewear protection is compulsory for squash players under 19 years of age during competitions. An educational campaign is underway to increase protective eyewear use by squash and racquetball players at all levels of play, with a view to expanding the regulations to these groups within the next few years (Paul Veer, Victorian Squash Federation, personal communication).

Emergency department surveillance systems could be usefully employed to monitor eye injuries associated with those sports in which the policy changes are proposed.

### **Child-resistant cigarette lighters**

From 1 March 1997, the importation of non-child resistant cigarette lighters (which are easily operated by young children and, because of their design, produce a large and long-burning flame) was banned across Australia and their sale was prohibited from 1 July 1997. This initiative was made possible through the collaborative efforts of Commonwealth and State and Territory Departments of Consumer Affairs, and many health, coronial and fire authorities, which provided data and evidence about the problem and the need for uniform regulations.

The exact number of injuries and deaths linked to house fires caused by cigarette lighters is not known. In many cases, the role of lighters may not be reported due to embarrassment or insurance considerations. However, evidence from the available statistics is as follows:

- in 1994 in New South Wales, there were 74 fires involving children playing with cigarette lighters in the home, resulting in \$1.4 million in damage;
- one study of fires in the area from northern Sydney to Newcastle found that, of 158 reported child-related fire incidents, 104 (66 per cent) were due to disposable cigarette lighters (Ministerial Council on Consumer Affairs 1996);
- injuries associated with cigarette lighters tend to be severe (51–66 per cent admission rate among those seeking emergency department care) and young children (under five years) are at greatest risk (Valuri 1994; National Injury Surveillance Unit 1994); and
- coroners from New South Wales and Victoria have identified many deaths (at least 10 in these two States within the last eight years) due to house fires caused by disposable cigarette lighters (Ministerial Council on Consumer Affairs 1996).

It is too early to evaluate the impact of the ban on non child resistant cigarette lighters. Australia has temporarily adopted the United States Consumer Product Safety Commission (US CPSC) product standard pending the development of an Australian standard. The US CPSC does not expect a review of their mandatory standard until 1998, but it was agreed that Australia should not await the results of that review because of the threat to lives. In this instance, decisive action has been taken as a result of established links between a serious injury outcome and a clearly identifiable hazard.

### **Community-based injury prevention programs**

Community-based injury prevention approaches have gained considerable support both within Australia and overseas. The World Health Organisation (WHO) in particular, has increased the profile of such prevention approaches by establishing a program in which communities that satisfy WHO criteria for a safe community receive formal accreditation. Several Australian communities have received or are in the process of receiving such accreditation. The WHO also organises annual international Safe Com conferences and associated travelling seminars in order to facilitate the exchange of information about safe communities.

## Infrastructure developments in injury prevention and control

Until recently, there has been little empirical evidence within Australia of the effectiveness of this strategy, which is an 'all injuries, all ages' approach based on building strategic partnerships to increase the emphasis on safe environments and safe choices at the local level.

Results from an evaluation of Australia's first 'safe community', the LaTrobe Valley Better Health Project, are now available (Day et al 1997). The aim of the project was to reduce the incidence of injury. Consistent with this aim, there was a 27 per cent reduction in injury-related emergency department presentations over the five years following the program. The study was limited by the absence of a comparison community. However, the outcome is comparable to the 28 per cent reduction in injuries reported by the founding safe community project in Falkoping, Sweden (Schelp 1987).

Although there was an overall reduction in injuries, the program did not result in a reduction in all major risk factors. Use of household safety devices, for example, was not reported to have increased over the study period. However, many environmental modifications to public facilities were clearly evident, such as changes in public playgrounds and sporting grounds, roads and pedestrian facilities.

In the LaTrobe study, it was estimated that the program cost (excluding in-kind time and other contributions) was \$272 per injury saved. With its potential savings, this multi-agency approach combining a variety of interventions would appear to be a worthwhile investment. Additional targeted evaluation of specific injury areas would assist in further understanding of the impact of safe community projects.

### Balancing need, evidence and action

Apart from the examples illustrated above, there is a striking imbalance between the relative burden or the level of need for intervention, evidence to choose the intervention, and the amount of action taken.

According to the WHO, research in injury prevention is best directed to those areas where the burden of disease is high (WHO 1996). Where burden (need) is high and evidence poor, a strategy of applied research and evaluation is advisable. Where need is low and evidence is equivocal or lacking, action should be limited. There will also be some issues where need is low to moderate, the evidence for effect is strong and where action can and should be pursued.

Table 3.1 provides examples of issues that illustrate that the amount of action is not necessarily based on need and sound evidence. The examples in the table were chosen following consultation with several expert researchers and practitioners in the field of injury surveillance and prevention, and on the basis of selected literature in the field of injury prevention. The table aims to show examples of different mixes of need, evidence, action and result, rather than a comprehensive analysis. There is a clear need to improve the availability of sound evidence for interventions.

**Table 3.1 Selected injury issues illustrating the different mixes of need, evidence and action**

| Injury  | Need | Evidence | Action | Result |
|---|------|----------|--------|--------|
| Suicide prevention                                | ++++ | + -      | +++    | ??     |
| Bicycle helmets                                   | ++   | ++       | +      | ++     |
| Alcohol-related injuries                          | +++  | ++       | +      | +      |
| Smoke detectors                                   | ++   | ++       | +      | +      |
| Preventing falls in older people                  | ++++ | + -      | ++++   | ??     |
| Child safety counselling, early childhood centres | +    | ??       | +++    | ??     |

*Key:* + Indicates importance of the category  
+ - Indicates equivocal evidence  
?? Indicates that there is little confirmed evidence relating to this category

## Trauma-related data collection focusing on prevention

The *Better Health Outcomes for Australians* report (DHFS 1994) recommended an improvement in the collection of data from trauma treatment centres, especially hospital emergency departments, for the purposes of guiding prevention.

A detailed data collection from sentinel emergency departments began in 1986 but became unsustainable by 1994 with the shift in focus to universal patient management systems in emergency departments. This led the NISU to develop a minimum data set, known as the National Data Set for Injury Surveillance (NDSIS), which could be used within the current data management systems.

NDSIS contains two levels. Level one provides for very basic data and permits broad descriptions of injury patterns presenting to emergency departments in a manner broadly compatible with the major headings in the International Classification of Diseases. Level two allows more detailed coding, although the level of detail is less than in the Injury Surveillance Information System (ISIS) system. Users interested in risk assessment and management, such as the Consumer Affairs Division of the Department of Industry, Science and Tourism, the Building Codes Board, and injury prevention researchers and policy makers more generally, have expressed a need for the higher level of detail. Provision for more detailed coding is being made in drafting the next edition of NDSIS, along with explicit mapping to ICD-10.

The implementation of NDSIS in patient management systems most commonly only uses level one data, and provides only limited text descriptions of the events leading to injury.

## Infrastructure developments in injury prevention and control

**Table 3.2 Current progress in collecting injury prevention-related data from emergency departments in each State/Territory**

| <b>State/Territory</b>       | <b>Status of injury data collection</b>   |
|------------------------------|---|
| New South Wales              | <ul style="list-style-type: none"> <li>• data collected largely through NSW Health Survey</li> <li>• several attempts to systematically collect injury data through emergency departments but with limited success</li> <li>• acceptance that specific resources are needed for successful data collection to occur in emergency departments</li> </ul> |
| Victoria                     | <ul style="list-style-type: none"> <li>• expectation that all hospitals collect data to level 1 of NDSIS</li> <li>• 24 hospitals due to collect level 2 NDSIS data</li> <li>• MUARC currently assessing validity of data</li> </ul>   |
| Queensland                   | <ul style="list-style-type: none"> <li>• four hospitals currently or due to collect injury data to level 2 of NDSIS using HAS software</li> <li>• acceptance that resources are needed to counter concern of emergency department directors about increased staff workload</li> </ul>   |
| Western Australia            | <ul style="list-style-type: none"> <li>• recent discussion about systematic collection of injury data</li> <li>• data currently collected at local level and in a small number of hospitals</li> </ul>  |
| South Australia              | <ul style="list-style-type: none"> <li>• small sentinel collection of injury data, based on one adults' and one childrens' hospital and the use of trauma registry</li> </ul>   |
| Tasmania                     | <ul style="list-style-type: none"> <li>• sporadic collection in three hospitals based on the ISIS collection</li> </ul>   |
| Australian Capital Territory | <ul style="list-style-type: none"> <li>• HAS software used to collect level 1 NDSIS data</li> </ul>   |
| Northern Territory           | <ul style="list-style-type: none"> <li>• casual paediatric collection</li> </ul>  |

*Key:* NDSIS, National Data Set for Injury Surveillance

HAS, HAS Solutions Emergency Department Patient Management System

ISIS, Injury Surveillance Information System

MUARC, Monash University Accident Research Centre

The Australasian College of Emergency Medicine and the Association of Emergency Nurses have indicated broad support for the collection of injury surveillance data suitable for prevention, through the emergency department. They have, however, argued strongly that resources must be provided to cover the costs involved.

In view of the difficulties involved in obtaining high quality data in a pressured clinical setting without additional resources, the Commonwealth Department of Health and Family Services has funded NISU to undertake a feasibility study for a nationally representative emergency department surveillance system. The view has been taken that universal data collection of possibly more than two million injury cases is inefficient, due to high costs and difficulties with quality control. A sample-based system, aimed at collecting high quality data from a relatively limited number of cases, is preferred. This system would provide national estimates of injury, but would not necessarily provide State and Territory specific information. The cost of stratifying the sample by State and Territory and increasing the sample size to obtain reliable estimates at State or Territory level, is likely to be high and would involve a considerable commitment by the States and Territories wishing to obtain separate estimates.

The results of the NISU feasibility study are due in 1998. At that time, the feasibility of different sampling approaches, the likely costs, and the possibilities for improving the level of detail obtained, will be better understood. As well as providing quantitative estimates of the incidence of injury, emergency department data also have the potential to provide the detailed information that is needed for planning injury prevention strategies. Such data provide a broader information base than do hospital admissions data. Current developments in computerisation of emergency department patient management systems will provide a window of opportunity to implement a new sample-based system, including new coding systems that better meet the needs of prevention planners.

Should the NISU feasibility study demonstrate that a national system would be practical and effective, long-term funding for the system might be obtained from all those areas within the health sector (Commonwealth and State) and other sectors that seek high quality data for their own research prevention and evaluation activities. These areas include the Public Health Division (as lead agency), and Mental Health Branch (youth suicide/attempted suicide) in the Commonwealth Department of Health and Family Services, the National Occupational Health and Safety Commission, and consumer affairs agencies.

## 3.2 Trauma care

The *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997), identified 'access of injured patients to optimal trauma care' as an NHPA injury prevention and control indicator (see Appendix 1). However, data are not yet available for this indicator. The review in this chapter therefore primarily focuses on infrastructure developments previously identified in the *Better Health Outcomes for Australians* report (DHSH 1994) and by the National Road Trauma Advisory Council (NRTAC) in the *Report of the Working Party on Trauma Systems* (DHSH 1993) as representing a means for improving trauma care.

These include:

- establishing a trauma management advisory committee in each State and Territory;
- developing a trauma management plan which includes a provision for rural areas;
- improving data collection systems at State and Territory levels;
- evaluating trauma systems;
- developing appropriate staffing policies and practices; and
- providing training opportunities in trauma management and retrieval.

Other strategies relevant to trauma care include communication processes, equipment and facilities, and guidelines and resources (manuals and training videos).

The Australian Council on Healthcare Standards (ACHS) published *Guidelines for Trauma Services* in 1997. The guidelines are based on information contained in the NRTAC report on trauma systems (DHSH 1993), and were developed with support from AHMAC and the Commonwealth Department of Health and Family Services. The guidelines provide practical guidance in the application of ACHS standards and criteria to trauma services, as well as encouraging best practice. Feedback from health professionals has indicated a high level of support for the guidelines.

### State and Territory progress

This section briefly summarises developments in trauma management structures in the States and Territories over the past two to three years. Trauma management systems are typically complex and managed by a number of different disciplines and individuals. No attempt will be made to describe these systems in detail. Rather, discussion is confined to a broad overview of trauma management developments and a selection of recent achievements in each State and Territory.

#### New South Wales

The New South Wales Trauma System Advisory Committee oversees the monitoring program for acute trauma services in New South Wales. In a report on the review of the State monitoring program the Committee recommended the expansion of the formal trauma triage process to regional and rural areas (NSW Health 1996a).

The monitoring program has shown that there have been no significant changes in workload since implementation of the metropolitan trauma plan. The Committee will continue to monitor workload issues of low volume trauma cases, which still call for a certain level of trauma care services. The major staffing issues concern agreement on the volume of trauma cases for each level of trauma care service.

Training opportunities include the Early Management of Severe Trauma (EMST) course conducted by the College of Surgeons, which is taken out to rural areas, and the recently established Emergency Life Support course, conducted by the College for Emergency Medicine, which extends to rural general practitioners.

The New South Wales Health Department has developed management guidelines and transfer guidelines for people with burns injuries (NSW Health 1996b). They have also established health outcome performance indicators (HOPIs) in conjunction with performance agreements and the legal requirement that each Area Health Service be responsible for the health of its population. The indicators are classified in the Health Outcomes Indicator Framework, which was endorsed by the Australian Health Ministers' Advisory Council in 1996.

#### Victoria

A 32 member multidisciplinary Ministerial Taskforce with a separate working party has been established to examine Victoria's trauma and emergency medical services. The Taskforce is to present a State-wide trauma management plan to the Minister for Health by September 1998, with an interim report planned for early 1998. Current areas of focus include the establishment of an integrated trauma system with pre-hospital triage guidelines and the development of indicators to evaluate the quality of trauma management.

Three critical care committees have been established in rural regions and more are being considered. Training opportunities provided for rural areas include the integration of rural general practitioners with other emergency services.

Data collection and research currently include several isolated studies (on unrelated issues), an ongoing review of road trauma fatalities, and the sentinel Victorian Emergency Minimum Dataset (VEMD) and data on waiting times for care in emergency departments. Although the VEMD data collection system examines the circumstances of injury and waiting times for care, it does not include indicators relating to retrieval and trauma management (although this is being considered by the Ministerial Taskforce). The data are part of the hospital accreditation system and facilitate ongoing improvements to the provision of emergency care services.

## **Queensland**

In planning for trauma management in Queensland, trauma is not singled out, but falls within the whole approach to emergency services. Hospital bypass planning is not considered an issue in this State, because of the vast distances involved and the clear delineation of areas captured by health care services (except in South Brisbane where a bypassing triage system has been developed).

Within the last two to three years, equipment and the aero-retrieval system have been significantly upgraded. For this purpose, \$20 million have been made available. Current planning projects that by the year 2003 all rural and remote communities will be covered by emergency retrieval services, in conjunction with the Queensland Ambulance Services and the Royal Flying Doctor Service (RFDS).

The Queensland Emergency Services Advisory Panel has been established and covers all areas of emergency medicine, not just trauma. The Queensland Emergency Services Advisory Committee (QEMSAC) is a high-level committee established by Queensland Health. The development of data collection systems is underway at both organisational and hospital levels and it is anticipated that it will be fully operational by the year 2003. The system will include linkages between relevant State and Territory agencies, ambulatory care, and intensive care units and rehabilitation services.

## **Western Australia**

Western Australia has established a State Trauma Advisory Committee and seven key areas of development including: education (with a special focus on medical, nursing and ambulance officers in rural areas); research; a burns management course; a disaster planning module; critical incidents debriefing; a hospital services database to assist in identifying deficient resources and, for example, how far the services are from an airport; and a trauma registry currently in four teaching hospitals. The Royal Perth Hospital has 8,000 cases documented to date.

The registry is currently being expanded, encompassing more regional centres, to achieve coverage of the whole State. It includes indicators such as injury severity scores, whether counselling or debriefing was provided and other indicators enabling the ongoing review of bypass and retrieval systems. The State strategic plan for trauma provides for a review each year. Most targets have been met.

It has been determined in Western Australia that the NRTAC recommendations relating to designation of major trauma centres and increasing staffing levels in rural hospitals are not relevant to the State's population size and geographical spread. The relatively small number of patients requiring services limits the development of centres of excellence in trauma management in Western Australia as will the planned introduction of a major road trauma prevention initiative.

## **South Australia**

A review of the trauma services of metropolitan Adelaide hospitals was undertaken in 1995, and in 1996, a review of rural trauma services was undertaken in order to make recommendations with respect to State-wide planning for trauma management. As a result of these reviews, the current South Australian Trauma Clinical Advisory Committee (SATCAC) was formed. It has wide representation from different disciplines and is responsible to the South Australian Minister for Human

## **Infrastructure developments in injury prevention and control**

Services. The Committee has overseen the development of an ongoing monitoring system of trauma cases and a better, more effective communication process for the whole State (in terms of suitable retrieval modes, staffing and training).

The trauma registry, administered by the South Australian Health Commission, is coordinated by two senior nursing staff at the central office and four senior clinical nurses based with the three major trauma centres. A list of specific indicators has been developed covering outcomes measures such as confirmed diagnosis, bed days, days in intensive care, complications and comorbidities. Regular reports on overall performance are submitted to SATCAC. At this point there is no further tracking of the patient, for example, to identify the rehabilitation provided or the recovery level. However, the inclusion of these data is seen as a desirable long-term goal.

The State Trauma Plan has recently been revised to improve services in rural and remote areas. New initiatives in this area include a new helipad, in-service training for emergency medicine staff and improved communication systems. The latter provide for more timely communication between rural hospitals and general practitioners, and between rural doctors and metropolitan-based specialists. For example, hands-free telephones permit rural doctors to talk to the specialists while treating the patient. The South Australian ambulance service has accelerated the hiring of paramedics to ensure a higher skill level among those attending and retrieving emergency cases.

### **Tasmania**

A number of initiatives ensure smoother retrieval and treatment of trauma cases throughout the State. These include:

- the provision of the Computer Aided Dispatch Information Service (CADIS) which enables the prompt response of the Tasmanian Ambulance Service to anywhere in the State;
- the use of the National Triage Category by emergency departments in all three major hospitals;
- a 24-hour State-wide Poisons Information Line providing information to doctors and the general public on every known poison and toxin; and
- the development and production of a training video, by the Department of Emergency Medicine in conjunction with rural general practitioners, to assist rural and remote practitioners maintain their knowledge and skills in relation to first-aid injury treatment.

Specialised care is available for specific injuries. For example, there is a Burns Unit at the Royal Hobart Hospital. Where definitive care is not available within Tasmania, agreements have been made with hospitals in other States to ensure the transfer of patients without delay. Such an arrangement is currently in place for the transfer of spinal patients to the Austin Hospital in Melbourne.

## **Australian Capital Territory**

In early 1996, a joint Australian Capital Territory/New South Wales Southern Area Critical Care Committee was established. It is a multidisciplinary team with representation from surgical and non-surgical services, and has developed a transfer protocol for interstate patients. It regularly reviews data on interstate transfers and is developing guidelines for managing critically ill patients. The work of this Committee is complemented by that of the Australian Capital Territory Royal Australian College of Surgeons' Trauma Care Committee which has coordinated trauma care since 1994.

The Canberra Hospital has appointed its first trauma surgeon and will be appointing, in 1998, a NRMA – ACT Safety Trust Professor of Road Trauma and Emergency Medicine. This will be a joint position between The Canberra Hospital and the University of New South Wales.

The development of a trauma registry has commenced under the auspices of the Division of General Surgery at The Canberra Hospital. It will provide an additional source of information on the quality of trauma care as a component of accreditation. The data will be reviewed regularly and used for quality assurance purposes. A telemedicine link is planned and will provide dynamic, interactive regional consultations via teleconferencing, assist with acute trauma care and reduce inappropriate inter-hospital transfers.

## **Northern Territory**

At present, trauma management in the Northern Territory operates on a bi-State level, with major trauma centres at the Royal Darwin Hospital and Alice Springs Hospital being responsible for the top and lower end of the Territory, respectively. Trauma planning and management occurs at a hospital level in these two centres and there is currently no Territory-wide trauma committee or trauma plan. The Royal Darwin Hospital plan follows closely the NRTAC recommendations and the Royal College of Surgeons' Trauma Management Guidelines. The Royal Darwin Hospital has commenced a trauma management database with performance indicators closely aligned with those in place at Liverpool Hospital, New South Wales.

Recent training opportunities in trauma management include the development of an education program for rural and remote health staff. In July 1997, a Rural Health Support Education and Training grant was awarded for this program which runs situation-specific courses for staff in remote area health centres and regional hospitals. To date, three courses for remote area staff have been conducted in each of three regions in the Top End. Courses for Darwin's general practitioners and staff in Katherine and Gove District hospitals will also be undertaken. There is a current proposal that the course be expanded to the Kimberly Region of Western Australia, which refers emergencies to the Royal Darwin Hospital.

Developments in communication to assist in the transfer and management of trauma cases include the installation of satellite telephones. However, further funds are required to enable their installation beyond the Darwin area. Two areas believed to offer the greatest promise for injury control in the Territory are greater use of current communication technologies and an increased focus on injury prevention.

## Infrastructure developments in injury prevention and control

### Overview of trauma management

Table 3.3 provides a summary of key features of developments in trauma management in each State and Territory. On the whole, over the last few years, there has been a considerable improvement in systems for trauma retrieval and management. Almost all States and Territories have introduced special initiatives to address trauma in rural and remote areas. Most States and Territories have a State-wide trauma planning committee and a trauma plan, and a growing number have established databases and clinical indicators to allow for monitoring and evaluation of trauma management services. The move toward greater collaboration between the sectors responsible for retrieval, treatment and data management requires a new level of openness between ambulance services, hospitals and health departments. This is occurring in most States, most notably in those with established interdisciplinary injury management committees or taskforces.

The New South Wales trauma database and its performance indicators appear to lead the way in terms of trauma management data collection systems. The system has been in place in the Sydney metropolitan area for over four years and is used in the evaluation of the trauma plan. For example, it is possible to estimate the reduction of 'avoidable deaths' achieved through more efficient transfer of seriously injured patients to major trauma centres. The trauma plan and database now encompass the entire State. Other States and Territories are at various stages of implementing or developing similar systems (generally at major metropolitan areas or select hospitals).

**Table 3.3 Current progress in trauma management in the States and Territories**

| Activity                                  | NSW | Vic         | Qld         | WA | SA | Tas         | ACT         | NT |
|---|-----|-------------|-------------|----|----|-------------|-------------|----|
| Trauma Management Committee               | ✓   | ✓           | ✓           | ✓  | ✓  | ✓           | ✓           | ✗  |
| State-wide trauma plan                    | ✓   | in progress | ✓           | ✓  | ✓  | ✓           | ✓           | ✗  |
| Plan includes rural areas                 | ✓   | in progress | ✓           | ✓  | ✓  | in progress | ✓           | ✗  |
| Trauma management data collection system  | ✓   | in progress | in progress | ✓  | ✓  | in progress | in progress | ✗  |
| Development/use of performance indicators | ✓   | in progress | ✗           | ✓  | ✓  | ✓           | ✗           | ✗  |

*Key:* ✓ completed  
✗ no progress  
in progress not yet completed but underway

While the databases that exist in South Australia, Western Australia and New South Wales have been based on international systems, they generally have adopted different cut-off points for items such as length of time between injury and retrieval, and length of time between retrieval and receiving definitive care. It is therefore not possible to compare and contrast the effectiveness of different trauma management strategies in different States and Territories. Furthermore, although some States or Territories have goals and plans to include rehabilitation data in their databases (to permit comprehensive tracking of patients and their recovery levels)

such a system has not yet been introduced anywhere in Australia. Identification of these indicators would enable evaluation of retrieval and treatment strategies in terms of longer term outcomes such as rehabilitation costs and quality of life measures. Such data systems exist in other countries (eg the United States), and permit greatly enhanced evaluation of post-injury management approaches and greater collaboration between the trauma management and rehabilitation sectors.

Many States have developed state-of-the-art resources and systems which could be transferred to other jurisdictions. Further collaboration between the States and Territories would assist in the dissemination of effective systems. South Australia, for example, has developed a number of products, including software for the trauma registry database, data dictionaries, and a set of agreed clinical indicators. Queensland is working on indicators relating to extended patient tracking (including rehabilitation services). New South Wales has developed guideline documents on the transfer and management of burns patients and Tasmania has developed a video for enhancing first aid skills for rural and remote health workers. It should be noted that the Australian Advisory Committee for Road Trauma (AACRT) and its sponsoring organisation the Federal Office of Road Safety have also developed a video resource for rural medical practitioners (*Trauma Treatment in Rural and Remote Australia*). Such duplication of effort could be avoided through effective collaboration between the States and Territories.

### **3.3 Rehabilitation**

*Rehabilitation looks at a person with a disability and asks what is possible. It concentrates on what now exists and what could develop in the future.*

(DHS 1994)

Rehabilitation includes a range of treatments, training, counselling and education aimed at optimising the injured person's functioning. It is a complex area where a variety of disciplines and value systems operate and continuous debate will occur about what outcomes are possible and reasonable.

The *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997) identified increased 'access to comprehensive rehabilitation programs' as an injury control and prevention indicator (see Appendix 1). Data are not available for this indicator at present. The section which follows is therefore an informal analysis of the current status of rehabilitation services including:

- service provision, with particular emphasis on the Commonwealth Rehabilitation Service;
- access to services;
- coordination of services; and
- standards and effectiveness of services.

#### **Overview of services**

Currently, rehabilitation in Australia is provided by a mix of public (State and Territory and Commonwealth funded) services and private services. Individual services contributing to rehabilitation are funded by compensation from insurers, Medicare, State and Territory hospital funding and private health insurance. Medicare funding is not available for services provided by allied health professionals.

## Infrastructure developments in injury prevention and control

### Commonwealth Rehabilitation Service

The Commonwealth Rehabilitation Service (CRS), is the major national structure for the delivery of vocational rehabilitation services. CRS is currently within the Commonwealth Department of Health and Family Services however, legislation is currently before Parliament pending corporatisation. Part III of the *Disability Services Act 1986* (Commonwealth) provides the legislative base for the provision of vocational rehabilitation services by the Commonwealth Government. These services are currently provided by the CRS, which assists Australians between the ages of 14 and 65 years, who have a disability attributable to an intellectual, psychiatric, sensory or physical impairment or a combination of these, to gain or keep paid employment and to live independently in the community.

Programs are provided free of charge to people with a disability who receive a pension or benefit, and to other people who cannot afford to pay. The legislation also provides for the Commonwealth to be paid for delivering rehabilitation services. Typically such payments are made under State motor accident and workers' compensation arrangements but costs are also recoverable from clients who receive legal compensation for their injuries.

The CRS has strong links with hospitals, doctors and community health centres to encourage early referral for vocational rehabilitation following injury. Anecdotal information from case studies, and detailed analysis of data from the rehabilitation services offered to Commonwealth employees, shows that early referral to rehabilitation services dramatically reduces the cost of rehabilitation. With Commonwealth employees, the cost of cases referred to rehabilitation services within 14 days of injury was only one-sixth the cost of cases where referral was delayed for one year (Comcare 1996).

In 1996–97, the CRS provided rehabilitation programs to 11,007 people whose disability was attributable to an accident or injury. Of these, 42 per cent had a non-compensable injury and received services free of charge.

**Table 3.4 CRS 1996–97 Program commencements — accidents/injuries**

| Category                       | Number        | Per Cent   |
|--------------------------------|---------------|------------|
| Compensable road and work      | 5,232         | 54         |
| Non-compensable road and work  | 2,458         | 22         |
| Compensable other injuries     | 427           | 4          |
| Non-compensable other injuries | 2,209         | 20         |
| <i>Total</i>                   | <i>11,007</i> | <i>100</i> |

The significant proportion of non-compensable road and work-related cases indicates that the CRS plays a central role in the rehabilitation of such cases, whereas a greater proportion of compensable cases are assisted outside the CRS. There were only 2,209 cases where the injury was non-compensable and occurred from a cause not related to road or work. Hospitalisation data indicate that more cases could be expected to require rehabilitation because of these 'other' causes. It is likely that gaps exist in the rehabilitation coverage of injuries occurring outside the road and work-related sectors even for those of workforce age.

In a financial analysis of the costs and returns of the CRS, ANUTECH estimated in 1993 that the ratio of net return to all levels of government compared to total CRS program costs was 9.6:1 (Commonwealth Rehabilitation Service 1997).

### Other rehabilitation services

The majority of rehabilitation services are provided by a diverse range of State and Territory and private providers and by different mixes of health and disability. Many of these services are offered through medical referrals and are funded under Medicare. Services by allied health professionals are funded through private health insurance or State managed community and primary health care services. There are a variety of workers' compensation schemes in each State and Territory and a large number of organisations are accredited rehabilitation providers under these schemes.

Rehabilitation of very severe trauma, such as spinal injury, is usually closely linked to specialist trauma services and major hospital facilities at a central point. There is no attempt to provide these services in a distributed manner due to the relatively low volume of cases and the level of expertise required. As the severity of the trauma decreases, services are more likely to be distributed and less closely tied to major hospitals. In addition, coordination of various aspects of rehabilitation is less often managed by rehabilitation specialists.

In the absence of a coordinated and clearly identified rehabilitation program for a particular client, a range of services are generally brought into play to provide some degree of rehabilitation. Domiciliary care services, in particular, play an important role in the rehabilitation of elderly people in some areas. Rehabilitation is carried out as part of the function of neurology, geriatric and orthopaedic services. Essentially, it would seem that local resources are matched to available funding to provide a service. The level, comprehensiveness and outcome of such services is likely to be variable.

## Important issues in rehabilitation

### Access to services

Access to comprehensive rehabilitation services remains a significant problem in the area of injury. The level and type of service varies markedly according to the compensation and employment status of the client and between different States or Territories.

As noted above, the CRS offers an integrated needs-based rehabilitation service for its clients but is limited by its Act to a vocational rehabilitation role. Clients outside the target group for the CRS experience a much more variable access to rehabilitation services. They are faced with poor links between treatment and rehabilitation services and are likely not to receive timely or adequate rehabilitation if their injuries are due

## Infrastructure developments in injury prevention and control

to a non-compensable cause. There has been some progress at State and Territory level in providing rehabilitation services for certain groups, such as those with less severe brain injury. However, this progress is far from uniform and has not resulted from an agreed policy framework for rehabilitation services.

Currently, gaps in rehabilitation services are most evident for:

- children;
- the elderly, especially those injured at home or at leisure from causes such as falls;
- non-compensable injuries to those not in the workforce; and
- conditions such as less serious brain injury, where the disability is less obvious and rehabilitation is often best carried out by those specialising in this type of problem regardless of the cause.

Some States and Territories do not provide extensive outpatient rehabilitation services whereas others have developed extensive outpatient programs. Also, the types of rehabilitation available vary markedly from city to country. In the country, staffing positions are often either not available, or remain unfilled due to the shortage of professionals prepared to live in rural areas. In addition, some specialist agencies such as sports medicine clinics tend to be concentrated in high-density population areas, providing a far greater range of services than is available to injured persons in other areas. In an attempt to address some of these gaps, Farmsafe Australia, with funding from the Commonwealth Department of Health and Family Services, is currently undertaking a project aimed at providing improved rehabilitation services to disabled farmers.

### Coordination of services

The need for improved coordination of rehabilitation and related services was raised in 1974 by the Woodhouse Committee which stated:

*The key to rehabilitation is the coordination of planning and effort, but at present coordination simply does not exist. . . Nor is there a definition of the areas of responsibilities between hospitals, rehabilitation centres and voluntary services. In addition . . . substantial numbers of the medical profession are unaware of the rehabilitation facilities that exist.*

(National Rehabilitation and Compensation Scheme Committee of Inquiry 1974)

In 1993, the interim *Review of Professional Indemnity Arrangements in Health Care* (DHS 1993) argued that little had changed. The *Better Health Outcomes for Australians* report (DHS 1994) also cited lack of planning as a major issue. The final report of the Professional Indemnity Review (DHS 1996) also identified these issues.

Lack of coordination of rehabilitation services remains an important problem to be addressed. To ensure cost-effective rehabilitation for people with injuries, rehabilitation services require strong links with primary and secondary health care services. There must also be clearer lines of responsibility for various segments of the rehabilitation continuum, particularly with respect to the provision of appropriate aids and equipment where there are potential 'grey' areas of overlap between State and Territory and Commonwealth responsibilities.

### **Standards and the effectiveness of services**

The *Better Health Outcomes for Australians* (DHS 1994) report recommended that the issue of national standards in rehabilitation be investigated.

Some work on standards has been commenced by the Faculty of Rehabilitation Medicine in conjunction with private insurers. Individual services may also have paid attention to standards and quality assurance. However, there is currently no over-arching benchmark that can be used to define standards of care and levels of outcome across the spectrum of rehabilitation services.

There exists an opportunity for the NHMRC or the Australian Council on Healthcare Standards to investigate the development of guidelines for protocols and quality assurance across the rehabilitation services. In addition to their role in improving care and health outcomes, such national standards, especially outcome standards, would provide a device for assessing the effectiveness of rehabilitation services and the equity of access to quality care, and for identifying realistic target outcomes.

### **Summary**

It is unclear how effective the existing system is in providing for the rehabilitation needs of injured persons. There is currently no means of accurately determining the equity of services across injury types or geographical areas. However, it does appear that access to rehabilitation remains a problem for some groups and that the availability of services and the outcomes achieved vary widely from area to area.

One of the key issues to be addressed is the provision of adequate rehabilitation for those not covered by compensation provisions and for those who are not part of the workforce. Once standards have been developed, the rehabilitation processes can be audited to accurately identify gaps. Given the mix of Commonwealth, State and Territory and private interests, this review process will require significant planning.

## **3.4 Research funding**

### **National Health and Medical Research Council (NHMRC)**

The NHMRC is the principal Government research planning and funding body in the health sector. In line with the NHPAs, the NHMRC has indicated that injury research is a significant area for research by designating it as a Strategic Initiative Area.

The NHMRC definition of injury includes cellular and other biological mechanisms of injury, which may be relevant to the development of medical treatments for injury.

As shown in Table 3.5, NHMRC funding of injury research (based on NHMRC and Research and Development Grants Advisory Committee (RADGAC) funding and also including pro-rata expenditure estimates of relevant research done in NHMRC funded research institutes where appropriate) was \$2.35 million in 1997 (1.6 per cent of NHMRC research expenditure that year).

Other areas of NHMRC funding are also relevant to injury; for example, in 1997 the NHMRC provided \$1.59 million for alcohol research, \$1.86 million for research on depression and suicide, and \$1.28 million for research into osteoporosis.

## Infrastructure developments in injury prevention and control

**Table 3.5 NHMRC funding for research in NHPAs — actual expenditure and percentage of total expenditure**

| Year | Total  | Injury |     | Mental health |      | Cardiovascular |      | Cancer |      | Diabetes |     | Indigenous health |     |
|------|--------|--------|-----|---------------|------|----------------|------|--------|------|----------|-----|-------------------|-----|
|      | \$m    | \$m    | %   | \$m           | %    | \$m            | %    | \$m    | %    | \$m      | %   | \$m               | %   |
| 1994 | 121.24 | 2.10   | 1.7 | 15.19         | 12.5 | 23.34          | 19.3 | 15.50  | 12.8 | 2.97     | 2.4 | N/A               |     |
| 1995 | 131.15 | 2.00   | 1.5 | 17.89         | 13.6 | 24.86          | 19.0 | 13.74  | 10.5 | 3.06     | 2.3 | N/A               |     |
| 1996 | 145.20 | 2.37   | 1.5 | 20.69         | 14.3 | 26.73          | 18.4 | 16.13  | 11.1 | 3.07     | 2.1 | 2.51              | 1.7 |
| 1997 | 150.75 | 2.35   | 1.6 | 22.95         | 15.2 | 29.70          | 19.7 | 17.57  | 11.7 | 3.61     | 2.4 | 2.52              | 1.7 |

*Notes:* 1 These figures are based on NHMRC and RADGAC funding and also include pro-rata expenditure estimates of relevant research done in NHMRC funded research institutes where appropriate.

2 Indigenous people are a designated priority population within the National Health Priority Areas process.

3 Data not available for Indigenous health research funding in 1994 and 1995.

*Source:* NHMRC

The Strategic Research Development Committee (SRDC) of NHMRC is currently examining the level and appropriateness of funding for injury research, and the relative proportions of research funding that need to be targeted at prevention and treatment. SRDC will work closely with the National Injury Prevention Advisory Council (NIPAC) in this examination.

### Other sources of funding

Two other areas, transport and occupational safety, possess substantial injury research infrastructure. The most developed is road safety, where the Federal Office of Road Safety (annual research budget \$2 million) and most State and Territory transport authorities have active research programs. Funding is provided from Commonwealth and State Government resources, with a major role being played by the third party insurers (eg Transport Accident Commission in Victoria). Researchers from this sector meet regularly in the Road Safety Researchers' Forum. In 1993, this forum estimated that the total State and Commonwealth road safety research and development budget in Australia was \$14.4 million (Road Safety Researchers' Forum 1993).

The National Occupational Health and Safety Commission (NOHSC) maintained a comprehensive research program until it was restructured in 1996 with a concomitant reduction in its research budget. Since that time, the Workers' Compensation Insurance bodies in each State and Territory have become the major source of research funding in occupational health and safety. Workers' compensation authorities conduct internal research as well as providing external research funds. The latter were estimated to total approximately \$5 million in 1996–97.

**Table 3.6 Expenditure on research by workers' compensation authorities**

| State/Territory                           | \$ million |
|---|------------|
| New South Wales                           | 2.00       |
| Victoria                                  | 0.80       |
| South Australia Workcover                 | 0.53       |
| South Australia Mining and Quarrying Fund | 0.34       |
| Western Australia                         | 0.80       |
| Tasmania                                  | 0.00       |
| Northern Territory                        | 0.02       |
| Australian Capital Territory              | 0.00       |
| Queensland                                | -          |
| Total                                     | 4.49       |

*Note:* Queensland funds in-house research through the Division of Workplace Health and Safety. The budget for 1996–97 was \$1.8 million but this includes training and standards development not included in the figures above.

*Source:* Heads of Workers' Compensation Authorities 1996

It is clear that most research expenditure occurs in the well-organised and administratively distinct areas of road and occupational safety. Suicide research has recently received a boost as part of the National Youth Suicide Prevention Strategy, with \$1 million being provided in this area. Although other areas of injury account for approximately 40 per cent of death and disability due to injury, research funding for those areas is small.

The recent report of the WHO entitled *Investing in Health Research and Development* has noted that injury research remains poorly developed compared with that into other major epidemics in developing countries (WHO 1996). In particular, the report notes the lack of:

- cooperative research between sectors;
- policy research dealing with the development of efficient infrastructures and the impact of policy decisions on the equity and efficiency of the health system;
- appropriate indicators of the burden of disease that include the disability impact of injury;
- practical research aimed at developing specific preventive strategies; and
- appropriate paradigms for evaluating non-clinical interventions.

This report provides a useful analysis of difficulties associated with injury research in developed countries such as Australia and valuable lessons may be learnt from this WHO review.



# **Chapter 4**

# **Issues in injury prevention and control**

## **4.1 Emerging and topical issues**

A number of emerging issues in injury require collaborative action. These include: the continuing over-representation of young males in injury statistics; patterns of injury and prevention in Indigenous peoples; extent and pattern of injury in rural and remote areas; interpersonal violence; and alcohol misuse.

### **Young males**

The NHMRC report, *Unintentional Injury in Young Males 15–29 Years*, reported patterns of injury similar to those discussed in Chapter 2 (NHMRC 1997a).

There is a paucity of evidence on countermeasures that specifically address injuries in young males, or those that address risk taking and other factors. Most of the evidence for successful interventions is drawn from research into motor vehicle accidents, with significant gaps in the identification of such successes for other important causes of death.

The NHMRC report recommended that there should be:

- increased efforts to develop and evaluate interventions effective in preventing injury to young males;
- implementation and evaluation of prevention strategies for which there is some evidence of effectiveness;
- greater intersectoral cooperation in the development and implementation of injury prevention programs for young males;
- greater interaction between agencies involved in injury prevention and the alcohol and drug field; and
- a more coordinated approach to prevention strategies aimed at unintentional injury, self harm and injury due to interpersonal violence.

The recommendations will be referred to the NIPAC for consideration and advice to the Commonwealth Department of Health and Family Services.

### **Interpersonal violence, self harm and firearms**

The massacre at Port Arthur, and the quick response of governments, focused attention on the issue of firearms safety. Public health workers were active in providing information and assisting the policy development process. The final package of measures demonstrated how the Medicare levy could be used to finance injury prevention strategies. The gun buy-back scheme not only reduced the number of weapons capable of rapid mass killing in the community, but also sent important signals about the place of firearms in Australian society. It is likely that further gains can be made with appropriate health sector involvement.

## Issues in injury prevention and control

In February 1997, the Commonwealth Department of Health and Family Services convened a meeting of public health and other researchers and policy makers to consider ways of maintaining the impetus toward greater firearm safety. NIPAC will consider the recommendations of this meeting and provide advice to the Commonwealth Department of Health and Family Services. Three of the recommendations were that:

- public health strategies on firearms should be developed in the context of violence as a whole;
- it should be recognised that the presence of a firearm in a domestic situation can increase the likelihood of a violent or self harm response, and strategies for reducing exposure to firearms, especially at times of stress, should be developed; and
- local public health and health promotion units should become involved in encouraging compliance and supporting the enforcement of the gun laws, and should participate in community education on health risks associated with gun availability.

While the firearm issue has taken centre stage, the more general issue of interpersonal violence and self harm should not be hidden. A large majority of firearms deaths are self inflicted. Two major programs that affect these issues have been developed. These are the National Campaign against Violence and Crime and the National Youth Suicide Prevention Strategy.

The National Campaign against Violence and Crime has received \$13 million of Commonwealth funds to:

- develop national crime prevention projects on burglary, domestic violence, fear of crime and working with young people to prevent crime and violence;
- evaluate crime and violence prevention programs, research into crime and violence within certain communities and the experience of the more vulnerable;
- conduct community education and public awareness programs to help individuals and organisations create safer communities;
- provide training programs to ensure the skills of crime prevention practitioners; and
- inform Australians of best practice in successful crime prevention strategies.

This initiative has been developed mainly within the Attorney General's Department and although it directly relates to issues in which the health sector has a great interest and has been actively working, health sector involvement is peripheral.

Domestic violence and child abuse and neglect are among the most prevalent forms of interpersonal violence. However, they are often overlooked within the health planning process due to a paucity of data describing the problem and because domestic violence and child abuse are traditionally managed outside the health sector. Typically, reporting of this form of interpersonal violence is confined to deaths. In addition, a significant number of deaths from child abuse, including poisoning and neglect, are not reported as homicide. As a result, only a fraction of the problem is being considered. With a growing body of evidence concerning effective prevention initiatives in child abuse and neglect in particular, this area of injury prevention is emerging as relevant to health sector planning.

The National Youth Suicide Prevention Strategy targets the prevention of suicide among young persons. Commonwealth funding amounting to \$31 million has been allocated to the strategy for the four-year period 1995–96 to 1998–99. The strategy includes:

- the trial and evaluation of improved processes for early identification of persons at risk;
- education of health and educational professionals about suicide and managing persons at risk;
- improvement of adolescent mental health programs and the treatment of depression; and
- the management of access to means of suicide.

Within the NHPAs process, self harm has been categorised as a mental health issue, and violence principally as a legal or criminal issue. If a population view is taken, it can be seen that similar groups are at the highest risk of self harm and violence. The same groups are at highest risk of accidental injury. Intervention strategies for each of these issues are targeting similar populations, but there is little formal coordination at policy and program management level.

### Indigenous peoples

The AIHW and NISU have undertaken analyses of injury deaths and hospitalisation data for Indigenous peoples (Harrison & Moller 1994; Moller 1994; Moller 1996a; Moller 1996b; Anderson et al 1996). These have shown that:

- Indigenous peoples experience a much higher rate of injury (an average of three-fold higher) than other Australians;
- the differentials are greater for interpersonal violence; fire, burns and scalds; falls; and injury of undetermined intent;
- patterns of injury across the lifespan are sufficiently different among Indigenous peoples to warrant the development of specifically targeted interventions; and
- patterns of injury vary significantly for urban, rural and remote dwelling Indigenous peoples.

Work by the Cairns Tropical Public Health Unit and NISU has shown that routinely collected statistics tend to underestimate the size of the injury problem among Indigenous peoples (Gladman et al 1997). This project has involved the development of new methods of injury surveillance that balance quantitative and qualitative approaches. Local communities are now using the resulting data to address specific injury-related issues. The project revealed that:

- alcohol was a major factor in precipitating and maintaining interpersonal violence;
- the community council suffered a major conflict of interest as the manager of the local canteen, the enforcer of licensing provisions, and the provider of community benefits from the canteen profits;
- treatment services for injury were limited and levels of care differed from those available in more populated areas; and
- specific hazards could be identified for each community and were likely to be amenable to interventions acceptable to the local people.

## **Issues in injury prevention and control**

The project has demonstrated that simple and relevant injury surveillance at the local level can stimulate preventive initiatives. Within six months of its completion, the project has led to:

- the commencement of planning for an alcohol management strategy for Cape York;
- a program of injury prevention for remote Indigenous peoples by Queensland Transport;
- a commitment among community leaders to develop further injury prevention strategies; and
- a commitment by health agencies in Queensland and New South Wales to replicate the project and initiate injury prevention strategies in other communities.

The injury experience of Indigenous peoples varies from community to community. It is unlikely, therefore, that generic injury prevention programs will be the most relevant in addressing the high rate of injury among Indigenous Australians.

Prevention needs to be targeted according to the needs of the communities. In order to reduce the inefficiencies of complex negotiations by each community with many different sectors, local initiatives need to be complemented by the development of prevention strategies that are coherent across sectors.

Indigenous Australians perceive health not only as the 'physical wellbeing of the individual', but also as the 'social, emotional and cultural wellbeing of the whole community' (National Aboriginal Health Strategy Working Party 1989). Within the framework of this holistic concept of health, injury prevention involves a diverse range of issues ranging from substance misuse to social depression.

As noted above, recent NISU research has contributed to the development of injury prevention programs. It is anticipated that a number of the activities under the Commonwealth's Indigenous Emotional and Social Wellbeing Action Plan will also contribute to identifying good practice models for intervention.

## **Rural and remote populations**

Clear evidence of higher injury rates in rural and remote areas has emerged over the last five years (Titulaer, Trickett & Bhatia 1997). Injury, cardiovascular disease and mental health were identified as key issues for rural health policy at the Rural Public Health Conference held in Adelaide in October 1997. Recent detailed work by the Australian Agricultural Health Unit, which has examined health differentials according to agricultural production type, has shown that rural and remote injury rates are far from homogenous (Fragar et al 1997). The study has also revealed that some people working in certain industries, and people living outside rural townships, experience particularly high rates of injury. Clearly, appropriate targeting of these groups is required. Rural areas also have higher rates of suicide, and have been targeted for particular attention by the National Youth Suicide Prevention Strategy.

## **Alcohol misuse**

The role of the misuse of alcohol as a contributing factor to the frequency and severity of injury, has now been well documented. Its influence is particularly notable in interpersonal violence, road injury, injury to young males, drowning, sport and leisure injury, and occupational injury.

Separate strategies for dealing with alcohol misuse have been adopted by a number of sectors. The transport sector has conducted effective campaigns based on education and regulation with enforcement using random breath testing. The National Drug Strategy and domestic violence strategies within the health sector, have targeted alcohol misuse, especially binge drinking. Public health initiatives in some regions have focused on responsible serving of alcohol and the modification of licensed premises to reduce the incentive to misuse alcohol.

There is considerable potential for developing cooperative strategies that increase the effectiveness of the efforts of individual sectors. A combined approach across sectors could target, in a coordinated way, the population who misuse alcohol.

## 4.2 Barriers and gaps in injury prevention

### Policy infrastructure

Although a number of important initiatives have been undertaken in the injury prevention and control area since injury was first recognised as a health priority more than 10 years ago, injury prevention has not received the policy recognition or level of resources enjoyed by many other significant public health issues.

The National Health Goals and Targets (now NHPAs) and related Medicare agreements have formed the broad basis for action on injury. Agreements under Section 24 of the *Health Insurance Act 1973* require that States and Territories undertake programs responding to the range of National Health Priorities. However, there is no requirement for performance in each or all of the priority areas. It is therefore not necessary for any State or Territory to focus on injury, if its overall response on national health goals and targets meets the terms of the funding agreement.

In general, policy development is fragmented and the lines of responsibility for injury prevention have not been clearly defined. Opportunities now exist to raise the profile of injury prevention and strengthen capacity, through greater interaction between the Commonwealth and the States and Territories, the Flinders University of South Australia Research Centre for Injury Studies, and the recently established NIPAC (see Chapter 5).

### Intersectoral links

Optimal progress in injury prevention relies on strategic cooperation between health and other sectors. A number of intersectoral links have been established. Examples include the Australian Advisory Committee on Road Trauma, which facilitates interaction between health and road safety agencies at national level, and the Australian Sports Injury Prevention Taskforce. However, mechanisms for intersectoral cooperation are limited and existing links are usually bilateral. There is a need for further major cooperative initiatives that maximise the impact of interventions, and for formal structures that facilitate cooperation between sectors on safety matters.

### Delivery infrastructure

Program implementation is the responsibility of the States and Territories. Some excellent interventions with positive impacts have taken place. National implementation has been possible through cooperation between Commonwealth, State and Territory injury prevention managers. A prime example has been the introduction of compulsory bicycle helmet wearing, led by Victoria. Another is the development of national standards for domestic hot water temperature led by New South Wales and fostered by the Commonwealth Department of Health and Family Services through chief medical officers. There have been significant reductions in injury among children, in road injury and there have been some successful projects targeting falls in the elderly. Injury prevention training courses have been offered at a number of universities and the Australian Injury Prevention Network has recently been formed as a forum for interchange among injury prevention professionals.

However, much of this progress has been achieved through the efforts of committed organisations and individuals rather than as a result of a coordinated plan of action. Overall, the gaps in policy framework, described previously, have limited the systematic implementation of programs.

In addition, progress has been hindered by a shortage of expertise and human resources at all levels. Neither a stable injury prevention workforce nor a viable infrastructure exists to support and train those who choose to work in this field. Many injury prevention professionals leave the field and take their expertise with them. Without well-trained personnel, resources may be wasted on the implementation of poorly planned programs. Lack of knowledge about important injury issues may also affect the capacity of senior management, and policy makers in general, to represent injury in policy priority setting forums.

### Strategic planning

Effective strategies are required for communicating details of successful projects, linking research and surveillance to practice, and building a mechanism for the continual upgrading of policy.

There is a need to strengthen the consideration of injury issues as part of the core strategic process of health departments at Commonwealth and State and Territory levels. The Commonwealth Department of Health and Family Services has been developing a framework to clarify its role and to form a basis of agreements with the States, Territories and other agencies about directions for the future (see Section 5.1). A number of States have also developed strategic plans for injury prevention and control, but few have allocated the resources necessary to bring them to fruition. Two larger States in particular have been able to develop more comprehensive policy approaches: Victoria through implementing its strategic plan, *Taking Injury Prevention Forward*; and New South Wales through a lead agency model for injury prevention endorsed by the New South Wales Government.

### Training opportunities, infrastructure and capacity

Injury prevention infrastructure in Australia lacks critical mass. The paucity of secure jobs within the injury field brings with it, as noted earlier, an absence of specialist injury practitioners, researchers and policy makers. As a result, there are few people in a position to provide training in injury surveillance and control.

Those who possess such skills are generally not provided with the infrastructure necessary to establish training programs. There are currently only two academic courses in Australia in injury surveillance and control (both in Western Australia). New South Wales and Victoria offer short (two to five days) courses and only South Australia has an apprenticeship program in place. These training programs provide models for the expansion of injury training across Australia. Given that many in the injury workforce currently commence their positions with little or no training in injury prevention, there is an urgent need to strengthen the capacity of the injury workforce through accessible, organised training courses and apprenticeships.

### Research

Comparisons between the burden of injury on the Australian community and the amount of funding allocated for injury research suggest that the overall research effort in injury in Australia is not congruent with national need. A substantial difficulty for expansion of the national research effort on injury is a lack of appropriately trained researchers in this field. The complex and varied nature of injury research requires the development and acceptance of a wide range of research methods. More emphasis therefore needs to be given to the development and provision of appropriate training for the injury workforce and to the development of other innovative strategies, such as the encouragement of appropriate networks and research clusters.

Road accident research is maintained through the Federal Office of Road Safety, but funding for external research in occupational health and safety at a national level has been reduced. The history of research funding of injury prevention in Australia has led to a view in some quarters that the provision of adequate road and occupational injury research is sufficient to address the problem of injury. This view fails to recognise the huge burden of injury generated within home and leisure environments and related to manufactured products.

At its August 1997 meeting, the Ministerial Council on Consumer Affairs called for better and more comprehensive data on injuries related to consumer products and resolved to raise the matter with the Australian Health Ministers' Conference.

The current situation has resulted in major gaps in research concerning potential countermeasures and evaluation of countermeasures in practice. This in turn, exacerbated by lack of training and the level of seniority of personnel, has led to a situation where injury prevention is unable to compete for resources alongside other areas where more evidence is available on intervention. This occurs even if there is a lesser need for action in the better-researched area.

### Evidence concerning cost-effectiveness

At this stage, information concerning the relative cost-effectiveness of different injury programs is unavailable. There is scant sound evidence of effective countermeasures to injury problems other than those relating to road trauma and, to a lesser extent, work-related injuries. The strength and quality of evidence in the road safety area reflects the level of research funding made available by governments that have been committed to addressing the transport injury problem. Even so, research comparing cost-benefit ratios for alternative road safety strategies is still at a formative stage. Other injury research lags far behind this.

### Data availability

There are clear links between the availability of injury data and opportunities for priority setting, monitoring of injury problems and the evaluation of interventions. Information systems facilitate best practice and optimal use of resources. However, to date, the need for investment in such systems has been far from universally accepted, even within the health sector.

Although national data collections on injury-related deaths and hospitalisations have become more timely in recent years, considerable delays remain in some areas. National data collections provide information on the external cause code of injury (eg for poisoning, the type of substance and the understanding of the level of intent). However, the level of detail provided does not permit a thorough identification of causes or activity at the time of injury. Nor does it provide specific details about the type of setting in which the injury occurred.

Identification of Indigenous status, although now noted on death registrations in all States (with Queensland introducing this requirement in 1996), is generally not well recorded on hospital and other services data (Moller 1996b).

As noted in Chapter 1, hospital separations data are proving unreliable indicators of injury trends. These collections do not directly measure injury incidence, but rather a mixture of injury incidence and admissions policy. The move to casemix funding for hospital admissions but not for emergency department cases, appears to be associated with a significant increase in the number of admitted injury cases. This has produced an artificial upward trend in injury rates in some jurisdictions. A more detailed discussion of these issues is found in Appendix 2.

At best, present mortality and morbidity reporting systems provide a blunt tool for understanding injury issues. Improvements resulting from the implementation of extended coding for International Classification of Diseases (ICD-9) will be seen in recent data. Further gains are possible through the implementation of the full ICD-10 injury codes. However, there is a need to develop systems for understanding the circumstance leading to injury that are more efficient and effective than those based on the ICD. This may require some reduction of existing high-volume, low-quality systems, in order to support systems of lower volume, broader coverage and higher quality.

Data on the greater proportion of injuries, those not resulting in death or requiring hospital admission, are not collected systematically. Some States (Queensland, South Australia, Tasmania and Victoria) do have a sentinel emergency department injury surveillance system in place in a selection of hospitals. However, these are generally not representative of the rest of the State. Other States are constrained by lack of funding, delays caused by different perspectives of a definitive national minimum data set, and failure to agree upon the agency responsible for data collection.

## **4.3 Interventions available for implementation**

Action in injury prevention is often based solely on the size or perceived importance of the problem, even when there is no empirical evidence upon which to base prevention initiatives. On the other hand, interventions which are known to be effective preventive measures for a specific injury problem are often not implemented. This section provides examples of these two realities so that State, Territory and national funding can be directed to those areas where intervention is likely to be effective. However, as indicated in the previous chapter, it is not possible to comment on the relative cost-effectiveness of different strategies for reducing injury incidence and severity as this information is currently unavailable.

It should be noted that the strategies described here (see Box, p63) do not constitute a definitive or comprehensive list of all effective or promising interventions, and that the list is based on the opinions of experts rather than on a systematic literature review.

### **Known effective strategies requiring greater action**

#### **Smoke detectors**

There is ample evidence from Australia and overseas that smoke detectors save lives. Currently, not all States and Territories have enacted legislation requiring the installation of smoke detectors when building a new home, or carrying out renovations requiring council approval. There is also scope for retro-fitting of smoke detectors at the point of sale of homes.

#### **Sports club/association policies regarding known effective protective gear**

There is strong evidence that personal protective devices can prevent sporting injuries. Effective devices include mouth guards for contact sports, ankle taping and knee braces for a previously injured joint, protective eyewear for all squash and racquetball players, and helmets for horse riding. Rarely are these devices mandatory except for competition or professional levels of play. All relevant sports clubs and associations should be held responsible when injuries are sustained during practice or play in the absence of such protective devices.

#### **Playground equipment safety standard and regulations**

Hazardous play equipment is still present in many playgrounds throughout Australia. One study, conducted by Kidsafe, found that of 240 randomly selected public playgrounds in 10 local government areas of New South Wales, not one playground met all three basic criteria for safety (Withaneachi & Meehan 1997). The three basic criteria for safety relate to the depth of the soft-fall surfacing, the area covered by the soft-fall surfacing, and the height of the play equipment. There is no current playground equipment safety standard in use in Australia and no mechanism for requiring compliance, even if there were such a standard. As the evidence and need are both strong, the action is urgently needed.

## Issues in injury prevention and control

### Speed cameras and red light cameras

Speed cameras and red light cameras were cited in the NHMRC report, *Unintentional Injury in Young Males 15–29 Years* (NHMRC 1997a) as being known effective strategies for reducing injuries due to road crashes. However, not all States have approved the use of these devices to address the problem of road trauma.

### Interlock devices for high-level drink-driving offenders

There is international evidence of the effectiveness of breath-activated interlock devices in preventing repeat or high-level offenders from driving while they are over the legal blood alcohol concentration, at least during the period of their use, and potentially over a longer term. South Australia is planning to trial this technology.

### Mandatory standards for nursery furniture

Although there are voluntary standards on most items of nursery furniture, it is still possible to sell within Australia unsafe nursery items such as high chairs without adequate safety harnesses and prams that can collapse and sever fingers. By contrast, many of the necessary safety features for nursery furniture are mandatory in Europe and the United States. Australia and New Zealand have recently implemented a mandatory standard for cots. This may create a precedent for wider use of mandatory standards for children's goods where there is poor adherence to voluntary standards.

### Legislation of 50°C maximum bathroom delivery temperature for all new hot water heaters

Following the amendment to the Australian Standard AS3500.4, States and Territories are in a position to introduce legislation requiring a 50°C maximum bathroom delivery temperature for water in new and renovated bathrooms. To date, this has only been taken up by Tasmania, South Australia and Western Australia and the new South Australian legislation is under review. Victoria will introduce legislation requiring a 50°C maximum temperature for new bathrooms in the first half of 1998. Queensland is intending to introduce new legislation this year to apply AS3500.4 which requires all new houses and major bathroom renovations to be fitted with temperature control devices. New South Wales is currently considering legislation which will eventually affect all homes (new and established) by introducing a safety standard for all new hot water heaters. Such a safety standard applies in at least 28 of the 50 States of the United States. There is clear evidence of the effectiveness of this strategy and definitive action is called for by the States and Territories.

### Strategies which merit further evaluation

#### Accords with licensed premises

Alcohol is a significant risk factor for injuries, particularly those involving road trauma and domestic violence and other forms of interpersonal violence. Several small-scale programs have been trialed in remote areas of Australia. These programs involve accords between licensed premises, the police and health authorities to address alcohol problems in remote communities. Although these accords appear to have resulted in some gains, an appropriate evaluation would require a larger population base. The potential for this approach to reduce alcohol-related injuries in remote areas of Australia needs to be thoroughly assessed.

### **Responsible serving of alcohol programs**

Related to the previous strategy, responsible serving of alcohol programs generally involve training programs for the serving staff of licensed premises. There is some evidence of the effectiveness of such programs in reducing intoxication, violence and street offences. This is especially true when they are used in conjunction with value reorientation of managers of licensed premises and with effective policing at community level (Homel, Hauritz & Wortley 1997). To date, there is no evidence concerning the effect of responsible serving programs on total injury rates. However, given the large and well-documented contribution of alcohol to injury, the approach appears to offer promise.

### **Risk management of baby walkers**

The benefits of walkers in helping infants to learn to walk are negligible and the risk of injury is great. It has been determined that the products are not of an unsafe design. However, when used by those for whom they are intended, generally children less than one year old, they greatly increase a child's risk of injury from falling down stairs and reaching hot objects on benches and tables. Paediatricians, physiotherapists and injury prevention workers have long called for a ban on this product. The United States has recently released a new standard for baby walkers. The relative merits of enforcing the United States standard in Australia or banning the sale of baby walkers needs to be assessed.

### **Falls prevention in older people**

Certain types of medication are established risk factors for falls in older people and the impact of this problem on individual lives and on the health system is enormous. Although the improved management of medications offers considerable promise as a means of reducing falls in older people (Kempton in press), its contribution to decreasing the number and severity of falls has yet to be determined. Work in this area is complex because even if one risk factor is removed, there may be other factors that maintain the incidence of falls and mask the effectiveness of a single strategy. Randomised controlled trials have pointed to gentle exercise and hip protectors as effective strategies, but evidence for the benefits of modification of high-risk areas in the home has been mixed. There is a need to implement known effective strategies, targeting all relevant risk factors for each individual and measuring their impact through pilot intervention programs.

The risk of incurring an injury due to a fall increases for older people with increasing age and fragility. Not surprisingly, the group at highest risk includes those within nursing homes. Some local area health services in some States have introduced performance agreements between the health department and nursing homes. In the Australian Capital Territory, nursing homes are participating in the development of a strategy to reduce falls in the elderly in nursing homes. These agreements serve to increase the capacity and commitment of nursing homes to reduce the risk of falls by their residents. To date, these strategies have been accompanied by anecdotal evidence of improvement, but appropriate evaluation is warranted.

### Daytime headlights on motorcycles

Although motorcycles represent only a small proportion of the total number of vehicles on the road, for the population aged 15–29 years, the death rate for motorcycle riders is nearly half that for all motor vehicle users. Moreover, the hospitalisation rate for motorcycle drivers aged 15–29 years is nearly double that for the motor vehicle drivers of the same age range (NHMRC 1997a). Estimates of the impact of daytime headlights have varied with studies reporting effects ranging from none to a three-fold reduction in the risk of an accident (NHMRC 1997a). While the 1992 Australian Design Rules requires hard-wired running lights in all new motorcycles, mandatory use of daytime headlights varies between States and Territories (Haworth et al 1994). Further commitment to this initiative and its evaluation is required.

### Occupational safety programs targeting new/apprentice workers

The report *Unintentional Injury in Young Males 15–29 Years* noted that inexperience, youth and exposure to new hazards combine to elevate the injury rate of new or apprentice workers (NHMRC 1997a). International studies have shown that formal and comprehensive introductory programs for new staff that ensure graduated exposure to hazardous procedures and hazardous machinery can be effective in reducing the rate of injuries. Evaluation of such an approach has not been reported in Australia but such an assessment would be appropriate as there is scant evidence of successful strategies targeting the occupational safety of young people.

### Hot beverage scalds reduction

Approximately half of emergency department visits, and one-third of hospital admissions due to scalds in young children are associated with hot beverages. The MUARC and some State health departments have investigated the feasibility of introducing a mug designed to reduce the risk of hot drinks spilling over a young child. Similar mugs are in widespread use, particularly in cars, in the United States. Although prototype mugs have been designed, the cost to manufacturers in ‘tooling up’ for the production of such a mug in Australia has prevented the testing of this strategy. A recent study of trends in burns in young children in Melbourne over the past 20 years, indicated that scalds due to hot beverages are the only types of burns in young children that are not declining (Streeton & Nolan 1997). Investment in identifying the potential of this strategy is overdue.

### Limiting availability of methods of suicide and self harm

Past experience has shown that limiting the availability of guns and barbiturates, and detoxifying of natural gas, have led to reductions in suicide mortality by these means. Monitoring the impact of guns legislation, acting to implement the recommendation on medication in the NHMRC’s clinical practice guidelines, *Depression in Young People* (NHMRC 1997b), and supporting other activities to reduce the availability, lethality and cultural acceptability of common means of suicide holds promise to reduce suicide rates. Some activity in this area has commenced under the National Youth Suicide Prevention Strategy, but further action could be undertaken in conjunction with other injury prevention approaches.

## Interventions available for implementation

### Known effective strategies

- smoke detectors
- sports policies regarding known effective protective gear
- playground equipment safety standard and regulations
- speed/red light cameras
- interlock devices for high-level drink-driving offenders
- mandatory standards for nursery furniture
- legislation of 50°C maximum bathroom delivery temperature for all new hot water heaters

### Promising strategies requiring evaluation

- accords with licensed premises
- responsible serving of alcohol programs
- risk management of baby walkers
- falls prevention in older people (eg medication management, gentle exercise, hip protectors, nursing home performance agreements)
- falls prevention agreements for nursing homes
- daytime headlights on motorcycles
- occupational safety programs targeting new/apprentice workers
- hot beverage scalds reduction
- limiting availability of methods of suicide and self harm

*Note:* This list contains examples of effective or promising intervention strategies. It is not a comprehensive or definitive list and is based on the opinion of experts rather than on a systematic literature review.



# **Chapter 5**

# **Opportunities and future directions**

There is increasing recognition of the opportunities within levels of government to improve the implementation of injury prevention and control initiatives. Some of these opportunities involve program and infrastructure developments. Others are in the form of positive or negative incentives, or are levers that utilise existing infrastructures to improve the uptake and efficiency of injury control strategies. Positive incentives take the form of program or project funding or cost sharing, while negative incentives take the form of sanctions such as discounting of funding or stricter specification of actions required. In addition, barriers created by organisational fragmentation can be addressed. These opportunities and levers are briefly outlined below. Further work is required to develop these ideas into an appropriate form for implementation.

## **5.1 Program and infrastructure development**

### **Prevention**

#### **National Injury Prevention Advisory Council**

The Commonwealth Department of Health and Family Services has established the National Injury Prevention Advisory Council (NIPAC) to provide high-level, independent advice to the Department, the National Health Priority Committee (NHPC) and the National Public Health Partnership Group on strategic directions for injury prevention.

The membership comprises injury prevention managers from State and Territory health departments, as well as practitioners and researchers from a variety of fields and sectors with an interest in injury prevention. This composition ensures that links are maintained between the Commonwealth and the States and Territories, and acknowledges the significant role the latter play in injury prevention. It also strengthens the partnerships that have developed across the different sectors in the injury prevention constituency.

#### **National Injury Prevention Strategy**

The Commonwealth Department of Health and Family Services has developed a framework to clarify its role in the implementation of injury prevention strategies in Australia. The framework will form the basis for a national injury prevention strategy to be developed by the Department and NIPAC in collaboration with other key stakeholders. The strategy will address the fragmentation noted earlier in this report and provide a basis for ensuring that injury issues are considered within broader national initiatives such as the National Public Health Partnership (NPHP) and the NHPAs.

## Opportunities and future directions

The broad directions for the strategy as agreed in consultation with State and Territory injury prevention managers are set out below.

*Affirm health agencies at Commonwealth and State and Territory levels as the leaders, catalysts and advocates for injury prevention by:*

- maintaining an overview of injury at a national level and, in collaboration with other sectors, identify national priorities for action;
- facilitating action nationally in areas of identified need; and
- promoting the incorporation of injury prevention strategies into public policy in health and other sectors.

*Enhance and maintain a viable injury prevention infrastructure in Australia by:*

- developing and maintaining a well-trained injury prevention workforce in health and other sectors;
- ensuring timely national and international exchange of information on injury prevention; and
- committing adequate resources at Commonwealth and State and Territory levels to undertake the work identified in the implementation framework.

*Develop a basis of sound evidence for setting priorities and choosing injury prevention and treatment strategies by:*

- supporting the development and maintenance of specific injury surveillance and reporting systems that will provide relevant information on the causes and outcomes of injury;
- supporting the research necessary to provide the evidence of the effectiveness and efficiency of widespread intervention strategies; and
- ensuring that interventions implemented on a broad scale are based on sound evidence.

### Training

Training plays a vital role in ensuring that there is an informed response to important issues, and that the resources allocated to injury prevention are used effectively. In the absence of a critical mass of well-trained injury prevention policy makers, researchers and practitioners, stimuli to promote injury control have limited effect. Injury control requires specialist knowledge and the development and delivery of properly planned programs rely on well-trained personnel.

Two types of levers are required to increase the effectiveness of training. The first is the development of a sound, locally applicable research base to serve as a foundation for training. Existing funding approaches have not resulted in the necessary foundation of high-level injury research in Australia. This lack of injury research material and expertise within the academic community has a direct, limiting effect on the implementation of injury control programs and significantly reduces the quality of training available. The development of a solid base of research and expertise within at least two universities is likely to prove the most cost-effective way of quickly addressing this issue.

## Program and infrastructure development

The second training related lever is the specific inclusion of injury prevention coursework in the curricula of health management, policy, promotion and public health courses. This would require the appointment of suitably skilled and experienced injury prevention and control experts to the academic staff of public health courses. This issue is discussed in Section 4.2.

The NPHP forms the framework for development of training in these areas. The relevant committees of NPHP should include representatives from the injury prevention field. This will ensure the inclusion of:

- core material about injury prevention in the training of public health professionals;
- elective components that clearly identify the specific skills and knowledge areas (eg extension of disease epidemiology) for injury control work and arrangements for teaching them; and
- opportunities for students to undertake research-based thesis work on injury surveillance and prevention topics.

### **Information systems for priority setting, monitoring and evaluation**

The implementation of appropriate surveillance systems and the refinement of injury indicators provide clear opportunities for significantly improving understanding of injuries and the interventions which are most effective in preventing them.

Potentially useful actions include:

- accelerating the introduction of uniform emergency department surveillance that presents a realistic approach to manageable data collection within the hospital setting and has the flexibility to address particular areas of interest such as domestic violence;
- establishing a National Coroners Information System (NCIS) to provide much needed information about the specific cause of deaths due to injuries, and information concerning the activity, setting and other situational factors relating to the injury event and subsequent death. There has been difficulty in coordinating funding from potential users. Negotiations are underway between all interested parties to establish the NCIS as soon as possible;
- establishing national sports injury data collections and reporting systems. Sports, which are responsible for very large numbers of injuries, are treated by a variety of practitioners and there is no coherent national approach to sports surveillance. However, a great deal of work has been done on defining the need for, and ways of proceeding with, systems. Coordination of evolving systems and incentives for maintaining comparable information with adequate attention to exposure measures is needed;
- establishing registers of injuries. As is accepted practice with certain infectious diseases and child abuse, there is a limited number of types of injuries, generally rare but serious conditions, with identified prevention opportunities, for which national registers should be established. Such a register has recently been developed for spinal cord injuries, and could be developed for severe burns and brain injuries which are treated at a limited number of sites;
- agreeing on national definitions for child abuse and neglect data collections;

## Opportunities and future directions

- developing indicators that more accurately reflect the burden of injuries and their comparative importance. The burden of injuries is reflected not only by the number of lives affected but also in numerous other ways, including time off work, direct treatment costs and costs associated with living with a disability. In addition, exposure data (such as kilometres travelled, person hours at a machine, or similar) are required to accurately assess whether incidence of injury is associated with high use or low use. Indicators assist priority setting and intervention evaluation. It is important that indicators provide comparable data on the burden of different injuries and the benefits of certain interventions. Injury risk factors and exposure data need to be obtained in a nationally consistent manner so that data can be pooled and the power of analyses improved, and comparable data are available for different States, Territories and regions; and
- developing, as a matter of some urgency, standardised implementation indicators that allow the comparison of an intervention in different settings. In practice, monitoring the impact of an intervention often involves measuring interim indicators (which are believed to lie on the causal pathway to injury outcome) such as changes in policies, products, practices and environments. In addressing the need for better evidence of what works in preventing injuries, it is essential that standardised implementation indicators are developed and adopted nationally where possible. How do we know we are having an impact on the risk factors for falls in older people? Is one strategy more effective than another? Is the impact of a program implemented in one region duplicable in another? Such questions can best be answered if there are accepted implementation indicators for different causes of injuries.

### Target groups and areas

A number of recent developments are shifting the focus of injury prevention research and practice. These developments include the NHMRC report on *Unintentional Injury in Young Males 15–29 Years* (NHMRC 1997a), improved data on injuries in Indigenous Australians, the availability of data concerning injuries in rural and remote areas, the recent national gun buy-back scheme, and emerging evidence of effective strategies in child abuse prevention. By devoting more attention to these largely neglected injury problems, a new balance is being achieved between targeting specific injury problems and adopting a population focus. There are clear gains to be made by the health sector developing national intersectoral strategies targeting young males, Indigenous peoples, interpersonal violence including domestic violence and child abuse, rural and remote areas, and alcohol misuse.

### Effective interventions

As discussed in the previous chapter, there are a number of effective and promising prevention intervention strategies which, if implemented, offer the opportunity for reducing injury rates.

## Trauma care

### Intersectoral committees and plans

A review of the present trauma management systems suggests that those States and Territories with State/Territory-wide trauma committees and trauma plans are best placed for effective collaboration between sectors responsible for retrieval, treatment and data management. These committees are also well placed to identify the opportunities for reducing avoidable deaths due to delays in receiving definitive trauma care. All States and Territories could benefit from such intersectoral committees and plans.

### Information sharing

There is also scope for improving information sharing between States and Territories about innovations and evaluation findings with respect to trauma management and data collection systems.

### Uniform clinical indicators

There would be value in exploring the use of uniform clinical indicators and the extension of data systems to include treatment outcomes and rehabilitation indicators.

## Rehabilitation

### Expansion of Commonwealth services

There is scope for the expansion of rehabilitation services provided by the Commonwealth to cover on a needs basis all ages and all causes of injury rather than to focus solely on vocational rehabilitation.

### Standards

Further improvements could be realised through the implementation of a standards, protocols and quality assurance mechanism for rehabilitation services in Australia.

## 5.2 Funding levers

States, Territories and the Commonwealth can use funding levers to influence progress in the implementation of injury initiatives in four ways as follows:

- by funding injury prevention programs. There is a need to clarify initiatives that address both national and State/Territory priorities, and allocate funds accordingly;
- by including performance indicators and incentives in funding arrangements; for example, purchase agreements with service providers could specify performance indicators which are linked to improved safety;

## Opportunities and future directions

- by ensuring that mainstream funding arrangements do not create perverse incentives that result in imbalances in support for injury prevention, treatment and rehabilitation. For example, it is necessary to ensure that funding for prevention is available to reduce the load on treatment facilities and for the total needs of those injured to be met by coordinated care across the spectrum of trauma care, inpatient treatment and rehabilitation; and
- by targeting research funding at injury. Such funds could address evidence-based treatment and rehabilitation, influences in injury-causing behaviour, and technical and allocative efficiency in rehabilitation and treatment services.

Given the level of unmet demand for treatment and rehabilitation, it is unlikely that savings in these areas can be easily identified which could be applied in injury prevention initiatives. In the same way, it is unlikely that investment in injury prevention would, in the short term, result in reductions in demand for injury treatment and rehabilitation services. Governments need to give injury prevention high priority as an investment in future health gain for the nation.

### 5.3 Legal levers

Although regulation may be an unpopular mechanism for addressing health issues, some of the most effective interventions have been based on legislation. The outstanding example is road safety where seat belt wearing regulation, speed limits, blood alcohol level control and enforcement, and compulsory bicycle helmet wearing have all been shown to lead to large reductions in injury rates. The most recent example of a regulatory approach to injury control has been the introduction of uniform gun legislation in Australia and the gun buy-back scheme. The effectiveness of this strategy in reducing injury will not be known for several years, but there is clear evidence that it has reduced the number of some types of guns in the community.

#### Laws regarding reporting of injury

Injury surveillance is vital to setting priorities and developing intervention strategies. At present, it relies on by-product data containing poor levels of information. The timeliness and specificity of available information is inadequate. There are no formal incentives for clinical services to provide the type of information useful for prevention and these services are reluctant to divert resources to surveillance.

Public health has a long history of mandatory reporting of certain communicable diseases. This approach has not been applied to injury. The recent report on public health law by Bidmeade and Reynolds (1997) argues that widespread mandatory reporting of injury should not be attempted and that cooperative strategies are preferable. It does, however, point out that should there be difficulty in obtaining sufficient information for effective prevention, legislation requiring certain injuries to be reported could be considered. Mandatory reporting of injury could occur at two levels. Firstly, reporting of specific types of injury could be required (for example, near drowning in domestic swimming pools). Secondly, emergency departments and possibly general practitioners, could be required to contribute to a sample-based injury surveillance system on a rolling basis.

### Alcohol licensing

Alcohol is a significant contributing factor to a wide range of injury events, including motor vehicle crashes, drowning, occupational injury, and violence. Legal controls on the serving of alcohol can be linked with health education regarding appropriate serving practices and venue design to reduce excess consumption of alcohol. This not only has a positive impact on injury but also on the disease consequences of alcohol.

In remote areas, including Indigenous communities, difficulties may arise when alcohol licensing is administered by the community council that holds the licence, particularly given that alcohol sales often constitute the principal source of income for the community. Legislation that works well in some areas may have fatal flaws in others. The review of public health-related legislation could consider appropriate model legislation to overcome these difficulties and to make this available to the State and Territory governments that cover remote areas.

Legislative strategies for reducing the contribution of alcohol to injury should not only be considered in remote and Indigenous communities. Alcohol appears to be a growing contributor to violence in urban areas and strategies that work across the board are likely to prove valuable.

### Mandatory safety standards

Mandatory safety standards are commonplace in the work environment and in the context of road safety. The *Trade Practices Act 1974* provides powers to require mandatory standards for consumer products and services. The *Therapeutic Goods Act 1989* provides similar powers with respect to medications and other therapeutic substances.

Comparatively limited use has been made of the powers under the Trade Practices Act. A recent review of mandatory standards by the Commonwealth Minister of Small Business and Consumer Affairs has identified a number of areas where voluntary codes have not been effective and where business would benefit from clear enforceable guidelines on required safety standards. Mandatory standards have been approved for cots and child-resistant cigarette lighters. These standards define clear performance benchmarks and will help protect business against liability claims and increase opportunities in the European and United States export markets.

If the appropriate mix of mandatory and voluntary standards is to be achieved in Australia, there will be a need for improved surveillance, technical capabilities, and research to identify hazards and develop appropriate design solutions.

Increased use of mandatory standards based on sound evidence, would benefit the health of Australians and improve the competitiveness of Australian business.

## 5.4 Insurance arrangements

There are several types of insurance cover for injury of which motor vehicle and work cover are the most prominent. The latter are compulsory and are typically managed by a single State entity. Coverage in other areas (eg sports, professional indemnity, public liability, product liability and personal disability) is not comprehensive and is provided by a wide range of general insurance companies.

## Opportunities and future directions

In the case of the latter category of insurance, there are few incentives for a particular company to contribute to prevention activities. Premiums can be adjusted to maintain profit margins and any lowering of the overall risk of injury as a result of outlays on prevention activities benefits competitors. Some insurers have developed risk management programs for their own clients or have used specific interventions to differentially lower the risk of their clients compared with those of other companies.

Companies with a large market share or a monopoly are more likely to support preventive programs. Two examples in Australia of insurers that have become strongly involved in preventive or risk management strategies are the Transport Accident Commission of Victoria and the Local Government Liability Scheme in South Australia. These insurers are characterised by a monopoly or concentrated market share, and operate in areas where there is significant government pressure to limit premiums and where coverage is either compulsory or almost universal.

Workers' compensation insurers have also developed risk management programs. There has been a particular focus on small business. For these businesses, claims history is an unreliable indicator of risk due to the small number of employees and the Poisson distribution of injury claims. Some workers' compensation insurers have therefore decided to set premiums according to a risk assessment and have provided discounts for businesses that comply with standards of risk control.

The interim *Review of Professional Indemnity Arrangements for Health Professionals* (DHS 1993) noted that despite the possibility of catastrophic claims, 'another noteworthy aspect of the current insurance arrangements in the public sector is the absence of comprehensive case and risk management strategies'.

In relation to adverse events and medical misadventure, the Commonwealth is supporting a range of national collaborative activity aimed at improving the safety and quality of health care services. These collaborations are focusing on key issues addressed in *The Final Report of the Taskforce on Quality in Australian Health Care* (AHMAC 1996) covering: information technology; implementation of guidelines and protocols; performance information; a focus on consumers; accreditation issues; and improved health service management. One of the aims is to reduce the risk and incidence of injury for patients within the acute health care sector and associated sectors through, for example, better admission and discharge planning.

## 5.5 Intersectoral policy arrangements

There are important opportunities for improving the development and implementation of specific injury strategies by establishing effective links between sectors. Ideally, such links require agreements at the highest policy levels, strategies for ensuring that interventions are implemented efficiently, and partnerships between all the relevant sectors. For example, the NHMRC report *Unintentional Injury in Young Males 15–29 Years* (NHMRC 1997a), emphasised that a number of sectors face the problem of reducing injury in this high-risk group. It is likely that a coordinated approach by the relevant sectors would be more effective and cost efficient than separate, fragmented strategies. Thus, the health, transport, sport, workplace, and education sectors could develop complementary strategies for prevention of injury among young males. The recently established NIPAC is well placed to identify those areas requiring intersectoral action.

There is also potential for enhanced injury prevention through greater involvement of non-government health sector groups in planning and implementing injury strategies. Such groups include various specialist medical colleges and the Australian Injury Prevention Network.

### 5.6 The way forward

There are numerous untapped opportunities for advancing injury prevention and control programs and research. These include improving training, increasing the critical mass of managers with advanced knowledge of injury prevention strategies, advancing injury data collection systems, introducing processes that ensure that research, policy and implementation are properly linked, and using available structures as levers for change. The road safety area provides a clear example of the gains that can be made and sustained through research, resources, and dissemination of information on best practice, many of which have been made possible through funding, legal and insurance levers.

Although much of the action in injury prevention is appropriately undertaken at local and State and Territory levels, clear gains can be made by establishing a mechanism for intersectoral cooperation on a range of national injury prevention initiatives. Such mechanisms would require support from the highest levels of government at Commonwealth, State and Territory levels and should target specific interventions and focus on high-risk populations.

The newly formed NIPAC is well placed to assist in improving intersectoral mechanisms and policy development, and to provide expert advice on the array of levers for change available to the injury prevention area. The Commonwealth Department of Health and Family Services will develop a National Injury Prevention Strategy in cooperation with NIPAC, and seek the resources and cooperation of States and Territories and other sectors to ensure effective and efficient attention to priority issues.

In keeping with international developments, there is considerable potential for establishing a series of standard indicators to reflect the burden of different types of injuries and to provide interim outcomes of the impact of major intervention programs. Such indicators would control for spurious fluctuations generated by shifts in treatment and service policies, and ensure comparability between States, Territories and regions.

There is a clear need for additional research in the area of injury prevention and control. NIPAC will provide a valuable source of advice for determining research priorities. The Strategic Research Development Committee of the NHMRC provides a mechanism for developing a strategic approach to funding identified injury surveillance and control priorities. This report provides some criteria and strategies which should assist in formulating a manageable list of priorities for research.



## **Appendix 1**

# **NHPA indicators for injury prevention and control**

## **Trend information for selected NHPA injury prevention and control indicators**

This Appendix provides indicator-based information on injury prevention and control in Australia. Only those indicators for which adequate data were available in 1997 have been included in the report (see Table A1.1).

In interpreting the data in this Appendix, it should be noted that hospitalisation rates as presented do not necessarily reflect a change in the incidence of injury alone but may also reflect changes in the admissions practice of hospitals, for example, subsequent to the introduction of casemix funding.

Information on mortality indicators has been updated to 1996 but the estimates of death rates for 1996 are preliminary and should be interpreted cautiously. The unit record file for deaths registered in 1996 only became available in late November 1997. Rigorous data checks are required before estimates based on this information can be objectively interpreted. For this reason, the textual information for mortality indicators is largely based on 1995 deaths registration data.

Information on injury hospitalisation indicators is in need of some revision. Technical matters in respect of this issue are detailed in Appendix 2. Although hospital separation time series for the period 1992–93 through to 1995–96 have been included in the report for the sake of completeness, no trend lines were fitted in view of these technical difficulties.

Information on two additional indicators, not covered in the *First Report on National Health Priority Areas 1996* (AIHW & DHFS 1997), has been provided in the report. These indicators relate to mortality patterns in rural and remote areas of Australia (indicator 2.4) and spinal cord injury (indicator 14). Information on several other injury-related indicators, required for biennial reporting, is under development and is expected to become available for 1999 reporting.

Baselines and targets for several of the indicators are in need of revision. Indicator-specific issues have been identified in the body of the Appendix.

## Appendix 1

**Table A1.1 Current NHPA injury indicators**

| Number | Priority injury indicator   | First NHPA report | This report |
|--------|---|-------------------|-------------|
| 1.1    | Death rate for injury and poisoning in the total population   | ✓                 | ✓           |
| 1.2    | Hospital separation rate for injury and poisoning in the total population   | ✓                 | ✓           |
| 2.1    | Death rate ratio comparing the injury status of Indigenous and non-Indigenous populations   | ✓                 | ✓           |
| 2.2    | Death rate ratio comparing the injury status of males and females   | ✓                 | ✓           |
| 2.3    | Death rate ratio comparing the injury status among males aged 25–45 years from low socio-economic groups with males from high socio-economic groups               | ✗                 | ✗           |
| 2.4    | Death rate ratio comparing the injury status among people living in rural and remote areas and the general population   | ✗                 | ✓           |
| 2.5    | Hospital separation rate ratio comparing the injury status among Indigenous and non-Indigenous populations  | ✗                 | ✗           |
| 2.6    | Hospital separation rate ratio comparing the injury status among males aged 25–54 years from low socio-economic groups with males from high socio-economic groups | ✗                 | ✗           |
| 3.1    | Death rate for road transport-related injury in the total population  | ✓                 | ✓           |
| 3.2    | Death rate for road transport-related injury among males aged 15–24 years   | ✓                 | ✓           |
| 3.3    | Hospital separation rate for road transport-related injury in the total population  | ✓                 | ✓           |
| 3.4    | Hospital separation rate for road transport-related injury among males aged 15–24 years   | ✓                 | ✓           |
| 4      | Work-related injury   | ✗                 | ✗           |
| 5.1    | Death rate for falls among people aged 65 years and over  | ✓                 | ✓           |
| 5.2    | Hospital separation rate for falls among people aged 65 years and over  | ✓                 | ✓           |
| 5.5    | Hospital separation rate for falls among children aged 0–4 and 5–9 years  | ✓                 | ✓           |
| 6.1    | Hospital separation rate for sport and recreation-related injuries  | ✗                 | ✗           |
| 6.2    | Non-hospital admitted sport and recreation-related injuries   | ✗                 | ✗           |

**Table A1.1 Continued**

## NHPA indicators for injury prevention and control

**Table A1.1 Current NHPA injury indicators (continued)**

| Number | Priority injury indicator   | First NHPA report | This report |
|--------|---|-------------------|-------------|
| 7.1    | Death rate for homicide among people aged 20–39 years   | ✓                 | ✓           |
| 7.2    | Death rate for homicide among children aged 0–9 years   | ✓                 | ✓           |
| 8.2    | Emergency department attendances resulting from product-related injury  | ✗                 | ✗           |
| 9.1    | Death rate for injury resulting from fire, burns and scalds among people aged 55 years and over                                     | ✓                 | ✓           |
| 9.2    | Hospital separation rate for injury resulting from fire, burns and scalds among children aged 0–4 years                             | ✓                 | ✓           |
| 9.3    | The proportion of houses equipped with smoke detectors and earth leakage breakers   | ✗                 | ✗           |
| 10.1   | Hospital separation rate due to poisoning among children aged 0–4 years   | ✓                 | ✓           |
| 11.1   | Death rate for drowning in the total population and among children aged 0–4 years   | ✓                 | ✓           |
| 11.2   | Hospital separation rate for near drowning among children aged 0–4 years  | ✓                 | ✓           |
| 11.3   | Number of States and Territories requiring separation of domestic pools from houses   | ✗                 | ✗           |
| 11.4   | The proportion of domestic pools with approved child-resistant fences, gates and barriers   | ✗                 | ✗           |
| 11.5   | The proportion of children and young people aged 10–16 who have successfully completed a water safety and lifesaving course         | ✗                 | ✗           |
| 12.1   | Access of injured patients to optimal trauma care   | ✗                 | ✗           |
| 13.1   | Access of people with trauma injuries to comprehensive rehabilitation programs and appropriate long-term care and community support | ✗                 | ✗           |
| 14     | Annual incidence rate of persistent spinal cord injury from traumatic cases   | ✗                 | ✓           |
| 15     | Brain injury  | ✗                 | ✗           |

*Note:* These indicators are a priority subset of the indicators listed in the BHO report (DHFS 1994).

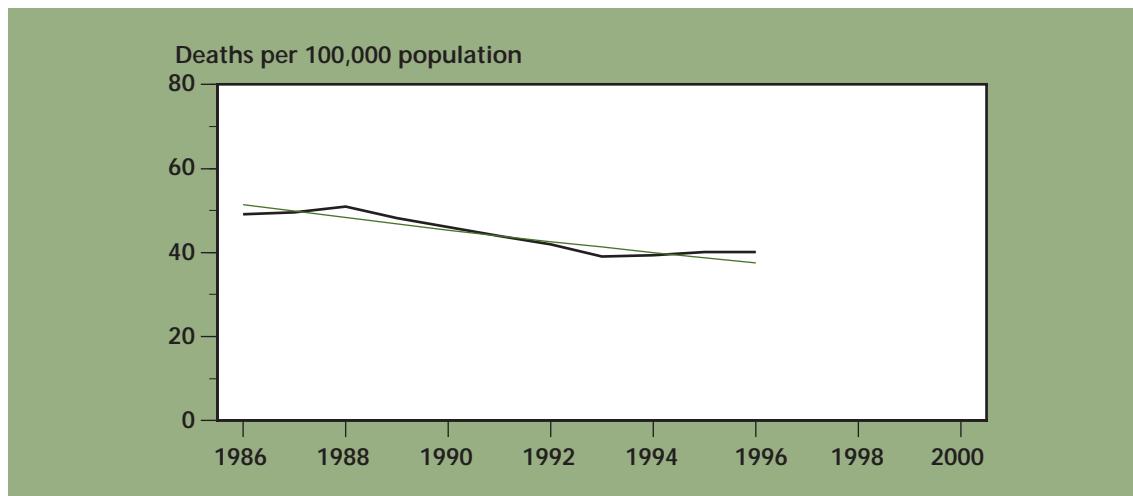
## Appendix 1

### Indicator 1.1

#### Death rate for injury and poisoning in the total population

(ICD-9 E800–869, E880–929, E950–999)

#### National trend



| Population group | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |
|------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|
| Total Population | 49.2 | 49.5 | 51.0 | 48.2 | 46.1 | 43.9 | 42.0          | 39.1 | 39.4 | 40.1 | 40.1 | 33.6        |

Note: The Year 2000 target reflects a 20% reduction in the baseline, as indicated in the BHO report.

Source: AIHW mortality database.

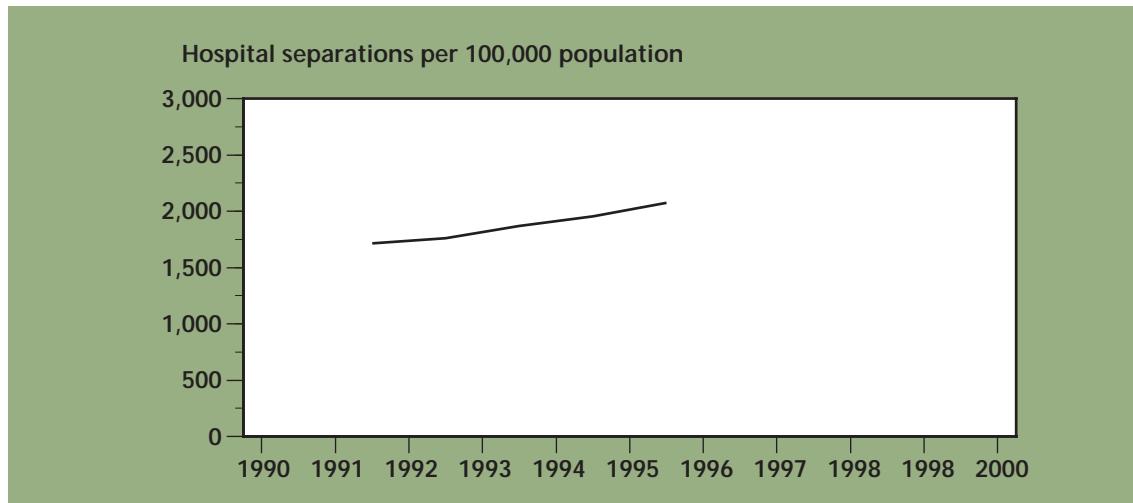
- Injury and poisoning constitute the fourth leading cause of death in Australia. In 1995, there were 7,357 deaths due to injury with an age-standardised death rate of 40.1 per 100,000 persons. The number of deaths registered in 1996 increased to 7,469.
- Injury death rates vary dramatically with age and sex, reflecting differences in activities, behaviours and injury threshold. The age-specific death rate is lowest between the ages of 5 and 14 years and highest at ages 75 years and over. Those between the ages of 20 and 29 years of age are at high risk of dying from an injury.
- Males are at greater risk of dying from an injury than are females. In 1995, there were 5,130 male and 2,227 female deaths due to injury with a death rate ratio of 2.6. The ratio increased to 3.0 in 1996.
- Injury death rates are much higher in the rural and remote areas of Australia (Titulaer, Trickett & Bhatia 1997) and among the Indigenous population groups (Anderson, Bhatia & Cunningham 1996). Over the period 1991–95, injury death rates in remote areas of Australia were more than double those in capital cities, both for males and females. The death rate ratio for Indigenous and non-Indigenous populations was much higher.
- Injury death rates have declined substantially over the past two decades. Between 1986 and 1995, the age-standardised death rate for all injuries in the total population declined by an average 3.1% per year. Much of the decline took place between 1988 and 1993.
- Australia ranked eleventh of 19 OECD countries for injury deaths from 1988 through to 1992. Australia has been more successful than most developed countries in reducing injury deaths. However, this downwards trend in injury deaths appears to have plateaued since 1993, and injury deaths may even be on the rise.
- The Year 2000 target of 20% reduction in injury death rate from the 1992 baseline is achievable given the long-term trend. However, the injury death rates have increased since 1993 and this may impact upon progress towards the target.

## Indicator 1.2

### Hospital separation rate for injury and poisoning in the total population

(ICD-9 E800–869, E880–929, E950–999)

#### National trend



| Population group | Baseline 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | Target 2000 |
|------------------|------------------|---------|---------|---------|---------|-------------|
| Total Population | 1,714            | 1,760   | 1,871   | 1,955   | 2,078   | 1,371       |

*Note:* The baseline figure of 1,826 hospital separations per 100,000 in 1991–92, given in the BHO report, was based on New South Wales hospital separation data, and has been revised to reflect the national rate.

The Year 2000 target, set at 20% below the 1991–92 baseline, has also been revised accordingly.

*Source:* AIHW hospital morbidity database.

- In 1995–96, injury or poisoning accounted for 377,955 hospital separations at an age-standardised rate of 2,078 episodes per 100,000 population. Overall, there were about 50 hospital separations for every death due to injury.
- The age-standardised hospital separation rate for all injuries was higher for males than for females with 2,496 per 100,000 compared to 1,611 per 100,000. Males were around one and a half times more likely than females to be hospitalised as a result of injury.
- Not all persons are at equal risk of being injured. Young males aged 15–24 years and elderly people aged 65 years are most at risk for being hospitalised as a result of an external cause, generally having the highest rates for most causes. Children, especially boys, aged between 0–9 years also have high rates for certain external causes such as falls, burns and scalds, and accidental poisoning. For young males,
- transport-related accidents, falls, interpersonal violence and other accidents are the major causes of hospitalisation. Elderly females are most at risk for being hospitalised as a result of falls, with females aged 75 or more years being hospitalised at a rate of over 7,000 per 100,000 population.
- Hospital statistics for the period 1993–94 to 1995–96 indicate that the age-standardised rate for all injury hospital separations has risen by about 11%. The relationship between the changes shown in the chart and changes in the incidence of injury cases resulting in hospital admission during the period is not known. Given the caveat, the Year 2000 target for hospital separations is in need of revision.
- Hospital separations for injury are much higher in rural and remote areas than in metropolitan areas, by almost more than 100%, among both males and females (Titulaer, Trickett & Bhatia 1997).

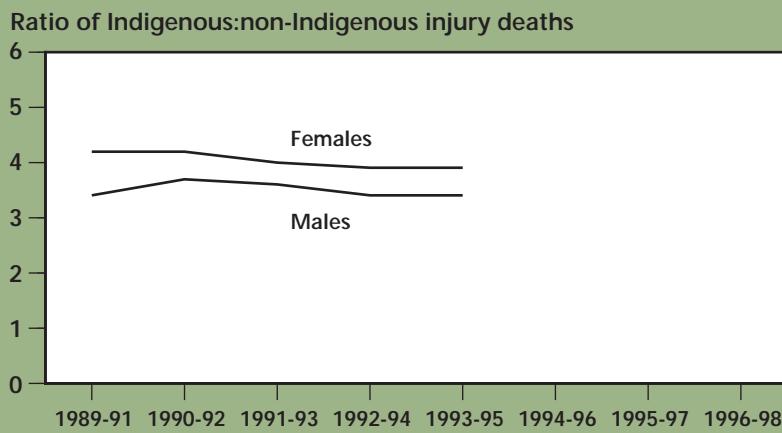
## Appendix 1

### Indicator 2.1

#### Death rate ratio comparing the injury status of Indigenous and non-Indigenous populations

(ICD-9 E800–869, E880–929, E950–999)

#### National trends



| Death rate ratio | 1989-91 | Baseline 1991-92 | 1991-93 | 1992-94 | 1993-95 | Target 2000 |
|------------------|---------|------------------|---------|---------|---------|-------------|
| Males            | 3.4     | 3.7              | 3.6     | 3.4     | 3.4     | 2.8         |
| Females          | 4.2     | 4.2              | 4.0     | 3.9     | 3.9     | 3.2         |

- Notes:*
- 1 Data from Western Australia, South Australia and the Northern Territory only. Indigenous deaths data for New South Wales, Victoria and Tasmania were of variable quality for this analysis. Identification of Indigenous deaths in Queensland has been introduced since 1996.
  - 2 An indirect method of age standardisation was used to estimate the death rate ratio, or standardised mortality ratio (SMR).
  - 3 The baseline given in the BHO report (2.9:1 in 1990-92, both sexes combined) was based on deaths data from all States and Territories except Queensland. In light of incompleteness of Indigenous identification in deaths data in some jurisdictions, the baselines and targets have been revised. Accordingly, the Year 2000 target reflects a 25% reduction from the baseline, as indicated in the BHO report.

*Source:* Unpublished AIHW data.

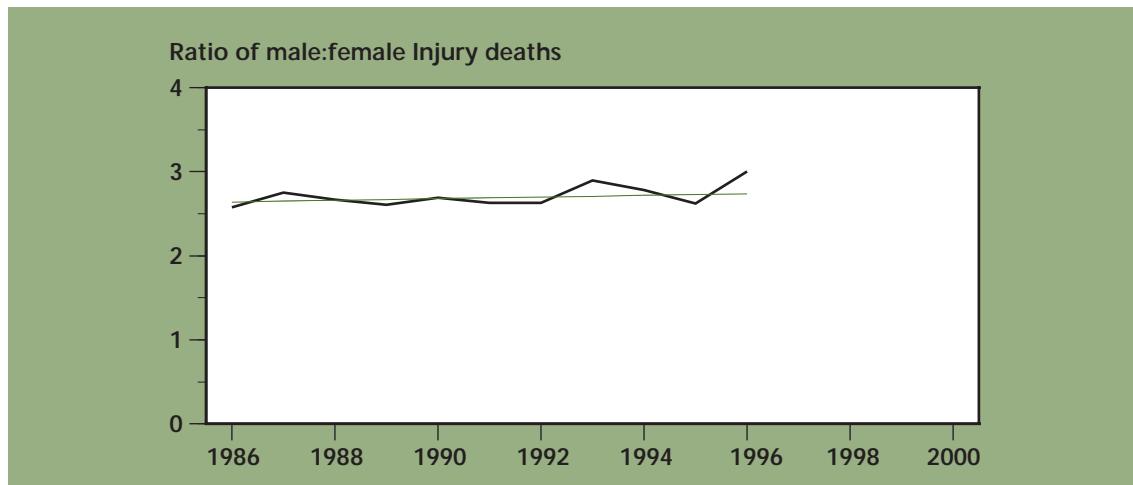
- Injury is one of the leading causes of death among Indigenous peoples, with an age-standardised death rate of 201 per 100,000 males and 82 deaths per 100,000 females in 1993-95.
- The death rates for injury are much higher among the Indigenous population than in the non-Indigenous population. The death rate ratio, or SMR, for all injuries between Indigenous and non-Indigenous males was 3.4 in 1993-95; the ratio for females was 3.9.
- The death rate for injury among Indigenous peoples is greatest for transport-related causes in middle age, drowning in adulthood, poisoning with non-pharmaceutical substances (particularly petroleum products and solvents), effects of fire in late adulthood, suicide in early adulthood and interpersonal violence throughout adulthood (Harrison & Cripps 1994).
- The three-year moving averages reveal consistent declines in the death rate ratios since 1990-92, the baseline triennium. Between 1990-92 and 1993-95, the ratio declined by 8.1% for Indigenous males and 7.1% for Indigenous females.
- The BHO targets of reducing the death rate ratios are stated in terms of reducing the Indigenous death rates towards non-Indigenous rates. While reductions in injury death rates have been noted among both Indigenous males and females, these reductions have been marginally higher than those seen in the non-Indigenous population.
- On current indications, the proposed targets may not be reached by the Year 2000.

## Indicator 2.2

### Death rate ratio comparing the injury status of males and females

(ICD-9 E800–869, E880–929, E950–999)

#### National trend



| Death rate ratio | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |     |
|------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|-----|
| Male:female      | 2.6  | 2.8  | 2.7  | 2.6  | 2.7  | 2.6  | 2.6           | 2.6  | 2.9  | 2.8  | 2.6  | 3.0         | 2.1 |

Notes: 1 The Year 2000 target reflects a 20% reduction in the baseline, as indicated in the BHO report.  
2 The direct method of age standardisation was used to estimate death rates. The death rate ratios were obtained using these age-standardised rates.

Source: AIHW mortality database.

- Death rates for injury have been historically much higher among males than females. In 1995, there were 5,130 male deaths and 2,227 female deaths, with an age-standardised death rate ratio of 2.6:1.0. The ratio increased to 3.0:1.0 in 1996.
- The rate of decline in injury death rates over the past several years has been much higher among females than males. This has led to a widening of the gap between male and female injury death rates. The 1996 male:female death rate ratio was an increase of 15.4% over the 1992 baseline.
- The male:female ratio for injury deaths is much higher in the rural and remote areas of Australia. In some areas, the female rate is less than one-third the male rate (Titulaer, Trickett & Bhatia 1997).
- Differences in male:female rates for transport-related injuries are a large contributor to this high death rate ratio. Significant differences also exist in the rate ratios for suicides and homicides.
- Differences in injury mortality between males and females are greatest in the age group 15–29 years, with young males experiencing more than four times the injury mortality of young females.
- The BHO target of reducing the death rate ratio is stated in terms of reducing the male rate towards the female rate. If current trends continue, it is unlikely that the Year 2000 target ratio of 2.1:1.0 will be reached.

## Appendix 1

### Indicator 2.4

#### Death rate ratio comparing the injury status among people living in rural and remote areas and the general population

(ICD-9 E800–869, E880–929, E950–999)

### National comparisons



| Sex     | RMAA category |           |           |          |           |         |         |  |
|---------|---------------|-----------|-----------|----------|-----------|---------|---------|--|
|         | Capital       | Oth metro | Lrg rural | Sm rural | Oth rural | Rem cen | Oth rem |  |
| Males   | 0.89          | 0.98      | 1.10      | 1.08     | 1.28      | 1.51    | 1.90    |  |
| Females | 0.94          | 0.98      | 0.98      | 1.03     | 1.19      | 1.33    | 1.96    |  |

Note: See Appendix 2 for detailed RRMA classification.

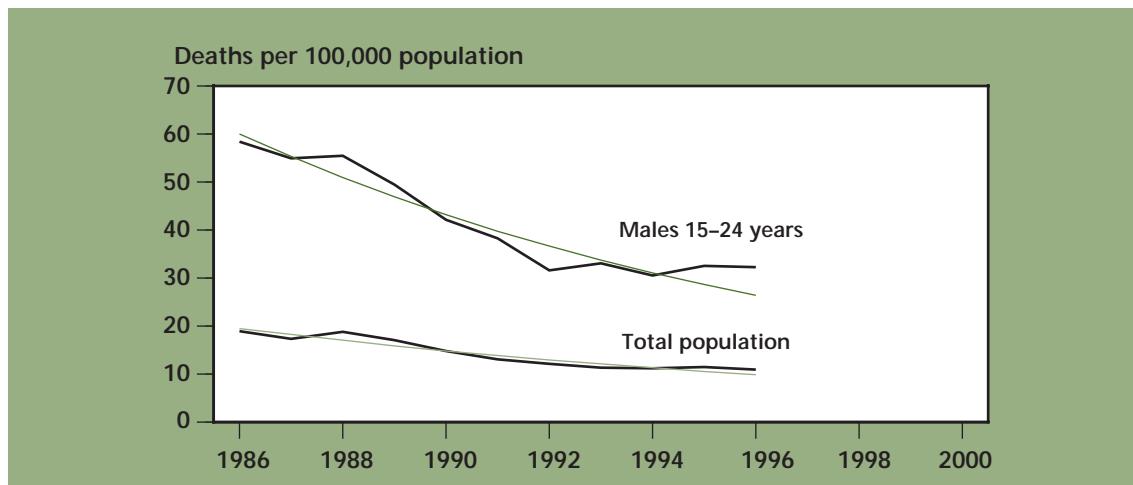
- The health disadvantage of rural and remote Australians is well described by differentials in death rates for injury and poisoning. An incremental rise in the rate for fatal injuries is noted as one travels away from capital cities and metropolitan areas to rural and remote areas of Australia (Titulaer, Trickett & Bhatia 1997).
- The Rural, Remote and Metropolitan Areas (RRMA) classification, developed by the Department of Primary Industry and Energy and the then Department of Human Services and Health (DPIE & DHS 1994), provides a useful model for determining the extent of rural and remote area health disadvantage. The functional hierarchies created by low population densities, isolation and the resulting disadvantage are reflected by RRMA distribution of injury-related deaths in Australia (Titulaer, Trickett & Bhatia 1997).
- Fatal injuries accounted for less than one in 12 deaths among Australian males in 1991–95, but the proportion was one in six deaths for males living in remote areas. The proportion of injury-related deaths among total deaths is much smaller for Australian females (less than one in 25), but rises steeply in rural and remote areas. The years of potential life lost through injury are consequently much higher in rural and remote areas.
- The age-standardised death rate for all injuries was 60 deaths per 100,000 males and 22 deaths per 100,000 females in 1991–95. In ‘other remote areas’, the rates per 100,000 were 115 deaths among males and 44 deaths among females. In comparison, injury-related death rates for ‘capital cities’ and ‘other metropolitan areas’ were lower than the national rates.

## Indicators 3.1 and 3.2

### Death rate for road transport-related injury in the total population, and among males aged 15–24 years

(ICD-9 E810–819, E826–829)

## National trends



| Population group       | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |
|------------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|
| Total Population       | 18.9 | 17.3 | 18.8 | 17.0 | 14.8 | 13.0 | 12.0          | 11.2 | 11.1 | 11.5 | 10.8 | 10.7        |
| Males aged 15–24 years | 58.3 | 54.8 | 55.3 | 49.4 | 42.1 | 36.1 | 31.5          | 33.0 | 30.5 | 32.5 | 32.2 | 23.6        |

- Notes:* 1 The baseline values differ slightly from the rates published in the BHO report due to different populations used for age standardisation.  
 2 The Year 2000 target for males aged 15–24 years reflects a 25% reduction from the 1992 baseline, as indicated in the BHO report.

*Source:* AIHW mortality database.

- Road transport-related accidents are a major cause of injury deaths. The death rates are particularly high among 15–24 year old males (almost three times that in the total population). In 1995, as many as 2,058 deaths (1,420 males and 638 females) occurred as a result of accidents on Australian roads. The numbers declined slightly in 1996.
- Fatal injuries following road accidents have consistently declined in Australia since 1988, except in 1995. In 1996, the death rate for transport-related injury was 10.8 deaths per 100,000 persons.
- The death rate for road transport-related injury among males aged 15–24 years has also fallen substantially. Although an increase in the rate for fatal road transport-related injury was noted in 1995 for males aged 15–24 years, the rate declined again in 1996.
- According to the Federal Office of Road Safety (1996), between July 1994 and June 1995, 42.0% of fatalities were drivers of vehicles, 25.9% were passengers in vehicles, 19.2% were pedestrians and 10.0% were motorcyclists (including pillion riders).
- Based on current trends, the Year 2000 targets of 10.7 deaths per 100,000 total population and 23.6 deaths per 100,000 males aged 15–24 years are expected to be reached. However, the data show a recent levelling off in road fatality numbers for young males.
- Road accidents are a much greater cause of death in rural and remote areas than in metropolitan areas. Rates for fatal injuries incurred in road accidents in remote areas are almost three times those for capital cities, among both males and females (Titulaer, Trickett & Bhatia 1997).

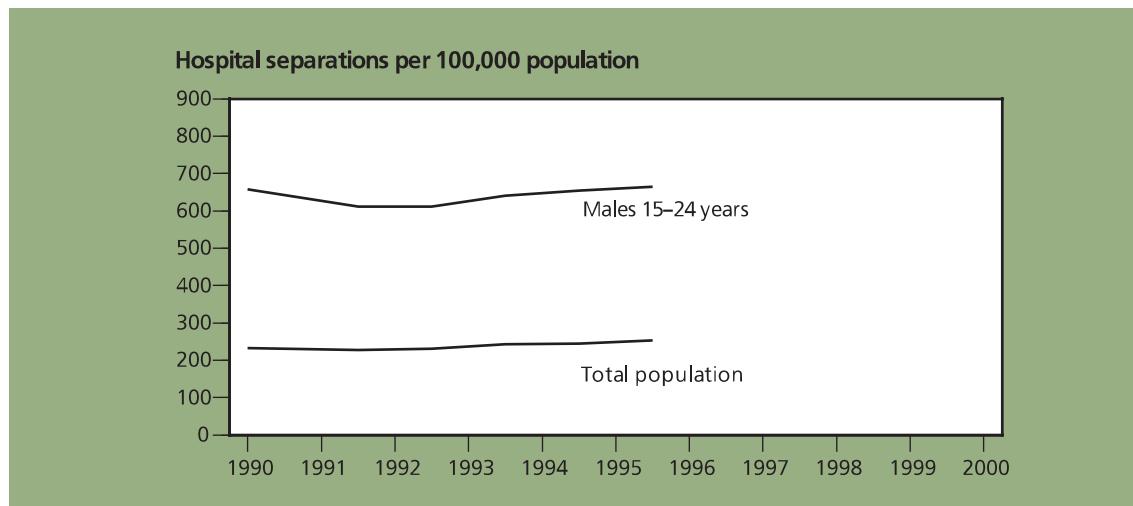
## Appendix 1

### Indicators 3.3 and 3.4

#### Hospital separation rate for road transport-related injury in the total population, and among males aged 15–24 years

(ICD-9 E800–819, E826–829)

### National trends



| Population group       | Baseline 1990 | 1991–92 | 1992–93 | 1993–94 | 1994–95 | 1995–96 | Target 2000 |
|------------------------|---------------|---------|---------|---------|---------|---------|-------------|
| Total Population       | 232           | 228     | 231     | 242     | 244     | 253     | 194         |
| Males aged 15–24 years | 858           | 612     | 612     | 640     | 654     | 665     | 494         |

Notes: 1 The baseline values given in the BHO report are for the calendar year 1990, and are not age standardised. ICD-9 codes E827–829 were also not included; these codes represent approximately 11% of total cases and 6% of cases for males aged 15–24 years.

2 The Year 2000 target reflect a 25% reduction in the baselines, as indicated in the BHO report.

Source: AIHW hospitality morbidity database.

- In 1995–96, there were almost 46,000 hospital separations due to road transport-related injuries at an age-standardised rate of 253 injuries per 100,000 population.
- Males aged 15–24 years are most at risk from road transport-related accidents. Over 9,000 males in this age group were hospitalised, accounting for 20% of all hospitalisations due to road transport-related accidents. In 1995–96, there were 665 hospitalisations per 100,000 for young males aged 15–24 years, a rate two and a half times that for the total population.
- Between 1993–94 and 1995–96, road transport-related hospital separations increased by around 4%. The relationship

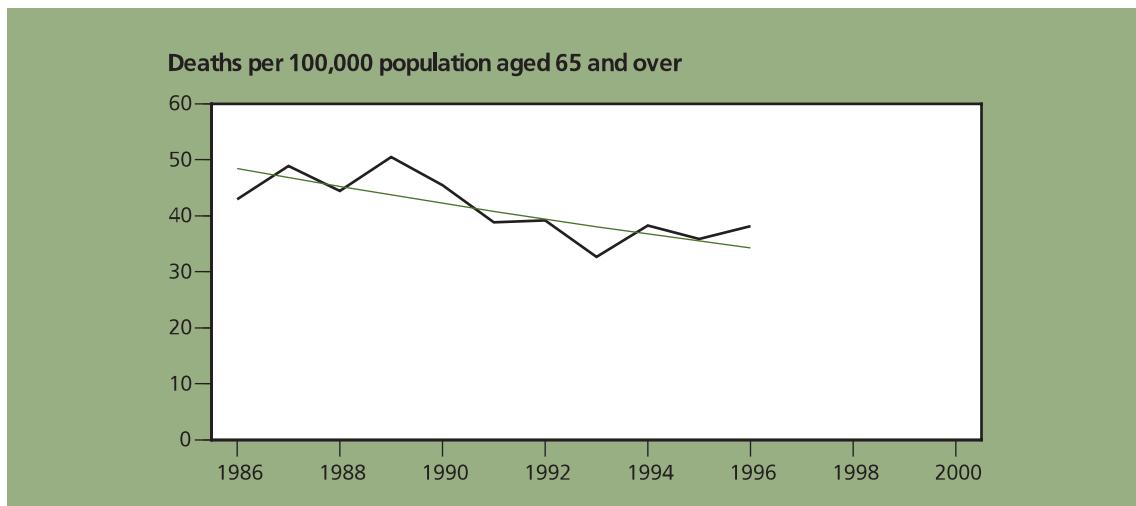
between the changes shown in the chart and changes in the incidence of injury cases resulting in hospital admission during the period is not known. It is difficult to determine progress toward the Year 2000 target however, the trends appear to be to the contrary.

- In 1995–96, the hospital separation rates for injury sustained in a road transport-related accident were much higher in rural and remote areas, in some cases by more than 100%, than in metropolitan areas. Rates for 'capital cities' were also slightly higher than in 'other metropolitan' areas (Titulaer, Trickett & Bhatia 1997).

## Indicator 5.1

### Death rate due to falls among people aged 65 years and over (ICD-9 E880–888)

#### National trend



| Population group       | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |
|------------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|
| Aged 65 years and over | 43.0 | 48.9 | 44.5 | 50.5 | 45.4 | 38.9 | 39.9          | 32.7 | 38.3 | 35.9 | 38.2 | 35.4        |

- Notes:*
- 1 The baseline value differs slightly from the rate published in the BHO report due to different populations used for age standardisation.
  - 2 The Year 2000 target reflects a 10% reduction in the baseline, as indicated in the BHO report.
  - 3 Unlike most other types of injury, a high proportion of deaths attributed to a fall are registered by a medical practitioner rather than a coroner. This practice may influence the comparability of deaths data.

*Source:* AIHW mortality database.

- A large proportion of deaths from external causes in old age result from falls, primarily due to complications developed after the fall. The proportion rises with age, from about 15% of deaths from all external causes among people aged 65–69 years to about 75% at age 85 years and above.
- Fractures are the most common serious injury resulting from falls, with hip fractures the most significant in terms of mortality and serious functional impairment (Fildes 1994). About half of the older people who sustain a fractured hip never regain their pre-fall level of function (Cummings et al 1985).
- More females than males die as a result of a fall, with osteoporosis greatly increasing the risk of fracture and complications. In 1996, 549 females and 367 males aged 65 years and over died of this cause. Of the 549 female fatalities, more than half were aged 85 years and over.
- The age-standardised death rate for falls among people aged 65 years and over declined by 21.9% between 1987 and 1996, falling substantially below the Year 2000 target in 1993. However, the rate has risen again and was higher than the Year 2000 target for the years 1994–96.
- Many of the fall-related injuries are preventable through exercise, diet, building redesign and other measures. Strategies which address these aspects of the health of older Australians may have contributed to the general decline of the rate over the past 10 years.

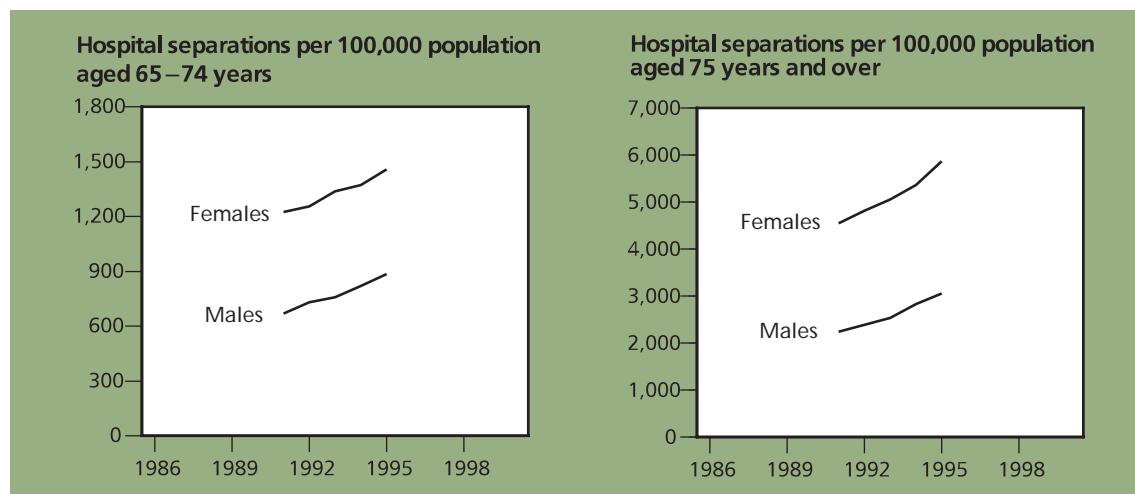
## Appendix 1

### Indicator 5.2

#### Hospital separation rate due to falls among people aged 65 years and over

(ICD-9 E800–888)

#### National trends



*Notes:* 1 The baselines given in the BHO report were based on Victorian data for the period 1986–91. The baselines have been revised and are national rates. The targets have also been adjusted accordingly.

2 The targets reflect a 10% reduction in the baseline for males and a 20% reduction in the baseline for females.

*Source:* AIHW hospital morbidity database.

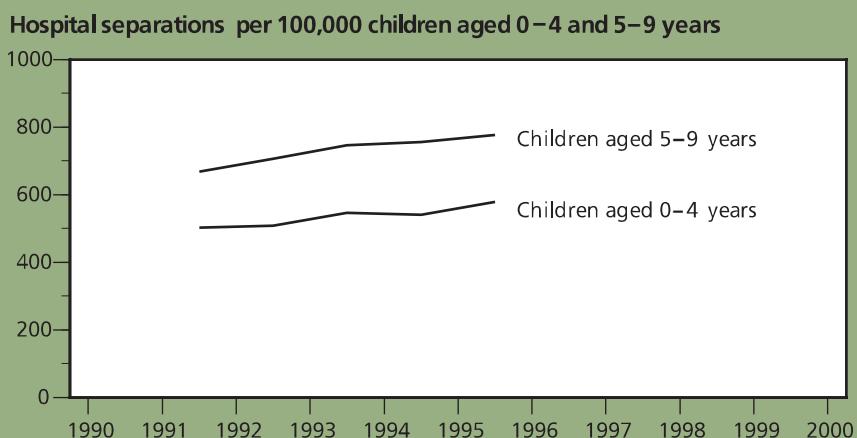
- Fall injuries contribute significantly to the number of hospital separations for all external causes. As people get older, the risk of hospitalisation from a fall increases substantially. Elderly persons aged 65 years or more are most at risk.
- Fractures are the most common serious injury resulting from falls requiring hospitalisation; high prevalence of osteoporosis among elderly females in particular contributes significantly to high rates of hospitalisation following a fall. Older females are more at risk than older men, with the former twice as likely to be hospitalised as a result of a fall-related accident.
- The rates for hospital separations in 1995–96 on account of injuries sustained through falls were 886 per 100,000 males and 1,456 per 100,000 females aged 65–74 years. These rates are much higher than those in the baseline year 1991–92; the rate increased for males by almost one-third during the four year period 1991–92 to 1995–96. The increase in rate among females aged 65–74 years was less marked.
- A similar picture emerges for hospital separations due to falls among those aged 75 years and over, although the rates rise to more than three-fold for those in the previous decade of life. The rates increased by more than one-third between 1991–92 (the baseline year) and 1995–96 for both sexes.
- The relationship between the changes shown in the chart and changes in the incidence of injury cases resulting in hospital admission during the period is not known. However, it seems that hospitalisation following a fall has risen considerably over the last few years. From these indications, it seems unlikely that the Year 2000 targets will be achieved.

## Indicator 5.5

### Hospital separation rate due to falls among children aged 0–4 and 5–9 years

(ICD-9 E880–888)

### National trends



| Age group | Baseline 1991–92 | 1992–93 | 1993–94 | 1994–95 | 1995–96 | Target 2000 |
|-----------|------------------|---------|---------|---------|---------|-------------|
| 0–4 years | 502              | 508     | 547     | 541     | 578     | 452         |
| 5–9 years | 868              | 707     | 747     | 755     | 777     | 601         |

*Notes:* 1 The baseline figures for hospital separation rates among 0–4 year olds (550 per 100,000) and among 5–9 year olds (634 per 100,000) given in the BHO report were based on New South Wales data only and have been revised to reflect national rates.

2 The Year 2000 targets reflect a 10% reduction in the baselines, as indicated in the BHO report.

*Source:* AIHW hospital morbidity database.

- Falls are the leading cause of hospitalisation for children. In 1995–96, there were 17,595 hospital separations for children aged 0–4 years (578 per 100,000) and 5–9 years (777 per 100,000), accounting for 5% of all hospital separations due to external causes of injury for all ages.
- Children aged 0–4 years are more likely to be hospitalised after falling from one level to another, while those aged 5–9 years are more likely to be admitted to hospital due to falls related to playground equipment. As with other external causes, falls are more common among boys in both the 0–4 years and the 5–9 years age groups.
- In the period 1991–92 to 1995–96, the hospital separation rate due to falls rose slightly (15% for 0–4 year olds and 16% for 5–9 year olds). The relationship between the changes shown in the chart and changes in the incidence of injury cases resulting in hospital admission during the period is not known.
- The Year 2000 targets were based on data collection procedures that have been improved significantly over the past couple of years. The introduction of more consistent data definitions and codes has increased the reliability of the estimates. Age-specific targets for this particular indicator are therefore now in need of revision.

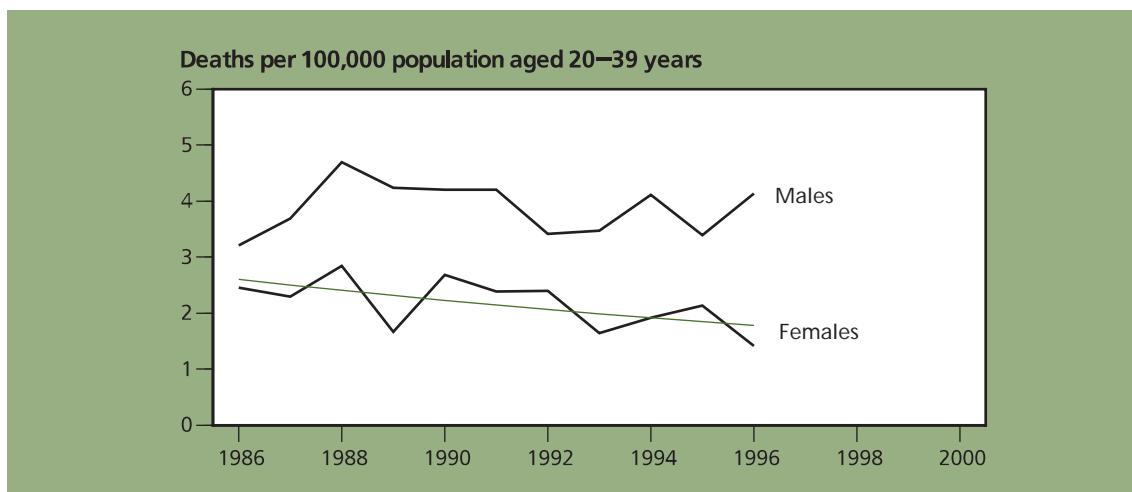
## Appendix 1

### Indicator 7.1

#### Death rate for homicide among people aged 20–39 years

(ICD-9 E960–978, E990–999)

#### National trends



| Population group<br>(20–39 years) | 1986 1987 1988 1989 1990 1991 |      |      |      |      |      | Baseline 1992 | 1993 1994 1995 1996 |      |      |      | Target 2000 |
|-----------------------------------|-------------------------------|------|------|------|------|------|---------------|---------------------|------|------|------|-------------|
|                                   | 1986                          | 1987 | 1988 | 1989 | 1990 | 1991 |               | 1993                | 1994 | 1995 | 1996 |             |
| Males                             | 3.2                           | 3.7  | 4.7  | 4.2  | 4.2  | 4.2  | 3.4           | 3.5                 | 4.1  | 3.4  | 4.1  | 3.4         |
| Females                           | 2.5                           | 2.3  | 2.8  | 1.7  | 2.7  | 2.4  | 2.4           | 1.6                 | 1.9  | 2.1  | 1.4  | 2.4         |

Note: The data for males aged 20–39 years did not support the fitting of a trendline.

Source: AIHW mortality database.

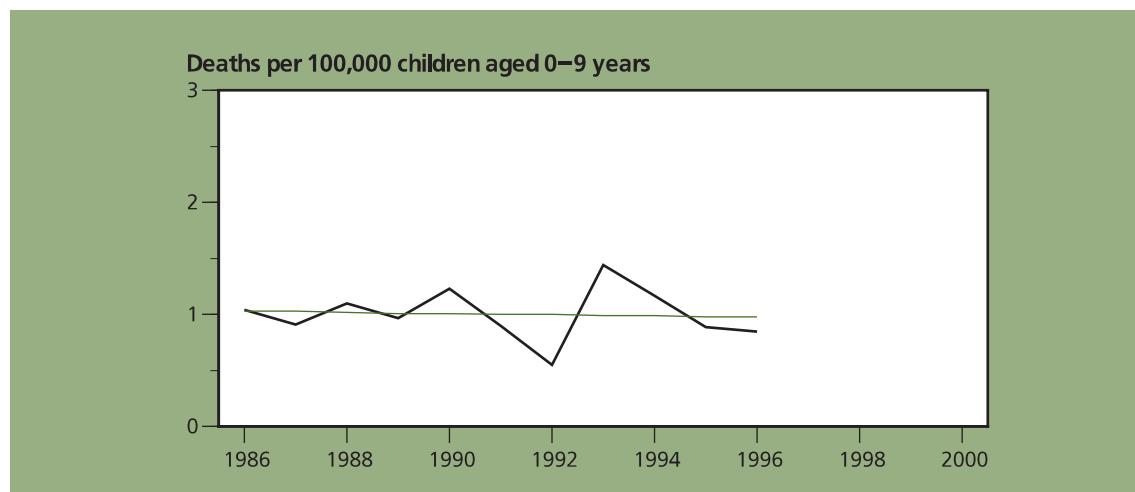
- Fatal outcomes from intentional injuries or homicides provide a practical indicator of the nature and extent of interpersonal violence in the population. However, homicides are not distributed evenly throughout the population, being more prevalent among young and Indigenous peoples, particularly those living in remote areas (Anderson, Bhatia & Cunningham 1996; Titulaer, Trickett & Bhatia 1997).
- In 1995, 79 males and 60 females aged 20–39 years died as a result of interpersonal violence, with a death rate ratio of 1.3:1.0. The number of male homicides rose to 118 in 1996, while the number of female homicides dropped to 40.
- Among men aged 20–39 years, no clear trend is discernible in the time series 1986–95. A comparison of death rates between 1987–89 and 1993–95 revealed a
- decline of 13.2%. The rate has shown large fluctuations on an annual basis, but has averaged around 3.8 deaths per 100,000 over the past six years (1991–96).
- Although the homicide rate for females rose consecutively in 1994 and 1995, it was still below the target. The rate declined in 1996 and was less than two-thirds of the target.
- Intentional injury resulting from interpersonal violence encompasses a range of injury types including homicide, sexual assault and assault, and domestic violence. Better data are available for fatal outcomes of interpersonal violence than for non-fatal injuries; it is therefore likely that the death rate represents only a small proportion of the injury problems resulting from interpersonal violence.

## Indicator 7.2

### Death rate for homicide among children aged 0–9 years

(ICD-9 E960–978, E990–999)

#### National trend



| Children       | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |
|----------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|
| Aged 0–9 years | 1.0  | 0.9  | 1.1  | 1.0  | 1.2  | 0.9  | 0.6           | 1.4  | 1.2  | 0.9  | 0.9  | 0.5         |

Note: The target reflects a 25% reduction in the baseline, as indicated in the BHO report.

Source: AIHW mortality database.

- A number of structural, cultural and psychosocial factors contribute to child battering and maltreatment. Injury deaths inflicted by others on children have been specifically targeted under the NHPA initiative.
- Babies and toddlers are at greater risk from death due to abuse and violence than are older children. Children aged 0–4 years accounted for 7% of all homicide deaths in the period 1993–95; children aged 5–9 years constituted an additional 2% of all homicides.
- There has been a slight upward trend in the homicide rate for this age group (0.4% annually between 1986 and 1995) despite consecutive declines in 1994 and 1995. No decline over the 1995 rate was noted in 1996. Annual average decline of 11.1% is required if the Year 2000 target of 0.5 deaths per 100,000 is to be reached.
- The baseline for this indicator was probably established using only one data point. Baselines, like targets, should be established on the basis of stable trends. This would create the basis for setting scientifically credible and achievable targets. Coincidentally, the homicide rate for children 0–9 years was at its lowest in 1992.
- Child battering and maltreatment result in a variety of injuries, some with fatal consequences. Better data are available for fatal outcomes than for non-fatal injuries. It is therefore likely that the death rate represents only a small proportion of the injury problems resulting from child abuse.

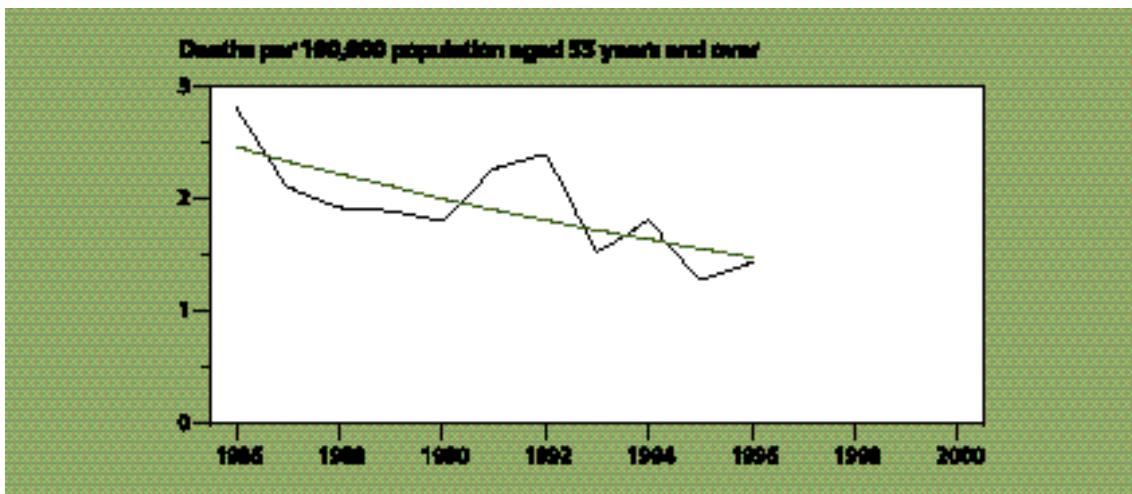
## Appendix 1

### Indicator 9.1

#### Death rate for injury resulting from fire, burns and scalds among people aged 55 years and over

(ICD-9 E890–899, E924.0)

#### National trend



| Population group       | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000 |
|------------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------|
| Aged 55 years and over | 2.8  | 2.1  | 1.9  | 1.9  | 1.8  | 2.3  | 2.4           | 1.6  | 1.9  | 1.3  | 1.4  | 1.2         |

Note: The Year 2000 target reflects a 50% reduction in the baseline, as indicated in the BHO report.

Source: AIHW mortality database.

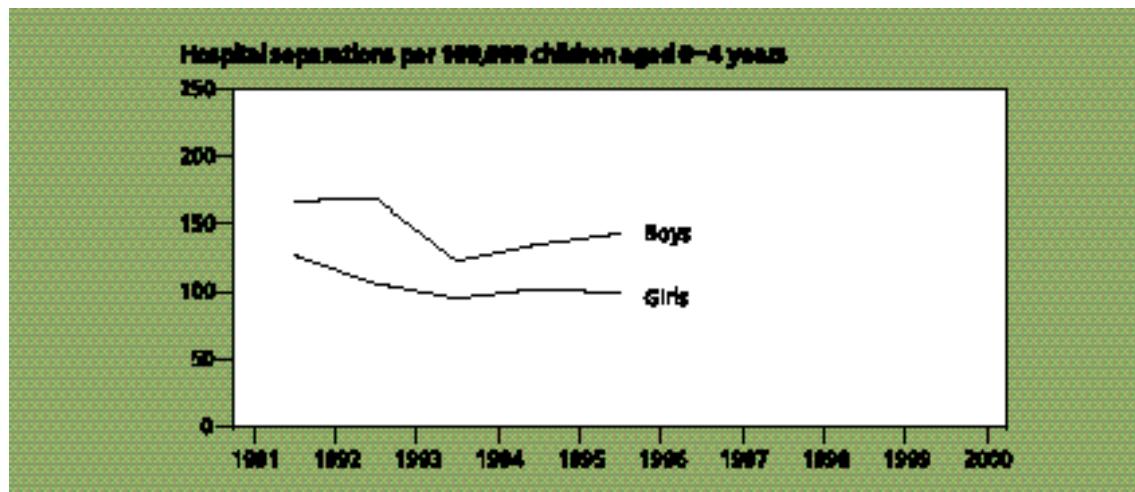
- Accidents due to fire, burns and scalds account for a relatively small proportion of injury incidents. However, the economic and long-term physical and psychosocial implications of serious burns and scalds injuries are enormous and highlight the need for more extensive preventive action.
- About 2% of external causes of death are attributed to this form of injury. Older people and children aged 0–4 years are particularly at risk of serious injury and death due to fire, burns and scalds. Among 0–4 year olds, the proportion is about 8%, and among people aged 55 years and over the proportion is approximately 3%.
- There has been a steady decrease in the age-standardised death rate for fire, burns and scalds among males and females aged 55 years and over. The trend since 1986 indicates an annual rate of decline of 4.8% per year among persons aged 55 years and over. With this rate of decline, although there was a slight increase in the rate during 1996, the Year 2000 target of 1.2 deaths per 100,000 is likely to be met.

## Indicator 9.2

### Hospital separation rate for injury resulting from fire, burns and scalds among children aged 0–4 years

(ICD-9 E890–899, E924.0)

### National trends



| Children aged 0–4 years | Baseline 1991–92 | 1992–93 | 1993–94 | 1994–95 | 1995–96 | Target 2000 |
|-------------------------|------------------|---------|---------|---------|---------|-------------|
| Boys                    | 167              | 169     | 123     | 135     | 143     | 132         |
| Girls                   | 127              | 106     | 95      | 102     | 99      | 101         |

Notes: 1 The baseline values given in the BHO report were based on New South Wales data only; the values given above were updated to reflect national rates.

2 The targets reflect a 20% reduction in the baselines, as indicated in the BHO report.

Source: AIHW hospital morbidity database.

- In 1995–96 there were 1,581 separations for children aged 0–4 years admitted to hospital with injuries resulting from fire, burns or scalds at a rate of 122 per 100,000 population. Boys aged 0–4 years are at a higher risk for this type of injury, being almost one and a half times more likely to be hospitalised due to burns and scalds than girls.
- Children were most likely to be hospitalised as a result of being scalded by hot substances. There were 1,340 hospital separations (85% of all children 0–4 years admitted to hospital due to burns and scalds) at a rate of 103 burns and scalds per 100,000 population in 1995–96.
- There was an increase of 11% in the rate of hospitalisation due to burns and scalds in the period 1993–94 to 1995–96 (16% for boys and 4% for girls). However, over the long term, between 1991–92 and 1995–96, the rates declined for both boys and girls.
- Given the recent increases in rates, in particular among boys, it is not possible to infer progress towards the targets.

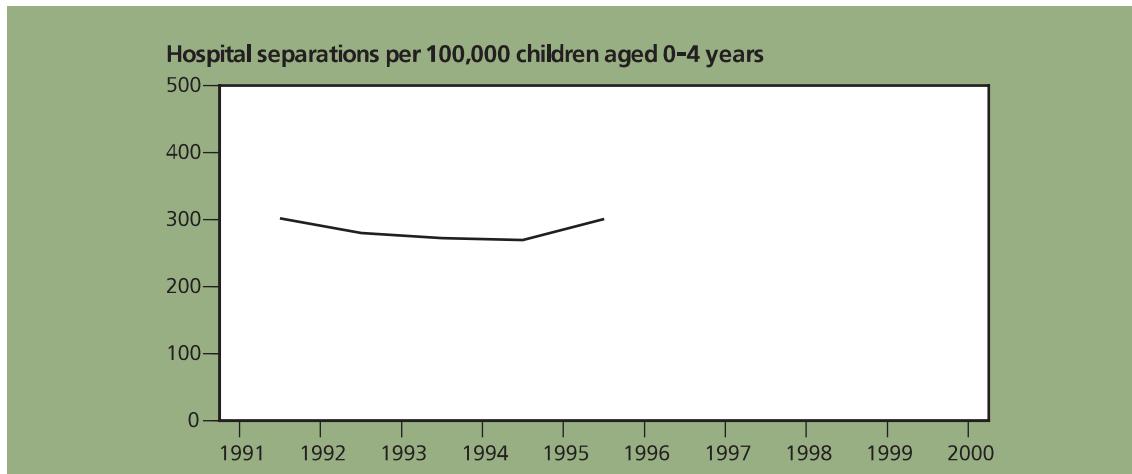
## Appendix 1

### Indicator 10.1

#### Hospital separation rate for poisoning among children aged 0–4 years

(ICD-9 E850–858, E860–869)

#### National trend



| Children       | Baseline 1991–92 | 1992–93 | 1993–94 | 1994–95 | 1995–96 | Target 2000 |
|----------------|------------------|---------|---------|---------|---------|-------------|
| Aged 0–4 years | 302              | 280     | 272     | 269     | 301     | 242         |

*Notes:* 1 The baseline value given in the BHO report was based on New South Wales data; the baseline given above was updated to reflect the national rate.

2 The Year 2000 target reflects a 20% reduction in the baseline, as indicated in the BHO report.

*Source:* AIHW hospital morbidity database.

- Accidental poisoning due to drugs and medications or by domestic chemicals and other substances is a significant cause of hospital admission for children aged 0–4 years. In 1995–96, there were 3,903 hospital separations due to accidental poisoning at a rate of 301 per 100,000 population.
- Unlike other external causes of hospitalisation, no dramatic difference in rates was observed between boys and girls. Boys (2,170 episodes) were at a slightly higher risk of accidental poisoning than were girls (1,733 episodes). Over 70% of all the separations were

the result of ingestion of drugs and medications, with the remaining 30% being caused by ingestion of domestic chemicals.

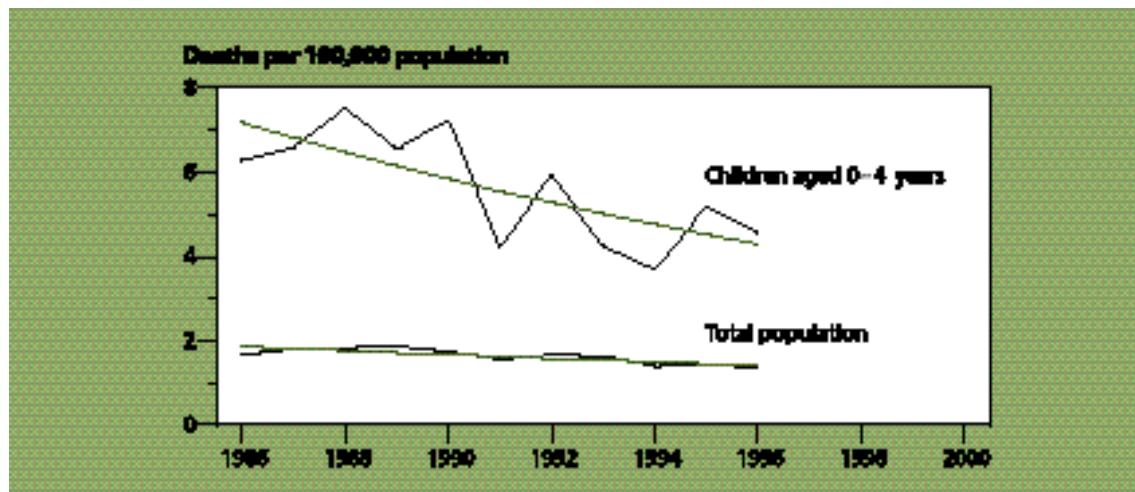
- After an apparent decline in the rate in the period 1991–92 to 1994–95, a large increase in the number of accidental poisoning episodes was noted in 1995–96. The relationship between the changes shown in the chart and changes in the incidence of injury cases resulting in hospital admission during the period is not known. No inference about progress towards the target can be made.

## Indicator 11.1

### Death rate for drowning in the total population and among children aged 0–4 years

(ICD-9 E910)

### National trends



| Population group        | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Baseline 1992 | 1993 | 1994 | 1995 | 1996 | Target 2000       |
|-------------------------|------|------|------|------|------|------|---------------|------|------|------|------|-------------------|
| Total population        | 1.7  | 1.8  | 1.8  | 1.9  | 1.8  | 1.6  |               | 1.7  | 1.6  | 1.4  | 1.4  | 1.4 no target set |
| Children aged 0–4 years | 6.3  | 6.6  | 7.5  | 6.5  | 7.2  | 4.3  |               | 5.9  | 4.3  | 3.7  | 5.2  | 4.6 3.0           |

Notes: 1 The Year 2000 target for children aged 0–4 years reflects a 50% reduction in the baseline, as indicated in the BHO report.

2 ICD-9 E-codes for drowning do not identify major categories of interest in Australia, most notably drowning in swimming pools. A more informative classification has been used for drowning deaths registered from 1992 onwards.

Source: AIHW mortality database.

- Drowning results in many deaths in Australia every year. There were 259 deaths by drowning in 1995 with an age-standardised rate of 1.4 per 100,000 persons. The number was slightly lower in 1996 at 247 deaths.
- The death rate for drowning among babies and toddlers is higher than at any other age. In 1995, 67 children aged 0–4 years died by drowning, compared with 59 in 1996. The most common cause of death among 0–4 year olds in Australia, drowning accounted for 36% of all injury deaths of children in that age group.
- Death by drowning is more common among males than females. Even in the 0–4 years age group, the ratio was 2:1 in 1995.
- No target has been set for the Year 2000 for this cause of death in the population as a whole. Consecutive declines in 1993 and 1994 followed by a stabilisation of the rate in 1995 and 1996, suggest opportunities for further reductions in the death rate.
- Death by drowning among 0–4 year olds rose to 5.2 per 100,000 in 1995 but declined again to 4.6 per 100,000 in 1996. Based on the long-term trend since 1986, the Year 2000 target is likely to be met.

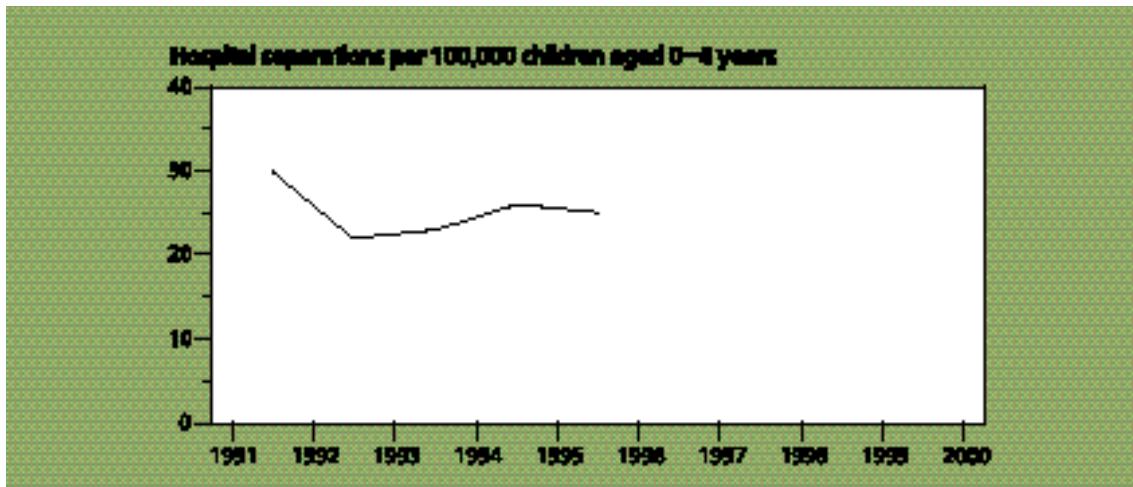
## Appendix 1

### Indicator 11.2

#### Hospital separation rate for near-drowning among children aged 0–4 years

(ICD-9 E910)

#### National trend



| Children       | Baseline 1991–92 | 1992–93 | 1993–94 | 1994–95 | 1995–96 | Target 2000 |
|----------------|------------------|---------|---------|---------|---------|-------------|
| Aged 0–4 years | 29.5             | 21.8    | 23.1    | 25.7    | 25.1    | 20.7        |

*Notes:* 1 A baseline of 12 separations per 100,000 population is given in the BHO report, a figure based on research by Nolan & Penny (1992). The baseline given above has been updated using information extracted from the national database.

2 The Year 2000 target reflects a 30% reduction in the baseline, as indicated in the BHO report.

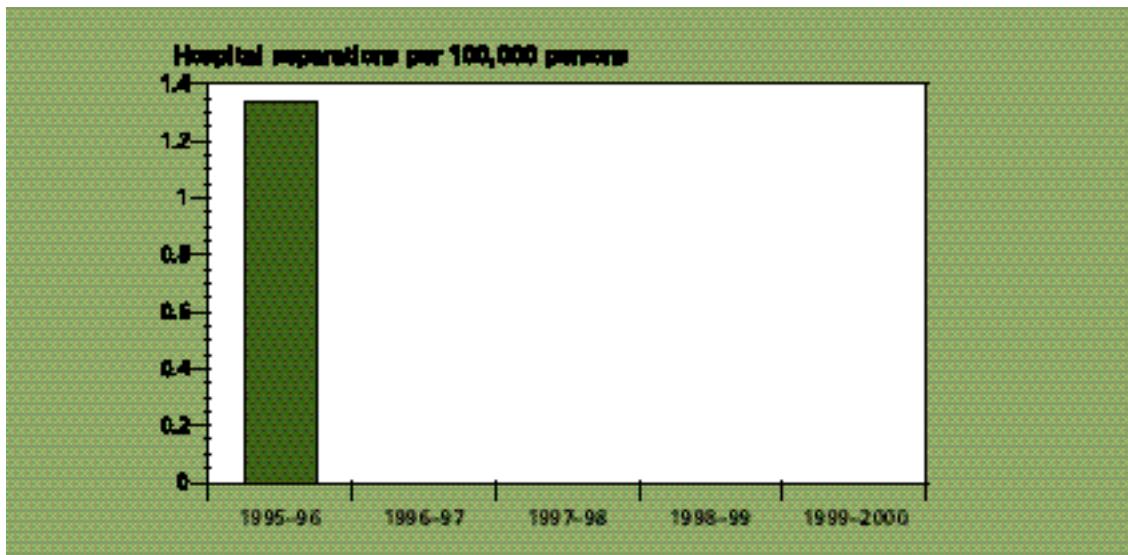
*Source:* AIHW hospital morbidity database.

- Near-drowning episodes for children aged 0–4 years is a continuing problem. In 1995–96, there were 326 episodes of hospitalisation following near-drowning, at a rate of 25 per 100,000. Almost twice as many boys (209 episodes) as girls (117 episodes) were hospitalised.
- Over the period 1991–92 to 1995–96, the number of episodes has remained reasonably static.
- Currently, due to data coding, it is not possible to determine where the majority of these cases are occurring. Pool-fencing legislations have been introduced in most jurisdictions, but without a more precise code as to the place of occurrence (pool, bath, etc) it is not possible to determine the overall effectiveness of these legislations.
- The rate for near-drowning has remained reasonably static since 1993–94. It is not possible to ascertain progress towards the Year 2000 target.

## Indicator 14

### Incidence rate for persistent spinal cord injury from traumatic causes

#### National rate



| Population group | 1995-96 | Target 2000   |
|------------------|---------|---------------|
| Total Population | 1.34    | no target set |

*Notes:* 1 The indicator given in the BHO report is stated in general terms. It has been redesigned to be more specific and reflect the nature of data collection through the Australian Spinal Cord Injury Register.  
2 No baseline has been established for this indicator because of the recency of the data collection. Both the baseline and the target would need to be established at a later date.

*Source:* Australian Spinal Cord Injury Register.

- The recent establishment of the Australian Spinal Cord Injury Register enables this indicator to be monitored. The scope of the Register is cases admitted to any of the specialist spinal units in Australia. Research into means to correct spinal cord injury is beginning to show some promise, but primary prevention remains important.
- In general terms, the incidence rate for spinal cord injury from traumatic causes is an indicator related to primary prevention of this condition. However, practical difficulties prevent meaningful measurement of cases of spinal cord injury that result in early or immediate death. Furthermore, permanence of injury often cannot be determined immediately after the event.
- For these reasons, the incidence rate of 'persistent spinal cord injury' (defined as cases where neurological deficit is present at the time of discharge) is a more suitable indicator.
- Spinal cord injury resulting from disease conditions (eg metastatic malignancy) is not covered by this indicator, as the causal factors and possibilities for prevention are markedly different.
- In the first year of the operation of the register, the incidence rate for persistent spinal cord injury resulting from traumatic causes was estimated to be 1.34 cases per 100,000 population (O'Connor & Cripps 1997).



## **Appendix 2**

# **Data and statistical issues**

## **Data issues**

This Appendix provides a brief overview of data requirements for improved monitoring of NHPA injury prevention and control indicators. It also provides a more detailed status report on using hospital separations data for defining and monitoring injury indicators, including suggestions for revision of the current indicators.

## **Sources of national data**

Major databases accessed for reporting on NHPA injury indicators are:

### **Mortality database**

Registration of deaths in Australia is the responsibility of the State and Territory Registrars of Births, Deaths and Marriages. Information on the cause of death is supplied by the medical practitioner certifying the death or by a coroner. Other information about the deceased is supplied by a relative or other person acquainted with the deceased, or by the official institution where the death occurred. Registration of death is a legal requirement in Australia, and compliance is virtually complete.

Information on deaths is provided by the Registrars to the Australian Bureau of Statistics (ABS) for coding of information and compilation into national statistics. AIHW maintains these data without unique identifiers in a national database. The reliability of deaths data depends principally on the information available in coroners' records and on the reliability of the application of ICD-9 E-codes, generally based on that information. There is considerable potential for factors relating to information recording or coding to affect data quality. Beginning with 1993 registrations, data coding has been centralised at the Brisbane office of the ABS. This arrangement should improve comparability of the information.

Deaths data are based on year of registration rather than year of death but for Indigenous deaths included in this analysis the latter information was used.

### **Hospital morbidity database**

Hospitals collect information about the patients they treat, both administrative and clinical data, including sociodemographic, diagnostic and duration of stay data and the procedures performed. This information is aggregated, on an admitted patient basis, by the various State and Territory health authorities, and by the Department of Veterans' Affairs. The AIHW receives the collections from various agencies, and maintains these without unique identifiers in a national hospital morbidity database.

## Appendix 2

Hospital separations for 1991–92 and 1992–93 relating to injury did not include data from the Northern Territory, as appropriate ICD-9 E-code data to four digits were not available at the time the information was collated. The coverage of public and private hospitals also varies. Information on separations from private hospitals in Victoria, Western Australia, the Australian Capital Territory and the Northern Territory is not included in the national collection for the years 1991–92 and 1992–93.

Hospital separation datasets for 1993–94, 1994–95, and 1995–96 exclude Victorian cases in which an E-code appeared in association with the second or subsequent diagnosis and not with the principal diagnosis. Such cases were included for 1991–92 and 1992–93 if the E-code appeared as one of the first six values in the diagnosis field.

The 1994–95 estimates of burns and scalds hospitalisations are inflated, probably by about 7 per cent. This is because the E-code values in the New South Wales and Northern Territory data for that year were limited to three digits, and the indicator requires information at the fourth digit. Consequently, all New South Wales and Northern Territory cases coded to E924 were included, as it was not possible to restrict inclusion to those coded to E924.0. In each of the adjacent years, about 80 per cent of the E924 cases in New South Wales and the Northern Territory had zero as the fourth digit.

The hospital separations data do not currently provide a reliable indication of changes in the incidence of injury requiring hospitalisation because of technical factors such as changing hospital coverage, possible changes in hospital admission practices, and uncertainty about the quality of external cause coding. Potential solutions to these matters are outlined below.

### Other sources

Information for the indicator on spinal cord injury was derived from the Australian Spinal Cord Injury Register.

## Status of injury indicators

Several of the NHPA injury indicators are based on mortality statistics aimed at providing a perspective on the cause of death. The current set of 12 mortality-related indicators not only offers some measure of external cause of death but also provides comparative information on various population groups. Most of the indicators are designed to extract maximum information on the cause of death by focussing on age groups, sex or populations most exposed to a particular environmental hazard.

Mortality data remain the most comprehensively collected national data pertaining to health. However, problems relating to coding of all conditions listed on death certificates, inadequate coding of factors relating to fatal injury (such as type of injury, place of injury) and poor identification of priority populations remain. Proposed changes to death registration, and the introduction of automatic coding, will allow study of all conditions on death certificates. Inadequate coding of factors relating to fatal injury will be addressed with the introduction of ICD-10 coding in 1998.

A major difficulty encountered in using the mortality datasets is the poor identification of Indigenous peoples in New South Wales and Victoria, and no information on Indigenous peoples in Queensland. Trends analysis for indicators of Indigenous mortality were therefore limited to the Northern Territory, Western Australia and South Australia, following Anderson et al (1996).

While there are issues of data comparability (information on injury-related deaths is provided by coroners or medical practitioners), a major limitation of the current set is that no information can be provided on other mitigating circumstances. Information on factors that increase susceptibility to injuries is also not covered by this set. Examples are indicators of blood alcohol content in traffic accidents and osteoporosis in fall-related injuries.

Despite recent improvements in the availability and quality of hospital separations data, reliable monitoring of injuries requiring hospitalisation cannot yet be based on this data source. Differences in rates between jurisdictions and changes over time are noted in hospital separation statistics, but much of this difference may be due to differences in coding practices and other characteristics of the information systems. It is not possible to delineate these factors fully at present.

The injury indicators based on hospital separation statistics are presently defined in terms of 'external cause'. Characteristics of the data and of data collection systems suggest that the validity of indicators will be improved by recasting them first in terms of 'principal diagnosis', and then in terms of 'external cause'. This is largely because 'principal diagnosis' has been the subject of more attention to ensure its quality than has 'external cause'.

Redesigning the indicators to improve the quality of monitoring is limited by the present coding of data supplied for each admitted patient separation. Further improvement would require changes in the information collected. In particular, the changes that would assist in this regard are:

- a data item that distinguishes whether an episode of care is the first (at any hospital) due to a particular injury event, or a subsequent one;
- a data item to flag injuries that arise while the injured person is engaged in health care activity, as a patient or as a client; and
- more attention to data quality assurance for external cause codes and for the associated item 'place of occurrence'. The same will apply to 'activity when injured', a new item to be introduced as part of ICD-10.

The subject matter of the current set of indicators was determined as much by the types of information available at the time they were developed as by an assessment of ideal indicator topics. The committee that developed the injury chapter in *Better Health Outcomes for Australians* (DHS 1994) discussed and proposed goals for a broad range of injury issues. However, numeric targets could not be established for an indicator unless baseline data were available at the time. Aspects of injury raised by the committee and for which suitable baseline data were not available include: work-related injury; sport-related injury; alcohol and injury (except road injury); consumer safety; near-drowning and consequences of diving into shallow water; and access to optimal trauma care, rehabilitation and support.

# Limitations of existing collections for NHPA injury reporting

Existing deaths-related collections and hospital inpatient data systems can only provide quite limited capability for monitoring injury, even after the aforementioned technical problems with the hospital data have been overcome. A large and probably increasing proportion of injury cases do not result in death or admission to a hospital. Little information is available on injury not resulting in death or admission to a hospital, though such cases account for much of the burden of injury. Development of data sources for cases treated in ambulatory care settings (emergency departments, general practices, sports medicine clinics etc) is necessary to overcome this deficiency.

In addition, existing sources provide limited information on the cases that come within their scope. This leads to 'blind spots' (eg it is still not possible to identify work-related and sport-related cases adequately), and severely limits the potential for using the data to guide preventive initiatives. Efforts are being made to correct several of these blind spots in the data. There is often a long time lag before new data actually become available. For example, coding changes designed to improve identification of sporting injuries in hospital inpatient records were developed in 1995, published in the second Australian edition of the ICD-9-CM early in 1996, and began being used to code cases on 1 July 1996. The resulting data are unlikely to become available for national surveillance reporting before 1998.

The capacity to monitor the current NHPA indicators, and the potential to develop better ones, depends on data system developments. Some indicators may require only relatively minor changes to the existing data sources. Others may require the development of new systems. These are indicated in the notes below.

## Minor changes

### Injury deaths

- Introduction of all relevant codes, when ICD-10 is introduced for routine deaths coding ie injury and poisoning codes, and external causes codes including 'place and activity'.
- Annual (or biennial) updating of external causes codes used for deaths data to parallel changes in the Australian ICD.

### Hospitalised cases

- Revise definitions of current indicators to better allow for limitations of current data.
- Add certain new categories to the Australian ICD-10.
- Give more attention to testing and improving the quality and consistency of coding 'external causes' of injury.
- Add a data item to indicate whether an inpatient episode is the first or subsequent admission due to a particular injury.

## New systems

### Injury deaths

- Implement National Coroner Information System.

### Ambulatory cases

- Continue development and implementation of emergency department surveillance based on a nationally representative sample of cases.
- Use the proposed general practice activity survey to obtain a sample of injury cases attending general practitioners.
- Investigate potential for representative sampling of injury cases attending other ambulatory services.

### Special collections

- Investigate the needs and opportunities for special purpose information systems concerning brain injuries, severe burns and other topics.
- Assess the potential for developing national-level reporting based on hospital, regional and State and Territory trauma registers.
- Develop national sports injury data collections and reporting systems.
- Introduce a series of national sample surveys of injury risk factors.

## Towards useful and valid indicators of injury morbidity

The current indicators based on hospital statistics need to be revised or redesigned for statistically valid monitoring of hospitalised injury. This section describes the problems with the current indicators, and proposes an approach to revise them.

### Restrict the scope of the indicators to cases whose principal diagnosis code is in the injury and poisoning chapter of the ICD

The current hospital morbidity indicators are defined in terms of external cause codes. Ostensibly, this approach was taken because external cause codes form the basis for nearly all analyses of injury mortality in Australia.

Analysis of morbidity data suggests two reasons why the scope of injury indicators should be limited to cases whose principal diagnosis code is included in the ICD chapter 'Injury and Poisoning' (chapter 17 in ICD-9-CM and chapter 19 in ICD-10). The first reason is the way external cause codes are dealt with in the data file. This introduces inconsistency between the jurisdictions if cases are defined solely in terms of external cause codes in one or more of the States and Territories.

The second reason is that cases given an external cause code, and a principal diagnosis code *not* included in the 'Injury and Poisoning' chapter, appear to be very different from those whose principal diagnosis code is available in that chapter.

## Appendix 2

Further investigation may determine that some of the aforementioned cases are relevant to injury reporting. In the meantime, however, improvement in the validity of the indicators may be achieved by limiting them to cases whose principal diagnosis is in the 'Injury and Poisoning' ICD chapter.

### **Introduce terms and definitions to clarify the reporting of injury related to medical care, and other injury**

The current NHPA indicators for injury are aimed at community injury, resulting from road crashes, suicide, sports, and exclude adverse effects of medical care and related medical injury. The exclusion has limited impact on injury mortality reporting, as less than 1 per cent of 'external causes' deaths are attributed to adverse effects of medical care. However, it has a large impact on the reporting of hospital cases. In 1995–96, adverse effects of medical care accounted for 13 per cent of cases whose principal diagnosis was recorded as 'injury or poisoning', and were associated with 4.4 per cent of all cases of hospitalisation (Hargreaves & Madden forthcoming). Further development of ICD-10 external cause codes is planned to enable better reporting of adverse effects within routine hospital statistics.

### **Use information available in the hospital morbidity data files to determine injury cases requiring hospitalisation**

The main focus of the injury indicators is to monitor the occurrence of new cases of injury, as this is the measure that primary prevention efforts aim to reduce.

Many injuries result in only one episode of admitted patient care, but some may result in more than one. This may occur when a person is admitted to one hospital, then transferred to another facility, or when there is planned or unplanned readmission to the original hospital. In addition, some cases are 'statistically' discharged and readmitted.

Preferably, the hospital separation data collection would distinguish the first from subsequent episodes of care arising from a single injury event. Ideally, the collection would enable the set of episodes due to a particular injury to be linked and such a development is now underway in Western Australia.

The information currently available in the data file enables reduction of the degree of overestimation of incidence of injury requiring hospitalisation due to multiple admissions. The most useful item in this regard is 'mode of separation', with a category 'discharge/transfer to an(other) acute hospital'. Implicitly, any case in this category should be counted as an episode of care at the destination hospital. Omission of such cases would improve estimates of injury cases requiring hospitalisation. Estimates of total patient days or average length of stay for a class of injury cases should, however, include these cases.

The same reasoning may also apply to two other modes of separation: 'statistical discharge-type change' and 'statistical discharge from leave'. Other injuries that should be omitted when estimating the incidence of new injury cases are those coded as 'late effects of injury'.

## Technical considerations

Technical issues concerning individual indicators have been discussed in Appendix 1. However, there are several issues that are common to several indicators. These include not only the demographic and statistical techniques used for determining rates, ratios and trends but also those that pertain to age-standardisation, establishment of baselines and progress towards the targets. This Section provides information to assist in the interpretation of data and statistical analysis given in the report.

### Modelling of trends

Underlying trends were determined by using a Poisson regression model, with a Poisson error distribution, a log link function and the natural log of population count treated as an 'offset' (Breslow & Day 1987; Brillinger 1986; Valkonen 1989).

For a particular cause of death, the model may be expressed as:

$$\log_e(D_t) = \log_e(N_t) + \text{constant} + \alpha t$$

where  $t$  is the year of registration of death or incidence,  $D_t$  is the expected number of new cases or deaths registered in year  $t$ ,  $N_t$  is the mid-year population in year  $t$ , and  $\alpha$  is the estimated annual rate of increase or decrease. An annual rate of change based on  $\alpha$  was derived as follows:

$$\text{per cent change} = [e^\alpha - 1] \times 100$$

This model uses the assumption that the annual rate of change is the same across all of the years used in this estimation. More complex models could be applied, but were not justified due to the small number of data points available for fitting the model.

The model was used to estimate trends in age-standardised death rates, using mortality data for the period 1986–94. Fitted trend lines are represented on the graphs. These lines, however, have not been extrapolated beyond the latest available data point. Trend lines were not fitted for hospital separation-related indicators, because of technical difficulties described earlier.

### Age-standardisation

To control for any effects of differing age structures, direct age-standardisation was applied to death rates, incidence rates, prevalence rates and hospital separation rates. The standard population used in age adjustment was the total estimated resident population of Australia at 30 June 1991 (Table A2.1).

## Appendix 2

**Table A2.1 Age composition of the Australian population by sex, 30 June 1991**

| Age group (years) | Males            | Females          | Total             |
|-------------------|------------------|------------------|-------------------|
| 0–4               | 652,302          | 619,401          | 1,271,703         |
| 5–9               | 652,418          | 619,790          | 1,272,208         |
| 10–14             | 638,311          | 603,308          | 1,241,619         |
| 15–19             | 698,773          | 665,301          | 1,364,074         |
| 20–24             | 707,124          | 689,640          | 1,396,764         |
| 25–29             | 702,728          | 696,935          | 1,399,663         |
| 30–34             | 713,784          | 711,951          | 1,425,735         |
| 35–39             | 664,228          | 664,159          | 1,328,387         |
| 40–44             | 655,138          | 639,133          | 1,294,271         |
| 45–49             | 526,498          | 502,647          | 1,029,145         |
| 50–54             | 433,762          | 413,172          | 846,934           |
| 55–59             | 367,302          | 358,648          | 725,950           |
| 60–64             | 366,779          | 370,089          | 736,868           |
| 65–69             | 320,142          | 351,248          | 671,390           |
| 70–74             | 228,494          | 282,261          | 510,755           |
| 75–79             | 158,993          | 225,502          | 384,495           |
| 80–84             | 84,413           | 145,415          | 229,828           |
| 85 and over       | 44,220           | 110,027          | 154,247           |
| <b>Total</b>      | <b>8,615,409</b> | <b>8,668,627</b> | <b>17,284,036</b> |

*Source:* Australian Bureau of Statistics.

The usual convention of using age-specific rates for five-year age groups, as shown in Table A2.1, was followed using the formula:

$$SR = \sum \{R_i \times P_i\} / \sum P_i$$

where      SR = the age-standardised rate

R<sub>i</sub> = the age-specific rate for age group i, and

P<sub>i</sub> = the standard population in age group i.

It should be noted that trends in age-standardised rates estimated using this standard population may differ from those obtained by using another standard population.

Indirect age-standardisation was used for computing standardised mortality ratios (SMR) between Indigenous and non-Indigenous populations.

The analysis of trends in mortality is usually done by year of registration, rather than year of occurrence, to utilise data for the latest year of registration. For Australia as a whole this makes little difference because the proportion of deaths not registered in the year of occurrence is fairly constant from year to year. However, the proportion of Indigenous deaths not recorded in the year of occurrence varies by year and jurisdiction (Anderson, Bhatia & Cunningham 1996). An analysis of Indigenous mortality by year of registration could be misleading; the estimates used in this report are therefore based on year of occurrence of death.

## Rural, remote and metropolitan areas classification

To compare the death rate ratio for injury and poisoning among people living in rural and remote areas of Australia and the general population (Indicator 2.4), the deaths data were cross-categorised using the Rural, Remote and Metropolitan Areas (RRMA) classification. The classification has been developed by the Commonwealth Departments of Primary Industries and Energy (DPIE) and Health and Family Services (DHFS) based primarily on population numbers and an index of remoteness. The RRMA categories show a natural hierarchy, providing a model for incremental health disadvantage with rurality and remoteness as risk factors. Based on population density, the following three zones and seven area categories are recognised as discussed in Table A2.2.

**Table A2.2 Structure of the Rural, Remote and Metropolitan Areas (RRMA) classification**

| <b>Zone</b>                                    | <b>Category</b>  |
|--|--|
| Metropolitan zone                              | Capital cities<br>Other metropolitan centres (urban centres population $\geq 100,000$ )  |
| Rural zone<br>(index of remoteness $< 10.5$ )  | Large rural centres (urban centres population 25,000 – 99,000)<br>Small rural centres (urban centres population 10,000 – 24,999)<br>Other rural areas (urban centres population $< 10,000$ ) |
| Remote zone<br>(index of remoteness $> 10.5$ ) | Remote centres (urban centres population $\geq 5,000$ )<br>Other remote areas (urban centres population $< 5,000$ )  |



# Acronyms and abbreviations

|         |  |
|---------|--|
| AACRT   | Australian Advisory Committee for Road Trauma                    |
| ABS     | Australian Bureau of Statistics                                  |
| ACHS    | Australian Council on Healthcare Standards                       |
| AHMAC   | Australian Health Ministers' Advisory Council                    |
| AIHW    | Australian Institute of Health and Welfare                       |
| BHO     | Better Health Outcomes for Australians                           |
| CADIS   | Computer Aided Dispatch Information Service                      |
| CRS     | Commonwealth Rehabilitation Service                              |
| DHFS    | Commonwealth Department of Health and Family Services            |
| EMST    | early management of severe trauma                                |
| FORS    | Federal Office of Road Safety                                    |
| HAS     | HAS Solutions Emergency Department Patient Management System     |
| HOPI    | health outcome performance indicator                             |
| ICD     | International Classification of Diseases                         |
| ISIS    | Injury Surveillance Information System                           |
| MUARC   | Monash University Accident Research Centre                       |
| NCIS    | National Coroners Information System                             |
| NDSIS   | National Data Set for Injury Surveillance                        |
| NHMRC   | National Health and Medical Research Council                     |
| NHPA    | National Health Priority Areas                                   |
| NIPAC   | National Injury Prevention Advisory Council                      |
| NISU    | National Injury Surveillance Unit                                |
| NOHSC   | National Occupational Health and Safety Commission               |
| NPHP    | National Public Health Partnership                               |
| NRTAC   | National Road Trauma Advisory Council                            |
| OATSIHS | Office for Aboriginal and Torres Strait Islander Health Services |
| QEMSAC  | Queensland Emergency Services Advisory Committee                 |
| RADGAC  | Research and Development Grants Advisory Committee               |

## **Acronyms and abbreviations**

|        |   |
|--------|---|
| SATCAC | South Australian Trauma Clinical Advisory Committee |
| SMR    | standardised mortality ratio                        |
| USCPSC | United States Consumer Product Safety Commission    |
| VEMD   | Victorian Emergency Minimum Dataset                 |
| WHO    | World Health Organization                           |
| YPLL   | years of potential life lost                        |

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# National Health Priority Areas 1997



## Injury Prevention and Control

The National Health Priority Areas (NHPAs) initiative is a collaboration between the Commonwealth, State and Territory Governments which aims to improve the health of Australians by targeting groups of diseases or conditions which impose a high social and financial cost and offer the opportunity for significant health gain. The initiative aims to identify the most appropriate promotion, prevention and intervention strategies in terms of outcomes, cost-effectiveness and equity for the health areas targeted.

The *First Report on National Health Priority Areas 1996* focused on the health of Australians by documenting progress towards goals and targets for the five priority areas of cardiovascular health, cancer control, injury prevention and control, mental health and diabetes mellitus.

The NHPA Report on *Injury Prevention and Control 1997* updates the data and trends provided in the *First Report* for the injury NHPA, provides an overview of progress in the field of injury, and identifies opportunities for improving injury prevention and control.