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

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	✗	✗

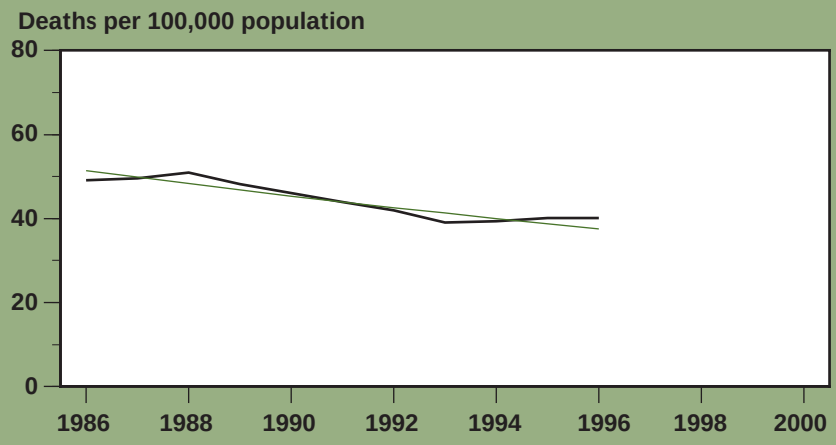
Note: These indicators are a priority subset of the indicators listed in the BHO report (DHFS 1994).

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.

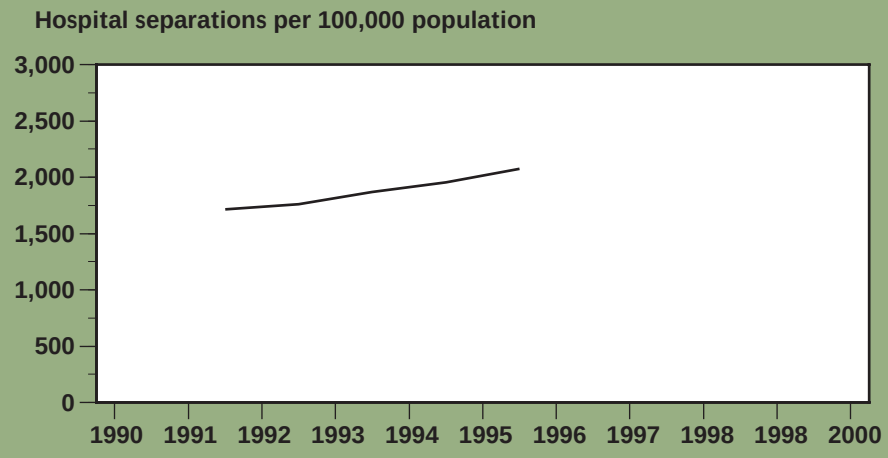
- Injury and poisoning constitute the fourth leading cause of death in Australia. In 1995, there were 7,357 deaths due to injury with an age-standardised death rate of 40.1 per 100,000 persons. The number of deaths registered in 1996 increased to 7,469.
- Injury death rates vary dramatically with age 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.

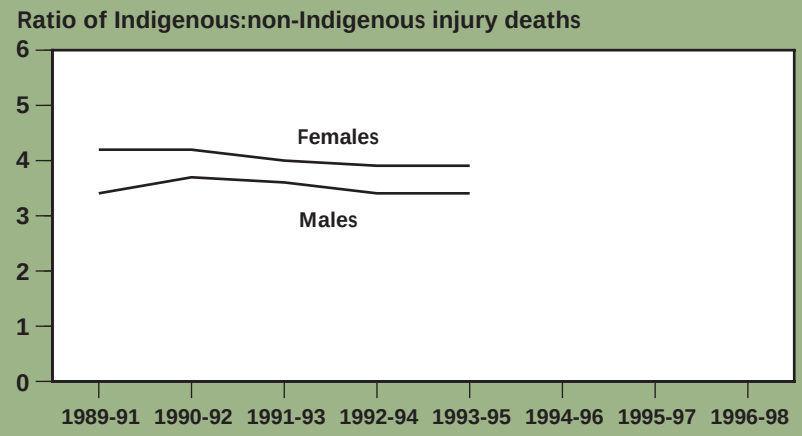
- In 1995–96, injury or poisoning accounted for 377,955 hospital separations at an age-standardised rate of 2,078 episodes per 100,000 population. Overall, there were about 50 hospital separations for every death due to injury.
- The age-standardised hospital separation rate for all injuries was higher 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).

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.

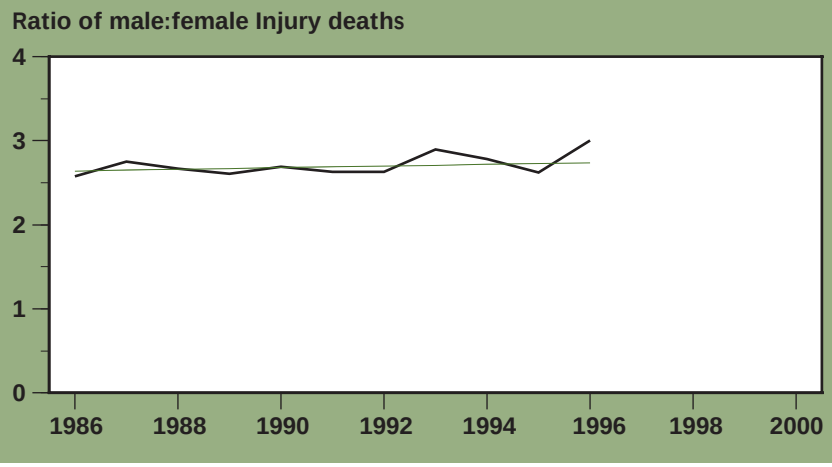
- Injury is one of the leading causes of death among Indigenous peoples, with an age-standardised death rate of 201 per 100,000 males and 82 deaths per 100,000 females in 1993–95.
- The death rates for injury are much higher among the Indigenous population than in the non-Indigenous population. The death 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	2.9	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.

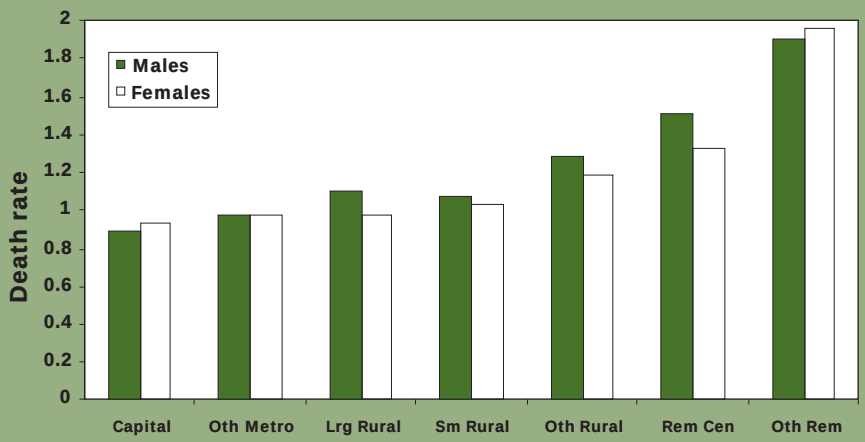
- Death rates for injury have been historically much higher among males than females. In 1995, there were 5,130 male deaths and 2,227 female deaths, with an age-standardised death rate ratio of 2.6:1.0. The ratio increased to 3.0:1.0 in 1996.
- The rate of decline in injury death rates over the past 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.

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



	RMAA category						
Sex	**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.

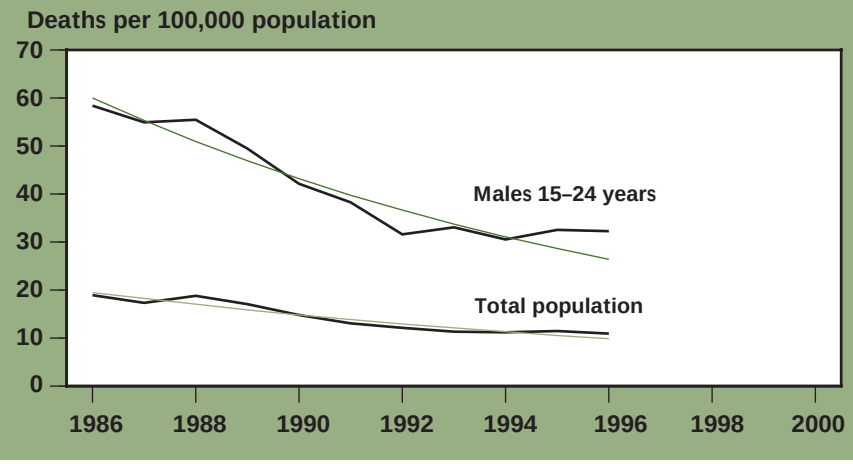
- The health disadvantage of rural and remote Australians is well described by differentials in death rates for injury and poisoning. An incremental rise in the rate for fatal injuries is noted as one travels away from capital cities and metropolitan areas to rural and remote areas of Australia (Titulaer, 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 & DHSH 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.

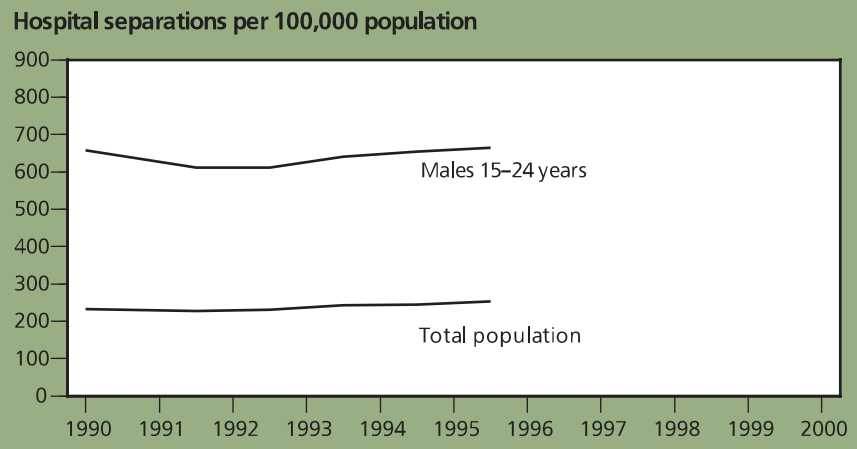
- Road transport-related accidents are a major cause of injury deaths. The death rates are particularly high among 15–24 year old males (almost three times that in the total population). In 1995, as many as 2,058 deaths (1,420 males and 638 females) occurred as a result of accidents on Australian roads. 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).

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.

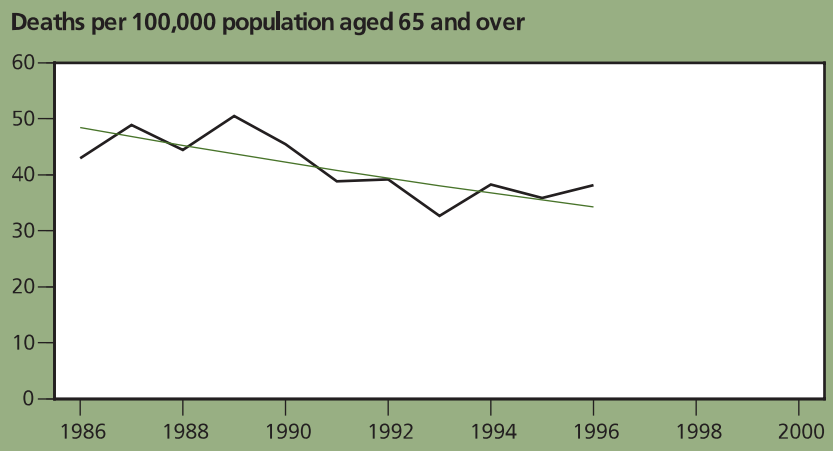
- In 1995–96, there were almost 46,000 hospital separations due to road transport-related injuries at an age-standardised rate of 253 injuries per 100,000 population.
- Males aged 15–24 years are most at risk from road transport-related accidents. Over 9,000 males in this age group were hospitalised, 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.

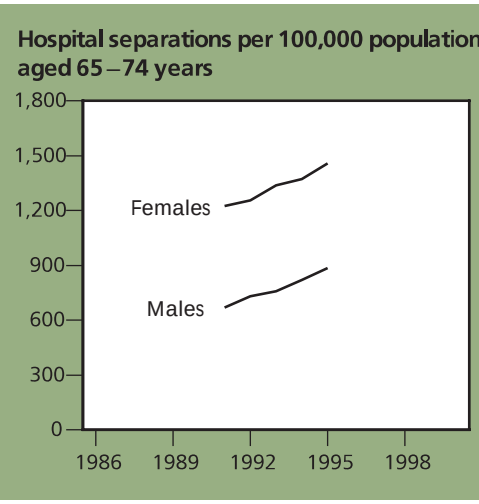
- A large proportion of deaths from external causes in old age result from falls, primarily due to complications developed after the fall. The proportion rises with age, from about 15% of deaths from all external causes among people aged 65–69 years to about 75% at age 85 years and above.
- Fractures 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.

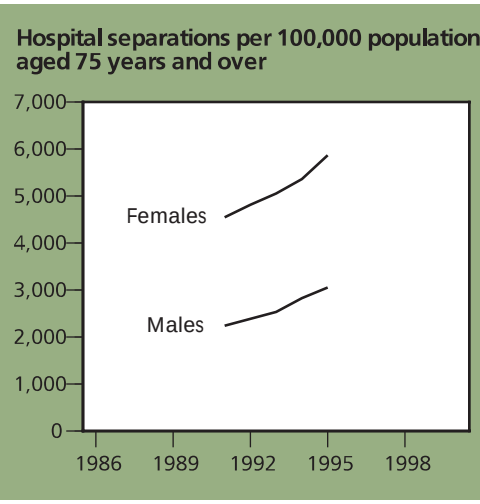
Indicator 5.2

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

(ICD-9 E800–888)

National trends





Age group	Sex	Baseline 1991–92	1992–93	1993–94	1994–95	1995–96	Target 2000
65–74 years	males	668	730	759	821	886	601
	females	1,225	1,256	1,336	1,370	1,456	980
75 years and over	males	2,242	2,391	2,539	2,823	3,059	2,018
	females	4,554	4,814	5,058	5,366	5,871	3,643

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.

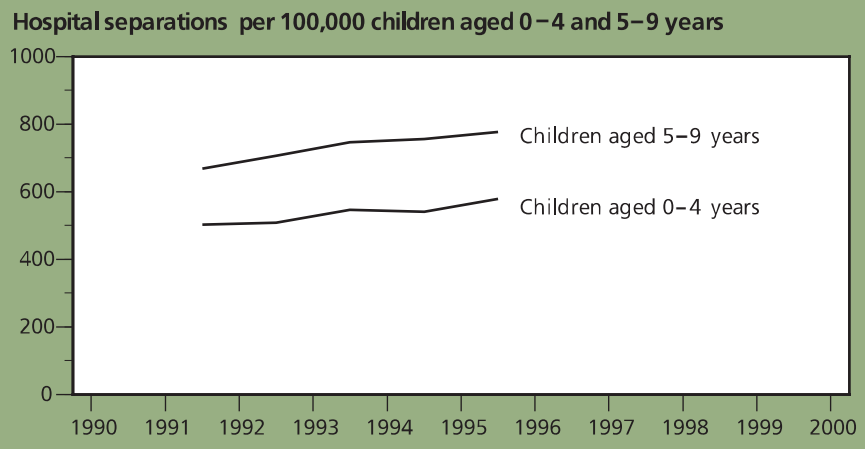
- Fall injuries contribute significantly to the number of hospital separations for all external causes. As people get older, the risk of hospitalisation from a fall increases substantially. Elderly persons aged 65 years or more are most at risk.
- Fractures are the most common serious injury resulting 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.

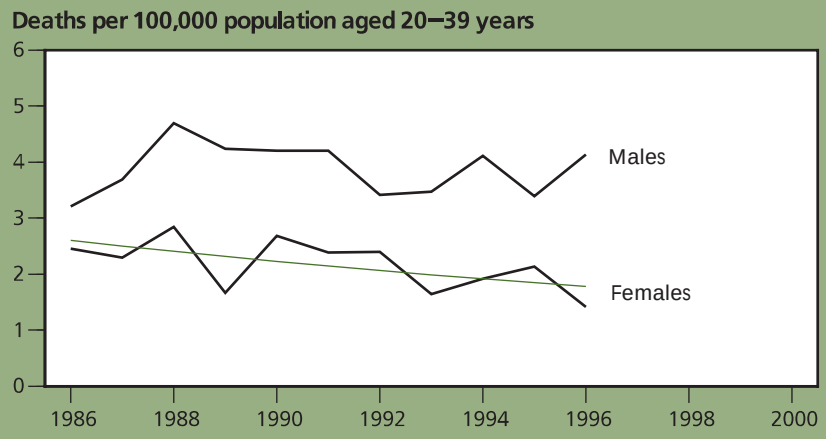
- Falls are the leading cause of hospitalisation for children. In 1995–96, there were 17,595 hospital separations for children aged 0–4 years (578 per 100,000) and 5–9 years (777 per 100,000), accounting for 5% of all hospital separations due to external causes of injury for all ages.
- Children aged 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.

Indicator 7.1

Death rate for homicide among people aged 20–39 years

(ICD-9 E960–978, E990–999)

National trends



Population group (20–39 years)	1986	1987	1988	1989	1990	1991	Baseline 1992	1993	1994	1995	1996	Target 2000
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.

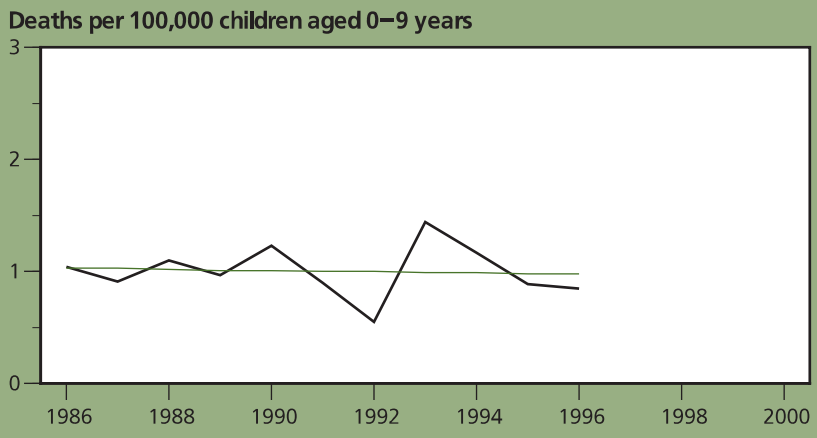
- Fatal outcomes from intentional injuries or homicides provide a practical indicator of the nature and extent of interpersonal violence in the population. However, homicides are not distributed evenly throughout the population, being more prevalent among young and Indigenous peoples, particularly those 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.

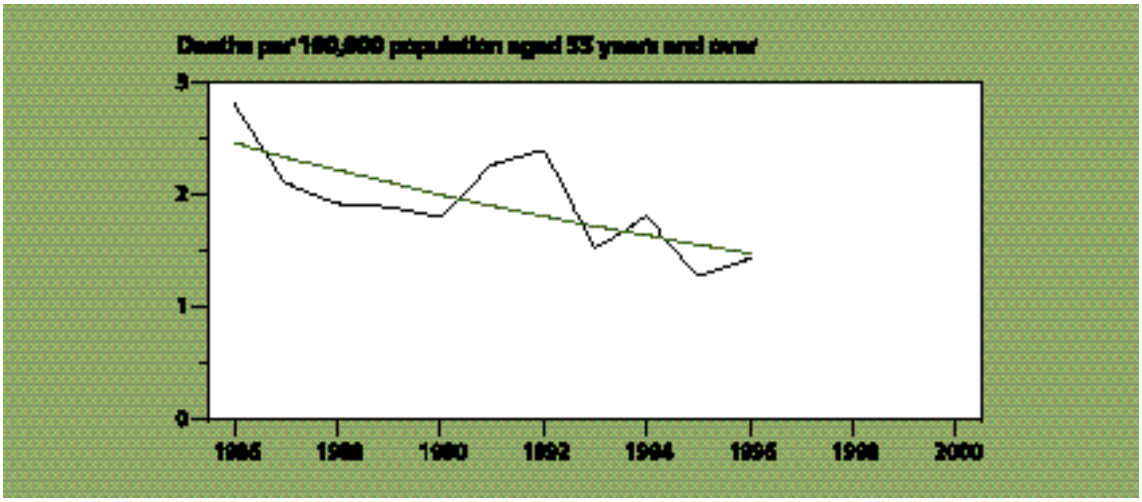
- A number of structural, cultural and psychosocial factors contribute to child battering and maltreatment. Injury deaths inflicted by others on children have been specifically targeted under the NHPA initiative.
- Babies and toddlers are at greater risk from death due to abuse and violence than are 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.

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.

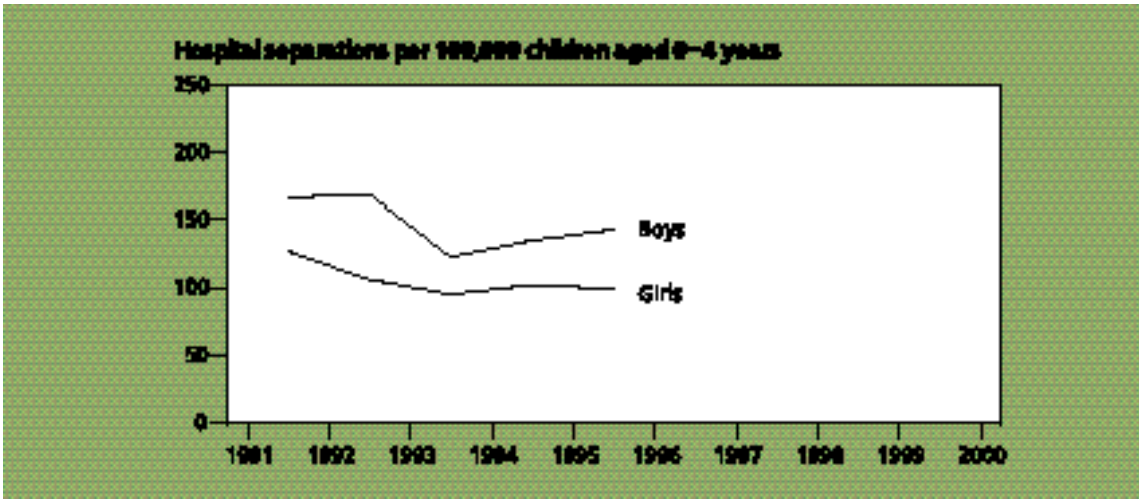
- Accidents due to fire, burns and scalds account for a relatively small proportion of injury incidents. However, the economic and long-term physical and psychosocial implications of serious burns and scalds injuries are enormous and highlight the need for more extensive preventive action.
- About 2% 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.

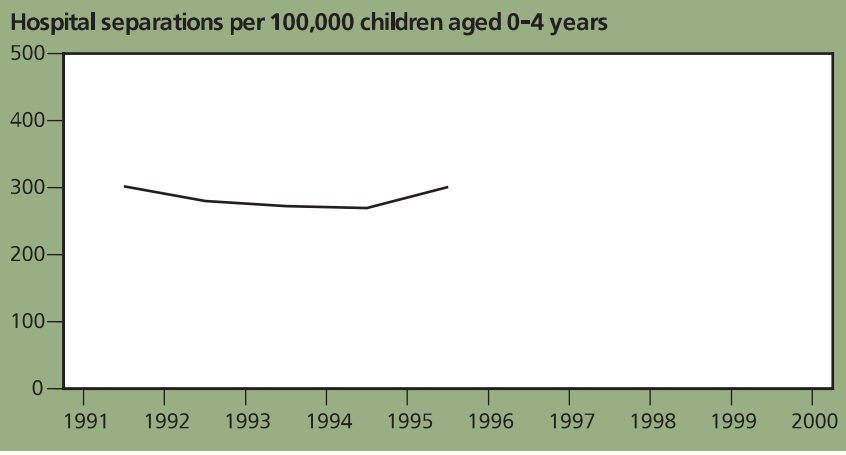
- In 1995–96 there were 1,581 separations for children aged 0–4 years admitted to hospital with injuries resulting from fire, burns or scalds at a rate of 122 per 100,000 population. Boys aged 0–4 years are at a higher risk for this type of injury, being almost one and a half times more likely to be 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.

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.

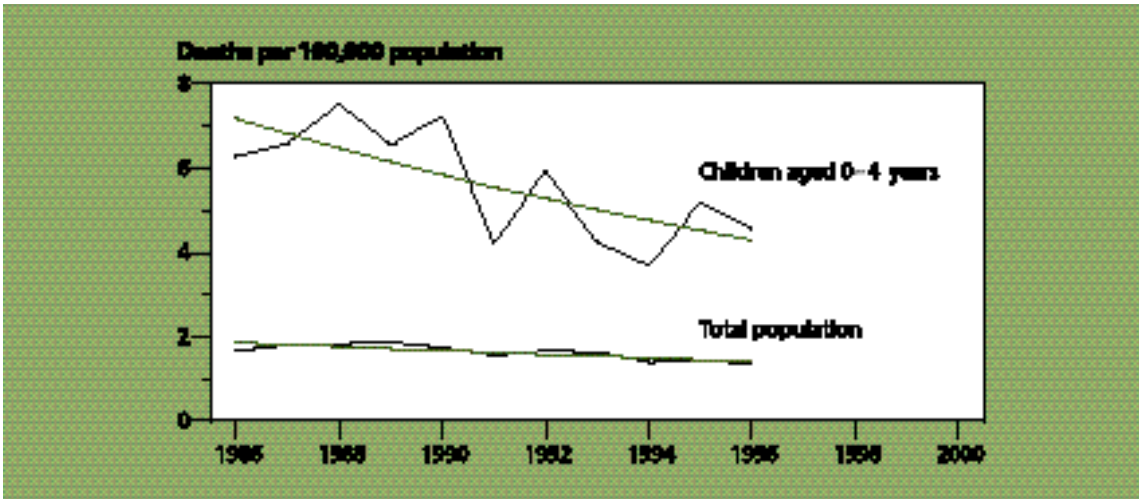
- Accidental poisoning due to drugs and medications or by domestic chemicals and other substances is a significant cause of hospital admission for children aged 0–4 years. In 1995–96, there were 3,903 hospital separations due to accidental poisoning at a rate of 301 per 100,000 population.
- Unlike other 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.

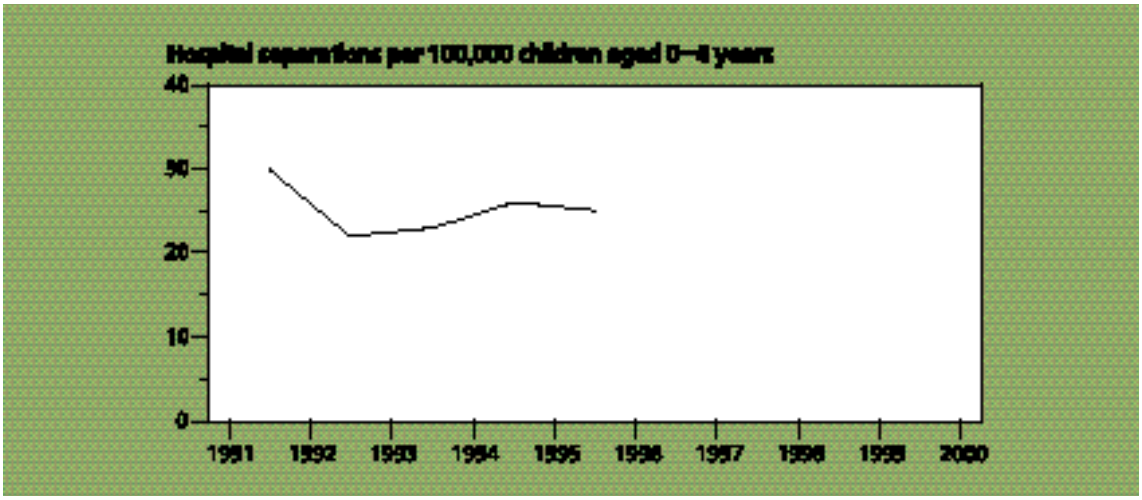
- Drowning results in many deaths in Australia every year. There were 259 deaths by drowning in 1995 with an age-standardised rate of 1.4 per 100,000 persons. The number was slightly lower in 1996 at 247 deaths.
- The death rate for drowning among babies and toddlers is higher than at any other age. 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.

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.

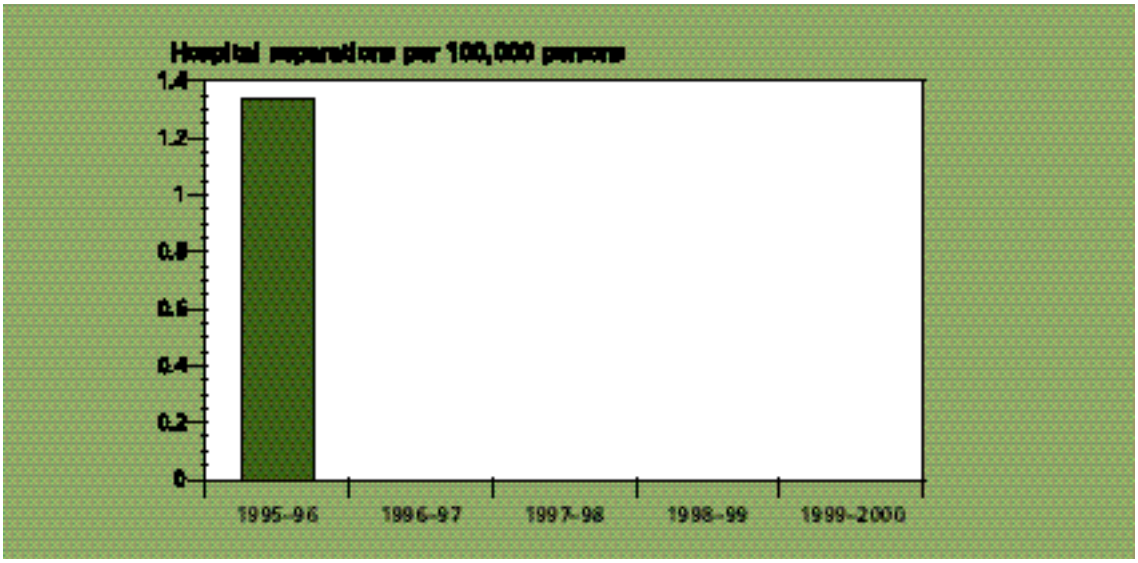
Source: AIHW hospital morbidity database.

- 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.

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* (DHSH 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.

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 α is the estimated annual rate of increase or decrease. An annual rate of change based on α 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
Total	**8,615,409**	**8,668,627**	**17,284,036**

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:

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

where SR = the age-standardised rate

R_i = the age-specific rate for age group *i*, and

P_i = 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

Zone	Category
Metropolitan zone	Capital cities
	Other metropolitan centres (urban centres population ≥100,000)
Rural zone (index of remoteness<10.5)	Large rural centres (urban centres population 25,000 – 99,000)
	Small rural centres (urban centres population 10,000 – 24,999)
	Other rural areas (urban centres population <10,000)
Remote zone (index of remoteness>10.5)	Remote centres (urban centres population ≥5,000)
	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.