



information

CIRCULAR

INJURY MORBIDITY AND MORTALITY IN QUEENSLAND

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SUMMARY

The main findings presented in this circular are:

- ▶ Injury is the leading cause of death in people younger than 45 years. Death rates from all injury have been declining since 1981-83. For most injury subcategories, death rates have declined or remained stable, with the notable exception of suicide deaths in males. However, latest figures indicate that the year 2000 targets in the National Health Priority Areas (NHPA) for most types of injury are unlikely to be met.
- ▶ Compared to the Australian average in the period 1994-98, Queensland had significantly higher mortality rates for injury in the total population, paediatric injury, suicide, motor vehicle accidents, and falls in those aged 65 and over.
- ▶ Of the National Health Priority Areas¹, injury provides the greatest potential for mortality reduction for the Queensland population. Of all injury subcategories suicide provides the greatest potential reduction in mortality.
- ▶ Higher risk groups include males, indigenous populations and people living in areas of low socio-economic status. Mortality rates are greater in rural and remote areas for total injury and road transport related injury. This difference is still apparent when the impact of the relatively high indigenous population in these areas is removed. Prevention strategies are needed to target these groups.
- ▶ Suicide, road transport injuries and falls are the three leading causes of injury mortality. Falls, road transport injuries and interpersonal violence are the three leading causes of hospitalisation due to injury. However, deaths and hospital separations represent only a small proportion of injury presentations, with a far greater proportion of injuries presenting to hospital emergency departments, general practitioners, first aid and other service providers.
- ▶ Similarly, the estimated cost of 290 million dollars for treatment of hospital inpatients for injury in 1997/98 represents only a small fraction of injury costs. Other direct costs include visits to hospital outpatient

¹ Cancer, injury & poisoning, cardiovascular disease, mental health, diabetes and asthma.

departments, non-hospital service providers, legal costs in work-related cases, equipment, pharmaceuticals and rehabilitation. Indirect costs are likely to be high because injury often results in permanent disability relatively early in life.

- The greater risk of all major types of injury in Aboriginal communities reflects a wide range of problems including abuse of alcohol and other substances, unemployment, limited availability of treatment services, economic dependency and unsafe environments. Strategies aimed at reducing injury will need to address a broad range of issues affecting the quality of life in these communities.
- While the health sector bears most of the costs related to injury treatment and rehabilitation, the capacity and responsibility for implementing many injury prevention strategies also rests with other sectors (eg workplace health and safety, sport and recreation, transport, education). Local government and police have a significant role to play in enforcing safety regulations.

INTRODUCTION

This information circular covers major aspects of mortality and hospital morbidity due to injury and poisoning in Queensland, as well as more detailed analysis of the major injury subcategories. Injury has been chosen as one of the six National Health Priority Areas (NHPAs), reflecting the importance of the problem to the community and its major impact in terms of mortality, morbidity, potential years of life lost and cost.

Deaths and hospital separations represent only a small proportion of injuries presenting to hospital emergency departments, general practitioners, first aid and other service providers. However, these other data sources are not available for all of Queensland and hence have not been fully utilised in this circular. By focussing on hospital separations and mortality, greater emphasis is placed in this circular on the more severe injuries. Subsequent information circulars will examine specific injury types in more detail (e.g. falls) and will utilise these other data sources.

Injury is an area in which improved health outcomes are achievable. To monitor health outcomes and the effect of interventions or services on the health of target populations, Queensland Health has chosen a number of health outcome indicators. These indicators are listed in the Queensland Health Outcome Indicator Dictionary, and have been adopted from the NHPA defined injury

prevention and control indicators. A year 2000 target has been set for most indicators and Queensland's progress against these targets is reported in the relevant sections (see also Appendix 1 for a summary of the status of NHPA injury prevention and control targets in Queensland).

Data were classified according to International Classification of Diseases 9th Revision (ICD9) External Cause codes. To be consistent with Queensland Health outcome indicators, "adverse effects" were in most cases not included in the calculation of counts and rates in this report (see Appendix 3 for methodology and definitions of outcome indicators and adverse effects). Hospital morbidity is reported in terms of hospital separations, which are based on episodes of care, and are defined in Appendix 3.

MORTALITY

Overview

- Of the 22,230 deaths in Queensland in 1998, 1,507 (6.8%) were due to injury. Injury was the fourth leading cause of death in Queensland after cancer, ischaemic heart disease and cerebrovascular disease (stroke). However, injury was the leading cause of death in people younger than 45 years. Of all deaths due to injury 58.5% occurred in this age group compared to only 5.4% of deaths due to all other causes.
- Of the leading causes of death, injury accounted for 27% of all potential years of life lost (PYLL) up to age 74 in 1998, compared to 27% of potential years of life lost for malignant cancers and 17% for total cardiovascular diseases (Figure 1). The effect of injury at young ages is clearly reflected in terms of potential years of life lost per death, with 32 PYLL per death due to injury in 1998, compared to 3.4 and 8.0 PYLL per death for cardiovascular disease and cancer respectively.
- There has been a downward trend in age standardised injury mortality rates, from 57.2 deaths per 100,000 in 1981-83 to 44.9 deaths per 100,000 in 1996-98 (Figure 2). Even with this trend it is unlikely that the NHPA year 2000 target of 33.6 deaths per 100,000 will be achieved (Table 1).
- Injury accounted for one third of all deaths in children aged under 15 years in Queensland² for the period 1996 to 1998, more than half of which involved children under five years (Queensland Council on

² This does not include neonatal deaths, ie. up to 28 days after birth.

Obstetric and Paediatric Morbidity and Mortality, 1998). By far the biggest single cause of death due to injury for 1 to 4 year olds was drowning in domestic swimming pools (n=32), followed by slow speed pedestrian (eg. driveway) runovers (n=14), vehicle passenger accidents (n=13), high speed pedestrian runovers (n=11) and house fires (n=11).

Interstate and overseas comparisons

- Of all the states, only Queensland and Tasmania had significantly higher mortality rates from injury than Australia as a whole for the period 1994-98 (Figure 3A). In the under 15 years age group, only Queensland and Western Australia had significantly higher injury mortality rates than Australia (Figure 3B). An important contributor to the excess mortality in the paediatric age group (under 5 years of age) is pool drownings. While not statistically significant, Queensland and Western Australia were the only states where mortality rates for pool drownings among children under five were higher than the Australian average (Figure 3C).
- Compared to the whole of Australia in the period 1994-98, Queensland had significantly higher mortality rates for suicide, motor vehicle accidents, and falls in those aged 65 and over (Figures 3D-F). Homicide rates were higher than the Australian average, but not significantly so (Figure 3G).
- Compared with 20 selected OECD countries in 1994, Queensland's mortality rate was 8th highest for deaths due to injury and poisoning (Figure 4) and this rank had not changed from 1988. Injury and poisoning is the National Health Priority Area which represents the greatest potential for saving of years life lost if Queensland rates were reduced to the lowest European mortality rates (Figure 5).

Age and sex distribution

- Injury mortality rates for males were substantially higher than for females in all age groups (except 0-14 years) and for all injury types (Figures 6 and 11). The overall male to female mortality ratio in 1996-98 was 2.8:1 (NHPA target 2.1:1). This ratio has remained unchanged since 1981-83. The injury mortality rate for males aged 20 to 34 years was more than four times that of females in the same age range.
- Injury mortality rates were low among children aged under 15 years, increased to a peak among young adults aged 20-24 years, gradually declined between the ages 25-69, and then increased for people aged

70 years and over (Figure 6). Injury mortality rates for accidental drowning were highest in the under 5 age group (Figure 7) whereas mortality rates for falls were higher in the over 70 years age group (Figure 8). Road transport deaths predominantly affected 15-34 year olds and over 75 year olds, particularly males (Figure 9). For males, suicide rates peaked in the 20-24 year and over 85 year age groups (Figure 10).

Causes of death

- Suicide, road transport accidents and falls account for the majority of injury deaths. Other causes include homicide, drowning, poisoning, fire, burns and scalds, other transport injury, suffocation and injury due to environmental factors (Figure 11).

Injury mortality in indigenous populations

- The most reliable data for indigenous populations comes from discrete Queensland Aboriginal communities. These communities only account for 12% of Queensland's indigenous population and may not be representative of the health of the rest of the Queensland indigenous population (see Appendix 3 for an explanation of problems with current sources of Indigenous data). In these communities, the age standardised death rate from injury is 203 per 100,000, which is four and a half times the rate for all of Queensland (Figure 12). The mortality ratios comparing the injury status of indigenous and non-indigenous people increased for males from 2.9 in 1982-86 to 4.9 in 1994-98 and for females it increased from 3.9 to 5.5.
- A study of injury in one Cape York community found that the increased risk of injury reflected a broad range of factors including abuse of alcohol and other substances, unemployment, limited availability of treatment services, economic dependency and unsafe environments (Gladman et al., 1997).

Urban/rural and socio-economic differences

- Rates of death from injury and poisoning increased with increasing economic disadvantage and also with increasing rurality (Figure 12). However, the increased death rates in the Rural and Remote Area (RaRA) categories may be confounded by a relatively large proportion of indigenous persons in these areas. When RaRA categories were separated into those statistical local areas (SLAs) with less than 5% Aboriginal and Torres Strait Islander population and those with more than 5% Aboriginal and Torres Strait Islander population, the differences in injury rates

between urban and rural areas were greatly reduced (Figure 13), though some significant differences still remained.

MORBIDITY

- Of 1,085,930 Queensland hospital separations in 1998/99, 97,365 (9%) were due to injury. This compares to 7.3% of all separations being due to cardiovascular disease and 7.5% due to cancers, making injury the leading cause of hospital separations of all major disease groups. Falls alone accounted for nearly 3% of hospital separations.
- Hospital separation rates for injury in the total population have generally increased since 1981. In 1998/99, the injury separation rate was 2,816 separations per 100,000 persons, well above the year 2000 target of 1,371 separations per 100,000 persons (Figure 15).
- Hospitalisations only represent a small fraction of injury events. The Queensland Injury Surveillance Unit, which keeps statistics on injury presentations to a number of emergency departments throughout Queensland, estimated that in the first half of 1998, only 12.8% of such presentations were admitted to hospital. In the Statewide Health Survey (1998), of 425 people who reported having a fall requiring medical attention in the last year, only 53 (12.5%) said they had been admitted to hospital. In comparison to emergency department presentations or hospital separations, a far greater proportion of injury events are treated by general practitioners, ambulance officers or other service providers (Figure 16).

COST OF INJURY

- The total estimated cost of inpatient separations to Queensland hospitals (based on 465,530 occupied bed days) was \$289.6 million in 1997/98, of which \$145 million were accounted for by falls.
- WorkCover Queensland estimated in its 1997/98 annual report that it spent \$393.6 million on injury related costs, of which 21.9% represented compensation payments and 11.5% represented hospital, medical and rehabilitation costs. The WorkCover scheme does not cover all workers, notably self-employed persons and Commonwealth employees.
- In addition to costs of care given by hospitals, general practitioners and other service providers, direct costs

of injury include those needed for rehabilitation, equipment, ambulance transport and pharmaceuticals.

- Indirect costs of injury include those which occur through premature death, lost productivity and disability. Because injury often occurs early in life and may result in long term disability, indirect costs due to injury are likely to be higher in comparison to other major disease groups.

SPECIFIC INJURIES

Suicide

Mortality

- Suicide was the most frequent cause of injury deaths for males, and the second most frequent cause of injury deaths after road transport accidents for females. For males, suicide rates peaked in the 20-24 year and over 85 year age groups (Figure 10).
- Suicide rates for males increased from 20.3 per 100,000 in 1981-83 to 26.4 per 100,000 in 1996-98. Suicide rates for females have remained at approximately 6 deaths per 100,000 between 1981-83 and 1996-98. Suicide rates in the total population have increased from 12.6 per 100,000 in 1981-83 to 16.1 per 100,000 in 1996-98, moving away from the Year 2000 target of 10.8 per 100,000 (Figure 17).
- In Queensland Aboriginal communities in 1994-98, the average suicide rate was 75.2 per 100,000. This was more than 4.9 times the total Queensland rate for a similar time period (Figure 18).
- Suicide rates increased with increasing economic disadvantage (from 12.7 to 23.3 deaths per 100,000). While there was no clear urban/rural difference in mortality rates in 1997-98, rates were slightly higher in remote areas (Figure 18).
- When compared to 20 selected OECD countries in 1994, Queensland ranked 5th highest for suicide and self-inflicted injury, with Australia as a whole ranking at 11. International comparisons of suicide rates should be regarded with caution due to variations in diagnostic and coding practices between countries (see Appendix 3). Of all injury and poisoning subcategory causes of death, suicide represents the greatest potential for saving years of life lost if Queensland rates were reduced to the lowest European mortality rates.

Road Transport

Mortality

- ▶ The average annual mortality rate from road transport injuries in the period 1994-98 was 11.2 per 100,000 persons, with a male to female ratio of 2.3:1. Death rates for males peaked in the 15-24 and over 75 year age groups (Figure 9).
- ▶ The overall death rate from road transport injuries has decreased by 55% from 22.6 to 10.2 per 100,000 in the period from 1981-83 to 1996-98 (Figure 19). For males aged 15 to 24 years, the death rate has declined dramatically, from 81 per 100,000 persons in 1981-83 to 33 per 100,000 persons in 1996-98. However, this decline appears to be levelling out, with very little change between 1993-95 and 1996-98 (Figure 20), so the NHPA year 2000 target of 23.6 per 100,000 persons is unlikely to be met.
- ▶ For the period 1997-1998 death rates from road transport injuries generally increased with increasing rurality, with the exception of "remote major" (Figure 21). Counts for this classification are small and the point estimates vary markedly from year to year. After removing SLAs with at least 5% of the population being either Aboriginal or Torres Strait Islander, urban areas still had significantly lower mortality rates than rural areas. Death rates increased with increasing economic disadvantage.
- ▶ In Queensland Aboriginal communities over the period 1994-1998, the death rate from road transport accidents was 17.2 per 100,000. This was 1.5 times the rate for Queensland as a whole, though not significantly higher. In contrast, the death rate for all transport accidents was 3.9 times the Queensland rate. This possibly reflects the more frequent use of other forms of transport, such as boat or light aircraft, in these remote communities and accidents that occur offroad.
- ▶ Compared with 20 OECD countries in 1994, Queensland ranked 10th highest in mortality rates from all transport accidents, with the UK having the lowest rates. Of all injury and poisoning subcategory causes of death, transport accidents would give the second highest potential for saving years of life lost if Queensland rates were reduced to UK rates.

Morbidity

- ▶ Hospital separation rates for road transport injury have declined since the 1980s but have not shown

any obvious trends in the 1990s. The 1998/99 rate of 299 separations per 100,000 persons is well above the Year 2000 target of 194 separations per 100,000 persons (Figure 22).

Accidental falls

Mortality

- ▶ In the period 1994-98, falls were the third most frequent cause of death for both sexes, with average mortality rates of 7.1 and 5.6 per 100,000 persons for males and females respectively (Figure 11).
- ▶ Compared with selected OECD countries in 1994, Queensland ranked 13th highest for mortality rates from accidental falls. Because deaths from accidental falls predominantly occur in older age groups (Figure 8), accidental falls had the lowest potential for mortality reduction for Queensland of all injury and poisoning subcategories.
- ▶ For people aged 65 and over, mortality rates have remained constant between 1981-83 (50 per 100,000) and 1996-98 (47 per 100,000). If this pattern continues, Queensland's rate would remain higher than the NHPA year 2000 target of 35.4 deaths from falls per 100,000 in this age group (Figure 23).

Morbidity

- ▶ Falls were the most frequent single major injury type to result in hospital separations in Queensland during 1997/98 and 1998/99 (Figure 14).
- ▶ For males aged 65 years and over, separation rates for falls increased by 152% from 1981 to 1998/99 to 2,373 per 100,000. For females aged 65 years and over, separation rates increased by 82% over the same time period to 3,640 per 100,000 in 1998/99.
- ▶ Data from the Queensland Injury Surveillance Unit (QISU) in 1995 showed that 70% of the falls injuries treated in emergency departments in South Brisbane were of children aged less than 15 years. During a 1998 QISU survey data was collected from participating Hospital Emergency Departments³ on 1,940 injuries involving persons aged 65 years and over of which 1,172 or 60% were the result of falls.

³ 1998 QISU data was based on emergency department presentations to hospitals in Brisbane, Redlands, Logan, Mt Isa, Mackay, Dysart, Prosepine, Moranbah, Sarina and Clermont.

Accidental drowning

Mortality

- The average annual death rate from accidental drowning in the period 1994-98 was 1.3 per 100,000 persons, with a male to female ratio of 3.5:1. Deaths from drowning occur most commonly in children under 5 years of age (Figure 7). The drowning rate during 1996-98 for this age group was 6.0 deaths per 100,000, much higher than the NHPA year 2000 target of 3 deaths per 100,000.
- In April 1992, uniform minimum pool fencing requirements were introduced and in the next two years there was increased publicity concerning the hazard of domestic swimming pools for under five year olds. Since then, the number of pools has increased by around 70% (Balanda et al., 1997). Eighty-seven per cent of pool owners reported having a child resistant fence surrounding their pool (Statewide Health Survey, 1998).
- Drownings can occur in baths, public pools, dams and natural water hazards, but the greatest number of drownings in children under five years of age occurs in domestic swimming pools. In the nine years before the introduction of the fencing requirements, an average of 12 children younger than five years of age drowned in domestic pools each year. In the first two years after the introduction of the requirements, the average number of drownings dropped to four per year. Following this the number of pool drownings has fluctuated, rising to 12 in 1995 then falling to 4 in 1998 (Figure 24).
- Of the 38 domestic pools in which drownings occurred between April 1992 and March 1997, 33 (87%) did not fully comply with the fencing legislation (Pitt and Balanda, 1998). Reasons for non-compliance included lack of a fence (11), the pool gate being propped open (3), and physical defects in pool gates (11), house doors (6) or fences (2).

Morbidity

- Near drownings can result in long term or permanent disability. Although there has been a net reduction in mortality rates from drowning among children under 5 years of age between 1984 and 1999 (Figure 24), there has been no observable decrease in hospital separation rates of near drowning over a similar time period (Figure 25).

Homicide and interpersonal violence

Mortality

- The overall average annual death rate from homicide in the period 1994-98 was 1.9 per 100,000 persons, with a male to female ratio of 1.7:1. Death rates were highest amongst males aged 20 to 54 years.
- For both males and females aged 20-39 years, there was no significant change in homicide rates between 1981-83 and 1996-98. However during this time, rates for males in this age group peaked at 4.9 per 100,000 persons in 1990-92 before reducing to 4.3 per 100,000 in 1996-98. The death rate from homicide in the 0 to 9 year age group has remained relatively steady with an average rate of about 1 per 100,000 between 1981-83 and 1996-98.
- Compared with 20 OECD countries in 1994, Queensland ranked 4th highest for death rates from homicide, with Japan the lowest and the USA the highest. Australia as a whole ranked 5th highest.
- In the period 1994-98, Queensland Aboriginal communities had an average annual homicide rate of 31 per 100,000 persons, which was 16 times the rate for Queensland overall.

Morbidity

- There has been an increase in the rate of separations due to assault in Queensland, from 76 separations per 100,000 persons in 1981 to 168 per 100,000 in 1998/99. A report on assault in Queensland (Criminal Justice Commission, 1997) indicated that the groups at greater risk of assault are young people, males, single people, the unemployed and indigenous people. For young people, the risk of assault is greater while out at night in places of public entertainment, while older people are more likely to be victimised in or near a private home.
- In a study of injury in one Aboriginal community in Cape York, 24% of initial clinic presentations were a result of injuries, with assault accounting for 42.8% of injuries (Gladman et al., 1997). Alcohol consumption played a significant role in precipitating injuries, with 51% of all injuries and 88% of assault injuries occurring in association with alcohol.
- The results of the 1998 Australian longitudinal study on women's health showed that in Queensland 13.1% of women aged 18-23 years had at some stage been in a violent relationship with a partner/spouse. The corresponding proportion for women aged 45-

50 years was 19.8%, while for women aged 70-75 years it was 6.7% (The Research Institute for Gender and Health).

- In Queensland in 1998/99 there were 4,195 cases of substantiated harm involving children aged 0-9 years, and 2,178 cases involving children aged 10-17 years (Personal communication with Department of Families, Youth and Community Care).

Fires, burns and scalds

Mortality

- The average annual death rate in the period 1994-98 from fires, burns or scalds was 0.6 per 100,000 persons, with a male to female ratio of 2.9:1. The most vulnerable age groups were the very young (0-4 years) and the elderly (75 years and over). Of the 106 deaths during this period, 70 (66%) were due to fires in private dwellings. The death rate among people aged 55 years and over from fires, burns and scalds has decreased from 2.9 per 100,000 in 1981-83 to 0.8 per 100,000 in 1996-98, which is below the year 2000 target.
- A study of fire fatalities in Australia between 1991 and 1996 (Department of Emergency Services, 1998) showed that, as well as young children and the elderly, people living in rental properties, adults not in the workforce and adults affected by alcohol were at greater risk of dying in a fire. In Queensland, alcohol may have played a role in 34% of deaths involving victims over the age of 18 years.
- Where the presence or absence of smoke alarms could be determined in the fatal fire case study, only 7 out of 202 structures (3.5%) had smoke alarms present (Department of Emergency Services, 1998). In the Statewide Health Survey (Queensland Health, 1998), 59% of respondents claimed to have at least one smoke detector in the house. In July 1997 legislation was introduced requiring that smoke alarms powered by mains electricity be introduced in all new houses and all houses undergoing major renovations. However, this is unlikely to impact on those in lower socio-economic groups who are at greater risk of death from house fires.

Morbidity

- Since the 1981 hospital separation rates for males under five years of age have fluctuated markedly, from a minimum of 161 per 100,000 (1993/94) to 327 per 100,000 (1996/97). For females aged under

five, separation rates followed a similar pattern ranging from 122 per 100,000 (1992/93) to 211 per 100,000 (1996/97). These rates continue to exceed the NHPA targets of 132 and 101 per 100,000 persons for males and females respectively.

- Of 1,802 hospital separations in 1998/99 due to fires, burns and scalds, 554 (31%) were in children aged 4 years and under. In this age group 252 (45%) of the separations were due to hot liquids (excluding hot tap water) and vapours (including steam), but the hospital separation data does not specify the agent involved. Hot tap water was recorded as the agent in 105 (19%) of the separations in this age group. It is expected in the long term that the number of children needing hospitalisation for scalds will be reduced following the introduction of legislation in April 1998 requiring all new hot water systems to deliver water at a temperature of 50°C (compared with the current 60-70°C).

Unintentional poisoning

Mortality

- The ICD-9-CM codes for accidental poisoning are referred to in this report as unintentional poisoning. Unintentional poisoning can be divided into two main types, poisoning by drugs and medicaments and poisoning by other substances. In the period 1994-98, the average annual death rate from poisoning was 1.5 per 100,000 persons, with a male to female ratio of 2.3:1.
- Of the 243 deaths due to poisoning in the five year period from 1994 to 1998, 67 (28%) were due to opiates and related narcotics. The deaths predominantly occurred in the 20-44 year age group, with 86% of male deaths and 67% of female deaths from narcotics occurring in this age range.

Morbidity

- For children under five years of age, hospital separation rates due to unintentional poisoning declined from 599 to 408 per 100,000 between 1981 and 1998/99, with some fluctuation over the last five years. Separation rates remain well above the Year 2000 target of 242 separations per 100,000 persons (Figure 26).

INJURY SETTINGS

- While it is not possible to report population data on injury settings, the Queensland Health draft health outcomes plan has identified sport, recreation and

workplace related injuries as involving significant numbers of preventable injuries.

- Between January and June 1998, three-quarters of patients with sports injuries seen at the hospital emergency department in South Brisbane were males, 40% were aged 15 to 24 years. Of the workplace-related injuries seen at the emergency department over the same time period, more than half were aged 25-44 years, and 84% involved males (QISU).

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APPENDIX 1

Table 1: Status of NHPA injury prevention and control targets in Queensland

				NHPA 2000 target
Mortality rate	1981-83	1996-98		
	/100,000	/100,000	(n*)	/100,000
Injury in the total population	57.2	44.9	1536	33.6
Road transport in the total population	22.6	10.2	343	10.7
Road transport in males aged 15-24 years	80.8	32.7	85	23.6
Suicide in the total population	12.6	16.1	547	10.8
Falls among people aged 65 years and over	50.0	47.2	200	35.4
Homicide for males aged 20-39 years	3.3	4.3	23	3.4
Homicide for children aged 0-9 years	0.3	1.5	7	0.5
Drowning in children aged under 5 years	9.4	6.0	15	3.0
Fires, burns and scalds in people aged 55 years and over	2.9	0.8	5	1.2
Hospital separation rate	1981	1998/99		
	/100,000	/100,000	(n**)	/100,000
Injury in the total population	2096	2816	97,365	1371
Road transport injury in the total population	339	299	10,102	194
Road transport injury in males aged 15-24 years	1254	827	2,154	494
Falls in males aged 75 years and over	1535	4251	2,761	2018
Falls in females aged 75 years and over	3425	6712	7,246	3643
Falls in males aged 65-74 years	594	1121	1,228	601
Falls in females aged 65-74 years	989	1600	1,890	980
Falls in children aged under 5 years	596	857	2,080	452
Falls in children aged 5-9 years	806	1048	2,642	601
Fires, burns and scalds in males aged under 5 years	239	269	334	132
Fires, burns and scalds in females under 5 years	197	186	220	101
Poisoning in children aged under 5 years	599	408	989	242
Near drowning in children aged under 5 years	39	46	112	21
Mortality Ratios for Total Injury	1982-86	1994-98		
Indigenous [#] males to non-indigenous males	2.9 (2.2, 3.8) ^{##}	4.9 (3.9, 5.9)		2.8
Indigenous females to non-indigenous females	3.9 (2.5, 5.9)	5.5 (4.2, 6.0)		3.2
	1981-83	1996-98		
Males to females in total population	2.8	2.8		2.1

(n*) Average annual number of deaths between 1996 and 1998

(n**) Number of hospital separations in 1998/99

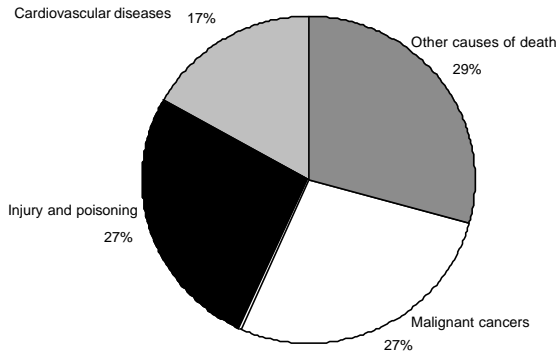
[#] Based on discrete Queensland Aboriginal communities (see Appendix 3)

^{##} Comparisons between indigenous and non-indigenous populations here are given as standardised mortality ratios using the non-indigenous population as the reference. Numbers in brackets indicate 95% confidence intervals

Note that from 1995/96 hospital separations were reported on an episode of care basis: this resulted in an approximate 5% increase in separations (from 1994/95 to 1995/96) due to statistical separations and changes in episode of care type.

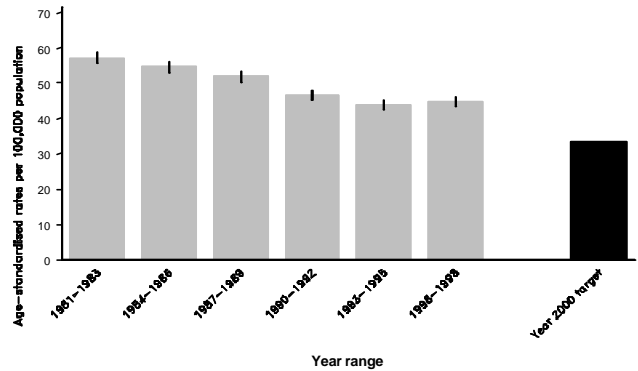
APPENDIX 2

Figure 1 Percentage of person years of life lost to age 74 in Queensland in 1997, by leading causes of death



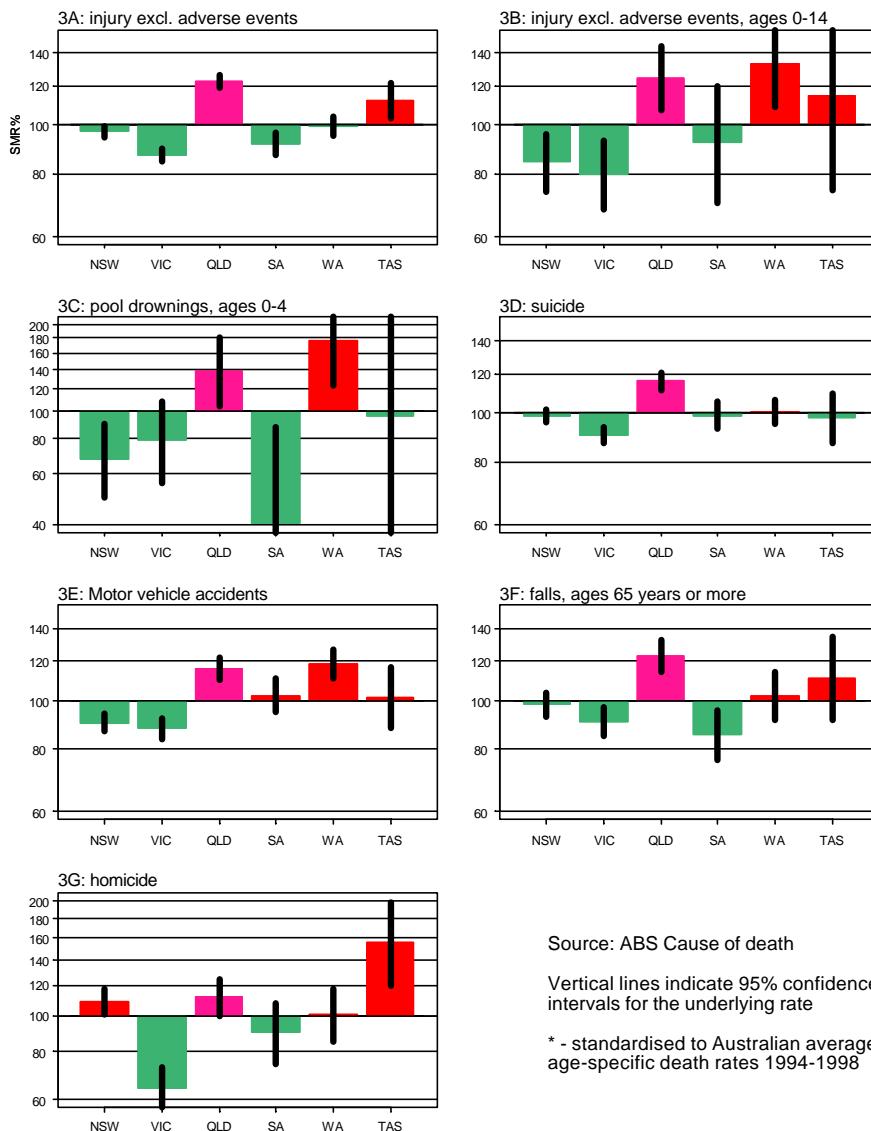
Causes of death grouped by ICD-9 chapters
Data source: Health Information Centre

Figure 2 Trends in age standardised mortality rates due to injury and poisoning in Queensland between 1981 and 1998, with year 2000 target



Vertical lines indicate 95% confidence intervals for underlying rate
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 3: Standardised mortality ratios* for persons by state for the period 1994-98

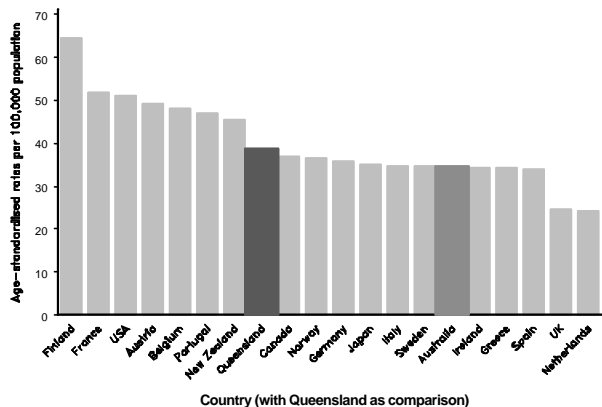


Source: ABS Cause of death

Vertical lines indicate 95% confidence intervals for the underlying rate

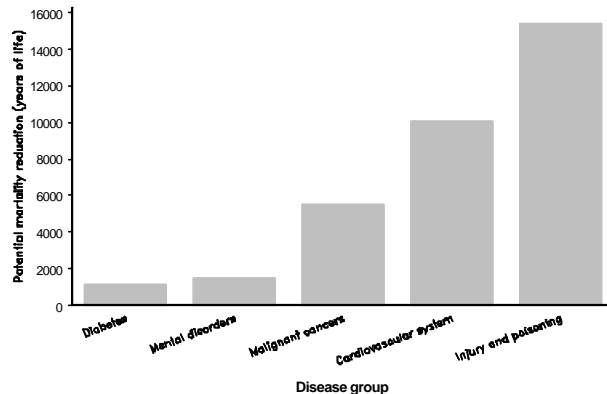
* - standardised to Australian average age-specific death rates 1994-1998

Figure 4 Age standardised mortality rates due to injury and poisoning among OECD countries in 1994



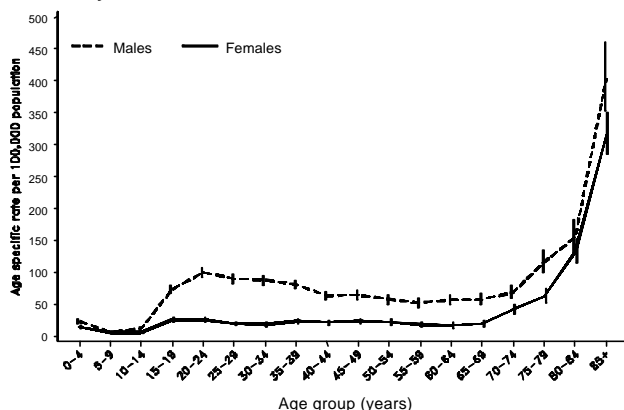
Country (with Queensland as comparison)
 Rates standardised using World Standard Population, 1960
 Data Source: World Health Organisation deaths data collection

Figure 5 Potential for reduction in mortality for Queensland in 1994 by major disease groups



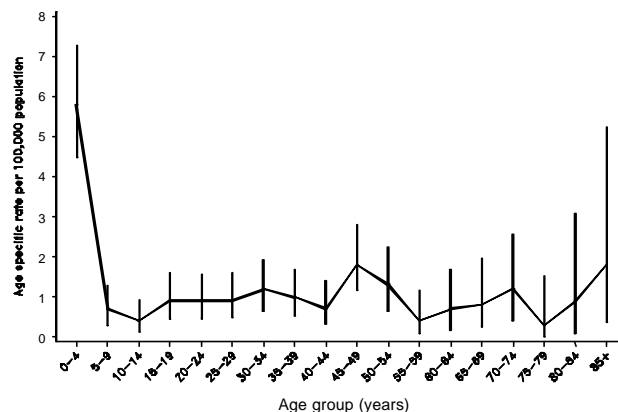
This calculation represents the reduction in years of life lost that would occur if mortality in Queensland was equivalent to the lowest European mortality rate for each disease group
 Data source: World Health Organisation deaths data collection

Figure 6 Average age-specific mortality rates for injury by sex in Queensland between 1994 and 1998



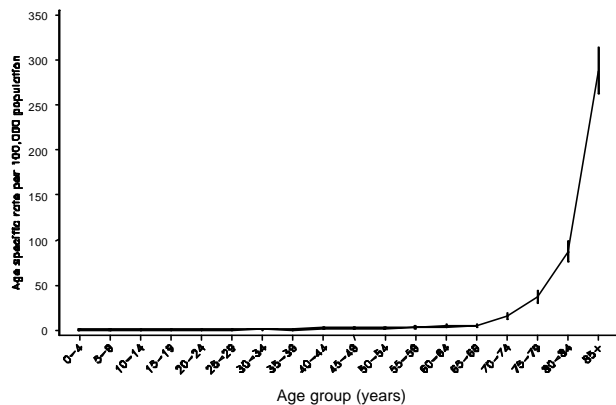
Vertical lines indicate 95% confidence intervals for underlying rate
 Data source: Health Information Centre

Figure 7 Average age-specific mortality rates for accidental drowning in Queensland between 1994 and 1998



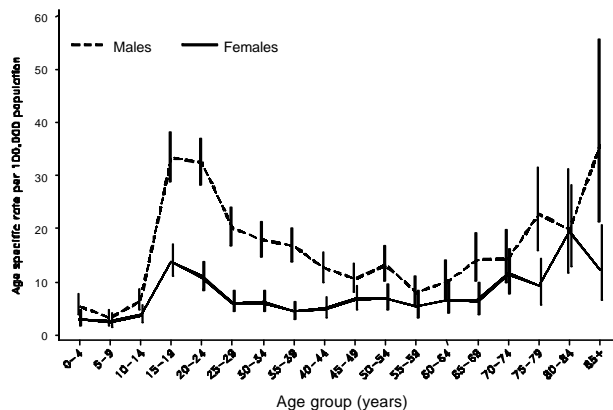
Vertical lines indicate 95% confidence intervals for underlying rate
 Data source: Health Information Centre

Figure 8 Average age-specific mortality rates for falls in Queensland between 1994 and 1998



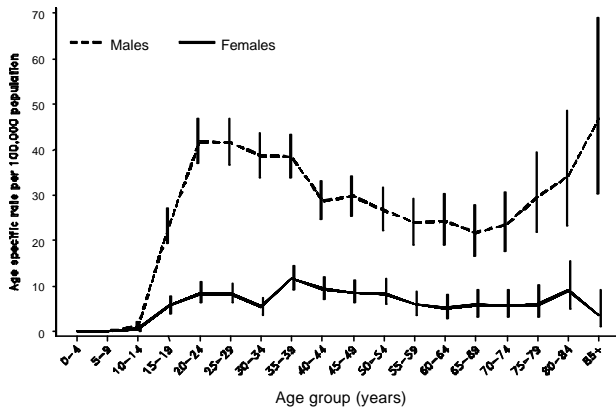
Vertical lines indicate 95% confidence intervals for underlying rate
 Data source: Health Information Centre

Figure 9 Average age-specific mortality rates for road transport injury by sex in Queensland between 1994 and 1998



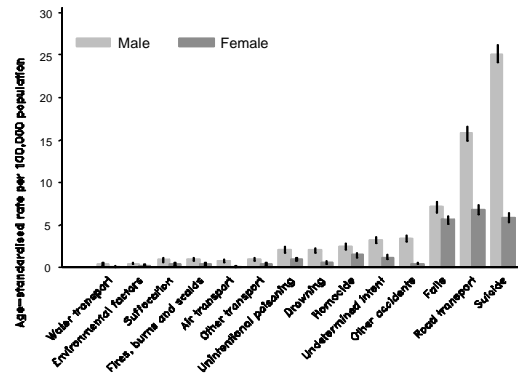
Vertical lines indicate 95% confidence intervals for underlying rate
 Data source: Health Information Centre

Figure 10 Average age-specific mortality rates for suicide by sex in Queensland between 1994 and 1998



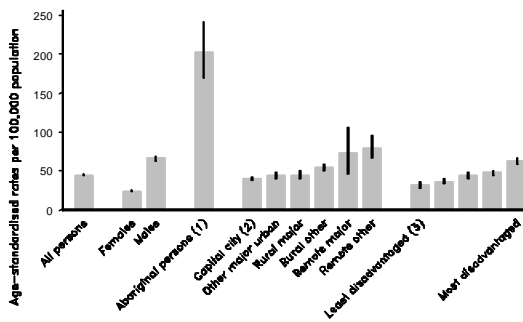
Vertical lines indicate 95% confidence intervals for underlying rate
Data source: Health Information Centre

Figure 11 Average age-standardised mortality rates for injury by sex and injury type in Queensland between 1994 and 1998



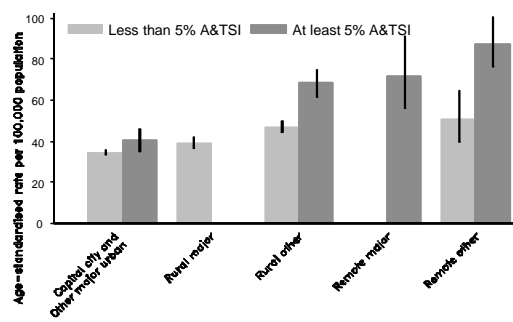
Vertical bars indicate 95% confidence intervals for underlying rate
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 12 Average age-standardised mortality rates for injury by sex, aboriginality, rurality and socio-economic status in Queensland between 1997 and 1998



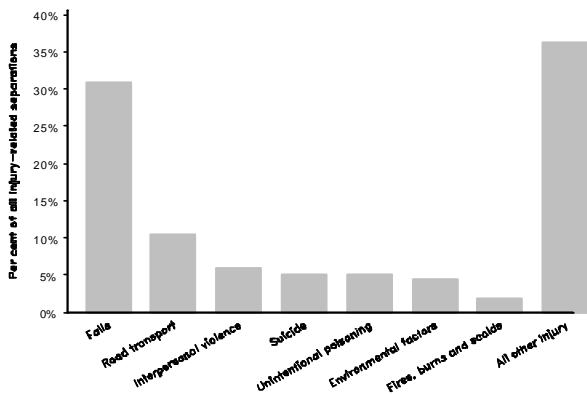
Vertical lines indicate 95% confidence intervals for underlying rate
1: Data from discrete Queensland Aboriginal communities, 1994-1998
2: Based on ABS 1996 rural and remote area classification (RaRA)
3: Quintiles arranged in order of increasing economic disadvantage for period 1997 to 1998
Rates standardised using Australian 1991 population
Source: Health Information Centre

Figure 13 Average age-standardised mortality rates for injury by rurality and SLA-specific A&TSI population in Queensland between 1994 and 1998



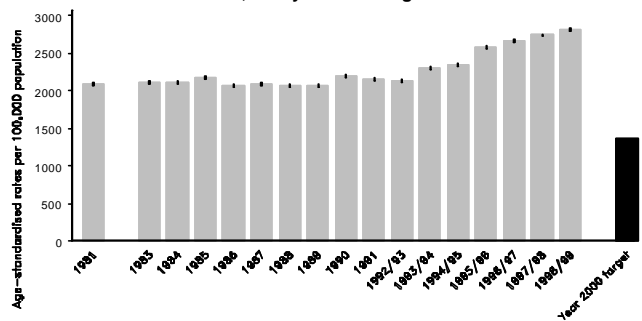
Vertical bars indicate 95% confidence intervals for underlying rate
There are no SLAs in rural major with at least 5% A&TSI population
There are no SLAs in remote major with less than 5% A&TSI population
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 14 Most common reasons for injury-related hospital separations in Queensland during 1997/98 and 1998/99, as a percentage of all hospital separations due to injury and poisoning



Source: Health Information Centre

Figure 15 Trends in age-standardised hospital separation rates for injury and poisoning in the Queensland population between 1981 and 1998/99, with year 2000 target

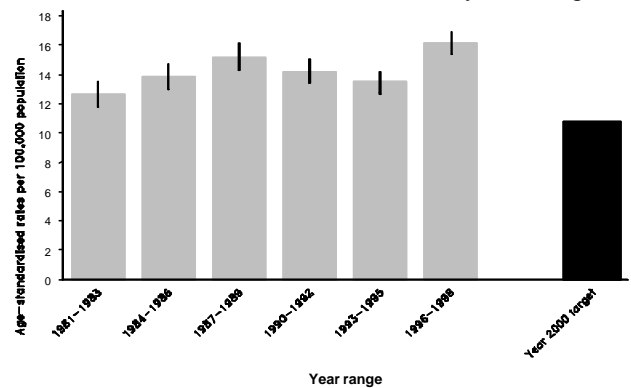


Vertical lines indicate 95% confidence intervals for underlying rate
From 1995/96 hospital separations were reported on an episode of care basis: this resulted in an approximate 5% increase in separations (from 1994/95 to 1995/96) due to statistical separations and changes in episode of care type.
Rates standardised using Australian 1991 population
Source: Health Information Centre

Figure 16 Diagrammatic representation of relative numbers of injury events requiring different classes of treatment

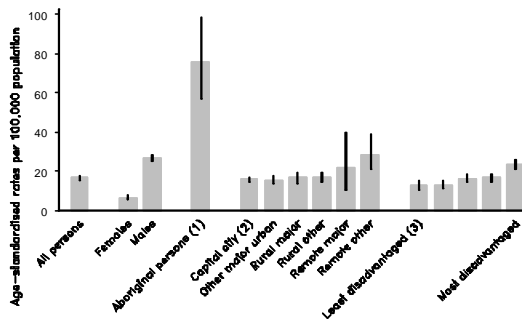


Figure 17 Trends in age-standardised mortality rates due to suicide in Queensland between 1981 and 1998, with year 2000 target



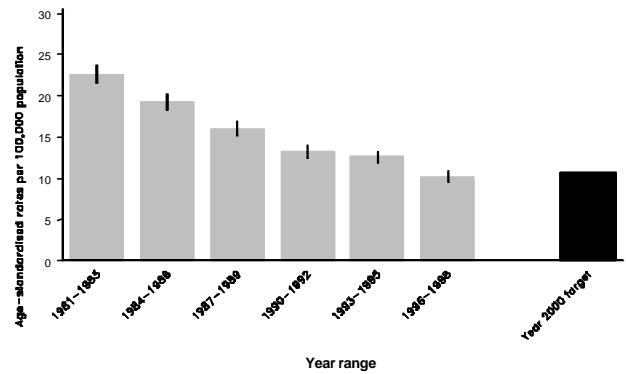
Vertical lines indicate 95% confidence intervals for underlying rate
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 18 Average age-standardised mortality rates for suicide by sex, aboriginality, rurality and socio-economic status in Queensland between 1997 to 1998



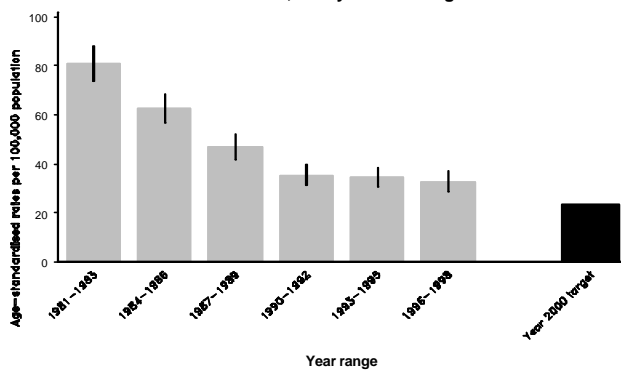
Vertical lines indicate 95% confidence intervals for underlying rate
1: Data from discrete Queensland Aboriginal communities, 1994-1998
2: Based on ABS 1996 rural and remote area classification (RaRA)
3: Quintiles arranged in order of increasing economic disadvantage for period 1997 to 1998
Rates standardised using Australian 1991 population
Source: Health Information Centre

Figure 19 Trends in age-standardised mortality rates due to road transport injury in Queensland between 1981 and 1998, with year 2000 target



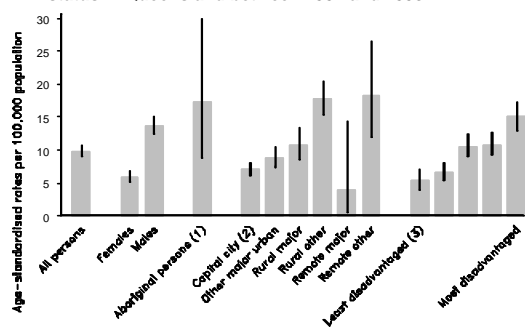
Vertical lines indicate 95% confidence intervals for underlying rate
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 20 Trends in age-standardised mortality rates due to road transport injury for 15-24 year old males in Queensland between 1981 and 1998, with year 2000 target



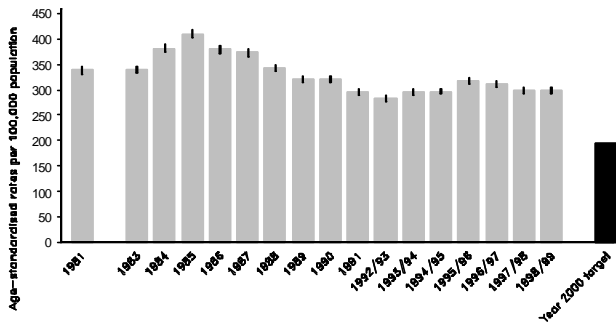
Vertical lines indicate 95% confidence intervals for underlying rate
Rates standardised using Australian 1991 population
Data source: Health Information Centre

Figure 21 Average age-standardised mortality rates for road transport injury by sex, aboriginality, rurality and socio-economic status in Queensland between 1997 and 1998



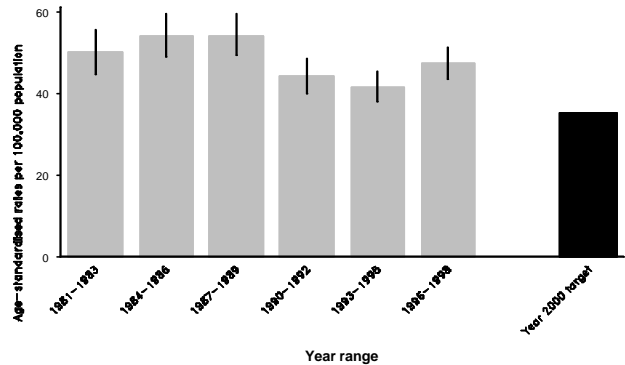
Vertical lines indicate 95% confidence intervals for underlying rate
1: Data from discrete Queensland Aboriginal communities, 1994-1998
2: Based on ABS 1996 rural and remote area classification (RaRA)
3: Quintiles arranged in order of increasing economic disadvantage for period 1997 to 1998
Rates standardised using Australian 1991 population
Source: Health Information Centre

Figure 22 Trends in age-standardised hospital separation rates due to road transport injury in the Queensland population between 1981 and 1998/99, with year 2000 target



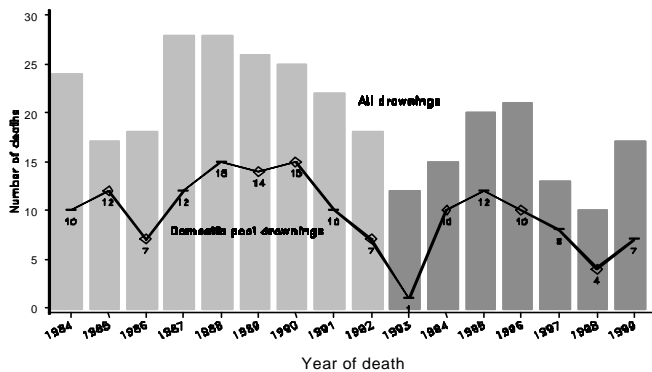
Vertical lines indicate 95% confidence intervals for underlying rate
 From 1995/96 hospital separations were reported on an episode of care basis: this resulted in an approximate 5% increase in separations (from 1994/95 to 1995/96) due to statistical separations and changes in episode of care type.
 Rates standardised using Australian 1991 population Source: Health Information Centre

Figure 23 Trends in age-standardised mortality rates due to falls among people aged 65 years and over in Queensland between 1981 to 1998, with year 2000 target



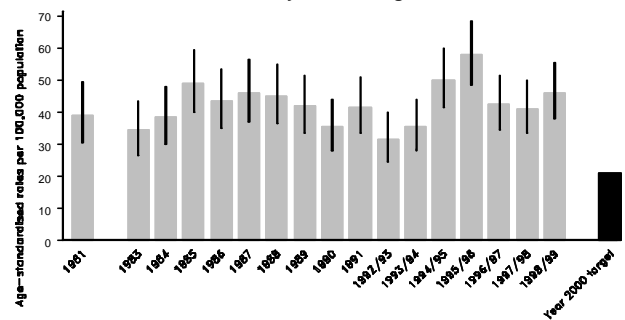
Vertical lines indicate 95% confidence intervals for underlying rate
 Rates standardised using Australian 1991 population
 Data source: Health Information Centre

Figure 24 Number of deaths of 0-4 year old children due to drowning (all types) and drowning in domestic pools in Queensland



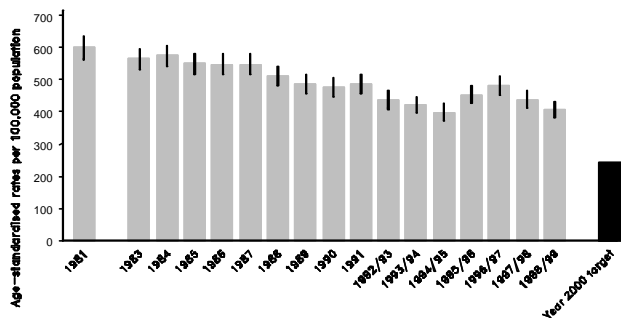
Source: Dr Robert Pitt, Director, Mater Childrens Hospital Emergency Department and Queensland Injury Surveillance Unit
 This data differs significantly from ABS data because it uses date of immersion rather than date of death registration and deaths from medical complications of near drowning are included in the year in which the immersion incident occurred
 Uniform pool fencing legislation was introduced in February 1992

Figure 25 Trends in age-standardised hospital separation rates due to near drowning in 0-4 year old children in Queensland between 1981 and 1998/99, with year 2000 target



Vertical lines indicate 95% confidence intervals for underlying rate
 From 1995/96 hospital separations were reported on an episode of care basis: this resulted in an approximate 5% increase in separations (from 1994/95 to 1995/96) due to statistical separations and changes in episode of care type.
 Rates standardised using Australian 1991 population Source: Health Information Centre

Figure 26 Trends in age-standardised hospital separation rates due to poisoning in 0-4 year old children in Queensland between 1981 and 1998/99, with year 2000 target



Vertical lines indicate 95% confidence intervals for underlying rate
 From 1995/96 hospital separations were reported on an episode of care basis: this resulted in an approximate 5% increase in separations (from 1994/95 to 1995/96) due to statistical separations and changes in episode of care type.
 Rates standardised using Australian 1991 population Source: Health Information Centre

APPENDIX 3

Methodology

Data Sources

Australian data

Deaths data are from the Australian Bureau of Statistics cause of death collection which is sourced from the Queensland Registrar General's records. These data are based on calendar years. Hospital separation data are from the Queensland Hospital Admitted Patient Data Collection, and from 1992/93 onwards are based on financial years. Data for separations were not available for the 1982 calendar year. The analysis based on mortality and hospital morbidity data only include people who are recorded as having their usual place of residence in Queensland. The results were based on analysis using the Health Information Analysis System (HIAS), with additional data accessed by SAS. From 1995/96 onwards hospital separations were reported on an episode of care basis. This resulted in an approximate 5% increase in separations from 1994/95 to 1995/96, which was a result of statistical separations and changes in episode of care type. The most recent available data for mortality were for 1998, while the most recent available data for hospital separations were for the 1998/99 financial year.

Hospital separations is the term used to refer to the episode of care, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care (AIHW, 1998).

Indigenous identifiers have only been included on the Queensland Registrar General's Cause of Death information since 1996 and it will be some years before enough data have accumulated to provide statistically reliable measures of the mortality rates for Indigenous Queenslanders. In the meantime, the most reliable source of mortality data is from thirteen discrete, mostly rural and remote indigenous Queensland communities. These communities are Aurukun, Cherbourg, Doomagee, Hopevale, Kowanyama, Lockart River, Mornington Island, Napranum, Palm Island, Pormpuraaw, Woorabinda, Wujal Wujal and Yarrabah. Data from these aboriginal communities were complete only for the years 1992-98. Data used for all these communities are for the period 1994-1998. Data from Torres Strait communities were not used because the quality of these data is considered to be less reliable.

It is not known whether data from these aboriginal communities can be generalised to all Indigenous people since they represent only rural/remote populations. Also, there is evidence to suggest there may be considerable under-enumeration of population denominators in these communities (Health Information Centre, unpublished data). If this is the case, then the rates derived in this publication may have over-estimated actual rates.

Numbers of deaths are based on year of registration, except for deaths data for Aboriginal populations, drowning in under five year olds and homicide in under ten year olds. In these cases year of death is used, firstly because small numbers of cases are involved, and secondly, because there can be significant delays in registration of deaths.

For data in Figure 3c showing pool drownings for children aged under 5 years, year of death was used, while for data in Figure 7 showing age specific rates for accidental drowning, year of registration was used.

Overseas comparisons

Data used to make comparisons between OECD countries and Queensland were from the World Health Organisation (WHO). The selected countries were: Australia, (Queensland), Japan, France, Spain, Netherlands, Sweden, Greece, Canada, Italy, Norway, Germany, Austria, Belgium, United States of America, United Kingdom, Finland, New Zealand, Portugal and Ireland. Coding is according to the International Classification of Diseases, but comparability of data may be influenced by differences in diagnostic and coding practices. In particular, suicide may be under reported in countries in which social or religious factors might prompt another cause of death to be entered on the death certificate.

Case definitions

The 9th revision of the International Classification of Diseases (ICD9) was used to define disease categories and subcategories. Causes of injury are defined using the ICD9 external cause (E code) classification.

In order to be able to compare measures of population health over time, Queensland Health has defined a number of health outcome indicators. Definitions of these indicators can be found in the Queensland Health Outcome Indicator Dictionary (QHOID). To be consistent with QHOID definitions, "adverse effects" are not included in the calculation of counts and rates of all

external causes of morbidity and mortality. Adverse effects includes “misadventures to patients during surgical and medical care (E870-876)”, “surgical and medical procedures as the cause of abnormal reaction of patient or later complication, without mention of misadventure at the time of the procedure (E878-879)” and “drugs and medicinal substances causing adverse effects in therapeutic use (E930-949)”. In 1996, 1% of deaths from injury and poisoning were due to “adverse effects”. During 1996/97, 28% of hospital admissions from injury and poisoning were due to “adverse effects”.

Cases in which all external causes of injury and poisoning (including adverse effects E800-999) are included in the calculation of rates are the mortality data for the discrete Queensland Aboriginal communities and the mortality data for interstate and overseas comparisons.

QHOID definitions are also used for injury subcategory causes of death or hospital separations (see Table 2 below for E codes used).

Table 2 E codes used in calculations of counts and rates for injury and injury sub-categories

External cause	E codes
total injury and poisoning	800-869,880-929, 950-999
road transport injuries	810-819, 826-829
suicide	950-959
falls	880-888
interpersonal violence	960-978, 990-999
fires, burns and scalds	890-899, 924
poisoning	850-869
drowning	910
other accidents (includes striking or being struck by objects, explosions and accidents caused by machinery, cutting and piercing instruments, electric currents, firearm missiles, exposure to radiation)	916-923,9,925-928,9

Statistical issues

To reduce the effect of differences in the age structures in the populations that are compared, all-ages rates for Australian data have been directly standardised to the Australian population in 1991. For the WHO data, rates have been standardised to the World Standard Population in 1960.

Because the numbers of cases in some injury subcategories are small, they can be subject to large chance variations in rates. Therefore, 95% confidence intervals have been placed around rates as a guide to the accuracy of estimates. If intervals do not overlap, differences are likely to be significant.

In Figures 3A to 3G, standardised mortality ratios have been presented using a logarithmic scale with states being compared to the horizontal line representing national mortality rates (100%). States with bars below the line have mortality rates below the national average and vice versa. The Northern Territory and the Australian Capital Territory (ACT) have not been included for two reasons: firstly, the relatively small numbers in these areas create large confidence intervals which cause difficulties in graphical representation and, secondly, the unique demographics of the territories make comparisons less meaningful. The Northern Territory has a high proportion of Indigenous persons and the ACT has a relatively high proportion of persons in the well-advantaged socio-economic groups.

Mortality ratios are given as a comparison between groups. In most cases these are calculated as a ratio of direct rates. Comparisons between indigenous and non-indigenous populations in Appendix 1 are given as standardised mortality ratios using the non-indigenous population as the reference.

The Queensland mortality gain calculation represents the years of life lost that would be saved if Queensland mortality rates were reduced to the lowest European mortality rates, in relation to each disease group. It is calculated using the following equation:

$$\text{Queensland Mortality Gain} = \frac{\text{Total person years of life lost} \times \% \text{ excess mortality}}{\% \text{ excess mortality} + 100}$$