Injury Mortality
Australia
1 9 9 5

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1. All external causes deaths, Australia 1995

(ICD9 E-codes 800-999)

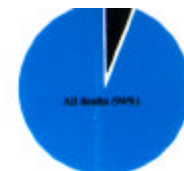## Table 1.1 Key indicators for all external causes deaths

Indicator	Males	Females	Persons
Cases	5153	2260	7413
Percent of all deaths	7.8%	3.8%	5.9%
Crude rate/100,000 pop	57.3	25.0	41.1
Age-adjusted rate/100,000 pop	59.6	23.3	41.1
Change in adj. rate since 1994	1.1%	9.6%	3.3%
Average years lost before age 75 yrs	34	26	32

- This Bulletin edition of *Injury Mortality, Australia 1995* is the third in the annual series of Bulletins reporting on the pattern of injury deaths experienced in Australia since 1979. It covers deaths due to external causes and presents detailed analyses of the major groupings of injury or poisoning.

- Of the 123,124 deaths registered in 1995, 7,143 (6%) were the result of an external cause or poisoning at a rate of 41 injury deaths per 100,000 population. Injury and poisoning was the fifth leading cause of death in 1995 behind malignant neoplasms, ischaemic heart disease, cerebrovascular disease and chronic obstructive pulmonary diseases. However, injury impacts most on the young with an average 32 years of potential life lost (YPLL) due to injury or poisoning, compared with 9 YPLL for cancer and 5 YPLL for ischaemic heart disease.

- Of the 7,143 external cause deaths 56 cases were attributed to *Adverse Effects*. This category includes "misadventures to patients during surgical and medical care"(E870.0-E876.9), "surgical and medical procedures as the cause of abnormal reaction of patient or later complication, without mention of misadventure at the time of procedure"(E878.0-E879.9), and "drugs and medicinal and biological substances causing adverse effects in therapeutic use"(E930.0-E949.9). These categories are sometimes considered separately from other external cause deaths (see Table 10.1). In this Bulletin *adverse effects* are included in the calculation of counts and rates of *All external Causes of Deaths*.

- Of note is the overall rise in female age adjusted rates, up 10% since 1994, compared to male rates which have risen by less than 1% in the same period.

- Since the mid 1980's suicide has accounted for more deaths than transport related deaths and in 1995 suicide was the leading cause of injury death in Australia. The apparent downward trend in suicide rates observed between 1990 and 1993 appears to have been reversed with the age-adjusted rate rising by 11% from 1993 to 1995.

- Despite a slight upturn in the overall age-adjusted injury rate since 1993, the age and sex distribution of injury deaths has shown little change. Age-adjusted rates for 1995 were among the lowest recorded in the period since 1979.

Fig. 1.1: Age-specific rates of injury death from all causes, by sex, Australia 1995
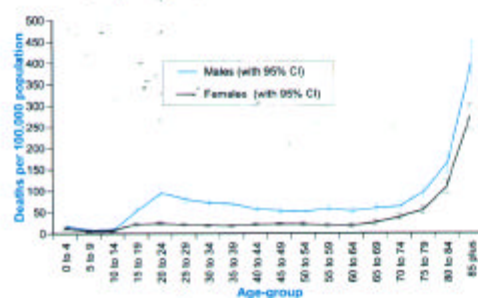
Age and sex distribution

- Injury and poisoning has the greatest impact on the young. It was the leading cause of death for persons aged 1-44 years, accounting for 4,182 (3%) of all deaths in 1995.

- Male rates were between 1.5 and 4 times the female rate for all ages, with overall rates being highest in old age (75+ years) with the leading cause of injury death in the elderly being falls.

- Young adults, in the age range 20-39 years, accounted for 38% of all injury deaths. Young males, alone, accounted for more than 30% of the total (n=2,263).

- Although male rates are generally higher than female rates, the age-adjusted rate of female deaths has risen by almost 10% since 1994 while the male age-adjusted rate rose by less than 1% in the same period.

Trends in death rates

- National injury control targets set in 1994 in the report *Better Health Outcomes for Australians* (1) have been reviewed, and the new *First report on National Health Priorities Areas* (NHPA) (2) has been published. The revised NHPA indicators are used in this Bulletin.

- Figure 1.2 shows that both male and female injury death rates declined in the period 1979-1995. In contrast to male rates, which began to level off around 1993, female rates have tended to rise. The ratio of male to female rates has thus fallen recently, from 2.8 in 1994 to 2.6 in 1995. (An NHPA goal is to reduce the ratio, but to do this by reducing the female rate towards the male rate).

- The dashed line in figure 1.2 reflects the 20% reduction from the 1992 baseline that is the year 2000 target in the NHPA report. It should be noted that *Adverse Effects* have been included in the *All External Causes of Deaths* counts and rates, while the NHPA goal does not include *Adverse Effects*. Since the very small numbers of deaths attributed to adverse effects do not result in an observable difference between all external causes less the number of deaths due to adverse effects, a separate line in figure 1.2 has not been plotted. Despite a rise of 3.2% since 1994, the overall age-adjusted external causes death rate has fallen by 33% since 1979. If the overall downward trend is maintained the year 2000 target should be achieved.

State and territory differences

- Despite a 12% rise in injury death rates for Victorian residents in 1995, the rate was still significantly lower than the national rate. Overall, the rate for this state fell by 36% from 1979-1995. Of note was the large decrease in the male rate which fell by almost 53% from 87 deaths per 100,000 in 1979 to 53 in 1995 and represented the greatest fall in male rates of any state or territory in that period.

- The rate for ACT residents fell by almost 16% to 27 injury deaths per 100,000 which was significantly lower than the national rate of 41 injury deaths per 100,000 and the lowest recorded rate of any state or territory.

- Injury rates for NT residents, while significantly higher than the national value of 80 injury deaths per 100,000, fell by almost 10% in 1995. Queensland, at 49 injury deaths per 100,000, was the only other state to record a rate higher than that for Australia.

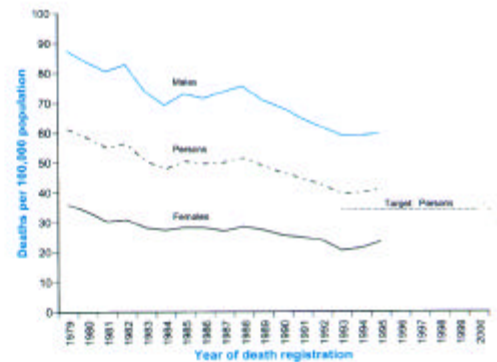**Fig 1.2: Age-adjusted rates of injury deaths from all causes, by sex, Australia 1979-95**

Fig. 1.3: Age-adjusted rates* of injury deaths from all causes, by state & territory of registration, Australia 1995
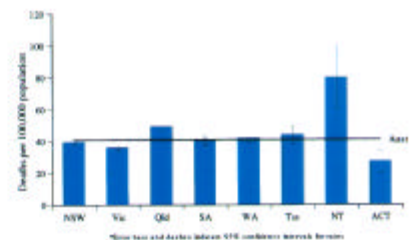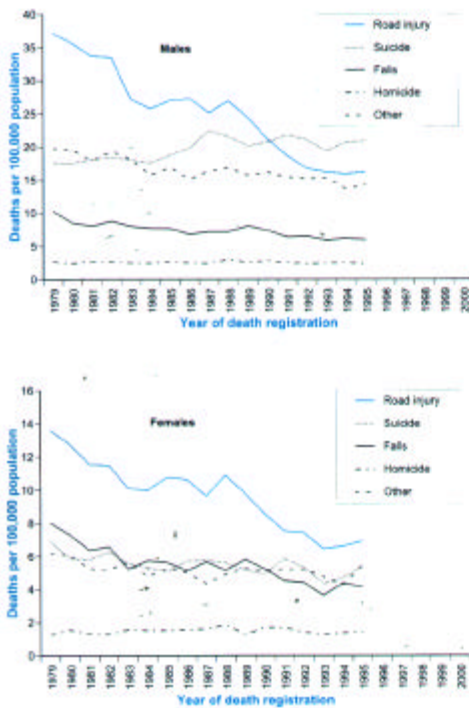
Fig. 1.4: Trends in major types of injury deaths rates, by sex, Australia 1979-95

Males

Females

Major types of injury deaths

- Of the 7,413 injury deaths registered in 1995, 32% were the result of suicide (n=2,367) and 31% were the result of transport related injuries (n=2,301).

- Injury deaths due to "falls"was the only major type where actual female numbers were higher than male numbers. This is due mainly to the fact that women tend to live longer than males and that death from this category is predominantly age related, with 94% of female cases and 70% of male cases in 1995 occurring to persons aged 65 or more years.

- Despite the small increase in the number of transport related deaths from 2,197 in 1994 to 2,301 transport deaths in 1995, the overall downward trend in the past two decades has accounted for most of the decline in overall injury death rates.

- The general pattern of injury deaths indicates that the proportions of different types of injuries are a factor of age. Drowning deaths were most prominent in the early childhood years, suicide and transport emerges in the adolescent years and continues until old age. Falls accounted for a large proportion of the elderly and homicide accounted for a reasonably constant proportion of injury deaths from infancy to late middle age.

- The major types of injury deaths are described in more detail on following pages.

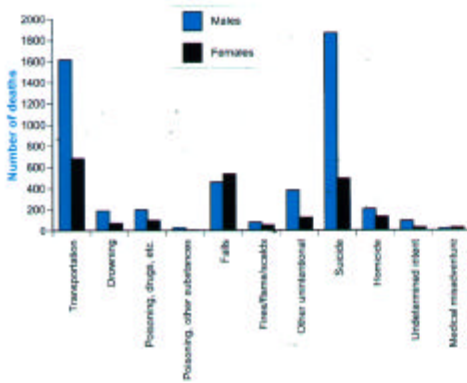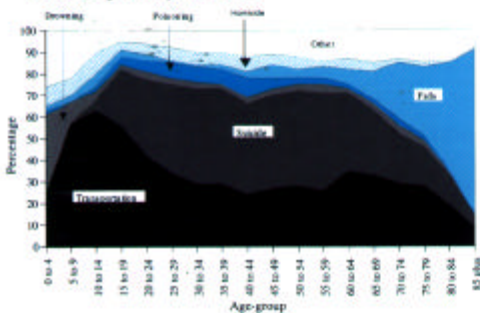**Fig. 1.5: Major types of injury deaths, Australia 1995**

Fig. 1.6: Proportions of major types of injury deaths by age-group, Australia 1995

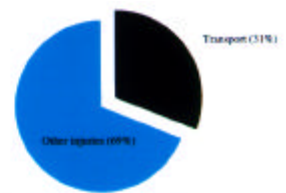# 2. Transport deaths, Australia 1995

(ICD9 E-codes 800-848)

Table 2.1.1 Key indicators for transport deaths

Indicator	Males	Females	Persons
Cases	1617	684	2301
Percent of all injury deaths	31.4%	30.3%	31.0%
Crude rate/100,000 pop	18.0	7.6	12.8
Age-adjusted rate/100,000 pop	18.4	7.4	12.8
Change in adj. rate since 1994	2.5%	6.6%	3.6%
Average years lost before age 75 yrs	39	34	37

Age and sex distribution

- This section covers all transport deaths including motor vehicle traffic and motor vehicle non-traffic, railway, water and air transport. It does not include transport-related injury deaths which were registered as intentional (see Table 10.1).

- Road traffic deaths accounted for over 89% of all transport deaths.

- Adolescents, young adults and the elderly continued to record the highest transport related death rates.

- Male age-specific rates were significantly higher than female rates in the ranges 15-59 and 85 plus years. Young adult males 20-29 years had rates 4 times the female rate in this age range.

- Young males aged 15-29 years accounted for 29% of all transport deaths (n=668) and females in the same age range accounted for a further 9% (n=202).

- Of note was a rise of 8.5% in the female age-adjusted death rate in the period 1992 to 1995 compared to a 3% fall in male rates.

Fig. 2.1.1: Age-specific rates of transport deaths, by sex, Australia 1995

Trends in death rates

- Despite a rise of 4% in age-adjusted transport related deaths rates from 1994 to 1995, overall age-adjusted rates fell by 53% in the period 1979-1995.

- In 1979 males were almost 3 times more likely to die in a transport related accident than were females, by 1995 this disparity between males and females had reduced to 2.5 times.

Fig. 2.1.2: Age-adjusted rates of transport deaths, by sex, Australia 1979-95

State and territory differences

- Transport related injury deaths continued to be higher in the NT than elsewhere in 1995 and were significantly higher than the national rate. The rate of 41 deaths per 100,000 (n=62) recorded for NT residents was almost 40% higher than the 29 deaths per 100,000 recorded in 1994 (large fluctuation have occurred in earlier years and reflect the small population of the NT). The rate for Queensland residents was also above the national average.

- The significantly lower than national age-adjusted rate which has been recorded in Victoria since 1992 was also seen in 1995. The rate for the ACT was also significantly lower than the national average, however, small numbers in this jurisdiction result in large year to year fluctuations.

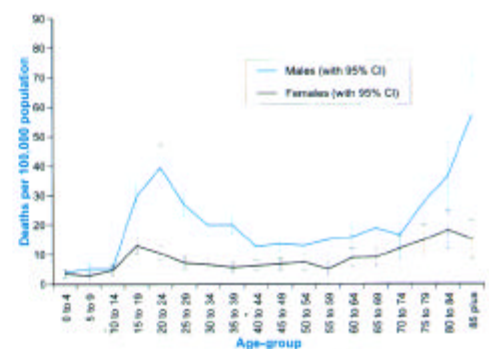Fig. 2.1.3: Age-adjusted rates* of transport deaths, by state & territory of registration,

Road traffic (28%)

Other injuries (72%)
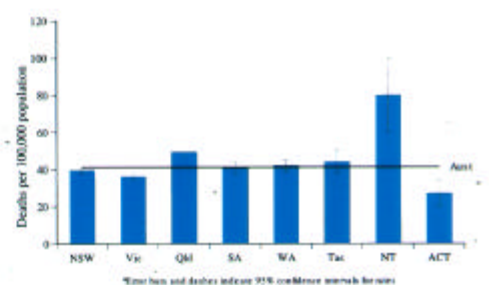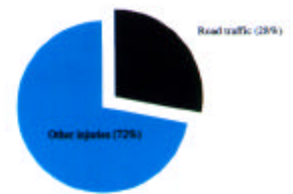
Transport deaths: road traffic
(ICD9 E-codes 810-819, 826-829)

Table 2.2.1 Key indicators for road traffic deaths

Indicator	Males	Females	Persons
Cases	1420	638	2058
Percent of all injury deaths	27.6%	28.2%	38.4%
Crude rate/100,000 pop	15.8	7.0	11.4
Age-adjusted rate/100,000 pop	16.2	6.9	11.5
Change in adj. rate since 1994	1.9%	4.8%	2.8%
Average years lost before age 75 yrs	38	34	37

Fig. 2.2.1: Road traffic deaths, by sex, Australia 1995
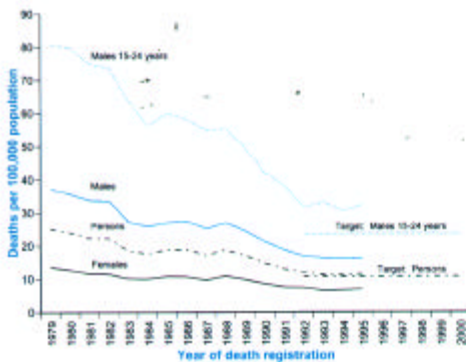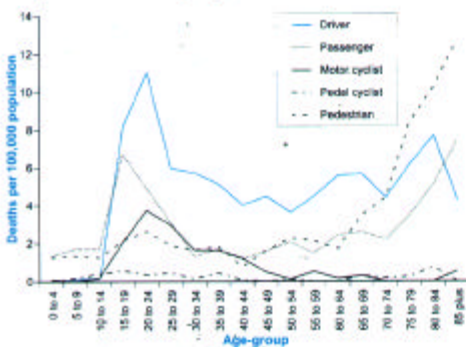

Fig. 2.2.2: Age-adjusted rates of road traffic deaths, by road user category, Australia 1979-95

- This section covers fatalities due to all on-road traffic accidents, whether or not a motor vehicle was involved.

- The 2,058 road traffic deaths in 1995 was an increase of 4% over the 1979 road traffic deaths recorded in 1994. The age-adjusted road traffic death rate rose by almost 3%, from 11.1 to 11.5 deaths per 100,000 population, attributable to an increase of almost 5% in the female rate and to a 2% rise in the male rate.

- Of the 2,058 road traffic deaths in 1995, 41% (n=841) were motor vehicle drivers. Male drivers accounted for 30% (n=611) of the total at a rate of 7 deaths per 100,000 population. The male to female ratio for motor vehicle drivers was 2.6:1 in 1995 compared to 4.2:1 in 1979.

- Males aged 15-24 years and 75 years and older had the highest rates of road traffic death.

- Males in the 15-24 year age range accounted for 22% (n=449) of all road deaths in 1995 and represented a rise of 6% over 1994, from 30.5 to 32.4 road deaths per 100,000 population. 44% (n=196) were motor vehicle drivers, accounting for almost 10% of all road traffic deaths. Passengers in motor vehicles and motor cycle riders or pillion passengers accounted for a further 38% (n=173) of road traffic deaths in this age range.

- Children and adolescents under the age of 15 years accounted for a further 129 road deaths in 1995, mostly as motor vehicle passengers (n=61) and pedestrians (n=49). Deaths in this age group represented 5% of all road traffic deaths.

Transport deaths: off-road
(ICD9 E-codes 820-825, 846-848)

Table 2.3.1 Key indicators for off-road transport deaths

Indicator	Males	Females	Persons
Cases	44	26	70
Percent of all transport deaths	2.7%	3.8%	3.1%
Crude rate/100,000 pop	0.5	0.3	0.4
Age-adjusted rate/100,000 pop	0.5	0.3	0.4
Change in adj. rate since 1994	-14.0%	61.1%	5.4%

- This section relates to accidents to road vehicles which occur entirely in any place other than a public road (ie off road). It also includes the small number of deaths due to otherwise unclassified vehicles (n=2)
- Of the 2,301 transport related deaths recorded in 1995, 3% (n=70) were a result of non-road traffic accidents, which represented a rise of 5% over 1994 figures, due mainly to a 62% rise in the number of female deaths in this category. The 26 female deaths recorded in this category was 10 more than the 16 recorded in 1994 and was the highest recorded total in the period 1979-1995.
- There were 11 more female motor vehicle driver/passenger deaths and 9 fewer male motor cycle rider/pillion passenger deaths than in 1994.
- Relatively small numbers in this category result in large year to year fluctuations and do not allow meaningful trends to be established.

Transport deaths: rail, water and air
(ICD9 E-codes 800-807, 830-838, 840-845)

Table 2.4.1 Key indicators for rail, water and air transport deaths

Indicator	Males	Females	Persons
Cases	153	20	173
Percent of all transport deaths	9.5%	2.9%	7.5%
Crude rate/100,000 pop	1.7	0.2	1.0
Age-adjusted rate/100,000 pop	1.0	0.2	1.0
Change in adj. rate since 1994	12.4%	9.1%	12.5%

Table 2.4.2 Number of deaths due to rail, water and air transport

Indicator	Males	Females	Persons
Rail	40	8	48
Water	57	3	60
Air	56	9	65

- This section deals with deaths attributed to railway, water and air transport. It includes drowning where this was associated with water transport (n=56). It does not include deaths attributed to human intent (eg suicide by standing in front of a railway train). Such cases should be included elsewhere (Sections 3 and 9). However, the existing classification of external causes does not allow them to be identified separately.

- Of the 2,301 transport deaths registered in 1995, 7.5% (n=173) were attributed to rail, water or air transport. Case numbers in this group have fluctuated in the period since 1979 from a high of 244 in 1983 to a low of 151 in 1994. While higher than the case number in 1994, that in 1995 was the second lowest in the period.

- Of the 48 railway deaths recorded in 1995, 75% (n=36) were hit by a train, either as a pedestrian (n=24) or unspecified person (n=12). 44% (n=21) of all railway deaths involved young adults aged from 10 to 24 years.

- There were 60 water transport deaths registered in 1995 of which 95% (n=57) were male. Submersion and drowning as a result of an accident to watercraft (small boat, powered and unpowered) accounted for 66% (n=40) of all water transport accident deaths. A further 27% (n=16) were recorded as drowning as a result of an accident other than accident to the watercraft.

- There were 65 air transport deaths recorded in 1995. Occupants, either crew or other occupants, of powered commercial aircraft accounted for 34% (n=22) of all air transport fatalities. Occupants of "other and unspecified" powered aircraft engaged in non-commercial activities, such as occupants of private planes, accounted for a further 29% (n=19). Occupants of powered aircraft, either taking off or landing, accounted for another 11% (n=7). Accidents to unpowered aircraft (such as balloons and hang gliders) resulted in 5 deaths.

- As with road transport injury deaths, males were more at risk than females, with 86% of all transport deaths in this group being deaths of males.

3. Suicide deaths, Australia 1995
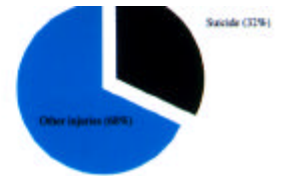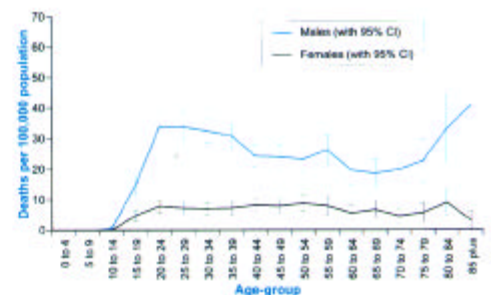
(ICD9 E-codes 950-959)

Table 3.1 Key indicators of suicide deaths

Indicator	Males	Females	Persons
Cases	1872	495	2367
Percent of all injury deaths	36.3%	21.9%	31.9%
Crude rate/100,000 pop	20.8	5.5	13.1
Age-adjusted rate/100,000 pop	20.9	5.4	13.0
Change in adj. rate since 1994	0.7%	13.0%	3.3%
Average years lost before age 75 yrs	35	33	34

Age and sex distribution

- There were 2,367 suicide deaths registered in 1995, up 2% on the 2,258 registered suicides in 1994. Suicide was responsible for 32% of all injury deaths in 1995, at an age-adjusted rate of 13 deaths per 100,000 and accounted for more deaths than transport related accidents.

- Males continued to have higher rates than females in all age groups, with the overall male age-adjusted rate of 21 deaths per 100,000 being almost 4 times the female rate of 5 deaths per 100,000.

- At 25.2 deaths per 100,000 population, the suicide rate for males aged 15 to 24 years remained close to the rate seen since the late 1980s. The rate remains high, but has not risen further in recent years.

- As in 1994, the 1995 male suicide rate at ages 20 to 24 years (34.2 per 100,000 population) was the highest of any 5-year age group up to ages 80 to 84 years. In 1995, the rates for men aged in their late 20s and in their 30s were almost as high. Suicides in the 20 year age band 20 to 39 years accounted for over half of all male suicides (51 percent).

- The age-adjusted rate for females rose by 13% from 4.7 suicide deaths per 100,000 in 1994 to 5.4 in 1995, with increased rates in most age groups, especially under 60 years of age.

- Males aged 20-44 comprised 47% of all suicide deaths in 1995, while females in the same age range accounted for 11% of all suicide deaths.

Trends in death rates

- All-ages rates of suicide have changed little, for males or females, in recent years. The rate for persons has been adopted as a National Health Priority Areas indicator, and a year 2000 target of 10.9 deaths per 100,000 population has been stated. Recent trends provide no indication that this target will be met.

- Figure 3.2 also shows trends in suicide rates for males aged 15 to 34 and 65 years and older, as these are other National Health Priority Area indicators (no targets have been set for these indicators). The rise from 1994 to 1995 in the rate for the 15 to 34 year old group was due to an increase at ages 25 to 34 years.

- There is a striking contrast between trends for suicide (little change) and those for most other types of injury (reducing). For example, transport injury mortality decreased by 53% during the period 1979 to 1995, while suicide rates increased by 7%. The rise in suicide is attributable to increases in male rates (18% higher in 1995 than in 1979).

- The rise in male suicide rates since 1979 was accounted for by large increases in suicide by hanging (up 157%) and by motor vehicle exhaust fumes (up 126%). Suicide by firearms, much the commonest method of suicide used by males in 1979, fell by 41% during the period to 1995.

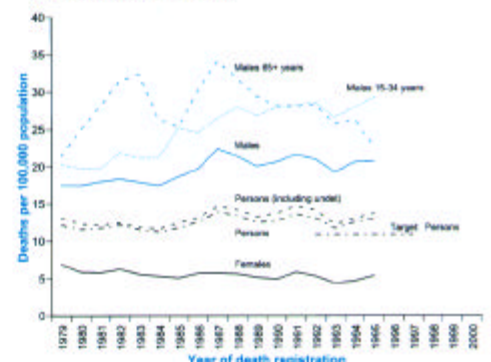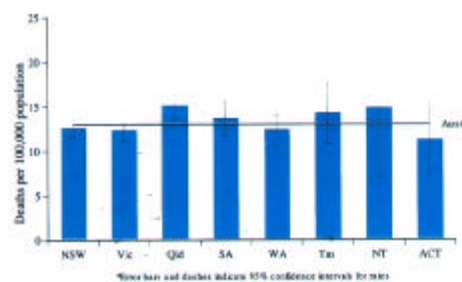Fig. 3.1: Age-specific rates of suicide deaths, by sex, Australia 1995

Fig. 3.2: Age-adjusted rates of suicide deaths, by sex, Australia 1979-95

Fig. 3.3: Age-adjusted rates* of suicide deaths, by state & territory of registration, Australia 1995

*Error bars and dashes indicate 95% confidence intervals for rates

- In Figure 3.2, the line for Persons and the target refer to deaths registered as suicide (E950-959). Some deaths registered as being of "undetermined intent"(E980-989) may also be suicides. A line has been included to show adjusted rates for persons if all of the "undetermined"cases were suicides. Inclusion of all "undetermined"cases as suicide would increase the estimated suicide rate by about 5 percent.

State and territory differences

- In 1995, no state or territory had an all-ages suicide rate that differed significantly from the national rate.

4. Fall deaths, Australia 1995

(ICD9 E-codes 880-888)

Table 4.1 Key indicators of falls deaths

Indicator	Males	Females	Persons
Cases	457	538	995
Percent of all injury deaths	8.9%	23.8%	13.4%
Crude rate/100,000 pop	5.1	5.9	5.5
Age-adjusted rate/100,000 pop	6.0	4.1	5.0
Change in adj. rate since 1994	-3.5%	-5.6%	-4.4%
Average years lost before age 75 yrs	12	3	7

- This section corresponds to the ICD "Accidental Falls"section. As such, it does not include falls found to be suicides (n=108 in 1995), homicides (n=2) or of undetermined intent (n=9). Nor does it include most falls associated with vehicles, nor those from animals or burning structures, nor falls into water which resulted in drowning (refer to Table 10.1).

Age and sex distribution

- The 995 falls deaths registered in 1995 accounted for 13% of all injury deaths.
- While transport-related deaths and suicide impact mostly on young males, the majority of deaths attributed to a fall occur in old age. In 1995, 94% of female cases and 70% of male cases occurred to persons aged 65 years or more. The average number of years lost before age 75 was 7 years for falls compared to 37 years for transport and 34 years for suicide. Rates rise approximately exponentially with age. For persons aged over 85 years the rate in 1995 was 236 deaths per 100,000 population.
- The incidence rate of death due to a fall is similar for males and females in childhood and at ages older than about 70 years. Male rates are higher than female rates at intermediate ages.
- The number of female deaths due to falls is larger than the number of male deaths from this cause because more women than men survive to advanced age (eg In 1995, 70 percent of persons aged 85 years or older were females).
- Fall-related deaths at younger ages differ from those in old age. In 1995, 169 falls deaths (17%) were at ages less than 65 years. Of these 168 cases, 138 (84%) were males, almost half of whom were recorded as having fallen from a building or from one level to another. In contrast, falls from a building or from one level to another were recorded in only 6% of cases at age 65 years and older.
- This data source provides little information about the circumstances of fatal falls by older people. In 711 (86%) of 827 cases at ages 65 years and older, the External Cause were recorded as "Fracture, cause unspecified"or as "Other and unspecified fall".
- In 1995, 12 deaths at ages under 15 years were attributed to falls (8 males and 4 females), of which 8 were recorded as falls from one level to another.

Trends in death rates

- The age-adjusted rate of falls deaths has declined by 45% since 1979 (42% males, 48% females), and by 4% since 1994.
- The overall male age-adjusted rate has been around 1.5 times the female rate since 1979.
- The NHPA target for the year 2000 is to reduce the rate of falls deaths of people aged 65 and over by 10% of the 1992 rate to around 35 deaths per 100,000 population. The rate of 38 deaths per 100,000 in 1995 was down by just 1% from the 1992 rate.

State and territory comparisons

- Rates for this type of injury are similar throughout Australia, with no state or territory being significantly different from the national average.

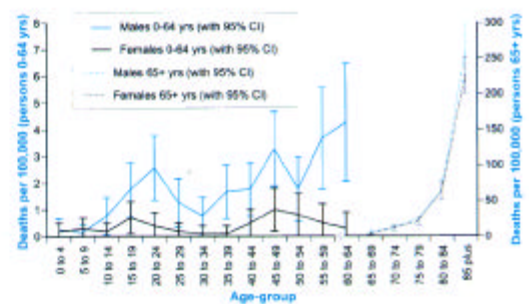Fig. 4.1: Age-specific rates of falls deaths, by sex, Australia 1995

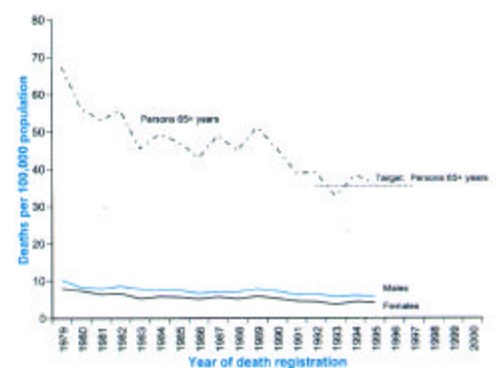Fig. 4.2: Age-adjusted rates of falls deaths, by sex, Australia 1979-95
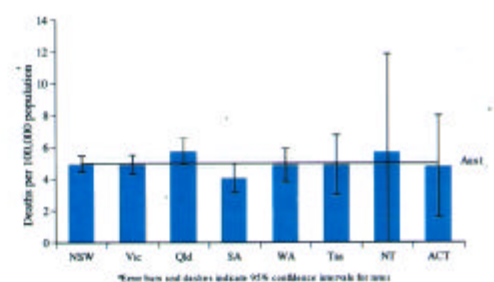

Fig. 4.3: Age-adjusted rates* of falls deaths, by state & territory of registration, 1995

5. Drowning deaths, Australia 1995
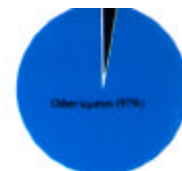
(ICD9 E-codes 910)

Table 5.1 Key indicators of drowning deaths

Indicator	Males	Females	Persons
Cases	190	69	259
Percent of all injury deaths	3.7%	3.1%	3.5%
Crude rate/100,000 pop	2.1	0.8	1.4
Age-adjusted rate/100,000 pop	2.1	0.8	1.4
Change in adj. rate since 1994	10.9%	40.8%	2.8%
Average years lost before age 75 yrs	44	46	45

This section focuses on "Accidental drowning and submersion" as defined in the ICD category of that name (E910). This category ("Drowning") includes 60% (n=259) of the 431 deaths registered in 1995 for which there is evidence that drowning was involved. Drowning deaths, including the other 40%, were coded as follows:

No	% of all drowning cases	E-codes	E-code category	Coverage in this Bulletin	Terminology in this Bulletin
259	60%	E910	Accidental drowning and submersion	Drowning	"Drowning"
56	13%	E830, E832	Water transport accident	Other Transport Deaths	
71	16%	E954	Suicide and self-inflicted injury by drowning	Suicide	"Other identifiable drowning"
5	1%	E964	Assault by submersion	Homicide	
8	2%	E984	Undetermined whether accidentally or purposely inflicted	–	
34	8%	Various	Various E-codes that do not mention drowning (eg road crash)	Various	"Hidden" drowning

The final category can only be identified by use of a special "drowning" data item, introduced at national level for deaths coding in 1992. The main reason for these otherwise hidden cases is that only one "external cause" code is applied to each death, and ICD coding rules give priority to factors other than submersion and drowning. For example, if a vehicle crashes from a bridge and sinks into water, the case will be coded as a motor vehicle crash, not submersion.

Age and sex distribution

- 259 "Drowning" deaths were registered in 1995, up 3% from 1994 and accounting for 3.5% of all injury deaths. *Total drowning* (including *Other identifiable* and *Hidden*) accounted for 431 (5.8%) injury deaths registered in 1995, compared with 408 (5.7%) in 1994 and 458 (6.5%) in 1993.

- Female *Drowning* deaths numbered 69 in 1995 compared with 41 in 1994, a rise of 41%. Twenty six of the 69 were aged 0-4 years (12 in 1994), of whom 13 were coded as "Fell, wandered into private swimming pool" (3 in 1994).

- 26% (n=67) of *Drowning* deaths occurred to children 0-4 years, of whom 34 drowned in a private swimming pool, 11 in a bathtub, and another 11 after "falling or wandered into" a body of water other than a swimming pool. *Drowning* accounted for 36% of injury deaths in this age group. There was one *"Hidden"* drowning death in this age group, registered as a late effect. Australian *Drowning* rates for this age group are high in comparison to other nations (3).

Fig. 5.1: Age-specific rates of drowning deaths, by sex, Australia 1995
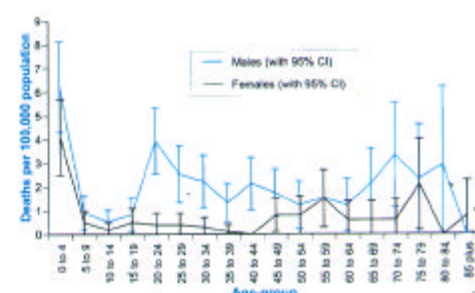
- Males 20-34 years had significantly higher drowning rates than females. In all other age categories the male rate was higher than the female rate, but not statistically different from it. The all-ages rate for males was 2.5 times the corresponding female rate.

Fig. 5.2: Age-adjusted rates of drowning deaths, by sex, Australia 1979-95
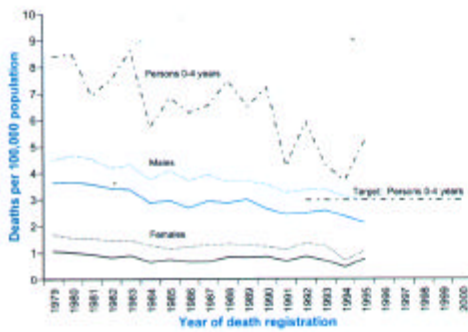
Trends in death rates

- A NHPA goal for the year 2000 is to reduce the rate of drowning deaths (no target has been set). The *Drowning* rate for (adjusted, persons) has fallen by 38% in the period 1979-1995 and by 12% since 1992. This continues a generally downward trend since at least 1920.

- A NHPA target for the year 2000 is to reduce *Drowning* deaths of children aged 0 to 4 years by 50% from the 1992 rate of 6 deaths per 100,000. Despite year to year fluctuations, a downward trend is noticeable. While the 1995 value (5.2 deaths per 100,000) was higher than in the two previous years, it remained 13% below the 1992 rate.

- In Figure 5.2, the lower lines for males and for females show trends in rates of *Drowning*. The upper line in each pair shows rates including *Other identifiable drowning*. (Almost all drowning cases at ages 0-4 years are coded to the "accidental drowning"(E910) category, so only one line has been charted for this age group.)

State and territory differences

Fig. 5.3: Age-adjusted rates of drowning deaths, by state & territory of registration, Australia 1995
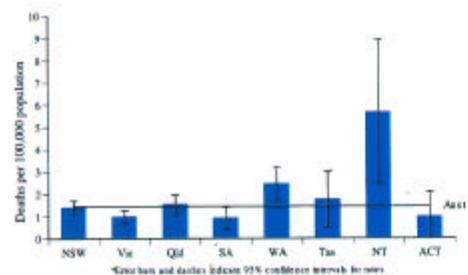
- The *Drowning* rate for NT residents was significantly higher than the national rate. Relatively small numbers of drowning deaths in this territory result in large fluctuations from year to year.

- No other state or territory rate differed significantly from the national rate.

6. Poisoning, Australia 1995
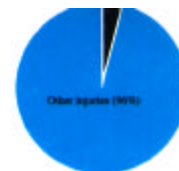
(ICD9 E-codes 850-858, 860-869)

Table 6.1.1 Key indicators of deaths due to poisoning

Indicator	Males	Females	Persons
Cases	231	100	331
Percent of all injury deaths	4.5%	4.4%	4.4%
Crude rate/100,000 pop	2.5	1.1	1.9
Age-adjusted rate/100,000 pop	2.6	1.1	1.9
Change in adj. rate since 1994	8.4%	-7.6%	3.0%
Average years lost before age 75 yrs	40	34	38

- This section focuses on "accidental poisoning" as defined by the ICD External Cause code range E850 to E869. These deaths comprise 25% of the 1341 poisoning cases identifiable among 1995 death registrations. Much the largest group is suicidal poisoning (67%). Intent remained undetermined in another 7% of poisoning deaths, and 1% were registered as being due to medical misadventure. No poisoning homicides were registered in 1995.

- Accidental poisoning can be divided into two main types, poisoning by drugs, medicaments, etc (E850-E858) and poisoning by other substances (E860-E869). In 1995, 298 and 33 cases, respectively, were coded to these two categories.

Table 6.1.2 Key indicators of deaths due to poisoning by drugs, medicants etc

Indicator	Males	Females	Persons
Cases	201	97	298
Age-adjusted rate/100,000 pop	2.3	1.1	1.7
Change in adj. rate since 1994	8.4%	-7.6%	3.0%

Age and sex distribution

- This sub-section focuses on deaths due to poisoning by drugs, medicaments, etc, which were recorded as "accidental". 298 such cases were registered in 1995, 3% more than in 1994. This category accounted for 4% of all injury deaths at a rate of 1.7 per 100,000.

- Rates were highest for males aged 20-44 years and this age group accounted for 80% of all male accidental drug deaths (n=161). Males 25-39 years had rates 4 to 5 times higher than females in equivalent age groups.

- 170 of the cases (57%) were coded to the category *Opiates and related narcotics* (132 male, 38 female), 142 (84%) of the 170 were in the age range 20 to 44 years.

- Other types of pharmaceuticals recorded frequently were tranquillisers (n=26) and antidepressants (n=32).

Trends in death rates

- The death rate for accidental poisoning by drugs, medicaments etc, changed little during the 1980s, remaining at an annual rate of about 1 death per 100,000 population. Rates trended slightly down for females and up for males. Rates rose sharply after 1991, and approximately doubled by 1995. The rise is attributable to a large increase in the *Opiates and related narcotics* category and a smaller rise in the category for *Antidepressants*.

- Figure 6.2 depicts the recent large rise in opiate death rates for males aged 25-44 years.

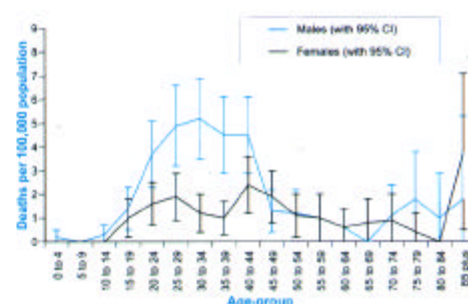Fig. 6.1.1: Age-specific rates of poisoning by drugs, medicaments etc, by sex, Australia 1995
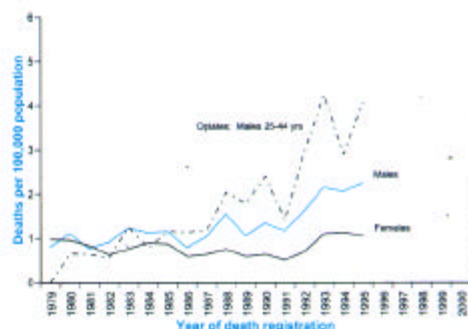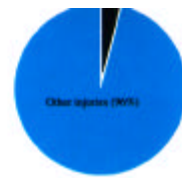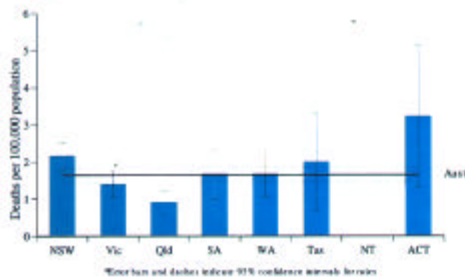

Fig. 6.1.2: Age-adjusted rates of poisoning by drugs, medicaments etc, by sex, Australia 1979-95

- While opiate poisoning has risen, barbiturate poisoning has fallen to very low levels (3 deaths in 1995 compared to 52 in 1979).

- The category to which suicide by means of *Analgesics*, etc (including opiates) is coded (E950.0) has shown increasing case numbers in recent years.

State and territory differences

- NSW rates shown in this Bulletin tend to be close to national rates because NSW accounts for a large proportion of the national population. However, the NSW rate for *Accidental poisoning by drugs*, etc is noticeably above the national average, though the difference does not quite reach statistical significance. The number of NSW registered deaths attributed to opiates, etc rose from 28 in 1992 to 60 in 1993, 66 in 1994 and 85 in 1995.

- Except in 1993, Victoria has had rates of accidental poisoning mortality significantly below the national average. A relatively large number of opiate poisoning deaths registered in 1995 (n=36) brought the rate for Victoria close to the national average. The equivalent number was 7 in 1994, and 20 in 1993.

- Queensland has recorded significantly lower rates for this category of deaths than the national average since 1988. The rate of a little under 1 death per 100,000 recorded in 1995 continued this trend. It is noteworthy that Queensland has relatively high rates of deaths coded to E950.0, the category to which suicide involving opiates (and certain other drugs) is coded.

- SA and WA recorded rates significantly higher than the national average in the period 1990 to 1994. The rates for these states in 1995 were lower and were very close to the national average. Opiate deaths registered in SA dropped from 29 in 1992 to 8 in 1995.

- Rates fluctuate due to small numbers in Tasmania, and the territories. However, in 1995 the largest numbers of opiate deaths for any year in the period beginning 1979 were registered in Tasmania (n=6) and in the ACT (n=10). No deaths of this type were registered in NT in 1995.

Fig. 6.1.3: Age-adjusted rates of poisoning by drugs, medicaments etc, by state & territory of registration, 1995

Table 6.1.2 Key indicators of deaths due to poisoning by other substances

Indicator	Males	Females	Persons
Cases	30	3	33
Age-adjusted rate/100,000 pop	0.3	0.0	0.2
Change in adj. rate since 1994	14.7%	-226.7%	-11.1%

Age and sex distribution

- This sub-section deals with accidental poisoning by substances other than drugs, medicaments, etc. It includes acute poisoning by alcoholic beverages, petroleum substances, agricultural chemicals, motor vehicle exhaust gas, foodstuffs and poisonous plants.

- In 1995, 33 deaths were registered as being due to accidental poisoning by other substances, 3 fewer than in 1994.

- Rates were relatively similar at all ages, apart from ages 5 to 14 years at which no cases occurred.

Fig. 6.2.1: Age-specific rates of deaths due to poisoning by other substances, by sex, Australia 1995

- Substances accounting for more than a single death were petroleum products (fuel, solvents and LPG, n=10), lead paints (n=4), motor vehicle exhaust gas (n=4), and poisoning by carbon monoxide from other or unspecified sources (n=3).
- At least five cases were Aboriginal or Torres Strait Islanders (information on Aboriginal status was not available for the 9 cases registered in Queensland). Four of the 5 were young men and involved petroleum products.

Trends in death rates

- Small case numbers in this category result in large year-to-year fluctuations which are not meaningful.
- Poisoning due to piped gas was a frequent cause of death before toxic "coal gas" (rich in carbon monoxide) was replaced by natural gas, beginning in the 1960s. By the early 1980s this cause still accounted for about 20 deaths per year in Australia. The number declined during the 1980s and no cases have been registered since 1991.

State and territory differences

- Small case numbers limit meaningful comparison between states and territories. The two cases in the NT continue a decline from a high of 9 cases of this type in 1992.

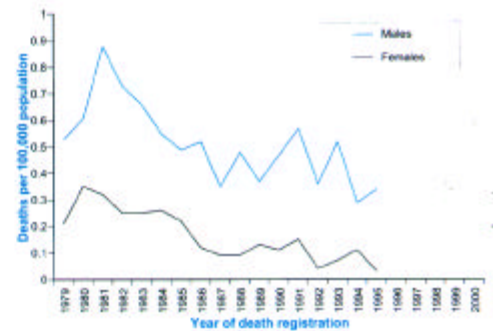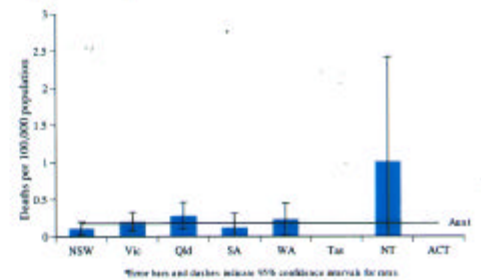**Fig. 6.2.2: Age-adjusted deaths due to poisoning by other substances, by sex, Australia 1979-95**

Fig. 6.2.3: Age-adjusted deaths due to poisoning by other substances, by state & territory of registration, Australia 1995

7. Fires, flames and scalds deaths, Australia 1995

(ICD9 E-codes 890-899,924.0, 924.8, 924.9)

Table 7.1 Key indicators of fires, flames and scalds deaths

Indicator	Males	Females	Persons
Cases	79	54	133
Percent of all injury deaths	1.5%	2.4%	1.8%
Crude rate/100,000 pop	0.9	0.6	0.7
Age-adjusted rate/100,000 pop	0.9	0.6	0.7
Change in adj. rate since 1994	-15.6%	-7.3%	-9.7%
Average years lost before age 75 yrs	35	33	34

Of 190 deaths due to burns, or exposure to fire or hot substances that were registered in 1995, 133 (70%) were recorded as accidental. The remainder were recorded as suicide (n=29; 15%), homicide (n=25; 13%) and undetermined intent (n=3; 2%). This section reports the deaths attributed to accidental exposure.

Age and sex distribution

- 133 fire, flame and scalds deaths were registered in 1995, 8% fewer than in 1994.

- While male and female rates were not significantly different at any age group, male rates were a little higher than female rates in most age groups, and the male age-adjusted rate was about 1.5 times the equivalent female rate.

- Rates were highest for males and females in old age. 49 deaths (37%) were at age 55 years or more.

- House fires accounted for 92 (69%) of the 133 deaths in 1995. One-third of the people who died due to a house fire were children less than 15 years (n=32).

- "Clothing ignition" accounted for 9% of all fire and flame deaths (n=12). All of these people were aged over 50 years. (One child death from clothing ignition was registered in 1994, the first since 1987. None occurred in 1995).

- 21 of the 133 deaths were infants and children aged from 0 to 4 years. 20 of these deaths occurred in house fires.

- No deaths registered in 1995 were coded to the category into which most bushfire deaths are put (E892). (Deaths in this category associated with the "Ash Wednesday"fires account for the 1983 peak seen in Fig. 7.2).

Trends in death rates

- Annual rates fluctuate because of relatively small case numbers and because of clusters of cases for years in which bushfire disasters occurred. There has, however, been a general downward trend in rates, and the adjusted rate for persons in 1995 was 39% lower than in 1979.

- A target stated in the NHPA report is to reduce the 1992 rate of 2.4 deaths per 100,000 due to burns and scalds for persons aged 55 or more by 50% by the year 2000. The 1995 rate for this age group was 1.3 deaths per 100,000, 44% below the 1992 rate. This target appears to be achievable.

State and territory differences

- No state or territory differed significantly from the national rate in 1995.

Fig. 7.1: Age-specific rates of deaths from fires, flames & scalds, by sex, Australia 1995
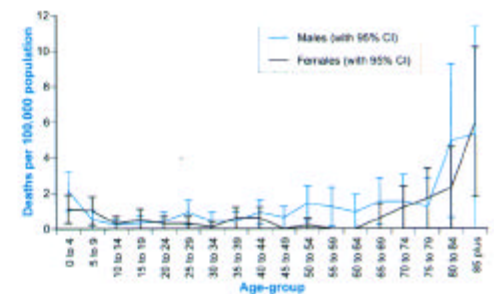

Fig. 7.2: Age-adjusted rates of deaths from fires, flames & scalds, by sex, Australia 1979-95
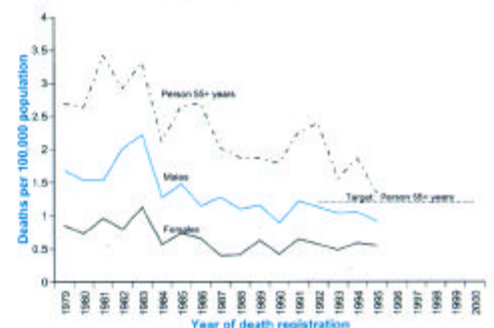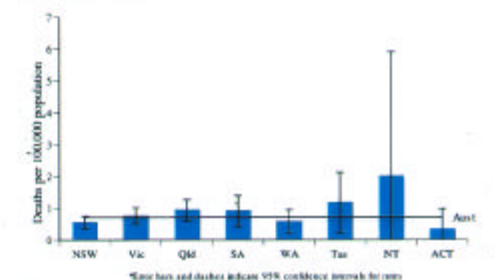

Fig. 7.3: Age-adjusted rates* of deaths from fire, flames & scalds, by state & territory of registration, Australia 1995

8. Other unintentional injury deaths, Australia 1995

(ICD9 E-codes 900-909,911-923, 924.1, 925-929)

Table 8.1 Key indicators of other unintentional injury deaths

Indicator	Males	Females	Persons
Cases	383	122	505
Percent of all injury deaths	7.4%	5.4%	6.8%
Crude rate/100,000 pop	4.3	1.4	2.8
Age-adjusted rate/100,000 pop	4.4	1.2	2.7
Change in adj. rate since 1994	-8.5%	14.2%	-3.7%
Average years lost before age 75 yrs	31	23	29

This residual category includes all injury deaths recorded as "accidental"and not covered by one of the previous sections.

Age and sex distribution

- The 505 unintentional injury deaths included in this group equate to a rate of 3 deaths per 100,000, and account for 7% of all injury deaths registered in 1995.

- As with most other forms of injury deaths, male rates were higher than female rates. Young males 20-49 years had significantly higher rates at more than 5 times the female rate. The highest rates were recorded for people over the age 75 years.

- This category contains many types of injury deaths, the most numerous of which are: late effects of accidental injury (n=93), aspiration of food (n=55), injury by machinery in operation (n=53), electrocution (n=48), injury by a falling object (n=45), excessive cold (n=25), explosions (n=21) and firearm missiles (n=15).

- Suffocation and choking as a result of foodstuffs, non-food stuffs and mechanical means accounted for 22% (n=109) of all "other unintentional" injury deaths. For children aged 0-4 years these categories accounted for 70% of cases (n=21).

- Machinery accidents and being struck by falling objects accounted for a further 19% (n=98). Deaths in these categories are almost all male (n=92) and are often work-related. Agricultural machinery accounted for 20 of the 53 machinery cases.

Trends in death rates

- The number of "other unintentional" injury deaths were down 2% from 1994, with the overall rate falling by 42% in the period 1979-95.

- Female rates have remained relatively constant in the period 1979 to 1995, though perhaps with a gradual decline. The 1995 rate was 21% higher than the unusually low rate in 1994.

- Male rates have declined since 1979. The rate in 1995 was 6% below that in 1994 and 45% lower than in 1979.

- The number of accidental firearm deaths continued to fall, down 74% since 1979.

State and territory differences

- While the rate for the NT was significantly higher than the national average it was still 17% lower at 9.6 unintentional deaths per 100,000 than the rate of 11.6 which was recorded in 1994.

- The slight increase in the rate for Queensland over 1994 figures was due mainly to 15 male deaths registered as a result of an explosion, compared to just 2 deaths recorded in 1994 in this category.

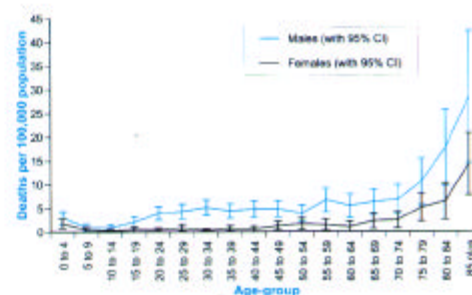Fig. 8.1: Age-specific rates of other unintentional deaths, by sex, Australia 1995

Fig. 8.2: Age-adjusted deaths of other unintentional deaths, by sex, Australia 1979-95
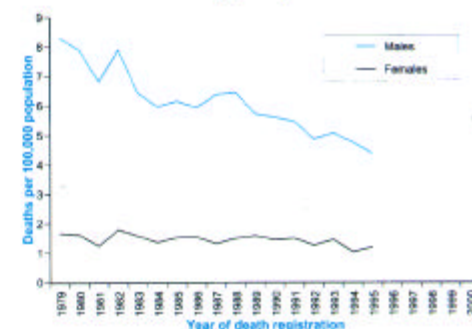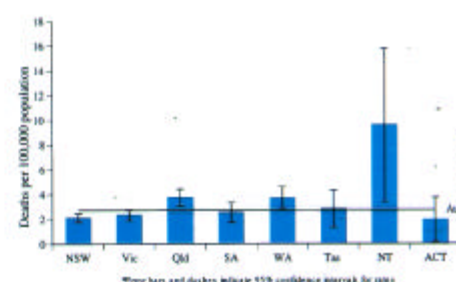

Fig. 8.3: Age-adjusted rates of other unintentional deaths, by state & territory of registration, Australia 1995

9. Homicide deaths, Australia 1995
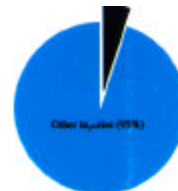
(ICD9 E-codes 960-978, 990-999)

Table 9.1 Key indicators of homicide deaths

Indicator	Males	Females	Persons
Cases	208	131	339
Percent of all injury deaths	4.0%	5.8%	4.6%
Crude rate/100,000 pop	2.3	1.5	1.9
Age-adjusted rate/100,000 pop	2.3	1.4	1.9
Change in adj. rate since 1994	-6.5%	4.9%	-2.1%
Average years lost before age 75 yrs	40	39	39

This category includes all deaths found to be due to intentional injury by another person, including Homicide and injury purposely inflicted by another person (n=333) and deaths resulting from legal intervention (n=6) and from operations of war (n=0).


Fig. 9.1: Age-specific rates of homicide deaths, by sex, Australia 1995
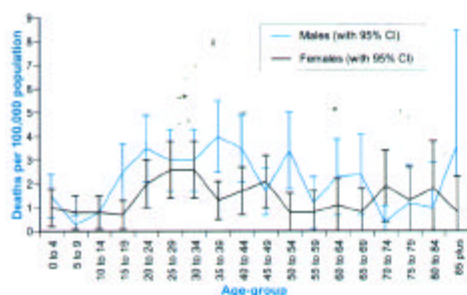
Age and sex distribution

- The 339 deaths registered to·this category in 1995 accounted for 4.6% of all injury deaths.
- Of the 208 male deaths registered in 1995, 36% (n=76) were due to assault by a "cutting or piercing instrument", 11% (n=22) resulted from an unarmed fight or brawl and 8% (n=17) were due to assault by firearms. 58% of the male homicides (n=120) occurred to males in age range 20-44 years.
- For females, assault by a "cutting or piercing instrument"accounted for 26% (n=34), with assault by "hanging and strangulation"(n=23) and being struck by "blunt or thrown object"(n=23) each accounting for 18% of cases. As for males, the majority of all female homicides occurred to females aged between 20-44 years (54%, n=71).
- 16 deaths were at ages 0 to 4 years (9 of these were coded as child battering or maltreatment), and another 7 died at ages 5 to 9 years.
- 10% (n=28) of the 280 people registered in Australia (excluding Queensland) as dying due to homicide were recorded as being Aboriginal or Torres Strait Islander. This proportion is about five times higher than the proportion of indigenous people in the population. The case number and proportion were lower in 1995 than in 1994 (n=37, 13%).

Fig. 9.2: Age-adjusted rates of homicide deaths, by sex, Australia 1979-95
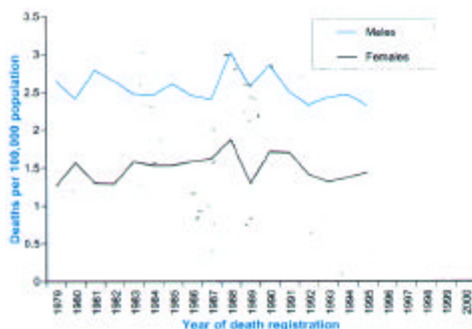
Trends in death rates

- While overall homicide rates remained relatively constant in the period 1979-1995, cause-specific comparisons show that rates for unarmed fights or brawls fell by 32%, firearm deaths decreased by 47% while rates for cutting and stabbing deaths increased by 51% in the same period.
- Homicide rates for males and females aged 20 to 39 years are being used as NHPA indicators, as rates for this cause of death are relatively high in early adult years. Targets for the year 2000 are to maintain the rates for these groups at or below levels in 1992 (ie 3.4 deaths per 100,000 for males and 2.4 for females). Rates fluctuate considerably from year to year. The 1995 rates of 3.4 homicide deaths per 100,000 for males 20-39 years and 2.1 deaths per 100,000 for females indicate that the target may be achievable.

• A second NHPA indicator is the homicide rate of children 0-9 years. A target for the year 2000 is to reduce the 1992 levels by 25%. This indicator shows if anything, a slight upward trend, suggesting that the target may not be met. It should be noted that the 1992 rate of 0.5 deaths per 100,000 was unusually low, and that rates fluctuate due to small case numbers. The rate of 0.9 deaths per 100,000 recorded in 1995, while higher than the 1992 base rate, was 24% below the 1994 rate and more in line with annual rates recorded since 1979.
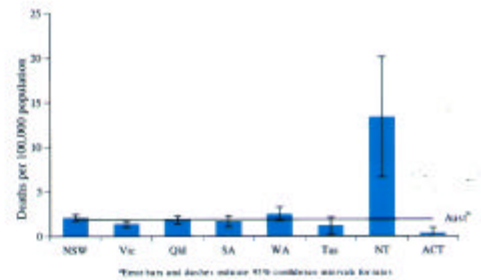
State and territory differences

• As in previous years the rate for the NT was well above the national rate. The majority of these deaths were recorded as Aboriginal (18 of 23), with 50% of these being stabbing deaths.

Fig. 9.3: Age-adjusted rates of homicide deaths, by state & territory of registration, Australia 1995

Special Topic

Table 10.1 presents Australian injury mortality data for the three years 1993 to 1995 according to a matrix in which the columns represent types of involvement of human intent in the occurrence of injury deaths, and the rows represent some of the more important ways in which injury comes about (the latter are referred to as mechanisms here, though other terms could be used). Injury deaths during three years are presented in the table to provide more stable estimates for uncommon categories. Note that the table presents three-year case counts and annual average incidence rates.

This type of presentation reveals (for example) the breakdown of firearm deaths according to the role of human intent, and the breakdown of suicide deaths according to the means of death.

The matrix is produced by aggregating ICD-9 'external causes' categories according to a recently published scheme (MMWR 1997; 46 No. RR-14). Construction of the matrix is constrained by features of the ICD-9 'external causes' classification. In particular, the combinations of intent and mechanism that are shaded in Table 10.1 cannot be distinguished in terms of 'external causes' categories. Despite its limitations, the matrix is a useful summary presentation of injury mortality data. If adopted widely, it will facilitate comparison of the injury experience of nations, states and other areas.

Table 10.1 Injury Mortality Australia, 1993-95

Manner/intent

Mechanism/ cause	Unintentional		Suicide		Homicide		Undetermined		Other		Total	
	Deaths (3 years)	Mean Annual Rate	Deaths (3 years)	Mean Annual Rate	Deaths (3 years)	Mean Annual Rate	Deaths (3 years)	Mean Annual Rate	Deaths (3 years)	Mean Annual Rate	Deaths (3 years)	Mean Annual Rate
Cut/Pierce	26	0.05	122	0.2	343	0.6	2	*	0		493	0.9
Drowning	930	1.7	206	0.4	17	*	34	0.1			1,187	2.2
Fall	1,194	2.2	311	0.6	3	*	23	0.04			1,531	2.9
Fire/Burn	406	0.8	90	0.2	35	0.1	5	*			536	1.0
Firearm	53	0.1	1,239	2.3	205	0.4	15	*	16	*	1,528	2.9
Machinery	190	0.4									190	0.4
M-V Traffic	5,854	10.9	35	0.1			4	*			5,893	11.0
• *Occupant*	*3,834*	*7.2*									*3,834*	*7.2*
• *Motorcyclist*	*581*	*1.1*									*581*	*1.1*
• *Pedal Cyclist*	*129*	*0.2*									*129*	*0.2*
• *Pedestrian*	*1,091*	*2.0*									*1,091*	*2.0*
• *Other (specified)*	*14*	***									*14*	***
• *Other (unspecified)*	*205*	*0.4*									*205*	*0.4*
Natural/Environ	187	0.3	0				0				187	0.3
Other Specified, classifiable	433	0.8	286	0.5	34	0.1	12	*	0		765	1.4
Other Specified, nec	23	0.04	14	*	15	*	4	*	3	*	59	0.1
Over-exertion	4	*									4	*
Pedal Cycle, Other	18	*									18	*
Pedestrian, Other	133	0.2									133	0.2
Poisoning	986	1.8	2,453	4.6	8	*	197	0.4	0		3,644	6.8
Struck by, Against	176	0.3			202	0.4			1	*	379	0.7
Suffocation	354	0.7	1,921	3.6	72	0.1	7	*			2,354	4.4
Transportation, Other	481	0.9	2	*			0				483	0.9
Unspecified	1,788	3.3	8	*	47	0.1	13	*	0		1,856	3.5
Adverse Effects											181	0.33
All Injury	13,236	24.7	6,687	12.5	981	1.8	316	0.6	20	0.04	21,240	39.7

Notes: Mean Australian resident population, 1993-95: 17,846,117.
Excludes non-residents (defined as cases where SLA of usual residence was 9299 [n=202 during the 3 years]).
Based on year of death registration, not year of death.
Rates based on counts of less than 4 have large standard errors and have been replaced by "*".
Shaded cells represent combinations of mechanism and intent which cannot be distinguished in the ICD-9 external cause classification.

Data Issues

1. Data sources

Deaths data are from the Australian Bureau of Statistics (ABS) mortality unit record data collection, 1979-95. Population data were obtained from the ABS.

2. Case definition

The cause of each death registered in Australia is classified by the ABS according to the International Classification of Diseases (ICD). The 9th revision (ICD9) has been used for death registrations beginning in 1979 (4). All deaths given an ICD9 "External Cause"code by the ABS are included in this Bulletin.

Data are presented according to the year in which deaths were registered. Nine percent of deaths registered in 1995 occurred in an earlier year. A similar proportion of deaths which occurred in 1995 will not have been registered until after 1995. Information on these cases is not yet available. State-specific data are presented on the basis of the state or territory in which death was registered. This is normally the one in which death occurred.

3. Age adjustment

Most all-ages rates have been adjusted to overcome the effect of differences in the proportions of people of different ages (and different injury risks) in the populations that are compared. Direct standardisation was employed, taking the Australian population in 1991 as the standard.

4. Confidence intervals

All (or nearly all) deaths are registered, so sampling errors do not apply to these data. However, the time periods used to group the cases (ie. calendar years) are arbitrary. Use of another period (eg. July to June) would result in different rates. Where case numbers are small, the effect of chance variation on rates can be large. Confidence intervals (95%, based on a Poisson assumption about the number of cases in a time period) have been placed around rates as a guide to the size of this variation. Chance variation alone would be expected to lead to a rate outside the interval only once out of 20 occasions. An extreme rate in a single period of enumeration should not be ignored simply because of a wide confidence interval - a time series may show such a rate to be part of a more significant pattern.

5. Time series

Time trends have been presented for the period 1979 to 1995. This is the period during which Australian deaths data have been classified according to the 9th revision of the International Classification of Diseases (ICD9).

6. Cause code aggregations

NISU statistical publications make use of standard aggregations of the ICD9 external cause (E-code) classification. The E-code equivalents of most groups presented in this Bulletin are noted in the text. In 1992, a uniform supplementary classification was, for the first time, applied to drowning deaths in all states and territories. This supplementary classification allows for the identification of more detailed groups of drowning cases than is possible under the ICD9 classification, eg. drowning in domestic swimming pools. For further information, refer to NISU's WWW site (http://www.nisu.flinders.edu.au) or contact NISU.

The aggregation used for Table 10.1 follows the approach described in the report *Recommended Framework for Presenting Injury Mortality data*(5).

7. Data reliability

The chief question concerns the reliability of information about type of injury death. This depends principally on the information available in coroner's records, and on the reliability of the application of ICD9 E-codes, generally based on that information. Little empirical information is available. There is considerable potential for factors to do with information recording or coding to affect data in different ways for different states and territories. Hence, apparent differences between jurisdictions should be interpreted with caution. Beginning with 1993 registrations, coding has been centralised at the Brisbane office of the ABS.

References

1. Commonwealth of Australia. *Better health outcomes for Australians*. Canberra: Department of Human Services and Health, 1994.

2. Australian Institute of Health and Welfare and Commonwealth Department of Health and Family Services 1997. *First report on National Health Priority Areas, 1996.*

3. National Injury surveillance Unit, Australian Institute of Health and Welfare. *Injury Deaths: international comparison with Australia, 1995.*

4. World Health Organisation. *International classification of diseases (1975 revision)*. Geneva: WHO, 1977.

5. Centres for Disease Control and Prevention. *Recommended Framework for Presenting Injury Mortality data*. MMWR 1997;46(No. RR-14).

Communications

The Australian Injury Prevention Bulletin is also published electronically on NISU's World Wide Web site. The Internet address is: http://www.nisu.flinders.edu.au.