# N I S U

# b r i e f i n g

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# Firearm deaths and hospitalisations in Australia

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## Introduction

Firearms have been a major cause of death over the years. Available deaths data covering the period 1979–2002 show that, in 1987, the year in which the highest number of firearm-related deaths was recorded, there were 711 such fatalities. Hospitalisations data covering a recent one-year period (2001–2002) record 443 cases of firearm-related hospitalisation over that period. These deaths and hospitalisations are described below.

## Deaths

### All firearm-related deaths

### Deaths registered between 1979–2002

Suicide was consistently the most common type of firearm-related death over the period 1979–2002, accounting for a mean annual proportion of 77% of all firearm deaths during that time frame (Table 1). The next most frequent type of case was homicide, which accounted for 15% of all firearm deaths. The frequency of unintentional firearm-related deaths was comparatively low (6%).

There has been a downward trend in the rate of firearm deaths since 1979. The all-Australia rate of deaths for persons in 1979 (5.1 per 100,000 population) was 3.4 times higher than the equivalent rate in 2002 (1.5 per 100,000) (Figure 1).

## Deaths registered in 2002

There were 299 firearm-related deaths registered in 2002. Such deaths were uncommon among females (n=27). Older men had the highest rates of death (Figure 2).

In 2002, Tasmania and the Northern Territory both had rates of firearm-related death that were significantly higher than that for Australia (3.8 and 5.8 per 100,000 respectively). Victoria had the lowest rate (1.0 per 100,000), which was significantly lower than the national rate. The rate for Australia in 2002 was 1.5 per 100,000 (Figure 3).

Where information was available, these deaths occurred most commonly at home (n=168, 57%) or on a 'Street or Highway' (n=28, 10%). A location was not coded in 62 (21%) of cases.

**Table 1: Firearm deaths by intent, Australia 1979-2002**

| Year of death registration | Unintentional | Suicide | Homicide | Undetermined | Legal intervention/war | Total |
|---|---|---|---|---|---|---|
| 1979 | 65 | 523 | 97 | 20 | .. | 708 |
| 1980 | 62 | 516 | 109 | 11 | .. | 700 |
| 1981 | 36 | 495 | 87 | 11 | .. | 632 |
| 1982 | 48 | 541 | 100 | 8 | 4 | 701 |
| 1983 | 40 | 512 | 92 | 6 | 4 | 654 |
| 1984 | 32 | 523 | 120 | 7 | 5 | 687 |
| 1985 | 35 | 550 | 97 | 24 | 4 | 710 |
| 1986 | 28 | 548 | 101 | 15 | 4 | 696 |
| 1987 | 27 | 571 | 96 | 10 | 7 | 711 |
| 1988 | 30 | 521 | 123 | 17 | 4 | 695 |
| 1989 | 19 | 450 | 80 | 13 | 7 | 569 |
| 1990 | 30 | 486 | 79 | 15 | 4 | 614 |
| 1991 | 29 | 505 | 84 | 5 | 6 | 629 |
| 1992 | 24 | 488 | 96 | 7 | 7 | 622 |
| 1993 | 18 | 431 | 64 | 6 | .. | 522 |
| 1994 | 20 | 420 | 76 | 6 | 7 | 529 |
| 1995 | 15 | 388 | 67 | .. | 6 | 479 |
| 1996 | 30 | 382 | 104 | 5 | .. | 521 |
| 1997 | 19 | 330 | 79 | .. | 7 | 437 |
| 1998 | 21 | 234 | 57 | 8 | 7 | 327 |
| 1999 | 28 | 269 | 50 | .. | .. | 353 |
| 2000 | 45 | 222 | 57 | .. | 5 | 331 |
| 2001 | 18 | 261 | 47 | .. | 4 | 333 |
| 2002 | 31 | 217 | 45 | .. | 6 | 299 |
| **Total** | **750** | **10,383** | **2,007** | **206** | **113** | **13,459** |

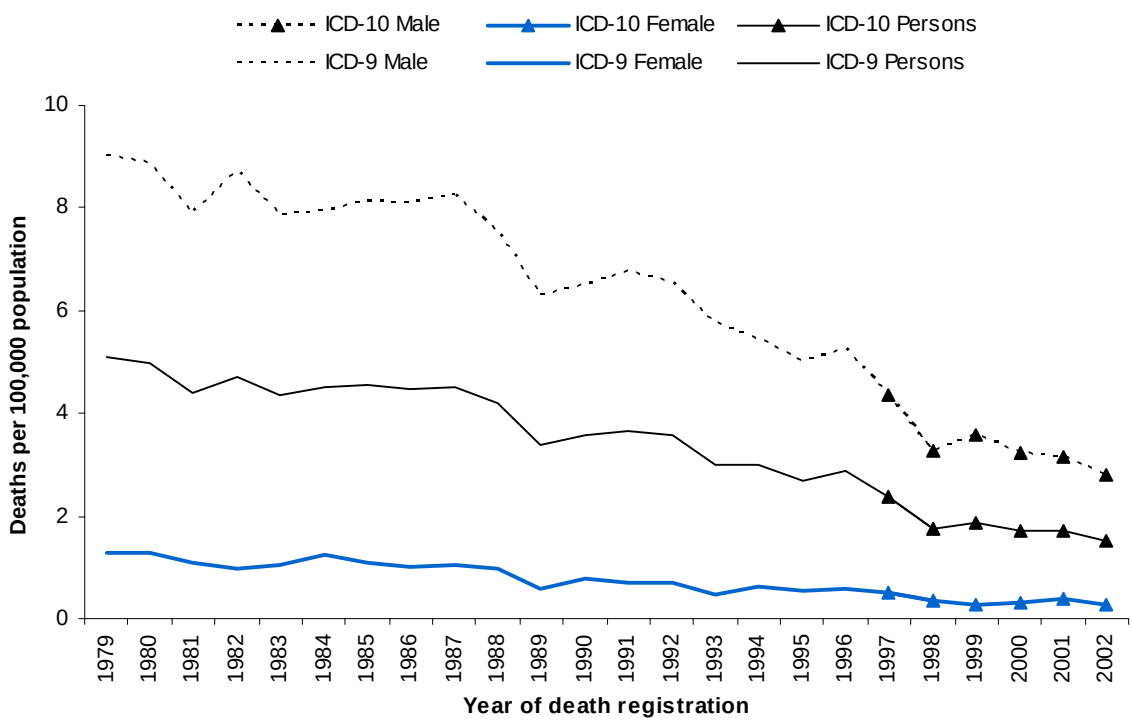


**Figure 1: Firearm-related deaths, Australia 1979–2002**

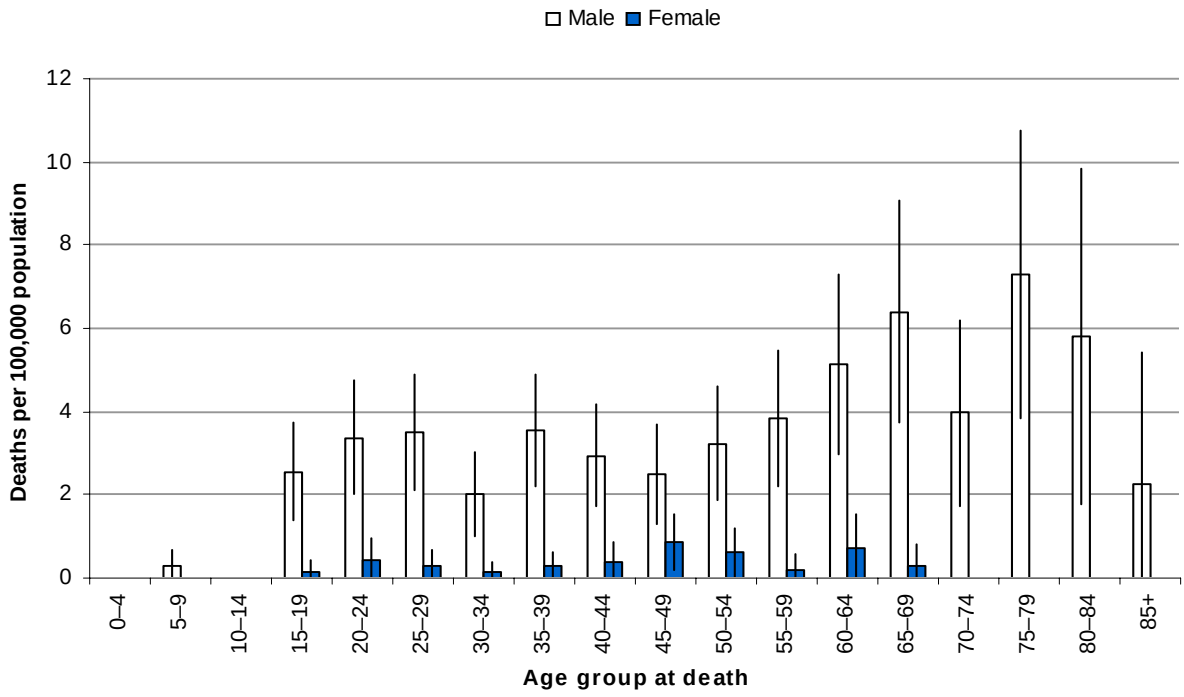


**Figure 2: Firearm-related deaths by age and sex, Australia 2002**

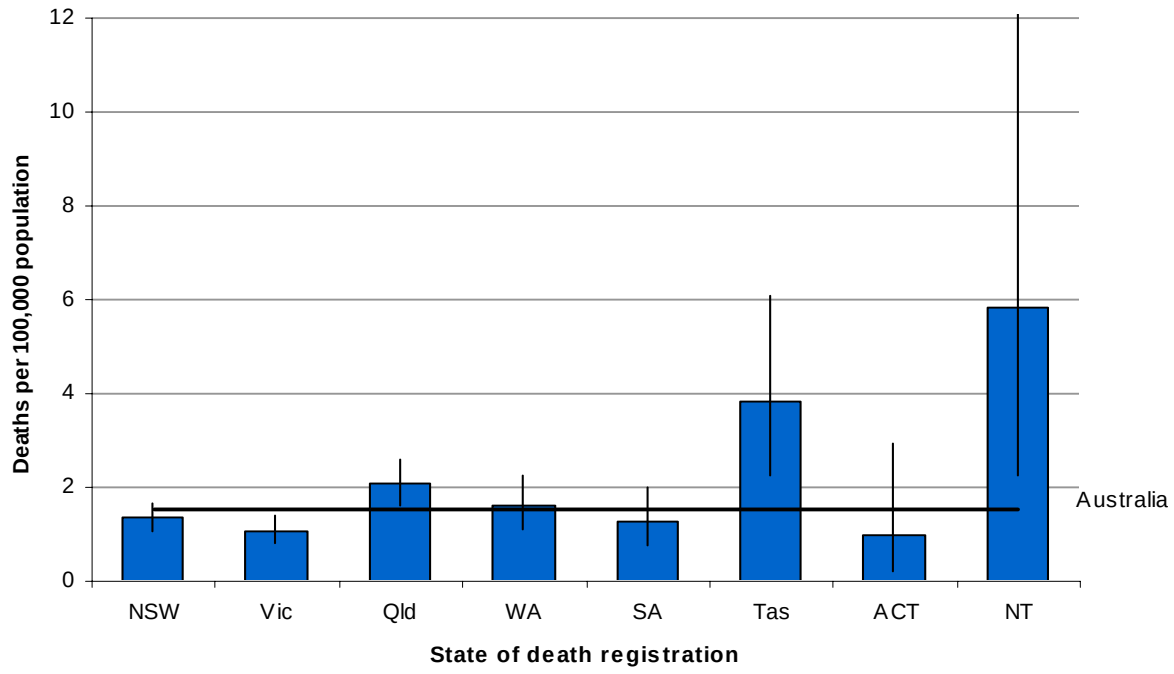


**Figure 3: Firearm-related deaths by State or Territory of registration, Australia 2002**

## Firearm-related suicide

## Deaths registered between 1979–2002

Rates of firearm-related suicide declined between 1979 and 2002. There was a noticeable dip in rates for males between 1987 and 1989, when the rate fell from 7.1 to 5.2 per 100,000 and another between 1996 and 1998 when it fell from 4.2 to 2.4 per 100,000 over the two-year period (Figure 4). The decline in the male rate of firearm-related suicide between 1987 and 1989 largely mirrored a decline in the rate of all suicide deaths, over the same period, from 23.3 to 20.6 per 100,000. However, the decline in the rate of firearm-related suicide between 1996 and 1998 contrasted with a rise in the rate of all suicide deaths during that period from 21.5 to 23.2 per 100,000 population (Figure 5).

Hunting rifles and shotguns were the two most common types of firearm associated with suicide during the period 1983–2002. The reported use of hunting rifles dropped markedly between the five-year periods 1988-92, 1993-1997 and 1998–2002. By the latter period, the frequency had fallen by more than half. There was a much less dramatic reduction in the frequency of use of shotguns over the same three periods. Although the use of handguns and military firearms was comparatively rare, there was a steady rise in the number of deaths where use of a handgun was reported (1983–87 n=53; 1988–92 n=79; 1993–97 n=105; 1998–02 n=123). Handgun-related firearm deaths have risen as a proportion of all deaths caused by identified firearms, suggesting that this apparent rise reflects a real increase in the number of handgun-related suicides. Conversely, it should be noted that at least some of the apparent rise may be due to other factors: For example, over the period 1983–2002, while the total number of firearm-related deaths fell by 56%, the number assigned to the category ‘Other/unspecified firearms’ declined by 65%. This would suggest that part of any increase in the number of identified firearms, including handguns, was due to improved coding (Figure 6).

## Deaths registered in 2002

There was a total of 217 suicide deaths registered in 2002 in which a firearm was the means used. 206 (95%) of these deaths were of males. The place where the suicide occurred was most commonly specified as the person's home (n=139; 64%). 17 (8%) cases occurred on a 'street or highway' and 11 (5%) on a 'farm'. Place was not specified for 15 (7%) cases. In 5 cases the person was recorded as being Aboriginal or Torres Strait Islander. (Note that under-reporting of Indigenous status occurs in deaths data.(Harrison JE Helps YL 2004)

The age distribution for firearm-related suicide deaths in 2002 was similar to that for firearm-related deaths as a whole (i.e. rates were highest among older men) (Figure 7).

The Northern Territory and Tasmania had rates that were significantly higher than the Australian rate in 2002 (9.0 and 7.3 per 100,000 respectively). Victoria had the lowest rate (0.7 per 100,000). The difference between the Victorian and Australian rates was statistically significant (Figure 8).

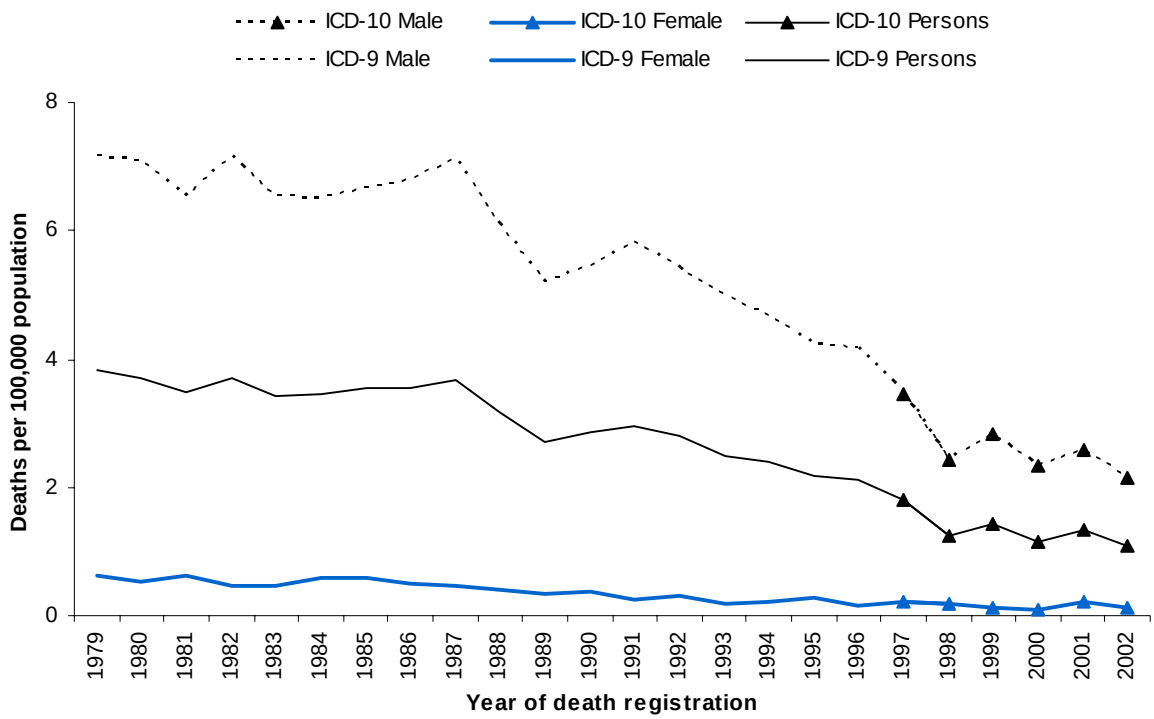


**Figure 4: Firearm-related suicide deaths by year of registration, Australia 1979–2002**

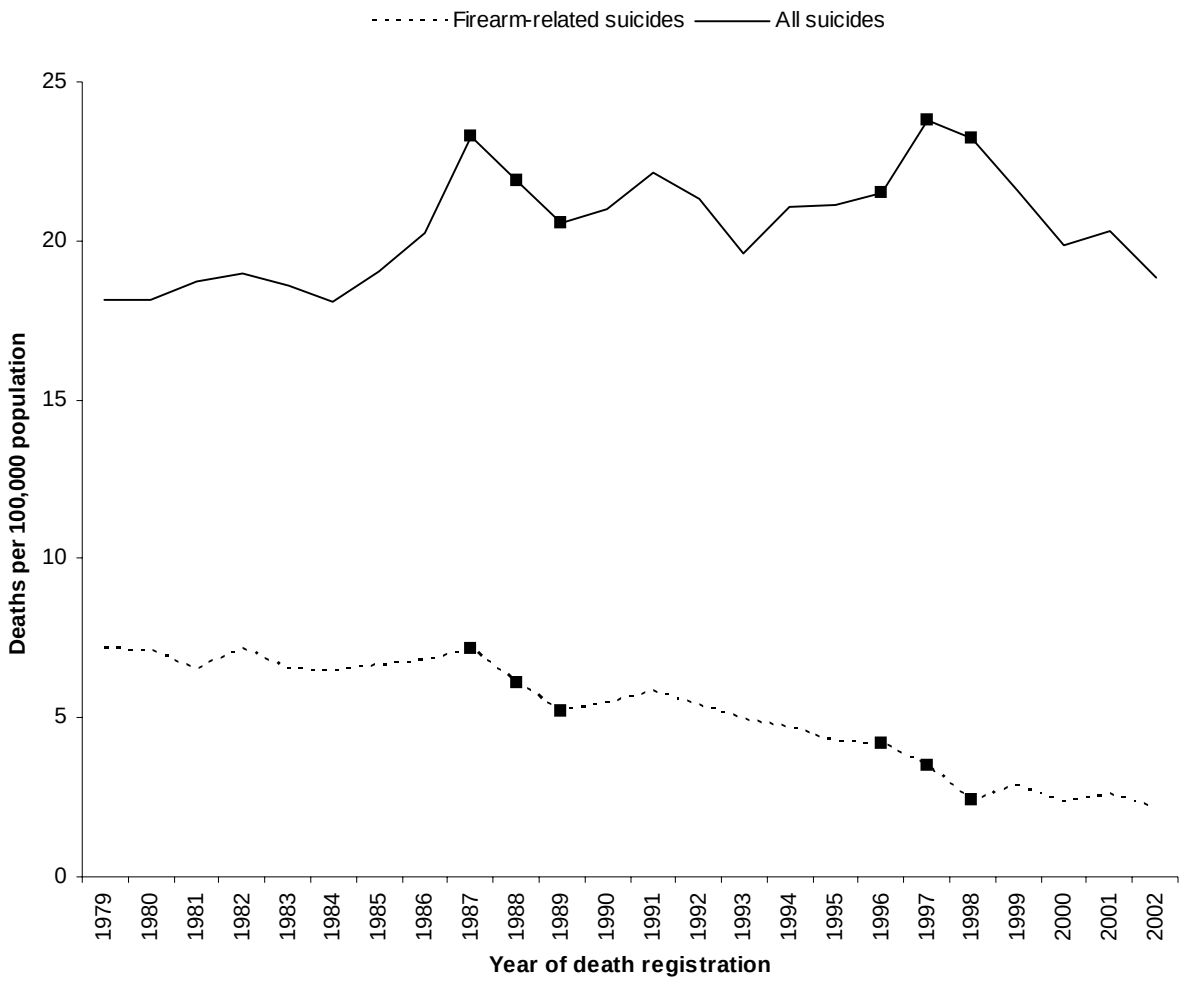


**Figure 5: Comparison in trends for all male suicides and firearm-related suicides, Australia 1979–2002**

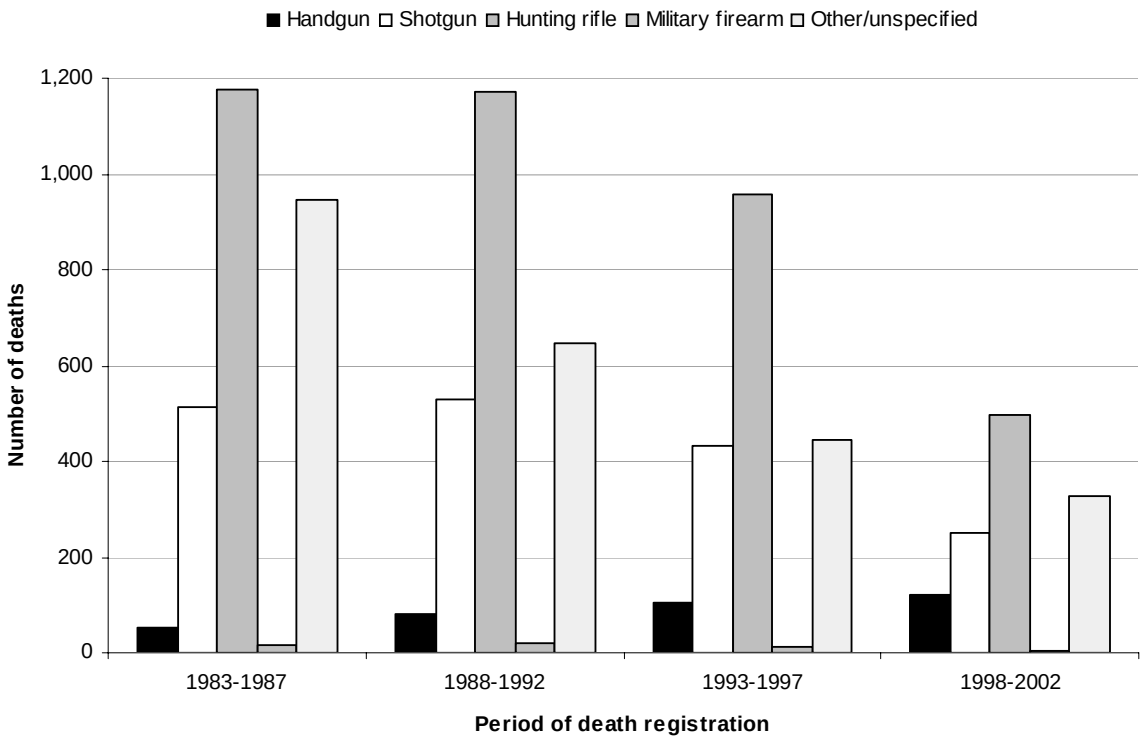


**Figure 6: Firearm-related suicide deaths by type of firearm used (five year time periods)**

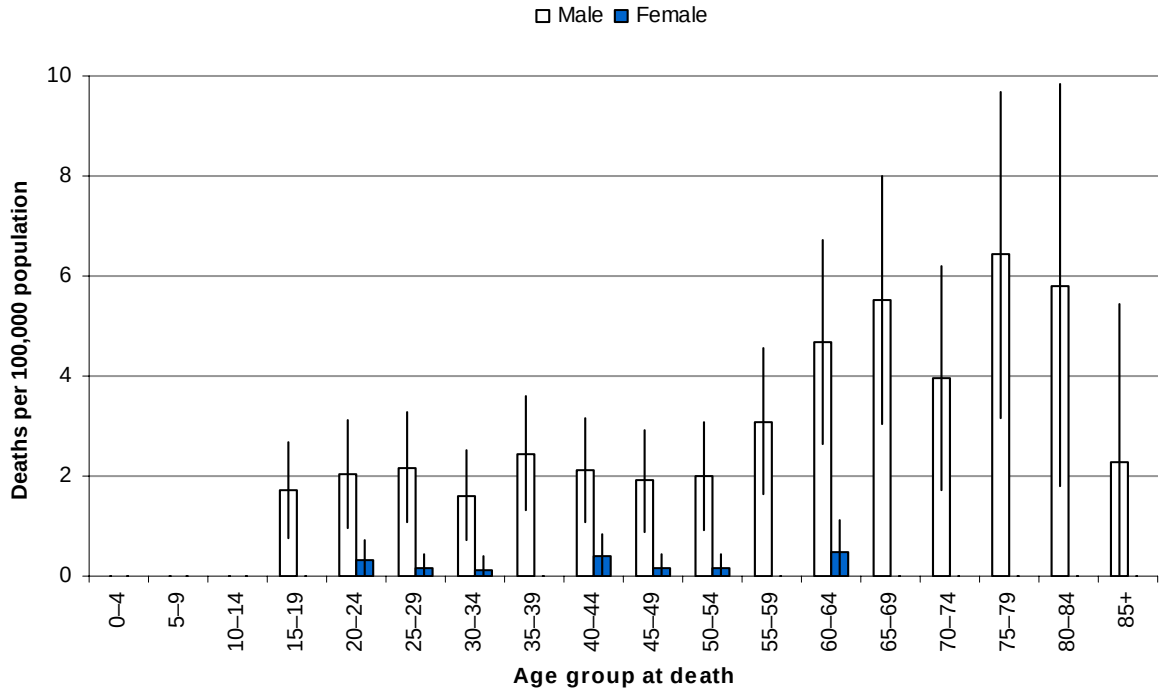


**Figure 7: Firearm-related suicide deaths by age and sex, Australia 2002**

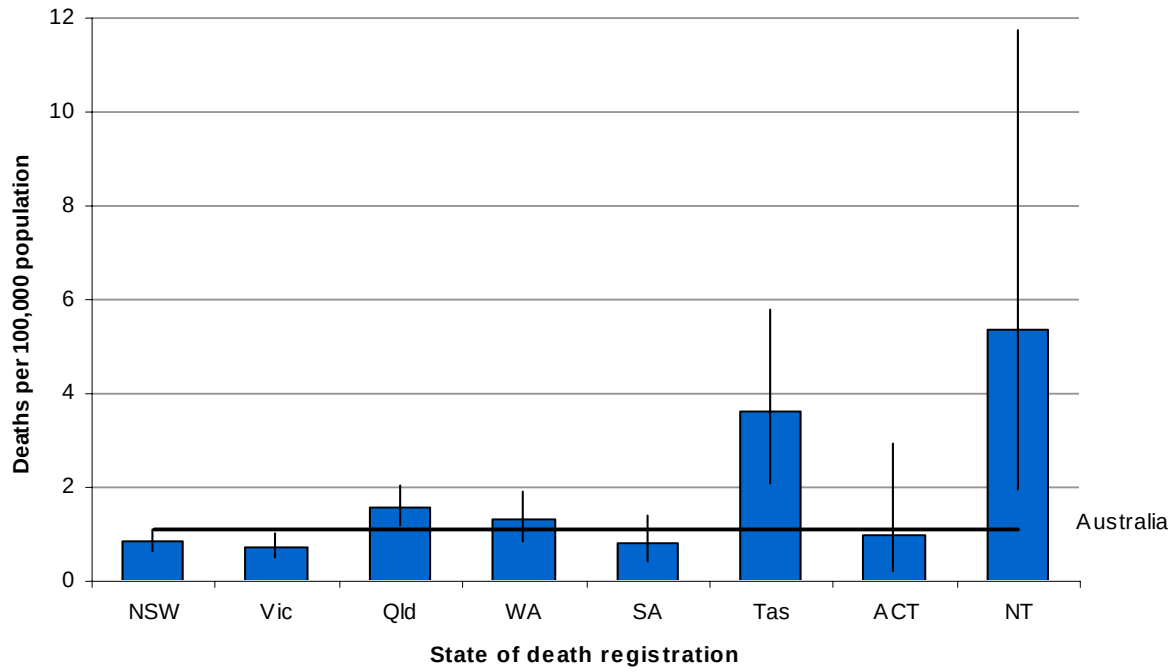


**Figure 8: Firearm-related suicide deaths by State or Territory of registration, Australia 2002**

## Firearm-related homicide

## Deaths registered between 1979–2002

There was a marked downward trend in rates of firearm-related homicide between 1979 and 2002. (Rates have been calculated as annual averages over four years because of small annual case numbers.) Female rates declined steadily over this period while for males, rates reached a plateau between 1979 and 1986 and again between 1991 and 1998 (Figure 9).

Hunting rifles and shotguns were the two most common firearms associated with homicides during the period 1983–2002. The use of hunting rifles dropped markedly between the five-year periods 1988-92, 1993-1997 and 1998–2002. There was a much less dramatic reduction in the frequency of use of shotguns over the same three periods. Handguns were used in a notable proportion of homicides, and their use appears to be rising in frequency. There was also a rise in the reported use of military weapons between the periods 1983–87, 1988–92 and 1993–97, but there has been a drop in the most recently reported 5 year period (Figure 10). The apparent rise in the use of military-style semi-automatic weapons is almost entirely due to the occurrence of several mass shootings. During the period 1988–92, semi-automatic weapons were used in three such events, in Hoddle and Queen Streets in Melbourne, and in Strathfield, a suburb of Sydney (Chappell D 1992). A total of 21 people died in these incidents. During the period 1993–97, semi-automatic weapons took the lives of 35 people in Port Arthur, Tasmania (Mouzos J May 2000). All of these events caused a strong public reaction and acted as a catalyst for the revision of firearm laws (Mouzos J May 1999).

## Deaths registered in 2002

There was a total of 45 firearm-related homicides in 2002. 34 (76%) of these involved males. While small case numbers limit interpretation, rates tended to be highest for young adult males (Figure 11).

No firearm deaths were recorded for the Northern Territory or the ACT during 2002. Differences in rates between the remaining States were not statistically significant, but confidence intervals are wide due to small case numbers (Figure 12).

16 (36%) of the homicides were recorded as occurring at home. The next most commonly coded location was a 'Street or highway' (n=8; 18%). Location was not specified in 10% of cases.

Where coded information was available, handguns were the most commonly used type of firearm (n=11, 24%). The type of firearm was not specified in 51% of cases.

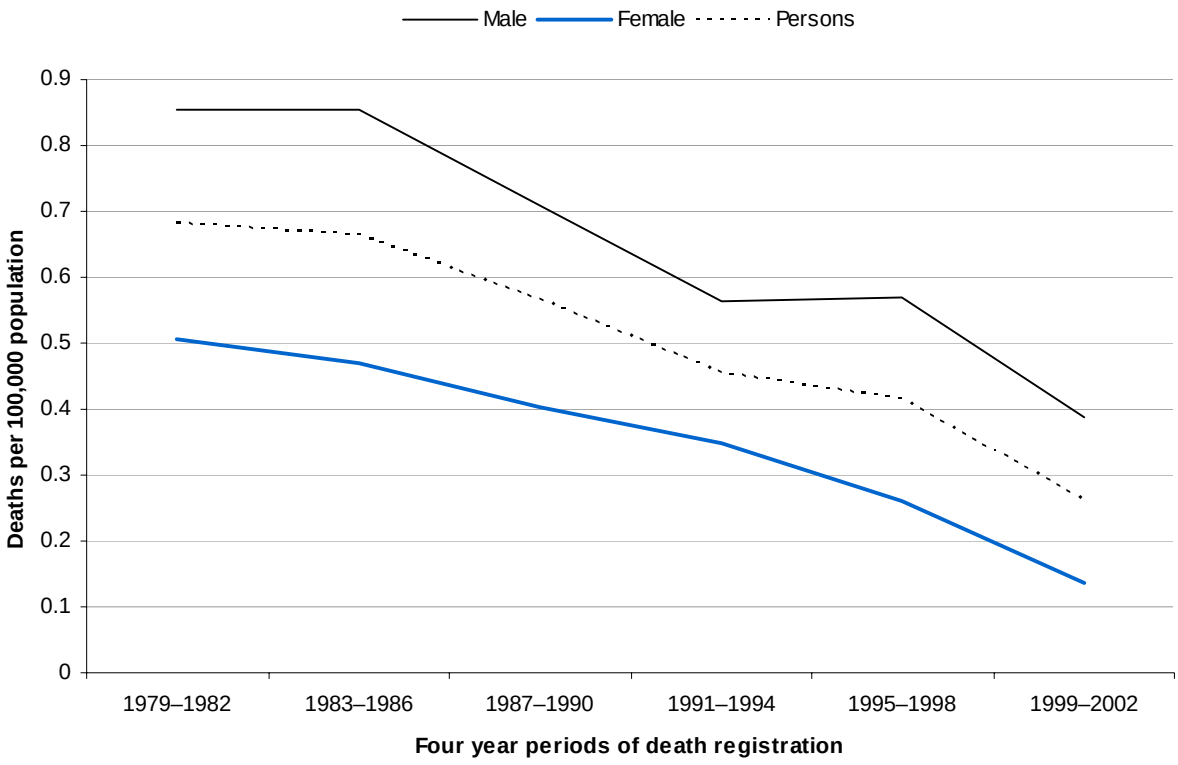


**Figure 9: Firearm-related homicide death by four year periods of registration, Australia 1979–2002**

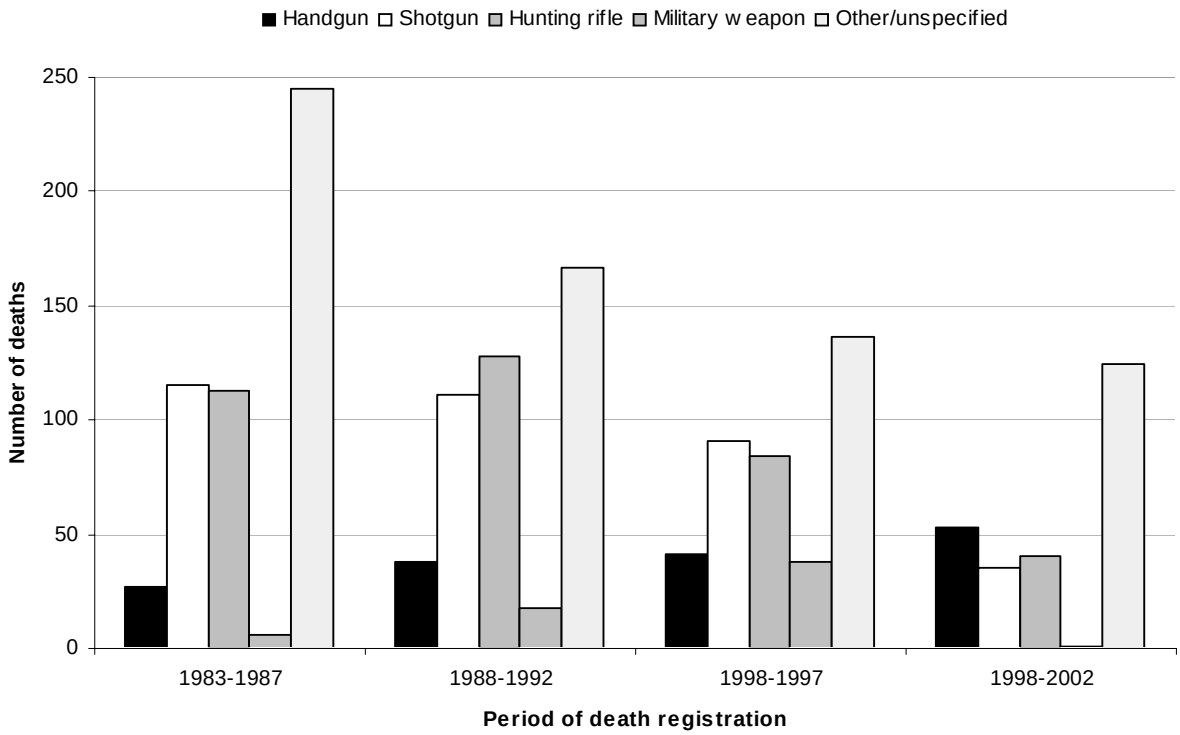


**Figure 10: Firearm-related homicide deaths by type of firearm used, Australia 1983–2002**

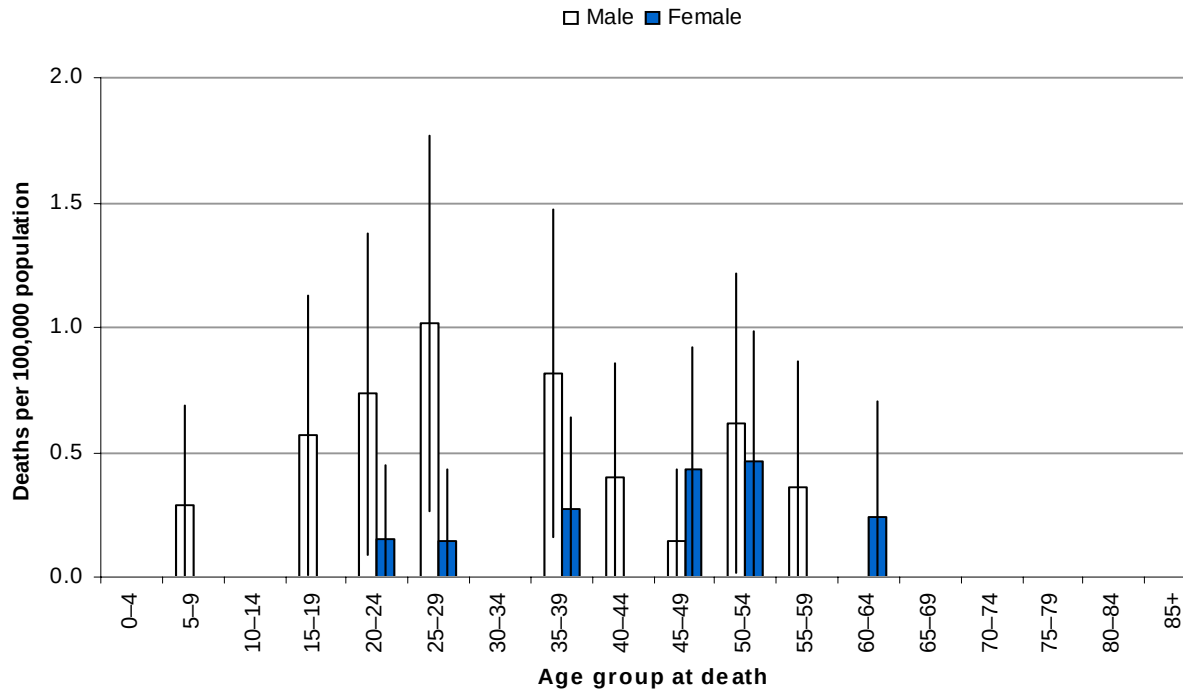


**Figure 11: Firearm-related homicide deaths by age and sex, Australia 2002**


**Figure 12: Firearm-related homicide deaths by State and Territory, Australia 2002**

## Unintentional firearm-related deaths

31 firearm-related deaths in 2002 were recorded as being unintentional, 26 (84%) of which were males. The deaths occurred most frequently at home, although it must be noted that in 39% of cases the place of occurrence was unspecified. Where the type of gun was specified, shotguns were the most commonly identified type of firearm (firearm type was not specified in 65% of cases).

# Hospitalisations, 12-month period to 30 June 2002

## All firearm-related hospitalisations

A total of 546 firearm-related records were identified for the year 2001/2002, the most recent year of data available. Identification was based on the presence of one or more external cause codes for firearm-related events in any given record. It is important to note that the number of records is not equivalent to the number of individuals who were hospitalised. A record represents one 'episode of care'. Individuals will often have more than one episode of care and therefore have more than one record. For example, an individual's hospitalisation might consist of a first record which begins with their admission from the community and terminates in their transfer to another hospital. Their second record might then consist of a transfer admission to hospital and will terminate in their release back into the community. In order to arrive at a figure which represents the number of cases rather than records, NISU has adopted a method which enables incidence to be approximated. This method is described in Appendix 1: Data Issues.

After application of the method, an estimate of 443 cases of firearm-related hospitalisation was arrived at. In 53 of these cases, although the presence of an external cause code indicated that the person had been injured as the result of a firearm-related event, their principal diagnosis was not an injury or poisoning code. A review of these cases indicates that many of these 53 hospital episodes may have been due to the late effects of a firearm-related injury. For example, in 27 cases patients were receiving rehabilitation or follow-up treatment; in 7 cases the person was suffering a mental or behavioural disorder; in 4 cases the principal diagnosis was some form of pain or a disturbance of skin sensation. Deducting these 53 cases of 'late effects' from the 443 cases selected for analysis in this report, produces an estimate of newly incident cases (n=390) for the period 2001-2002.

Analysis of the 443 cases identified showed that most were unintentional injuries caused by firearms (43%). The next most common type of case was occasioned by an assault with a firearm (Table 2). 24 (5%) of cases were identified as Aboriginal or Torres Strait Islander persons.

The cases were predominantly male (n=401, 91%) and were most frequent in the 15–54 year age group (Figure 13).

Mean length of stay in hospital was calculated by dividing total bed-days for the 546 firearm-related records by the estimated number of cases (n=443), producing a mean value of 8 bed-days per case. The longest single episode of care was 121 days (the available data does not allow for an estimate of the longest total period of hospitalisation to be calculated). 40 (9%) of the selected subset of 443 cases died while in hospital. In 15 (3%) of the cases, patients absconded or discharged themselves from hospital against medical advice.

The principal body region injured was most commonly the hip and lower limb (n=131, 30% of all separations) (Table 3).

Cases were analysed according to their first-stated external cause code. (A record can attract up to 31 External cause codes, though few have more than two.) The results of the analysis provide a degree of insight into the type of firearm that was used in each incident. It should be noted that, for a substantial number of cases, no specific firearm was identified (n=156, 35%). In the cases for which a firearm was identified, handguns were the most commonly used weapon (n=112, 25%), particularly in instances of assault. The next most commonly implicated firearm was a shotgun (n=68, 15%), most frequently appearing as the mechanism of unintentional injuries in this category (Table 4).

**Table 2: All firearm-related hospitalisations by intent, Australia 2001/02**

| Intent | Number | Percentage | Estimated incident cases |
|---|---|---|---|
| Unintentional | 192 | 43.3 | 180 |
| Assault | 142 | 32.1 | 127 |
| Intentional self-harm | 60 | 13.5 | 54 |
| Legal intervention/Operations of war | 25 | 5.6 | 8 |
| Undetermined intent | 24 | 5.4 | 21 |
| **Total** | **443** | **100.0** | **390** |

Note: Cases where the principal diagnosis suggests that the hospital episode was associated with a late effect of a firearm-related injury were subtracted from the first column to arrive at an estimate of the number of incident cases reported in the third column.

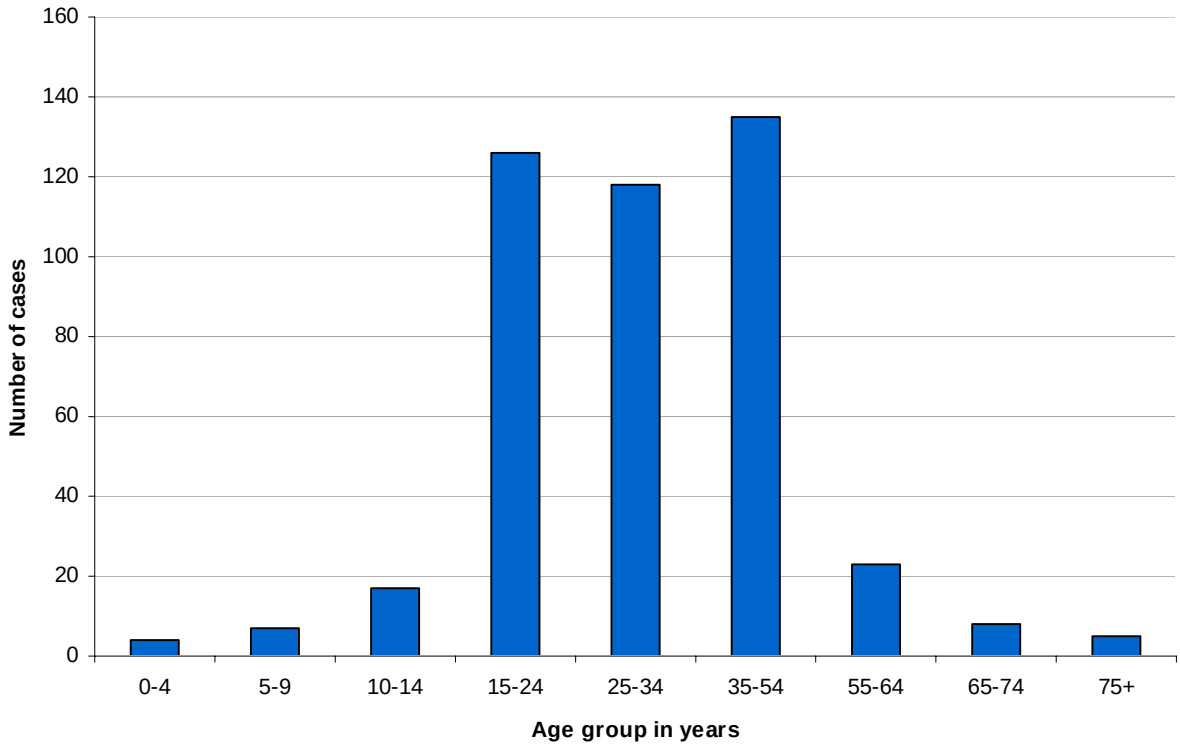


**Figure 13: All firearm-related hospitalisations by age, Australia 2001/02**

**Table 3: Firearm-related hospitalisations by principal body region injured and mean length of stay, Australia 2001/02**

| Principal body region injured | Number | Percentage | Mean length of stay in days* |
|---|---|---|---|
| Hip and lower limb | 131 | 29.6 | 8 |
| Trunk (neck, thorax, abdomen to pelvis) | 90 | 20.3 | 10 |
| Head | 79 | 17.8 | 7 |
| Shoulder and upper limb | 83 | 18.7 | 4 |
| Other injuries not specified by body region | 60 | 13.5 | 16 |
| **Total** | **443** | **99.9**** | **8** |

* Mean length of stay in hospital was calculated by dividing the total bed-days for all hospital separation records associated with each major body region by the estimated number of cases associated with each body region.

** Total percentage does not sum to 100 due to rounding.

**Table 4: All firearm-related hospitalisations by intent and type of firearm used, Australia 2001/02**

| Type of firearm | Unintentional | Self-harm | Assault | Undetermined intent | Legal intervention | Operations of war | Total |
|---|---|---|---|---|---|---|---|
| Handgun | 29 | 10 | 66 | .. | 4 | 0 | 112 |
| Air rifle | 34 | .. | 4 | .. | 0 | 0 | 42 |
| Shotgun | 30 | 12 | 15 | 9 | .. | 0 | 67 |
| Small calibre rifle | 25 | 20 | 5 | 0 | .. | 0 | 51 |
| Large calibre rifle | .. | .. | .. | .. | 0 | 0 | 5 |
| Other and unspecified firearm | 69 | 14 | 46 | 8 | 4 | 15 | 156 |
| First-stated external cause code was not a firearm-related code | | | | | | | 10 |
| **Total firearms** | 192 | 60 | 142 | 24 | 10 | 15 | 443 |

## Firearm-related self-harm

There were 60 cases of firearm-related self harm during the year 2001/2002. These cases were overwhelmingly male (n=56, 93%). The cases most frequently involved men in the 25–54 year age group (Figure 14). There were fewer than 4 cases in the age group 75 years and over.

In 52% (n=31) of cases, the principal injury sustained was to the head. The next most common site was the trunk (neck, thorax or abdomen) which was the main site of injury in 14 (23%) cases. The mean length of stay in hospital was 3 days, with the longest period being 27 days. 23 people died while in hospital.

The most commonly used firearm, a small calibre rifle, was used in around one-third of these cases. (The type of firearm was not specified in 23% of cases.) (Table 5).

**Table 5: Firearm-related hospitalisations due to self-harm by type of firearm used, Australia 2001/02**

| Type of firearm | Number | Percentage |
|---|---|---|
| Handgun | 10 | 17 |
| Air rifle | .. | 3 |
| Shotgun | 12 | 20 |
| Small calibre rifle | 20 | 33 |
| Large calibre rifle | .. | 2 |
| Other/unspecified firearm | 14 | 23 |
| First-stated external cause code was not a firearm-related code | .. | 2 |
| Total | 60 | 100.0 |

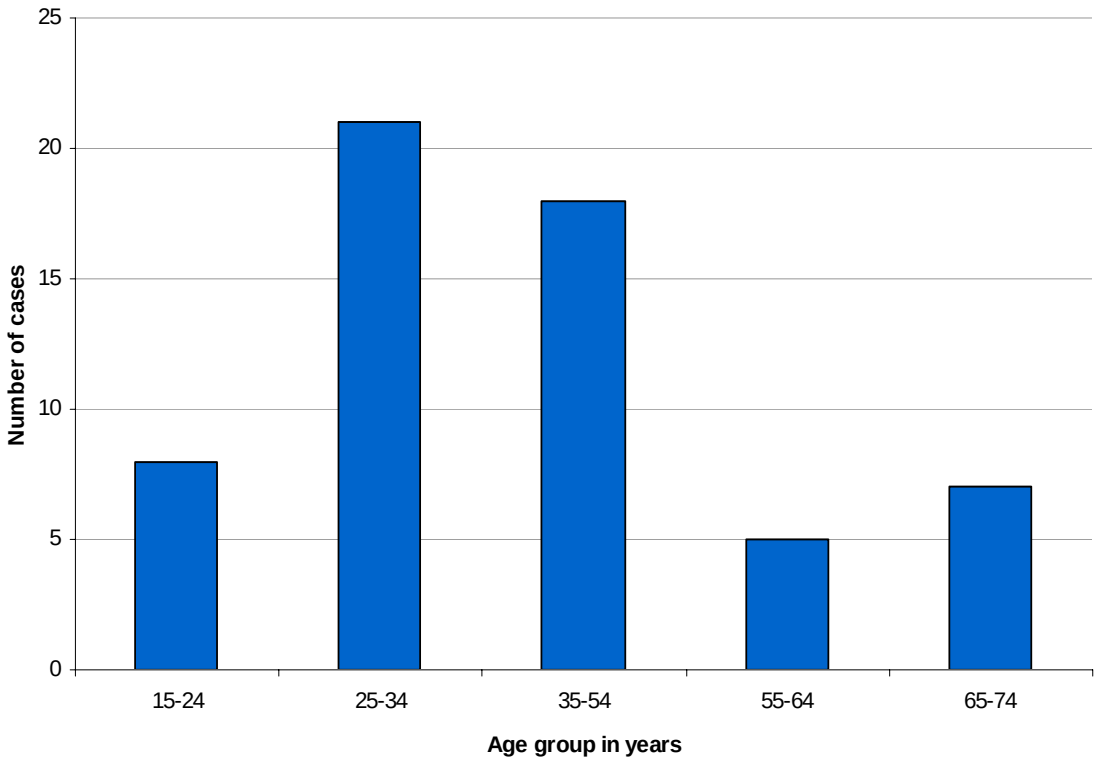


**Figure 14: Firearm-related cases of self harm, Australia 2001/02**

Note: The data series for age groups 75 years and over were suppressed because they contained fewer than 4 cases.

## Firearm-related assault

There were 142 cases of firearm-related hospitalisation during the 12-month period 2001/2002. These were principally male (n=127, 89%) and were most frequent in the 20–24 year age group (Figure 15). There were fewer than 4 cases in the age groups below 15 years of age and for those 55 years and over.

The mean length of stay in hospital was 5 days, with the maximum stay being 44 days. 10 people in this group of cases died while in hospital. Handguns were the most commonly used firearm in cases of assault (n=66). (The type of firearm was not specified in 32% of cases.)

The three most common sites for the main injury sustained were the hip and lower limb (n=52, 37%); the trunk (n=41, 29%); and the head (n=18, 13%) (Table 6). This pattern differs from those for firearm-related self harm and unintentional injury.

**Table 6: Principal body region injured in firearm-related assaults, Australia 2001/02**

| Principal body region injured | Number | Percentage |
|---|---|---|
| Other injuries not specified by body region | 16 | 11 |
| Head | 18 | 13 |
| Trunk (neck, thorax, abdomen to pelvis) | 41 | 29 |
| Shoulder and upper limb | 15 | 11 |
| Hip and lower limb | 52 | 37 |
| **Total** | **142** | **100** |

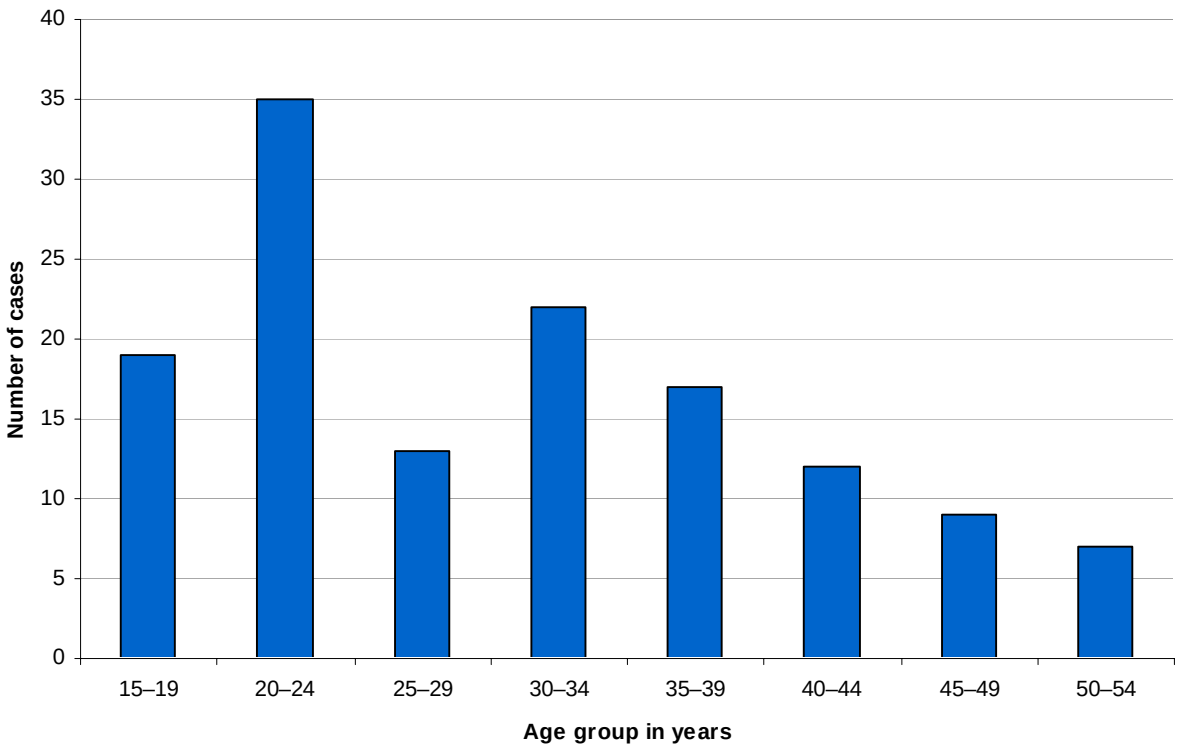


**Figure 15: Firearm-related cases of assault, Australia 2001/02**

Note: The data series for the age groups under 15 years and 55 years and over have been suppressed because they contained fewer than 4 cases.

## Unintentional firearm-related hospitalisations

There were 192 cases of unintentional firearm-related injury in the year 2001/02. Of these, the major proportion were males (n=172, 90%) and were concentrated in the 15–54 year age range (Figure 16). There were fewer than four cases in the age groups 65 years and over.

The most common sites for the principal injury sustained were the hip and thigh (n=72, 38%); shoulder and upper limb (n=50, 26%); and the trunk (n=29, 15%) (Table 6). This pattern differs from those for assault (Table 5) and intentional self-harm (Table 7). The mean length of stay in hospital was 8 days, with the longest episode being 76 days. 5 people died while in hospital.

The three most commonly implicated firearms in unintentional incidents were air rifles (n=34, 18%), shotguns (n=30, 16%), and handguns (n=29, 15%) (Table 8).

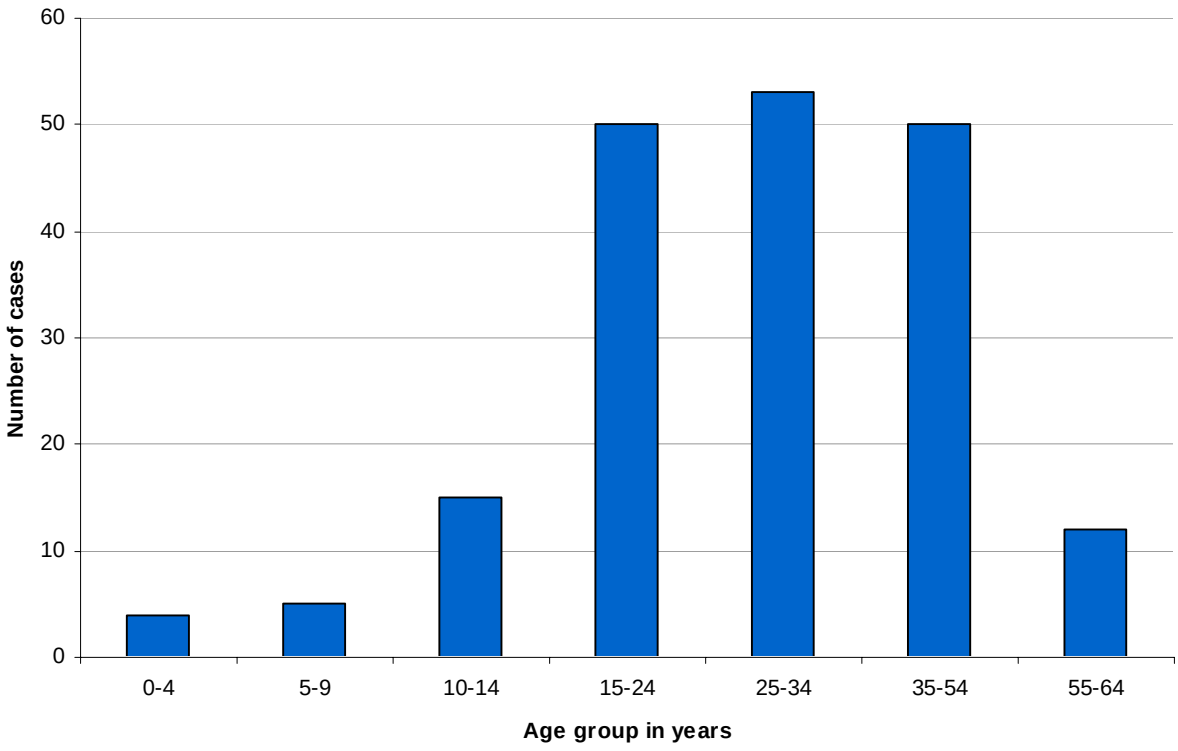


**Figure 16: Cases of firearm-related unintentional injury, Australia 2001/02**

**Table 7: Principal body region injured in cases of unintentional firearm-related injury, Australia 2001/02**

| | Number | Percentage |
|---|---|---|
| Hip and lower limb | 72 | 38 |
| Shoulder and upper limb | 50 | 26 |
| Trunk (neck, thorax, abdomen to pelvis) | 29 | 15 |
| Head | 23 | 12 |
| Other injuries not specified by body region | 18 | 9 |
| **Total** | **192** | **100** |

**Table 8: Unintentional firearm-related hospitalisations by type of firearm used, Australia 2001/02**

| Type of firearm | Number | Percentage |
|---|---|---|
| Handgun | 29 | 15 |
| Air rifle | 34 | 18 |
| Shotgun | 30 | 16 |
| Small calibre rifle | 25 | 13 |
| Large calibre rifle | .. | .. |
| Other/unspecified firearm | 69 | 36 |
| First-stated external cause code was not a firearm-related code | .. | .. |
| **Total** | **192** | **100** |

# Conclusions

By far the most common type of firearm-related deaths are suicides. Unintentional deaths caused by firearms are comparatively infrequent.

Cases of firearm-related deaths and hospitalisations most commonly involved males

There has been a downward trend in firearm-related deaths since 1979. The rate has fallen from 5.1 per 100,000 in 1979 to 1.5 per 100,000 in 2002.

The pattern for firearm-related hospitalisations differs from that for deaths. Hospitalisations resulting from the use of a firearm are most commonly unintentional.

# References


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# Appendix 1: Data issues

## Data sources

Deaths data are from the Australian Bureau of Statistics (ABS) mortality unit record data collection, 1979–2002. Population data were obtained from the ABS.

The data on hospital separations were provided by the AIHW (Australian Health and Welfare). NISU processed, checked an combined the relevant data years to facilitate analysis.

Population data were obtained from the Australian Institute of Health and Welfare and are similar to data presented in the Demographic Statistics Catalogue No. 3101.0 (ABS).

## Age adjustment

Most all-ages rates have been adjusted for age 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 2001 as the standard. Changes in age composition are small within narrow age bands (e.g. 65–69 years) and adjustment has not been applied to five year age groups. Where crude rates are reported, this is noted.

## Confidence intervals

## Deaths

Nearly all deaths are believed to be included in the sources used for this report, so sampling errors do not apply to these data. However, the time periods used to group the cases (e.g. calendar years) are arbitrary. Use of another period (e.g. April to March) would result in different rates, especially where case numbers are small. The 95% confidence intervals of these rates are based on a Poisson assumption about the number of cases in a time period. Chance variation alone would be expected to lead to a rate outside the 95% confidence interval on 5% of occasions. Confidence intervals were calculated using the methods described by Anderson and Rosenberg (Anderson 1998). Asymmetrical confidence intervals were calculated for case numbers up to 100. Symmetrical intervals, based on a normal approximation, were calculated where case numbers exceed 100.

## Hospital separations

Less than 1% of injury/poisoning separations are thought to be missing from the data reported, representing minimal risk of sampling error. Data are based on the financial year of separation, but could equally be based on calendar year, in which case rat4es would differ slightly. Confidence intervals for rates indicate the size of such differences (95%; based on Poisson distribution).

## Estimation of incidence for hospital separations

Incidence of hospitalisations is not equivalent to the number of hospital separations. A hospital separation refers to a single ‘episode of care’. An individual may have more than one ‘episode of care’ or ‘separation’ as a consequence of the same external cause of injury. The following adjustments have been made to the hospital separations data in order to approximate incidence of hospitalisations. Records have been excluded where the mode of separation was a:

1. Discharge or transfer from one acute hospital to another acute hospital; or a
2. Statistical separation—the administrative process by which a hospital records the cessation of an episode of care for a patient within the one hospital stay.

Cases with these modes of separation are likely to have resulted in at least two separations. The method described here is intended to reduce multiple counting of cases.

More detailed information about the estimation of incidence for hospital separations can be found in the report *Hospital separations due to injury and poisoning, Australia 1999-00.*(Cripps R Helps YL, Harrison JE, 2002)

## Case definition

## Deaths

The Underlying Cause of each death (UCoD) registered in Australia is classified by the ABS according to the *International Classification of Diseases* (ICD). The *9th Revision* (ICD-9) was used for death registrations between 1979 and 1998 (World Health Organization 1977). The *10th Revision* (ICD-10) was used for deaths registered from 1999 onwards (World Health Organization 1992). All deaths registered in 2002 and given an ICD-10 External Cause code by the ABS are included in this report.

In general, the inclusion criterion used for the report was that the UCoD was an External Cause. Additional cases are included in some sections, as described in the text.

Data are presented according to the year in which deaths were registered. 5% of injury deaths registered in 2002 occurred in an earlier year. A similar proportion of deaths that occurred in 2002 will not have been registered until after 2002. Information on these cases was not available at the time of writing. State-specific data are presented on the basis of the State or Territory in which death was registered. This is usually the one in which death occurred.

## Hospitalisations

Hospital separations data used in this report are classified according to the Australian Modification of the *International Classification of Diseases* (ICD). The 10$^{th}$ Revision (ICD-10-AM) was used for hospital separations that occurred during the 12 month period ending 30 June 2002.

The inclusion criterion for the report was the presence of a firearm-related code among any of the external causes assigned to a record.

## Time series

## Deaths

Time trends have been presented, where possible, for the period 1979–2002. Australian deaths data registered in the period 1979–1998 were classified according to the *9th Revision of the International Classification of Diseases* (ICD-9) and, for 1999–2002, according to the *10th Revision of the International Classification of Diseases* (ICD-10). The change to ICD-10 has had an impact on the ability to produce meaningful time trends for some aspects of injury. This was discussed in detail in Injury deaths, Australia 1999 (Kreisfeld 2004).

## Data quality

### Deaths

The reliability of information about cause of death depends on the reliability of ICD codes provided by the ABS. This depends largely on the adequacy of the information provided to the ABS through Registrars of Births, Deaths and Marriages, and originating from coroners and medical practitioners. Little published information is available on the quality of the data resulting from this process, particularly as it applies to injury deaths. Centralisation of mortality coding in the Brisbane office of the ABS since the mid 1990s has reduced the potential for variation due to local differences in coding practice. However, factors affecting information recording, provision, or coding could affect data in different ways for different jurisdictions, periods or population groups. Hence, apparent differences should be interpreted with caution.

### Hospitalisations

This report uses data collected from State and Territory hospitals. After coding and collection from the States and Territories, the data is further processed by the AIHW and NISU. The geographical spread of the data and the large number of people involved in its processing increases the risk of inconsistencies across time and place in the data. Variations in reporting and coding continue to exist across jurisdictions, although National Minimum Data Sets have been in place for some considerable amount of time.

## Firearms Flag

### Deaths

ICD-10 provides less detail concerning types of firearms involved in injury than ICD-9. In response to public interest in the details of firearms associated with Australian deaths, the ABS introduced a *Firearms Flag* with the following categories: Handgun; Shotgun; Hunting rifle; Military firearms; Other firearms; Unspecified firearms. The categories are similar to those that were provided in ICD-9 (e.g. subcategories of E922).

### Hospitalisations

A similar approach was not taken with respect to hospital separations data when ICD-9-AM was superseded by ICD-10-AM. The firearm-related codes in ICD-10-AM differ from those that make up the ABS *Firearms Flag.* The ICD-10-AM codes specify the following categories of firearm: Handgun; Air rifle; Shotgun; Small calibre; Large calibre; Other or unspecified firearm.