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NSW INJURY RISK
MANAGEMENT RESEARCH CENTRE

UNSW

**NSW INJURY PROFILE:
A REVIEW OF INJURY DEATHS
DURING 1998–2002**

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Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AUS	Australia
CDC	Centres for Disease Control and Prevention
CI	95% confidence interval
Ecode	External cause of injury code
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10 th Revision
ICD-9	International Classification of Disease, 9 th Revision
ICEHS	American Public Health Association's Injury Control and Emergency Health Services Section
IPV	Interpersonal violence
IRMRC	NSW Injury Risk Management Research Centre
NCCH	National Centre for Classification in Health
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
Ncode	Nature of medical condition or injury
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
SLA	Statistical Local Area
TAS	Tasmania
VIC	Victoria
WA	Western Australia
WHO	World Health Organization

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Executive Summary

Injury is an internationally recognised public health problem across all age groups. In 2002, injury was the fourth leading cause of death in New South Wales (NSW) and the leading cause of death for all people aged one to four years and 10–44 years. Approximately 2500 people died each year in NSW as the result of an injury from 1986 to 2002.

This report presents a detailed profile of injury mortality in NSW using currently available data from the Australian Bureau of Statistics for 1986 to 2002. Injury mortality was defined in terms of the underlying cause of death. Cases were included where the underlying cause of death was determined to be an external cause of injury (injury mechanism or Ecode) and the state of residence of the deceased person was NSW.

Data from 1986 to 2002 were used to produce trends in annual death rates over time for the 15 most common injury death mechanisms. Data during 1998–2002 were grouped for each mechanism and used to calculate injury death rates for all people, males and females, as well as age-specific injury death rates and frequencies for all people. Injury death rates and frequencies for all people, males and females, were also calculated for injury mechanism subcategories (e.g. the different methods of suicide).

This report presents the detailed profiles of the 15 leading causes of injury death during 1998–2002. These 15 injury mechanisms account for 86% of all injury deaths. The top four of these 15 injury mechanisms accounted for 70% of all injury deaths occurring during 1998–2002 (in descending order):

- suicide
- motor vehicle transport
- poisoning
- falls.

Analysis of all injury death rates from 1986 to 2002 in NSW showed a statistically significant decline overall. A statistically significant decline was also found in nine of the 15 injury mechanisms profiled. These injury mechanisms were: motor vehicle transport, interpersonal violence, drowning, fire/burns, rail transport, natural/environmental factors, air transport, machinery and firearms. There was a statistically significant increase in poisoning deaths during 1986 to 2002. There was no significant trend in the remaining five injury mechanisms between 1986 and 2002.

Comparison of the age-specific death rates for all injuries between 1998 and 2002 showed that people aged 70+ years had the highest death rates for all injuries. Within each of the 15 injury mechanisms

profiled, particular age groups had higher rates of death. Comparison of the age-specific rates showed that, as people age, their risk for different types of injury death changes:

- In children under the age of one year, suffocation was the leading cause of death.
- In children aged one to four years, drowning was the leading cause of injury death followed very closely by motor vehicle transport.
- In people aged five to 24 years, motor vehicle transport was the leading cause of death.
- In people aged 25–74 years, the leading cause of injury death was suicide.
- In people aged 75–79 years, two injury mechanisms (motor vehicle transport and falls) were the leading causes of death.
- In people aged 80+ years, falls were the leading cause of death.

An analysis of the number of deaths by age group showed that people aged 70+ years accounted for just over 27% of all injury deaths. The age group with the second highest of all injury death rates was people aged 20–44 years. This age group accounted for almost 41% of all injury deaths from 1998–2002.

Males accounted for 70% of all injury deaths between 1998 and 2002. Death rates for males exceeded those in females for all injury mechanisms reported. A comparison of male and female mortality rates for each of the 15 injury mechanisms profiled showed that males were at least three times more likely than females to die from the following injury causes:

- struck by or against another object or person (unintentional)
- rail transport
- air transport
- suicide
- drowning.

The statements below summarise the key findings from the analysis of all injuries and individual injury mechanisms. Death data from 1986 to 2002 were used to describe the demographic profile of injury mortality in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002. One or more words in some key points are italicised. These italicised words correspond to specific subcategories of the injury mechanisms (e.g. the different methods of suicide).

All injury

- In 2002, injury and poisonings were the fourth leading cause of death in NSW overall.
- In 2002, injury and poisonings were the leading cause of death among people aged 1–4 years and 10–44 years.

- There was a statistically significant decline in injury death rates from 1986 to 2002.
- People aged 70+ years had the highest age-specific injury death rate in NSW from 1986 and 2002.
- Males accounted for 70% of all injury deaths in NSW between 1998 and 2002.
- Death rates for males were significantly higher than those for females for all major injury mechanisms, except for complications of care.

Suicide

- Suicide was the leading cause of injury mortality in NSW during 1998–2002, accounting for 30% of all injury deaths.
- There was no statistically significant trend in suicide death rates over 1986 to 2002.
- People aged 30–39 and 85+ years had the highest and second highest rates of death due to suicide respectively.
- Males accounted for 80% of all suicide deaths.
- *Hanging, strangulation or suffocation* was the leading suicide method for persons aged 10–44 years and 65+ years, while *poisoning* ranked highest for persons aged 45–64 years followed by *hanging, strangulation or suffocation*.

Motor vehicle transport

- There was a statistically significant decline in motor vehicle transport death rates from 1986 to 2002.
- People aged 15–24 and 80+ years had the highest rates of death due to motor vehicle transport in NSW during 1998–2002.
- Males accounted for 72% of all motor vehicle transport deaths in NSW during 1998–2002.
- *Motor vehicle occupant in traffic* was the leading road-user class for all motor vehicle transport deaths, except in children aged 5–9 years. Children aged 5–9 years died most often as *pedestrian traffic*.

Poisoning

- There was a statistically significant increase in poisoning death rates from 1986 to 2002.
- People aged 25–44 years had the highest rates of death due to poisoning in NSW during 1998–2002.
- Males accounted for 73% of all poisoning deaths in NSW during 1998–2002.

- Narcotics and hallucinogens caused the highest number of poisoning deaths in people aged 15–44 years. Other pharmaceuticals caused the highest number of poisoning deaths in people aged 45+ years.

Falls

- There was no statistically significant trend in falls death rates from 1986 to 2002.
- People 70+ years had the highest rates of death due to falls in NSW during 1998–2002.
- Males accounted for 59% of all falls deaths in NSW during 1998–2002.
- Fall *from a building or other structure* was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 10–34 years, fall *from one level to another* was the leading cause of falls death. Fall on the *same level* was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 55 and older, *other and unspecified* falls were the leading cause of falls death.

Interpersonal violence

- There was a statistically significant declining trend in interpersonal violence death rates from 1986 to 2002.
- People aged 30–34 years had the highest rate of death due to interpersonal violence in NSW during 1998–2002. Children under age five years also had high interpersonal violence rates.
- Males accounted for 70% of all interpersonal violence deaths in NSW during 1998–2002.
- *Sharp or blunt object* (used to hit, cut or stab another person causing bleeding or other type of injury) was the leading method used in interpersonal violence deaths in people aged 10+ years, with the exception of people aged 15–24 years. The majority of deaths in this age group were caused by *firearms*. Children under age one year died most often as the result of interpersonal violence by being *struck by/struck against* (another person or object) and children aged one to nine years died most often as a result of *hanging, strangulation or suffocation*.

Drowning

- There was a statistically significant decline in drowning death rates from 1986 to 2002.
- Children under age five years and people aged 75–79 years had the highest rates of death due to drowning in NSW during 1998–2002.
- Males accounted for 78% of all drowning deaths in NSW during 1998–2002.
- *Bathtubs* were the location where the majority of drowning deaths occurred in children under age one year. *Swimming pools* were the location where the majority of drowning deaths occurred in children aged one to four years. For people over age five years, *natural water* was the location where the majority of drowning deaths occurred.

Suffocation

- There was no statistically significant trend in suffocation death rates from 1986 to 2002, though there was a suggestion of a rise since 1995.
- People aged 75+ years had the highest rates of death due to suffocation. An elevated rate was also seen in children under age five years.
- Males accounted for 64% of all suffocation deaths in NSW during 1998–2002.
- *Other and unspecified causes* were responsible for the majority of suffocations in people aged one to 54 years. Children aged under one year died of suffocation caused in bed most often (due to linens, pillows, co-sleeping) and people aged 55+ years died most often due to suffocation caused by food.

Fire/burns

- There was a statistically significant decline in fire/burn death rates from 1986 to 2002.
- People aged 70+ years had the highest rates of death due to fire/burns.
- Males accounted for 57% of all fire/burn deaths in NSW during 1998–2002.
- *Fires in private dwellings and other buildings* were the leading cause of fire/burns deaths across all age groups. People aged 65+ years experienced the majority of burn-related deaths compared to all other age groups.

Complications of care

- There was no statistically significant trend in complications of care death rates from 1986 to 2002, though there was a suggestion of a rise since 2000.
- People aged 65+ years had the highest rates of death due to complications of care.
- Males accounted for 49% of all complications of care deaths in NSW during 1998–2002.
- *Misadventures to patients during surgical and medical care* resulted in all complications of care deaths in children under age one year. For people aged 15+ years, procedures causing abnormal reaction or complication of care after procedure resulted in the majority of complications of care deaths.

Struck by/struck against

- There was no statistically significant trend in struck by/struck against death rates from 1986 to 2002.
- People aged 85+ years had the highest rates of death due to struck by/struck against, but accounted for only 2% of all struck by/struck against deaths. Other high death rates for struck by/struck against were seen in children under age five years and people aged 45–54 years.

- Males accounted for 89% of all struck by/struck against deaths in NSW during 1998–2002.
- Struck by/struck against a person or object was the leading cause of struck by/struck against deaths in all age groups.

Rail transport

- There was a statistically significant declining trend in rail transport death rates from 1986 to 2002.
- People aged 15–19 years and people aged 25–29 years had the highest rates of death due to rail transport.
- Males accounted for 84% of all rail transport deaths in NSW during 1998–2002.
- People aged 15–64 years died most often in rail transport incidents as pedestrians.

Natural and environmental factors

- There was a statistically significant decline in natural/environmental factors death rates from 1986 to 2002.
- People aged 80+ years had the highest rates of death due to natural/environmental factors.
- Males accounted for 66% of all natural/environmental factors deaths in NSW during 1998–2002.
- *Excess temperatures* were the leading cause of natural/environmental factors death in children aged one to four years, people aged 25–54 years and people aged 65+ years. *Other and unspecified causes* were responsible for the majority of natural/environmental factors deaths in people aged 54–64 years. *Natural events* were the leading cause of natural/environmental factors death in people aged five to 24 years, but accounted for only a small number of deaths.

Air transport

- There was a statistically significant decline in air transport death rates from 1986 to 2002.
- People 60–69 years had the highest rates of death due to air transport in NSW during 1998–2002.
- Males accounted for 82% of all air transport deaths in NSW during 1998–2002.
- *Other and unspecified aircraft types* were the leading cause of air transport deaths in people aged 10–24 years, people aged 35–44 years and people aged 55+ years. For people aged 25–34 years and people aged 45–54 years, *powered aircraft* was the leading cause of air transport death.

Machinery

- There was a statistically significant decline in machinery death rates from 1986 to 2002.
- People aged 50–54 years had the highest rate of death due to machinery in NSW during 1998–2002.
- Males accounted for all machinery deaths in NSW during 1998–2002.
- *Other and unspecified machinery* was the leading cause of machinery death in all people aged 15+ years, with the exception of people aged 25–34 years. *Agricultural machinery* was the leading cause of machinery death for people in this group.

Firearm

- Overall, there was a statistically significant decline in deathrates from firearms from 1986 to 2002. However, when restricted to the period 1993 to 2002, there was a significant increase in death rates from firearms.
- People aged 60–64 years had the highest rate of death due to firearms and accounted for 11% of all firearms deaths. Other high death rates from firearms were seen in people aged 25–29 years and people aged 50–54 years.
- Males accounted for 91% of all firearms deaths in NSW during 1998–2002.
- *Other and unspecified firearm* use was the leading cause of firearms death in people age 15+ years. *Larger firearm* use was the only cause of firearms death in children aged 5–9 years.

I Introduction

Injury is an internationally recognised public health problem affecting all age groups. Across Australia, injuries account for approximately 7800 deaths annually (Schmertmann and Williamson, 2002). In 1998, 33% of all Australian injury deaths occurred in New South Wales (Schmertmann and Williamson, 2002).

This report presents a demographic profile of injury mortality in NSW using currently available data. Injury mortality data were obtained from the Australian Bureau of Statistics and all injury mechanisms that resulted in more than 20 deaths during 1998–2002 were analysed. Both unintentional and intentional injury mechanisms were included.

Recommendations for improvements in data collection and directions for future research are also included in Section 19. These findings will be used to update current injury death statistics and identify target areas for further research.

I.1 DEFINITIONS

The following sections present the case definitions of injury, injury death and injury mechanism used in this report.

I.1.1 Injury and injury death

According to Robertson (1998), “An injury results when too much or too little energy (in the case of asphyxiation) is transferred to the human body, at rates or amounts that are above or below the tolerance of human tissues, resulting in damage”. The World Health Organization (WHO) defines an injury similarly as “a bodily lesion at the organic level resulting from acute exposure to energy (this energy can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts or rates that exceed the threshold of physiological tolerance” (WHO Injury Report 2001).

In order to recognise the physical nature of an injury (e.g. broken leg) and the external cause of the injury (e.g. a fall), two separate sets of codes were developed by WHO for its International Classification of Diseases (ICD) coding structure (WHO 1977, WHO 1996). One set, known as diagnostic codes (Ncodes), describes the physical nature of an injury and provides important information from a clinical standpoint. The other set, known as external cause codes (Ecodes), provides important information for prevention purposes, by identifying the type of energy that caused the physical injury.

Injury mortality is defined in terms of the underlying cause of death. For this analysis, cases were included where the underlying cause of death was determined to be an external cause of injury (injury mechanism or Ecode) and the state of residence of the deceased person was NSW.

1.1.2 Injury mechanism

Injuries are usually classified in terms of their external cause and intent. An injury mechanism (represented by an Ecode) is defined as the external object or circumstance that caused the injury, such as motor vehicle transport or drowning. The intent could be unintentional, intentional or undetermined.

Injury mechanisms that are intentional are either self-inflicted or inflicted by another person or persons. All injury mechanisms that are intentionally self-inflicted are grouped together under a separate injury mechanism called suicide. For example, a poisoning that is self-inflicted would be considered suicide and would be classified separately from poisonings that had occurred unintentionally. All injury mechanisms that are intentionally inflicted by another person or persons are grouped under a separate injury mechanism called interpersonal violence. Death caused by the intentional use of a firearm would be considered interpersonal violence and would be classified separately from unintentional firearms deaths.

Fifteen injury mechanisms are included in this report. These account for all of the injury mechanisms that resulted in more than 20 deaths during 1998–2002. They are as follows (in alphabetical order):

- air transport
- complications of care
- drowning
- falls
- fire/burns
- firearms
- interpersonal violence
- machinery
- motor vehicle transport
- natural/environmental factors
- poisonings
- rail transport
- struck by/struck against
- suffocation
- suicide.

The burn subcategory of the fire/burn mechanism group refers to injuries received from hot objects or substances and not burns sustained from a fire. The firearms injury mechanism only includes unintentional deaths due to use of a firearm. Firearms used intentionally on oneself or another person are included in the injury mechanisms of suicide and interpersonal violence respectively.

The two ICD revisions covered in this report are the ICD 9th Revision (ICD-9) and the ICD 10th Revision (ICD-10). The ICD-9 and ICD-10 Ecodes for the injury mechanisms included in this report are listed in Appendix 1.

1.2 INJURY DATA SOURCES AND CODING ISSUES

1.2.1 Mortality (numerator) data

Data were obtained for NSW for 1986–1998 from the Australian Bureau of Statistics (ABS) for all Ecoded death records. Records for these years were coded using ICD-9. All death records for 1999–2002 were also obtained from the ABS, with data being coded according to ICD-10.

Injury death records were selected and analysed according to the year of occurrence and not the year the death was registered with the ABS. Injury deaths that occurred during 1986–2002, which were not registered with the ABS, are not included in this report. Of the deaths registered in 2001, for example, 94% actually occurred in 2001, 5% occurred in 2000 and the remaining 1% occurred prior to 2000. In the following year (2002), deaths occurring in 2002 accounted for 94% of all the registered deaths and deaths occurring in 2001 accounted for 6% of all registered deaths.

Deaths attributed to the late effects of an injury are not included in this report.

1.2.2 Population (denominator) data

Annual data were obtained from the ABS for the estimated resident population of NSW in each year from 1986 to 2002. The source was the ABS time series spreadsheet 3201.0 Population by Age and Sex, Australian States and Territories which contained population estimates for June 1971 to June 2003.

1.2.3 Injury data coding issues

As mentioned above, the data used in this report span a change in the ICD coding scheme used to classify injury. This coding scheme was initially formalised in 1893. Since 1948, it has been revised in its entirety approximately every 10 years by WHO. The two ICD revisions covered in this report are the ICD 9th Revision (ICD-9) which was in use from 1979 to 1998 and the ICD 10th Revision (ICD-10) used from 1999 onward.

In ICD-10 alphanumeric codes were introduced (e.g. A37, R10) to represent injury or disease, superseding the numeric codes (e.g. 125, 802) used in ICD-9. The external cause of injury codes have been included within the alphanumeric structure of ICD-10, as opposed to the separate scheme in ICD-9 (i.e., use of E800-E999).

When a person dies as a result of an injury, a consequence or 'nature of injury' code is assigned using the death certificate. In ICD-9, there was a specific Ncode for each injury (i.e., 800–999) and the codes were organised by the type of injury (e.g. fracture, dislocation). In ICD-10, a unique Ncode still exists, but the codes are organised by the location of the body part injured (e.g. head) instead of the type of injury.

For each injury Ncode and a few other disease Ncodes, an external cause of injury code (Ecode) must also be supplied to identify the cause or mechanism of the injury (e.g. drowning, fall, burn). Two major changes regarding Ecodes occurred between ICD-9 and ICD-10. In ICD-9, the person injured in a transport event (e.g. motor vehicle) was secondary to the type of event (e.g. collision with other motor vehicle); however, in ICD-10, the coding structure focuses on the person injured first and then the type of event. The second change in ICD-10 was the introduction of codes for the place where the injury occurred (e.g. home) and the activity at the time of the injury (i.e., playing sport).

Specific rules for coding injury mortality are part of each ICD revision and all injury deaths are coded using the guidelines established by WHO.

In coding the causes of death for the purposes of national statistics, the ABS assumes that children under the age of 10 years are not capable of forming the intent to commit suicide. This convention has been followed in this report.

1.3 ANALYSIS APPROACH

Description of the injury data presented in this report is limited to demographic analysis by age and sex. Injury data for place of occurrence and activity at the time of the injury (e.g. at work) were not analysed as these variables were available only from 1999 forward and the quality of the data is unknown. Also, injury data were not analysed by ethnic status (such as aboriginality) as the quality of population data for ethnic groups is questionable due to under-reporting.

Each of the following sections briefly describes the types of analysis undertaken with the death data. Three types of epidemiological calculations were performed:

- frequency of death
- age-specific rate
- age-adjusted rates.

The frequency of death was calculated as the number of times such a death occurred in a given time period (e.g. number of drownings in 1992). The frequency of death was subdivided into categories (e.g. age and gender groups) so that comparisons between the different categories were possible.

An age-specific rate was calculated by dividing the frequency of death for a particular age group (e.g. under five years) by the total estimated population in that age group. Once this was done, the resulting

value was multiplied by 100,000 to give the number of deaths for that age group per 100,000 population. For example, suppose that one under five-year-old drowned in Place X in 1992. The total population of under-five-year-old children in Place X in 1992 was estimated as 4000. The resulting age-specific rate for drowning in under five-year-old children in Place X in 1992 would therefore be 25/100,000 population.

An age-adjusted rate is the weighted sum of individual age-specific rates. Each age-specific rate was multiplied by a standard population weight for that age group. The standard population weight was calculated by dividing the frequency in an age group by the total population for the year chosen to represent the standard year. The standard population used was the 2001 Australian population census.

Once all of the age groups had been weighted, the new age-specific values were added together to produce one age-adjusted rate. This method of age-adjustment is called direct standardisation. When the same age-specific population weights are used, standardisation allows for comparison between different states and territories that may have different age structures.

For the purposes of this report, age-adjusted rates were calculated both annually and for the block of years during 1998–2002. Age-specific rates and frequencies were calculated for the block of years during 1998–2002.

1.3.1 Top 10 causes of death in NSW

All death cases occurring in 2002 were grouped into disease and injury categories, using the cause of death. The disease categories were based on the disease chapter headings and the injury category was based on the external cause chapter in the ICD-10 coding manual. The list of disease and injury categories used is presented in Appendix 2. The top 10 causes of death tables were generated by ranking the frequencies of the disease and injury categories by age group.

The following age groups were used to present frequencies for the top 10 leading causes of death tables: under 1, 1–4, 5–9, 10–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65+ years.

1.3.2 Top 10 causes of injury death in NSW

All injury death cases occurring during 1998–2002 were grouped into injury mechanism categories, using the cause of death and principle Ecode respectively. The injury mechanism categories were based on a recommended framework for Ecode groupings for injury mortality developed by the Centres for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control (NCIPC) and National Centre for Health Statistics (NCHS) in collaboration with members of the American Public Health Association's Injury Control and Emergency Health Services Section (ICEHS) (Anonymous 1997) and the National Data Standards for Injury Surveillance (AIHW 1998). The list of injury mechanism categories used is presented in Appendix 3. The top 10 causes of injury death tables were generated by ranking the frequencies of the injury mechanism categories by age group.

The following age groups were used to present frequencies for the top 10 leading causes of injury death tables: under 1, 1–4, 5–9, 10–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65+ years.

1.3.3 Trend analyses

Age-adjusted rates for each injury mechanism were calculated annually from 1986 to 2002 for deaths and presented as a time trend. For each trend, Poisson regression analyses were performed to determine the statistical significance of changes in the trend from 1986 to 2002.

Age- and sex-specific rates for five-year age groups were calculated for each injury mechanism for 1998–2002 and presented as trends by age group. For each age- and sex-specific rate, 95% confidence intervals were calculated to examine the statistical significance of differences between age groups.

1.3.4 Injury mechanism subcategory-specific frequencies and rates

The total frequencies for each injury mechanism for 1998–2002 were divided into subcategories specific to each injury mechanism. The list of injury mechanism subcategories by Ecode is presented in Appendix 4.

Frequencies for the injury mechanism subcategories were also ranked by age group and presented in a 'Top 10' table format. The following age groups were used to present frequencies for the top 10 leading causes of injury death tables: under 1, 1–4, 5–9, 10–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65+ years.

Frequencies and rates for all persons, males and females, were also calculated for each injury mechanism. This information was presented in a table and the subcategories were ranked by the number of deaths per subcategory. For each sex-specific rate, 95% confidence intervals were calculated to examine the statistical significance of differences in rates between males and females. Also, a male/female mortality rate ratio was calculated to determine the magnitude of the difference between male and female rates for the subcategories of each injury mechanism.

1.4 SPECIAL NOTATIONS

Injury mechanism subcategories

Each injury mechanism consists of a number of individual ICD-9 and ICD-10 Ecodes. In each injury mechanism chapter, the individual Ecodes that comprise that mechanism are discussed as subcategories of that injury mechanism (e.g. different methods of suicide).

The text of the subcategories is derived from the actual text from the individual ICD-9 and ICD-10 Ecodes for each injury mechanism. In order to differentiate the subcategories from the injury mechanism itself, all subcategories are italicised whenever they are used in the text.

Small cell sizes

Caution should be used when interpreting cells with small numbers. Although an effort has been made to reduce the occurrence of small cell sizes by using five years of death data in this report, cells with counts less than five do occur in some of the tables and figures. Cells with values less than five for either an injury mechanism or injury mechanism subclass will be represented by a # symbol.

Null values

Although an effort has been made to reduce the occurrence of null values by using five years of death data in this report, cells with null values do occur in some of the tables and figures. Cells with values of zero for either an injury mechanism or injury mechanism subclass have been left blank.

For example, in tables where injury mechanism subclasses are compared, blank cells in an age group column represent null values for one or more injury mechanism subclasses.

Comparison with previous data

Where applicable, the death data presented in this report has been compared to injury death data presented in a previous report by Schmertmann and Williamson (2002). Although injury death data for the years 1998 and 1999 are included in both reports, comparison with the previous report still provides valuable information. Comparison of age- and sex-specific rates for the time periods 1995–1999 and 1998–2002 shows both continuing and changing patterns in the risk for injury death.

2 Overview of injury deaths in NSW

In 2002, injury and poisonings were the fourth leading cause of death in NSW (see Table 1), as well as the leading cause of death among people aged one to four years and 10–44 years. During the years 1986–2002, approximately 2500 people died each year in NSW as the result of an injury.

Figure 1 shows the trend for all injury deaths rates between 1986 and 2002. Overall, there was a statistically significant declining trend in injury death rates from 1986 to 2002. Male injury deaths rates were significantly higher than those for females in every year. Between 1998 and 2002, 12,605 people died as the result of an injury, at an overall rate of 38.7/100,000 population.

Figure 1. Comparison of male and female annual death rates for all injuries: NSW, 1986–2002

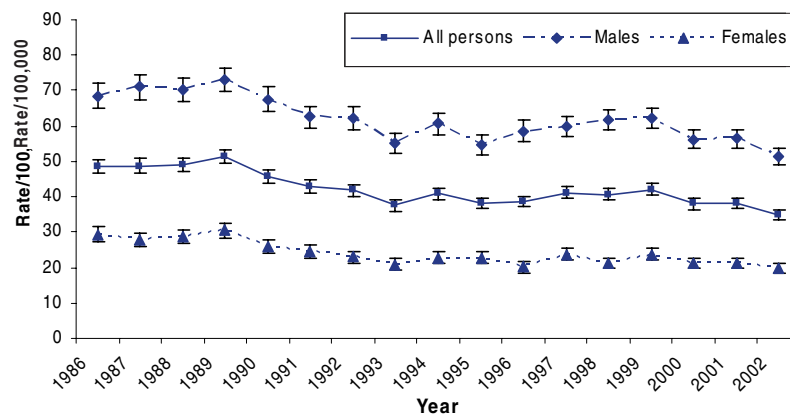


Figure 2 shows the age-specific death rates for all injuries between 1998 and 2002. Death rates were highest in people aged over 70 years and this group accounted for just over 27% of all injury deaths. Collectively, people aged 20–44 years accounted for almost 41% of all injury deaths from 1998–2002.

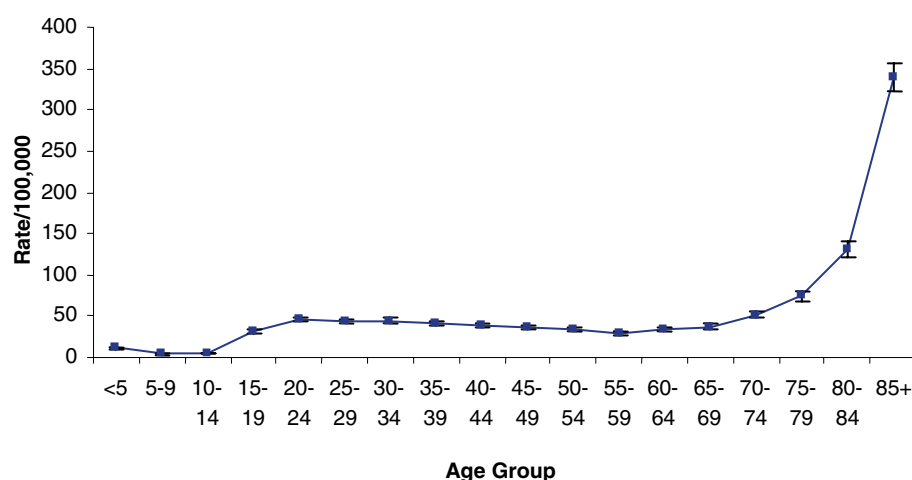
Table 2 shows the number of deaths and death rates by injury mechanism for all persons, males and females, during 1998–2002. The mechanisms presented in this table account for 86% of all injury death causes. Table 2 also shows that 70% of all injury deaths between 1998 and 2002 were in males. Male death rates were significantly higher than female death rates for all injury mechanisms except complications of care. Males were at least three times more likely than females to die from the following injury causes (in descending order):

Table I. Top 10 leading causes of death* by age group: NSW, 2002

Rank	Age group										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Perinatal conditions 195	Injury and poisoning 24	Cancer 16	Injury and poisoning 16	Injury and poisoning 264	Injury and poisoning 381	Injury and poisoning 354	Cancer 889	Cancer 1921	Diseases of circulatory system 15466	Diseases of circulatory system 17222
2	Congenital abnormalities 75	Congenital abnormalities 9	Injury and poisoning 13	Nervous system diseases 10	Cancer 38	Cancer 74	Cancer 288	Diseases of circulatory system 468	Diseases of circulatory system 1031	Cancer 9166	Cancer 12414
3	Ill-defined conditions 51	Cancer 9	Congenital abnormalities #	Cancer 7	Nervous system diseases 25	Diseases of circulatory system 49	Diseases of circulatory system 180	Injury and poisoning 302	Respiratory diseases 226	Respiratory diseases 3519	Respiratory diseases 3882
4	Nervous system diseases 10	Ill-defined conditions 7	Infectious diseases #	Respiratory diseases #	Congenital abnormalities 14	Nervous system diseases 28	Digestive diseases 58	Digestive diseases 143	Digestive diseases 176	Nervous system diseases 1340	Injury and poisoning 2357
5	Cancer 6	Diseases of circulatory system 5	Nervous system diseases #	Congenital abnormalities #	Endocrine Systems 13	Mental disorders 26	Infectious diseases 47	Respiratory diseases 77	Injury and poisoning 174	Digestive diseases 1105	Nervous system diseases 1611
6	Injury and poisoning 6	Respiratory diseases 5	Endocrine systems #	Diseases of circulatory system #	Diseases of circulatory system 10	Congenital abnormalities 19	Nervous system diseases 29	Nervous system diseases 69	Endocrine systems 119	Endocrine systems 1071	Digestive diseases 1497
7	Endocrine systems #	Infectious diseases 5	Ill-defined conditions #	Endocrine systems #	Mental disorders 8	Respiratory diseases 18	Mental disorders 27	Infectious diseases 62	Nervous system diseases 92	Genitourinary disease 978	Endocrine systems 1313
8	Diseases of circulatory system #	Nervous system diseases #	Diseases of circulatory system #	Infectious diseases #	Respiratory diseases 7	Endocrine systems 10	Endocrine systems 26	Endocrine systems 60	Infectious diseases 59	Mental disorders 883	Genitourinary disease 1028
9	Respiratory diseases #	Endocrine systems #	Respiratory diseases #	Blood diseases #	Infectious diseases 7	Digestive diseases 9	Respiratory diseases 21	Mental disorders 24	Mental disorders 49	Injury and poisoning 823	Mental disorders 1017
10	Digestive diseases #	Perinatal conditions #	Blood diseases #	Musculoskeletal diseases #	Ill-defined conditions #	Infectious diseases 7	Congenital abnormalities 14	Ill-defined conditions 21	Genitourinary disease 25	Infectious diseases 503	Infectious diseases 697

* Number represents number of deaths. Cause of death was classified according to ICD-10 chapter headings for diseases and external causes of injuries and poisonings (see Appendix 1)

Cell size less than five cases

Figure 2. Age-specific death rates for all injuries: NSW, 1998–2002**Table 2. Number of deaths and age-adjusted death rates/100,000* by injury mechanism: NSW, 1998–2002**

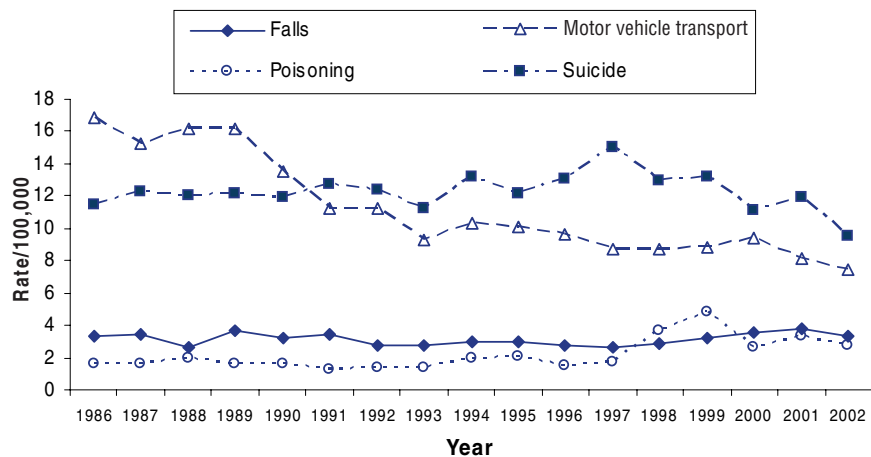
Injury mechanism	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate†(CI) ††	N	Rate† (CI)	
Suicide	3822	11.71	3051	19.12 (18.44–19.80)	771	4.67 (4.34–5.00)	4.09
Motor vehicle transport	2765	8.49	1983	12.48 (11.93–13.04)	782	4.68 (4.35–5.01)	2.67
Poisoning	1118	3.41	821	5.04 (4.70–5.39)	297	1.80 (1.59–2.00)	2.80
Fall	1093	3.37	642	4.75 (4.38–5.13)	451	2.29 (2.08–2.50)	2.08
Interpersonal violence	513	1.57	360	2.21 (1.98–2.44)	153	0.94 (0.79–1.08)	2.36
Drowning	468	1.44	366	2.28 (2.04–2.51)	102	0.62 (0.50–0.74)	3.68
Suffocation	331	1.02	213	1.48 (1.27–1.68)	118	0.65 (0.53–0.77)	2.27
Fire/burn	180	0.55	103	0.71 (0.57–0.85)	77	0.44 (0.34–0.53)	1.64
Complications of care	174	0.53	85	0.62 (0.48–0.75)	89	0.47 (0.37–0.57)	1.31
Struck by/struck against	111	0.34	99	0.62 (0.50–0.74)	12	0.07 (0.03–0.11)	8.69
Rail transport	83	0.26	70	0.43 (0.33–0.53)	13	0.08 (0.04–0.12)	5.55
Natural/environmental factors	67	0.20	44	0.30 (0.21–0.39)	23	0.13 (0.07–0.18)	2.36
Air transport	66	0.20	54	0.33 (0.24–0.42)	12	0.07 (0.03–0.11)	4.54
Machinery	40	0.12	40	0.25 (0.17–0.32)			
Firearm	35	0.11	32	0.20 (0.13–0.27)			
All Injury**	12605	38.76	8798	57.57 (56.35–58.79)	3807	21.35 (20.67–22.03)	2.70

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. ** includes all other injury mechanisms as well as the 15 mechanisms listed. †† 95% confidence interval.

- struck by or against another object or person (unintentional)
- rail transport
- air transport
- suicide
- drowning.

Figure 3 compares the trends in death rates between 1986 and 2002 for the top four injury mechanisms listed in Table 2 (i.e., suicide, motor vehicle transport, poisoning, falls). These four injury mechanisms accounted for 70% of all injury deaths.

Figure 3. Yearly trend in death rates by selected injury mechanisms: NSW, 1986–2002



In 1991, suicide overtook motor vehicles as the leading cause of injury death. There was a steadily increasing trend until 1997 and then the suicide rate decreased. The incidence of motor vehicle transport deaths has steadily decreased since 1989, although the rate of decline has slowed in recent years. Of the other injury mechanisms shown in Figure 3, the death rate for falls has remained relatively stable, while poisoning death rates increased between 1997 and 1999 and decreased between 1999 and 2002.

SUMMARY

Injury was the fourth leading cause of death for all ages in 2002, accounting for 2357 deaths. It was also a leading cause of death for many age groups, particularly amongst people aged 1–44 years. Analysis of injury death rate trends showed a statistically significant decline from 1986 to 2002 in NSW. Four injury mechanisms accounted for almost 70% of all injury deaths—suicide, motor vehicle transport, poisoning and falls.

Compared with data on all injury deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the age-specific pattern of injury has not changed. People aged 70+ years had the highest death rates due

to all injuries in NSW during 1998 to 2002. People aged 20–44 years had the second highest rates for all injury deaths.

Males accounted for 70% of all injury deaths between 1998 and 2002 in NSW. Male rates were also significantly higher for all injury mechanisms except complications of care. Males and females had relatively equal risk for fire/burns and complications of care. These results are similar to those reported for males and females from 1995 to 1999 in NSW (Schmertmann and Williamson, 2002). This suggests that factors independent of sex influence the causation of fire/burns and complications of care.

Similarities between the 1995–1999 and 1998–2002 periods for age- and sex-specific injury deaths were found for all injury causes. This demonstrates a stable association between the cause of injury death and age over these years. As people get older, their risk for some types of injury increases whereas their risk for other types of injury decreases.

For example, children under age five years are most at risk of drowning, poisoning or being injured as a result of a fall. As children age, they become more physically active and often participate in sports and other activities with an increased risk of being injured as the result of a fall. Teenagers and young adults are most at risk of suicide and motor vehicle transport injuries. Adults who work are at risk of occupational injuries. Finally, older adults are at risk of injury caused by falls.

These examples serve to illustrate how people's life experiences can influence their level of injury risk from different causes as they age.

The following chapters present trend and age- and sex-specific data for the top 15 causes of injury death. Age-specific data is then presented to compare the top six injury mechanisms for selected age groups.

3 Suicide

Suicide is the term used to describe purposely self-inflicted injury (WHO 1977, WHO 1996). WHO classifies the cause of suicide by the method used. These methods include *hanging, strangulation or suffocation, poisoning by overdose, shooting by firearm (gun), jumping from a high place or lying in front of moving object, drowning* and using a *sharp or blunt object* to cause bleeding or other type of injury.

Suicide death data from 1986 to 2002 were used to describe the demographic profile of suicide in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Suicide was the leading cause of injury death from 1998–2002 and accounted for 30% of all injury deaths (see Table 2). During these years, 3822 people died from suicide, at an overall rate of 11.7/100,000 population and 80% were male. Approximately 743 people died each year from 1986 to 2002 as a result of a suicide.

Figure 4 shows the yearly trend in death rates for suicide from 1986 to 2002. There was a statistically significant increase in the suicide death rates between 1986 and 1997, and a statistically significant decline from 1997 to 2002 (Figure 4). However, overall there was no significant trend in suicide deaths from 1986 to 2002.

Figure 4. Yearly trend in death rates for suicide: NSW, 1986–2002

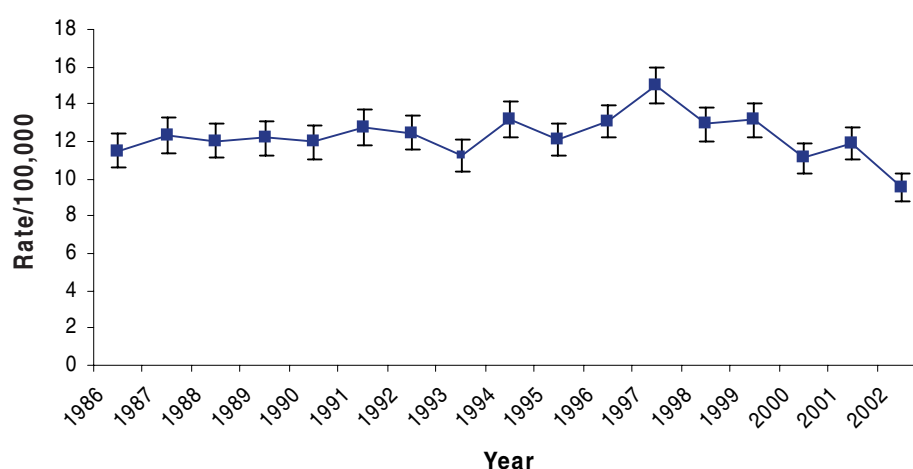


Figure 5 shows the age-specific death rates for suicide for the period 1998–2002. Although suicide deaths occurred in all age groups over 10 years of age, people aged 30–39 years and aged 85+ years had the highest and second highest rates of death due to suicide respectively. Suicide deaths in people aged

30–39 accounted for 24% of all suicide deaths between 1998 and 2002, whereas people aged 85+ years accounted for only 2% of all suicide deaths during the same years. There was also an upward trend in age-specific suicide death for those age 55 years or older.

Previous data from 1995 to 1999 showed people aged 20–29 were at greatest risk of suicide and other age groups had higher levels of risk than people aged 85 years and older (Schmertmann and Williamson, 2002). A separate analysis of the trend in suicide rates for people aged 20–39 by five-year age groups (i.e., 20–24, 25–29) confirmed that people aged 30–34 and 35–39 years had higher rates than people aged 20–24 and 25–29 years from 2000–2002.

Figure 5. Age-specific death rates for suicide: NSW, 1998–2002

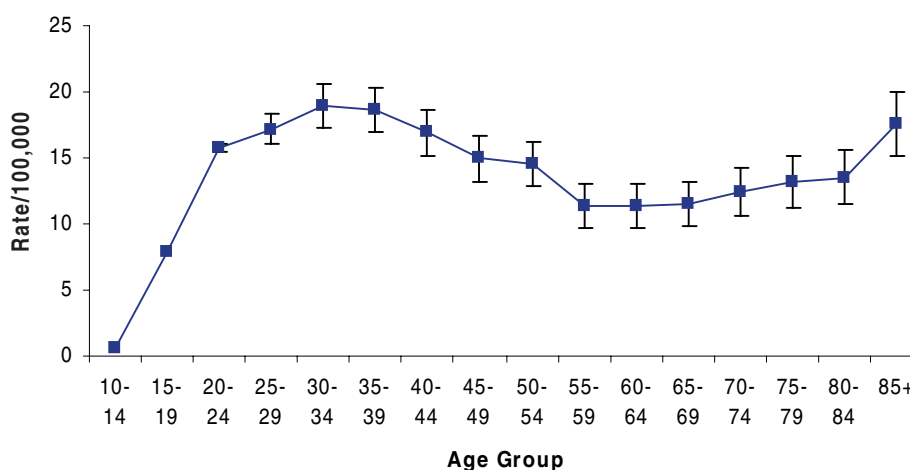


Table 3 shows the number of suicide deaths and death rates by the method used for all persons, males and females, during 1998–2002. The results in Table 3 are similar to data reported for suicide from 1995 to 1999 (Schmertmann and Williamson, 2002). *Hanging, strangulation or suffocation* and *poisoning* were the suicide methods used most often and accounted for 44% and 30% of all suicides respectively. Males accounted for 83% of all suicides by *hanging, strangulation or suffocation* and 73% of all suicides by *poisoning*.

Hanging, strangulation or suffocation was the suicide method used most often by males and accounted for 46% of all male suicide deaths. The rate for males exceeded the corresponding rate for females for each suicide method in Table 3. Male rates were significantly higher than females for all suicide methods except *drowning*. Male rates were more than five times higher than the corresponding female rates for suicide by *firearm* and by *hanging, strangulation or suffocation*.

Poisoning was the most common suicide method used by females during 1998–2002 and accounted for almost 40% of all female suicides. Nonetheless, male *poisoning* suicide death rates were still 2.9 times higher than those in females.

Table 4 shows suicide deaths by age group and method used in NSW for 1998–2002. *Hanging, strangulation or suffocation* was the leading suicide method for persons aged 10–44 years and 65+ years, while poisoning ranked highest for persons aged 45–64 years followed by *hanging, strangulation or suffocation*. Suicide by *firearms* was the second most common method of suicide for 10- to 14-year-olds and the third most common method all people aged 35+ years.

Table 3. Number of suicide deaths and death rates/100,000* by method used: NSW, 1998–2002

Method	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Hanging, strangulation or suffocation	1700	5.20	1415	8.80 (8.34–9.26)	285	1.74 (1.53–1.94)	5.07
Poisoning	1152	3.54	847	5.32 (4.96–5.68)	305	1.84 (1.63–2.05)	2.89
Firearm	354	1.08	333	2.14 (1.90–2.37)	21	0.13 (0.07–0.18)	16.53
Jumping from building/high place	224	0.69	170	1.07 (0.90–1.23)	54	0.33 (0.24–0.42)	3.23
Jumping/lying in front of moving object	126	0.39	100	0.61 (0.49–0.73)	26	0.16 (0.10–0.22)	3.85
Other and unspecified means	112	0.34	84	0.52 (0.41–0.63)	28	0.17 (0.10–0.23)	3.12
Drowning	77	0.24	42	0.29 (0.20–0.38)	35	0.21 (0.14–0.28)	1.38
Sharp or blunt object	77	0.24	60	0.38 (0.29–0.48)	17	0.10 (0.05–0.15)	3.79
All suicide	3822	11.71	3051	19.12 (18.44–19.80)	771	4.67 (4.34–5.00)	4.09

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. ††95% confidence interval

These results are also comparable to previous data, with the exception of the third leading method of suicide. From 1995 to 1999, *firearms* were the third leading method of suicide for all age groups over age 14 years (Schmertmann and Williamson, 2002). From 1998–2002, *firearms* were the third leading cause for people aged 15–24 years and people aged over 34 years. For people aged 25–34 years, *jumping from a building or other high place* was the third leading method of suicide during 1998–2002.

SUMMARY

Suicide was the leading cause of injury death for people in NSW during 1998–2002, accounting for approximately 743 deaths each year. Analysis of the suicide death rates found no statistically significant trend overall during 1986–2002. However, there was evidence of a statistically significant incline from 1986 to 1997 and then a statistically significant decline from 1997 to 2002.

Compared to data on suicide deaths from 1995 to 1999, the pattern of age-specific rates has changed. People aged 30–39 years had the highest death rates due to suicide in NSW during 1998–2002. There was also an upward trend in suicide incidence from age 55 years onward, with people aged 85+ years having suicide death rates almost as high as those for people aged 30–39 years.

The leading suicide methods during 1998–2002 in NSW were *hanging, strangulation or suffocation* and *poisoning*. *Hanging, strangulation or suffocation* was the suicide method used most often by persons aged 10–34 years and 65+ years, while *poisoning* ranked highest for persons aged 35–64 years followed fairly closely by *hanging, strangulation or suffocation*.

Males accounted for nearly 80% of all suicide deaths in NSW during 1998–2002. In particular, they accounted for 83% of all suicides by *hanging, strangulation or suffocation* and 73% of all suicides by *poisoning*. Males also had significantly higher rates for each method of suicide used in comparison to females, with the exception of *drowning*.

These results indicate that suicide is a serious public health problem in NSW, especially amongst males and that *hanging, strangulation or suffocation* was the method used most often.

Further study may be needed to understand the age-related factors which influence the choice of suicide method used, especially for males compared to females. It would also be useful for future coding systems to allow for more differentiation within the broader category of *hanging, strangulation or suffocation* because different age groups may use one of the three more often compared to other age groups.

Table 4. Suicide deaths* by age group and method used†: NSW, 1998–2002

Rank	Age group							Total
	10–14	15–24	25–34	35–44	45–54	55–64	65+	
1	Hanging, strangulation or suffocation 11	Hanging, strangulation or suffocation 303	Hanging, strangulation or suffocation 463	Hanging, strangulation or suffocation 383	Poisoning 255	Poisoning 125	Hanging, strangulation or suffocation 192	Hanging, strangulation or suffocation 1700
2	Firearm #	Poisoning 74	Poisoning 233	Poisoning 302	Hanging, strangulation or suffocation 236	Hanging, strangulation or suffocation 112	Poisoning 163	Poisoning 1152
3	Jumping/lying in front of moving object #	Firearm 43	Jumping from high place 53	Firearm 65	Firearm 53	Firearm 47	Firearm 97	Firearm 354
4		Jumping from high place 40	Firearm 48	Jumping from high place 55	Jumping from high place 32	Jumping from high place 18	Drowning 32	Jumping from high place 224
5		Jumping/lying in front of moving object 34	Jumping/lying in front of moving object 41	Other and unspecified method 26	Other and unspecified method 20	Other and unspecified method 15	Jumping from high place 26	Jumping/lying in front of moving object 126
6		Other and unspecified method 12	Other and unspecified method 20	Jumping/lying in front of moving object 25	Sharp or blunt object 19	Sharp or blunt object 9	Other and unspecified method 18	Other and unspecified method 112
7		Sharp or blunt object 5	Sharp or blunt object 12	Sharp or blunt object 17	Drowning 13	Drowning 9	Sharp or blunt object 15	Drowning 77
8		Drowning #	Drowning 6	Drowning 13	Jumping/lying in front of moving object 11	Jumping/lying in front of moving object 9	Jumping/lying in front of moving object 5	Sharp or blunt object 77

* Numbers represent the number of cases. † See Appendix 4 for suicide method codes. # Cell size less than five cases

4 Motor vehicle transport

Motor vehicle transport is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of motor vehicle transport deaths according to a number of dimensions. Motor vehicle transport deaths occur in either in *traffic* situations (i.e., occurring on a public road) or *non-traffic* situations (i.e., occurring anywhere other than a public road). Motor vehicle transport deaths are also classified according to the type of road user involved (e.g. motorcyclist). Motor vehicle transport road-user classes include motor vehicle occupants (driver and passengers), motorcyclists (driver and passenger), pedal cyclists and pedestrians. The person that is injured is usually referred to by the type of traffic situation (i.e., traffic, non-traffic) and the road-user class (e.g. pedestrian).

Motor vehicle transport death data from 1986 to 2002 were used to describe the demographic profile of motor vehicle transport deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Motor vehicle transport was the second leading cause of injury death during 1998–2002 and accounted for 22% of all injury deaths (see Table 2). During these years, 2765 people died from motor vehicle transport injuries, at an overall rate of 8.5/100,000 population and 72% were male (Table 2). Approximately 682 people died each year from 1986 to 2002 as the result of motor vehicle transport.

Figure 6 shows the yearly trend in death rates for motor vehicle transport from 1986 to 2002. Overall, there was a statistically significant decline in the motor vehicle transport death rates between 1986 and 2002 although the rate of decline slowed post 1993.

Figure 6. Yearly trend in death rates for motor vehicle transport: NSW, 1986–2002

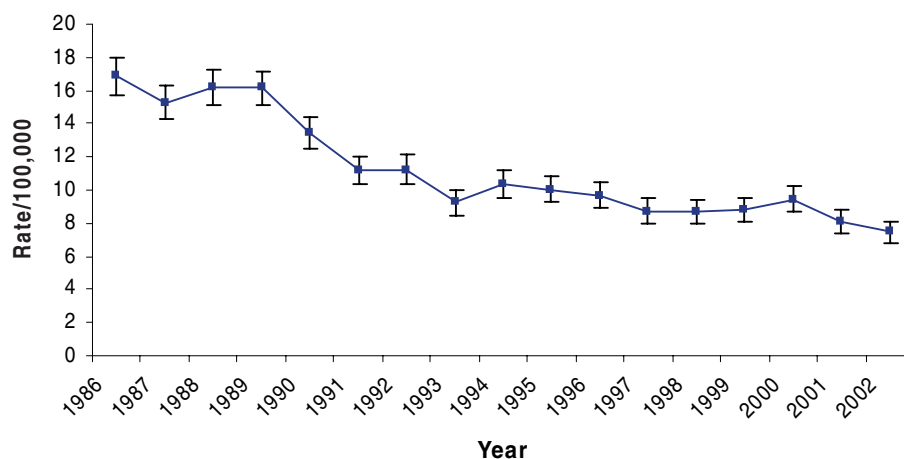


Figure 7 shows the age-specific death rates for motor vehicle transport between 1998 and 2002. People aged 15–24 and 80+ years had the highest rates of death due to motor vehicle transport. Motor vehicle transport deaths in people aged 15–24 and 80+ years accounted for 25% and 8% respectively, of all motor vehicle transport deaths between 1998 and 2002. Children under age ten years had much lower death rates in comparison to other age groups and death rates increased steadily in people from age 60 years onward. The pattern of age-specific death rates for motor vehicle transport in Figure 7 is similar to the pattern of age-specific death rates for motor vehicle transport from 1995 to 1999 (Schmertmann and Williamson, 2002).

Figure 7. Age-specific death rates for motor vehicle transport: NSW, 1998–2002

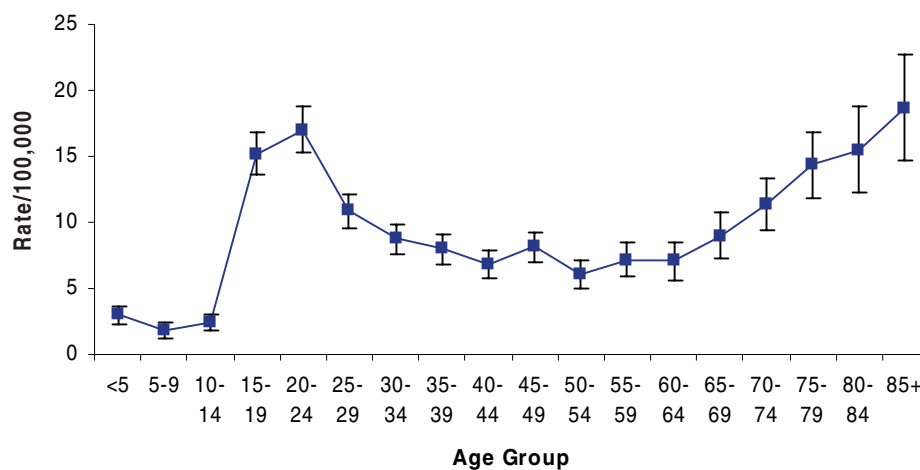


Table 5 shows the number of motor vehicle transport deaths and death rates by road-user class for all persons, males and females, during 1998–2002. *Motor vehicle occupants in traffic* and *pedestrians in traffic* were the road-user classes that died most often and accounted for 62% and 17% of all motor vehicle transport deaths respectively. Males accounted for 68% of all *motor vehicle occupants in traffic* deaths and 67% of all *pedestrians in traffic* deaths. The results for males and females in Table 5 are similar to data reported for motor vehicle transport deaths from 1995 to 1999 (Schmertmann and Williamson, 2002).

Motor vehicle occupants in traffic was the leading road-user class for male motor vehicle transport deaths and accounted for 59% of all male motor vehicle transport deaths. The rate for males exceeded the corresponding rate for females for each road-user class in Table 5. Male rates were significantly higher for the following motor vehicle transport road-user classes:

- motor vehicle occupant—traffic
- pedestrian—traffic
- motorcyclist—traffic

- other/unspecified road user—traffic
- motor vehicle occupant—non-traffic
- pedal cyclist—traffic.

Male road class user rates were more than six times the corresponding female rates for *motorcyclist—traffic* and *motor vehicle occupant—non-traffic*.

Motor vehicle occupants in traffic was also the leading road-user class in female motor vehicle transport deaths during 1998–2002 and accounted for 69% of all female motor vehicle transport deaths.

Table 5. Number of motor vehicle transport deaths and death rates/100,000* by road-user class: NSW, 1998–2002

Road-user class	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate† (CI)††	N	Rate† (CI)	
Motor vehicle occupant—traffic	1715	5.27	1173	7.37 (6.94–7.79)	542	3.27 (2.99–3.54)	2.26
Pedestrian—traffic	484	1.49	324	2.11 (1.88–2.34)	160	0.93 (0.78–1.07)	2.27
Motorcyclist—traffic	280	0.85	263	1.60 (1.40–1.79)	17	0.11 (0.06–0.16)	15.00
Other and unspecified road user—traffic	97	0.30	69	0.44 (0.34–0.55)	28	0.16 (0.10–0.23)	2.67
Motor vehicle occupant—non-traffic	79	0.24	68	0.44 (0.33–0.54)	11	0.07 (0.03–0.11)	6.61
Pedestrian—non-traffic	43	0.13	29	0.18 (0.11–0.24)	14	0.08 (0.04–0.13)	2.17
Pedal cyclist—traffic	39	0.12	30	0.19 (0.12–0.25)	9	0.06 (0.02–0.09)	3.34
Motorcyclist—non-traffic	26	0.08	25	0.15 (0.09–0.21)			–
Pedal cyclist—non-traffic	#		#				–
Other and unspecified road user—non-traffic	#		#		***		–
All motor vehicle transport	2765	8.49	1983	12.48 (11.93–13.04)	782	4.68 (4.35–5.01)	2.67

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. # Cell size less than five cases. **includes motorcyclist—non-traffic for females. ††95% confidence interval

Table 6 shows motor vehicle transport deaths by age group and road-user class in NSW for 1998–2002. *Motor vehicle occupant in traffic* was the leading road-user class for all motor vehicle transport deaths, except in children aged 5–9 years. Children aged 5–9 years died most often during 1998–2002 as *pedestrians in traffic*. Children under age five years, people aged 10–14 years and all aged groups

above 45 years had the second highest number of motor vehicle transport deaths during 1998–2002 as *pedestrians in traffic*. People aged 15–44 years had the second highest number of motor vehicle transport deaths during 1998–2002 as *motorcyclists in traffic*.

The results in Table 6 are similar to data from 1995 to 1999 (Schmertmann and Williamson, 2002), but there is one difference. From 1995–1999, children aged 5–9 years died more often as occupants than as pedestrians.

SUMMARY

Motor vehicle transport was a leading cause of injury death for people in NSW, accounting for approximately 682 deaths each year from 1986 to 2002. Analysis of the trend for motor vehicle transport death rates showed a statistically significant decline overall between 1986 and 2002 although the rate of decline has slowed since 1993.

Compared to data on motor vehicle transport deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the pattern of age-specific rates has remained unchanged. People aged 15–24 and 80+ years had the highest rates of death due to motor vehicle transport in NSW during 1998–2002.

Traffic-related motor transport deaths were much more common than non-traffic motor transport deaths. *Motor vehicle occupant in traffic* and *pedestrian in traffic* were the road-user classes that died most often during 1998–2002 in NSW. *Motor vehicle occupant in traffic* was the leading road-user class for all motor vehicle transport deaths except in children aged 5–9 years. Children aged 5–9 years died most often during 1998–2002 as *pedestrians in traffic*.

Males accounted for nearly 72% of all motor vehicle transport deaths in NSW during 1998–2002. They also accounted for 68% of all *motor vehicle occupants* in traffic deaths and 67% of all *pedestrians in traffic* deaths. Males also had significantly higher rates for each road-user class in traffic as well as one road-user class in non traffic (i.e., *motor vehicle occupant—non-traffic*) in comparison to females.

These results indicate that motor vehicle transport death continues to be a serious public health problem for young adults and older adults in NSW. *Pedestrians in traffic* are also a significant motor vehicle transport death problem. Finally, males continued to have an excess burden of motor vehicle transport deaths.

Further preventive actions into road safety should focus on the following areas in NSW:

- young people aged 15–24 years as occupants (and/or drivers) in traffic situations
- older people (65+ years) as occupants (and/or drivers) in traffic situations
- pedestrians in traffic situations, especially children aged 5–9 years and people aged over 45 years.

Table 6. Motor vehicle transport deaths* by age group and road-user class: NSW, 1998-2002.

Rank	Age group										Total	
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Pedestrian—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic	Motor vehicle occupant—traffic
2	#	26	20	24	515	289	228	192	120	303	Pedestrian—traffic	1715
3	#	20	15	13	73	96	60	47	49	162	Pedestrian—traffic	484
4		Pedestrian—non-traffic	Pedestrian—non-traffic	Motorcyclist—traffic	Pedestrian—traffic	Pedestrian—traffic	Pedestrian—traffic	Motorcyclist—traffic	Motorcyclist—traffic	Other and unspecified road user—traffic	Other and unspecified road user—traffic	Motorcyclist—traffic
5		13	#	#	69	54	49	26	14	25	280	280
6		Motor vehicle occupant—non-traffic	Motor vehicle occupant—non-traffic	Pedal cyclist—traffic	Other and unspecified road user—traffic	Other and unspecified road user—traffic	Other and unspecified road user—traffic	Motor vehicle occupant—non-traffic	Motor vehicle occupant—non-traffic	Motor vehicle occupant—non-traffic	Other and unspecified road user—non-traffic	Other and unspecified road user—non-traffic
7		#	#	#	16	15	15	17	14	20	97	97
8		#	Motorcyclist—traffic	Motorcyclist—non-traffic	Pedal cyclist—traffic	Motor vehicle occupant—non-traffic	Motor vehicle occupant—non-traffic	Other and unspecified road user—traffic	Other and unspecified road user—traffic	Pedestrian—non-traffic	Pedestrian—non-traffic	Motor vehicle occupant—non-traffic
9			Pedal cyclist—traffic	Other and unspecified road user—traffic	Motorcyclist—non-traffic	Motorcyclist—non-traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedestrian—non-traffic	Motorcyclist—traffic	Pedestrian—non-traffic	Motorcyclist—non-traffic
10			#	Motor vehicle occupant—non-traffic	Motor vehicle occupant—non-traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedal cyclist—traffic	Pedal cyclist—non-traffic
				#	#	#	#	#	#	#	#	#
					Other and unspecified road user—non-traffic	Other and unspecified road user—non-traffic					Other and unspecified road user—non-traffic	Other and unspecified road user—non-traffic
					#	#	#	#	#	#	#	#

* Numbers represent the number of cases. † See Appendix 4 for motor vehicle transport road-user class codes. # Cell size less than five cases

5 Poisoning

Poisoning is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of poisoning deaths by the substance causing the poisoning. These substances include *narcotics and hallucinogens, other pharmaceuticals, antidepressants, barbiturates and tranquilisers, gases and vapours* and *alcohol*. A poisoning can also be intentional. A self-inflicted poisoning resulting in death is classified as a suicide and a poisoning inflicted on one person by another resulting in death is classified as an interpersonal violence death (WHO 1977, WHO 1996). Deaths due to intentional poisoning are covered in other chapters (see suicide and interpersonal violence chapters).

Poisoning death data from 1986 to 2002 were used to describe the demographic profile of poisoning deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Poisoning was the third leading cause of injury death from 1998–2002 and accounted for almost 9% of all injury deaths (see Table 2). During these years, 1118 people died from poisoning, at an overall rate of 3.4/100,000 population and 73% were male. Approximately 138 people died each year from 1986 to 2002 as the result of a poisoning.

Figure 8 shows the yearly trend in death rates for poisoning from 1986 to 2002. There was a statistically significant increase in poisoning death rate between 1986 and 2002.

Figure 8. Yearly trend in death rates for poisoning: NSW, 1986–2002

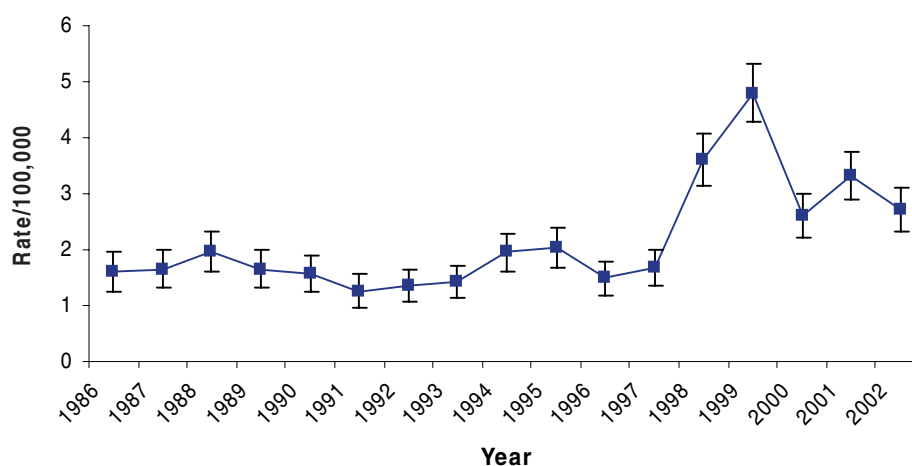


Figure 9 shows the age-specific death rates for poisoning between 1998 and 2002. People aged 25–44 years had the highest rates of death due to poisoning. Poisoning deaths in people aged 25–44 years accounted for 61% of all poisoning deaths between 1998 and 2002. The pattern of age-specific death rates for poisoning in Figure 9 is similar to the pattern of age-specific death rates for poisoning from 1995 to 1999 (Schmertmann and Williamson, 2002).

Figure 9. Age-specific death rates for poisoning: NSW, 1998–2002

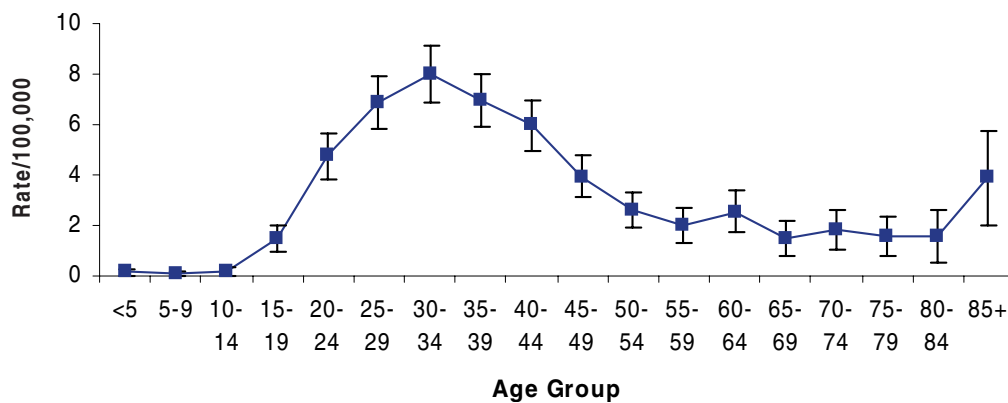


Table 7 shows the number of poisoning deaths and death rates by type of substance for all persons, males and females, during 1998–2002. These results are similar to data reported for poisoning deaths from 1995 to 1999 (Schmertmann and Williamson, 2002). *Narcotics and hallucinogens* and *other pharmaceuticals* were the types of substances that led to a poisoning death most often and accounted for 42% and 16% of all poisoning deaths respectively. Males accounted for 84% of all *narcotics and hallucinogens* poisoning deaths and 64% of all *other pharmaceuticals* poisoning deaths.

Narcotics and hallucinogens were the leading type of substances for male poisoning deaths and accounted for 48% of all male poisoning deaths. The rate for males exceeded the corresponding rate for females for each type of substance in Table 7. Male rates were significantly higher for all types of substances causing death, except for *antidepressants, barbiturates and tranquilisers*. Male poisoning death rates were more than five times higher than the corresponding female poisoning death rates for *narcotics and hallucinogens*.

Other pharmaceuticals were the leading type of substance in female poisoning deaths during 1998–2002 and accounted for 54% of all female poisoning deaths. Nonetheless, males had a poisoning death rate two times the corresponding female rate for this type of substance.

Table 8 shows poisoning deaths by age group and type of substance in NSW for 1998–2002. *Narcotics and hallucinogens* caused the highest number of poisoning deaths in people aged 15–44 years. *Other pharmaceuticals* caused the highest number of poisoning deaths in people aged 45+ years.

Table 7. Number of poisoning deaths and death rates/100,000* by type of substance: NSW, 1998–2002

Type of substance	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Narcotics and hallucinogens	473	1.44	399	2.44 (2.20–2.68)	74	0.45 (0.35–0.56)	5.39
Other pharmaceuticals	453	1.38	293	1.80 (1.59–2.01)	160	0.97 (0.82–1.12)	1.86
Antidepressants, barbiturates and tranquilisers	117	0.36	64	0.40 (0.30–0.50)	53	0.32 (0.24–0.41)	1.24
Gases and vapours	28	0.08	25	0.15 (0.09–0.21)	#		–
Alcohol	26	0.08	23	0.14 (0.08–0.20)	#		–
Other and unspecified	21	0.07	17	0.11 (0.06–0.17)	#		–
All poisoning	1118	3.41	821	5.04 (4.70–5.39)	297	1.80 (1.59–2.00)	2.80

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. # Cell size less than five cases. ††95% confidence interval

SUMMARY

Poisoning was a leading cause of injury death for people in NSW, accounting for approximately 138 deaths each year from 1986 to 2002. Analysis of the poisoning death rates over 1986 to 2002 showed no statistically significant trend. Compared to data on poisoning deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the pattern of age-specific rates has remained unchanged. People aged 25–44 years had the highest rates of death due to poisoning in NSW during 1998–2002.

Narcotics and hallucinogens and *other pharmaceuticals* were the types of substances that led to a poisoning death most often during 1998–2002 in NSW. *Narcotics and hallucinogens* caused the highest number of poisoning deaths in people aged 15–44 years. *Other pharmaceuticals* caused the highest number of poisoning deaths in people aged 45+ years.

Males accounted for nearly 73% of all poisoning deaths in NSW during 1998–2002. They accounted for 84% of all *narcotics and hallucinogens* poisoning deaths and 64% of all *other pharmaceuticals* poisoning deaths. Male rates were significantly higher for all types of substances causing death, except for *antidepressants, barbiturates and tranquilisers*.

These results indicate that poisoning is still a serious public health problem for people in NSW, especially those aged 25–44 years. *Narcotics and hallucinogens* and *other pharmaceuticals* were the substances used most often that resulted in a poisoning death. More research needs to be done to identify the factors associated with poisoning due to use of pharmaceuticals by people aged 45+ years (i.e., unintentional poisonings) and narcotics and hallucinogens by people aged 25–44 years (i.e., overdoses) in NSW.

Table 8. Poisoning deaths* by age group and substance used: NSW, 1998-2002

Rank	Age group										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Other pharmaceuticals #	Narcotics and hallucinogens #	Other and unspecified #	Other pharmaceuticals #	Narcotics and hallucinogens 71	Narcotics and hallucinogens 190	Narcotics and hallucinogens 142	Other pharmaceuticals 60	Other pharmaceuticals 24	Other pharmaceuticals 41	Narcotics and hallucinogens 473
2				Other and unspecified #	Other pharmaceuticals 51	Other pharmaceuticals 132	Other pharmaceuticals 140	Narcotics and hallucinogens 47	Antidepressants, barbiturates and tranquilisers 22	Antidepressants, barbiturates and tranquilisers 13	Other pharmaceuticals 453
3				Narcotics and hallucinogens #	Antidepressants, barbiturates and tranquilisers 6	Antidepressants, barbiturates and tranquilisers 23	Antidepressants, barbiturates and tranquilisers 28	Antidepressants, barbiturates and tranquilisers 25	Narcotics and hallucinogens 14	Narcotics and hallucinogens 7	Antidepressants, barbiturates and tranquilisers 117
4					Other and unspecified #	Gases and vapours 11	Gases and vapours 6	Alcohol #	Alcohol 6	Alcohol 7	Gases and vapours 28
5					Gases and vapours #	Alcohol #	Alcohol #	Other and unspecified #	Gases and vapours #	Other and unspecified 7	Alcohol 26
6					Alcohol #	Other and unspecified #	Other and unspecified #	Gases and vapours #	Other and unspecified #	Gases and vapours #	Other and unspecified 21

* Numbers represent the number of cases. † See Appendix 4 for poisoning substance codes. # Cell size less than five cases

6 Falls

Falls are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of falls deaths by the circumstance in which they occur. The types of falls include same level (due to tripping, stumbling, etc.), from *one level to another*, *from a building or other structure*, on *stairs*, and on a *ladder/scaffolding* (WHO 1977, WHO 1996).

Falls death data from 1986 to 2002 were used to describe the demographic profile of falls deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002. These analyses did not include the late effects of falls.

Falls were the fourth leading cause of injury death from 1998–2002 and accounted for almost 9% of all injury deaths (see Table 2). During these years, 1093 people died from falls at an overall rate of 3.4/100,000 population and approximately 59% were male. Approximately 176 people died each year from 1986 to 2002 as the result of falls.

Figure 10 shows the yearly trend in death rates for falls from 1986 to 2002. There was no statistically significant trend in the falls death rate between 1986 and 2002.

Figure 10. Yearly trend in death rates for falls: NSW, 1986–2002

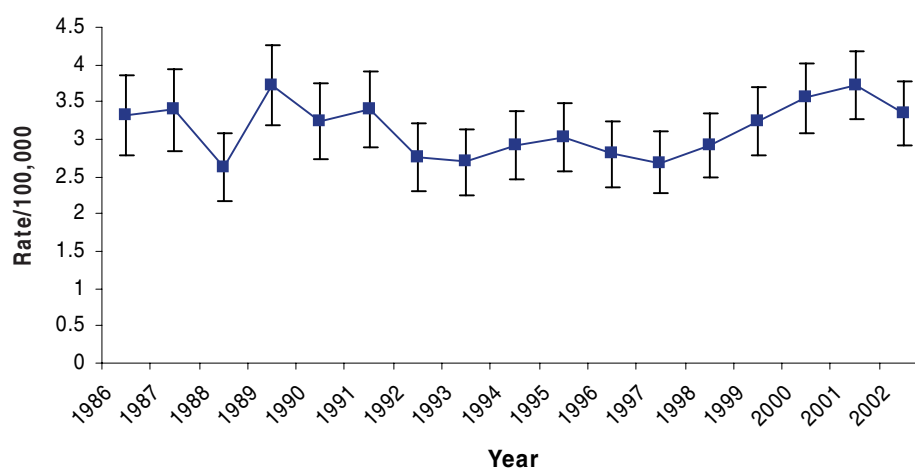
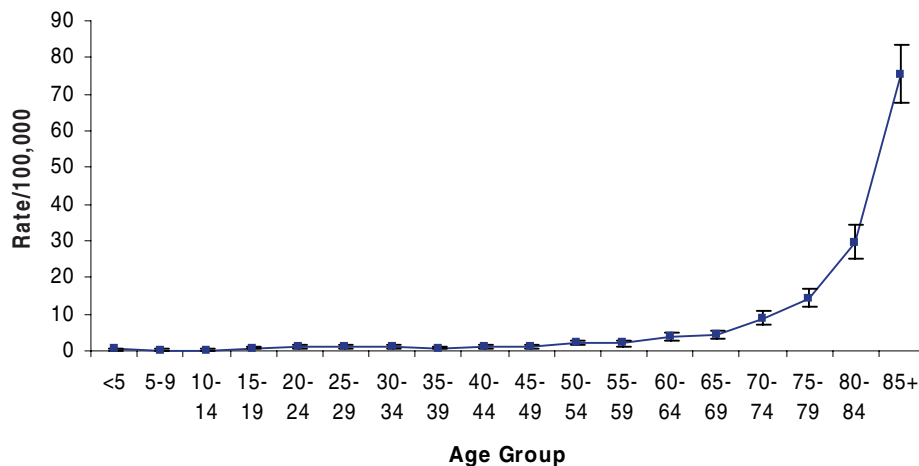


Figure 11 shows the age-specific death rates for falls between 1998 and 2002 and this is similar to the pattern of age-specific death rates for falls from 1995 to 1999 (Schmertmann and Williamson, 2002). People 70+ years had the highest rates of death due to falls. Falls deaths in people aged 70+ years accounted for 66% of all falls deaths between 1998 and 2002.

Table 9 shows the number of falls deaths and death rates by type of fall for all persons, males and females, during 1998–2002. *Other/unspecified* falls and falls on the *same level* were the types of falls that led to a falls death most often and accounted for 52% and 15% of all falls deaths respectively. Females accounted for 53% of all *other/unspecified* falls deaths and males accounted for 60% of all *same level* falls deaths.

Figure 11. Age-specific death rates for falls: NSW, 1998–2002



Other and unspecified falls were the leading type of male falls death and accounted for 42% of all male falls deaths. The rate for male falls deaths exceeded the corresponding rate for females for each type of fall in Table 9. Male falls death rates were also significantly higher for all types of falls. Male falls death rates were more than five times higher than the corresponding female falls death rates for falls from a *building or other structure*.

Table 9. Number of falls deaths and death rates/100,000* by type of fall: NSW, 1998–2002

Type of fall	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Other and unspecified	563	1.75	267	2.20 (1.93–2.47)	298**	1.47 (1.30–1.64)	1.50
Same level—tripped or pushed	168	0.52	100	0.72 (0.58–0.87)	68	0.35 (0.27–0.44)	2.04
One level to another	137	0.42	94	0.63 (0.50–0.76)	43	0.23 (0.16–0.30)	2.75
Building or other structure	95	0.29	80	0.50 (0.39–0.61)	15	0.09 (0.04–0.13)	5.74
Stairs	91	0.28	64	0.46 (0.34–0.57)	27	0.15 (0.09–0.20)	3.11
Ladder/scaffolding	39	0.12	37	0.24 (0.16–0.32)			–
All falls	1093	3.37	642	4.75 (4.38–5.13)	451	2.29 (2.08–2.50)	2.08

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes ladder/scaffolding for females. ††95% confidence interval

Other and unspecified falls were also the leading type of female falls death during 1998–2002 and accounted for 66% of all female falls deaths.

Table 10 shows falls deaths by age group and type of fall in NSW for 1998–2002. Fall *from a building or other structure* was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 10–34 years, fall *from one level to another* was the leading cause of falls death. Fall on the same level was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 55 and older, *other and unspecified* falls were the leading cause of falls death.

SUMMARY

Falls were a leading cause of injury death for people in NSW, accounting for approximately 176 deaths each year from 1986 to 2002. Analysis of the trend for falls death rates showed no statistically significant trend between 1986 and 2002. Compared to data on falls deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the pattern of age-specific rates has remained unchanged. People 70+ years had the highest rates of death due to falls in NSW during 1998–2002.

Other and unspecified falls and falls on the *same level* were the types of falls that led to a falls death most often during 1998–2002 in NSW. Fall *from a building or other structure* was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 10–34 years, falls *from one level to another* were the leading cause of falls death. *Same level* falls was the leading cause of falls death for children aged one to nine years and people aged 35–44 years. For people aged 55 and older, *other and unspecified* falls were the leading cause of falls death.

Males accounted for nearly 59% of all falls deaths in NSW during 1998–2002. Females accounted for 53% of all other/unspecified falls deaths and males accounted for 60% of all *same level* falls deaths. Male falls death rates were also significantly higher than those in females for all types of falls.

These results indicate that falls are a serious public health problem in NSW, especially in people aged 70+ years. However, the majority of elderly falls deaths were classified as *other and unspecified*, limiting the usefulness of these results. More information regarding the circumstances of these falls is needed in order to design effective prevention programs.

Future efforts should focus on improvements to the coding and data collection systems so that the number of cases coded as *other and unspecified* is greatly reduced. Until these changes can be made, an alternate data source (e.g. coronial data) should be used to investigate the nature of falls deaths coded as *other and unspecified*.

Table 10. Falls deaths* by age group and type of fall†: NSW, 1998-2002

Rank	Age group										Total	
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1		Building	Building	One level to another	One level to another	One level to another	Building	Same level	Other and unspecified	Other and unspecified	Other and unspecified	563
2		One level to another	One level to another	Building	Building	Building	Same level	Other and unspecified	Stairs	Same level	Same level	168
3		Other and unspecified	Other and unspecified	Other and unspecified	Same level	Other and unspecified	Stairs	One level to another	Same level	One level to another	One level to another	137
4					Other and unspecified	Same level	One level to another	Stairs	One level to another	Stairs	Building	95
5					Ladder/scaffolding	Stairs	Other and unspecified	Building	Building	Building	Stairs	91
6					Stairs		Ladder/scaffolding	Ladder/scaffolding	Ladder/scaffolding	Ladder/scaffolding	Ladder/scaffolding	39

* Numbers represent the number of cases. † See Appendix 4 for types of falls codes. # Cell size less than five cases

7 Interpersonal violence

Interpersonal violence is the term used to describe injury purposely inflicted by one or more persons on another person (WHO 1977, WHO 1996). WHO classifies the cause of interpersonal violence deaths by the method used to inflict the injury on another person. These methods include using of a *sharp or blunt object* to hit, cut or stab another person causing bleeding or other type of injury, shooting by *firearm (gun)*, *struck by/struck against* a person or object, *hanging, strangulation or suffocation* and *poisoning*. It is not possible to specifically identify domestic violence from the ICD codes.

Interpersonal violence death data from 1986 to 2002 were used to describe the demographic profile of interpersonal violence in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Interpersonal violence was the fifth leading cause of injury death from 1998–2002 and accounted for 4% of all injury deaths (see Table 2). During these years, 513 people died from interpersonal violence at an overall rate of 1.6/100,000 population and approximately 70% were male. Approximately 111 people died each year from 1986 to 2002 as the result of interpersonal violence.

Figure 12 shows the yearly trend in death rates from interpersonal violence from 1986 to 2002. There was a statistically significant decline in the interpersonal violence death rate between 1986 and 2002.

Figure 12. Yearly trend in death rates for interpersonal violence: NSW, 1986–2002

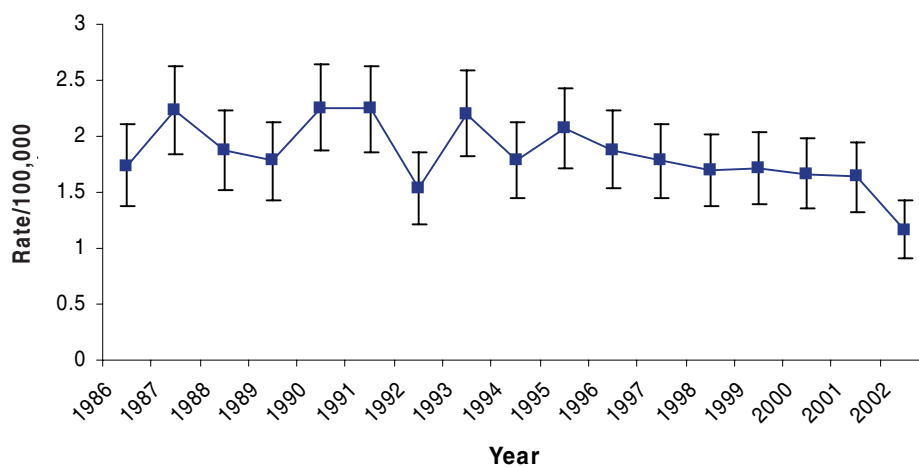


Figure 13 shows the age-specific death rates for interpersonal violence between 1998 and 2002. People 30–34 years had the highest rate of death due to interpersonal violence and this group accounted for almost 15% of all interpersonal violence deaths between 1998 and 2002. Children under age five years

also experienced high interpersonal violence rates. These children were most likely to be the recipients of interpersonal violence and accounted for 6% of interpersonal violence deaths between 1998 and 2002.

The pattern of age-specific death rates for interpersonal violence in Figure 13 is similar to that for the period from 1995 to 1999 (Schmertmann and Williamson, 2002) with one exception. People aged 25–29 years had the highest interpersonal violence death rate during 1995 to 1999.

Figure 13. Age-specific death rates for interpersonal violence: NSW, 1998–2002

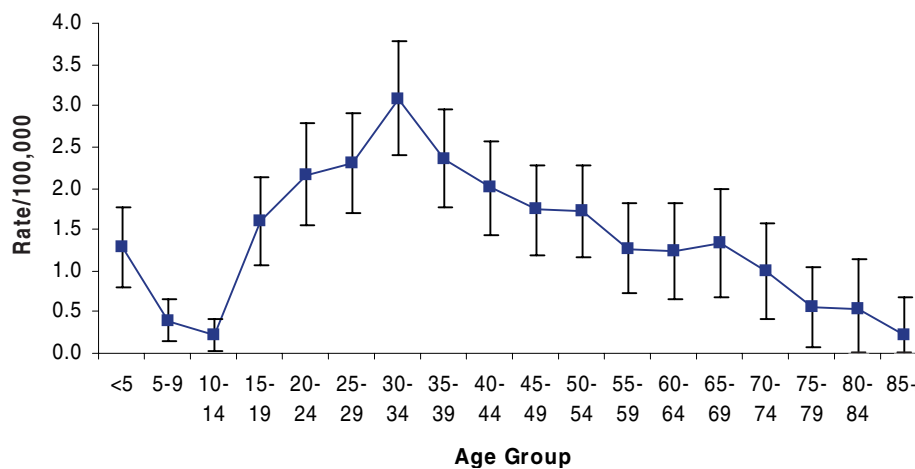


Table 11 shows the number of interpersonal violence deaths and death rates by the method used for all persons, males and females, during 1998–2002. *Sharp or blunt object* and *firearms* were the methods used that led to an interpersonal violence death most often and accounted for 43% and 21% of all interpersonal violence deaths respectively. Males accounted for 69% of all interpersonal violence deaths by *sharp or blunt object* and 83% of all interpersonal violence deaths by *firearm*.

Sharp or blunt object was the leading method of male interpersonal violence death and accounted for 42% of all male interpersonal violence deaths. The rate for male interpersonal violence deaths exceeded the corresponding rate for females for each type of method in Table 11 except for interpersonal violence by *hanging, strangulation or suffocation*. Male interpersonal violence death rates were also significantly higher than those in females for the following types of methods:

- sharp or blunt object
- firearm
- struck by/struck against.

Male death rates were at least four times the corresponding female death rates for *firearms* and *struck by/struck against* interpersonal violence methods. *Sharp or blunt object* was also the leading

type of female interpersonal violence death during 1998–2002 and accounted for 44% of all female interpersonal violence deaths. Females had a higher death rate than males for interpersonal violence by *hanging, strangulation or suffocation* and the rate was 2.3 times the male rate.

Table 11. Number of interpersonal violence deaths and death rates/100,000* by method used: NSW, 1998–2002

Method	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate† (CI) ††	N	Rate† (CI)	
Sharp or blunt object	220	0.67	153	0.94 (0.79–1.09)	67	0.41 (0.31–0.51)	2.30
Firearm	110	0.34	91	0.55 (0.44–0.67)	19	0.12 (0.06–0.17)	4.76
Struck by/struck against	71	0.22	60	0.37 (0.28–0.47)	11	0.07 (0.03–0.11)	5.45
Other and unspecified	54	0.17	34	0.21 (0.14–0.28)	20	0.12 (0.07–0.18)	1.68
Hanging, strangulation or suffocation	43	0.13	13	0.08 (0.04–0.12)	30	0.18 (0.12–0.25)	0.43
Poisoning	15	0.05	9	0.05 (0.02–0.09)	6	0.04 (0.01–0.06)	1.52
All interpersonal violence	513	1.57	360	2.21 (1.98–2.44)	153	0.94 (0.79–1.08)	2.36

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. ††95% confidence interval

Table 12 shows interpersonal violence deaths by age group and method used in NSW for 1998–2002. *Sharp or blunt object* was the leading method used in interpersonal violence deaths in people aged 10+ years, with the exception of people aged 15–24 years. The majority of deaths in this age group were caused by firearms. The results in Table 12 are similar to data from 1995 to 1999 for interpersonal violence deaths (Schmertmann and Williamson, 2002), with one exception. Sharp or blunt object was the leading cause of interpersonal violence death in people aged 15–24.

Children under age one year died most often as the result of interpersonal violence by being *struck by/struck against* another person or object and children aged one to nine years died most often as a result of *hanging, strangulation or suffocation*.

SUMMARY

Interpersonal violence was a leading cause of injury death for people in NSW, accounting for approximately 111 deaths each year from 1986 to 2002. Analysis of the trend for interpersonal violence death rates showed a statistically significant decline between 1986 and 2002.

Compared to data on interpersonal violence deaths from 1995 to 1999 (Schmertmann and Williamson 2002), the pattern of age-specific rates has remained unchanged. People 30–34 years had the highest rate of death due to interpersonal violence in NSW during 1998–2002. Children under age five years also had high interpersonal violence rates.

Sharp or blunt object and *firearms* were the methods used that led to an interpersonal violence death most often during 1998–2002 in NSW. *Sharp or blunt object* was the leading method used in interpersonal violence deaths in people aged 10+ years, with the exception of people aged 15–24 years. The majority of deaths in this age group were caused by *firearms*. Children under age one year died most often as the result of interpersonal violence by *struck by/struck against* and children aged one to nine years died most often as a result of *hanging, strangulation or suffocation*.

Males accounted for nearly 70% of all interpersonal violence deaths in NSW during 1998–2002. Males accounted for 69% of all interpersonal violence deaths by *sharp or blunt object* and 83% of all interpersonal violence deaths by *firearm*. Male interpersonal violence death rates were also significantly higher for several interpersonal violence methods—*sharp or blunt object, firearms* and *struck by/struck against*.

These results indicate that interpersonal violence is a serious public health problem for people in NSW. Males are at increased risk of death due to interpersonal violence compared to females and the reasons for this need to be better understood. Most deaths were caused by the use of firearms and knives, which often result in more serious wounds. The high numbers of firearms deaths should be investigated given recent government action to reduce the availability of firearms.

Table 12. Interpersonal violence deaths* by age group and method used: NSW, 1998–2002

Rank	Age group										Total
	<1	1–4	5–9	10–14	15–24	25–34	35–44	45–54	55–64	65+	
1	Struck by/struck against #	Hanging, strangulation or suffocation 6	Hanging, strangulation or suffocation #	Sharp or blunt object #	Firearm 31	Sharp or blunt object 56	Sharp or blunt object 57	Sharp or blunt object 36	Sharp or blunt object 20	Sharp or blunt object 16	Sharp or blunt object 220
2	Hanging, strangulation or suffocation #	Struck by/struck against 5	Other and unspecified means #	Other and unspecified means #	Sharp or blunt object 29	Firearm 36	Firearm 26	Struck by/struck against 15	Struck by/struck against 12	Struck by/struck against 6	Firearm 110
3	Other and unspecified means #	Poisoning #	Struck by/struck against #	Poisoning #	Other and unspecified means 9	Other and unspecified means 13	Struck by/struck against 11	Firearm 12	Firearm #	Other and unspecified means 6	Struck by/struck against 71
4	#	Sharp or blunt object #	Sharp or blunt object #	Firearm #	Struck by/struck against 8	Hanging, strangulation or suffocation 12	Other and unspecified means 8	Other and unspecified means 9	Hanging, strangulation or suffocation #	Hanging, strangulation or suffocation 5	Other and unspecified means 54
5	#	Other and unspecified means #	#	#	Hanging, strangulation or suffocation #	Struck by/struck against 9	Hanging, strangulation or suffocation 5	Hanging, strangulation or suffocation #	Other and unspecified means #	Firearm #	Hanging, strangulation or suffocation 43
6	#	#	#	#	Poisoning #	Poisoning 5	Poisoning #	Poisoning #	Poisoning #	Poisoning #	Poisoning 15

* Numbers represent the number of cases. † See Appendix 4 for interpersonal violence method codes. # Cell size less than five cases

8 Drowning

Drowning is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of drowning deaths by the location in which the drowning occurred. The locations of drowning include a *bath tub*, *swimming pool*, *natural water* or a *boat-related* location. Drowning deaths can also be intentional. A self-inflicted drowning injury that results in death is classified as a suicide. Deaths due to intentional drowning are covered in the suicide chapter.

Drowning death data from 1986 to 2002 were used to describe the demographic profile of drowning deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Drowning was the sixth leading cause of injury death from 1998–2002 and accounted for almost 4% of all injury deaths (see Table 2). During these years, 468 people died from drowning, at an overall rate of 1.6/100,000 population and 78% were male. Approximately 102 people died each year from 1986 to 2002 as the result of drowning.

Figure 14 shows the yearly trend in death rates for drowning from 1986 to 2002. There was a statistically significant decline in the overall drowning death rate between 1986 and 2002.

Figure 14. Yearly trend in death rates for drowning: NSW, 1986–2002

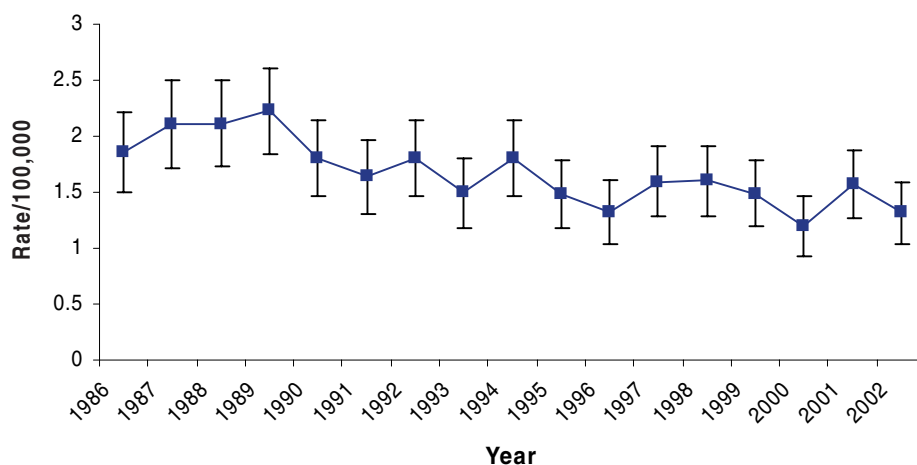


Figure 15 shows the age-specific death rates for drowning between 1998 and 2002. Children under age five years and people aged 75–79 years had the highest rates of death due to drowning. Drowning deaths in children aged under five years and people aged 75–79 years accounted for 16% and 5% respectively of all drowning deaths between 1998 and 2002.

The pattern of age-specific death rates for drowning in Figure 15 is similar to the pattern of age-specific death rates for drowning from 1995 to 1999 (Schmertmann and Williamson, 2002) with one exception. The drowning death rate for people aged 75–79 years was not one of the highest rates during 1995 to 1999.

Figure 15. Age-specific death rates for drowning: NSW, 1998–2002

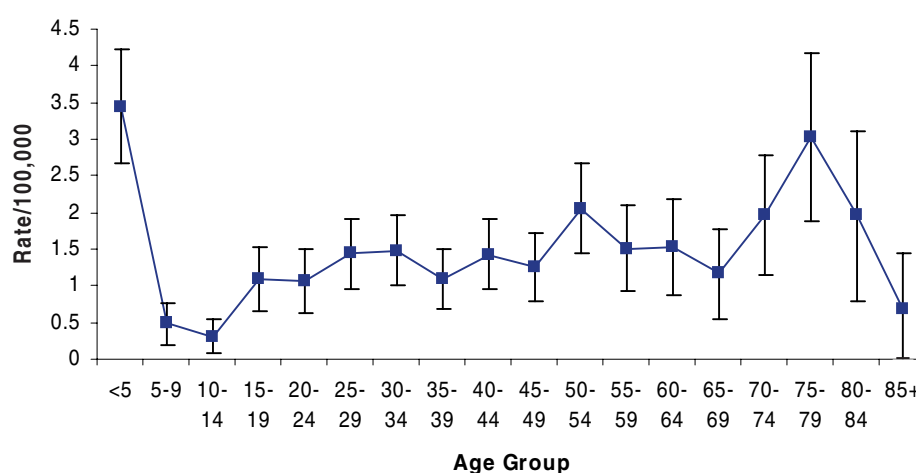


Table 13 shows the number of drowning deaths and death rates by location for all persons, males and females, during 1998–2002. *Natural water* and *pools* were the locations that led to a drowning death most often and accounted for 48% and 19% of all drowning deaths respectively. Males accounted for 85% of all drowning deaths in *natural water* and 76% of all drowning deaths in *pools*.

Natural water was the location of the majority of male drowning deaths and accounted for 53% of all male drowning deaths. The rate for male drowning deaths exceeded the corresponding rate for females for each location in Table 13 except for drowning in *bathtubs*. Male drowning death rates were also significantly higher for all locations except for drowning in bathtubs. Male death rates were more than five times higher than the corresponding female death rates for drowning in natural water incidents.

Natural water was also the location of the majority of female drowning death during 1998–2002 and accounted for 34% of all female drowning deaths.

The results in Table 13 are similar to data reported for drowning deaths from 1995 to 1999 (Schmertmann and Williamson, 2002).

Table 14 shows drowning deaths by age group and location in NSW for 1998–2002. *Bathtubs* were the location where the majority of drowning deaths occurred in children under age one year. Pools were the location where the majority of drowning deaths occurred in children aged one to four years. For people over age five years, *natural water* was the location where the majority of drowning deaths occurred.

Table 13. Number of drowning deaths and death rates/100,000* by location: NSW, 1998–2002

Location	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate† (CI) ††	N	Rate† (CI)	
Natural water	227	0.70	192	1.19 (1.02–1.36)	35	0.21 (0.14–0.28)	5.55
Pools	91	0.28	69	0.44 (0.33–0.54)	22	0.13 (0.08–0.19)	3.30
Other and unspecified	55	0.17	42	0.26 (0.18–0.34)	13	0.08 (0.04–0.12)	3.29
Boat-related	49	0.15	45	0.28 (0.20–0.36)	#		–
Bathtub	46	0.14	18	0.11 (0.06–0.16)	28	0.17 (0.11–0.23)	0.65
All drowning	468	1.44	366	2.28 (2.04–2.51)	102	0.62 (0.50–0.74)	3.68

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. # cell size less than five cases. †† 95% confidence interval.

SUMMARY

Drowning was a leading cause of injury death for people in NSW, accounting for approximately 102 deaths each year from 1986 to 2002. Analysis of the trend for drowning death rates showed a statistically significant decline over the period 1986 and 2002.

Compared to data on drowning deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the pattern of age-specific rates for 1998–2002 is similar for most age groups. Children under age five years and people aged 75–79 years had the highest rates of death due to drowning in NSW during 1998–2002.

Natural water and *pools* were the locations that led to a drowning death most often during 1998–2002 in NSW. *Bathtubs* were the location where the majority of drowning deaths occurred in children under age one year. *Swimming pools* were the location where the majority of drowning deaths occurred in children aged one to four years. For people over age five years, natural water the location where the majority of drowning deaths occurred.

Males accounted for nearly 78% of all drowning deaths in NSW during 1998–2002. They accounted for 85% of all drowning deaths in *natural water* and 76% of all drowning deaths in *pools*. Male drowning death rates were also significantly higher for all locations except for drowning in *bathtubs*.

These results indicate that drowning is still a serious public health problem for people in NSW. People of all ages are at risk for drowning in various locations. The high rates in children under age five years warrant particular further attention.

Table 14. Drowning deaths* by age group and location†: NSW, 1998–2002

Rank	Age group										Total
	<1	1–4	5–9	10–14	15–24	25–34	35–44	45–54	55–64	65+	
1	Bathtub 11	Pools 32	Natural water 6	Natural water #	Natural water 34	Natural water 41	Natural water 42	Natural water 44	Natural water 20	Natural water 28	Natural water 227
2	Pools #	Other and unspecified location 10	Pools #	Pools #	Pools 8	Boat-related 14	Other and unspecified location 9	Other and unspecified location 7	Boat-related 10	Pools 20	Pools 91
3	Other and unspecified location #	Natural water 10	Other and unspecified location #	Bathtub #	Other and unspecified location #	Pools 7	Boat-related 8	Boat-related 7	Pools 7	Other and unspecified location 13	Other and unspecified location 55
4		Bathtub 9		Boat-related #	Boat-related #	Other and unspecified location 6	Pools #	Pools 7	Bathtub 6	Bathtub 9	Boat-related 49
5		Boat-related #			Bathtub #	Bathtub #		Bathtub 6	Other and unspecified location #	Boat-related 7	Bathtub 46

* Numbers represent the number of cases. † See Appendix 4 for drowning location codes. # Cell size less than five cases

9 Suffocation

Suffocation is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of suffocation deaths by the object or circumstance that affects a person's ability to breathe (other than drowning) (WHO 1996). The causes of suffocation include *food*, *non-food* (items other than food), *bed* (linens, pillows, co-sleeping) and *cave-ins* (WHO 1977, WHO 1996). Suffocation deaths can also be intentional. A self-inflicted suffocation injury that results in death is classified as a suicide and a suffocation injury inflicted on one person by another that results in death is classified as an interpersonal violence death. Deaths due to intentional suffocation (i.e., subcategory *hanging, strangulation and suffocation*) are covered in earlier chapters (see the suicide and interpersonal violence chapters).

Suffocation death data from 1986 to 2002 were used to describe the demographic profile of suffocation deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Suffocation was the seventh leading cause of injury death from 1998–2002 and accounted for almost 3% of all injury deaths (see Table 2). During these years, 331 people died from suffocation, at an overall rate of 1.0/100,000 population and 64% were male. Approximately 53 people died each year from 1986 to 2002 as the result of suffocation.

Figure 16 shows the yearly trend in death rates for suffocation from 1986 to 2002. The suffocation death rate showed no statistically significant trend between 1998 and 2002, though there is a rising trend since 1995.

Figure 16. Yearly trend in death rates for suffocation: NSW, 1986–2002

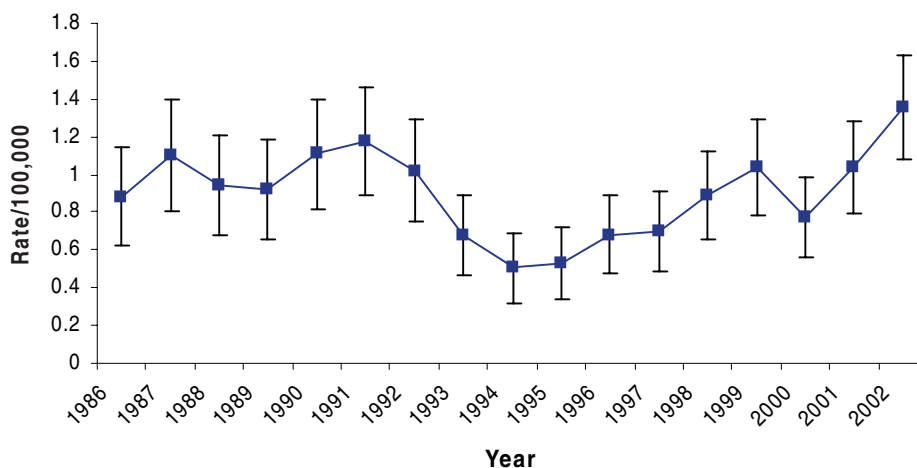


Figure 17 shows the age-specific death rates for suffocation between 1998 and 2002. People aged 75+ years had the highest rates of death due to suffocation. Suffocation deaths in people aged 75+ years accounted for 36% of all suffocation deaths between 1998 and 2002. An elevated rate was also seen in children under age five years and suffocation deaths in this age group accounted for 12% of all suffocation deaths.

Figure 17. Age-specific death rates for suffocation: NSW, 1998–2002

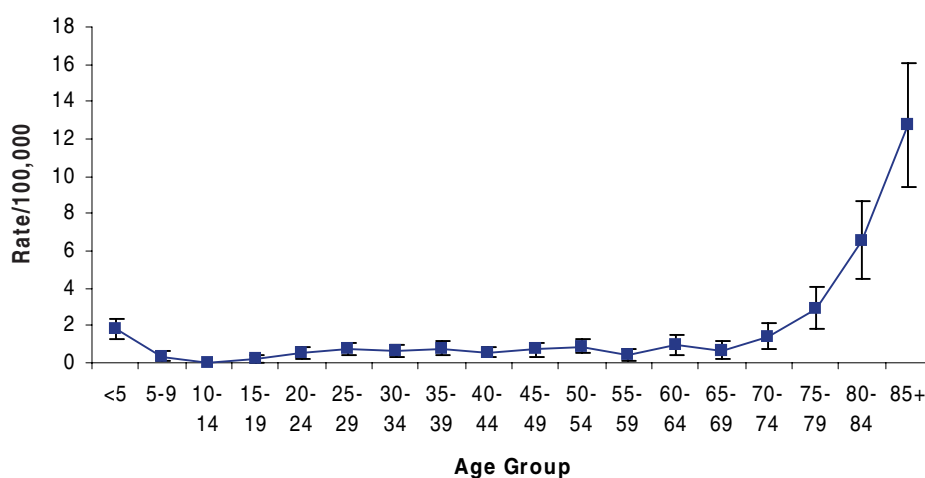


Table 15 shows the number of suffocation deaths and death rates by cause for all persons, males and females, during 1998–2002. *Other and unspecified causes* and *food* were the causes that led to a suffocation death most often and accounted for 47% and 29% of all suffocation deaths respectively. Males accounted for 70% of all suffocation deaths due to *other and unspecified causes* and 57% of all suffocation deaths due to *food*.

Other and unspecified causes were responsible for the majority of male suffocation deaths, accounting for 51% of all male suffocation deaths. The rate for male suffocation deaths exceeded the corresponding rate for females for each cause in Table 15. Male suffocation death rates were also significantly higher for all suffocations due to *other and unspecified causes* and *non-food*. Male death rates were also more than twice the corresponding female death rates for suffocations due to *other and unspecified causes* and *non-food items*.

Other and unspecified causes were also responsible for the majority of female suffocation deaths during 1998–2002 and accounted for 39% of all female suffocation deaths.

Table 15. Number of suffocation deaths and death rates/100,000* by cause: NSW, 1998–2002

Causes	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Other and unspecified	154	0.47	108**	0.70 (0.57–0.83)	46**	0.27 (0.19–0.34)	2.63
Food	95	0.29	54	0.38 (0.27–0.48)	41	0.22 (0.15–0.29)	1.70
Nonfood	65	0.20	41	0.34 (0.23–0.45)	24	0.12 (0.07–0.17)	2.82
Bed	17	0.05	10	0.06 (0.02–0.10)	7	0.04 (0.01–0.08)	1.36
All suffocation	331	1.02	213	1.48 (1.27–1.68)	118	0.65 (0.53–0.77)	2.27

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes cave-ins for males and females. †† 95% confidence interval.

Table 16 shows suffocation deaths by age group and cause in NSW for 1998–2002. *Other and unspecified causes* were responsible for the majority of suffocations in people aged one to 54 years. Children aged under one year died of suffocation caused *in bed* most often (due to linens, pillows, co-sleeping) and people aged 55+ years died most often due to suffocation caused by food.

SUMMARY

Suffocation was a leading cause of injury death for people in NSW, accounting for approximately 53 deaths each year from 1986 to 2002. Analysis of the trend for suffocation death rates showed no statistically significant change was present between 1986 and 2002, though there is a suggestion of a rise since 1995. People aged 75+ years had the highest rates of death due to suffocation. An elevated rate was also seen in children under age five years. No comparison can be made with previous results for male and female death rates as suffocation was not examined from 1995 to 1999 by Schmetzmann and Williamson (2002).

Other and unspecified causes and *food* were the causes that led to a suffocation death most often. *Other and unspecified causes* were responsible for the majority of suffocations in people aged one to 54 years. Children aged under one year died of suffocation caused *in bed* most often (due to linens, pillows, co-sleeping) and people aged 55+ years died most often due to suffocation caused by food.

Males accounted for nearly 64% of all suffocation deaths in NSW during 1998–2002. Males accounted for 70% of all suffocation deaths due to *other and unspecified causes* and 57% of all suffocation deaths *due to food*. Male suffocation death rates were also significantly higher for all suffocations due to *other and unspecified causes* and *non-food*.

These results indicate that suffocation is a serious public health problem for very young children and older people in NSW. Children aged less than one year are most at risk whilst in bed (e.g. own cot, parents bed) and older adults are at risk while eating. Further research is needed to study the factors contributing to suffocation deaths in these age groups.

Unfortunately, a large proportion of suffocation deaths were coded as *other and unspecified causes*, limiting the effectiveness of the results. Further work needs to be undertaken to clarify whether additional codes are needed to describe suffocation death or if inadequate information was presented on the death certificate to inform coding of the suffocation deaths.

Table 16. Suffocation deaths* by age group and cause†: NSW, 1998-2002

Rank	Age group											Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1	Bed 15	Other and unspecified 6	Other and unspecified #		Other and unspecified 13	Other and unspecified 28	Other and unspecified 27	Other and unspecified 22	Food 11	Food 55	Other and unspecified 152	
2	Other and unspecified 11	Food #	Non-food items #		Non-food items #	Food #	Food 5	Food 11	Other and unspecified 6	Non-food items 52	Food 95	
3	Food #	Bed #	Food #		Food #	Non-food items #	Non-food items #	Non-food items #	Non-food items #	Other and unspecified 35	Non-food items 65	
4										Cave-in #	Bed 17	
5											Cave-in #	

* Numbers represent the number of cases. † See Appendix 4 for suffocation cause codes. # Cell size less than five cases

10 Fire/burns

Fire/burns are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of fire/burns deaths by the location or circumstance in which the fire/burn occurred. These locations/circumstances include fires in *private dwellings and other buildings*, fires *not in buildings and burns*.

Fire/burns death data from 1986 to 2002 were used to describe the demographic profile of fire/burns deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Fire/burns were the eighth leading cause of injury death from 1998 to 2002 and accounted for approximately 1.4% of all injury deaths (see Table 2). During these years, 180 people died from fire/burns, at an overall rate of 0.6/100,000 population and 57% were male. Approximately 44 people died each year from 1986 to 2002 as the result of fire/burns.

Figure 18 shows the yearly trend in death rates for fire/burns from 1986 to 2002. There was a statistically significant decline in the overall fire/burns death rate between 1986 and 2002.

Figure 18. Yearly trend in death rates for fire/burns: NSW, 1986–2002

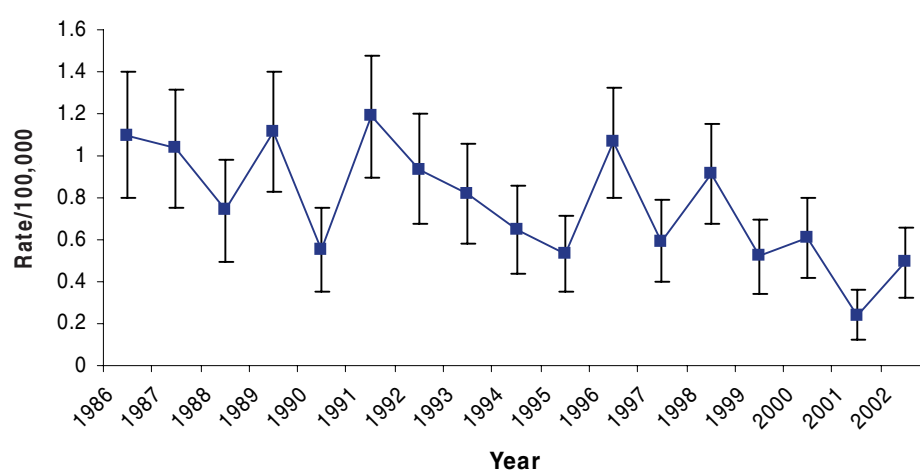


Figure 19 shows the age-specific death rates for fire/burns between 1998 and 2002. People aged 70+ years had the highest rates of death due to fire/burns, accounting for 44% of all fire/burns deaths between 1998 and 2002.

The pattern of age-specific death rates for fire/burns in Figure 19 is similar to the pattern of age-specific death rates for fire/burns from 1995 to 1999 (Schmertmann and Williamson, 2002) with one exception. The fire/burns death rate for children less than five years was higher than many other age groups during 1995 to 1999.

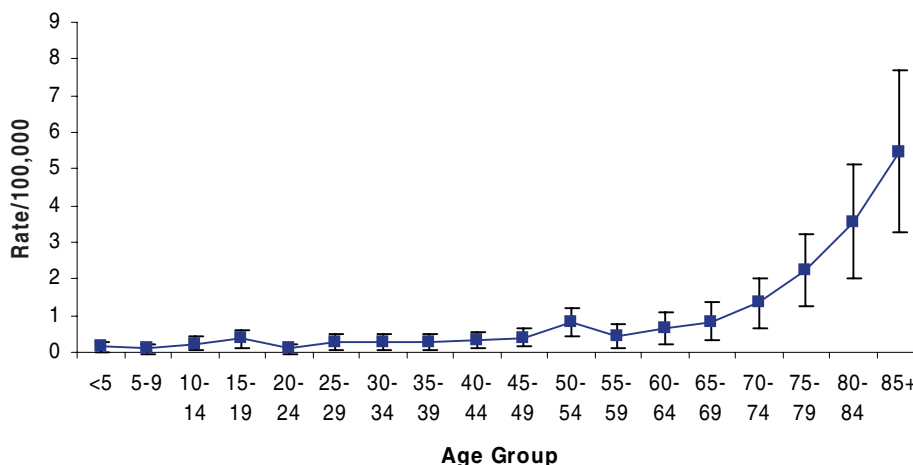
Figure 19. Age-specific death rates for fire/burns: NSW, 1998–2002

Table 17 shows the number of fire/burn deaths and death rates by type for all persons, males and females, during 1998–2002. The majority of fire/burn deaths occurred in *private dwellings and other buildings* and accounted for 61% of all fire/burn deaths. Males accounted for 54% of all fire/burn deaths in *private dwellings and other buildings*.

Fires in *private dwellings and other buildings* were responsible for the majority of male fire/burn deaths and accounted for 57% of all male fire/burn deaths. The rate for male fire/burn deaths exceeded the corresponding rate for females for each type in Table 17. Male death rates were also more than twice the corresponding female death rates for fire/burns of *other and unspecified types*. There were no significant differences between male and female fire/burn death rates for any of the fire/burns types.

Fires in *private dwellings and other buildings* were also responsible for the majority of female fire/burn deaths during 1998–2002 and accounted for 65% of all female fire/burn deaths.

Table 17. Number of fire/burns deaths and death rates/100,000* by type: NSW, 1998–2002

Type	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Private dwellings and other buildings	109	0.34	59	0.40 (0.29–0.50)	50	0.29 (0.21–0.37)	1.36
Other and unspecified	40	0.12	27	0.18 (0.11–0.25)	15**	0.08 (0.04–0.12)	2.25
Burns	23	0.07	11	0.09 (0.04–0.15)	12	0.06 (0.03–0.10)	1.49
Not in buildings	8	0.02	6	0.04 (0.01–0.07)			–
All fire/burns	180	0.55	103	0.71 (0.57–0.85)	77	0.44 (0.34–0.53)	1.64

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes not in building for females. †† 95% confidence interval.

Table 18 shows fire/ burns deaths by age group and type of fire/ burn in NSW for 1998–2002. Fires in *private dwellings and other buildings* were the leading cause of fire/ burns deaths across all age groups from children under age one year to people aged 65+ years. People aged 65+ years also had the majority of burn-related deaths compared to all other age groups. These results are similar to data from 1995 to 1999 for fire/ burns deaths (Schmertmann and Williamson, 2002).

SUMMARY

Fire/ burn was a leading cause of injury death for people in NSW, accounting for approximately 44 deaths each year from 1986 to 2002. Analysis of the trend for fire/ burn death rates showed a statistically significant decline over the period from 1986 to 2002.

Compared to data on fire/ burn deaths from 1995 to 1999 (Schmertmann and Williamson, 2002), the pattern of age-specific rates for 1998–2002 was similar for most age groups. People aged 70+ years had the highest rates of death due to fire/ burns.

Fires in *private dwellings and other buildings* and *other and unspecified types* caused the majority of fire/ burn deaths during 1998–2002 in NSW. Fires in *private dwellings and other buildings* were the leading cause of fire/ burns deaths across all age groups from children under age one year to people aged 65+ years. People aged 65+ years also experienced the majority of burn-related deaths.

Males accounted for nearly 57% of all fire/ burn deaths in NSW during 1998–2002. They accounted for 54% of all fire/ burn deaths due to *private dwellings and other buildings*. There were no significant differences between male and female fire/ burn death rates for any of the fire/ burns types.

While the fire/ burn death rate has declined significantly since 1986, deaths caused by fire/ burn events, particularly in private dwellings and other buildings, are still a serious public health problem for people of all ages in NSW. In order to address this public health problem, the circumstances, location and type of private residences and other buildings where these deaths are occurring in NSW should be investigated, and the presence of a functioning smoke alarm reported.

Table 18. Fire/burns deaths* by age group and type†: NSW, 1998-2002

Rank	Age group										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1		Private dwelling and other building #	Private dwelling and other building #	Private dwelling and other building #	Private dwelling and other building 8	Private dwelling and other building 10	Private dwelling and other building 14	Private dwelling and other building 15	Private dwelling and other building 10	Private dwelling and other building 43	109
2				Other and Unspecified #	Other and Unspecified #	Other and Unspecified #	Not in building #	Other and Unspecified 7	Other and Unspecified #	Other and Unspecified 25	40
3					Not in building #			Not in building #	Burns #	Burns 20	Burns
4								Burns #	Not in building #	Not in building #	23
											8

* Numbers represent the number of cases. † See Appendix 4 for fire/burn type codes. # Cell size less than five cases

II Complications of care

Complications of care are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of complications of care deaths by the type of medical service received. These types include the following:

- *procedures causing abnormal reaction or complication of care after procedure*
- *drugs and medicaments in therapeutic use*
- *misadventures to patient during surgical and medical care*
- *misadventures due to medical devices.*

Complications of care death data from 1986 to 2002 were used to describe the demographic profile of complications of care deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Complications of care were the ninth leading cause of injury death from 1998–2002 and accounted for approximately 1.4% of all injury deaths (see Table 2). During these years, 174 people died from complications of care, at an overall rate of 0.5/100,000 population and 48% were male. Approximately 31 people died each year from 1986 to 2002 as the result of complications of care.

Figure 20 shows the yearly trend in death rates for complications of care from 1986 to 2002. The complications of care death rate did not significantly change between 1986 and 2002, though there is an evidence of a rise since 2000.

Figure 20. Yearly trend in death rates for complications of care: NSW, 1986–2002

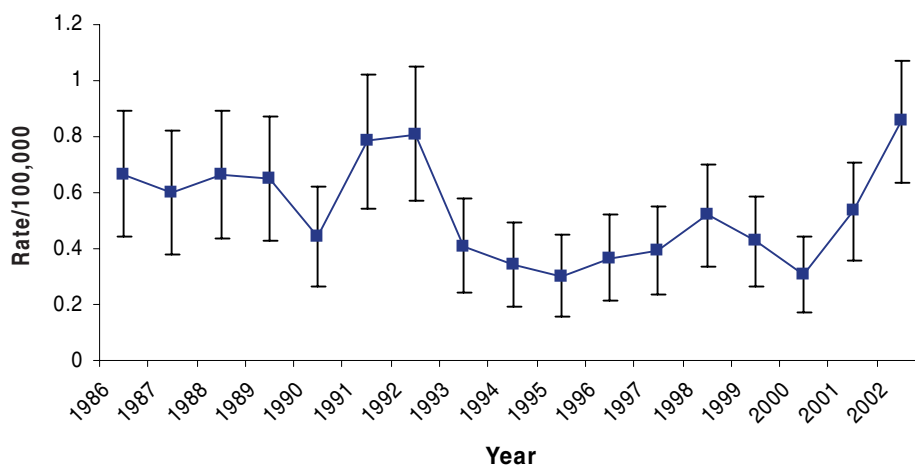


Figure 21 shows the age-specific death rates for complications of care between 1998 and 2002. People aged 65+ years had the highest rates of death due to complications of care, accounting for 77% of all complications of care between 1998 and 2002. The pattern of age-specific death rates for complications of care in Figure 21 is similar to the pattern of age-specific death rates for complications of care from 1995 to 1999 (Schmertmann and Williamson, 2002).

Figure 21. Age-specific death rates for complications of care: NSW, 1998–2002

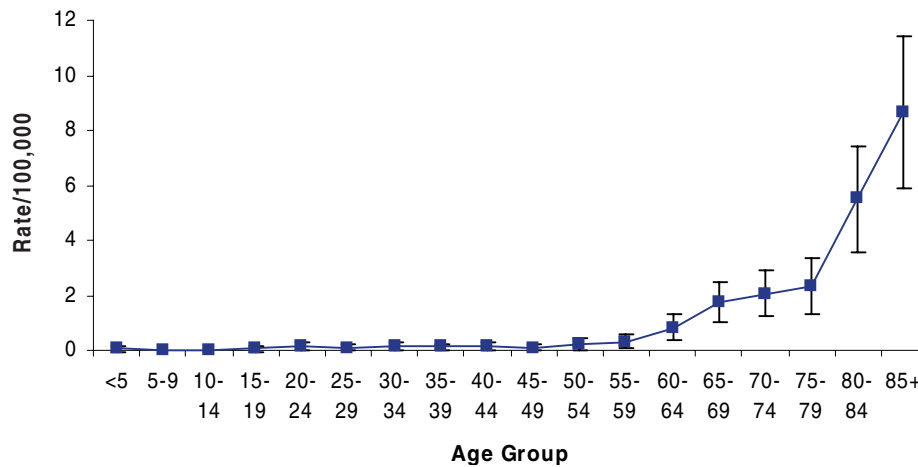


Table 19 shows the number of complications of care deaths and death rates by the nature of the complications of care for all persons, males and females, during 1998–2002. *Procedures causing abnormal reaction or complication of care after procedure* and *drugs and medicaments in therapeutic use* caused the majority of complications of care deaths and accounted for 66% and 26% of all complications of care deaths respectively. Males accounted for 53% of all complications of care deaths due to *procedures causing abnormal reaction or complication of care after procedure* and females accounted for 63% of all complications of care deaths due to *drugs and medicaments in therapeutic use*. The results in Table 19 are similar to data reported for complications of care deaths from 1995 to 1999 (Schmertmann and Williamson, 2002).

Procedures causing abnormal reaction or complication of care after procedure were responsible for the majority of male complications of care deaths and accounted for 72% of all male complications of care deaths. The rate for male complications of care deaths exceeded the corresponding rate for females for both *procedures causing abnormal reaction or complication of care after procedure* and *other/unspecified*. Unlike other injury mechanisms, male complications of care death rates were not significantly higher than females for all complications of care subgroups. Male death rates were also similar to corresponding female death rates for all complications of care subgroups.

Procedures causing abnormal reaction or complication of care after procedure were also responsible for the majority of female complications of care deaths during 1998–2002 and accounted for 61% of all female complications of care deaths.

Table 19. Number of complications of care deaths and death rates/100,000* by nature of the complication of care: NSW, 1998–2002

Nature	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Procedures causing abnormal reaction or complication of care after procedure	115	0.35	61	0.45 (0.34–0.57)	54	0.29 (0.21–0.36)	1.59
Drugs, medicaments in therapeutic use	46	0.14	17	0.12 (0.06–0.17)	29	0.15 (0.10–0.21)	0.76
Other and unspecified	13	0.04	7**	0.05 (0.01–0.08)	6**	0.03 (0.00–0.06)	1.60
All complications of care	174	0.53	85	0.62 (0.48–0.75)	89	0.47 (0.37–0.57)	1.31

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes both misadventures to patient during surgical and medical care and misadventures due to medical devices for males and females. †† 95% confidence interval

Table 20 shows complications of care deaths by age group and nature of the event in NSW for 1998–2002. For people aged 15+ years, *procedures causing abnormal reaction or complication of care after procedure* resulted in the majority of complications of care deaths. These results are similar to data from 1995 to 1999 for complications of care deaths (Schmertmann and Williamson, 2002).

SUMMARY

Complications of care accounted for approximately 31 deaths each year from 1986 to 2002. Analysis of the trend for complications of care death rates showed there was no statistically significant change over the period 1986 and 2002, though there is a suggestion of a rise since 2000. Compared to data on complications of care deaths (Schmertmann and Williamson, 2002), the pattern of age-specific rates has remained unchanged. People aged 65+ years had the highest rates of death due to complications of care.

Procedures causing abnormal reaction or complication of care after procedure and *drugs and medicaments in therapeutic use* caused the majority of complications of care deaths. For people aged 15+ years, *procedures causing abnormal reaction or complication of care after procedure* resulted in the majority of complications of care deaths.

Unlike other injury mechanisms, male complications of care death rates were not significantly higher for any of the complications of care subgroups.

These results indicate that complications of care are mostly a problem for people aged 65+ years. This is likely to be the age group with the greatest need for a number of hospital stays for various medical conditions. *Procedures causing abnormal reaction or complication of care after procedure* accounted for 66% of complications of care deaths as well as the majority of deaths in people aged 65+ years. The codes covered in this subcategory of complications of care refer to surgery and other medical procedures that are done to treat medical conditions (e.g. heart problems, kidney failure).

Table 20. Complications of care deaths* by age group and nature of the event†: NSW, 1998–2002*

Rank	Age group							Total	
	<1	1–14	15–24	25–34	35–44	45–54	55–64		65+
1	Misadventures to patient during surgical and medical care #		Procedures causing abnormal reaction or complication of care after procedure #	Procedures causing abnormal reaction or complication of care after procedure #	Procedures causing abnormal reaction or complication of care after procedure #	Procedures causing abnormal reaction or complication of care after procedure 5	Procedures causing abnormal reaction or complication of care after procedure 9	Procedures causing abnormal reaction or complication of care after procedure 92	Procedures causing abnormal reaction or complication of care after procedure 115
2			Misadventures to patient during surgical and medical care #	Misadventures to patient during surgical and medical care #	Drugs, medicaments in therapeutic use #	Misadventures to patient during surgical and medical care #	Drugs, medicaments in therapeutic use 5	Drugs, medicaments in therapeutic use 36	Drugs, medicaments in therapeutic use 46
3			Drugs, medicaments in therapeutic use #	Drugs, medicaments in therapeutic use #			Misadventures to patient during surgical and medical care #	Misadventures to patient during surgical and medical care 5	Misadventures to patient during surgical and medical care 12
4								Other and unspecified #	Other and unspecified #

* Numbers represent the number of cases. † See Appendix 4 for nature of complications of care codes. # Cell size less than five cases

I2 Struck by/struck against

Struck by/struck against is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of struck by/struck against deaths by the event causing contact to be made between one person and another person(s) or object(s) as the result of an unintentional event (e.g. sporting activity). The events which cause contact to occur include *struck by/against a person or object* and *caught between two objects*. Struck by/struck against deaths can also be intentional. A struck by/struck against injury inflicted on one person by another that results in death is classified as an interpersonal violence death (WHO 1977, WHO 1996). Deaths due to intentional struck by/struck against events are covered in the interpersonal violence chapter.

Struck by/struck against death data from 1986 to 2002 were used to describe the demographic profile of struck by/struck against deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Struck by/struck against was the tenth leading cause of injury death from 1998–2002 and accounted for approximately 1% of all injury deaths (see Table 2). During these years, 111 people died from struck by/struck against causes at an overall rate of 0.3/100,000 population and 89% were male. Approximately 23 people died each year from 1986 to 2002 as the result of being struck by/struck against.

Figure 22 shows the yearly trend in death rates for struck by/struck against from 1986 to 2002. The struck by/struck against death rate showed no statistically significant trend between 1986 and 2002.

Figure 22. Yearly trend in death rates for struck by/struck against: NSW, 1986–2002

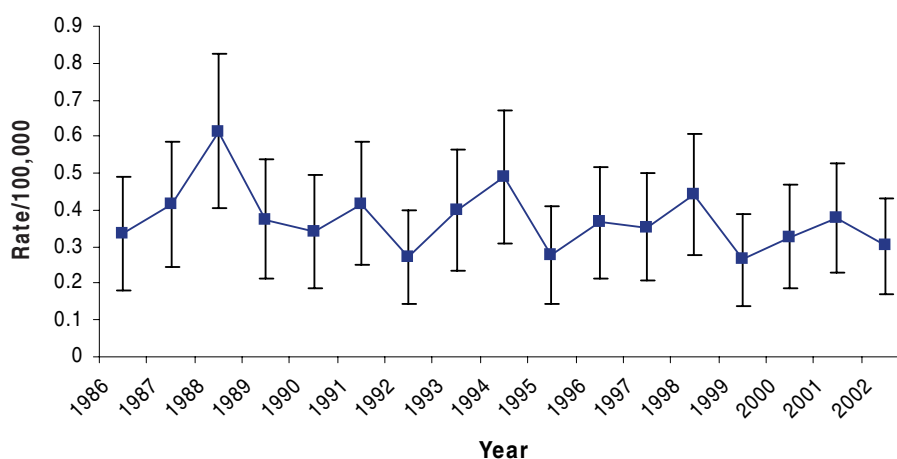


Figure 23 shows the age-specific death rates for struck by/struck against events between 1998 and 2002. People aged 85+ years had the highest rates of death due to struck by/struck against, but accounted for only 2% of all such deaths. Other high death rates for struck by/struck against were seen in children under age five years and people aged 45–54 years. Struck by/struck against deaths in children under age five and people aged 45–54 years of age accounted for 10% and 23% respectively of all struck by/struck against deaths between 1998 and 2002.

Figure 23. Age-specific death rates for struck by/struck against: NSW, 1998–2002

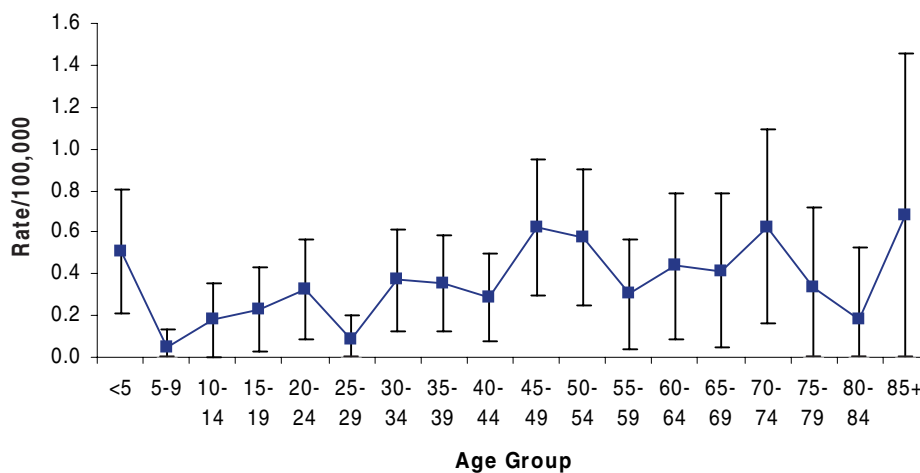


Table 21 shows the number of struck by/struck against deaths and death rates by cause for all persons, males and females, during 1998–2002. *Struck by/against a person or object* and *caught between two objects* were the causes of all struck by/struck against deaths and accounted for 60% and 20% of all struck by/struck against deaths respectively. Males accounted for 86% of all struck by/struck against deaths due to *struck by/against a person or object* and all struck by/struck against deaths due to being *caught between two objects*.

Struck by/against a person or object caused the majority of male struck by/struck against deaths and accounted for 76% of all male struck by/struck against deaths. The rates for male struck by/struck against deaths exceeded the corresponding rate for females for *struck by/against a person or object* deaths in Table 21. The male struck by/struck against death rate was also significantly higher than female rates for *struck by/against a person or object* deaths. The male death rate was more than six times the corresponding female death rate struck by/against a person or object.

Struck by/against a person or object caused all of the female struck by/struck against deaths during 1998–2002. No females died as a result being *caught between two objects*.

Table 22 shows struck by/struck against deaths by age group and cause in NSW for 1998–2002. *Struck by/against a person or object* was the leading cause of struck by/struck against deaths in all age groups.

Table 21. Number of struck by/struck against deaths and death rates/100,000* by cause: NSW, 1998–2002

Causes	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Struck by/against person or object	88	0.27	76	0.47 (0.37–0.58)	12	0.07 (0.03–0.11)	6.65
Caught between 2 objects	23	0.07	23	0.15 (0.09–0.21)	0		–
All struck by/against	111	0.34	99	0.62 (0.50–0.74)	12	0.07 (0.03–0.11)	8.69

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. †† 95% confidence interval.

SUMMARY

Struck by/struck against was a leading cause of injury death for people in NSW, accounting for approximately 23 deaths each year from 1986 to 2002. Analysis of the trend for struck by/struck against death rates showed no statistically significant change was present between 1986 and 2002. No comparison can be made with previous results as data for struck by/ struck against was not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

People aged 85+ years had the highest rates of death due to struck by/struck against, but accounted for only 2% of all struck by/ struck against deaths. Other high death rates for struck by/struck against were seen in children under age five years and people aged 45–54 years.

Struck by/against a person or object and *caught between two objects* were the causes of all struck by/struck against deaths. *Struck by/against a person or object* was the leading cause of struck by/struck against deaths in all age groups.

Males accounted for 89% of all struck by/struck against deaths in NSW during 1998–2002. Males accounted for 86% of all struck by/struck against deaths due to *struck by/against a person or object* and all struck by/struck against deaths due to being *caught between two objects*. The male struck by/struck against death rate was also significantly higher than female rates for *struck by/against a person or object* deaths.

These results indicate that struck by/struck against deaths are a public health problem for people in NSW, especially for males. Being struck by or struck against another person or object accounted for 60% of all struck by/struck against deaths. The specific factors that caused the people or objects to strike or to be struck by other people or objects and the types of injuries that resulted should be investigated. If patterns are found in terms of the types of environments or situations in which fatal injury due to *struck by/against a person or object* are likely, this would provide useful information about potentially dangerous situations.

Table 22. Struck by/struck against deaths* by age group and cause†: NSW, 1998–2002

Rank	Age group										Total
	<1	1–4	5–9	10–14	15–24	25–34	35–44	45–54	55–64	65+	
1	Struck by/ against person or object #	Struck by/ against person or object 7	Struck by/ against person or object #	Struck by/ against person or object #	Struck by/ against person or object 9	Struck by/ against person or object 9	Struck by/ against person or object 13	Struck by/ against person or object 19	Struck by/ against person or object 9	Struck by/ against person or object 16	88
2		Caught between 2 objects #		Caught between 2 objects #	Caught between 2 objects #	Caught between 2 objects #	Caught between 2 objects #	Caught between 2 objects 7	Caught between 2 objects #	Caught between 2 objects #	Caught between 2 objects 23

* Numbers represent the number of cases. † See Appendix 4 for struck by/struck against cause codes. # Cell size less than five cases

13 Rail transport

Incidents in rail transport are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of rail transport deaths by the person injured. The type of people injured includes *occupants (including people boarding or alighting)* and *pedestrians*.

Rail transport death data from 1986 to 2002 were used to describe the demographic profile of rail transport deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Rail transport was the eleventh leading cause of injury death from 1998–2002 and accounted for less than 1% of all injury deaths (see Table 2). During these years, 83 people died from rail transport, at an overall rate of 0.3 people/100,000 and 84% were male. Approximately 23 people died each year from 1986 to 2002 as the result of rail transport.

Figure 24 shows the yearly trend in death rates for rail transport from 1986 to 2002. The rail transport death rate showed a statistically significant decline over 1986 and 2002.

Figure 24. Yearly trend in death rates for rail transport: NSW, 1986–2002

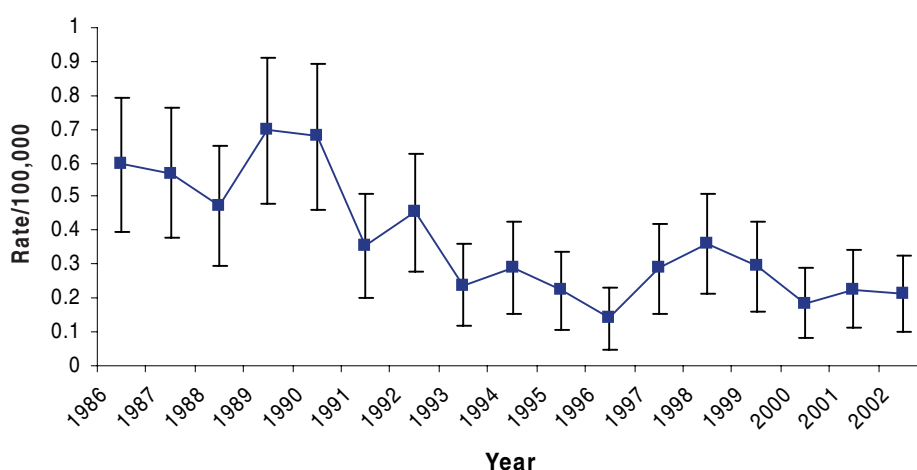


Figure 25 shows the age-specific death rates for rail transport between 1998 and 2002. People aged 15–19 years and people aged 25–29 years had the highest rates of death due to rail transport. Deaths in people aged 15–19 years and people aged 25–29 years accounted for 19% and 14% respectively of all rail transport deaths between 1998 and 2002.

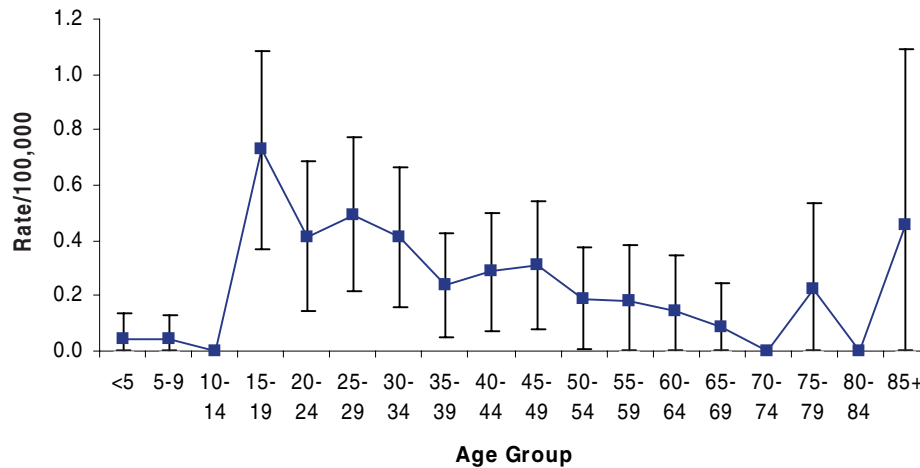
Figure 25. Age-specific death rates for rail transport: NSW, 1998–2002

Table 23 shows the number of rail transport deaths and death rates by the cause of the death for all persons, males and females, during 1998–2002. *Pedestrians* and *occupants* were the types of people that died most often in rail transport incidents and accounted for 71% and 26% of all rail transport deaths respectively. Males accounted for 86% of all *pedestrian* rail transport deaths and 72% of all *occupant* rail transport deaths.

Males died most often as *pedestrians* in rail transport incidents, accounting for 74% of all male rail transport deaths. The rates for male rail transport deaths exceeded the corresponding rates for females for *pedestrian* and *occupant* in Table 23. The male rail transport death rate was also significantly higher for all rail transport deaths as a *pedestrian*. The male death rate as a rail transport *pedestrian* was 7.8 times that of the corresponding female death rate.

Females also died most often as *pedestrians* in rail transport incidents, accounting for 53% of all female rail transport deaths.

Table 23. Number of rail transport deaths and death rates/100,000* by cause: NSW, 1998–2002

Cause	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Pedestrian	59	0.18	52	0.32 (0.23–0.41)	7	0.04 (0.01–0.07)	7.84
Occupant	22	0.07	16	0.10 (0.05–0.15)	6	0.04 (0.01–0.07)	2.70
Other and unspecified	#		#		0		–
All rail transport	83	0.26	70	0.43 (0.33–0.53)	13	0.08 (0.04–0.12)	5.55

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. # Cell size less than five cases. †† 95% confidence interval.

Table 24 shows rail transport deaths by age group and cause in NSW for 1998–2002. People aged 15–64 years died most often in rail transport incidents as *pedestrians*. No comparison can be made with previous results as rail transport deaths were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

SUMMARY

Rail transport was a leading cause of injury death for people in NSW, accounting for approximately 23 deaths each year from 1986 to 2002. Analysis of the trend for rail transport death rates showed a statistically significant decline between 1986 and 2002. People aged 15–19 years and people aged 25–29 years had the highest rates of death due to rail transport. No comparison can be made with previous figures as rail transport death was not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

Pedestrians and *occupants* were the types of people that died most often in rail transport incidents in NSW during 1998–2002. People aged 15–64 years died most often in rail transport incidents as *pedestrians*.

Males accounted for 84% of all rail transport deaths in NSW during 1998–2002. Males accounted for 86% of all pedestrian rail transport deaths and 72% of all *occupant* rail transport deaths. The male rail transport death rate was also significantly higher for all rail transport deaths as a *pedestrian*.

Rail transport is a leading cause of injury death in NSW, particularly for male pedestrians who are involved in rail transport incidents. Further research should focus on identifying factors contributing to rail transport deaths in male pedestrians.

Table 24. Rail transport deaths* by age group and cause: NSW, 1998-2002

Rank	Age group										Total
	<5	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1	Pedestrian #	Occupant #		Pedestrian 20 Occupant	Pedestrian 14 Occupant	Pedestrian 9 Occupant	Pedestrian 8 Occupant	Pedestrian # Occupant	Pedestrian # Occupant	Pedestrian 59	
2				Other and unspecified person #	Other and unspecified person 7 #					Occupant 22	
3										Other and unspecified person #	

* Numbers represent the number of cases. † See Appendix 4 for rail transport cause codes. # Cell size less than five cases

14 Natural and environmental factors

Natural and environmental factors are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of natural/environmental factors deaths by the circumstances causing the death. These causes include *excess temperatures (i.e., very hot and very cold)*, *natural events (e.g. mudslides, floods)* and *venomous plants/animals*.

Natural and environmental factors death data from 1986 to 2002 were used to describe the demographic profile of natural/environmental factors deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Natural/environmental factors were the twelfth leading cause of injury death from 1998–2002 and accounted for less than 1% of all injury deaths (see Table 2). During these years, 67 people died from natural/environmental factors, at an overall rate of 0.2 people/100,000 and approximately 66% were male. Approximately 18 people died each year from 1986 to 2002 as the result of natural/environmental factors.

Figure 26 shows the yearly trend in death rates for natural/environmental factors from 1986 to 2002. There was a statistically significant decline in the natural/environmental factors death rate showed a statistically significant decline overall between 1986 and 2002.

Figure 26. Yearly trend in death rates for natural/environmental factors: NSW, 1986–2002

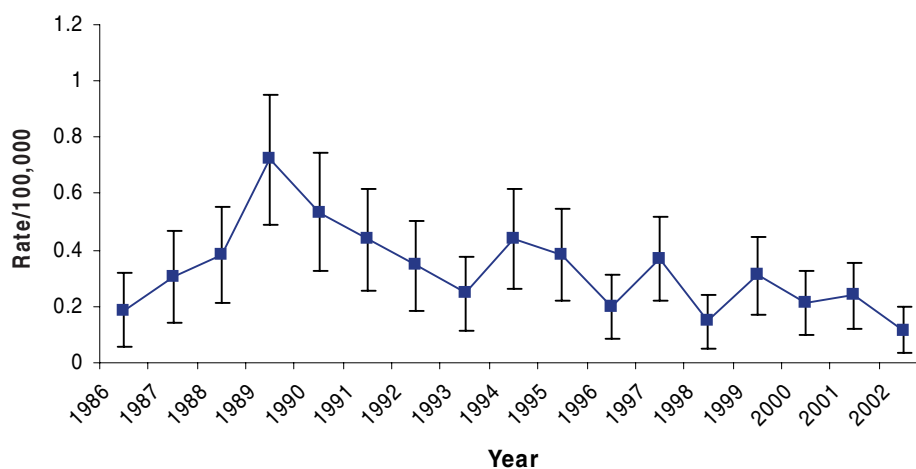


Figure 27 shows the age-specific death rates for natural/environmental factors between 1998 and 2002. People aged 60+ years and especially those aged 80+ years had the highest rates of death due to natural/environmental factors. Natural/environmental factor deaths in people aged 80+ years accounted for nearly 24% of all natural/environmental factors between 1998 and 2002.

Figure 27. Age-specific death rates for natural/environmental factors: NSW, 1998–2002

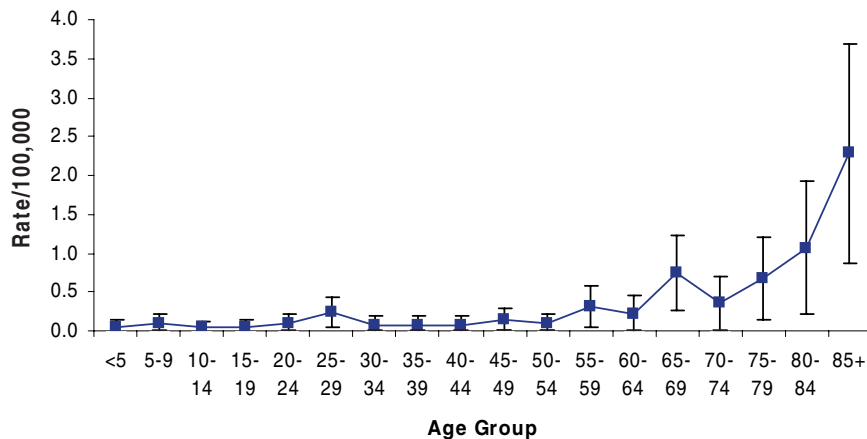


Table 25 shows the number of natural/environmental factors deaths and death rates by cause for all persons, males and females, during 1998–2002. *Excess temperatures* led to a natural/environmental factors death most often and accounted for 55% of all natural/environmental factors deaths. Males accounted for 68% of all natural/environmental factors deaths due to *excess temperatures*.

For males, *excess temperatures* were responsible for the majority of natural/environmental factors deaths and accounted for 57% of all male natural/environmental factors deaths. The rates for male natural/environmental factors deaths exceeded the corresponding rates for females for all causes in Table 25. The male natural/environmental factors death rate was also significantly higher for all natural/environmental factors deaths due to *excess temperatures*. The male death rate was more than twice the corresponding female death rate for natural/environmental factors due to *excess temperatures*.

Excess temperatures were also responsible for the majority of female natural/environmental factors deaths during 1998–2002, accounting for 52% of all female natural/environmental factors deaths.

Table 26 shows natural/environmental factors deaths by age group and cause in NSW for 1998–2002. *Excess temperatures* were the leading cause of natural/environmental factors death in people aged 25–54 years and people aged 65+ years. *Excess temperatures* were the only cause of natural/environmental factors death in children aged 1–4 years but accounted for only a small number of deaths. *Other and unspecified causes* were responsible for the majority of natural/environmental factors deaths in people aged 54–64 years. *Natural events* were the leading cause of natural/environmental factors death in people aged five to 24 years, but again accounted for only a small number of deaths.

Table 25. Number of natural/environmental factor deaths and death rates/100,000* by cause: NSW, 1998–2002

Cause	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate† (CI) ††	N	Rate† (CI)	
Excess temperatures	37	0.11	25	0.18 (0.11–0.25)	12	0.06 (0.03–0.10)	2.91
Other and unspecified	20	0.06	11**	0.07 (0.03–0.11)	11**	0.05 (0.02–0.09)	1.33
Natural events	10	0.03	8	0.05 (0.02–0.09)			–
All natural/environmental factors	67	0.20	44	0.30 (0.21–0.39)	23	0.13 (0.07–0.18)	2.36

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes venomous plants/animals for males and females and natural events for females. †† 95% confidence interval

No comparison can be made with previous results as natural/environmental deaths were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

SUMMARY

Natural/environmental factors accounted for approximately 18 deaths each year from 1986 to 2002. Analysis of the trend for natural/environmental factors death rates showed a statistically significant decline was present between 1986 and 2002. People aged 80+ years had the highest rates of death due to natural/environmental factors. No comparison can be made with previous results for age-specific death rates as data for Natural/environmental factors were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

Excess temperatures and *other and unspecified causes* led to a natural/environmental factors death most often. Excess temperatures were the leading cause of natural/environmental factors death in people aged 25–54 years and people aged 65+ years. *Other and unspecified causes* were responsible for the majority of natural/environmental factors deaths in people aged 54–64 years. *Natural events* were the leading cause of natural/environmental factors death in people aged five to 24 years, but accounted for only a small number of deaths.

Males accounted for 66% of all natural/environmental factors deaths in NSW during 1998–2002. They also accounted for 68% of all natural/environmental factors deaths due to *excess temperatures* and 54% of all natural/environmental factors deaths due to *other and unspecified causes*. Males had higher death rates for all subcategories of natural/environmental factors deaths compared to females.

These results indicate that natural/environmental factors account for only a small proportion of deaths each year. Future research could focus on the factors that make older people more susceptible to excess temperatures.

Table 26. Natural and environmental factor deaths* by age group and cause†: NSW, 1998-2002

Rank	Age group										Total	
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+		
1		Excess temperatures #	Natural events #	Natural events #	Natural events #	Excess temperatures #	Excess temperatures #	Excess temperatures #	Other and unspecified #	Excess temperatures #	Excess temperatures 24	Excess temperatures 37
2			Other and unspecified #		Excess temperatures #	Natural events #	Natural events #	Natural events #	Excess temperatures #	Other and unspecified #	Other and unspecified 6	Other and unspecified 13
3					Venomous plants/animals #	Venomous plants/animals #	Venomous plants/animals #	Venomous plants/animals #	Natural events #	Natural events #	Venomous plants/animals #	Natural events 10
4						Other and unspecified #	Other and unspecified #			Natural events #	Natural events #	Venomous plants/animals 7

* Numbers represent the number of cases. † See Appendix 4 for natural/environmental factors cause codes. # Cell size less than five cases

15 Air transport

Incidents in air transport are an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of natural/environmental factors deaths by the type of aircraft used. The aircraft types include *powered* (with a motor) and *non-powered* (e.g. glider). No additional information regarding the role of the occupants (i.e., pilot, passenger), the size of the aircraft or the circumstances of the air transport death is available.

Air transport death data from 1986 to 2002 were used to describe the demographic profile of air transport deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Air transport was the thirteenth leading cause of injury death from 1998–2002 and accounted for less than 1% of all injury deaths (see Table 2). During these years, 66 people died from air transport-related events, at an overall rate of 0.2 people/100,000 and approximately 82% were male. Approximately 18 people died each year from 1986 to 2002 as the result of air transport.

Figure 28 shows the yearly trend in death rates for air transport from 1986 to 2002. The air transport death rate showed a statistically significant decline between 1986 and 2002, the rates have been particularly lower since 1999.

Figure 28. Yearly trend in death rates for air transport: NSW, 1986–2002

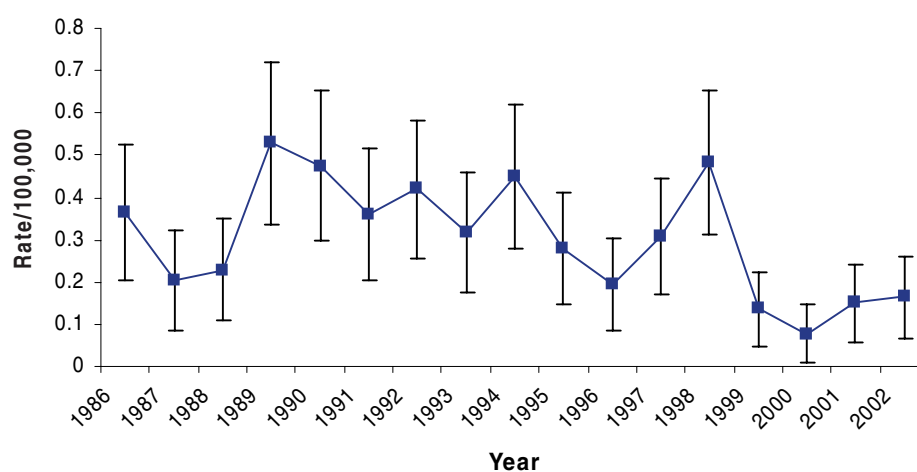


Figure 29 shows the age-specific death rates for air transport between 1998 and 2002. People aged 60–69 years had the highest rates of death due to air transport. Deaths of people aged 60–69 years accounted for 25% of all air transport deaths between 1998 and 2002.

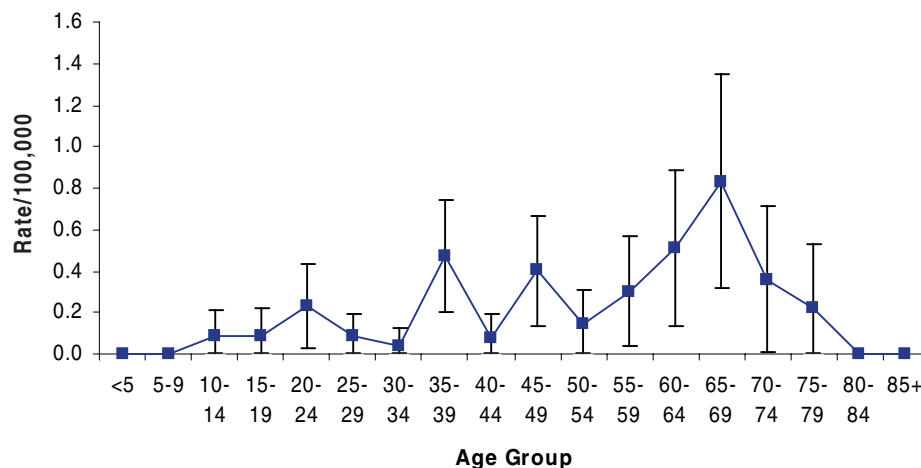
Figure 29. Age-specific death rates for air transport: NSW, 1998–2002

Table 27 shows the number of air transport deaths and death rates by the type of aircraft involved for all persons, males and females, during 1998–2002. *Other and unspecified aircraft types* and *powered aircraft* caused all air transport deaths and accounted for 60% and 40% of all air transport deaths respectively. Males accounted for 85% of all air transport deaths due to *other and unspecified aircraft types* and 78% of all air transport deaths due to *powered aircraft*.

Other and unspecified aircraft types were responsible for the majority of male air transport deaths and accounted for 61% of all male air transport deaths. The male air transport death rate was more than three times the corresponding rates for females in all categories. *Other and unspecified aircraft types* and *powered aircraft* types were equally responsible for female air transport deaths during 1998–2002.

Table 28 shows air transport deaths by age group and type of aircraft involved in NSW for 1998–2002. *Other and unspecified aircraft types* was the leading cause of air transport deaths in people aged 35–44 years and people aged 55+ years. For people aged 25–34 years and people aged 45–54 years, *powered aircraft* was the leading cause of air transport death.

Table 27. Number of air transport deaths and death rates/100,000* by type of aircraft: NSW, 1998–2002

Type of aircraft	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Other and unspecified	39	0.12	33**	0.20 (0.13–0.27)	6**	0.04 (0.01–0.07)	5.53
Powered	27	0.08	21	0.13 (0.07–0.18)	6	0.04 (0.01–0.07)	3.53
All air transport	66	0.20	54	0.33 (0.24–0.42)	12	0.07 (0.03–0.11)	4.54

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. **includes non-powered aircraft for males and females. †† 95% confidence interval.

SUMMARY

Air transport accounted for approximately 18 deaths each year from 1986 to 2002. Analysis of the trend for air transport death rates showed no statistically significant change between 1986 and 2002, though rates have been generally lower since 1999. Lower air transport death rates may be due to the change in coding structures between ICD-9 and ICD-10. People aged 60–69 years had the highest rates of death due to air transport in NSW during 1998–2002. No comparison can be made with previous results for age-specific death rates as data for air transport were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

Other and unspecified aircraft types and *powered aircraft* led to air transport deaths most often in NSW during 1998–2002. *Other and unspecified aircraft types* was the leading cause of air transport deaths in people aged 35–44 years and people aged 55+ years. For people aged 25–34 years and people aged 45–54 years, *powered aircraft* was the leading cause of air transport death.

Males accounted for 82% of all air transport deaths in NSW during 1998–2002. They accounted for 85% of all air transport deaths due to *other and unspecified aircraft types* and 78% of all air transport deaths due to *powered aircraft*.

Although only a small number of deaths are caused each year by air transport, males account for the majority of deaths. Powered aircraft accounted for nearly half of all air transport deaths, but details of the nature of the aircraft itself (i.e., size) and the purpose of the flight is unknown (i.e., recreation, business) from this data. These unknown variables indicate the need for more information regarding the circumstances of air transport deaths.

Future attention should be given to improving the data collection and coding systems so that the number of air transport deaths coded as *other and unspecified* is greatly reduced. Until these changes can be made, an alternate data source (e.g. coronial data, Australian Transport Safety Bureau data) should be used to investigate the nature of these air transport-related deaths.

Table 28. Air transport deaths* by age group and aircraft type †: NSW, 1998-2002

Rank	Age group								Total
	<10	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1		Other and unspecified #	Other and unspecified #	Powered #	Other and unspecified 6	Powered 7	Other and unspecified 8	Other and unspecified 10	Other and unspecified 34
2		Powered #	Other and unspecified #	Powered 5	Powered 5	Other and unspecified #	Powered #	Powered 6	Powered 27
3		Non-powered #	Non-powered #	Non-powered #	Non-powered #	Non-powered #	Non-powered #	Non-powered #	Non-powered 5

* Numbers represent the number of cases. † See Appendix 4 for air transport aircraft type codes. # Cell size less than five cases

16 Machinery

Machinery is an unintentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of machinery-related deaths by the type of machinery causing the death. These types include *agricultural* and *lifting and transmission machinery*.

Machinery death data from 1986 to 2002 were used to describe the demographic profile of machinery deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Machinery was the fourteenth leading cause of injury death from 1998–2002 and accounted for less than 1% of all injury deaths (see Table 2). During these years, 40 people died from machinery-related events at an overall rate of 0.1 people/100,000 and all were male. Approximately 18 people died each year from 1986 to 2002 as the result of machinery-related events.

Figure 30 shows the yearly trend in death rates from machinery from 1986 to 2002. The machinery associated death rate showed a statistically significant decline between 1986 and 2002.

Figure 30. Yearly trend in death rates for machinery: NSW, 1986–2002

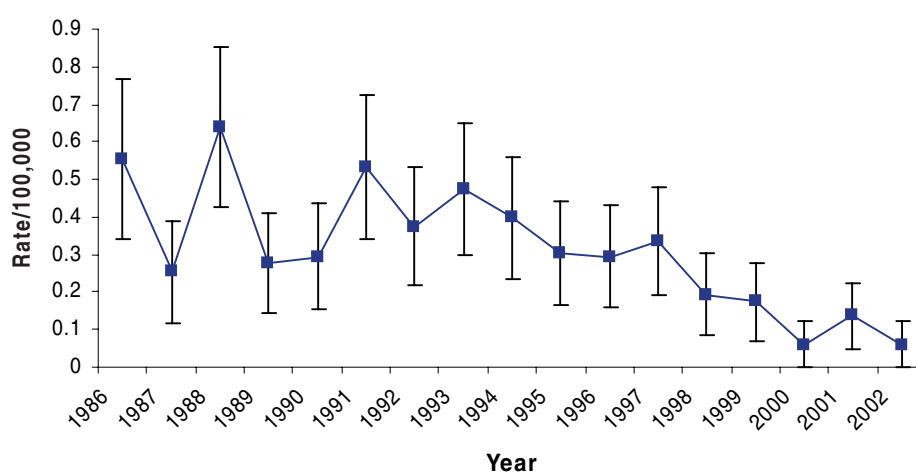


Figure 31 shows the age-specific death rates from machinery between 1998 and 2002. People aged 50–54 years had the highest rate of death due to machinery. Deaths in people aged 50–54 years accounted for almost one quarter of all machinery deaths between 1998 and 2002. There were no machinery-related deaths in people aged under 15 years.

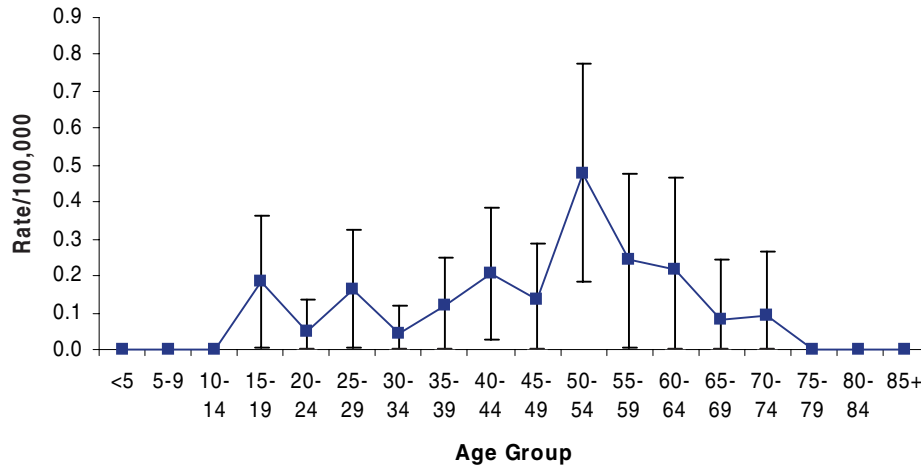
Figure 31. Age-specific death rates associated with machinery: NSW, 1998–2002

Table 29 shows the number of machinery deaths and death rates by type for all persons, males and females, during 1998–2002. *Other and unspecified types* led to a machinery-related death most often and accounted for 60% of all machinery deaths. Males accounted for all machinery deaths in NSW during 1998–2002. There were no female machinery-related deaths reported during 1998–2002.

Table 29. Number of machinery deaths and death rates/100,000* by type used: NSW, 1998–2002

Type	All persons		Males		Females		Ratio [‡]
	N	Rate [†]	N	Rate [†] (CI) ^{††}	N	Rate [†] (CI)	
Other and unspecified	24	0.07	24	0.15 (0.09–0.21)	0	–	–
Agricultural	8	0.02	8	0.05 (0.02–0.08)	0	–	–
Lifting and transmission	8	0.02	8	0.05 (0.02–0.08)	0	–	–
All machinery	40	0.12	40	0.25 (0.17–0.32)	0	–	–

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. †† 95% confidence interval.

Table 30 shows machinery-related deaths by age group and type of machinery used in NSW for 1998–2002. No machinery-related deaths occurred in children under age 15 years. *Other and unspecified machinery* was the leading cause of machinery-related death in all people aged 15+ years, with the exception of people aged 25–34 years. *Agricultural machinery* was the leading cause of machinery-related death for people in this group

SUMMARY

Machinery-related events accounted for approximately 18 deaths each year in NSW from 1986 to 2002. Analysis of the trend for machinery-related death rates showed a statistically significant decline between 1986 and 2002. All machinery-related deaths occurred in males of working age, with no deaths in children under age 15 years. The majority of deaths occurred in males aged 15–65 years. Males aged 50–54 years had the highest rate of death due to machinery in NSW during 1998–2002. Males accounted for all machinery-related deaths in NSW during 1998–2002. No comparison can be made with previous figures as machinery-related deaths were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

Other and unspecified types led to a machinery-related death most often in NSW during 1998–2002. *Other and unspecified machinery* was the leading cause of machinery-related death in males aged 15+ years, with the exception of males aged 25–34 years. *Agricultural machinery* was the leading cause of machinery-related death for males in this group

These results indicate that death due to working around machinery is a serious problem for males in NSW. The majority of the deaths caused by machinery were classified as *other and unspecified types*, indicating a need for better classification of machinery-related deaths.

Future research efforts should focus on improvements that need to be made in the data collection and coding systems so that the number of machinery-related deaths coded as *other and unspecified* is greatly reduced. Until these changes can be made, an alternate data source (e.g. coronial data) should be used to investigate the nature of machinery-related deaths coded as *other and unspecified*.

Table 30. Machinery-related deaths* by age group and type of machinery†: NSW, 1998–2002

Rank	Age group							Total
	<14	15–24	25–34	35–44	45–54	55–64	65+	
1		Other and unspecified #	Agricultural #	Other and unspecified 5	Other and unspecified 7	Other and unspecified 6	Other and unspecified #	Other and unspecified 24
2		Agricultural #	Other and unspecified #	Lifting and transmission #	Lifting and transmission #	Agricultural #	Agricultural #	Agricultural 8
3			Lifting and transmission #		Agricultural #			Lifting and transmission 8

* Numbers represent the number of cases. † See Appendix 4 for machinery type codes. # Cell size less than five cases

17 Firearms

Firearms are an unintentional or intentional cause of injury death (WHO 1977, WHO 1996). WHO classifies the cause of unintentional firearms deaths by the type of firearm causing the death. These types include *larger firearms and handguns*. Firearms deaths can also be intentional. A self-inflicted firearm injury that results in death is classified as a suicide and a firearm injury inflicted on one person by another that results in death is classified as an interpersonal violence death. Deaths due to intentional firearm use are covered in earlier chapters (see suicide and interpersonal violence).

Firearm death data from 1986 to 2002 were used to describe the demographic profile of firearms deaths in NSW. Death data during 1998–2002 were used for the majority of the analyses, but trend analyses used death data from 1986 to 2002.

Firearms were the fifteenth leading cause of injury death from 1998–2002 and accounted for less than 1% of all injury deaths (see Table 2). During these years, 35 people died from firearms at an overall rate of 0.1 people/100,000 and 91% were male. Approximately 7 people died each year from 1986 to 2002 as the result of firearms incidents.

Figure 33 shows the yearly trend in death rates for firearms 1986 to 2002. The firearms death rate showed a statistically significant decline between 1986 and 2002. However, when the trend analysis was only conducted over 1993 to 2002, there was no significant increase in death rates.

Figure 32. Yearly trend in death rates for firearms: NSW, 1986–2002

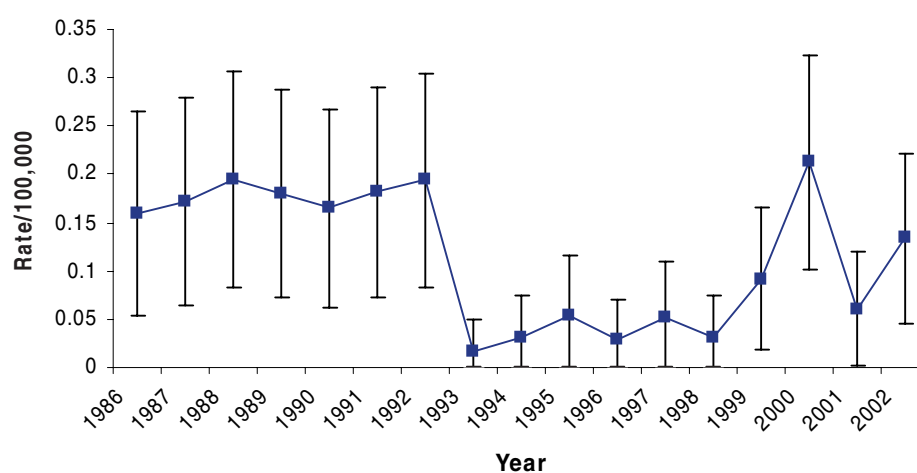


Figure 33 shows the age-specific death rates for firearms between 1998 and 2002. People aged 60–64 years had the highest rate of death due to firearms and accounted for 11% of all firearms deaths. Other high death rates for firearms were seen in people aged 25–29 years and people aged 50–54 years.

Firearms deaths in people aged 25–29 years and people aged 50–54 years accounted for 17% and 14% respectively, of all firearms deaths between 1998 and 2002.

Figure 33. Age-specific death rates for firearms: NSW, 1998–2002

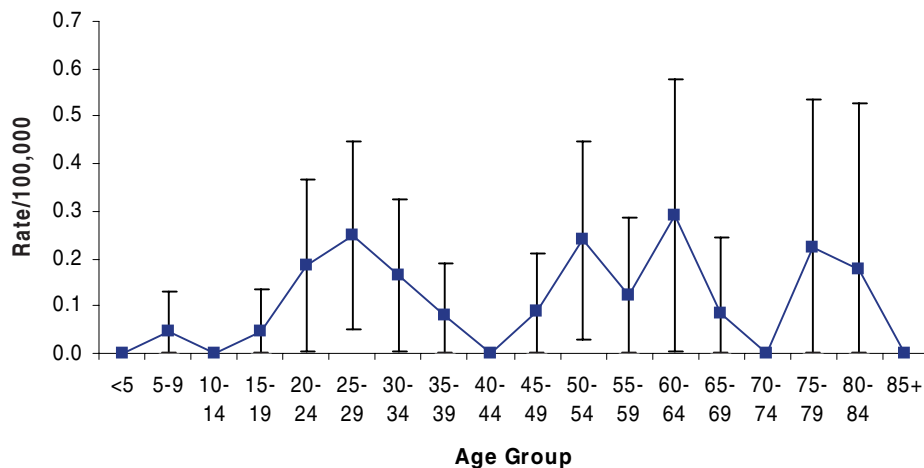


Table 31 shows the number of firearms deaths and death rates by the type of firearm for all persons, males and females, during 1998–2002. *Other and unspecified firearm* and *larger firearms* and *handgun* use were the types of firearms causing all firearms deaths. These two subcategories of firearms accounted for 77% and 23% of all firearms deaths respectively. Males accounted for 89% of all firearms deaths due to other and unspecified firearms and all firearms deaths due to *larger firearms* and *handguns*.

Other and unspecified firearms use was responsible for the majority of male firearms deaths and accounted for 75% of all male firearms deaths. *Other and unspecified firearm* use was also responsible for all female firearms deaths during 1998–2002. There were no female deaths due the use of *larger firearms* or *small handguns*.

Table 32 shows firearms deaths by age group and type of firearms in NSW for 1998–2002. *Other and unspecified firearm* use was the leading cause of firearms death in people age 15+ years. *Larger firearm* use was the second leading cause of cause of firearms death in people aged 15–34 years.

Table 31. Number of firearms deaths and death rates/100,000* by type: NSW, 1998–2002

Type of firearm	All persons		Males		Females		Ratio‡
	N	Rate†	N	Rate† (CI) ††	N	Rate† (CI)	
Other and unspecified	27	0.08	24	0.15 (0.09–0.21)	#	–	–
Larger firearms and handguns	8	0.02	8	0.05 (0.02–0.08)	0	–	–
All firearm	35	0.11	32	0.20 (0.13–0.27)	#	–	–

* Death rates have been age-adjusted using the 2001 Australian census population. † Rate/100,000. ‡ Mortality ratio for male/female. # Cell size less than five cases. †† 95% confidence interval.

SUMMARY

Firearms accounted for approximately 7 deaths each year from 1986 to 2002. Analysis of the trend for firearm death rates showed no statistically significant change between 1986 and 2002, though rates have been generally lower since 1993. Overall, unintentional firearms deaths occurred mainly in people age 15+ years. Age-specific death rates were small due to the distribution of a small number of cases across all age group. People aged 60–64 years had the highest rate of death due to firearms and accounted for 11% of all firearms deaths. Other high death rates for firearms were seen in people aged 25–29 years and people aged 50–54 years. No comparison can be made with previous NSW figures as data for firearms deaths were not examined from 1995 to 1999 by Schmertmann and Williamson (2002).

Other and unspecified firearm and *larger firearm* use led to firearms deaths most often in NSW during 1998–2002. *Other and unspecified firearm* use was the leading cause of firearms death in people age 15+ years. *Larger firearm* use was the second leading cause of cause of firearms death in people aged 15–34 years.

Males accounted for 91% of all firearms deaths in NSW during 1998–2002. They accounted for 89% of all firearms deaths due to *other and unspecified firearms* and all firearms deaths due to *larger firearms* and *handguns*.

Although only a small number of deaths each year are caused unintentionally by firearms, the majority of the deaths are in males aged 15+ years as *other and unspecified firearm* cases. In order to effectively describe the problem of injury deaths caused by unintentional firearm usage, more information is needed regarding the deaths due to *other and unspecified firearm* use.

Future efforts should focus on improvements to the data collection and coding systems so that the number of unintentional firearms deaths coded as *other and unspecified* is greatly reduced. Until these changes can be made, an alternate data source (e.g. coronial data) should be used to investigate the nature of unintentional firearm-related deaths coded as other and unspecified.

Table 32. Firearms deaths* by age group and type of firearm: NSW, 1998-2002

		Age group									
		<4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1			Larger firearm #		Other and unspecified #	Other and unspecified 6	Other and unspecified #	Other and unspecified 7	Other and unspecified 6	Other and unspecified #	Other and unspecified 27
2					Larger firearm #	Larger firearm #				Handgun #	Larger firearm 6
3					Handgun #	Handgun #					Handgun #

* Numbers represent the number of cases. † See Appendix 4 for type of firearm codes. # Cell size less than five cases

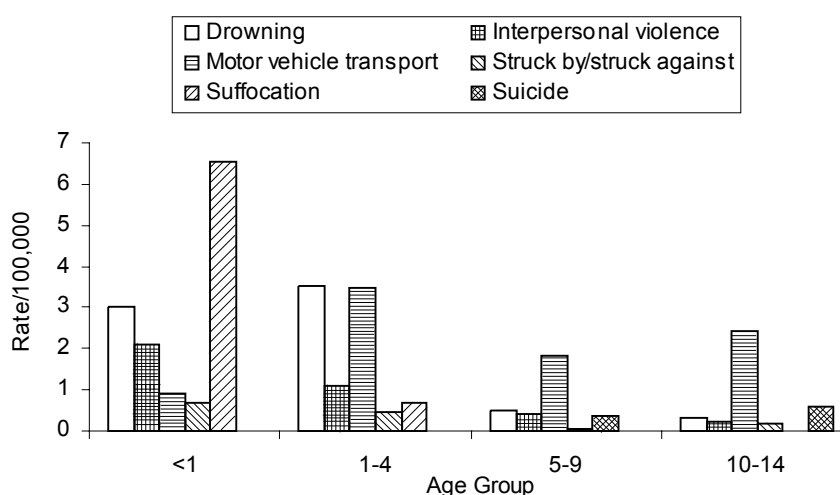
18 Injury mechanism comparison within age groups

The following sections compare death rates for various age groups by each injury mechanism. The age groups are broken down into five age-brackets: under age 15 years, 15–34 years, 35–54 years, 55–74 years and 75+ years.

18.1 Death rates in under-15-year-olds

Figure 34 shows the age-specific death rates for the six most common injury mechanisms in children under age 15 years. Suffocation was the leading cause of injury death in children under age one year in NSW for 1998–2002, followed by drowning. Drowning was the leading cause of injury death for children aged one to four years, followed very closely by motor vehicle transport. For children aged five to 14 years, motor vehicle transport was the leading cause of injury death. Age-specific rates for other causes of injury death in children aged five to 14 years were much lower compared to the age-specific death rate for motor vehicle transport.

Figure 34. Comparison of age-specific death rates in under-15-year-olds by injury mechanism: NSW, 1998–2002

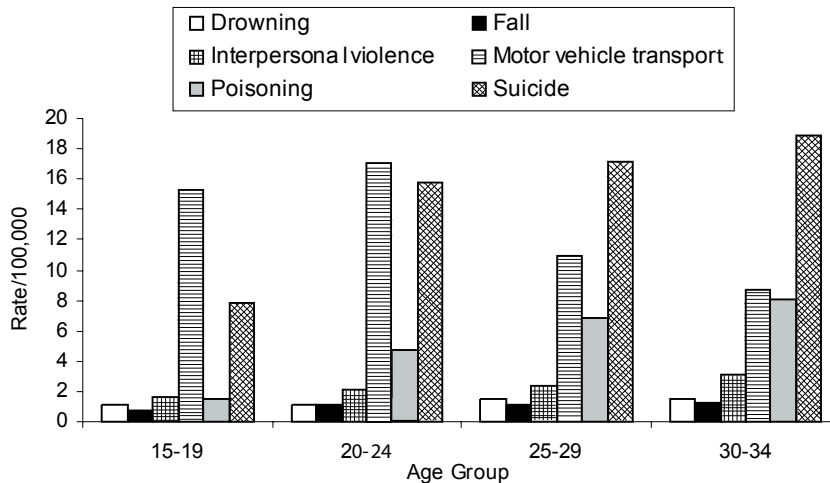


18.2 Death rates in 15–34-year-olds

Figure 35 shows the age-specific death rates for the six most common injury mechanisms for people aged 15–34 years. Motor vehicle transport was the leading cause of death in people aged 15–24 years in NSW during 1998–2002, followed by suicide. For people aged 25–34, suicide was the leading cause of

injury death, followed by motor vehicle transport. Poisoning was the third leading cause of injury death for people aged 15–34. For interpersonal violence, poisoning and suicide, death rates increased as age increased.

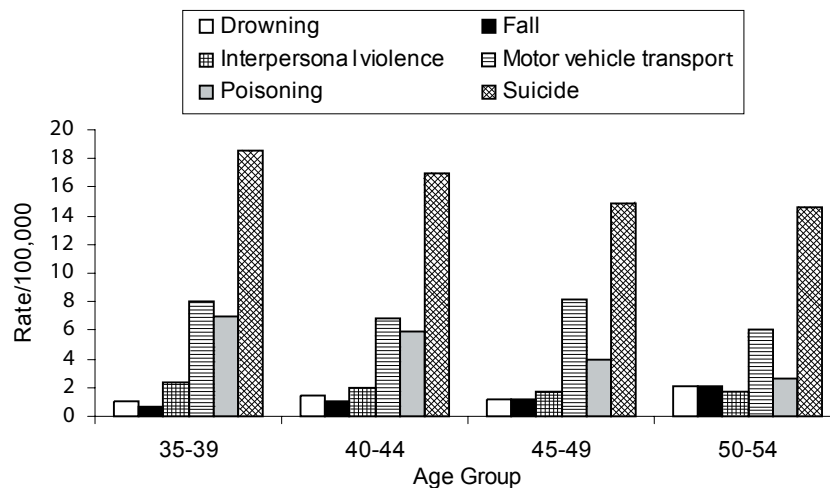
**Figure 35. Comparison of death rates in 15–34-year-olds by injury mechanism:
NSW, 1998–2002**



18.3 Death rates in 35–54-year-olds

Figure 36 shows the age-specific death rates for the six most common injury mechanisms for people aged 35–54 years. Suicide was the leading cause of injury death in people aged 35–54 years in NSW for 1998–2002. Motor vehicle transport was the second leading cause of injury death for people aged 35–54, but the age-specific rates were much smaller compared to the rates for suicide. Poisoning was the third leading cause of injury death for people aged 35–54, but showed decreasing death rates with increasing age.

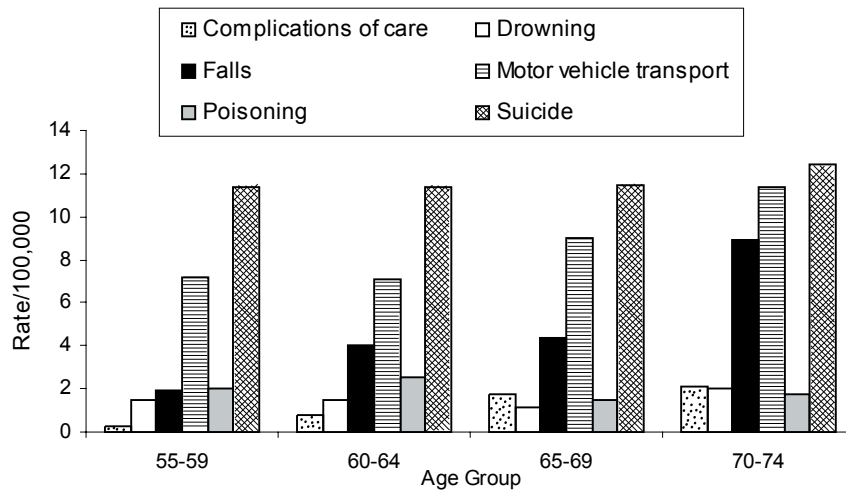
**Figure 36. Comparison of death rates in 35–54-year-olds by injury mechanism:
NSW, 1998–2002**



18.4 Death rates in 55–74-year-olds

Figure 37 shows the age-specific death rates for the six most common injury mechanisms for people aged 55–74 years. Suicide was the leading cause of injury death in people aged 55–74 in NSW during 1998–2002, but the age-specific rates were roughly equal among the individual age groups. Motor vehicle transport and poisoning were the second and third leading causes of injury death respectively, for people aged 55–74 years. Both of these injury mechanisms showed increasing death rates with increasing age.

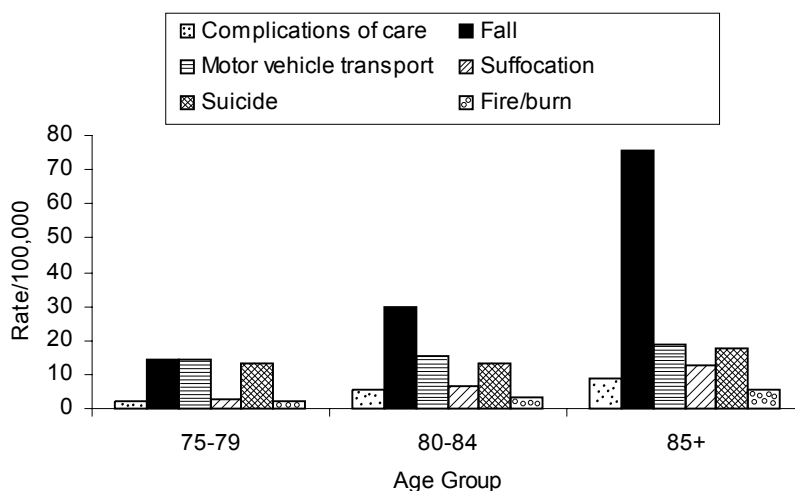
Figure 37. Comparison of death rates in 55–74-year-olds by injury mechanism: NSW, 1998–2002



18.5 Death rates in people aged at least 75 years

Figure 38 shows the age-specific death rates for the six most common injury mechanism by age-specific death rates for people aged 75+ years. People aged 75–79 had very similar rates for the leading causes of injury death in NSW during 1998–2002. These causes were falls, motor vehicle transport and suicide. For people aged 80+ years, falls were the leading cause of injury death. Age-specific death rates for people aged 80+ years due to motor vehicle transport and suicide were also very similar as the second leading cause of death.

**Figure 38. Comparison of death rates for 75+-year-olds by injury mechanism:
NSW, 1998–2002**



18.6 Top 10 leading causes of injury deaths by age group

Table 33 shows the leading causes of injury death by age groups in NSW for 1998–2002. Suffocation was the leading cause of injury death in children under age one year and drowning was the leading cause of injury death for children aged one to four years. For people aged five to 24 years, motor vehicle transport was the leading cause of death. Suicide was the leading cause of death for people aged 25 to 64 years and falls were the leading cause for people aged 65+ years.

18.7 Summary

A comparison of injury death rates across age groups demonstrates that an age group's risk for a particular injury mechanism changes as the group ages. The leading cause of injury death varied across the life span:

- In children under age one year, suffocation was the leading cause of injury death.
- In children aged one to four years, drowning was the leading cause of injury death, followed very closely by motor vehicle transport.
- In people aged five to 24 years, motor vehicle transport was the leading cause of injury death.
- In people aged 25–74 years, the leading cause of injury death was suicide.
- In people aged 75–79 years, two injury mechanisms (motor vehicle transport and falls) were the leading causes of injury death.
- In people aged 80+ years, falls were the leading cause of injury death.

The differences in the causes of injury death across age groups are similar to data previously reported for the period 1995 to 1999 (Schmertmann and Williamson, 2001), although a direct comparison was not possible for most age groups due to the use of different age groups in the this report. The consistency of the leading causes of injury death for age groups across the two time periods suggests a stable association between the cause of injury death and age groups at risk.

Two mechanisms accounted for the leading causes of injury death in most age groups (i.e., suicide and motor vehicle transport). In the case of motor vehicle transport deaths, two subcategories of motor vehicle transport accounted for the leading causes of death in people aged five to 24 years. Children aged five to nine years died most often as pedestrians in a traffic situation whereas people aged 10–24 years of age died most often as occupants of motor vehicles in traffic situations. A subgroup of people aged 10–24 years of age would have been drivers and not just occupants of the motor vehicle, but this specific information was not available for this report. Motor vehicle transport was also the second leading cause of death in children aged one to four years. Children in this category died most often as motor vehicle occupants.

In the case of suicide deaths, two sub-mechanisms accounted for the leading cause of death in people aged 25–74 years. Suicide cases aged 24–44 and 65+ years died most often as the result of hanging, strangulation or suffocation. Suicide cases aged 45–64 years died most often as a result of poisoning.

As age is obviously a contributing factor in injury deaths, it would seem to play a larger role in injury deaths for children than for adults. As children continue to age and become adults, factors other than their physical development will play the largest roles in the occurrence of injuries causing death. For adults, these factors are behavioural and/or environmental in nature (e.g. risk-taking behaviour).

The factors influencing the occurrence of injury resulting in death may be developmental, behavioural or environmental in nature depending on the age of the person involved. It would be appropriate for these factors to be investigated as appropriate for the age group and injury mechanism being studied in order to identify targeted avenues for injury prevention and policy initiatives.

Table 33. Top 10 leading causes of death* by age group and injury mechanism: NSW, 1998-2002[†]

	Age group										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Suffocation 28	Drowning 62	Motor vehicle transport 41	Motor vehicle transport 54	Motor vehicle transport 703	Suicide 876	Suicide 886	Suicide 639	Suicide 344	Fall 778	Suicide 3822
2	Drowning 13	Motor vehicle transport 61	Drowning 11	Suicide 13	Suicide 515	Motor vehicle transport 476	Motor vehicle transport 370	Motor vehicle transport 308	Motor vehicle transport 216	Suicide 548	Motor vehicle transport 2765
3	Interpersonal violence 9	Interpersonal violence 19	Interpersonal violence 9	Drowning 7	Poisoning 136	Poisoning 361	Poisoning 323	Poisoning 143	Fall 87	Motor vehicle transport 532	Poisoning 1118
4	Motor vehicle transport #	Suffocation 12	Suffocation 8	Interpersonal violence 5	Interpersonal violence 82	Interpersonal violence 131	Interpersonal violence 109	Interpersonal violence 75	Poisoning 68	Suffocation 143	Fall 1093
5	Struck by/against #	Struck by/against 8	Fall #	Fire/burn 5	Drowning 47	Drowning 71	Drowning 63	Fall 73	Drowning 46	Complications of care 134	Interpersonal violence 513
6	Poisoning #	Fall 6	Fire/burn #	Struck by/against #	Fall 39	Fall 58	Fall 45	Drowning 71	Interpersonal violence 38	Fire/burn 89	Drowning 468
7	Complications of care #	Fire/burn #	Natural/environmental factors #	Poisoning #	Rail transport 25	Suffocation 34	Suffocation 34	Suffocation 35	Suffocation 20	Poisoning 78	Suffocation 331
8		Poisoning #	Struck by/against #	Fall #	Suffocation 17	Rail transport 22	Struck by/against 16	Struck by/against 26	Fire/burn 16	Drowning 77	Fire/burn 180
9		Rail transport #	Poisoning #	Water transport #	Struck by/against 12	Fire/burn 14	Fire/burn 15	Fire/burn 26	Complications of care 16	Interpersonal violence 36	Complications of care 174
10		Natural/environmental factors #	Rail transport #	Air transport #	Fire/burn 10	Struck by/against 11	Air transport 14	Machinery 13	Air transport 12	Natural/environmental factors 35	Struck by/against 111

* Numbers represent the number of cases. † Injury mechanisms were classified according to recommended Ecode groupings for ICD-9 and ICD-10 from the Centers for Disease Control, USA.
See Appendix 3. # Cell size less than five cases

19 Conclusions and recommendations

This report has presented demographic profiles of the 15 most common injury mechanisms causing death in NSW. Only nine of these injury mechanisms were associated with a statistically significant declining trend in death rates over the period 1986 to 2002, indicating that many remain as serious public health problems for the people of NSW.

As with earlier reports for the period 1995–1999 (Schmertmann and Williamson, 2002), suicide was the leading cause of injury death during 1998–2002 and males accounted for the majority of deaths overall. A comparison across age groups showed that the causes of injury death varied as age increased but that two injury mechanisms, namely suicide and motor vehicle transport, are the leading causes of death across several age groups.

This report presents only a fragment of the overall burden of injury on NSW society, as death is the most serious consequence of injury. Non-fatal injuries are treated at general practitioner clinics, ambulance services, poison information services, emergency departments, hospitals and through allied health services (e.g. dentists, physiotherapists). Unfortunately, routine injury data collection systems do not cover all of these levels and many questions about the true impact of injury on the people of NSW remain unanswered.

To the extent possible, this report has highlighted aspects of the 15 injury mechanisms that should receive focus as research and intervention priorities. Recommendations for improving the existing data collections and for enhancing these with additional information are listed below.

19.1 Improved data systems

A number of injury mechanisms would benefit from improved data collection and/or coding systems to allow a specific cause of injury death to be identified. While detailed information regarding injury deaths is available from coronial files and potentially from other data sources (e.g. Australian Transport Safety Bureau), access to these data sources often requires special approval. Furthermore, these data collections may not be as easy to use as the ABS data presented in this report which were coded using a standard coding system.

In order to improve the quality of death data obtained from the ABS, improvements in data collection and/or data coding systems are recommended for the following injury mechanisms:

Suicide

Hanging, strangulation or suffocation was the leading method used to commit suicide. Differentiation of methods within this broad group is needed as different age groups may use one of the three methods more often than do other age groups.

Falls

The majority of falls by the elderly were classified as *other and unspecified* and more information regarding the circumstances of these falls is needed in order to design effective prevention programs. Further investigation is required as to whether it is a lack of information on the death certificate that prevents a more accurate code from being assigned or if there is a lack of codes to properly describe the fall event that occurred. Information from this investigation could be used to draft new codes for inclusion in the next revision of the ICD and/or improve notations made by the person filling out the death certificate.

Suffocation

The majority of suffocation deaths were classified as *other and unspecified* and more information regarding the circumstances of these suffocation deaths is needed. Further investigation is needed to determine whether it is a lack of information on the death certificate that prevents a more accurate code from being assigned or if there is a lack of codes to properly describe the suffocation event that occurred. Information from this investigation could be used to draft new codes for inclusion in the next revision of the ICD and/or improve notations made by the person filling out the death certificate.

Aircraft

Powered aircraft accounted for nearly half of all air transport deaths, but the nature of the aircraft itself (i.e., size) and the purpose of the flight is unknown from this data (i.e., recreation, business). Furthermore, 52% of all air transport deaths were coded *other and unspecified* aircraft type. These unknown variables indicate the need for more information regarding the circumstances of air transport deaths.

In regards to the air transport deaths coded as *other and unspecified*, further investigation is needed to determine whether it is a lack of information on the death certificate that prevents a more accurate code from being assigned or if there is a lack of codes to properly describe the air transport event that occurred. Information from this investigation could be used to draft new codes for inclusion in the next revision of the ICD and/or improve notations made by the person filling out the death certificate.

Consideration could also be given to the development of additional codes to provide more information about the nature of the flight (i.e., recreation, business).

Machinery

The majority of the deaths caused by machinery were classified as *other and unspecified* types, indicating a need for better data collection and classification of machinery-related deaths.

Further investigation should determine whether it is a lack of information on the death certificate that prevents a more accurate code from being assigned or if there is a lack of codes to properly describe the machinery-related death that occurred. Information from this investigation could be used to draft new codes for inclusion in the next revision of the ICD and/or improve notations made by the person filling out the death certificate.

Firearm (unintentional)

The majority of firearms deaths were classified as *other and unspecified* firearm. In order to effectively address the problem of injury deaths caused by unintentional firearm usage, more information is needed regarding deaths due to other and unspecified firearm use.

Further investigation should determine whether it is a lack of information on the death certificate that prevents a more accurate code from being assigned or if there is a lack of codes to properly describe the unintentional firearm-related death that occurred. Information from this investigation could be used to draft new codes for inclusion in the next revision of the ICD and/or improve notations made by the person filling out the death certificate.

19.2 Additional data analysis/collection

Additional analysis and/or collection of data is recommended for the following injury mechanisms in order to develop targeted interventions:

Suicide

Research efforts should focus on increasing knowledge regarding the risk factors for suicide. Further study may be needed into age-related and other factors influencing the choice of method used, and to compare these in males and females.

Motor vehicle transport

The motor vehicle transport death rate trend decreased significantly between 1986 and 2002. However, children, young adults and older people appear to still be at increased risk. Pedestrians in traffic had the second highest motor vehicle transport death rate of all road-user classes assessed and males continued to constitute a significant proportion of all motor vehicle transport deaths.

To address these issues, research into road safety should focus on the following areas in NSW:

- young people aged 15–24 years as occupants (and/or drivers) in traffic situations
- older people (65+ years) as occupants (and/or drivers) in traffic situations
- pedestrians in traffic situations, especially children aged 5–9 years and older people

Poisoning

More research is needed to identify the factors associated with poisoning due to the use of pharmaceuticals by people aged 45+ years (i.e., unintentional poisonings) and narcotics and hallucinogens by people aged 25–44 years (i.e., overdoses) in NSW.

Fire/burns

While the fire/burn death rate has declined significantly since 1986, death caused by fire/burn events is still a serious public health problem for people of all ages in NSW, occurring mainly in private dwellings. In order to address this public health problem, the circumstances and place and type of residences where deaths are occurring in NSW should be investigated, including the presence of a functioning smoke alarm.

Interpersonal violence

Interpersonal violence is a serious public health problem for many people in NSW. Factors contributing to interpersonal violence, including the role played by alcohol and drugs, should be investigated. The high numbers of firearms deaths should also be investigated given government action to reduce availability of firearms.

Struck by/struck against

Being struck by or struck against another person or object accounted for 60% of all struck by/struck against deaths. The specific factors that caused these types of deaths and the types of injuries that resulted should be investigated. If patterns are found in terms of the types of environments or situations in which fatal injury due to being struck by/against a person or object is likely, those findings would provide useful information to people at risk in potentially dangerous situations.

Drowning

As drowning in children under age five years often occurs in the child's own home, more research needs to be done to identify the factors that put children in this age group at risk of drowning, including the role of parental supervision and safety precautions.

Suffocation

These results indicate that suffocation is a serious public health problem for very young children and older people in NSW. Children aged less than one year are most at risk while in bed (e.g. own cot, parents bed) and older adults are at risk while eating. Further research is needed to study the factors contributing to suffocation deaths in these age groups.

Rail transport

Rail transport is a leading cause of injury death in NSW, particularly for male pedestrians who are involved in rail transport incidents. Further research should focus on identifying factors contributing to rail transport deaths in male pedestrians.

Complications of care

Complications of care are mostly a problem for people aged 65+ years who may experience a number of hospital stays for various medical conditions. Research could focus first on the factors leading to these medical conditions, and second, on reducing the likelihood of complications associated with these medical conditions.

Natural and environmental factors

Natural/environmental factors account for only a small proportion of deaths each year. Future research could focus on the factors that make older people more susceptible to excess temperatures.

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APPENDIX I. LIST OF ECODES BY MECHANISM

Injury mechanism	ICD-9 Ecodes	ICD-10 Ecodes
Air transport	E840–E845 (.0–.9)	V95–V97
Complications of care	E870–E879, E930–E948	Y40–Y84
Drowning	E830, E832, E910	V90, V92, W65–W74
Fall	E880–E886, E888, E929.3	W00–W19
Fire/burns	E890–E899, E924, E929.4	X00–X19
Firearm	E922 (.0–.3, .8,.9)	W32–W34
Interpersonal violence	E960–E969	X85 –Y09, Y87.1
Machinery	E919 (.0–.9)	W24, W30, W31
Motor vehicle transport	E810–E825, E929.0	V02–V04, V09 (not .9), V12–V14, V19(.0–.6), V20–V79, V80.3–V80.5, V81.0–V81.1, V82.0–V82.1, V83.0–V83.3, V84–V88, V89 (not .1), Y85.0
Natural/ environmental factors	E900–E909, E928 (.0–.2)	W42–W43, W53–W64, W92–W99, X20–X39, X51–X57
Poisoning	E850–E869, E929.2	X40 –X49
Rail transport	E800–E807 (.0–.9)	V05, V15, V80.6, V81 (.2–.9)
Struck by/struck against	E916–E917.9	W20–W22, W50–W52
Suffocation	E911–E913.9	W75–W84
Suicide	E950–E959	X60–X84, Y87.0

Source: World Health Organization

APPENDIX 2. LIST OF DISEASE AND INJURY CATEGORIES FOR TOP 10 CAUSES OF DEATH TABLE

Disease or injury category	ICD-10 Ncode	ICD-10 Ecode
Infectious diseases	A00–B99'	
Cancer	C00–D48'	
Diseases of blood	D50–D89'	
Endocrine systems	E00–E90'	
Mental disorders	F00–F99'	
Nervous system diseases	G00–G99'	
Disease of eye and adnexa	H00–H59	
Disease of ear and mastoid process	H60–H95	
Diseases of circulatory system	I00–I99	
Respiratory diseases	J00–J99'	
Digestive diseases	K00–K93'	
Skin diseases	L00–L99'	
Musculoskeletal diseases	M00–M99'	
Genitourinary disease	N00–N99'	
Pregnancy	O00–O99'	
Perinatal conditions	P00–P96'	
Congenital abnormalities	Q00–Q99'	
Ill-defined conditions	R00–R99'	
Injury and poisoning		V00–Y98

Source: World Health Organization

APPENDIX 3. LIST OF ECODES BY MECHANISM FOR TOP 10 CAUSES OF DEATH INJURY TABLE

Injury mechanism	ICD-9 Ecodes	ICD-10 Ecodes
Water transport	E831 (.0-.9), E833-E838 (.0-.9)	V91, V93, V94
Sharp/blunt object	E920 (.0-.9)	W25-W29, W45
Overexertion	E927	X50
Air transport	E840-E845 (.0-.9)	V95-V97
Complications of care	E870-E879, E930-E948E949	Y40-Y84
Drowning	E830, E832, E910	V90, V92, W65-W74
Fall	E880-E886, E888, E929.3	W00-W19
Fire/burns	E890-E899, E924, E929.4	X00-X19
Firearm	E922 (.0-.3, .8,.9)	W32-W34
Interpersonal violence	E960-E969	X85 -Y09, Y87.1
Machinery	E919 (.0-.9)	W24, W30, W31
Motor vehicle transport	E810-E825, E929.0	V02-V04, V09 (not .9.0,.2), V12-V14, V19(.0-.2, .4-.6), V20-V79, V80.3-V80.5, V81 (.0,-V81.1), V82 (.0-V82.1), V83.0-V863.3, V874-V88 (.0-.8), V89 (not .1.0,.2), Y85.0
Natural/environmental factors	E900-E909, E928 (.0-.2)	W42-W43, W53-W64, W92-W99, X20-X39, X51-X57
Poisoning	E850-E869, E929.2	X40 -X49
Rail transport	E800-E807 (.0-.9)	V05, V15, V80.6, V81 (.2-.9)
Struck by/struck against	E916-E917.98	W20-W232, W50-W52
Suffocation	E911-E913.9	W75-W84
Suicide	E950-E959	X60-X84, Y87.0

Source: World Health Organization

APPENDIX 4. LIST OF ECODES BY INJURY MECHANISM AND INJURY MECHANISM SUBCATEGORY

Injury mechanism	Injury mechanism subcategory	ICD-9 Ecodes	ICD-10 Ecodes
Air transport		E840–E845 (.0–.9)	V95–V97
	Powered	E840–E841 (.0–.9)	V95
	Non-powered	E842 (.0–.9)	V96
	Other and unspecified	all remaining Air transport Ecodes	V97
Complications of care		E870–E879, E930–E949	Y40–Y84
	Drugs, medicaments in therapeutic use	E930–E949.9	Y40–Y59
	Misadventures to patient during surgery and medical care	E870–E876.9, but not E874	Y60–Y69
	Procedures causing abnormal reaction or complication of care after procedure	E878–E879.9	Y83–Y84
	Other and unspecified complications of care	All remaining Complications of care Ecodes	All remaining Complications of care Ecodes
Drowning		E830, E832, E910	V90, V92, W65–W74
	Boat-related	E830(.0–.9), E832(.0–.9)	V90(.0–.9), V92(.0–.9)
	Natural water	E910(.0–.3)	W69, W70
	Bathtub	E910.4	W65, W66
	Pools	E910(.5,.6,.8)	W67, W68
	Other and unspecified location	All remaining Drowning Ecodes	All remaining Drowning Ecodes
Fall		E880–E886, E888	W00–W19
	Same level	E885, E886	W01–W03, W18
	One level to another	E883(.0–.9), E884(.0–.9)	W05–W09, W14, W15, W17
	Ladder or scaffolding	E881(.0–.1)	W11, W12
	Building or other structure	E882	W13
	Stairs/steps	E880(.0–.9)	W10
	Other and unspecified type	All remaining Falls Ecodes	All remaining Falls Ecodes
Firearm (unintentional)		E922 (.0–.3, .8, .9)	W32–W34
	Handguns	E922.0	W32
	Larger firearms	E922 (.1–.3)	W33
	Other and unspecified	All remaining Firearms Ecodes	W34

Injury mechanism	Injury mechanism subcategory	ICD-9 Ecodes	ICD-10 Ecodes
Fire/burns		E890–E899, E924	X00–X19
	Fire—in a private dwelling or other building	E890(.0–.9), E891(.0–.9), E895, E896	X00, X02
	Fire—not in a building	E892, E897	X01, X03
	Burn—hot/caustic/corrosive substances	E924(.0–.9)	X10–X19
	Other and unspecified type	All remaining Fire/burn Ecodes	All remaining Fire/burn Ecodes
Interpersonal violence		E960–E969	X85–Y09
	Firearm	E965.0–E965.4	X93–X95
	Bodily force	E960(.0–.9), E967	Y04–Y05, Y07
	Poisoning	E962.0–E962.9	X85, X87–X90
	Suffocation	E963	X91
	Sharp or blunt object	E966, E968.2	X99, Y00
	Other and unspecified means	All remaining Interpersonal violence Ecodes	All remaining Interpersonal violence Ecodes
Machinery		E922 (.0–.3, .8,.9)	W24, W30, W31
	Agricultural	E919.0	W30
	Lifting and transmission	E919.2, E919.6	W24
	Other and unspecified (all remaining Ecodes)	All remaining Machinery Ecodes	W31
Motor vehicle transport		E810–E825	V02–V04, V09 (.0,.2), V12–V14, V19(.0–.2, .4–.6), V20–V79, V80.3–V80.5, V81 (.0,.1), V82 (.0–.1), V83–V86, V87–V88 (.0–.8), V89 (.0,.2)
		E810–E819 (.0,.1)	V30–V38(.4, .5, .6, .7, .9), V40–V48(.4, .5, .6, .7, .9), V50–V58(.4, .5, .6, .7, .9), V60–V68(.4, .5, .6, .7, .9), V70–V78(.4, .5, .6, .7, .9), V39 (.4, .5, .6, .8, .9), V49 (.4, .5, .6, .8, .9), V59 (.4, .5, .6, .8, .9), V69 (.4, .5, .6, .8, .9), V79 (.4, .5, .6, .8, .9), V80(.3–.5), V83–V86 (.0–.4)
	Motor vehicle occupant—traffic	E820–E825 (.0,.1)	V30–V79(.0–.3), V83–V86 (.5, .6, .7, .9)
	Motor vehicle occupant—non-traffic	E810–E819 (.2,.3)	V20–V28 (.3, .4, .5, .9), V29 (.4, .5, .6, .8, .9)
	Motorcyclist—traffic	E820–E825 (.2,.3)	V20–V28 (.0–.2), V29 (.0–.3)
	Motorcyclist—non-traffic	E810–E819 (.6)	V12–V14 (.3, .4, .5, .9), V19 (.4–.6)
	Pedal cyclist—traffic	E820–E825 (.6)	V12–V14 (.0–.2), V19 (.0–.2)
	Pedal cyclist—non-traffic	E810–E819 (.7)	V02–V04 (.1, .9), V09 (.2)
	Pedestrian—traffic	E820–E825 (.7)	V02–V04 (.0), V09 (.0)
	Pedestrian—non-traffic		

Injury mechanism	Injury mechanism subcategory	ICD-9 Ecodes	ICD-10 Ecodes
Natural/ environmental factors	Other and unspecified user—traffic	All remaining Motor vehicle transport traffic Ecodes	All remaining Motor vehicle transport traffic Ecodes
	Other and unspecified user—non-traffic (all remaining Motor vehicle Ecodes))	All remaining Motor vehicle transport non-traffic Ecodes	All remaining Motor vehicle transport non-traffic Ecodes
		E900–E909, E928 (.0–.2)	W42–W43, W53–W64, W92–W99, X20–X39, X51–X57
	Excess temperatures	E900,E901	W92,W93,X30, X31
	Venomous plants/animals	E905	X20–X29
	Dog bites	E906.0	W54
	Natural events (9)	E907–E909	X33–X38
	Other and unspecified (all remaining Ecodes)	All remaining Natural/environmental factors Ecodes	All remaining Natural/environmental factors Ecodes
Poisoning		E850–E869	X40 –X49
	Narcotics and hallucinogens	E850.0–E850.2, E854.1	X42
	Antidepressants, barbiturates, tranquilisers	E851–E855.0 (but not E854.1)	X41
	Other pharmaceuticals	E850(.3–.9), E855–E858	X40,X43, X44
	Alcohol	E860	X45
	Gases and vapours	E867–E869	X47
	Other and unspecified drug or substance	All remaining Poisoning Ecodes	All remaining Poisoning Ecodes
Rail transport		E800–E807 (.0–.9)	V05, V15, V80.6, V81 (.2–.9)
	Occupant	E800–E807 (.0, .1)	V81 (.2–.9)
	Pedestrian	E800–E807 (.2)	V05
	Pedal cyclist	E800–E807 (.3)	V15
	Other and unspecified	All remaining Rail transport Ecodes	All remaining Rail transport Ecodes
Struck by/struck against		E916–E918	W20–W23, W50–W52
	Struck by/struck against a person or object	E916,E917	W20–W22, W50–W52
	Caught between two objects	E918	W23
	Other/unspecified	All remaining Struck by/struck against Ecodes	All remaining Struck by/struck against Ecodes
Suffocation		E911–E913.9	W75–W84
	Due to food	E911	W78,W79
	Due to non-food	E912	W80
	In bed	E913.0	W75
	Cave in	E913.3	W77

Injury mechanism	Injury mechanism subcategory	ICD-9 Ecodes	ICD-10 Ecodes
Suicide	Other and unspecified	All remaining Suffocation Ecodes E950–E959	All remaining Suffocation Ecodes X60–X84
	Firearm	E955.0–E955.4	X72–X74
	Poisoning	E950–E952.9	X60–X69
	Suffocation	E953(.0–.9)	X70
	Drowning	E954(0–.9)	X71
	Sharp or blunt object	E956	X78
	Jumping from building or other high structure	E957(.0–.9)	X80
	Jumping/lying in front of moving object	E958.0	X81
	Other and unspecified means	All remaining Suicide Ecodes	All remaining Suicide Ecodes

Source: World Health Organization