

# Child injuries due to falls

*Malinda Steenkamp  
Raymond Cripps*



# **CHILD INJURIES DUE TO FALLS**

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is to improve the health and well-being of Australians by informing community discussion and decision making through national leadership in developing and providing health and welfare statistics and information.

Injury Research and Statistics Series  
Number 7

# **CHILD INJURIES DUE TO FALLS**

**Malinda Steenkamp  
and  
Raymond Cripps**

**2001**

Australian Institute of Health and Welfare  
Canberra

AIHW cat. no. INJCAT 37

© Australian Institute of Health and Welfare 2001

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without prior written permission from the Australian Institute of Health and Welfare. Requests and enquiries concerning reproduction and rights should be directed to the Head, Media and Publishing Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601.

This publication is part of the Australian Institute of Health and Welfare's Injury Research and Statistics Series. A complete list of the Institute's publications is available from the Publications Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web site (<http://www.aihw.gov.au>). Electronic copies of publications in this series can be downloaded from the Research Centre for Injury Studies web site (<http://www.nisu.flinders.edu.au>)

ISSN 1444-3791

ISBN 1 74024 143 6

### **Suggested citation**

Steenkamp M & Cripps R. 2001. Child injuries due to falls. Injury Research and Statistics Series. Adelaide: AIHW (AIHW cat no. INJCAT 37).

### **Australian Institute of Health and Welfare**

Board Chair  
Dr Sandra Hacker

Director  
Dr Richard Madden

Any enquiries about or comments on this publication should be directed to:

AIHW National Injury Surveillance Unit  
Research Centre for Injury Studies  
Flinders University of South Australia  
GPO Box 2100,  
Adelaide 5001, South Australia

Phone: (08) 8374 0970  
email: [nisu@nisu.flinders.edu.au](mailto:nisu@nisu.flinders.edu.au)

Web site: [www.nisu.flinders.edu.au](http://www.nisu.flinders.edu.au)

Published by Australian Institute of Health and Welfare

Printed by Snap Printing

# Contents

<b>Contents</b> .....	<b>v</b>
<b>Executive summary</b> .....	<b>vii</b>
<b>Acknowledgments</b> .....	<b>ix</b>
<b>Abbreviations used</b> .....	<b>xi</b>
<b>1 Introduction</b> .....	<b>1</b>
<b>2 Fall-related deaths by children; Australia</b> .....	<b>3</b>
2.1 Data source.....	3
2.2 Identifying fall-related injury deaths .....	3
2.3 Deaths due to accidental falls by children (E880–E888) .....	5
2.4 'Extra' falls among children aged 0–14 years .....	15
2.5 Data issues.....	16
<b>3 Hospital separations due to falls among children; Australia</b> .....	<b>20</b>
3.1 Data source.....	20
3.2 Identifying hospitalisations due to falls.....	20
3.3 Hospital separations due to accidental falls among children (E880–E888) .....	22
3.4 'Extra' falls in children .....	47
3.5 Data issues.....	49
<b>4 Emergency department visits due to falls by children; Victoria</b> .....	<b>54</b>
4.1 Data source.....	54
4.2 Identifying ED visits due to falls.....	54
4.3 ED visits due to falls among children .....	55
4.4 Data issues.....	62
<b>5 Discussion</b> .....	<b>66</b>
<b>6 Conclusions</b> .....	<b>72</b>
<b>References</b> .....	<b>75</b>
<b>Appendices</b> .....	<b>76</b>
<b>List of Tables</b> .....	<b>109</b>
<b>List of Figures</b> .....	<b>113</b>



# Executive summary

## Introduction

Falls are a major cause of injury morbidity in children aged 0–14 years. This Report analysed fall-related deaths data among children for 1979–1998 and similar hospital separations data for 1993/94–1997/98. It also examined emergency department data for the period 1 July 1996–30 June 1998, as obtained from the Monash University Accident Research Centre.

## Epidemiology of fall-related injury among children

- Cases due to falls among children are numerous, but they are rarely life-threatening. However, a notable number of children have more serious outcomes following falls.
- There is an association between the circumstances leading to injury and age, as well as sex (to a lesser degree). This reflects behavioural and developmental changes that occur as children grow older.
- The height involved in a fall plays an important role in regard to injury outcome.

## Issues relevant to data sources on fall-related injury among children

- There are several general issues that are relevant when interpreting different data sources used in this Report.
- The three data sources used in this Report each has distinct strengths and weaknesses for surveillance of fall-related injury among children.
- The transition to ICD-10(-AM) may result in a break in the time series for both deaths and hospitalisations, but ICD-10-AM may expand coding categories for hospital separations data.
- Inclusion of 'extra' fall-related cases have some impact on deaths, but very little on hospital separations.

## Conclusions

- It is necessary to target fall-related injury research and interventions.
- The impact of fall-related injury with more severe outcomes needs to be assessed.
- Data available for monitoring the incidence of fall-related injury can be improved in specific ways.

*More detailed discussions of these points can be found in Sections 5 and 6.*





# Acknowledgments

We gratefully acknowledge the constructive input by Ian Scott who commented on the final draft of this Report.

We thank Maria Corbo and Mark Sinclair-Stokes, Monash University Accident Research Centre for providing us with the VEMD data.

Thank you to Stacey Wendt, RCIS, for her assistance in preparing this publication.



# Abbreviations used

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ALOS	Average length of stay
E-code	ICD-9(-AM) External cause code
ED	Emergency Department
GP	General practitioner
ICD-9	International Classification of Diseases, 9 <sup>th</sup> Revision
ICD-9-CM	International Classification of Diseases, 9 <sup>th</sup> Revision, Clinical Modification
ICD-10	International Classification of Diseases, 10 <sup>th</sup> Revision
ICD-10-AM	International Classification of Diseases, 10 <sup>th</sup> Revision, Australian Modification
LOS	Length of stay
MUARC	Monash University Accident Research Centre
n.a.	Not available
nec	Not elsewhere classifiable
NCIS	National Coroners Information System
NDS-IS	National Data Standards for Injury Surveillance
NHMD	National Hospital Morbidity Database
NISU	National Injury Surveillance Unit
RCIS	Research Centre for Injury Studies
unspec.	Unspecified
VISAR	Victorian Injury Surveillance and Applied Research System
VEMD	Victorian Emergency Management Dataset
VAED	Victorian Admitted Episodes Dataset
..	Not applicable
#	Fracture



# 1 Introduction

Falls among children are one of the priorities in the National Injury Prevention Action Plan: Priorities for 2001–2003 (Department of Health and Aged Care 2000). Falls are a frequent cause of injury morbidity in children. For example, the Victorian Injury Surveillance and Applied Research System (VISAR) reported that falls represented 41% of hospital separations and 42% of emergency visits for injury to children aged 0–14 years at participating hospitals (Ashby and Corbo 2000). The direct cost of falls in children to the health care system in Australia has been estimated to be more than \$130 million, of which \$28 million was the cost of hospital inpatient care (Mathers, Penm 1999).

This Thematic Report broadly aimed to analyse deaths and hospital separations data concerning falls among Australian children; and to assess some emergency department data available on falls by children. Our objectives were to:

## **A) To describe the epidemiology of fall-related injury among children aged 0–14 years by analysing three data sources:**

### **ABS mortality data in order to:**

- Analyse fall-related injury as identified by the International Classification of Diseases, 9<sup>th</sup> Revision (ICD-9) external cause codes (E-codes) E880–E888.
- Describe the profile and trends of falls by sex and age.
- Present falls by external causes.
- Show the profile of falls for various jurisdictions.

### **AIHW hospital separations data in order to:**

- Analyse fall-related injury as identified by the E-codes E880–E888, as found in the clinical modification of ICD-9 (ICD-9-CM).
- Highlight the profile and trends of falls by sex and age.
- Describe falls by external causes.
- Show the profile of falls for various jurisdictions.
- Describe the profile of fall-related injury by principal diagnoses, length of stay, procedures performed, and separation mode.

### **An example of emergency department data, i.e. to:**

- Analyse fall-related data obtained from VISAR, in order to describe the profile of fall-related emergency presentations by sex and age.

**B) To report on relevant data issues in relation to the data sources used in this Report in order to:**

- Report on general data issues relevant to interpretation of the data sources used.
- Comment on the usefulness of the data sources used in the Report for surveillance of fall-related injury in children.
- Comment on the impact of the transition to ICD-10(-AM) for deaths and hospitalisations data.
- Examine the impact of including fall-related ICD E-codes other than those in the range E880–E888 on the incidence of fall-related deaths and hospitalisations among children.

In writing this Report we examined deaths data from 1979–1998 and hospital separations data for the financial years 1993/94–1997/98. We also used emergency department data (ED) for the period 1 July 1996–30 June 1998, as obtained from VISAR at Monash University Accident Research Centre (MUARC).

Section 2 of this Report deals with fall-related deaths in children. Section 3 with hospital separations and Section 4 with the VISAR data.

In each of these Sections we start by discussing the data source and the selection criteria for included cases. A presentation of the results of the data analyses follows, together with a discussion of relevant data issues. We then comment on the usefulness of these data for surveillance of fall-related injury among children and the impact of the introduction of ICD-10(-AM).

Section 5 contains the Discussion and is followed by the Recommendations in Section 6. The References and Appendices follows after this. The Appendices present tables of data relating to Sections 2–4.

Children are defined as children aged 0–14 years. We also distinguish between three five-year age groups within this age range, i.e. the age groups 0–4 years, 5–9 years and 10–14 years. The terms 'children less than 15 years' and 'children aged 0–14 years' are used interchangeably.

# 2 Fall-related deaths by children; Australia

## 2.1 Data source

Deaths data used in this Report are from the Australian Bureau of Statistics (ABS) mortality unit record data collection. These represent the number of deaths registered by Registrars of Births, Deaths and Marriages during each calendar year for the whole of Australia. Time trends for fall-related deaths are presented for the period 1979–1998. This is the period during which Australian deaths data have been classified according to ICD-9.

## 2.2 Identifying fall-related injury deaths

The ICD-9 External cause code (E-code) range E880–E888 (see Table 2.8) is traditionally seen as accidental fall codes and most of the discussions in this Report deal with injuries coded to this E-code range. However, other E-codes also relate to falls.<sup>1</sup> These are:

- E804 (Fall in, on, or from railway train)
- E833 (Fall on stairs or ladders in water transport)
- E834 (Other fall from one level to another in water transport)
- E835 (Other and unspecified fall in water transport)
- E843 (Fall in, on, or from aircraft)
- E929.3 (Late effects of accidental fall)
- E957 (Suicide and self-inflicted injuries by jumping from high place)
- E968.1 (Assault by pushing from a high place)
- E987 (Falling from high place, undetermined whether accidentally or purposely inflicted).

In this Report, relevant fatal cases resulting from falls were selected by identifying those cases among children aged 0–14 years with 'traditional' ICD-9 fall E-codes (E880–E888), as well as those identified by 'extra' fall E-codes, i.e. cases coded to E804, E833–E835, E843, E929.3, E957, E968.1, and E987.

Of all the cases selected according to these criteria, about 91% were cases in the E880–E888 range and two-thirds were either due to falls from one level to another (E884), or falls from or out of a building or other structure (E882). This was true for both males and females.

Less than 9% of the cases were due to falls identified by 'extra' fall-related E-codes and, of these, the majority (for both sexes) were due to falls among, on, or from a railway train (E804).

---

<sup>1</sup> Some other E-codes relate to a range of injuries, but includes fall-related injury. Examples of these are E826 'Pedal cycle accident' and E828 'Accident involving animal being ridden'. For these codes it is not possible to distinguish between injury resulting from falls and injury from other types of mechanisms. For purposes of this Report, we did not consider these codes.



**Table 2.1: External causes of deaths from falls among children aged 0–14 years: case counts and proportions by sex; Australia 1979–1998**

External cause	E-code	Males		Females		Children	
		Count	Per cent <sup>(a)</sup>	Count	Per cent <sup>(a)</sup>	Count	Per cent <sup>(a)</sup>
<b>Accidental falls (E880–E888)</b>							
Fall on or from stairs or steps	E880	9	5.6%	7	8.1%	16	6.5%
Fall on or from ladders or scaffolding	E881	0	..	0	..	0	..
Fall from or out of building or other structure	E882	41	25.5%	21	24.4%	62	25.1%
Fall into hole or other opening in surface	E883	7	4.3%	1	1.2%	8	3.2%
Other fall from one level to another	E884	66	41.0%	35	40.7%	101	40.9%
Fall on same level from slipping, tripping, or stumbling	E885	7	4.3%	5	5.8%	12	4.9%
Fall on same level from collision, pushing, or shoving, by or with other person	E886	3	1.9%	1	1.2%	4	1.6%
Fracture, cause unspecified	E887	4	2.5%	1	1.2%	5	2.0%
Other and unspecified fall	E888	11	6.8%	6	7.0%	17	6.9%
<i>Subtotal for accidental falls</i>		<b>148</b>	<b>91.9%</b>	<b>77</b>	<b>89.5%</b>	<b>225</b>	<b>91.1%</b>
<b>'Extra' falls</b>							
Fall in, on, or from railway train	E804	8	5.0%	4	4.7%	12	4.9%
Fall on stairs or ladders in water transport	E833	0	..	0	..	0	..
Other fall from one level to another in water transport	E834	0	..	0	..	0	..
Other and unspecified fall in water transport	E835	1	0.6%	0	..	1	0.4%
Fall in, on, or from aircraft	E843	0	..	0	..	0	..
Late effects of accidental fall	E929.3	2	1.2%	1	1.2%	3	1.2%
Suicide and self-inflicted injuries by jumping from high place	E957	2	1.2%	1	1.2%	3	1.2%
Assault by pushing from a high place	E968.1	0	..	3	3.5%	3	1.2%
Falling from high place, undetermined whether accidentally or purposely inflicted	E987	0	..	0	..	0	..
<i>Subtotal for other falls</i>		<b>13</b>	<b>8.1%</b>	<b>9</b>	<b>10.5%</b>	<b>22</b>	<b>8.9%</b>
<b>Total falls</b>		<b>161</b>	<b>100%</b>	<b>86</b>	<b>100%</b>	<b>247</b>	<b>100%</b>

(a) Due to rounding, totals will not necessarily add up to 100.0%.

Fall-related deaths coded to the E-codes E880–E888 are described as 'accidental' falls in this Report and are discussed further in Section 2.3. This was done:

- as the current National Health Priority Areas indicator for fall-related hospitalisations in children identifies the E880–E888 range as the one signifying falls among children; and
- because the ABS assumes that children under the age of 10 years are not capable of forming the intent to commit suicide - this impacts on the use of codes E957 and E987.

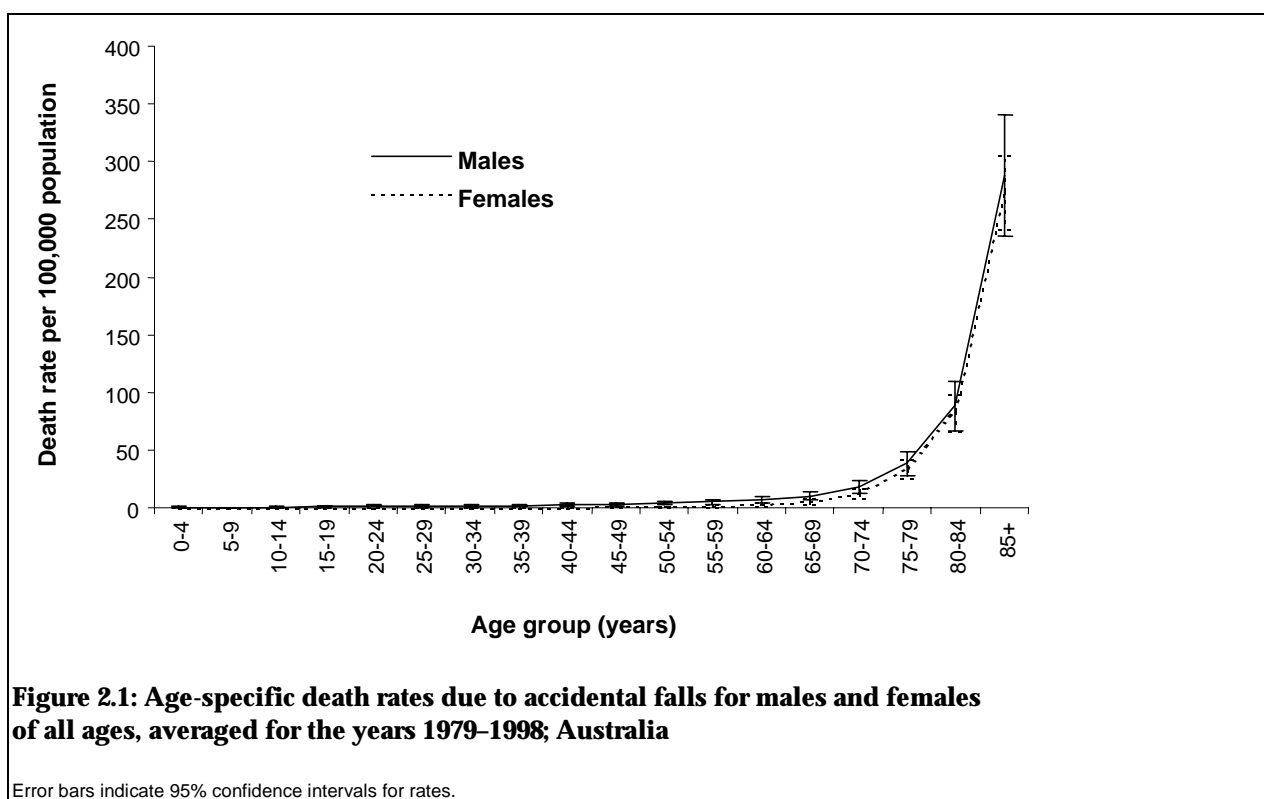
'Extra' fall-related deaths in children (i.e. those coded to E804, E833–E835, E843, E929.3, E957, E968.1 and E987) are discussed in Section 2.4.

## 2.3 Deaths due to accidental falls by children (E880–E888)

### 2.3.1 Introduction

In Australia during 1979–1998, there were 20,193 deaths due to accidental falls among people of all ages. Of these, 225 (1.1%) were children aged 14 years or less.

Age-specific rates for five-year age groups were averaged for the 20-year period reported. Figure 2.1 shows that these average rates are very low for children, as well as for the other age groups up to 70–74 years, but that rates increase very steeply for those aged 75 years or more.



For children aged 0–14 years, accidental falls accounted for 2.3% (n=225) of deaths from all external causes in children (n=9,974) for the period 1979–1998 (Table 2.2). Falls were, therefore, the sixth leading external cause of death for children aged 14 years or less over the 20-year period considered.

**Table 2.2: Deaths due to all external causes in males, females and children aged 0–14 years: case counts and proportions; Australia 1979–1998**

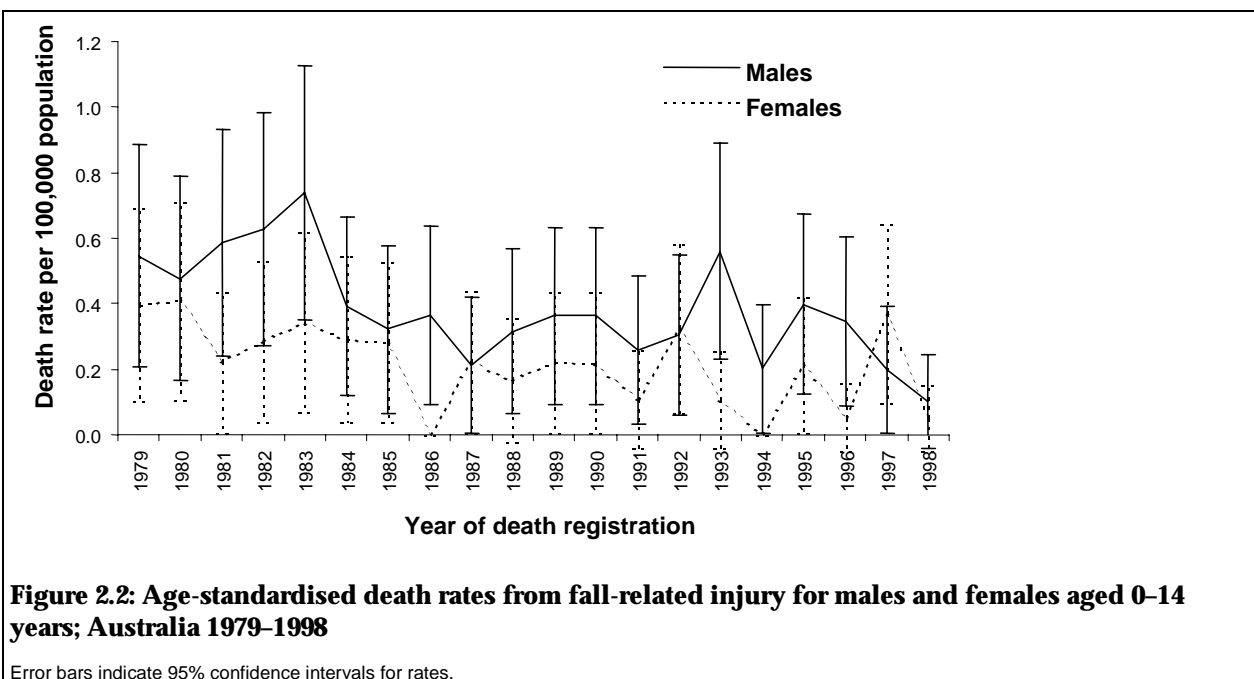
External cause	E-code range	Males 0–14 years		Females 0–14 years		Children 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent
Transportation	E800–E848	3,006	47.2%	1,789	49.6%	4,795	48.1%
Drowning	E910	1,320	20.7%	623	17.3%	1,943	19.5%
Other unintentional	E900–E909, E911–E923, E924/1, E925–E929	1,014	15.9%	510	14.1%	1,524	15.3%
Intentional, inflicted by another	E960–E978, E990–E949	319	5.0%	293	8.1%	612	6.1%
Fires/flame/scalds	E890–E899, E924/0,8,9	286	4.5%	173	4.8%	459	4.6%
Falls	E880–E888	148	2.3%	77	2.1%	225	2.3%
Intentional, self inflicted <sup>(a)</sup>	E950–E959	130	2.0%	37	1.0%	167	1.7%
Undetermined intent	E980–E989	43	0.7%	15	0.4%	58	0.6%
Poisoning, other substances	E860–E869	35	0.5%	29	0.8%	64	0.6%
Medical misadventure	E870–E879, E930–E949	32	0.5%	33	0.9%	65	0.7%
Poisoning, pharmaceuticals	E850–E858	31	0.5%	31	0.9%	62	0.6%
<b>All causes</b>	<b>E800–E999</b>	<b>6,364</b>	<b>100%</b>	<b>3,610</b>	<b>100%</b>	<b>9,974</b>	<b>100%</b>

(a) For purposes of national statistics, the ABS assumes that children under 10 years are not capable of forming the intent to commit suicide. These figures, therefore, reflect cases that occurred among children aged 10–14 years.

### 2.3.2 Profile for children aged 0–14 years

The total 225 deaths due to accidental falls among children yielded an average of about 11 cases per year (range 2–16, SD±3.3) for the period 1979–1998. Two-thirds of the deaths (n=148, 65.8%) occurred in males. The age-standardised rate for children aged 0–14 years averaged over the 20-year period was 0.6 per 100,000 population. For males, the average rate was 0.4 per 100,000 population, whereas the rate for females was 0.2 per 100,000 population. In 1998, there were three childhood deaths due to accidental falls in Australia. Two of these were males.

Small numbers complicate interpretation of the data, but Figure 2.2 indicates that male rates were higher than the rates for females aged 0–14 years over the time period reported. Also, age-adjusted rates of fall-related deaths appeared to be declining for both sexes during the period 1979–1998.



In order to better assess the change in rates, the data were grouped in five-year periods and the per cent change between the most recent five-year period (1994–1998) and the baseline period for this Report (1979–1983) was calculated (Table 2.3). For both males and females, deaths due to accidental falls more than halved in the 20-year period, whereas rates declined by just less than 60% (Table 2.3).

**Table 2.3: Five-year average case counts and age-standardised rates for males, females and children aged 0–14 years; Australia 1979–1998**

Five-year period	Males 0–14 years		Females 0–14 years		Children 0–14 years	
	Average count	Average rate	Average count	Average rate	Average count	Average rate
1979–83	11.2	0.60	5.8	0.33	17	0.47
1984–88	6.2	0.32	3.4	0.19	9.6	0.26
1989–93	7.2	0.37	3.6	0.20	10.8	0.29
1994–98	5.0	0.25	2.6	0.14	7.6	0.19
<b>% change between 1979–83 and 1994–98</b>	<b>-55%</b>	<b>-58%</b>	<b>-55%</b>	<b>-59%</b>	<b>-55%</b>	<b>-58%</b>

Two decimal points are used in this Table to show differences more clearly.

### 2.3.3 Profiles for age groups 0–4, 5–9 and 10–14 years

Of the total 225 childhood deaths due to accidental falls, 47.6% occurred in children aged 0–4 years, 20.0% in those aged 5–9 years and 32.4% in 10–14 year olds for the period 1979–1998. Within these age groups, there was a difference between males and females (Table 2.4).

For females, the 0–4 year age group made up 57% of the fall-related deaths compared to just less than 43% for males. In the age group 10–14 years, the proportion of males was about double the proportion for females. The male to female ratio was 3.9:1 (Table 2.4). i.e. more than double the male to female ratio for the other two age groups.

**Table 2.4: Case counts, proportions and male to female ratio for five-year age groups for children aged 0–14 years; Australia 1979–98**

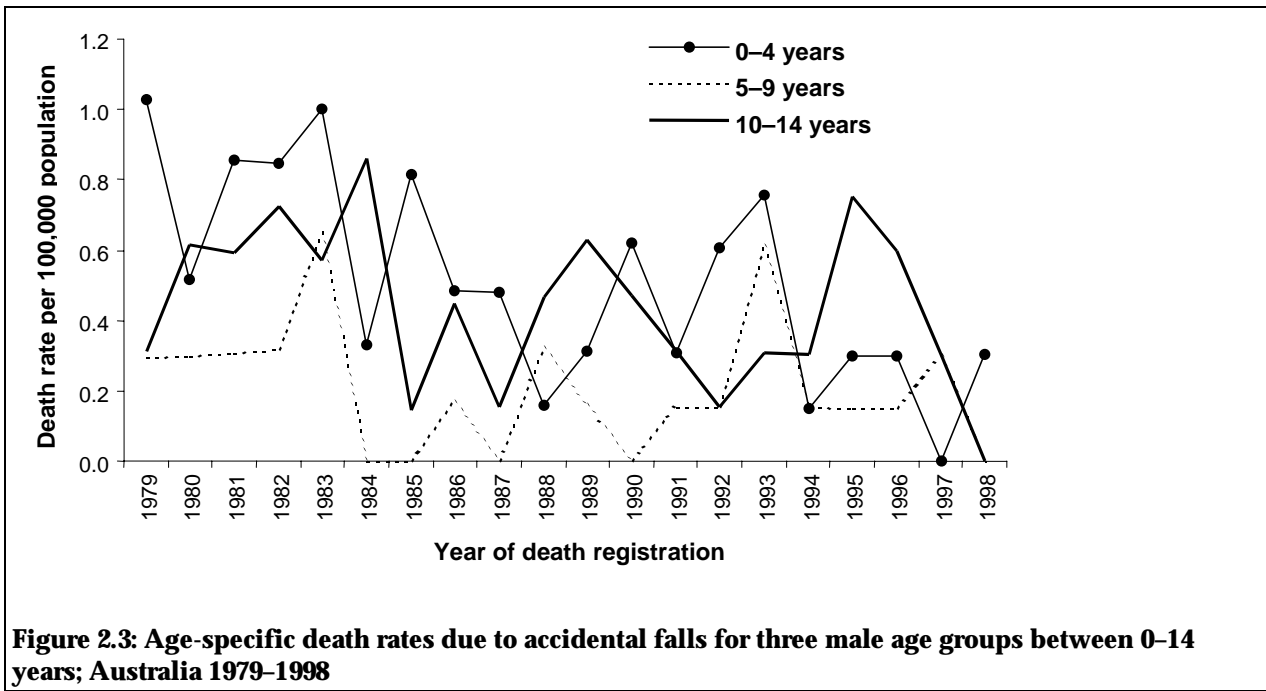
Age group (years)	Males 0–14 years		Females 0–14 years		Children 0–14 years		M:F ratio <sup>(a)</sup>
	Count	Per cent	Count	Per cent	Count	Per cent	
0–4	63	42.6%	44	57.1%	107	47.6%	1.4
5–9	27	18.2%	18	23.4%	45	20.0%	1.5
10–14	58	39.2%	15	19.5%	73	32.4%	3.9
<b>Total</b>	<b>148</b>	<b>100%</b>	<b>77</b>	<b>100%</b>	<b>225</b>	<b>100%</b>	<b>1.9</b>

Shaded areas indicate notable differences.

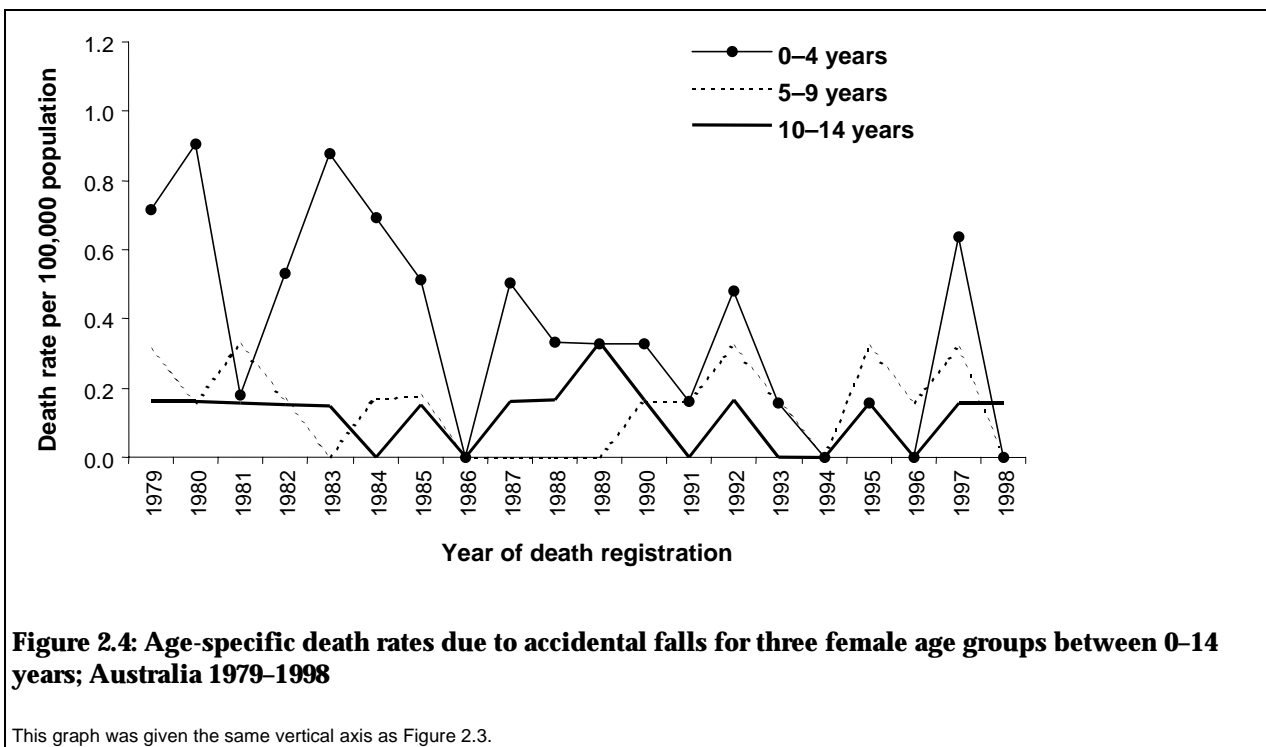
(a) Male to female ratio was based on case counts. The male to female rate ratio for children aged 0–14 years for 1998 was 2.

Figure 2.3 shows that for males aged 5–9 years during the 20-year period, the accidental fall death rate tended to be lower than the comparative rates for the other two age groups. Rates for the 0–4 and 10–14 year age groups were somewhat similar over time.

Although small numbers result in some distortion of the data, it seems as if rates for all three age groups have declined between 1979 and 1998 (Figure 2.3).



The rates for females seemed to be lower than the male rates (Figure 2.4). Also, for the girls in general, the rate for the 0-4 year olds appeared to be higher than the rates for the other two age groups.



## 2.3.4 Mechanism of fall

The term 'mechanism of fall' is used here to refer to the circumstances of the fall or the type of fall as described by the E-code. ICD-9 E-codes E880–E886 give some insight into the circumstances or mechanisms of falls resulting in death and are tabulated in Table 2.5. However, the codes E887 (Fracture, cause unspecified) and E888 (Other or unspecified fall) do not provide specific information about the circumstances of the fall.

Table 2.5 shows that for both males and females aged 0–14 years, falling from one level to another (E884) accounted for about 45% (n=66 and n=35, respectively) of fall-related deaths between 1979–1998 (Table 2.5). This was followed by falls from or out of buildings or other structures (E882) at about 27% for both sexes (n=41 for males and n=21 for females).

**Table 2.5: Mechanism of childhood deaths from falls: proportions by age group and sex; Australia 1979–1998**

Mechanism as described by E-code	E-code	Males 0–14 years		Females 0–14 years		M:F ratio <sup>(a)</sup>
		Counts	Per cent	Counts	Per cent	
<b>Fall on or from stairs/steps</b>						
Fall on or from stairs/steps	E880	9	6.1%	7	9.1%	1.3
<b>Fall on or from ladders or scaffolding</b>						
Fall on or from ladders or scaffolding	E881	0	..	0	..	..
<b>Fall from or out of building or other structure</b>						
Fall from or out of building or other structure	E882	41	27.7%	21	27.3%	2.0
<b>Fall into hole or other opening in surface</b>						
Accident from diving or jumping into water	E883.0	3	2.0%	0	..	..
Fall into other hole or opening in surface	E883.9	4	2.7%	1	1.3%	4.0
<i>Subtotal</i>	<i>E883</i>	7	4.7%	1	1.3%	7.0
<b>Other fall from one level to another</b>						
Fall from playground equipment	E884.0	5	3.4%	2	2.6%	2.5
Fall from cliff	E884.1	23	15.5%	8	10.4%	2.9
Fall from bed or chair	E884.2	12	8.1%	7	9.1%	1.7
Other fall from one level to another	E884.9	26	17.6%	18	23.4%	1.4
<i>Subtotal</i>	<i>E884</i>	66	44.6%	35	45.5%	1.9
<b>Fall on same level from slipping, tripping, stumbling</b>						
Fall on same level	E885	7	4.7%	5	6.5%	1.4
<b>Fall on same level from collision, pushing, shoving, by or with other person</b>						
In sports	E886.0	1	0.7%	0	..	..
Other and unspecified	E886.9	2	1.4%	1	1.3%	2.0
<i>Subtotal</i>	<i>E886</i>	3	2.0%	1	1.3%	3.0
<b>Fracture, cause unspecified</b>						
Fracture, cause unspecified	E887	4	2.7%	1	1.3%	4.0
<b>Other and unspecified fall</b>						
Other and unspecified fall	E888	11	7.4%	6	7.8%	1.8
<b>All fall external causes</b>	<b>E880–E888</b>	<b>148</b>	<b>100%</b>	<b>77</b>	<b>100%</b>	<b>1.9</b>

(a) M:F ratio is based on case counts and not rates.

Because of the relatively small differences between males and females in regard to mechanism, these data are presented together for the rest of this subsection and for Figures 2.5–2.9 where differences between childhood age groups are discussed.

**Fall from one level to another (E884)** was the leading fall mechanism for those aged 0–4, 5–9 and 10–14 years (Figure 2.5). However, this mechanism accounted for varying proportions in the three age groups. In those aged 5–9 years, falls from one level to another accounted for the highest proportion, i.e. nearly 60%. For those aged 10–14 years, the proportion was 45% and for those less than 5 years, it was just more than 39% (Figure 2.5).

In all children under 15 years, **falls from or out of a building (E882)** was the second most common mechanism of fall-related death between 1979 and 1998 (Figure 2.5). For those aged 0–4 years, falls from or out of buildings resulted in about 26% of the fall-related deaths for this age group (Figure 2.5). In those aged between 5–9 years, the proportion was just less than 18% and for 10–14 year olds, the proportion was 36% (Figure 2.5).

The proportion of **falls on or from stairs and steps (E880)** declined as age increased.

**Falls on the same level from collision, pushing, shoving by or with other person (E886)** accounted for notable proportion of deaths in children aged 10–14 years, but did not feature in the younger age groups.

Proportions of cases where the **mechanism was unclear** (i.e. coded to E887 [Fracture, cause unspecified] or E888 [Other and unspecified fall]) also declined as age increased (Figure 2.5).

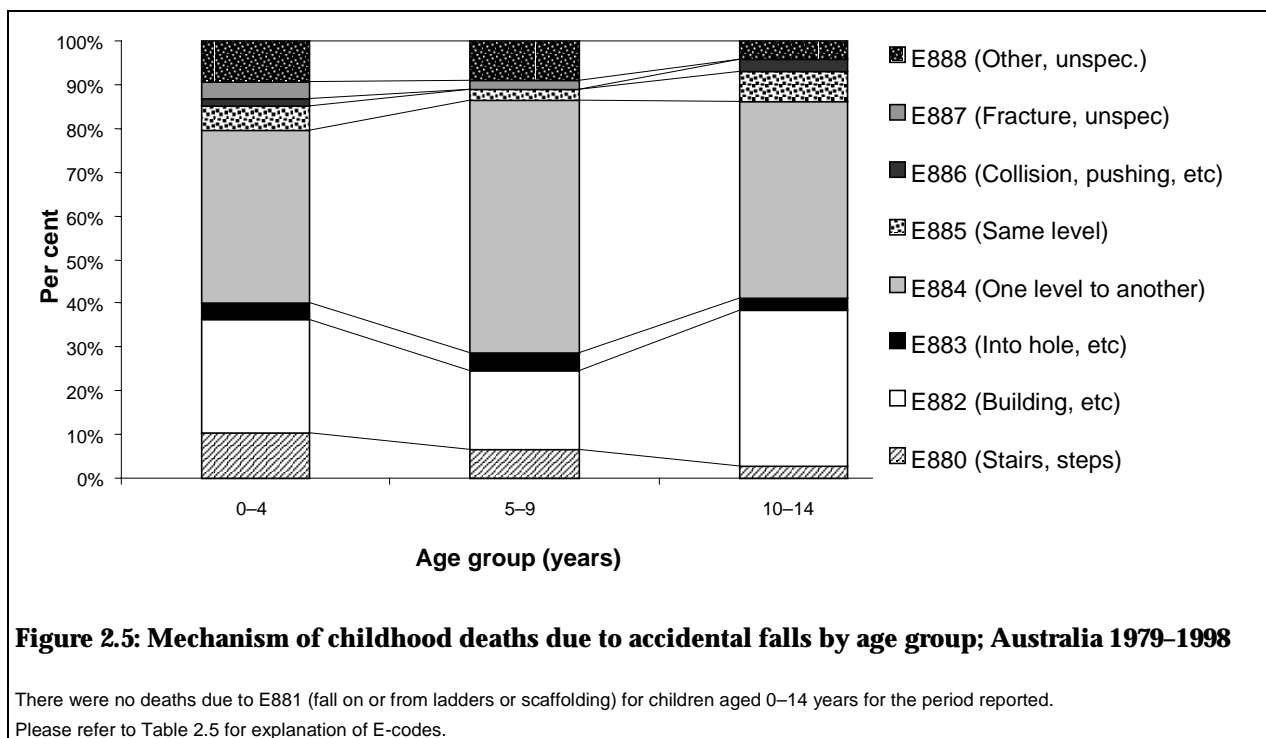


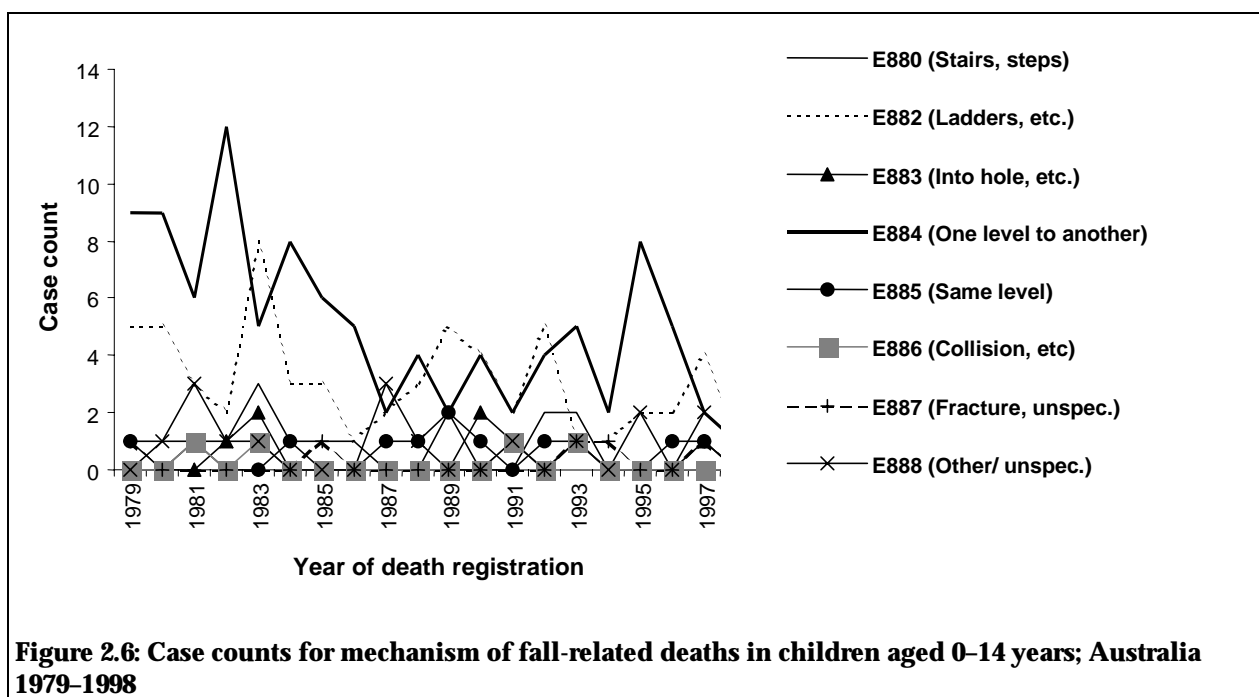
Table 2.5 shows **subcategories of falls coded to E884** (fall from one level to another). For these cases, falls from a bed or a chair (E884.2) made up just less than half of the cases for those aged 0–4 years (Table 2.6). In the age group 5–9 years, fall from a cliff (E884.1) and fall from playground equipment (E884.0) were more prominent, but in reality amounted to small case numbers, i.e. 8 and 4 cases out of 26, respectively. For those aged between 10 and 14 years, falling from a cliff (E884.1) made up a notable proportion (i.e. 21 out of 33 cases).

**Table 2.6: Falls coded to E884 (fall from one level to another): case counts and proportions by age group and subcategory; Australia 1979–1998**

E884 Subcategory	E-code	0–4 years		5–9 years		10–14 years		0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Fall from playground equipment	E884.0	2	4.8%	4	15.4%	1	3.0%	7	6.9%
Fall from cliff	E884.1	2	4.8%	8	30.8%	21	63.6%	31	30.7%
Fall from bed or chair	E884.2	17	40.5%	1	3.8%	1	3.0%	19	18.8%
Other fall from one level to another	E884.9	21	50.0%	13	50.0%	10	30.3%	44	43.6%
<b>Total</b>	<b>E884</b>	<b>42</b>	<b>100%</b>	<b>26</b>	<b>100%</b>	<b>33</b>	<b>100%</b>	<b>101</b>	<b>100%</b>

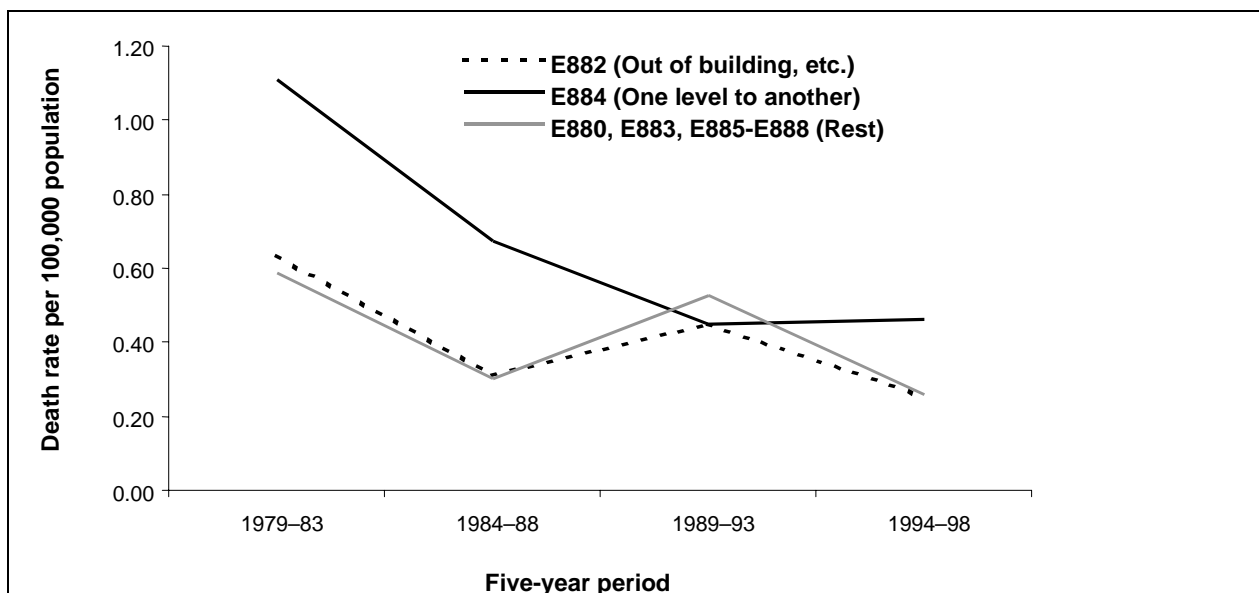
Shaded areas indicate notable differences.

There is of course the question as to whether **changes in mechanism** have occurred between 1979 and 1998. Small numbers complicate the interpretation of the data, but case numbers appeared to be fairly stable over time for most mechanisms. However, for deaths due to falls from or out of a building (E882) and for deaths due to falls from one level to another (E884), there seemed to be a decrease in case counts over time (Figure 2.6).



Data for **falls among children aged 0–14 years coded to E884 and E882** were grouped in five-year periods and the change in age-standardisation rates between the most recent (1994–1998) and the baseline (1979–1983) periods were calculated. These calculations indicated that average rates for the two most common mechanisms (as defined by E882 and E884) both decreased between 1979 and 1998 (Figure 2.7). It also showed that the age-standardised rate for the remaining cases (E880, E883, E885–E888) were similar to the rate for E882 over time and also decreased (Figure 2.7).





**Figure 2.7: Age-standardised rates averaged for five-year periods for mechanisms of falls among children aged 0–14 years; Australia 1979–1998**

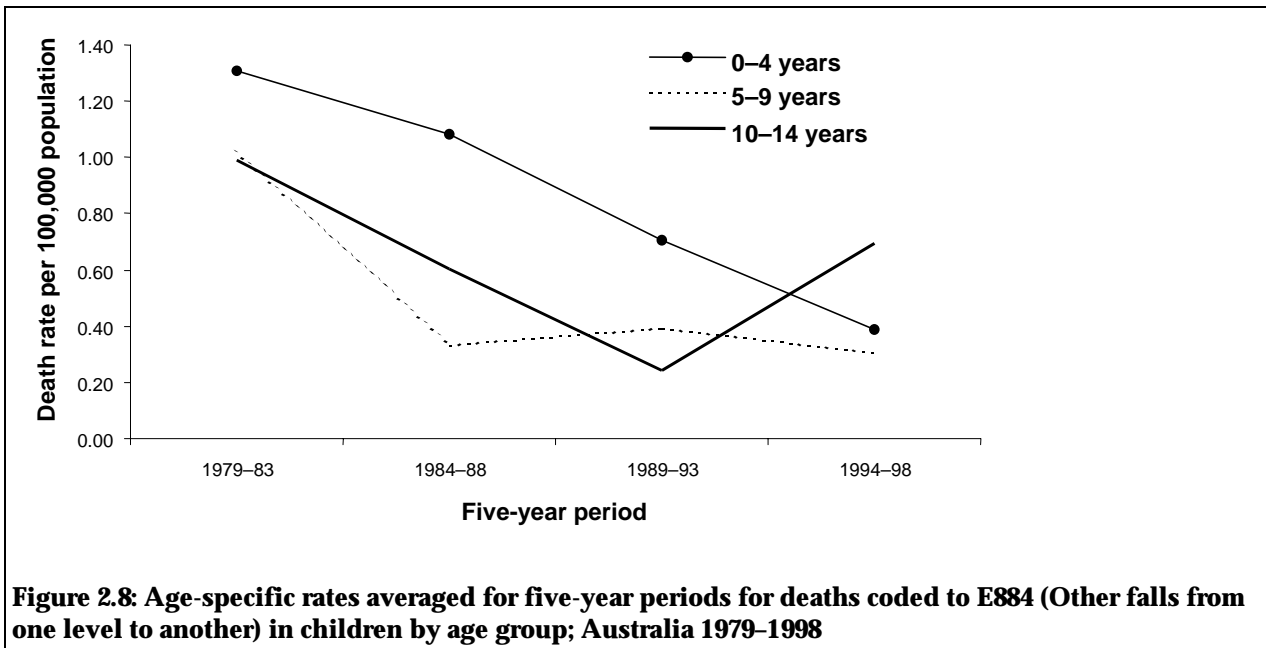
There were no deaths due to E881 (fall on or from ladders or scaffolding) for children aged 0–14 years for the period reported.

There were, however, differences between the three five-year age groups within the 0–14 years age category in regard to falls coded to E884 and E882 (Figures 2.8 and 2.9).

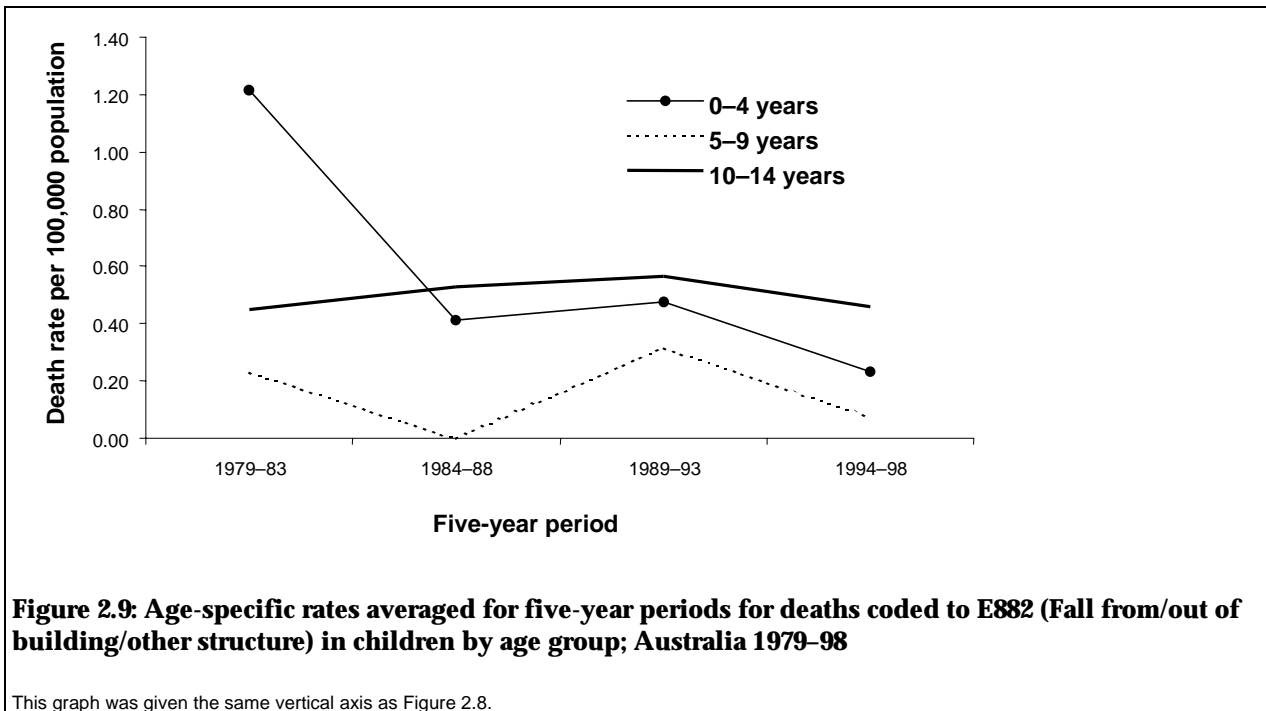
For **other falls from one level to another (E884)**, the rate was highest in the 0–4 year age group and there was a 71% decrease in the age-specific rate between 1979–1983 and 1994–1998 (Figure 2.8).

The age-specific rate for 5–9 year olds was lower than the rate for the 0–4 year olds and decreased by about 71% from 1979–1983 to 1984–1988 (i.e. from a rate of 1.0 per 100,000 population to 0.33 per 100,000 population). The rate remained fairly stable for the two five-year periods thereafter (Figure 2.8).

In the 1979–1983 period, the rate for 10–14 year olds were similar to the rate for children aged 5–9 years. The rate for those aged 10–14 years decreased from 1.0 per 100,000 population in 1979–1983 to 0.6 in 1984–88 and then to 0.2 in 1989–1993 (i.e. a total decrease of 76%). However, the rate increased by 187% to 0.69 per 100,000 population in 1997/98 (Figure 2.8). Interpretation of these changes should be made with caution. Small numbers are involved which can often lead to distortion of trends.

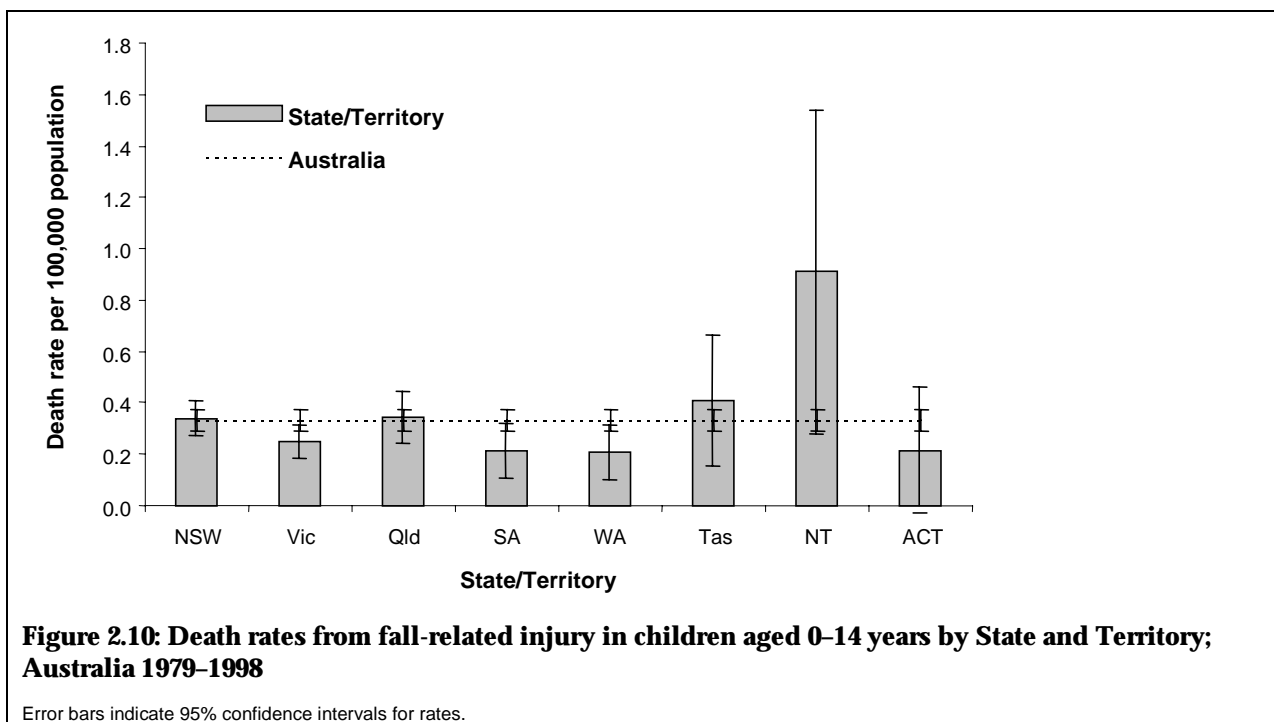


Rates for deaths due to **falls from or out of buildings or other structures (E882)** were generally of a slightly lower order than the rates for falls coded to E884 (compare Figure 2.9 with Figure 2.8). For periods other than 1979-1983, the rates for 10-14 year olds tended to be higher than the rates for the other two age groups (Figure 2.9), but seemed fairly stable over the period shown. For children aged 5-9 years, the rates were lower than the rates for the other two age groups and seemed to remain stable, given small numbers. For children aged 0-4 years, the rate in 1979-1983 was 1.2 per 100,000 population, but showed a decrease of 66% to the 1984-1988 period. Thereafter the rate remained more stable and showed a further decrease of 105% between 1989-1993 and 1994-1998, i.e. from 0.48 to 0.2 per 100,000 population (Figure 2.9).



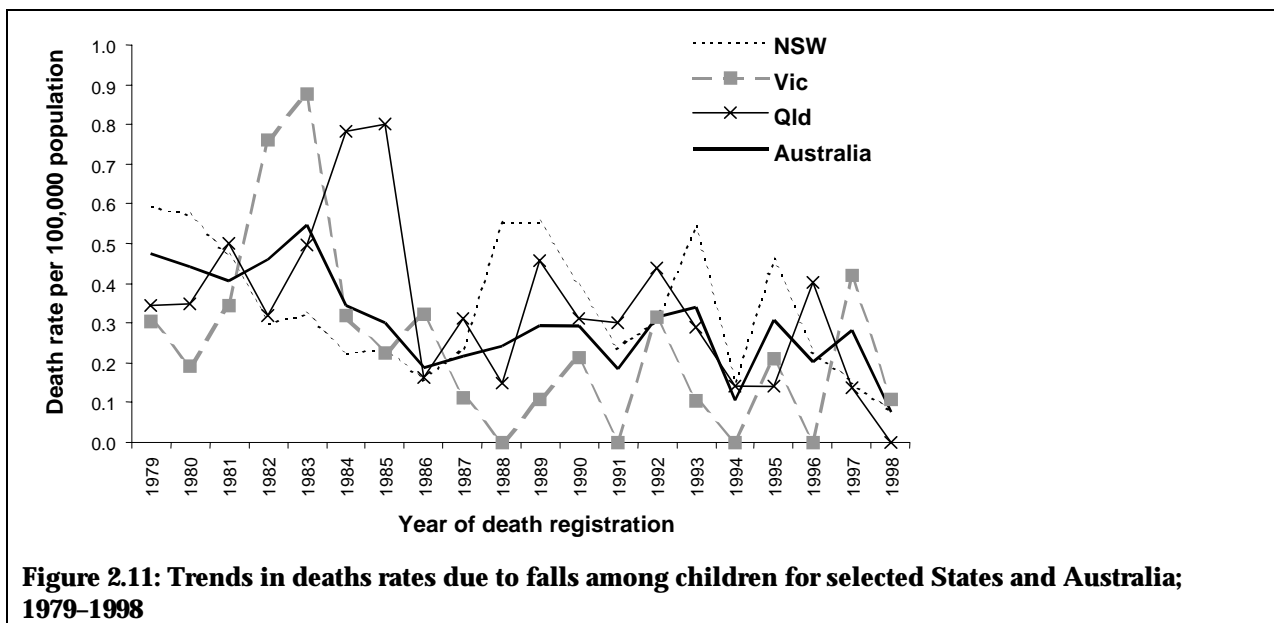
### 2.3.5 States and Territories

Fall-related death rates in **children aged 0–14 years** for the various States and Territories did not differ significantly from the national average (Figure 2.10). This held true for NT where the rate appears to be higher but was influenced by small numbers (Figure 2.10).



Small numbers make the comparison between age-specific rates for children aged 0–4, 5–9 and 10–14 years problematical and was not done. For the same reason, trends over time were difficult to interpret.

Data for the three States with the largest population numbers show that **death rates** due to falls among children aged 0–14 years seemed to decrease in NSW, Victoria and Queensland during the 1979–1998 period (Figure 2.11).



## 2.4 'Extra' falls among children aged 0–14 years

As stated in Section 2.2, there were some 'extra' E-codes that identified fall-related cases in addition to those coded to E880–E888, i.e. E804, E833–E835, E843, E929.3, E957, E968.1, and E987. Cases coded to these E-codes made up about 9% of all fall-related deaths in children during 1979–1998 (see Table 2.1).

For the period reported here, a total of 22 deaths were coded to these 'extra' fall codes (Table 2.7), i.e. an average of 1.1 per calendar year. This yielded an annual average rate of <0.1 per 100,000 population.

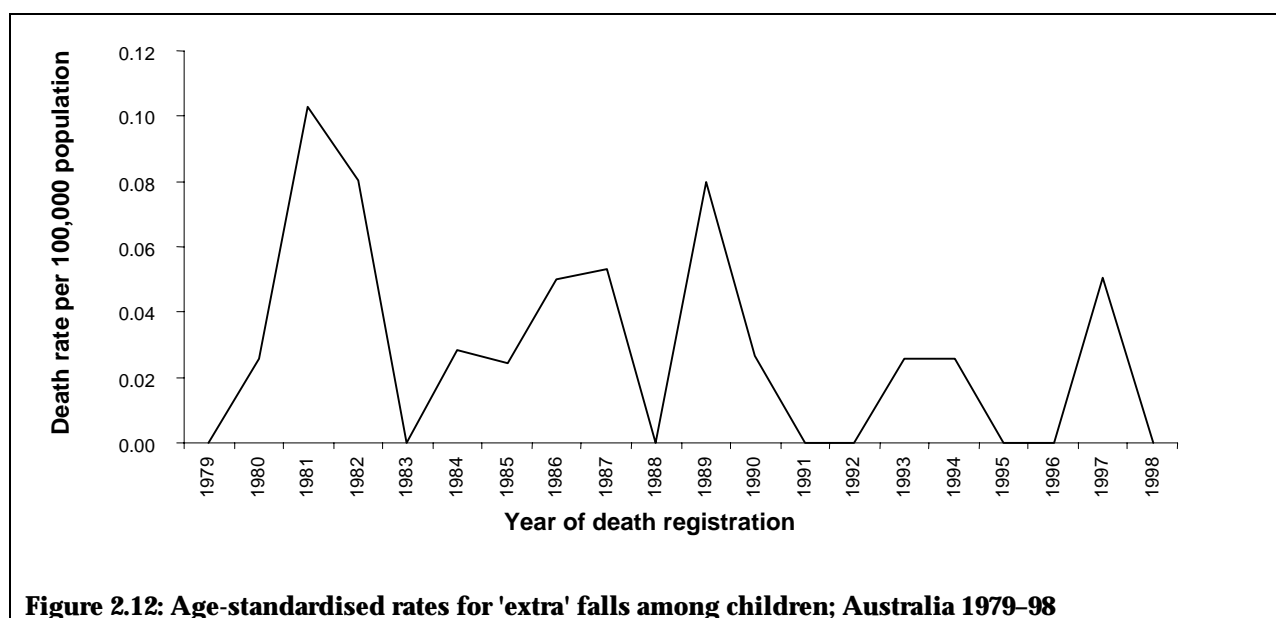
About 60% of the 22 deaths occurred in males and nearly two-thirds of the 22 cases occurred in children aged 10–14 years (Table 2.7).

**Table 2.7: Number of deaths in children coded to 'extra' fall codes; Australia 1979–98**

External cause	E-code	0–4 years	5–9 years	10–14 years	0–14 years
Fall in, on, or from railway train	E804	0	1	11	12
Other and unspecified fall in water transport	E835	0	1	0	1
Late effects of accidental fall	E929.3	1	2	0	3
Suicide and self-inflicted injuries by jumping from high place <sup>(a)</sup>	E957	..	..	3	3
Assault by pushing from a high place	E968.1	3	0	0	3
<b>Total number of 'extra' fall-related deaths</b>		<b>4</b>	<b>4</b>	<b>14</b>	<b>22</b>

(a) For purposes of national statistics, the ABS assumes that children under the age of 10 years are not capable of forming the intent to suicide.

No clear trend in the age-standardised rates could be detected for the 20-year period discussed in this Report, but rates seemed to be lower in more recent years (Figure 2.12).



**Figure 2.12: Age-standardised rates for 'extra' falls among children; Australia 1979–98**

## **2.5 Data issues**

### **2.5.1 Cause of death coding**

The cause of each death registered in Australia is classified by the ABS according to International Classification of Diseases (ICD). The 9th revision has been used for death registrations from 1979–1998, i.e. the years reported here. All deaths given a relevant ICD-9 E-code by the ABS are included in this Report.

Until the end of 1996, the ABS coded only one cause of death for each death. This is the “underlying cause”, defined as “the disease or injury which initiated the train of morbid events leading directly to death”. The underlying cause is derived from information on the death certificate according to rules that form part of the International Classification of Diseases. However, beginning with deaths registered in 1997, other morbid conditions, diseases and injuries entered on the death certificate were also coded, as “multiple causes”. Up to 13 multiple causes may be recorded for each death, in addition to the underlying cause. These are not discussed in this Report because of small numbers for the two years that multi-cause coding is available.

### **2.5.2 Population data**

Population data were obtained from the Australian Institute of Health and Welfare and are similar to data presented in the Demographic Statistics Catalogue No. 3101.0 (Australian Bureau of Statistics ). Rates were calculated using final population estimates as at 31 June of the relevant years.

### **2.5.3 Data reliability**

The reliability of information about the type of injury that resulted in death depends principally on the information available in coroners' records and on the reliability of ICD-9 External cause coding which is usually based on coronial information. Little empirical information is available on the quality of these sources. Consequently, there is considerable potential for factors concerned with information recording or coding to affect data in different ways for different States and Territories. Hence, apparent differences between States and Territories should be interpreted with caution. Beginning with 1993 death registrations, coding has been centralised at the Brisbane office of the ABS, which may have increased the reliability of recording and coding information.

All (or nearly all) fall-related deaths in children are registered, so sampling errors do not apply to these data. However, the time periods used to group the cases (i.e. calendar years) are arbitrary. Use of another period (e.g. July to June) would result in different rates. Where case numbers are small, the effect of chance variation on rates can be large. Confidence intervals (95%, based on a Poisson assumption about the number of cases in a time period) have been placed around rates in some graphs and tables as a guide to the size of this variation. Chance variation alone would be expected to lead to a rate outside the interval only once out of 20 occasions.

National mortality data are released annually by the ABS. Each annual file includes all deaths registered in a calendar year. Most deaths are registered during the year in which they occur, but some are not registered until later, mainly early in the following year.

An assumption is often made that the number of registrations in a particular period provides a good estimate of the number of death occurrences. This holds true often enough to be useful, but it works best if the true incidence of a cause of death does not fluctuate greatly over short periods of time and if the time between occurrence and registration of death is not long or variable.

## **2.5.4 Calculation of rates**

Rates have been adjusted for age to overcome the effect of differences in the proportions of people of different ages (and different injury risks) in the populations that are compared. Direct standardisation was employed, taking the Australian population in 1991 as the standard. Changes in age composition are small within narrow age bands (e.g. 5–9 years) and adjustment has not been applied to 5-year age groups. Where crude rates are reported these are referred to as age-specific rates.

## **2.5.5 Usefulness of deaths data for surveillance**

Surveillance of injury has a number of purposes (Langley 1992). Four that are specifically relevant to surveillance of fall-related injury in children are:

- Determining the extent of a problem;
- Monitoring changes in frequency over time;
- Characterising cases that occur; and
- Identifying new and emerging problems.

The data presented in this Section described the extent of fall-related injury in children. These data indicated that relatively few deaths result from fall-related injury among children, i.e. an average of 11 cases occurred annually between 1979 and 1998.

Although there is some indication that the occurrence of childhood deaths due to falls is declining, the number of cases for the period considered, is too small to be meaningful for monitoring fall-related injury on a year-to-year basis. These are, however, useful for longer periods of time, e.g. five-year periods.

Current data items available in the deaths data and the coding scheme used, i.e. ICD-9, do not provide sufficient information to describe fall-related injury to the extent necessary for informing prevention initiatives. The new National Coroners Information System (NCIS) may be able to provide more detailed information and this system may also be useful in identifying new or emerging problems in regard to fall-related deaths in children. However, the issue of small case numbers remains.

## 2.5.6 Transition from ICD-9 to ICD-10

As shown in Table 2.8, ICD-9 has 17 categories in the E-code range E880–E888 that describe fall-related injury, whereas ICD-10 has 20 in the range W00–W19 - a subset of external cause codes that has the heading "Falls".

**Table 2.8: Comparison of ICD-9 and ICD-10 external cause codes relating to falls**

ICD-9 External causes		ICD-10 External causes	
Code	Description	Code	Description
E880	Fall on or from stairs or steps	W00	Fall on same level involving ice and snow
E881	Fall on or from ladders and scaffolding	W01	Fall on same level from slipping, tripping and stumbling
E882	Fall from or out of building or other structure	W02	Fall involving ice-skates, skis, roller-skates or skateboards
E883	Fall into hole or other opening in surface	W03	Other fall on same level due to collision with, or pushing by, another person
E883.0	Fall into hole or other opening in surface: accident from diving or jumping into water	W04	Fall while being carried or supported by other children
E883.9	Fall into other hole or other opening in surface	W05	Fall involving wheelchair
E884	Other fall from one level to another	W06	Fall involving bed
E884.0	Other fall from one level to another: from playground equipment	W07	Fall involving chair
E884.1	Other fall from one level to another: from cliff	W08	Fall involving other furniture
E884.2	Other fall from one level to another: from bed or chair	W09	Fall involving playground equipment
E884.9	Other fall from one level to another: Other	W10	Fall on or from stairs and steps
E885	Fall on same level from slipping, tripping, stumbling	W11	Fall on or from ladder
E886	Fall on same level from collision, pushing, shoving, by or with other person	W12	Fall on or from scaffolding
E886.0	Fall on same level from collision, pushing, shoving, by or with other person: in sports	W13	Fall from, out of or through building or structure
E886.9	Fall on same level from collision, pushing, shoving, by or with other person: other and unspecified	W14	Fall from tree
E887	Fracture, cause unspecified	W15	Fall from cliff
E888	Other and unspecified fall	W16	Diving or jumping into water causing injury other than drowning or submersion
		W17	Other fall from one level to another
		W18	Other fall on same level
		W19	Unspecified fall

There are many similarities in the fall-related codes between ICD-9 and ICD-10, e.g. both ICD-9 and ICD-10 have codes for falls from or on ladders and scaffolding (even though ICD-10 has two separate codes for this fall-related category). Another example is falls involving playground equipment.

ICD-10 introduces some extra fall-related codes which do not have an equivalent in ICD-9, e.g. 'Fall on same level involving ice and snow' [W00].

The major concern about the transition to ICD-10 relates to ICD-9 E-codes E887 and E888. There is no equivalent for E887 (Fracture, cause unspecified) and E888 (Other and unspecified fall) in ICD-10.

A brief review of fall-related data for 1999 (which was coded to ICD-10) indicated that there were two fall-related deaths among children aged 0–14 years for this year. This is in-line with the total number of deaths for 1998 (three cases), but is less than the total for 1997 (eleven cases). Small numbers complicate interpretation of these data and more analysis with larger case counts are needed to draw conclusions about the impact of the transition to ICD-10.

The issues outlined above will have an impact on comparability of the two classification systems over time if falls are defined in terms of external cause codes.

There has been a push to have ABS deaths data coded according to ICD-10-AM which will enhance the data source substantially. The introduction of multicause coding has removed some of the arguments against introduction of ICD-10-AM for deaths data coding and the codes in the clinical modifications are as relevant for mortality data.



# 3 Hospital separations due to falls among children; Australia

## 3.1 Data source

Hospital separations data reported on below are from the AIHW National Hospital Morbidity Database. A “separation” is the event that occurs at the conclusion of an episode of in-patient care in a hospital. Most often, the patient goes to their usual residence, but some separations are to another health care facility, and some occur because the patient has died.

In this Section, we focus mainly on the financial year 1997/98. Trends for the years 1993/94–1997/98 are also presented. These data were coded to the Clinical Modification of ICD-9 (ICD-9-CM). Hospital data are presented by financial year.

## 3.2 Identifying hospitalisations due to falls

Cases that had the following criteria were selected for inclusion in this Section:

- Principal Diagnosis in the ICD-9-CM range 800–999 (i.e. Chapter 17 ‘Injury or Poisoning’ codes); and
- External cause code categories of E880–E888 (accidental falls), as well as E804, E833–E835, E843, E910.6, E910.7, E929.3, E957, E968.1, and E987 (‘extra’ falls).

As explained in section 2.2, we used the E-code range E880–E888 to define ‘traditional’ falls. ‘Extra’ falls were defined as cases coded to E804, E833–E835, E843, E929.3, E957, E968.1, and E987.2

During 1997/98, hospitalisations due to ‘traditional’ and ‘extra’ falls accounted for 25,590 episodes of hospital care in children aged less than 15 years (Table 3.1). Ninety-nine per cent of these episodes were ‘accidental’, i.e. coded to E880–E888 (Table 3.1).

These ‘traditional’ falls are discussed in Section 3.3 and fall-related injuries coded to the ‘extra’ fall E-codes are reported on in Section 3.4. As stated in Section 2, this is done because the current National Health Priority Areas indicator for fall-related hospitalisations in children identifies the E880–E888 range as the one signifying falls among children; and we aim to ensure comparability between this Report and others reporting on this indicator.

---

<sup>2</sup> Other E-codes that might have included falls, such as those coded to ‘Pedal cycle accident’ (E826) or ‘Accident involving animal being ridden’ (E828) were not considered because available information does not allow us to distinguish the cases that involved a fall from other non-fall related cases.

**Table 3.1: External causes of hospital separations due to falls among children aged 0–14 years: case counts and proportions by sex; Australia 1997/98**

External cause	E-code	Males		Females		Children	
		Count	Per cent <sup>(a)</sup>	Count	Per cent <sup>(a)</sup>	Count	Per cent <sup>(a)</sup>
<b>Accidental falls</b>							
Fall on or from stairs or steps	E880	423	2.7%	334	3.4%	757	3.0%
Fall on or from ladders or scaffolding	E881	78	0.5%	38	0.4%	116	0.5%
Fall from or out of building or other structure	E882	661	4.2%	310	3.1%	971	3.8%
Fall into hole or other opening in surface	E883	107	0.7%	72	0.7%	179	0.7%
Other fall from one level to another	E884	7,128	45.6%	5,243	52.6%	12,371	48.3%
Fall on same level from slipping, tripping or stumbling	E885	2,185	14.0%	1,391	14.0%	3,576	14.0%
Fall on same level from collision, pushing or showing, by or with other person	E886	1,947	12.5%	554	5.6%	2,501	9.8%
Fracture, cause unspecified	E887	1,004	6.4%	531	5.3%	1,535	6.0%
Other and unspecified fall	E888	1,977	12.7%	1,418	14.2%	3,395	13.3%
<i>Subtotal for accidental falls</i>		<i>15,510</i>	<i>99.3%</i>	<i>9,891</i>	<i>99.3%</i>	<i>25,401</i>	<i>99.3%</i>
<b>'Extra' falls</b>							
Fall in, on or from railway train	E804	4	<0.1%	1	<0.1%	5	<0.1%
Fall on stairs or ladders in water transport	E833	1	<0.1%	3	<0.1%	4	<0.1%
Other fall from one level to another in water transport	E834	9	0.1%	5	0.1%	14	0.1%
Other and unspecified fall in water transport	E835	8	0.1%	6	0.1%	14	0.1%
Drowning and submersion following fall into swimming pool	E910.6	65	0.4%	42	0.4%	107	0.4%
Drowning and submersion following fall into natural water	E910.7	19	0.1%	8	0.1%	27	0.1%
Late effects of accidental fall	E929.3	6	<0.1%	4	<0.1%	10	<0.1%
Suicide and self-inflicted injuries by jumping from high place	E957	1	<0.1%	0	..	1	<0.1%
Assault by pushing from a high place	E968.1	1	<0.1%	0	..	1	<0.1%
Falling from high place, undetermined whether accidentally or purposefully inflicted	E987	4	<0.1%	2	<0.1%	6	<0.1%
<i>Subtotal 'extra' falls</i>		<i>118</i>	<i>0.7%</i>	<i>71</i>	<i>0.7%</i>	<i>189</i>	<i>0.7%</i>
<b>Total falls</b>		<b>15,628</b>	<b>100%</b>	<b>9,962</b>	<b>100%</b>	<b>25,590</b>	<b>100%</b>

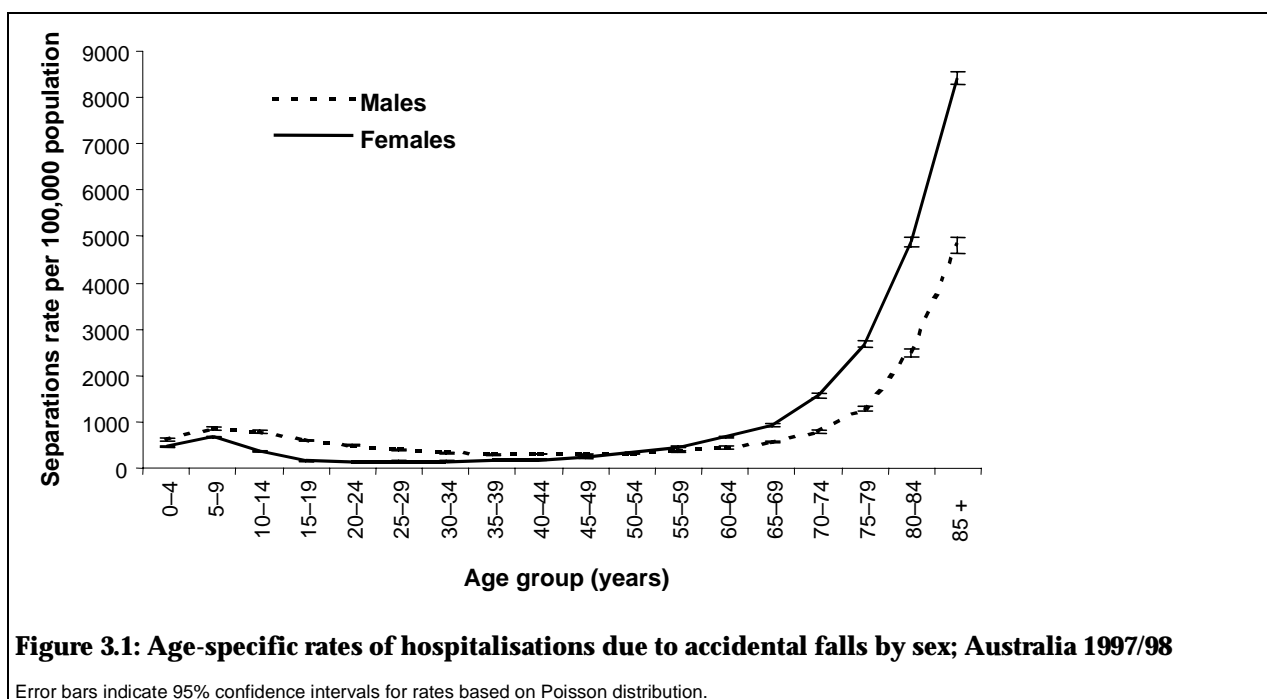
(a) Due to rounding, totals and subtotals will not necessarily add up to 100.0%.

### 3.3 Hospital separations due to accidental falls among children (E880–E888)

#### 3.3.1 Introduction

In Australia during the financial year 1997/98, there were 112,713 hospital separations for fall-related injuries among persons of all ages. Of these, 25,401 (2.3%) were by children aged less than 15 years.

Age-specific rates for hospital separations for age groups 0–14 years are slightly higher than for ages 15–55 years, whereas rates for ages over 55 years increase steeply for every five-year age group thereafter (Figure 3.1).



Accidental falls were the leading cause of all injury-related hospitalisations in children. In 1997/98, they accounted for about 40% of injury-related hospitalisations among children (Table 3.2).

**Table 3.2: All external causes of hospitalisations in children aged 0–14 years: case counts and proportions by sex; Australia 1997/98**

External cause	E-code range	Males		Females		Children	
		Count	Per cent	Count	Per cent	Count	Per cent
Falls	E880–E888	15,510	37.2%	9,891	39.3%	25,401	38.0%
Other unintentional	E900–E909, E911–E923, E924.1, E925–E929	12,075	29.0%	6,583	26.2%	18,659	27.9%
Transportation	E800–E848	6,736	16.2%	3,264	13.0%	10,000	15.0%
Medical misadventure, etc	E870–E879, E930–E949	2,866	6.9%	1,842	7.3%	4,708	7.0%
Poisoning, pharmaceuticals	E850–E858	1,589	3.8%	1,469	5.8%	3,058	4.6%
Fires/flame/scalds	E890–E899, E924.0, .8, .9	1,186	2.8%	696	2.8%	1,882	2.8%
Poisoning, other substances	E860–E869	772	1.9%	542	2.2%	1,314	2.0%
Intentional, inflicted by another	E960–E978, E990–E999	575	1.4%	333	1.3%	908	1.4%
Intentional, self inflicted	E950–E959	104	0.2%	339	1.3%	443	0.7%
Drowning	E910	239	0.6%	154	0.6%	393	0.6%
Undetermined intent	E980–E989	31	0.1%	23	0.1%	54	0.1%
<b>All external causes</b>	<b>E800–E999</b>	<b>41,683</b>	<b>100%</b>	<b>25,136</b>	<b>100%</b>	<b>66,820<sup>(a)</sup></b>	<b>100%</b>

<sup>(a)</sup> Sex was not reported for one case in the 'Other unintentional' injury category.

### 3.3.2 Profile for children aged 0–14 years

The 25,401 hospitalisations due to falls among children yielded an age-standardised rate of 647.6 per 100,000 population for 1997/98. Nearly two-thirds (n=15,510, 61.1%) of these occurred in males. Males had an age-standardised rate of 770.5 per 100,000 population, whereas the comparable rate for females was 518.5 per 100,000 population.

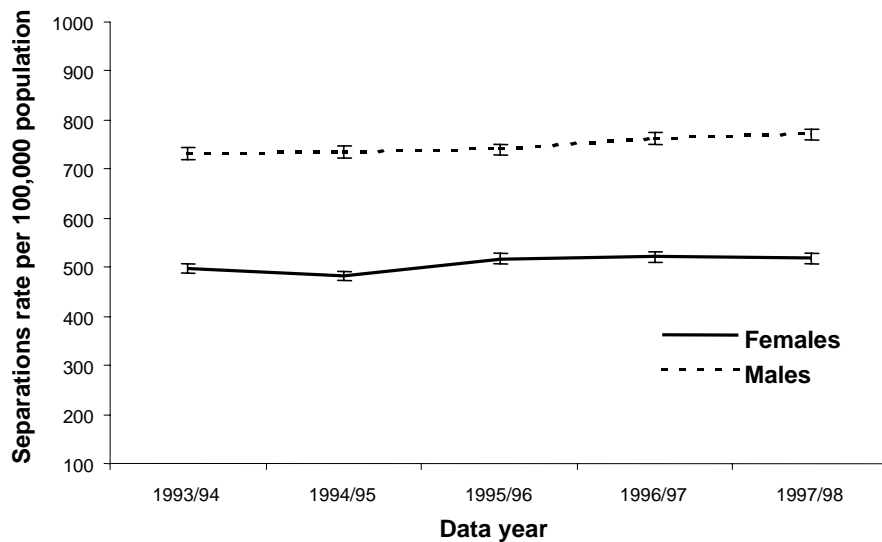
Reasonably complete and reliable national hospital separations data only go back to the financial year 1993/94. Interpretation of trends remains problematic for reasons outlined below.

Case counts have increased from a total of 23,774 in 1993/94 to 25,401 in 1997/98 and hospitalisation rates based on these counts have increased slightly between 1993/94 and 1997/98 (Figure 3.2). For both males and females, the rates for 1996/97 and 1997/98 differed significantly from the rate for 1993/94. The per cent change between 1997/98 and 1993/94 was about 5% for both sexes (Figure 3.2).

Interpretation of these data should be done with caution as it is unclear whether these changes indicate an increase in the incidence rate of fall-related hospitalisations in children. The reasons are:

- Not all hospital separations are new incident cases, i.e. hospital separation cases include repeat admissions and there is no particularly satisfying way to single these out in order to identify incident cases.
- Changes in hospital admission policies may have influenced the reported rates, e.g. it may be that more children are admitted for observation in more recent data years. Little empirical evidence is around to determine what influence such policies had on the data reported here.
- Changes to coding or reporting may also play a role, e.g. there has been an increase in the use of some fall-related E-codes as discussed in later sections. Although we know of one such example, other changes may not be known.

Therefore, more data points and increased knowledge about admission policies and coding practices are needed to interpret trends in hospital separations data in a more meaningful way.



**Figure 3.2: Age-standardised rates for hospitalisations due to accidental falls among children aged 0-14 years by sex; Australia, 1993/94-1997/98**

Error bars indicate 95% confidence intervals for rates based on Poisson distribution.

Figure 3.2 shows that male rates were significantly higher than female rates in all the years shown. In 1997/98, the male to female rate ratio of hospitalisations due to falls among children aged less than 15 years was 1.5. This rate ratio was similar for all the years shown, except for 1995/96 when the male to female rate ratio was 1.4.

The male to female rate ratio for hospitalised children aged 0-14 years (1.5) was lower than the male to female rate ratio for deaths among children for 1998, which was 2.

Although uncertainties about of the data impose limits on the interpretation of recent trends in hospitalisation of children due to falls, two conclusions can be drawn with more confidence:

1. The rate of hospitalisations for fall-related injury in children is about 650 per 100,000 population.
2. There was no large change or steep trend in hospitalisation rates in the period considered.

### 3.3.3 Profiles for age groups 0–4, 5–9 and 10–14 years

Counts and proportions for the three age groups within the 0–14 year age category are presented in Table 3.3. In contrast with deaths (see Table 2.4), both male and female children aged 5–9 years made up the largest proportions of fall-related hospitalisations in 1997/98 (Table 3.3)

**Table 3.3: Hospitalisations due to accidental falls among children aged 0–14 years: case counts and proportions by age group and sex; Australia, 1997/98**

Age group (years)	Males		Females		Children		M:F ratio <sup>(a)</sup>
	Count	Per cent	Count	Per cent	Count	Per cent	
0–4	4,179	26.9%	3,065	31.0%	7,244	28.5%	1.4
5–9	5,895	38.0%	4,433	44.8%	10,328	40.7%	1.3
10–14	5,436	35.1%	2,393	24.2%	7,829	30.8%	2.3
<b>Total</b>	<b>15,510</b>	<b>100%</b>	<b>9,891</b>	<b>100%</b>	<b>25,401</b>	<b>100%</b>	<b>1.6</b>

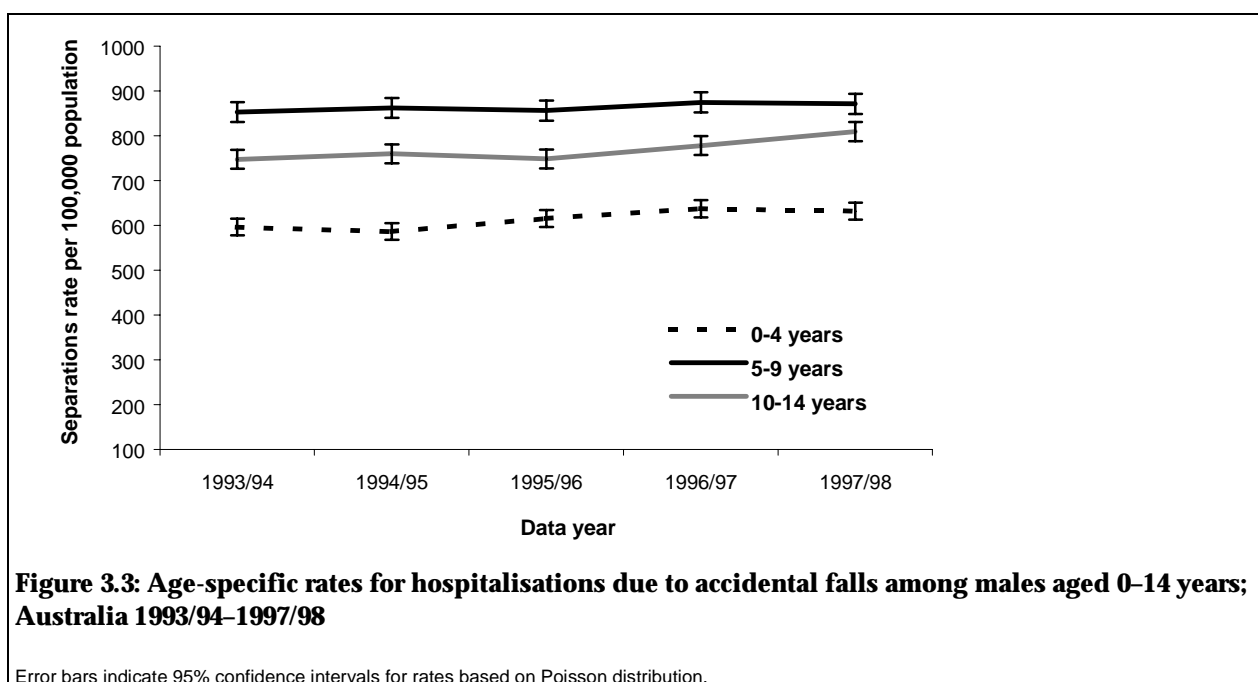
Shaded areas indicate largest proportion or figure.

(a) Male to female ratio was based on case counts.

In 1997/98, the **hospitalisation rate** for boys aged 5–9 years was significantly higher than the rate for males aged 10–14 years (Figure 3.3). Also, the rates for boys aged 0–4 years were significantly lower than the rates for males aged 5–9 years, as well as the cases for those aged 10–14 years. This is different from the death rates discussed in section 2.3.3.

The male rates for the age groups 0–4 and 5–9 years seemed fairly stable for the period considered (Figure 3.3). However, for males aged 10–14 years there seemed to be an increase in the hospitalisation rate since 1995/96. The 1997/98 rate for this age group differed significantly from the rate for 1993/94. Also, for the 5–9 year age group there also seems to be a slight rise since 1995/96 (Figure 3.3).

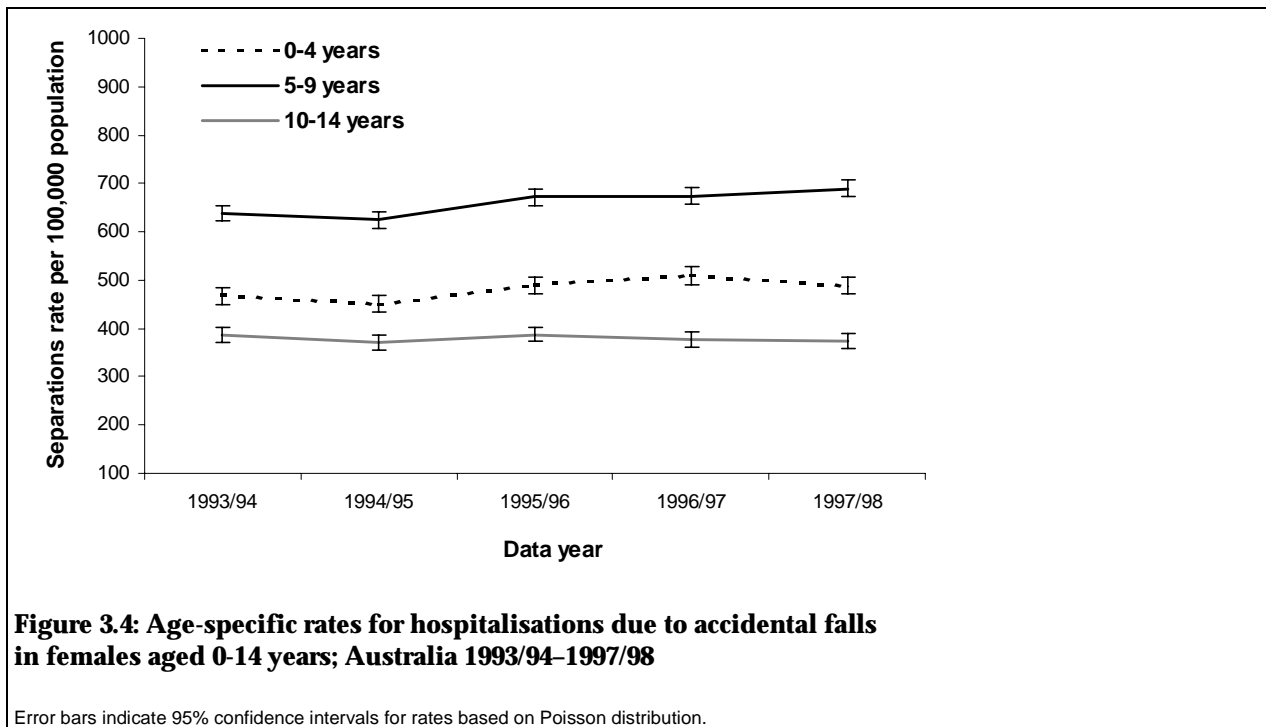
These changes reflect an artefact of the data and is due to the increase in the use of the code E886.0. It is not a true increase in incidence. This is discussed in detail in the Section 3.3.4.



The **female rates** for children aged 0–4, 5–9 and 10–14 years were lower than the rates for males in the same three age groups (compare Figures 3.3 and 3.4). For children aged 0–4 and 5–9 years, the male to female rate ratio was 1:1 for all the data years shown, but for those aged 10–14 years the rate ratio for all five years was 1:4.

For females (as for males), the rates for children aged 5–9 years were also significantly higher than the rates for the other two age groups over the period considered. However, the rates for girls aged 10–14 years was lower than the other two age groups (Figure 3.4).

For females, the rates for the 10–14 year age group appears to be stable (Figure 3.4), whereas there seemed to be slight increases for the other two age groups.



### 3.3.4 Mechanism of fall

ICD-9-CM E-codes E880–E886 give some insight into the circumstances or mechanisms of falls resulting in hospitalisation, whereas E-codes E887 (Fracture, cause unspecified) and E888 (Other and unspecified fall) provide less specific information. In this Section, the term mechanism is used when the circumstances of the injury event are referred to.

In 1997/98, **falls from one level to another (E884)** were the most common mechanism for both males and females aged 0–14 years in 1997/98 (Table 3.4). However, the proportion was somewhat larger for females, i.e. 53% (n=5,243) compared with 46% for males (n=7,128). The male to female ratio for this mechanism overall was 1.4, which is somewhat similar to the overall male to female ratio (1.6).

Table 3.4 shows that **falls on the same level through slipping, tripping or stumbling (E885)** was the second most common mechanism for males and the third most common mechanism for females. This mechanism accounted for a much smaller proportion of hospitalisations for both males and females than falls coded to E884, i.e. around 14% for each sex compared to more than 45% for E884.

**Falls coded to E888** (Other and unspecified falls) made up the third largest proportion of falls for males and the second largest proportion for females - nearly 13% in males and more than 14% in females.

Accidental **falls coded to E887** (Fracture, cause unspecified) accounted for around 6% of the accidental falls among children.

**Falls from or out of buildings (E882)** made up less than 5% of hospital separations for both males and females (Table 3.4) – this is different from deaths where E882 was the second most common mechanism.

The remaining mechanisms (E880, E881, and E883) each accounted for less than 4% of the accidental falls among children.

The male to female ratio for **falls on the same level from collision, pushing or shoving by another person (E886)** was the highest for all fall mechanisms. This was mainly attributable to falls coded to E886.0, i.e. sports-related falls. For this specific mechanism, males outnumbered females 4.3 to 1.

Table 3.4 also indicates that, for both males and females, the largest proportion of **hospitalisations coded to E884** was related to falls from playground equipment (E884.0), i.e. 2,504 cases out of 7,128 for males (35%) and 2,037 out of 5,243 for females (39%). Other falls from one level to another (E884.9) was the second most common mechanism coded to the E884 category for both males and females with 1,802 cases out of 7,128 (25.3%) and 1,159 out of 5,243 (22.1%), respectively. This was followed by falls from a tree (E884.3) for males with 941 cases out of 7,128 (13.2%). The male to female ratio for this mechanism was 2.6, which is different from most of the other mechanisms coded to E884. The other exception in this regard is falls from a cliff (E884.1) where the ratio was 3.0, however, small numbers were involved. For females the third most common mechanism in the E884 category was falls from a trampoline (E884.5), i.e. 593 cases out of 5,243 (11.3%).



**Table 3.4: Mechanisms for hospitalisations due to accidental falls among children aged 0–14 years: case counts and proportions; Australia 1997/98**

Accidental fall mechanism	E-code	Males		Females		Children		M:F ratio (a)
		Count	Per cent	Count	Per cent	Count	Per cent	
Fall on or from stairs or steps (E880)								
On or from escalator	E880.0	13	0.1%	8	0.1%	21	0.1%	1.6
From footpath kerb (b)	E880.1	6	<0.1%	7	0.1%	13	0.1%	0.9
From other stairs or steps	E880.9	404	2.6%	319	3.2%	723	2.8%	1.3
	<i>Subtotal</i>	<i>423</i>	<i>2.7%</i>	<i>334</i>	<i>3.4%</i>	<i>757</i>	<i>3.0%</i>	<i>1.3</i>
Fall on or from ladders or scaffolding (E881)								
From ladder	E881.0	76	0.5%	36	0.4%	112	0.4%	2.1
From scaffolding	E881.1	2	<0.1%	2	<0.1%	4	<0.1%	1.0
	<i>Subtotal</i>	<i>78</i>	<i>0.5%</i>	<i>38</i>	<i>0.4%</i>	<i>116</i>	<i>0.5%</i>	<i>2.1</i>
Fall from or out of building or other structure (E882)								
From building or structure	E882	661	4.3%	310	3.1%	971	3.8%	2.1
	<i>Subtotal</i>	<i>661</i>	<i>4.3%</i>	<i>310</i>	<i>3.1%</i>	<i>971</i>	<i>3.8%</i>	<i>2.1</i>
Fall into hole or other opening in surface (E883)								
From dive or jump into water	E883.0	82	0.5%	52	0.5%	134	0.5%	1.6
Into well	E883.1	2	<0.1%	0	..	2	<0.1%	
Into storm drain or manhole	E883.2	2	<0.1%	2	<0.1%	4	<0.1%	1.0
Into other hole/opening	E883.9	21	0.1%	17	0.2%	38	0.1%	1.2
	<i>Subtotal</i>	<i>107</i>	<i>0.7%</i>	<i>71</i>	<i>0.7%</i>	<i>178</i>	<i>0.7%</i>	<i>1.5</i>
Other fall from one level to another (E884)								
From playground equipment	E884.0	2,504	16.1%	2,037	20.6%	4,541	17.9%	1.2
From cliff	E884.1	30	0.2%	10	0.1%	40	0.2%	3.0
From chair	E884.2	618	4.0%	554	5.6%	1,172	4.6%	1.1
From tree (b)	E884.3	943	6.1%	362	3.7%	1,305	5.1%	2.6
Involving bed (b)	E884.4	636	4.1%	515	5.2%	1,151	4.5%	1.2
From trampoline (b)	E884.5	569	3.7%	593	6.0%	1,162	4.6%	1.0
Involving wheelchair (b)	E884.6	21	0.1%	12	0.1%	33	0.1%	1.8
Involving commode (b)	E884.7	5	<0.1%	4	<0.1%	9	<0.1%	1.3
Other	E884.9	1,802	11.6%	1,156	11.7%	2,958	11.6%	1.6
	<i>Subtotal</i>	<i>7,128</i>	<i>46.0%</i>	<i>5,243</i>	<i>53.0%</i>	<i>12,371</i>	<i>48.7%</i>	<i>1.4</i>
Fall on same level from slipping, tripping or stumbling (E885)								
Fall on same level	E885	2,185	14.1%	1,391	14.1%	3,576	14.1%	1.6
	<i>Subtotal</i>	<i>2,185</i>	<i>14.1%</i>	<i>1,391</i>	<i>14.1%</i>	<i>3,576</i>	<i>14.1%</i>	<i>1.6</i>
Fall on same level from collision, pushing, or shoving by or with other person: (E886)								
In sports	E886.0	1,674	10.8%	393	4.0%	2,067	8.1%	4.3
Other and unspecified	E886.9	273	1.8%	161	1.6%	434	1.7%	1.7
	<i>Subtotal</i>	<i>1,947</i>	<i>12.6%</i>	<i>554</i>	<i>5.6%</i>	<i>2,501</i>	<i>9.8%</i>	<i>3.5</i>
Fracture, cause unspecified								
Fracture, cause unspecified	E887	1,004	6.5%	531	5.4%	1,535	6.0%	1.9
	<i>Subtotal</i>	<i>1,004</i>	<i>6.5%</i>	<i>531</i>	<i>5.4%</i>	<i>1,535</i>	<i>6.0%</i>	<i>1.9</i>
Other and unspecified fall (E888)								
Other & unspecified fall	E888	1,977	12.7%	1,418	14.3%	3,395	13.4%	1.4
	<i>Subtotal</i>	<i>1,977</i>	<i>12.7%</i>	<i>1,418</i>	<i>14.3%</i>	<i>3,395</i>	<i>13.4%</i>	<i>1.4</i>
<b>Total of all accidental falls</b>	<b>E880–888</b>	<b>15,510</b>	<b>100%</b>	<b>9,891 (c)</b>	<b>100%</b>	<b>25,401 (c)</b>	<b>100%</b>	<b>1.6</b>

(a) Male to female ratio based on case counts.

(b) These categories were not available before 1996/97.

(c) 4<sup>th</sup>-digit E-code was not reported for one case.

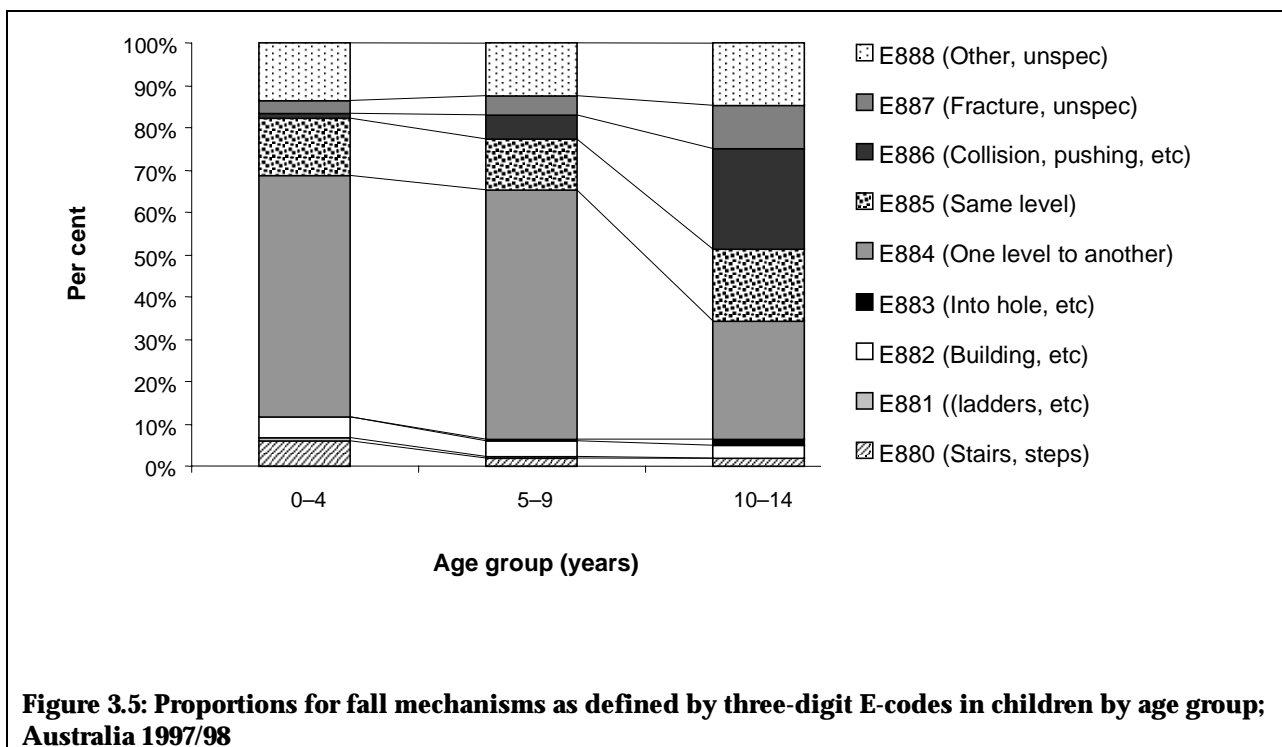
There were differences in regard to mechanisms for the **three five-year age groups** within the 0–14 year age category and these are shown in Figure 3.5. The data for the two sexes are presented together on this page.

Falls from one level to another (E884) made up just less than 60% for both the 0–4 and 5–9 year olds (Figure 3.5). In the 10–14 year olds, the proportion of falls coded to E884 was about half that at 28%. Falls on same level from slipping, tripping or stumbling (E885) accounted for notable proportions in all three age groups, especially for the 10–14 year olds.

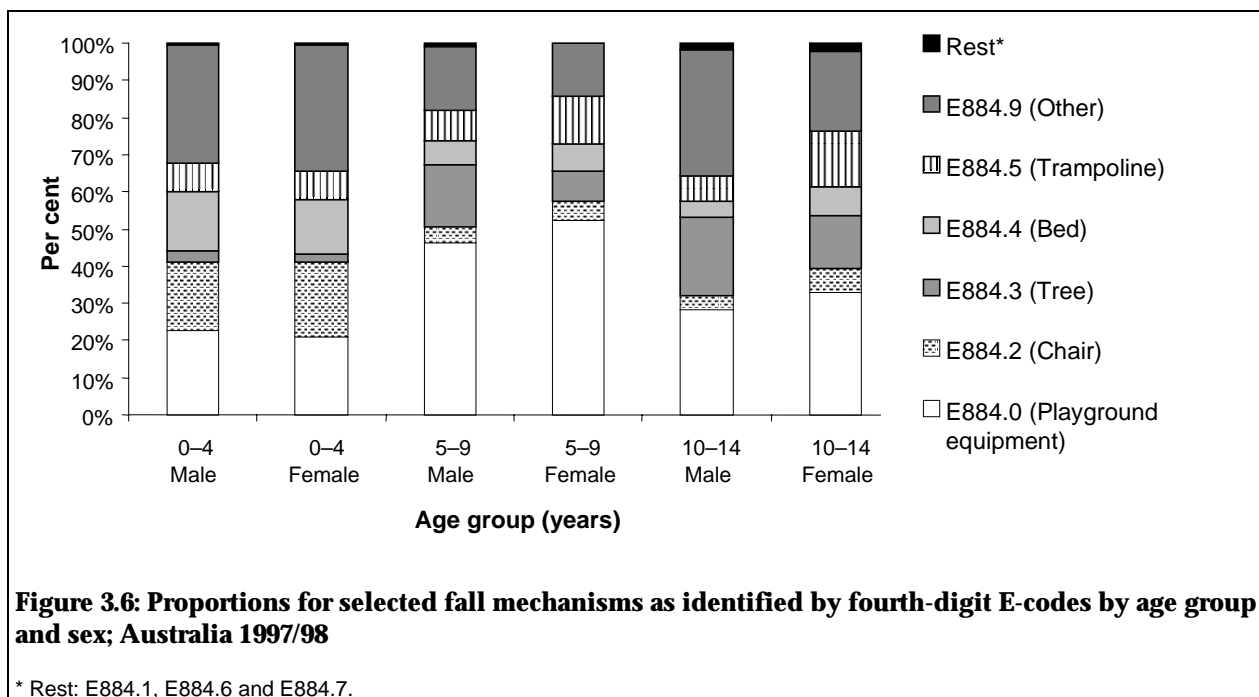
For the 10–14 year olds, cases coded to E886 (fall on same level from collision, pushing, or shoving by or with other person) nearly accounted for a similar proportion (24%) of separations than cases coded to E884.

The proportion of cases coded to E887 (Fracture, cause unspecified) increased with age, i.e. from a proportion of about 3% for children aged 0–4 years to 10% in those aged 10–14 years. This also holds for cases coded to E886.

Cases coded to E888 (other and unspecified falls) made up similar proportions for all three age groups.



As shown in Table 3.4 and Figure 3.5, **cases coded to E884** made up the largest proportions of falls for both male and female children aged 0–14 years. These cases are shown in Figure 3.6.



**Figure 3.6: Proportions for selected fall mechanisms as identified by fourth-digit E-codes by age group and sex; Australia 1997/98**

For children aged **0–4 years**, the proportions of different E884 mechanisms were similar for boys and girls (Figure 3.6). For around one-third of children aged 0–4 years, little insight into the mechanism is available as the cases were coded to E884.9, i.e. other falls from one level to another. Falls from playground equipment (E884.0) was the most common specified E884 mechanism for boys and girls aged 0–4 years - for both sexes the proportion was about 22% (Figure 3.6). This was followed by falls from chairs (E884.2) - 18.2% for boys and 20.2% for girls.

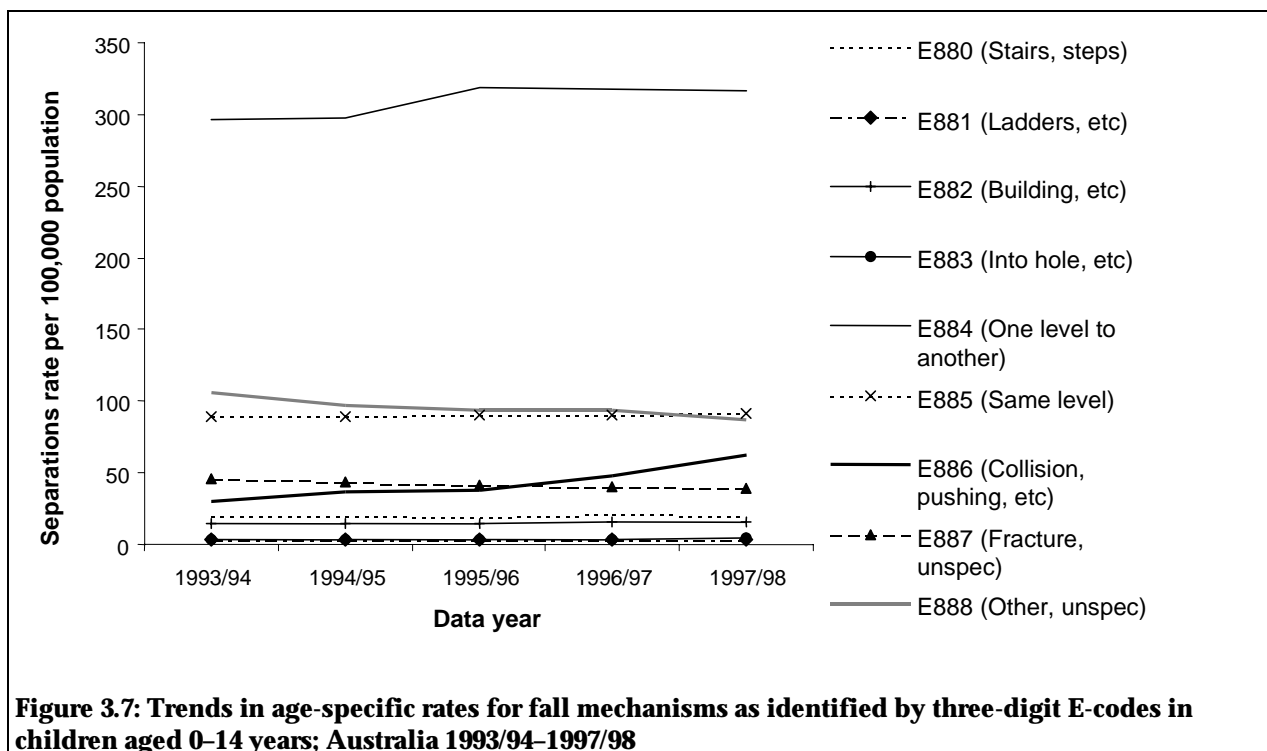
The profile of mechanisms coded to E884 for children aged **5–9 years** was different from the profile for 0–4 year olds and there were also differences between males and females aged 5–9 years. For boys, falls from playground equipment (E884.0) made up more than 46% of falls among the 5–9 year age group, but the proportion of this mechanism for girls was even higher at nearly 53% (Figure 3.6). Falls from trees (E884.3) made up 16.8% of falls for 5–9 year old boys, compared to 8.2% for girls of the same age. Falls from a trampoline (E884.5) accounted for 12.8% of falls among girls aged 5–9 years, compared with 7.8% for boys in the same age group (Figure 3.6).

Compared with children aged 0–4 and 5–9 years, the E884 category made up a much smaller proportion of all falls for children aged **10–14 years**. Also, as for the 5–9 year age group, the profile for males and females differed. For 10–14 year old males about one-third of cases were coded to E884.9, whereas the proportion for females of the same age group was about 22%. The largest specified mechanism for males was falls from playground equipment (E884.0), i.e. 28.5% - which is much lower than the comparable proportion for males aged 5–9 years (46.3%). For females aged 10–14 years, falls coded to E884.0 accounted for the largest proportion of all E884 mechanisms (32.9%). This was followed by falls from trampolines (E884.5) for females at 14.9%. For males falls from trees (E884.3) accounted for about one in five of cases coded to E884 (Figure 3.6).

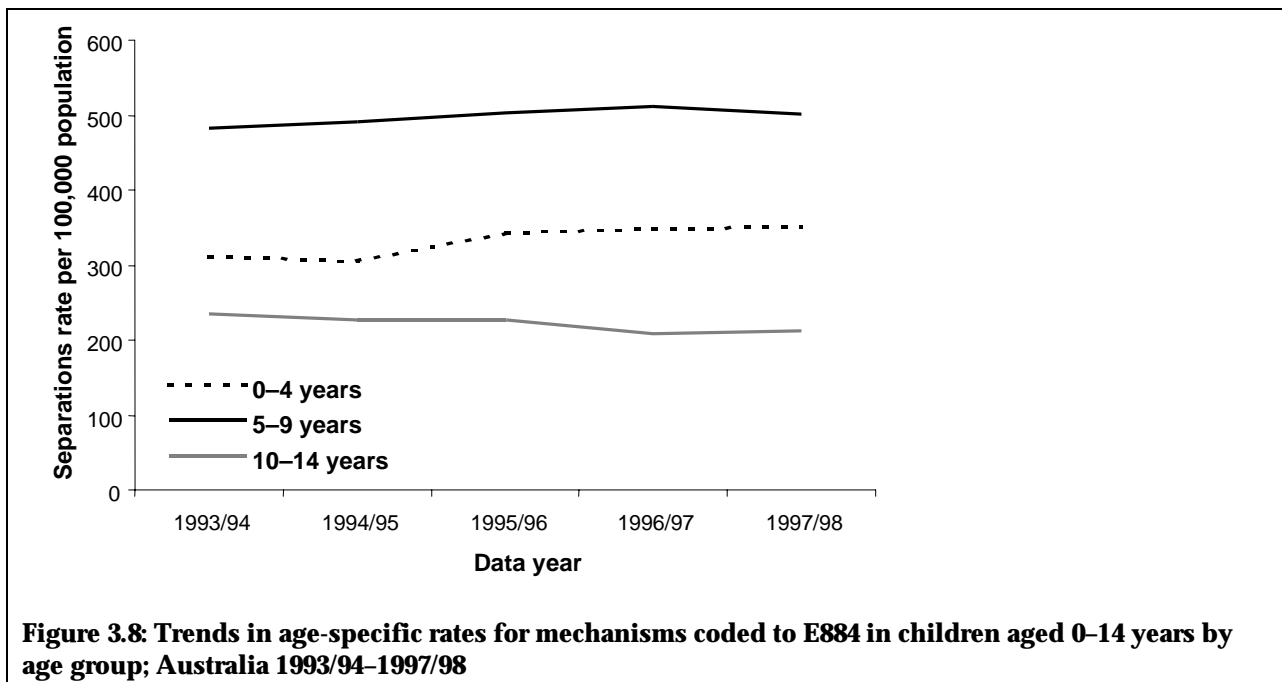
**Trends for mechanisms** are presented for children aged 0–14 years, considering males and females together in Figure 3.7. For most of the mechanisms, rates appeared to be fairly stable over the period shown (Figure 3.7). The exceptions are falls coded to E884, E886 and E888. These are discussed below.

Figure 3.7 shows a decline in the rate for cases coded to E888 (Other and unspecified fall), but this may be an artefact of the data — as coders became more knowledgeable, they may have used this more general code less.

The rate for cases coded to E884 (fall from one level to another) has increased between 1994/95 and 1995/96 whereafter it seemed to remain stable (Figure 3.7). The rates for these cases are also much higher than the rates for the other mechanisms in all the years shown.



**Rates for E884** are shown for the three five-year age groups in Figure 3.8. Children aged 0–4 years had high rates of falls coded to E884, but the rates for children aged 5–9 were higher still, whereas the rate for those aged 10–14 years were much lower than both these other rates (Figure 3.8). The rates appear fairly stable, although there was an increase between 1994/95 and 1995/96 for children aged 0–4 years and a possible slight decrease for children aged 10–14 years.



For **falls coded to E886** (fall on same level from collision, pushing, or shoving by or with other person), the rate increased between 1993/94 and 1997/98 (please refer back to Figure 3.7). This is, however, an artefact of the data and is due to a particular coding practice in regard to the code E886.0 (fall on same level from collision, pushing, or shoving by or with other person: in sports).

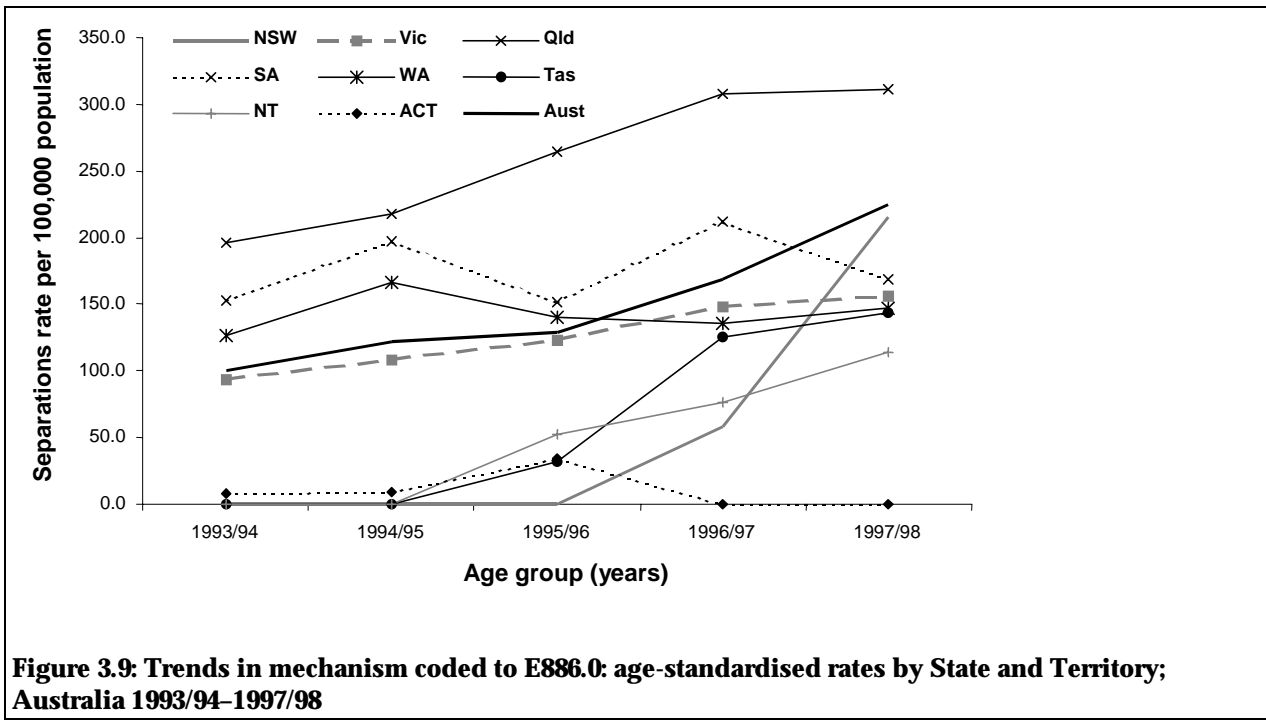
Prior to 1 July 1996, NSW Health had developed a unique coding system to enable identification of sports injuries to overcome the lack of specificity inherent in the sports-related codes of ICD-9-CM. A new coding scheme was, therefore, implemented and hospitals coded sports-related injuries to the improvised codes.

The result was that few cases were coded to the official ICD-9-CM sports-related codes (i.e. E886.0 and E917.0) for the 1993/94 to 1995/96 period. The second Australian version of ICD-9-CM was introduced in July 1996 and this version had improved sports-related codes. Analysis of the data from the year 1996/97 indicated that NSW sporting injuries have appeared in the previously unused codes E886.0 and E917.0 – in this Report, we only discuss the E886.0 codes.

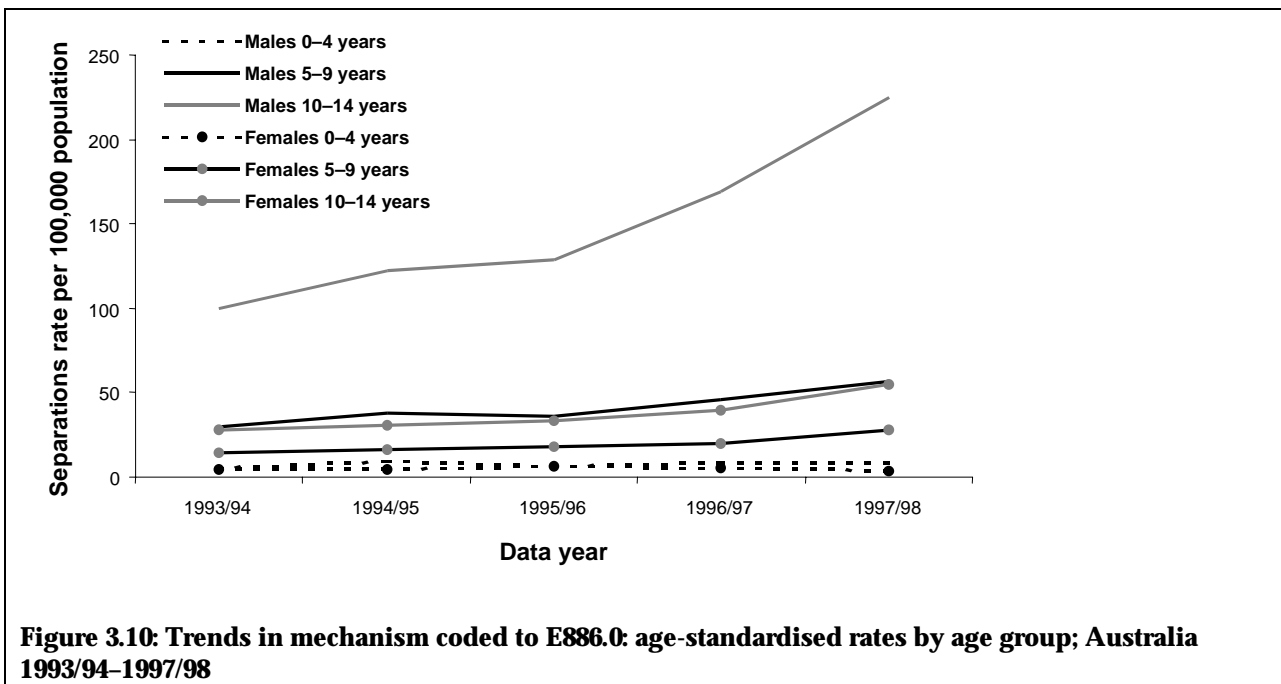
Analysis showed that there were no cases (relevant to this Report) coded to E886.0 in NSW prior to 1996/97. In 1996/97, there were 35 cases for NSW and in 1997/98 the total increased to 136. Figure 3.9 reflects the resulting age-standardised rates for NSW.

Rates for NT and Tasmania seemed to mirror the NSW trend to some extent (Figure 3.9). However, the unique coding system developed by NSW was not used in these jurisdictions. It may be that growing familiarity with the codes contributed to the increases in these two jurisdictions.

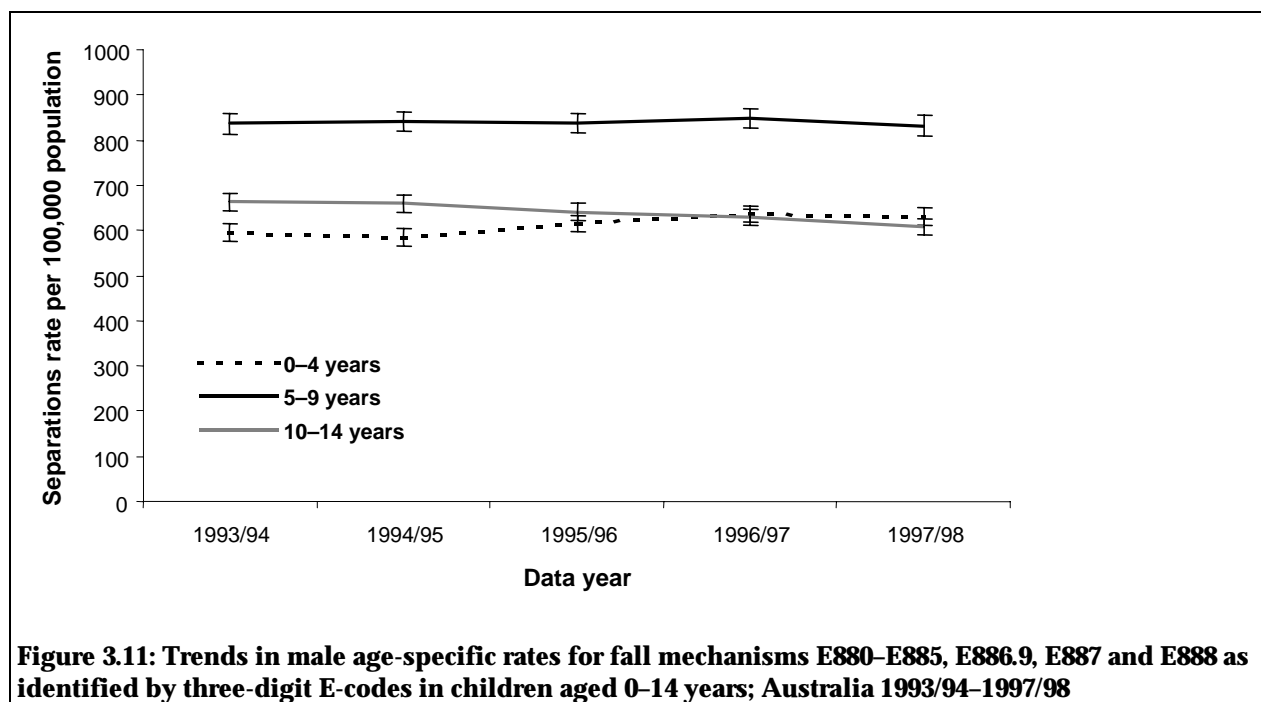
Both Queensland and Victoria showed increased rates (Figure 3.9), but these may reflect true increases in hospitalisations due to E886.0, or it may also be that coders were becoming more familiar with the codes. Rates for the other jurisdictions were more stable (Figure 3.9).



Analysis has also shown that the NSW coding practice seemed to affect the male 10–14 year age group more than the others, although some effect was also seen for the male 5–9 year age group (Figure 3.10).



The increase in overall numbers for sports-related fall injuries (please refer back to Figure 3.7) is mostly an artefact of the specific coding practice in NSW, although there were some increases in rates for some jurisdictions (see Figure 3.9). These factors have implications for the overall male rates. Figure 3.11 shows the effect of excluding E886.0 from calculating the age-specific rates for males in Australia. That is, instead of the apparent increase in rates for males aged 10–14 years (see Figure 3.3), the rate for this male age group actually showed a decrease over the period shown (Figure 3.11).



**Figure 3.11: Trends in male age-specific rates for fall mechanisms E880–E885, E886.9, E887 and E888 as identified by three-digit E-codes in children aged 0–14 years; Australia 1993/94–1997/98**

### 3.3.5 Place of occurrence

Table 3.5 summarises the place of occurrence for fall-related hospitalisations in children. Cases from SA were excluded due to problems in reporting the ‘Place of occurrence’ data item (see Section 3.5).

In 1997/98, ‘Other/unspecified place’ was reported for a large number of cases (n=10,512, 45.8%) and the proportion was higher for older children (Table 3.5). This may be due to a lack of information in case notes.

For cases where the place of occurrence was specified, home (including yard) was the most common location where injury occurred for children aged 0–14 years with over 26% (n=6,171) of these hospitalisations recorded in 1997/98. A further 14.8% was reported as having occurred in a place of recreation or sports.

The pattern of place of occurrence varied by age group - this reflects the changes in activities and exposures as children grow and mature.

In children aged 0–4 years about 50% of fall-related injuries occurred at home. For children aged 5–9 years the proportion was less than half that at 21.9%, with the proportion for those aged 10–14 years lower still at 11.9% (Table 3.5).

The proportion of hospitalised falls among 10–14 year olds that occurred in places of recreation and sport (24.2%) was about five times the comparable proportion for children aged 0–4 years (4.5%), whereas the proportion for those aged 5–9 years was 14.7% (Table 3.5).

Hospitalisations in the 5–9 year age group from falls in public buildings (which includes schools) were higher than the 0–4 and 10–14 year age groups (Table 3.5). This may, at least partly, be attributed to falls during school playground activities. (For all children, falls from playground equipment accounted for about 4,500 hospitalisations (Table 3.4) and 66% (n=2,981) were in 5–9 year old children.)

Other places of occurrence such as farm, mine and quarry, street/highway, and residential institution accounted for less than 3% of cases for all three age groups.

**Table 3.5: Place of occurrence of accidental fall resulting in hospitalisation in children aged 0–14 years: case counts and proportions by age group; Australia 1997/98 (excluding SA)**

Place of occurrence	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Home	3,278	49.9%	2,054	21.9%	839	11.9%	6,171	26.9%
Farm	17	0.3%	24	0.3%	19	0.3%	60	0.3%
Mine and quarry	1	<0.1%	3	<0.1%	5	0.1%	9	<0.1%
Industrial place	12	0.2%	15	0.2%	11	0.2%	38	0.2%
Place recreation/sport	315	4.8%	1,381	14.7%	1,703	24.2%	3,399	14.8%
Street/highway	35	0.5%	48	0.5%	88	1.3%	171	0.7%
Public building	344	5.2%	1,273	13.6%	832	11.8%	2,449	10.7%
Residential institution	52	0.8%	57	0.6%	54	0.8%	163	0.7%
Other/not specified	2,513	38.3%	4,526	48.2%	3,473	49.4%	10,512	45.8%
<b>All places</b>	<b>6,567</b>	<b>100%</b>	<b>9,381</b>	<b>100%</b>	<b>7,024</b>	<b>100%</b>	<b>22,972<sup>(a)</sup></b>	<b>100%</b>

Shaded areas indicate aspects of interest.

(a) 537 cases where place was not specified and another 1,892 South Australia cases were not included because of problems with the data.

### 3.3.6 Body region involved

The nature of injuries due to falls among children for 1997/98 are summarised by body region in Table 3.6. This section is based on the 'Principal Diagnosis' recorded for each separation. For purposes of convenience these data are presented together for the sexes, but differences are highlighted in the text.

In children aged 0–14 years, injuries to the upper limb and shoulder region were the most common body region injured in accidental falls, representing nearly two-thirds of the cases. One in four of the injuries diagnosed was associated with the head and face (Table 3.6). However, there were differences between the age groups.

In children aged 0–4 years, injuries to the head and face were reported in almost half the cases, and more than one-third was to the upper limb and shoulder region (Table 3.6). Injuries to these two body regions accounted for 84% (n=6,115 cases) of the cases diagnosed. The injury pattern for this group was similar in both sexes.

Head and face injuries decreased with increasing age from a high of 3,535 cases in the 0–4 year age group to 1,618 cases in the 5–9 and 1,222 cases in the 10–14 year age group, a decrease of 54% and 65%, respectively.



Injuries to the upper limb and shoulder region were most often diagnosed in age groups 5–9 and 10–14 years. In the 5–9 year age group, they accounted for more than 70% of the injuries diagnosed and for more than 62% in the 10–14 year age group (Table 3.6). In general, females proportionally had a slightly higher number of injuries diagnosed for this body region than males.

Injury to the lower limb and pelvic region, although proportionally low in age groups 0–4 and 5–9 years, were the third most commonly injured region in children aged 10–14 years (Table 3.6). Injuries to this region were proportionally higher in females than in males.

Injuries diagnosed for body region neck and trunk were low in both males and females at all ages.

**Table 3.6: Fall-related injuries diagnosed in children aged 0–14 years: case counts and proportions by body region and sex; Australia 1997/98**

Body region injured	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Head and face	3,535	48.8%	1,618	15.7%	1,222	15.6%	6,375	25.1%
Neck and trunk	41	0.6%	111	1.1%	148	1.9%	300	1.2%
Upper limb and shoulder region	2,580	35.6%	7,662	74.2%	4,923	62.9%	15,165	59.7%
Lower limb and pelvic region	722	10.0%	655	6.3%	1,169	14.9%	2,546	10.0%
Injuries not specified by body region	366	5.1%	282	2.7%	367	4.7%	1,015	4.0%
<b>Total</b>	<b>7,244</b>	<b>100</b>	<b>10,328</b>	<b>100</b>	<b>7,829</b>	<b>100</b>	<b>25,401</b>	<b>100</b>

Shaded areas indicate aspects of interest.

### 3.3.7 Principal diagnosis

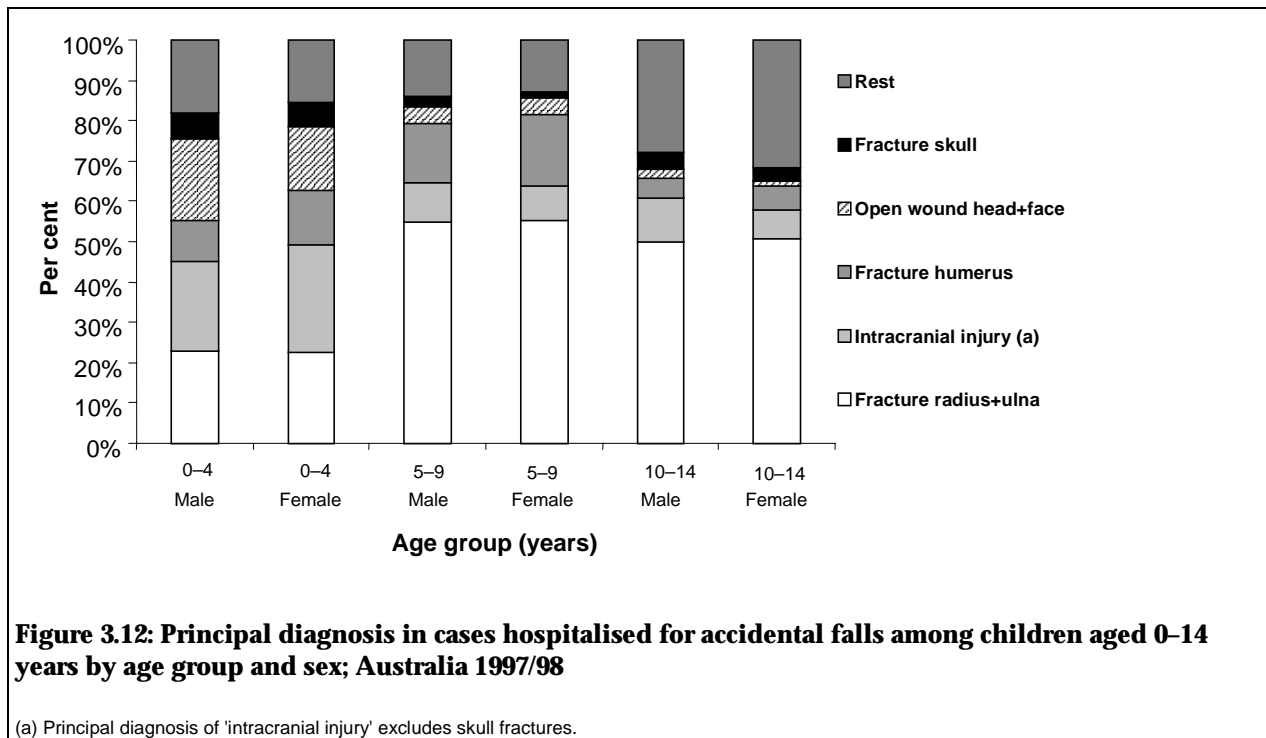
In 1997/98, fracture of the radius and ulna (ICD-9-CM Nature of injury code 813) accounted for 44.3% of all fall-related separations in children aged 0–14 years. This was followed by intracranial injury, excluding skull fracture (850–854) with 13.7%; fracture of the humerus (812) with 11.3%; open wound of head and face (870–873) with 7.5%; and fracture of the skull (800–804) with 3.9%. These five principal diagnoses, therefore, made up about 80% of all the principal diagnoses for children aged 0–14 years who were admitted to hospital. These five are discussed in more detail further below. Information on the other principal diagnoses is provided in Appendix A2.

There were differences between the age groups and sex in regard to the principal diagnosis of injury sustained (Figure 3.12).

At 0–4 years of age, proportions for fracture of the radius and ulna (about 22%) and skull fracture (around 6%) were similar in both sexes (Figure 3.12). Proportions of open wounds to the face and head were larger for boys (20.2%) than for girls in this age group (15.6%), whereas proportions of intracranial injury (excluding skull fracture) and fracture of the humerus were larger in girls aged 0–4 years, i.e. 26.8% and 13.3%, respectively for girls, compared to 22.3% and 10.0% for boys (Figure 3.12).

Proportions of radius and ulna fractures were largest in both boys and girls aged 5–9 years, i.e. around 55% for both sexes (Figure 3.12). For this age group, there were few differences between males and females in the profile of proportions for the principal diagnoses. Compared with the other two age groups, fractures of the humerus made up a notable proportion of diagnoses in children aged 5–9 years; i.e. 14.6% for males and 17.7% for females.

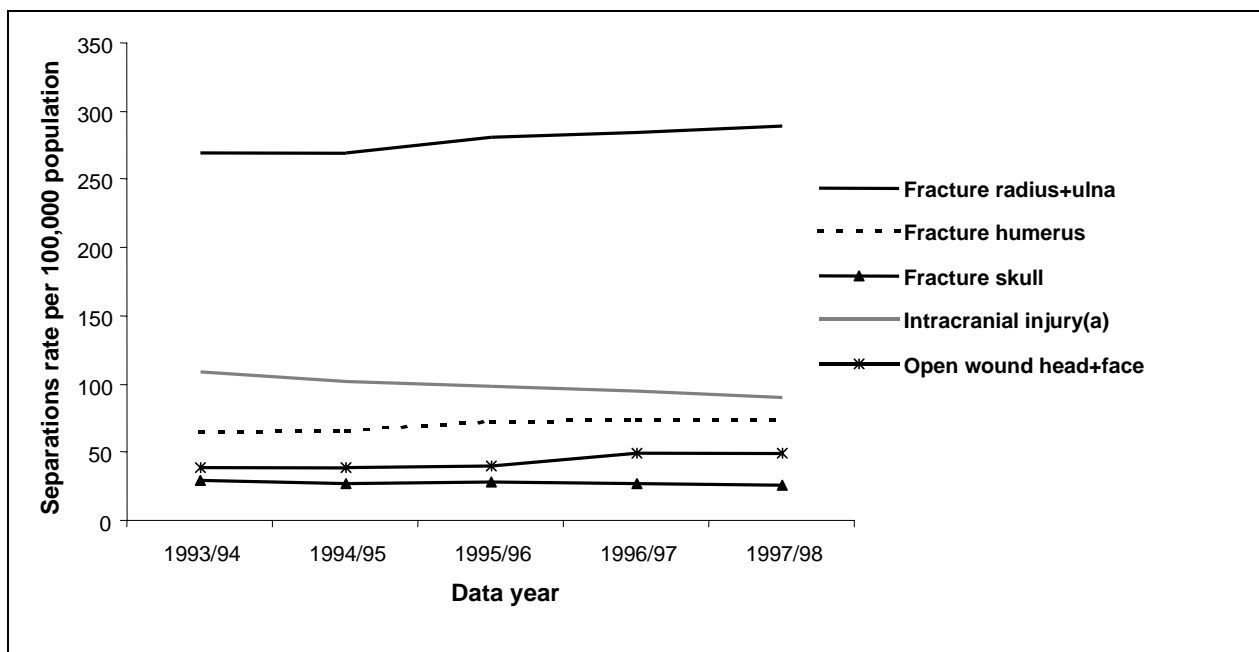
For children aged 10–14 years, fractures of the radius and ulna made up about 50% for both males and females (Figure 3.12). Proportions of intracranial injury, humerus fractures, skull fractures and open wounds to head and face were much smaller for the 10–14 year olds than for the two younger age groups. Other types of diagnoses made up roughly 30% of injuries to children aged 10–14 years.



**Rates for the five most common principal diagnoses** for the period 1993/94 to 1997/98 are shown in Figure 3.13. Analysis indicated that the trends for the principal diagnoses were similar for males and females aged 0–14 years and data are not presented by sex.

The rates for fractures of the radius and ulna were highest of all the rates for principal diagnoses (Figure 3.13). Also, rates for fractures of the radius and ulna have increased significantly by 8% over the years considered. Again, caution should be used in interpreting these rates, especially in regard to the discussion about the use of E886.0 in a previous section. (When E886 was excluded from the calculation of the age standardised rate for children aged 0–14 years, the rate still showed an increase, but the difference was not statistically significant.)

Rates for fractures of the humerus and fractures of the skull also showed an increase, while intracranial injury showed a decrease (Figure 3.13). Rates for open wounds to the head and face seemed more stable.



**Figure 3.13: Principal diagnosis in cases hospitalised for accidental falls among children aged 0–14 years by age group and sex; Australia 1997/98**

(a) Principal diagnosis of 'intracranial injury' excludes skull fractures.

### 3.3.8 Length of stay

The burden that childhood falls place on the health care system can be estimated by the total number of hospital bed days consumed, i.e. the length of stay (LOS). LOS is also a proxy measure for severity. However, the calculation of LOS due to injury events is not straightforward.

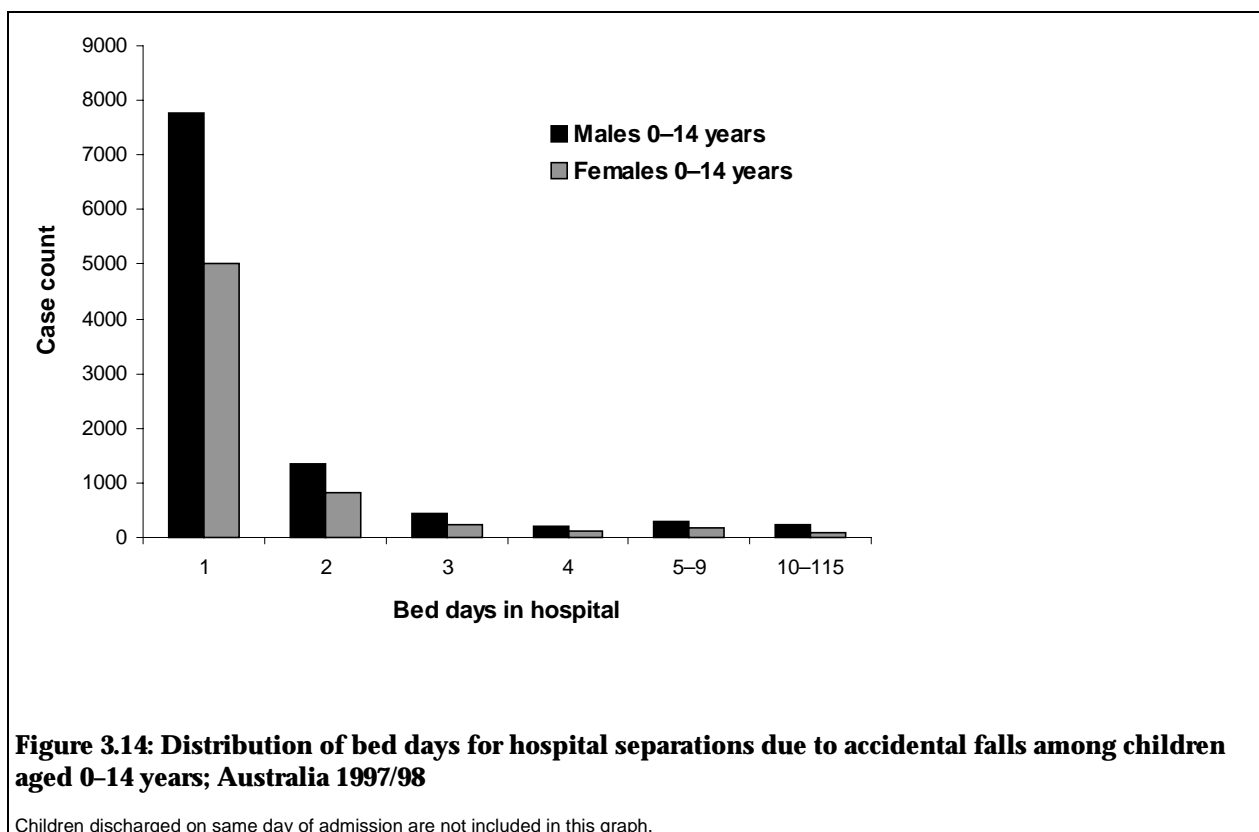
The first episode of care for an incident case will start with admission to a hospital bed. A particular case may be transferred to another hospital and each hospital only records the number of days the particular patient spent in their facility. To determine the total number of bed days for a particular case, the LOS needs to be added across hospitals. Also, some cases may be readmitted for further episodes of care related to a particular injury. This LOS should also be added in order to calculate the total LOS for particular incident cases. There is no case linkage across hospitals or the possibility of identifying readmitted cases on a national scale and the LOS cannot be determined for individual cases.<sup>3</sup> These factors have the effect that the data understates long-term stay and overstates short stay. A way to address this is unknown at this stage.

The data presented below represents an aggregated estimate of LOS as the LOS for all separations having a relevant diagnosis code and E-code are added. This includes separations of incident cases, readmissions and transfers.

In 1997/98, the 25,401 accidental falls among children aged 0–14 years resulted in a total of 39,254 bed days, i.e. an average LOS of 1.5 days. For 40% (n=8,633) of these separations, discharge occurred on the same day of admission.

<sup>3</sup> There are some areas such as WA where data linkage is possible.

Of the remaining cases, most of the children admitted had a short stay with about 70% (n=21,988) of the separations occurring one day or less after admission (Figure 3.14). This short stay in hospital for a large proportion of children indicated that most injuries were not serious, but it should be kept in mind that the LOS in hospitalisations data overstates short stay.



Of the children for whom discharge did not occur on the same day as admission, 10.8% (n=1,815) had a **stay of three days or more** (Figure 3.14). Nearly 70% of these children sustained fractures to the lower limb (40.1%) or the upper limb (29.2%) (Table 3.7). Another 13% of cases had some head injury, i.e. either fractures of the skull (8.2%) or an intracranial injury (4.6%).

There were differences between the age groups in regard to types of injuries sustained (Table 3.7). More children aged 10-14 years sustained fractures of the lower limb than younger children. The proportion for fractures of the upper limb were similar for age groups 5-9 years and 10-14 years. For both groups of head injury (i.e. skull fractures and intracranial injury), about half of the cases were to children aged 0-4 years (Table 3.7).

**Table 3.7: Principal diagnosis group for hospitalised children with a LOS of three days or more, by age group; Australia 1997/98**

Principal diagnoses (Chapter 17 groups)	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Row per cent	Count	Row per cent	Count	Row per cent	Count	Column per cent
Fracture of lower limb	263	36.2%	147	20.2%	317	43.6%	727	40.1%
Fracture of upper limb	71	13.4%	235	44.3%	224	42.3%	530	29.2%
Fracture of skull	72	48.3%	40	26.8%	37	24.8%	149	8.2%
Intracranial injury	42	50.6%	23	27.7%	18	21.7%	83	4.6%
Internal injury of chest/abdomen/pelvis	5	6.7%	38	50.7%	32	42.7%	75	4.1%
Open wound lower limb	4	8.3%	17	35.4%	27	56.3%	48	2.6%
Fracture of neck & Trunk	6	12.8%	11	23.4%	30	63.8%	47	2.6%
Open wound head/neck/trunk	11	34.4%	13	40.6%	8	25.0%	32	1.8%
Contusion with intact skin	16	50.0%	4	12.5%	12	37.5%	32	1.8%
Certain Traumatic comp. & unspec injuries	3	10.0%	8	26.7%	19	63.3%	30	1.7%
Dislocation	5	17.2%	7	24.1%	17	58.6%	29	1.6%
Sprains & strains	0	..	2	15.4%	11	84.6%	13	0.7%
Open wound upper limb	0	..	5	50.0%	5	50.0%	10	0.6%
Superficial injury	1	20.0%	1	20.0%	3	60.0%	5	0.3%
Injury nerves & spinal cord	0	..	0	..	3	100.0%	3	0.2%
Comp. of surgical & medical care	0	..	1	50.0%	1	50.0%	2	0.1%
<b>Total</b>	<b>499</b>	<b>27.5%</b>	<b>552</b>	<b>30.4%</b>	<b>764</b>	<b>42.1%</b>	<b>1,815</b>	<b>100%</b>

Shaded areas indicate aspects of interest.

**Certain principal diagnoses** resulted in a significant health burden among hospitalised cases — the diagnoses that resulted in the ten highest LOS totals (Table 3.8), accounted for more than 90% of the total LOS for all children admitted with fall-related injury.

As stated previously, fractures of the radius and ulna made up more than 44% (n=11,265) of the case numbers of children aged 0–14 years who were hospitalised with fall-related injury. This diagnosis group also accounted for the largest LOS total, even though the average LOS per case was less than 0.8 days.

Fractures of other or unspecified parts of the femur only made up 2.1% of total LOS for all fall-related cases (n=528), but these types of injuries resulted in the second largest LOS total, as well as the highest average LOS (10.6 days) (Table 3.8). Fractures of the neck of femur resulted in the second longest average LOS (8.7 days) (Table 3.8).

Intracranial injury, excluding skull fractures, (n=3,481) and skull fractures (n=992) together accounted for nearly 18% of fall-related hospitalisations, which resulted in a total LOS of 5,268. The average LOS for intracranial injury (excluding skull fractures) was 0.8. This may be because many younger children with suspected head injury are admitted for observation purposes only and these cases are mostly discharged because no serious outcomes eventuated.

**Table 3.8: Selected principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex and ranked by length of stay; Australia 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 code	Males				Females				Children			
		Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS
Fracture of radius and ulna	813	6,901	44.5	5,957	0.9	4,364	44.1	3,531	0.8	11,265	44.3	9,488	0.8
Fracture of other/ unspec. parts of femur	821	370	2.4	4,186	11.3	158	1.6	1,386	8.8	528	2.1	5,572	10.6
Fracture of humerus	812	1,540	9.9	2,077	1.3	1,337	13.5	1,728	1.3	2,877	11.3	3,805	1.3
Intracranial injury excl. skull fracture	850–854	2,114	13.6	1,650	0.8	1,367	13.8	965	0.7	3,481	13.7	2,615	0.8
Fracture of the skull	800–804	657	4.2	1,015	1.5	335	3.4	638	1.9	992	3.9	1,653	1.7
Fracture of tibia and fibula	823	448	2.9	997	2.2	191	1.9	374	2	639	2.5	1,371	2.1
Fracture of ankle	824	353	2.3	627	1.8	249	2.5	435	1.7	602	2.4	1,062	1.8
Open wound of head and face	870–873	1,209	7.8	500	0.4	693	7	280	0.4	1,902	7.5	780	0.4
Fracture neck of femur	820	41	0.3	355	8.7	31	0.3	273	8.8	72	0.3	628	8.7
Injury to other and unspec. internal organs	862–869	81	0.5	440	5.4	30	0.3	136	4.5	111	0.4	576	5.2
Contusion with intact skin surface	920–924	236	1.5	223	0.9	176	1.8	192	1.1	412	1.6	415	1
Remainder of principal diagnoses		1,560	10.1%	1,664	1.1	960	9.7%	990	1.1	2,520	9.9%	2,654	1.1
<b>All principal diagnoses</b>		<b>15,510</b>	<b>100%</b>	<b>19,691</b>	<b>1.3</b>	<b>9,891</b>	<b>100%</b>	<b>10,928</b>	<b>1.1</b>	<b>25,401</b>	<b>100%</b>	<b>30,619</b>	<b>1.2</b>

### 3.3.9 Procedures performed

Procedures recorded for each separation were based on the ‘Principal Procedure’ associated with the ‘Principal Diagnosis’ and are tabulated in Table 3.9.

In 1997/98, about 27% of all children aged 0–14 years admitted to a hospital for a fall-related injury did not have any procedures done (Table 3.8). A higher proportion of children aged 0–4 years did not have a procedure done during their stay than children aged 5–9 or 10–14 years, i.e. about 40% of those aged 0–4 years, compared with around 22% for both the two older age groups. This may be because younger children were more often admitted for observation than older children (Table 3.8).

**Table 3.9: Principal procedures performed for hospitalisations due to accidental falls: case counts and proportions by age group; Australia 1997/98**

Principal procedure	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Operations on the musculoskeletal system	2,298	31.7%	6,888	66.7%	4,991	63.8%	14,177	55.8%
No principal procedure code reported	2,834	39.1%	2,173	21.0%	1,765	22.5%	6,772	26.7%
Miscellaneous procedures	784	10.8%	558	5.4%	503	6.4%	1,845	7.3%
Operations on nose, mouth, and pharynx	654	9.0%	207	2.0%	265	3.4%	1,126	4.4%
Operations on the integumentary system <sup>(a)</sup>	472	6.5%	372	3.6%	245	3.1%	1,089	4.3%
Operations on the eye	101	1.4%	35	0.3%	11	0.1%	147	0.6%
Operations on the female genital organs	24	0.3%	37	0.4%	11	0.1%	72	0.3%
Operations on the nervous system	29	0.4%	19	0.2%	17	0.2%	65	0.3%
Operations on the ear	22	0.3%	13	0.1%	6	0.1%	41	0.2%
Operations on the male genital organs	15	0.2%	9	0.1%	6	0.1%	30	0.1%
Operations on the digestive system	3	<0.1%	7	0.1%	3	<0.1%	13	0.1%
Operations on the urinary system	2	<0.1%	3	<0.1%	4	0.1%	9	<0.1%
Operations on the cardiovascular system	5	0.1%	2	<0.1%	1	<0.1%	8	<0.1%
Operations on the respiratory system	1	<0.1%	3	<0.1%	0	..	4	<0.1%
Operations on the haemic and lymphatic system	0	..	2	<0.1%	1	<0.1%	3	<0.1%
<b>Group Total</b>	<b>7,244</b>	<b>100%</b>	<b>10,328</b>	<b>100</b>	<b>7,829</b>	<b>100</b>	<b>25,401</b>	<b>100</b>

(a) Relating to the skin and its appendages, including hair and nails.

### 3.3.10 Separation Mode

Mode of separation for children aged less than 15 years admitted because of accidental falls are summarised for the financial year 1997/98 in Table 3.11. Nearly 95% of children were discharged to their usual residence. Only four of the hospitalised children died. (Please note that these separations exclude those cases that died shortly after arrival at hospital, i.e. before they were admitted.)

**Table 3.10: Mode of separation for children aged 0–14 years admitted because of accidental falls; Australia 1997/98**

Mode of separation	Count	Per cent
Other – usual residence	24,026	94.6%
Discharge/transfer to an(other) acute hospital	1,292	5.1%
Discharge at own risk	38	0.1%
Statistical discharge from leave	16	0.1%
Discharge/transfer to a nursing home	2	<0.1%
Discharge/transfer to other health care accommodation	10	<0.1%
Statistical discharge - type change	4	<0.1%
Died	4	<0.1%
Not reported	9	<0.1%
<b>Total</b>	<b>25,401</b>	<b>100%</b>

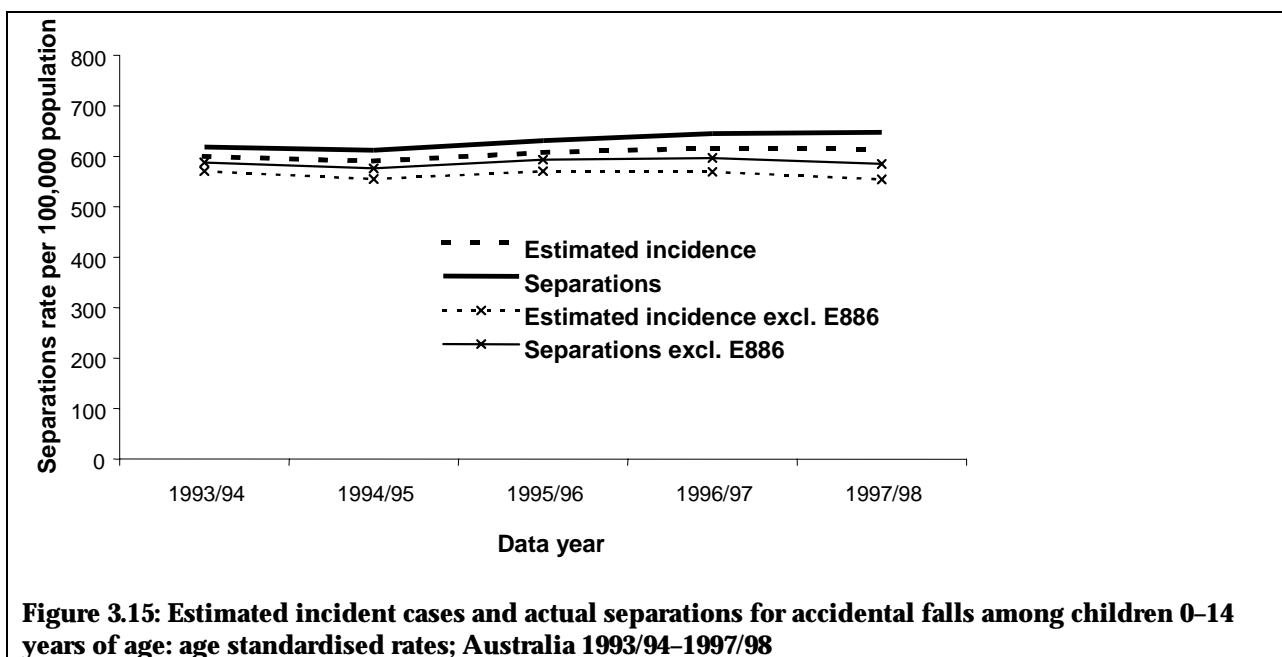
For the purposes of national statistics, the incidence of new injury cases is of particular interest. Data on cases admitted to a hospital can provide some insight, but current morbidity data have particular characteristics that limit the potential of determining injury incidence.

'Separations' are not equivalent to newly incident cases that result in hospitalisation. This is because some incident cases result in more than one separation. National hospital statistics do not presently provide a direct means to account for such multiple counting. A partial means is provided by the data element 'Mode of Separation'. Separations recorded as being to another acute care hospital can be expected to result in another separation, i.e. from the destination hospital. Similarly, statistical separations are followed by another episode of care in the same hospital, and another separation. The omission of such cases is a way to obtain an estimate of newly incident cases. Limitations of this method for estimating incidence of fall-related injury are that it does not allow for cases in which subsequent episodes of care in hospital follow separation to usual residence. It may also over-correct if the record of the subsequent episode of care is coded differently to the initial episode (e.g. if the first-occurring external cause code is in the falls range for the initial separation but not for subsequent ones).

The method described above was used in this Report to calculate estimated incident cases during the period 1993/94–1997/98 (Figure 3.15). As expected, the average estimated incident rate was about 4% lower than the average separation rate.

During the data period considered, the change in rate of separations due to accidental falls injury in children was quite low, with lowest rates occurring in financial year 1994/95 and highest rate in 1997/98. A similar pattern was observed in estimated incidence cases up until 1996/97 after which the rate seemed more stable (Figure 3.15).

When E886 (Fall on same level from collision, pushing or shoving, by or with other person) was excluded to account for the difference in coding practice of NSW coders who did not include sports injuries in E886.0 during the period prior to 1996/97, the pattern of rates for both estimated incidence cases and separations was similar. The difference in average rates remained about the same as the rates calculated with E886 cases included (Figure 3.15).

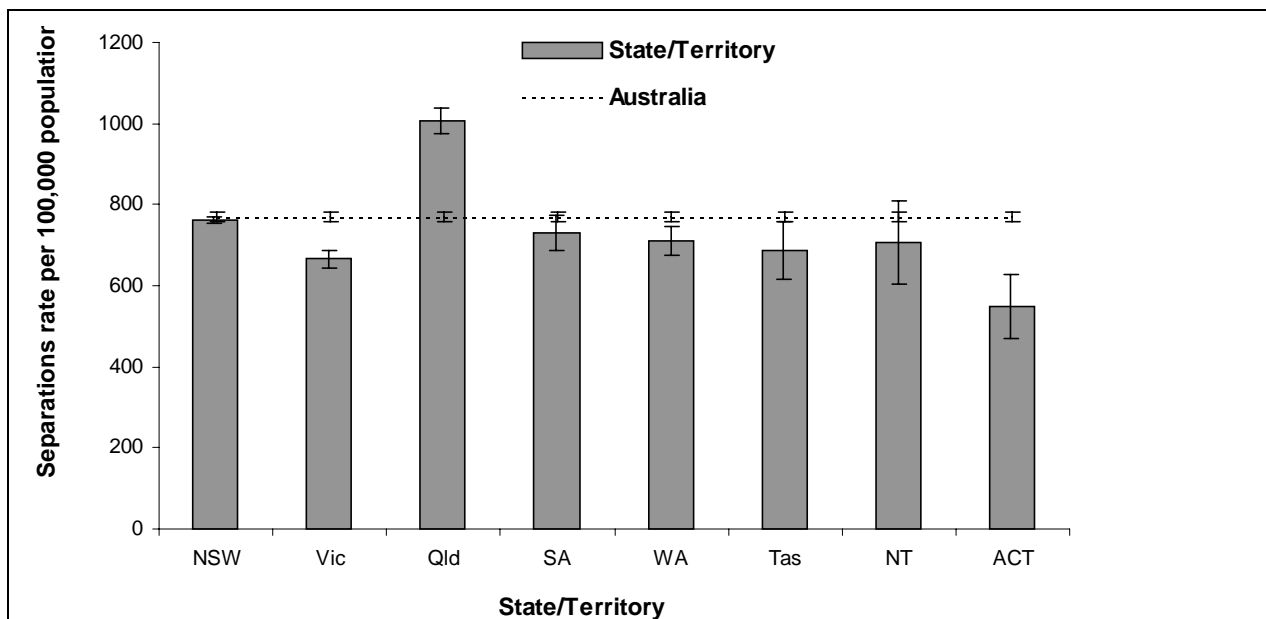




This leads one to conclude that an estimate of the incidence of injury due to accidental falls by children based on hospital separations is not seriously distorted by multiple counting of cases resulting in more than one separation from a hospital. However, the possible effect of differences in admission practices remain unknown.

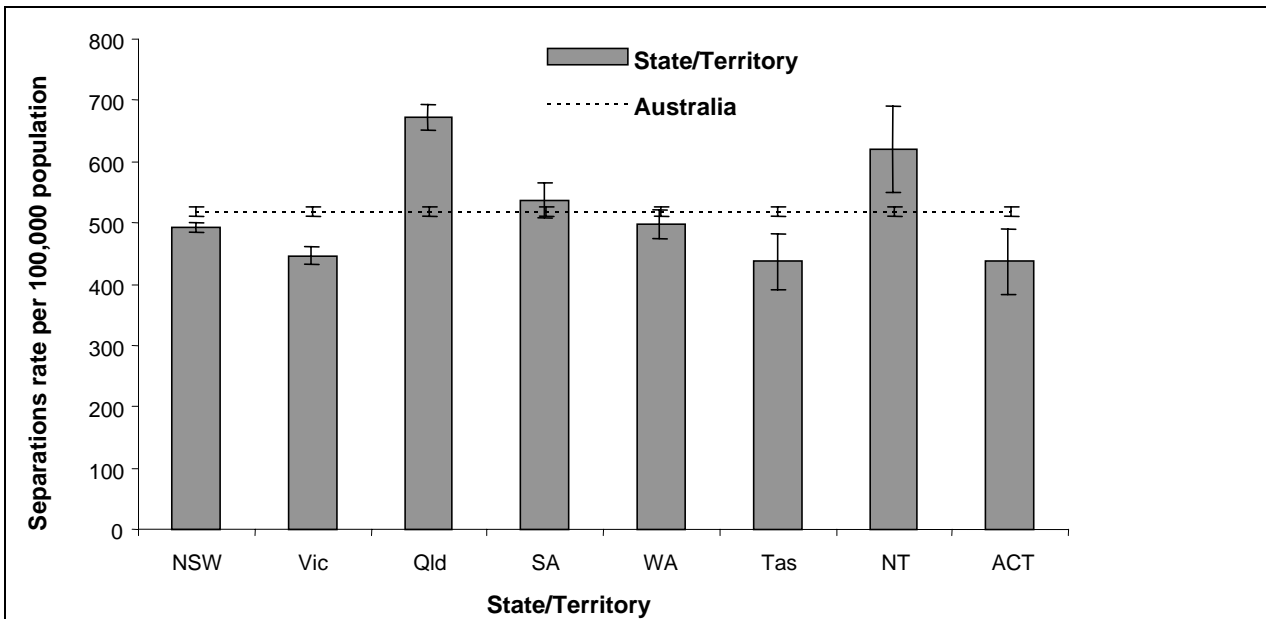
### 3.3.11 States and Territories

For **males** aged 0–14 years, Queensland had a separations rate due to accidental falls that was significantly higher than the rate for Australia in 1997/98. Victoria, Western Australia and ACT had rates significantly lower than the national average for the same year (Figure 3.16).



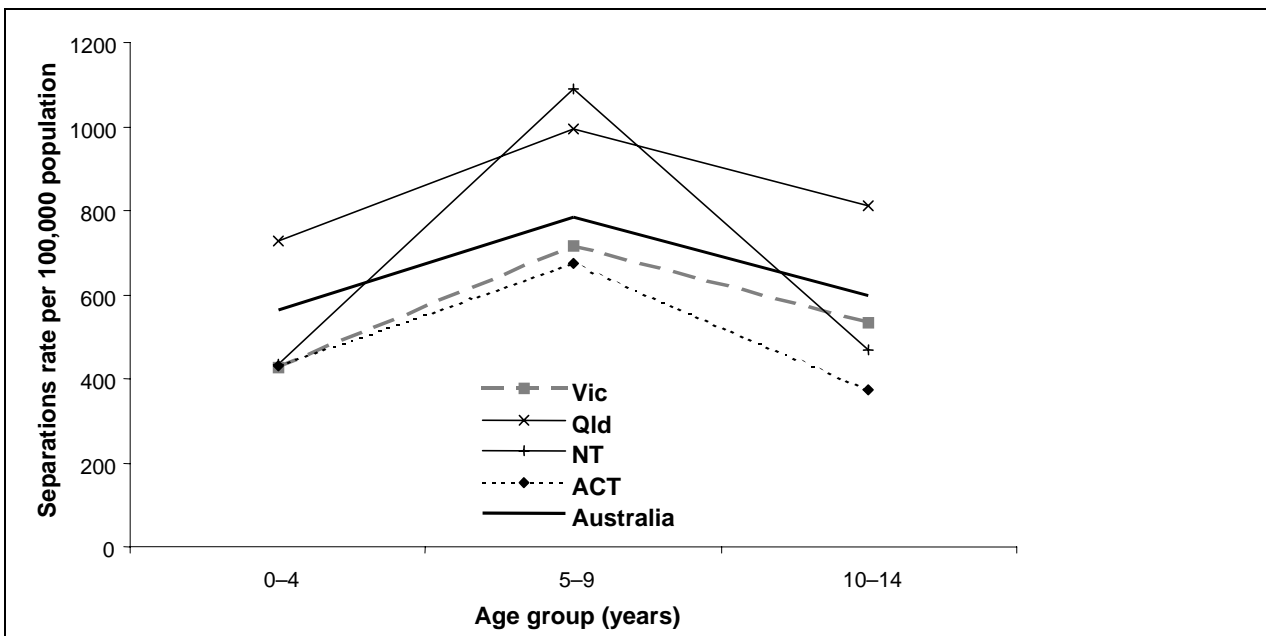
**Figure 3.16: Hospitalisations due to accidental falls among males aged 0–14 years by State or Territory of residence; Australia 1997/98**

In **females** aged less than 15 years, both Queensland, NT and SA had rates that were higher than the national average, but only the rate of Queensland was significantly different. Victoria and Tasmania had rates that were significantly lower than the national rate (Figure 3.17).



**Figure 3.17: Hospitalisations due to accidental falls among females aged 0-14 years by State or Territory of residence; Australia 1997/98**

An examination of the **three five-year age groups** within the 0-14 year range indicated that the rate for the 5-9 years age group was highest for all States and Territories and rates for the 0-4 year and 10-14 year olds were similar (Figure 3.18). For individual States, the rate for Queensland was highest for all three age groups, except for NT which had the highest rate for the 5-9 year olds. ACT had the lowest rates of separations for all three age groups (Figure 3.18).

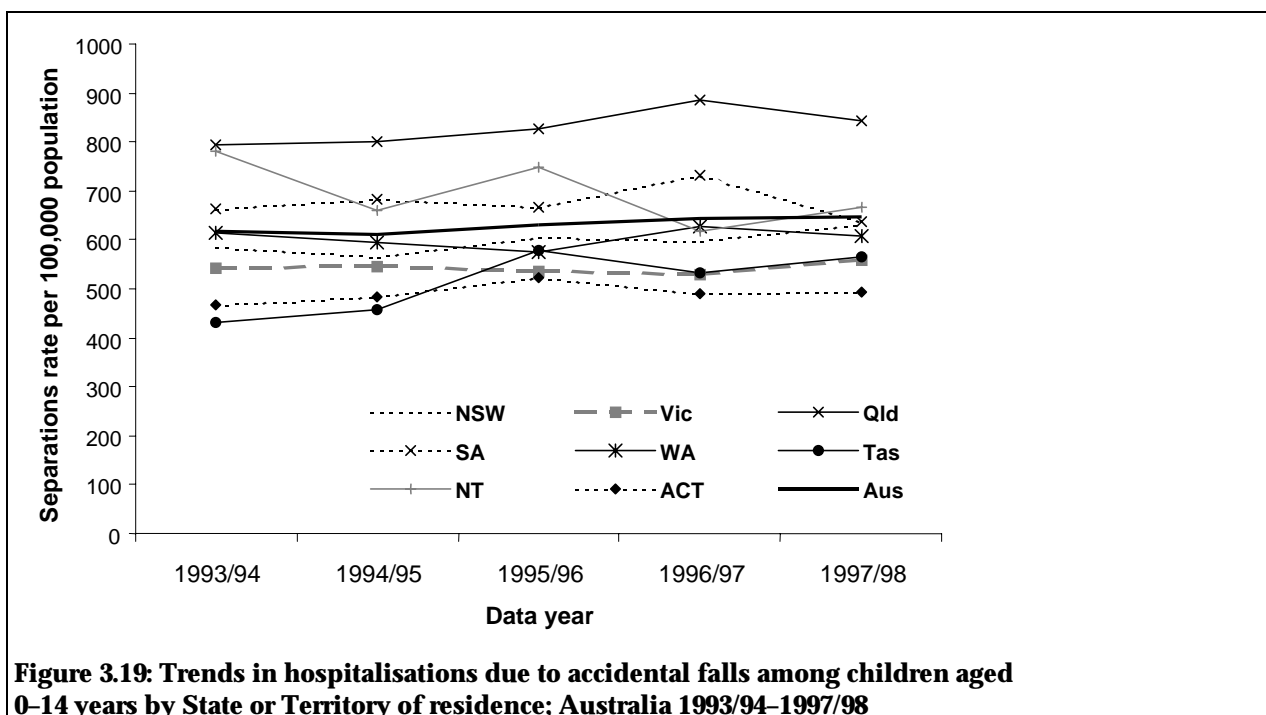


**Figure 3.18: Hospitalisations due to accidental falls among children aged 0-14 years by State or Territory of residence and by age group; Australia 1997/98**

**Trends over time** show that the rate for Queensland was highest in all data years, and seemed to increase in the period shown. ACT also showed an increase. The rate for NT seemed to have decreased. For the other jurisdictions, the rates were fairly stable (Figure 3.19).

Specific reasons why Queensland have rates higher than the national average are unknown. As are the reasons why Victoria have lower rates. However, these findings are in keeping with injury rates in general. That is, Queensland tend to have higher rates than the national average and Victoria lower rates for other types of injuries as well (Bordeaux and Harrison 1998). The differences in rates may reflect real differences in incidence, differences in admission practices, or a combination of both.

It should be noted that, as for other types of injuries, similarities between States and Territories are more striking than differences. Also, longer-term trends are more likely to be meaningful than short-term fluctuations, especially for smaller jurisdictions. These changes do not necessarily reflect incidence of injury. Also, small numbers have markedly influenced jurisdictions with small populations.



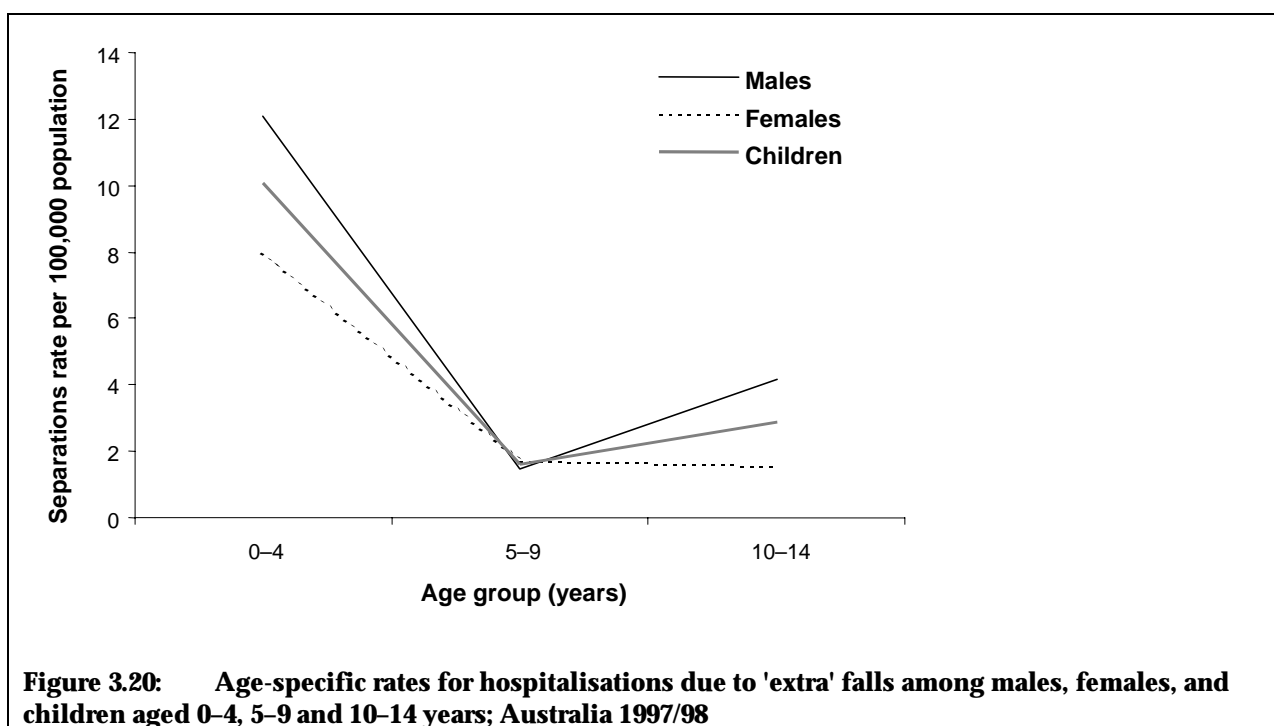
**Figure 3.19: Trends in hospitalisations due to accidental falls among children aged 0–14 years by State or Territory of residence; Australia 1993/94–1997/98**

### 3.4 'Extra' falls in children

As stated in section 3.2, there are some 'extra' E-codes that identify fall-related cases in addition to those coded to E880–E888.<sup>4</sup> These E-codes are E804, E833–E835, E843, E929.3, E957, E968.1, and E987. Cases coded to these made up less than 1% of all fall-related hospitalisations in children (refer to Table 3.1).

In 1997/98, there were 189 hospitalisations due to these 'extra' falls at ages 0–14 years. Of these, 62.3% were to males. The age-standardised rate was 4.9 per 100,000 population for all children aged 0–14 years, and 5.9 per 100,000 population for males and 3.8 for females.

In 1997/98, the rates for children aged 0–4 years was higher than the rates for children aged 5 years and older and this was the case for both males and females (Figure 3.20).



For both males and females, most of the 'extra' falls were coded to E910.6 or E910.7 (i.e. drowning and submersion following fall into swimming pool or into natural water). The majority by far was in the 0–4 year age group (Table 3.12 – see shaded cells).

<sup>4</sup> Please note that the falls described in this Section do not include falls from horses, falls from motorcycles or falls from bicycles. These types of falls are coded to E-codes where it is not possible to distinguish between injury resulting from falls and injury resulting from other mechanisms.

**Table 3.11: Number of hospitalisations in children coded to 'extra' fall codes, Australia 1997/98**

External cause	E-code	Males			Females		
		0-4	5-9	10-14	0-4	5-9	10-14
Fall in, on or from railway train	E804		1	3			1
Fall on stairs or ladders in water transport	E833	1			1	2	
Other fall from one level to another in water transport	E834	2	1	6	3	2	
Other and unspecified fall in water transport	E835	2		6	2	1	3
Drowning and submersion after fall into swimming pool	E910.6	60	2	3	37	2	3
Drowning and submersion after fall into natural water	E910.7	13	2	4	6	2	
Late effects of accidental fall	E929.3	1	2	3	1	2	1
Suicide and self-inflicted injuries by jumping from high place	E957			1			
Assault by pushing from a high place	E968.1		1				
Falling from high place, undetermined whether accidentally/not	E987	1	1	2			2
<b>Total number of 'extra' fall-related hospitalisations</b>		<b>80</b>	<b>10</b>	<b>28</b>	<b>50</b>	<b>11</b>	<b>10</b>

Shaded areas indicate aspects of interest.

For the period 1993/94–1997/98, a total of 570 hospitalisations were coded to these 'extra' fall codes (Table 3.13) see shaded areas. There was a change between 1995/96 and 1996/97, as the E-codes E910.6 and E910.7 were only introduced in 1996/97.

**Table 3.12: Case counts of 'extra' falls; Australia 1993/94–1997/98**

Data year	Males (age group in years)				Females (age group in years)			
	0-4	5-9	10-14	0-14	0-4	5-9	10-14	0-14
93/94	6	10	18	34	5	6	18	29
94/95	8	16	19	43	7	9	10	26
95/96	5	14	17	36	4	5	18	27
96/97	84	16	30	130	43	6	7	56
97/98	80	10	28	118	50	11	10	71

Shaded areas indicate aspects of interest.

## 3.5 Data issues

### 3.5.1 Data sources

The data on hospital separations were provided by the AIHW (Australian Institute of Health and Welfare 1999). NISU processed, checked and combined the relevant data years to facilitate analysis including assessment of trends.

Population data were obtained from the Australian Institute of Health and Welfare and are similar to data presented in the Demographic Statistics Catalogue No. 3101.0 (Australian Bureau of Statistics). Rates were calculated using final population estimates as at 31 December of the relevant years.

### 3.5.2 Confidence intervals

All (or nearly all) separations are included, so sampling errors do not apply to these data. However, the time periods used to group the cases (i.e. financial years) are arbitrary. Use of another period (e.g. January to December) would result in different rates. Where case numbers are small, the effect of chance variation on rates can be large. The 95% confidence intervals of these rates are based on a Poisson assumption about the number of cases in a time period. Therefore, chance variation alone would be expected to lead to a rate outside the 95% confidence interval on only 5% of occasions.

### 3.5.3 Selection criteria

The selection criteria were discussed in Section 3.2. In short, the principal diagnosis was Chapter 17 'Injury and Poisoning' and the first appearing E-codes were selected E804, E833–E835, E843, E880–E888, E910.6, E910.7, E929.3, E957, E968.1, and E987. Accidental falls (External cause codes E880–E888) were chosen in accordance with recommendations set out on page 101 of the *1997 National Health Priority Areas Report: Injury Prevention and Control*, printed in 1998. The 'extra' fall E-codes were included at the request of DHAC. Other important issues are highlighted below.

The data source allows for more than one E-code to be recorded. For purposes of this Report, the 'main' E-code was not used. Instead, the 'first appearing' E-code for accidental falls (E880–E888) and 'extra' falls (E804, E833–E835, E843, E910.6, E910.7, E929.3, E957, E968.1, and E987) were used in order to have comparable data between jurisdictions. This was necessary because, for one State, E-codes did not appear in the 'main' E-code field for some years, but there were E-codes recorded in the first E-code field of additional E-codes.

### 3.5.4 Hospitalised cases vs other cases

Only some injuries from falls result in admission to a hospital. Hence, cases which rapidly result in death are not included. Also, the large number of cases that result in a visit to a general practitioner or to an emergency department, but do not get admitted to a hospital, are excluded, as is the still larger group of cases that do not result in a visit to a medical service at all. In general, cases admitted to a hospital are serious, or require observation because they might be serious, or require particular forms of treatment.

### 3.5.5 Errors, inconsistencies and uncertainty in the data

The data used for this report were abstracted from medical records in hundreds of hospitals and coded and entered by a large number of people, operating in distinct State and Territory hospital systems over a period of five years or longer and further processed by the AIHW and NISU. Consequently, and despite the existence of a well defined National Minimum Data Set for hospital inpatient data, variations occur in the data, between places and over time. The following data issues are relevant to this project:

- The quality of External Cause and Place coding in Australian hospital in-patient collections remains uncertain. They have been the subject of few published studies, and they are not necessary for deriving Diagnosis Related Groups and other key outputs of the data source.
- The change in the use of sports codes had a major influence of data regarding falls among children (as discussed in section 3.3.4).
- As stated earlier, not all hospital separations are new incident cases, i.e. hospitalisations include repeat admissions and transfers between acute hospitals.
- Changes in hospital admission policies may have influenced these rates, as might changes to coding or reporting of data.
- There is limited scope of the ICD requirement to apply a 'Place' code to injury and poisoning cases. Rules originating with ICD-9 and retained in ICD-9-CM (including its Australian editions) specify use of a place code only if the accompanying External Cause code is in the range E850–E869 and E880–E928. This changed with the introduction of ICD-10-AM.
- There is an inconsistency in coding of 'Place = farm' in SA. The number of separations in SA where Place = 1 (the value meaning 'farm' according to the ICD) rose about four-fold from 1994/95 to 1995/96, and remained high in the following two years. Internal evidence in the data suggests that use of the values '0' and '1' was reversed for some hospitals in this period. Consequently, SA data were omitted from relevant parts of the analysis.

### 3.5.6 Length of stay

Length of stay (LOS) and average length of stay (ALOS) in this document are based on differences between the dates recorded in the 'DateOut' and 'DateIn' data fields. Based on previous years' work, values calculated in this manner, when compared with correct length of stay reported in some years, are about 0.5% greater due probably to 'hospital leave days'.

### 3.5.7 Calculation of rates

Rates have been adjusted for age to overcome the effect of differences in the proportions of people of different ages (and different injury risks) in the populations that are compared. Direct standardisation was employed, taking the Australian population in 1991 as the standard. Changes in age composition are small within narrow age bands (e.g. 15–19 years) and adjustment has not been applied to 5-year age groups. Where crude rates are reported these are referred to as age-specific rates.

### 3.5.8 Usefulness of hospital separations data for surveillance

Hospital separations seem to be more useful for describing the **extent** of childhood fall-related injury than deaths data. This is largely because large case numbers of hospitalised fall-related injury are recorded annually. For example, in 1997/98 more than 25,000 children were recorded in the NHMD.

The role of hospitalisations data in regard to ongoing **monitoring** are somewhat problematic at the current time. The reasons for this are:

- The case definition of fall-related injury among children is not independent of services and case outcomes. Although this seems to be less of a problem than for cases presenting to emergency departments, little is known about how admission criteria differ between and within jurisdictions. The impact of changes to these criteria on fall-related injury among children is also not known.
- Rates calculated from hospital separations data should be interpreted with caution because, as outlined in Section 3.3.2 hospital separations rates are not equivalent to incidence rates. However, the hospitalisation rates for overall fall-related injury in children seem to be reasonable proxies for incidence rates of childhood fall-related injury (see Section 3.3.10).
- At the time of writing, the time-series available at national level only went back five years. (Data for earlier years do exist, but technical and quality issues severely limit their usefulness.)
- Transition to ICD-10-AM is likely to result in a break of comparable data in the time-series if fall-related injury continues to be defined in terms of ICD external cause codes.

Hospital separations data may have a role to play in **characterisation** of fall-related injury in children as the database contains large case numbers and these data are useful in informing prevention practitioners about broad categories of problem areas. However, the value of such characterisation is limited by the coding scheme used. This is because coding according to ICD do not provide the type of qualitative data needed for designing intervention measures.

The use of the pre-determined ICD external cause codes also limits the usefulness of hospitalisation data in detecting new or emerging problems. An existing category may provide a place to code instances of a **new or emerging type of case**, but its label does not change to reveal the new type of case.

### 3.5.9 Transition from ICD-9-CM to ICD-10-AM

As shown in Table 3.13, ICD-9-CM has 24 categories in the E-code range E880–E888 that describe fall-related injury, whereas ICD-10-AM has 20 in the range W00–W19 - a subset of external cause codes that has the heading "Falls".



**Table 3.13: Comparison of ICD-9-CM and ICD-10-AM fall-related codes**

ICD-9 External causes		ICD-10 External causes	
Code	Description	Code	Description
E880	Fall on or from stairs or steps	W00	Fall on same level involving ice and snow
E880.0	Fall on or from escalator	W01	Fall on same level from slipping, tripping and stumbling
E880.1	Fall from footpath kerb	W02	Fall involving ice-skates, skis, roller-skates or skateboards
E880.9	Fall from other stairs or steps	W03	Other fall on same level due to collision with, or pushing by, another person
E881	Fall on or from ladders and scaffolding	W04	Fall while being carried or supported by other children
E881.0	Fall from ladder	W05	Fall involving wheelchair
E881.1	Fall from scaffolding	W06	Fall involving bed
E882	Fall from or out of building or other structure	W07	Fall involving chair
E883	Fall into hole or other opening in surface	W08	Fall involving other furniture
E883.0	Fall into hole or other opening in surface: accident from diving or jumping into water	W09	Fall involving playground equipment
E883.1	Fall into hole or other opening in surface: into well	W10	Fall on or from stairs and steps
E883.2	Fall into hole or other opening in surface: into storm drain or manhole	W11	Fall on or from ladder
E883.9	Fall into other hole or other opening in surface	W12	Fall on or from scaffolding
E884	Other fall from one level to another	W13	Fall from, out of or through building or structure
E884.0	Other fall from one level to another: from playground equipment	W14	Fall from tree
E884.1	Other fall from one level to another: from cliff	W15	Fall from cliff
E884.2	Other fall from one level to another: from bed or chair	W16	Diving or jumping into water causing injury other than drowning or submersion
E884.3	Other fall from one level to another: from tree	W17	Other fall from one level to another
E884.4	Other fall from one level to another: involving bed	W18	Other fall on same level
E884.5	Other fall from one level to another: from trampoline	W19	Unspecified fall
E884.6	Other fall from one level to another: involving wheelchair		
E884.7	Other fall from one level to another: involving commode		
E884.9	Other fall from one level to another: other		
E885	Fall on same level from slipping, tripping, stumbling		
E886	Fall on same level from collision, pushing, shoving, by or with other person		
E886.0	Fall on same level from collision, pushing, shoving, by or with other person: in sports		
E886.9	Fall on same level from collision, pushing, shoving, by or with other person: other and unspecified		
E887	Fracture, cause unspecified		
E888	Other and unspecified fall		

There are many similarities in the fall-related codes between ICD-9-CM and ICD-10-AM, e.g. both have separate codes for falls from or on ladders and from or on scaffolding. Another example is falls involving playground equipment.

ICD-10-AM introduces some extra fall-related codes which do not have an equivalent in ICD-9-CM, e.g. 'Fall on same level involving ice and snow' (W00).

The major concern about the transition to ICD-10-AM relates to ICD-9-CM E-codes E887 and E888. There are no equivalents for either E887 (Fracture, cause unspecified) or E888 (Other and unspecified fall). Investigations into continuity of the time-series for hospital separations data still need to be done.

The issues discussed above will have an impact on comparability of the two classification systems over time if falls are defined in terms of external cause codes.

Until recently, the external cause categories provided by ICD were essentially fixed. Users of data had little opportunity to prompt changes that would make data more useful for prevention. In recent years processes have been established for (currently) biennial updates of ICD-10-AM. Part of the update for the second to third version of ICD-10-AM (in progress at the time of writing) is a series of Classification Update Forums, one of which is focussed on the External causes chapter. Draft changes include enhancements to the coding of falls.

# 4 Emergency department visits due to falls by children; Victoria

## 4.1 Data source

In order to comment on the surveillance potential of emergency department (ED) data, an example of such data was obtained. The data discussed in this Section comes from the Victorian Emergency Minimum Dataset (VEMD). VEMD is an ongoing database of injury presentations to 26 public hospital emergency departments in Victoria. The database is one of the data sources maintained by the Victorian Injury Surveillance and Applied Research System (VISAR), which is located in the Monash University Accident Research Centre. It is estimated that VEMD captures approximately 80% of injuries presenting to Victorian public hospital emergency departments and that the VEMD has an accurate ascertainment rate of about 83% (Stokes, Ozanne-Smith 2000). Data are coded according to codes based on the National Data Standards for Injury Surveillance (NDS-IS), Level 1 (Victorian Injury Surveillance and Applied Research System 2000). Data are presented by financial year.

## 4.2 Identifying ED visits due to falls

Injuries to children aged 0–14 years associated with falls were identified on the VEMD database by searching for NDS-IS "Injury Cause" codes of "9 - Fall up to 1 metre, including unspecified height" and "10 - Falls over 1 metre". Additional cases were identified by searching for "Injury Cause" codes of "3 - Motorcycle driver", "4 - Motorcycle passenger", "5 - Pedal/cyclist rider/passenger", and "7 - Horse related" and limited to those cases containing "fall" or "fell" in a 100 character "Description of Injury Event" variable.

It is therefore clear that the scope of the data discussed in this Section differs from the scope of the data reported in Sections 2 and 3. The deaths data presented in Section 2 were coded according to ICD-9 and the hospital separations discussed in Section 3 according to ICD-9-CM. Both these classifications do not generally allow the height of a fall to be specified and are problematic for identifying falls related to bicycles, motorcycles, and horses.

There was a total of 51,537 cases of injury that met the specified search criteria for falls in the VEMD over the three-year period July 1996 to June 1999 (Table 4.1). The majority of falls for both sexes were due to 'low' falls, with 'other' falls accounting for less than 6% of fall-related injury for males and less than 4% of such injuries for females.

**Table 4.1: Types of falls among ED presentations for children aged 0–14; Victoria 1996/97–1998/99**

Fall Type	Males		Females		Children	
	Count	Per cent	Count	Per cent	Count	Per cent
Fall up to 1 metre	24,482	83.0%	18,810	85.4%	43,293	84.0%
Fall over 1 metre	3,399	11.5%	2,442	11.1%	5,841	11.3%
Extra falls	1,633	5.5%	770	3.5%	2,403	4.7%
<b>Total</b>	<b>29,514</b>	<b>100%</b>	<b>22,022</b>	<b>100%</b>	<b>51,537</b>	<b>100%</b>

Source: VEMD 1996/97–1997/98.

## 4.3 ED visits due to falls among children

### 4.3.1 Introduction

Between 1996/97 and 1998/99, among persons of all ages, there was a total of 149,922 hospital ED presentations for fall-related injury to hospitals providing VEMD data. Of these, 51,539 (34.4%) were to children aged less than 15 years.

Falls were by far the leading cause of injury-related ED visits in children – falls up to a metre (i.e. low falls) and falls over one metre (i.e. high falls) accounted for about 38% of ED presentations from all causes of injury to children during the three-year period considered (Table 4.2, see shaded cells).

**Table 4.2: ED visits due to external causes in children aged 0–14 years: case counts and proportions by sex; Victoria 1996/97–1998/99**

External Injury Cause	Frequency	Per cent
Falls (up to 1 metre)	43,293	33.8%
Cutting, piercing object	8,291	6.5%
Struck by collision with object	7,059	5.5%
Struck by collision with person	7,025	5.5%
Falls (over 1 metre)	5,841	4.6%
Poisoning – medication	2,079	1.6%
Other animal related	2,017	1.6%
Poisoning – other	2,012	1.6%
Motor vehicle passenger	1,897	1.5%
Pedal cyclist rider/passenger <sup>(a)</sup>	1,686	1.3%
Contact burn (hot object)	1,467	1.1%
Dog related	1,209	0.9%
Scalds	1,147	0.9%
Pedestrian	632	0.5%
Cold conditions	530	0.4%
Motorcycle driver <sup>(a)</sup>	380	0.3%
Machinery	346	0.3%
Other transport	266	0.2%
Fire, flames, smoke	263	0.2%
Horse related <sup>(a)</sup>	242	0.2%
Other threat to breathing	195	0.2%
Motor vehicle driver	127	0.1%
Motorcycle passenger <sup>(a)</sup>	119	0.1%
Hot conditions	105	0.1%
Electricity	97	0.1%
Submersion drown other	63	0.1%
Submersion drown pool	51	0.1%
Firearm	16	0.1%
Other specified external causes	8,415	6.6%
Unspecified causes	9,898	7.7%
Struck by collision person or object	6,138	4.8%
Missing	14,823	11.6%
Invalid code	225	0.2%
<b>Total</b>	<b>127,954</b>	<b>100%</b>

(a) Includes some fall-related injuries.

Source: VEMD 1996/97–1997/98.

### 4.3.2 Profile for children aged 0–14 years

In 1997/98, there were 16,719 falls among children aged less than 15 years recorded in the VEMD database. Of these cases, 56% (n=9,526) occurred in males.

Between 1996/97 and 1998/99, case counts for ED visits due to falls among children aged 0–14 years have increased from a total of 16,531 in 1996/97 to 18,287 in 1998/99. For both males and females, the proportion change between 1996/97 and 1998/99 was of the order of 11% (Figure 4.1).

It is unclear whether these changes indicated an increase in the incidence rate of fall-related injury in children presenting to participating EDs. This is because:

- The data shown do not represent all ED presentations in the whole of Victoria nor all cases at VEMD sites. It is unknown whether there have been changes in presentation patterns to Victorian EDs and/or changes in completeness of ascertainment of childhood fall-related presentations at VEMD sites.
- Data on presentations at other treatment points, such as general practitioners, are needed in order to determine whether any changes in ED presentations reflect incidence changes and such data are not currently available. (Please also see Section 4.4 – Data Issues.)
- More data points are necessary to interpret trends in a more meaningful way. (Please note that VEMD data have been collected since 1995, but for this Report, only more recent data years were requested).

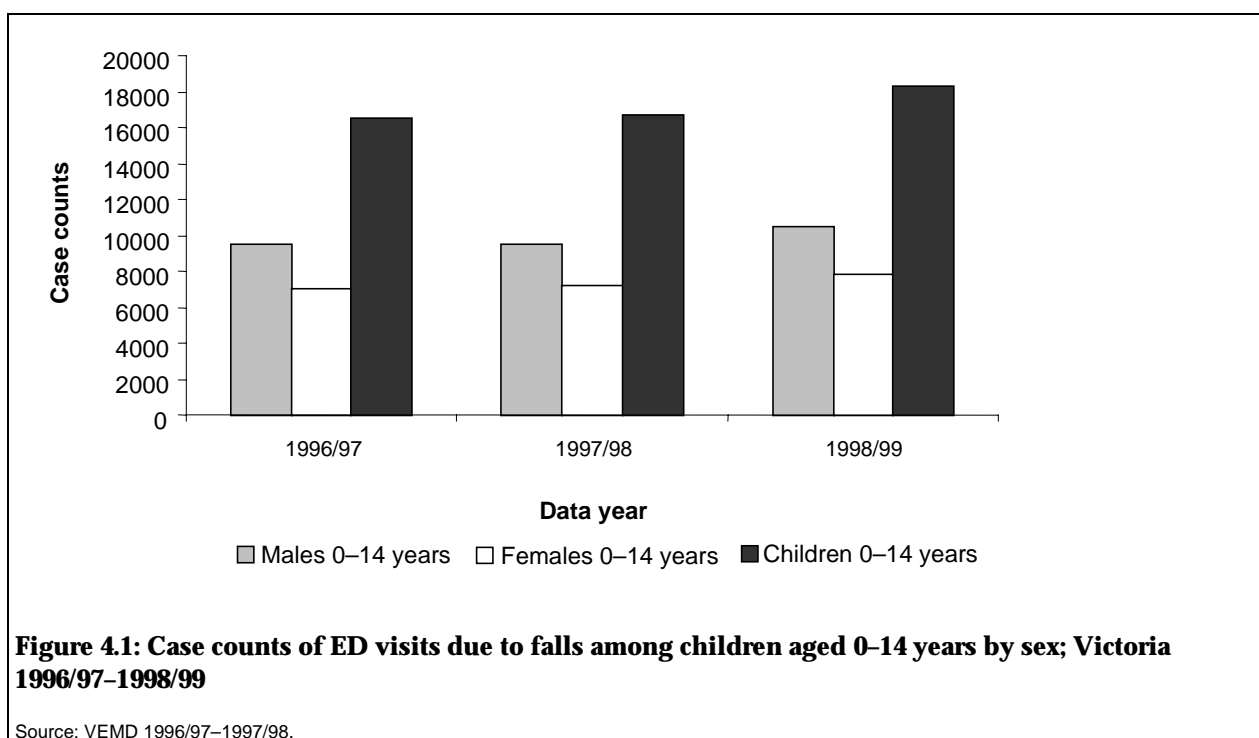


Figure 4.1 also shows that male counts were higher than female counts in all the years shown. In all three years, the male to female ratio of ED presentations due to falls among children aged less than 15 years was about 1.3.

### 4.3.2 Profiles for age groups 0–4, 5–9 and 10–14 years

In all three years shown, the proportional distribution for the three male age groups was fairly even, i.e. boys aged 0–4 years and 5–9 years each made up around 32% of the falls, and males aged 10–14 years accounted for about 37%.

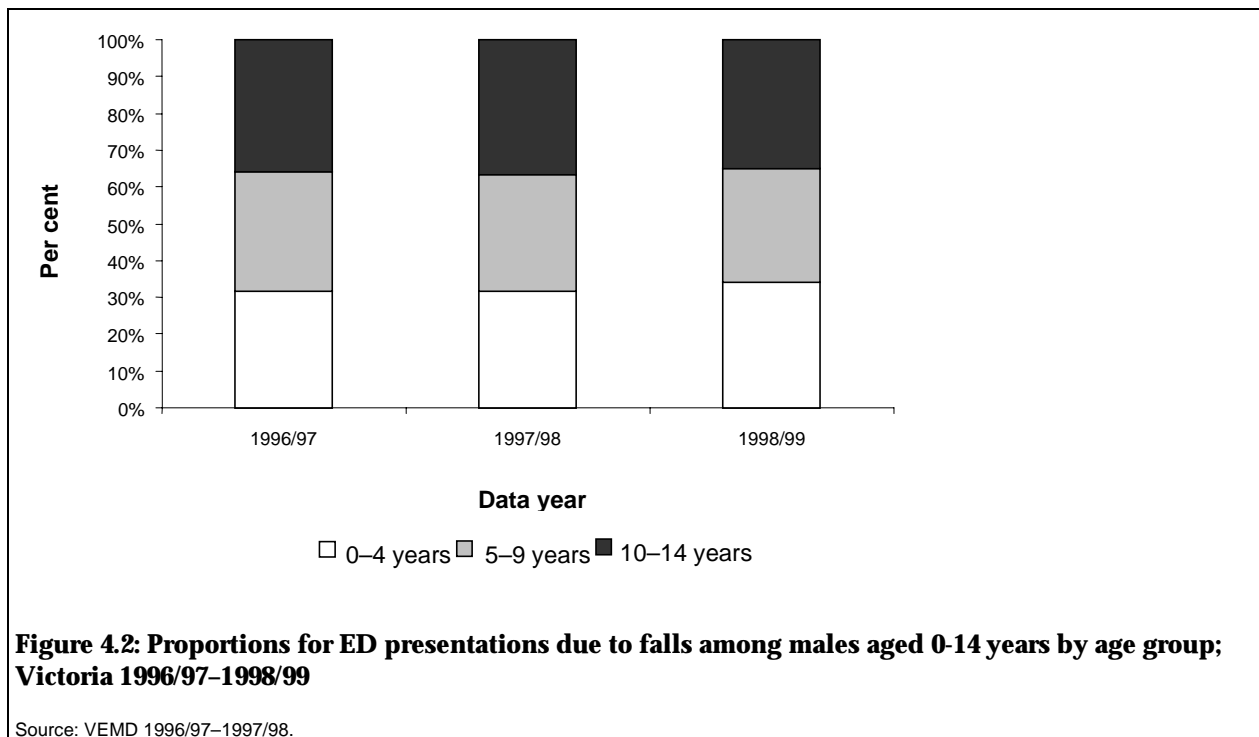
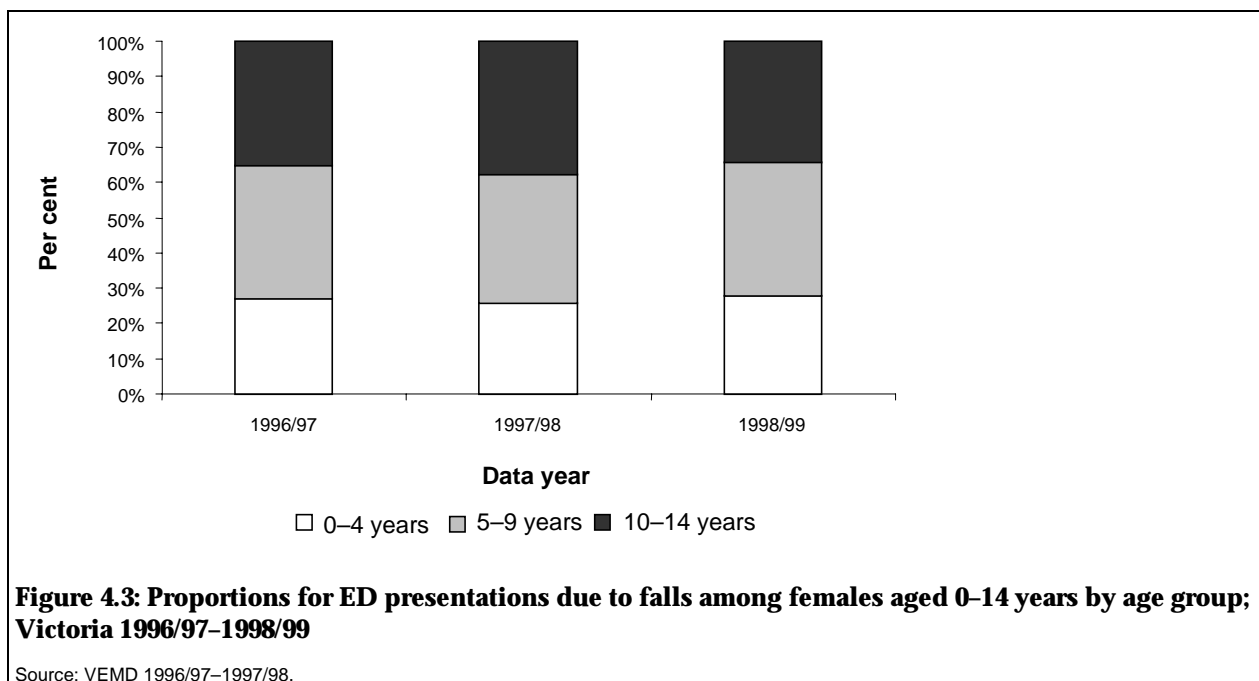


Figure 4.3 shows that, for females, the proportion for those aged 0–4 years ( $\pm 24\%$ ) was lower than the proportions for females aged 5–9 and 10–14 years (proportions were around 33% for both age groups).



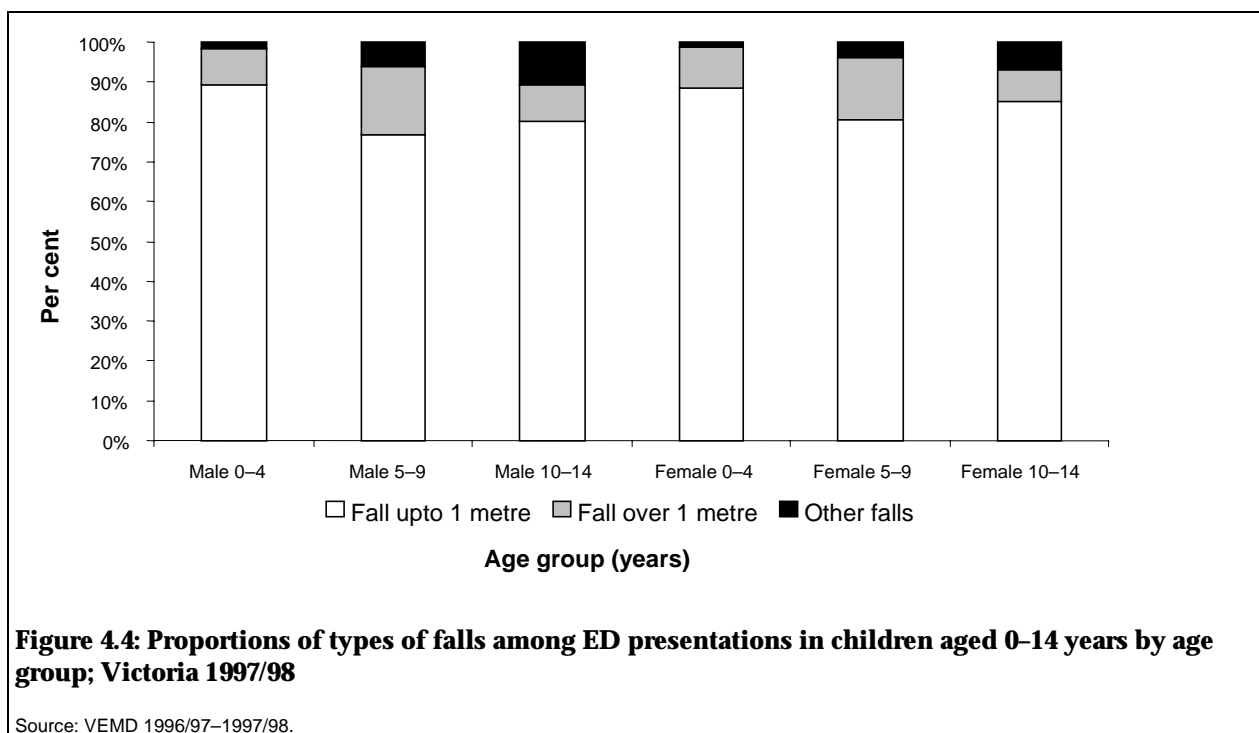
### 4.3.4 Fall types

Over the period considered, the majority of falls for both sexes were due to low falls (see Table 4.2). 'Other' falls (i.e. those related to pedal cycles, horses, etc.) accounted for less than 6% of falls for males and less than 4% of falls for females.

There were some differences between the three five-year age groups within the 0–14 year age category as illustrated by the data for 1997/98 shown in Figure 4.4.

For males in 1997/98, high falls and 'other' falls together made up larger proportions in children aged 5 years and over than for those aged 0–4 years (Figure 4.4). For males aged 5–9 years, high falls made up 17.1% of ED presentations and the proportion of 'other' falls for this age group was 6.1% (i.e. a total of 23.1%). For males aged 10–14 years, the proportion of falls due to high falls was 8.9% and the proportion for 'other' falls 10.7% (i.e. a total of just less than 20%). For boys aged 0–4 years high falls and 'other' falls accounted for just more than 10% (Figure 4.4).

For females aged 0–4 years, high falls made up 10.4% of all ED presentations due to falls. The proportion for 'other' falls for this age group was 1%. For females aged 5–9 years, high falls accounted for 15.5% and 'other' falls for just less than 4%. In the older age group, high falls formed 11.3% of all falls and 'other' falls made up 4% (Figure 4.4).



These profiles for the two sexes and the three age groups did not vary between the three years considered. Because of the similarity between the three data years considered, further discussions only concern the financial year 1997/98.

### 4.3.5 Place of occurrence

ED presentations for fall-related injuries in children and their place of occurrence during 1997/98 are presented in Table 4.3 (for purposes of convenience and because of little difference, the data for the sexes are presented together).

In general, fall-related injuries occurred most often in the home (including areas around the home) for all age groups and accounted for half of the fall presentations. With increasing age, the number of injuries occurring at home declined from 4,141 cases in the 0–4 year age group to a low of 1,752 cases in the 10–14 year age group, a difference of 68% (Table 4.3).

With increasing age, the pattern of activity and place of injury occurrence changed, with a gradual shift from the home to places of recreation and sports. For 5–9 year old children, the home remained a major place for fall related injury, accounting for almost a half of the ED presentations (Table 4.3). However, school playgrounds and other places of recreation accounted for an increasing proportion of fall injuries in this age group (38%), as well as in the older age group (49%). In 10–14 year olds, about 11% of fall injuries occurred on roads and streets. This may be due to recreation activities such as skateboarding and cycling which may be more common in this age group.

Other places of occurrence such as farm, mine and quarry, industrial/construction area, trade or service area, medical hospital, and residential institution accounted for about 2% of cases reported. ‘Other/unspecified place’ was reported as a place of occurrence for 8% of fall presentations. These cases were proportionally fairly similar for all three age groups.

**Table 4.3: Place of occurrence of falls resulting in ED visits in children aged 0–14 years: case numbers and proportions by age group; Victoria 1997/98**

Place of occurrence	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Home	4,141	78.3%	2,570	47.4%	1,752	29.1%	8,463	50.6%
School, day care, public administration area	187	3.5%	1,388	25.6%	1,450	24.1%	3,025	18.1%
Place for recreation	256	4.8%	532	9.8%	834	13.9%	1,622	9.7%
Road, street or highway	94	1.8%	313	5.8%	659	11.0%	1,066	6.4%
Athletics and sports area	21	0.4%	132	2.4%	637	10.6%	790	4.7%
Trade or service area	129	2.4%	35	0.6%	29	0.5%	193	1.2%
Farm	11	0.2%	27	0.5%	66	1.1%	104	0.6%
Residential institution	7	0.1%	13	0.2%	17	0.3%	37	0.2%
Mine or quarry	1	0.1%	0	..	1	0.1%	2	0.1%
Industrial/construction area	0	..	3	0.1%	3	0.1%	6	0.1%
Medical hospital	15	0.3%	3	0.1%	3	<0.1%	21	0.1%
Other/not specified	414	7.8%	378	7.0%	494	8.2%	1,286	7.7%
Missing/invalid code	15	0.3%	23	0.4%	66	1.1%	104	0.6%
<b>All places</b>	<b>5,291</b>	<b>100%</b>	<b>5,417</b>	<b>100%</b>	<b>6,011</b>	<b>100%</b>	<b>16,719</b>	<b>100%</b>

Shaded areas indicate notable differences.

Source: VEMD 1996/97–1997/98.



### 4.3.6 Body region injured

In children aged 0–14 years, injuries to the upper limb and shoulder region were the most common body region injured, accounting for about 40% of the ED presentations for fall related injuries (Table 4.4). An additional 19% of the injuries diagnosed were associated with injuries to the head and face.

In children aged 0–4 years, injuries to the head and face were the most common body region reported with about 40% of the cases diagnosed, followed by injuries to the upper limb and shoulder region (19.7%).

For children aged 5–9 and 10–14 years, head and face injuries from falls decreased in frequency with increasing age (Table 4.4). In these older age groups, injuries to the upper limb and shoulder region predominated and were diagnosed in close to 50% of the cases in each age group.

Injury to the lower limb and pelvic region, although low proportionally in age groups less than 10–14 years, were the second most common region in children 10 years old and above (Table 4.4).

Injuries diagnosed for body region neck and trunk were low in all age groups (Table 4.4).

**Table 4.4: Fall-related injuries diagnosed in children aged 0–14 years: case counts, proportions by body region and age group; Victoria 1997/98**

Body region injured	Age group (years)						Ages	
	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Upper limb and shoulder region	1,042	19.7%	2,612	48.2%	2,951	49.1%	6,605	39.5%
Head and face	2,109	39.9%	795	14.7%	282	4.7%	3,186	19.1%
Lower limb and pelvic region	397	7.5%	704	13.0%	1,523	25.3%	2,624	15.7%
Neck and trunk	63	1.2%	114	2.1%	174	2.9%	351	2.1%
Injuries not specified by body region	1,680	31.8%	1,192	22.0%	1,081	18.0%	3,953	23.6%
<b>All injuries diagnosed</b>	<b>5,291</b>	<b>100%</b>	<b>5,417</b>	<b>100%</b>	<b>6,011</b>	<b>100%</b>	<b>16,719</b>	<b>100%</b>

Shaded areas indicate notable differences.

Source: VEMD 1996/97–1997/98.

### 4.3.7 Diagnosis recorded

Fractures, sprains, and open wounds together accounted for 62% of the fall-related injuries diagnosed in children (Table 4.5).

Injuries such as open wounds and superficial wounds from falling were common in children 0–4 years of age (26.1% and 14.1, respectively). Intracranial injuries, although low in frequency, were proportionally higher in children under 5 years of age than in older children.

Fractures, common in children older than 4 years of age were most often diagnosed in the 5–9 year age group.

For children aged 10–14 years, 62.9% of fall presentations were due to fractures and sprains or strains.

**Table 4.5: Fall-related injuries diagnosed in children aged 0–14 years: case counts and proportions by age group; Victoria 1997/98**

Nature of Main Injury	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Fracture, excludes tooth	783	14.8%	2,070	38.2%	2,144	35.7%	4,997	29.9%
Sprain or strain	441	8.3%	797	14.7%	1,633	27.2%	2,871	17.2%
Open wound, excludes eye	1,382	26.1%	736	13.6%	370	6.2%	2,488	14.9%
Superficial, excludes eye	746	14.1%	392	7.2%	379	6.3%	1,517	9.1%
Intracranial injury	398	7.5%	240	4.4%	165	2.7%	803	4.8%
Injury to muscle or tendon	79	1.5%	124	2.3%	231	3.8%	434	2.6%
Dislocation	62	1.2%	29	0.5%	87	1.4%	178	1.1%
Other/unspecified nature of injury	425	8.0%	287	5.3%	341	5.7%	1,053	6.3%
No injury detected/invalid code/missing	975	18.4%	742	13.7%	661	11.0%	2,378	14.2%
<b>All injuries diagnosed</b>	<b>5,291</b>	<b>100%</b>	<b>5,417</b>	<b>100%</b>	<b>6,011</b>	<b>100%</b>	<b>16,719</b>	<b>100%</b>

Shaded areas indicate notable differences.

Source: VEMD 1996/97–1997/98.

### 4.3.8 Separation mode

The majority of children who were recorded in the VEMD database were discharged home (83.3%) after treatment at the ED (Table 4.6). Some children (12.5%) were admitted to a ward from the ED for treatment of injuries that required hospitalisation, e.g. fractures commonly diagnosed in 5–9 year olds and intracranial injuries often diagnosed in 0–4 year olds. Only a few children were transferred to other hospitals for treatment (1.2%).

**Table 4.6: Mode of separation for fall-related ED presentations by children aged 0–14 years: counts and proportions; Victoria 1997/98**

Mode of separation	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Discharge to home or nursing home	4,595	86.8%	4,254	78.5%	5,075	84.4%	13,924	83.3%
Admission to ward	454	8.6%	934	17.2%	708	11.8%	2,096	12.5%
Admission within ED	55	1.0%	99	1.8%	106	1.8%	260	1.6%
Transferred to another hospital	52	1.0%	79	1.5%	66	1.1%	197	1.2%
Left before being seen by doctor	107	2.0%	39	0.7%	35	0.6%	181	1.1%
Left at own risk after treatment commenced	16	0.3%	3	0.1%	10	0.2%	29	0.2%
Missing	12	0.2%	9	0.2%	11	0.2%	32	0.2%
<b>Total</b>	<b>5,291</b>	<b>100%</b>	<b>5,417</b>	<b>100%</b>	<b>6,011</b>	<b>100%</b>	<b>16,719</b>	<b>100%</b>

Source: VEMD 1996/97–1997/98.

## 4.4 Data issues

### 4.4.1 Data source

The Victorian Emergency Minimum Dataset (VEMD) is an ongoing surveillance database of injury presentations to 26 Victorian public hospital emergency departments. (See Section 4.1) An extract from the VEMD User Manual is provided in Appendix A4.

### 4.4.2 Selection criteria

These were described in detail in Section 4.2.

### 4.4.3 Data quality of the VEMD

A recent study reported on ascertainment rates, accuracy of data and the presence of bias within the VEMD (Stokes, Ozanne-Smith 2000). The main findings were that overall, the VEMD reported just less than 83% of the total estimated injury-related presentations to four test sites. There were variations between the four sites with the ascertainment rate varying from about 75% to 95%.

Error rates for data elements varied between 0% for 'Age group' and 42% for 'Activity when injured'. For 'External injury cause' some 150 cases from a total 382 cases had errors (i.e. 39%). For 'Location when injured' the proportion was 31%.

Proportions of missing data varied from 0% for age and sex to around 10% for 'Location when injured', 'Activity when injured', and 'Intent of injury'. Content validity for the variables 'Body Region', 'Nature of Injury' and 'Intent' was above 90%. However, for the data element 'Location when injured' content validity was 21%, for 'External injury cause' 27%, and for 'Activity when injured' 30%. (Stokes, Ozanne-Smith 2000).

The VEMD also contains an item that can be used to "briefly and concisely describe the injury event" (Victorian Injury Surveillance and Applied Research System 2000). (Such a narrative is not currently available in the two national data sets reported on in Sections 2 and 3.) Stokes, *et al.* (2000) assessed the descriptive validity of these narratives. However, they found that the VEMD descriptive data "was not generally adequate" and that narratives rarely provided a history of the event or relevant product information (Stokes, Ozanne-Smith 2000). The descriptions were found to be the worst data recorded with approximately 14% of descriptions being valid.

Overall, the conclusion of the study by Stokes *et al.* (2000) were that the VEMD is generally a reliable and valid computerised data set. However, there are areas that need attention, notable valuable descriptive data that are poorly collected. Further training of ED staff in data collection and greater understanding of the utility of injury surveillance data are appropriate.

#### 4.4.4 Usefulness of ED data for surveillance

Currently there is no national data collection that provides estimates of the **extent** of fall-related presentations to EDs. The VEMD data discussed in this Section do indicate that large numbers of children visit EDs with fall-related injury annually.

**Monitoring** childhood fall-related injury by means of ED data has distinct limitations. As noted there is no national data source available for such monitoring. Even if such a data source did exist, monitoring the incidence of fall-related injury in children would be problematic. A reason for this is that "meaningful measurement of injury incidence and trends requires a case definition that is independent of services and case outcomes" (Harrison (In Press)). ED data are, however, defined by the type of service that is delivered and cases going to EDs share many similarities with those going to GPs.

ED data, such as those collected by VISAR, are useful in **characterisation** of fall-related injury in that large numbers of records are collected and reasonably rich data are theoretically available. The validation study of the VEMD data showed that there are limitations to the usefulness of the data because of the frequency of incomplete records and errors in coding.

Of special interest for this Report was the **descriptive narrative** found in the VEMD and its potential for providing more detailed case information about the circumstances that resulted in an injury. An example would be better description of the mechanism or objects that led to the injury.

To assess the effectiveness of the injury event narrative to provide extra information, the text descriptions of a subset of the fall-related injuries provided by VISAR was examined in greater detail. This subset related to fall-related ED cases which presented during 1997/98 and which had a fracture as a principal diagnosis.

The injury event narratives of the selected subset were analysed and recoded to four axes where possible: mechanism/cause, object, type of place, and activity. These four axes are similar to those found in the recently published *International Classification of External Causes of Injuries* (ICECI) (WHO Collaborating Center on Injury Surveillance 2001).<sup>5</sup>

In 1997/98, just less than 5,000 children aged 0–14 years presented with a fracture to participating EDs. Of these, some text entry was made for more than 90% of cases. However, about 45% of all the cases in the data set had no information on the circumstances that led to the injury and the usefulness of the remaining entries varied (Table 4.7). For mechanism, nearly 50% of the cases did not mention a fall mechanism. In regard to object, nearly 30% of the cases did not mention a fall at all and for another 19% of cases, a fall was mentioned but no object was noted. The narrative did not prove very useful for place or activity (Table 4.7). For place of occurrence, more than 88% of cases did not specify any place. For activity this proportion was close to 91%.

---

<sup>5</sup> ICECI is a new international standard for classifying ED data. The outstanding characteristic of ICECI is its multi-axial approach. As such, it proposes a series of recommended data elements that can be used to collect information about a variety of external cause related topics at varying levels of detail. ICECI distinguishes between the variables 'Intent', 'Mechanism of injury', 'Object/substance producing the injury', 'Place of occurrence', and 'Activity when injured'.

**Table 4.7: Fall-related fractures diagnosed in children aged 0–14 years: multi-axial coding of structured narrative, counts and proportions, Victoria 1997/98**

Mechanism	Count	Per cent	Object/substance	Count	Per cent	Place of occurrence	Count	Per cent	Activity	Count	Per cent
Fall off/from	1,548	38.3	Bicycle	370	9.1	School	264	6.5	Sports	233	5.8
Fall on	199	4.9	Monkey bar	245	6.1	Home	100	2.5	Playing	69	1.7
Fall over	142	3.5	In-line skates	144	3.5	Road/track etc.	27	0.7	Running	38	0.9
Fall out of	93	2.3	Play equipment	128	3.2	Day care/creche	23	0.6	Walking	7	0.2
Slip or trip	73	1.8	Tree	120	3.0	Playground	14	0.3	Other spec.	33	0.8
Fall down	33	0.8	Trampoline	118	2.9	Park	13	0.3	Unspecified	3,665	90.6
Fall in	8	0.2	Slide	98	2.4	Commercial establishment	10	0.2	<b>Total</b>	<b>4,045</b>	<b>100</b>
Other/ unspec.	1,949	48.2	Horse or pony	89	2.2	Garden	5	0.1			
<b>Total</b>	<b>4,045</b>	<b>100</b>	Flying fox	63	1.6	Other specified	17	0.4			
			Swing	63	1.6	Unspecified	3,572	88.3			
			Motor/trial bike	61	1.5	<b>Total</b>	<b>4,045</b>	<b>100</b>			
			Bed	56	1.4						
			Bunk	48	1.2						
			Chair	36	0.9						
			Playground equipment	34	0.8						
			Fence	29	0.7						
			Stairs	26	0.6						
			Couch	24	0.6						
			Step	20	0.5						
			Gym equipment	19	0.5						
			Football	16	0.4						
			Table	16	0.4						
			Skateboard	14	0.3						
			Ladder	10	0.2						
			Stool	10	0.2						
			Roof	10	0.2						
			Car/truck/trailer	9	0.2						
			Clothes line	9	0.2						
			Climbing equipment	5	0.1						
			Ice skates	5	0.1						
			Pram	4	0.1						
			Trolley	4	0.1						
			Seesaw	4	0.1						
			Balcony	4	0.1						
			Cot	3	0.1						
			Bath	2	<0.1						
			Skis	2	<0.1						
			Hammock	1	<0.1						
			Basket ball	1	<0.1						
			Boogie board	1	<0.1						
			Fall mentioned, other object spec.	156	3.9						
			Fall mentioned, object unspec.	770	19.0						
			Fall not mentioned	1,198	29.6						
			<b>Total</b>	<b>4,045</b>	<b>100</b>						

Source: VEMD 1996/97–1997/98.

Further examination of the narrative, particularly with respect to the object producing the injury and the age of the injured child, revealed that for children aged 0–4 years, falls from beds, slides, and other play equipment were common among those who suffered fractures (Table 4.8). (It should be noted that this tabulation was based on about 50% of cases in the selected subset of data).

For older children aged 5–9 years, circumstances associated with their fall differed from younger children with a higher frequency of injury from more physically challenging activities involving monkey bars, bicycles and trampolines. Falling out of trees was also fairly common in this group.

Children aged 10–14 years, appeared to be at particular risk of injury from bicycle riding. Horse or pony riding and in-line skating also were responsible for many of the fractures in this group (Table 4.8).

**Table 4.8: Circumstances reported in fall-related injury event narratives that lead to fractures in children ranked by frequency of occurrence (case counts and proportions by age group); Victoria 1997/98**

Rank	0–4 years	5–9 years	10–14 years	Ages 0–14 years
1	BED (n=36, 9.3%)	MONKEY BAR (n=199, 19.3%)	BICYCLE (n=265, 36.1%)	BICYCLE (n=369, 17.1%)
2	SLIDE (n=32, 8.2%)	BICYCLE (n=88, 8.5%)	HORSE OR PONY (n=61, 8.3%)	MONKEY BAR (n=243, 11.3%)
3	PLAY EQUIPMENT (n=32, 8.2%)	TRAMPOLINE (n=75, 7.3%)	IN-LINE SKATING (n=54, 7.4%)	TREE (n=119, 5.5%)
4	TRAMPOLINE (n=27, 6.9%)	TREE (n=74, 7.2%)	MOTORBIKE/TRAILBIKE (n=52, 7.1%)	IN-LINE SKATING (n=118, 5.5%)
5	CHAIR (n=26, 6.7%)	PLAY EQUIPMENT (n=69, 6.7%)	NETBALL/BASKETBALL (n=47, 6.4%)	TRAMPOLINE (n=118, 5.5%)
6	SWING (n=23, 5.9%)	IN-LINE SKATING (n=63, 6.1%)	TREE (n=38, 5.2%)	PLAY EQUIPMENT (n=110, 5.1%)
7	COUCH (n=20, 5.1%)	SLIDE (n=54, 5.2%)	MONKEY BAR (n=25, 3.4%)	SLIDE (n=91, 4.2%)
8	FALL OFF OR FROM (n=20, 5.1%)	FLYING FOX (n=50, 4.8%)	TRIP (n=22, 3.0%)	HORSE OR PONY (n=89, 4.1%)
9	MONKEY BAR (n=19, 4.9%)	SWING (n=41, 4.0%)	TRAMPOLINE (n=16, 2.2%)	SWING (n=72, 3.3%)
10	BICYCLE (n=16, 4.1%)	TRIP (n=30, 2.9%)	FALL OFF OR FROM (n=12, 1.6%)	TRIP (n=65, 3.0%)

Source: VEMD 1996/97–1997/98.

ED data, such as those collected in the VEMD, are very useful in **identifying new or emerging problems**.

On the whole, although there are problems with it, the VEMD is a useful source of information on fall-related injury. It is also a source in which increased resources will allow for collection of more complete and informative narratives.

# 5 Discussion

## Epidemiology of fall-related injury in children

**In Australia, cases due to falls among children are numerous, but they are rarely life-threatening.**

- Between 1979 and 1998, there were about eleven childhood deaths due to falls annually. Fall-related deaths accounted for 2.3% (n=225) of all deaths due to injury and poisoning in children aged 0–14 years during the stated period. These cases are few in number, but they obviously result in much emotional suffering for affected relatives and care givers.
- There seems to be a declining trend in age-standardised rates for fall-related injury among children between 1979 and 1998.
- In contrast to the small number of deaths, childhood falls accounted nearly 38% of hospital admissions due to injury and poisoning at ages 0–14 years, making it the leading cause of hospitalisation among children. In 1997/98, falls resulted in 25,401 hospital separations.
- Hospital separations data are available for the five financial years 1993/94–1997/98. No clear trend for fall-related separations among children was noted.
- About 40% of the children who were admitted for a fall-related injury were discharged on the same day of admission. Of the remaining cases, about 70% (n=21,988) were discharged after one day, but nearly 11% (n=1,815) were hospitalised for three days or more.
- ED data from Victoria indicate that accidental falls account for a large number of ED presentations due to injury. Victorian Emergency Management Dataset (VEMD) data showed that just about 42% of ED presentations to participating VISAR hospitals among children were due to fall-related injury (Ashby and Corbo 2000).
- In 1997/98, nearly 87% of the 16,719 VEMD cases with fall-related injury were discharged home after treatment. About 15% of the cases were admitted (to a ward or within the ED) or were transferred to another hospital. No deaths were recorded among the ED cases for 1997/98.
- Between 1996/97 and 1998/99, case numbers of fall-related ED presentations due to falls increased by about 11%. However, it is uncertain whether this change reflects an increase in the incidence rate of fall-related injury among children recorded in the VEMD.
- In addition to the large number of fall-related cases presenting to hospitals and being admitted, it is likely that many other fall-related cases among children are treated by general practitioners (Britt, Sayer 1999); (Day, Valuri 1995); (Harrison (In Press)).

**A notable number of children have more serious outcomes following falls.**

- Among hospitalised cases, fractures to the radius and ulna resulted in large case numbers (n=6,901 cases) and the largest total length of stay (LOS; n=9,488 days), even though the average LOS per case was less than one day.

- Fractures of the femur contributed relatively few cases among hospitalisations (n=411 cases), but resulted in the second largest total LOS (n=4,441 days). These diagnoses also had the longest average LOS per case, i.e. more than ten days for fractures of other and unspecified parts of the femur and more than eight days for fractures involving the neck of femur.
- Head injury also contributed significantly to the burden of fall-related injury among hospitalisations. Intracranial injury (n=2,114 cases) and skull fractures (n=657 cases) together accounted for 18% of case numbers and the third largest total LOS (n=4,268 days).
- Fall-related cases with more severe injuries have the potential for chronic morbidity and disability, e.g. certain fractures that do not heal well or long-term consequences of traumatic brain injury. Due to limitations of the data sources, little insight about such long-term outcomes of severe cases could be gained from the data analysed for this Report.

### **There is an association between the outcome of fall-related injuries sustained and children's age and sex.**

Among fall-related **deaths**, the 0–4 year olds made up about 50% (n=107) of the cases, whereas the 5–9 year old age group accounted for 20% (n=45) of fall-related deaths. In contrast to deaths, the 5–9 year age group accounted for about 40% (n=10,328) of the **hospitalisations**, while the 0–4 year olds made up about 29% (n=7,244). Older children (those aged 10–14 years) made up similar proportions among fall-related deaths and hospitalisations resulting from falls, i.e. around 31% (n=73 for deaths and n=7,829 for separations).

- Children aged **0–4 years** generally suffered more head and face injuries than the other two age groups. A contributing factor to this may be that in children under four years, the head of a young child is proportionally bigger and heavier than for older children. Young children may also be less likely to break their falls by using their hands, especially for those younger than 1 year.
- At **ages 5–9 years**, physical development (including increased skill to use upper limbs to break a fall) may help to reduce head and face injuries. In addition, these children are more capable of climbing and this may lead to more falls from heights. As a consequence the frequency of injury to the forearms increases in this age group .
- More **children aged 10–14 years** sustained fractures of the lower limb than younger children. However, the proportion for fractures of the upper limb were similar for age groups 5–9 years and 10–14 years.

### **There is an association between the circumstances leading to injury and age, as well as sex (a lesser degree). This reflects behavioural and developmental changes that occur as children grow older.**

- Hospitalisation data showed that **children aged 0–4 years** were often injured at home (i.e. about 50%) and that nearly 60% of the cases in this age group were due to falls from one level to another (E884). For this age group, falls from one level to another more often involved furniture, such as a bed (E884.4) or chair (E884.2), than for the other two age groups. Falls from playground equipment (E884.1) was less prominent in this age group than for the 5–9 year age group.

VEMD data reinforced that, for children aged 0–4 years, most of the fall-related injuries presenting to EDs occurred at home (78%) and that most fall-related injuries resulted from low falls (i.e. about 90%).



- Compared to the younger age group, **5–9 year olds** had less injuries resulting in hospitalisation occurring at home (22%). For the 5–9 year old age group, more hospitalised injuries happened at other venues such as place of recreation or sport (15%), or public buildings, which includes schools, (14%). Also, for this age group about 60% of the fall-related injuries were from one level to another (E884). Of these falls, a larger proportion involved playground equipment (E884.1) than for children aged 0–4 years. Also, more 5–9 year olds (especially 5–9 year old boys) were hospitalised because of falls from trees (E884.3).
- VEMD data showed that a smaller proportion of fall-related cases for 5–9 year olds that presented to EDs occurred at home (47%), whereas injuries occurring at school, day care or other public administration areas accounted for more than 25%. Also, high falls and other types of falls made up a larger proportion of falls among the fall-related ED presentations recorded in the VEMD.
- For **10–14 year olds**, even less hospitalised injuries occurred at home (12%), whereas places of recreation and sport made up nearly 25%. Public buildings (which includes schools and day care centres) also made up a notable proportion (11%). Falls from one level to another (E884) accounted for a smaller proportion of injuries than for the other two age groups, i.e. about 28% compared to just less than 60% for both the 0–4 and 5–9 year olds. Falls on the same level from collision, pushing or shoving by or with another person (E886) accounted for nearly as many cases as those coded to E884. Most of the falls coded to E886 could be attributed to sports-related activities. Falls on the same level from slipping, tripping or stumbling (E885) also made up a notable proportion in this age group.
- For deaths and hospital separations data, case numbers and rates for **males** are higher than for **females**. Case numbers and proportions in the VEMD data are also higher for males. These findings may reflect higher risk taking behaviour in males.
- The differences between males and females are most noticeable in the **10–14 year age group**. One particular type of injury where males outnumbered females four to one was sports-related falls (i.e. those coded to E886.1). There may be several reasons that have an impact on this. Boys have higher participation rates in sports than girls (Australian Sports Commission 1993); the type of sports they participate in may have higher injury rates; or boys may play sports in a more physically aggressive manner which more often results in more injuries and/or more severe ones. The data sources employed in this Report do not provide insight into issues of exposure. Interestingly, many more females aged 10–14 years than males in the same age group were injured in falls from trampolines (E884.5), whereas more males than females fell from trees.

### **The height involved in a fall plays an important role in regard to injury outcome.**

- Among fall-related deaths, **falls from or out of buildings (E882)** made up a significant proportion for all age groups (27%), whereas these falls only accounted for small proportions of hospitalisations (less than 4%).
- The role of the height involved in the fall is also illustrated by **falls coded to E884** (i.e. falls from one level to another). For these deaths, falls from cliffs (E884.1) made up about one-third of all the falls coded to E884. In contrast, hospitalisations due to falls from cliffs (E884.1) represented less than 1% of all hospitalised falls coded to E884.

## Issues relevant to data sources on fall-related injury in children

**There are several general issues that are relevant when interpreting different data sources used in this Report.**

- **Deaths data** are provided by the ABS and are reported by calendar year of death registration and not by year of death occurrence. Deaths data for 1979–1998 are coded according to ICD-9. Data from 1999 onwards are coded according to ICD-10. Since 1997, deaths data include multiple causes of deaths and not only the underlying cause of death.
- **Data on hospitalisations** are provided by the AIHW and reflect all hospital separations occurring in relevant financial years. At the time of writing, national data were available for the years 1993/94–1998/99. Hospitalisations data for the period 1993/94–1997/98 were coded according to ICD-9-CM. For 1998/99 data, half of the States and Territories coded data according to ICD-9-CM, but the other half coded to ICD-10-AM.
- **VEMD data** used in this Report were provided by VISAR by financial year and are coded according to NDS-IS (Version 2c). It is estimated that the VEMD includes about 80% of all injury-related ED presentations to hospitals in Victoria. A recent study also found that the VEMD captures about 80% of ED presentations to participating VEMD hospitals (Stokes, Ozanne-Smith 2000). This study also found that the VEMD is generally a reliable and valid computerised data set, but that there are areas that need attention.

**The three data sources used in this Report each has distinct strengths and weaknesses for surveillance of fall-related injury.**

- Four main functions of surveillance were considered relevant to this discussion:
  - determining the extent of the child injuries due to falls;
  - monitoring change of such injuries over time;
  - characterising fall-related cases so as to inform injury prevention; and
  - identifying new and/or emerging problems in regard to fall-related injury.
- The two national data sources on **deaths and hospitalisations** provide reasonable insight into the **extent** of fall-related injury among children. However, there are some issues that impact on the utility of these data for monitoring change in incidence over time.

The annual number of fall-related **deaths** among children is (fortunately) too small to be meaningful for year-to-year **monitoring** of fall-related injury incidence, but it is useful over longer periods, e.g. five-year stretches.

**Hospital separations** data are potentially valuable for **monitoring** of injury in that they record large case numbers per data year; nearly all severe cases are likely to be included; the collection system is well established; and has shown much improvement over recent years. However, only part of this potential can be tapped at present, because:

- the case definition of fall-related injury among children is not independent of services and case outcomes;
- separations rates are not equivalent to incidence rates; and
- at the time of writing, the time-series available nationally only went back five years.

**Deaths and hospital separations data** are useful in informing prevention practitioners about broad categories of problem areas in regard to fall-related injury. However, the use of ICD-9 (for deaths) and ICD-9-CM (for hospital separations data) limits the value of such **characterisation** because coding according to ICD does not provide the type of in-depth qualitative data needed for designing intervention measures.

One particular problem relates to two **ICD-9 external causes**, i.e. ‘Other or unspecified fall’ (**E888**) and ‘Fracture, cause unspecified’ (**E887**). These two codes account for about 5,000 hospital separations (19.3%) and thus do not help to identify risks or assist in the development of countermeasures to decrease the risk of falls in children. Failure to code almost one-fifth of the separations to more descriptive E-codes is a major limitation of the current ICD-9(-CM) E-code classification of external causes. The introduction of ICD-10(-AM) does not alleviate this problem – see below. The limitations mentioned above will be lessened to some degree because of initiatives such as the Injury Classification Update Forums, which allows for more detailed categories of falls to be added to the third version of ICD-10-AM. If deaths data are also coded according to ICD-10-AM in future, the information available for fall-related deaths will be further enhanced.

The use of the pre-determined ICD external cause codes limits the usefulness of **deaths and hospitalisation data** in detecting **new or emerging problems** to a large extent, although the NCIS system may be useful in this regard as it may be able to provide more detailed information on childhood deaths related to falls. Narrative information about the circumstances of a fall would greatly improve the value of these sources. The NCIS may also be useful in this regard.

- For this Report, **ED data from Victoria** was analysed to determine what such data can contribute to the understanding of surveillance data on falls among children. Currently, there is no national data source on ED in Australia, nor is there likely to be one in the future.

The VEMD data was useful to provide insight into the **extent** of fall-related ED presentations, i.e. significant numbers of such cases occur annually.

The ability of VEMD data to **monitor** fall-related incidence is very limited. The reasons are that fall-related injury is currently not defined in terms of the trauma sustained, irrespective of the outcome or clinical services available. Also, VEMD data do not cover all ED presentations in Victoria or all presentations to participating VEMD hospitals. In addition, information about fall-related cases seen at GPs in Victoria is needed to interpret changes in case numbers in the VEMD.

The third relevant function of surveillance is **characterising** cases. Data elements that are considered to be important at the most basic level for informing falls prevention are mechanism(s) of injury, object(s) or substance(s) involved in the injury, place where injury occurred and activity engaged in at the time of the injury.

The injury narrative in the VEMD appears to have the potential to provide extra or more detailed information about the circumstances that resulted in an injury. However, analysis of a subset of VEMD data showed that the quality of the completed narratives were unsatisfactory. Although, the narratives did provide some extra and useful data on objects involved in falls leading to injury, appropriate information for a large proportion of cases were missing and the narratives lacked detail on mechanism, place and activity.

This is understandable when it is considered that data collection is not seen as a core function by ED staff in general and in the light of heavy work loads experienced in EDs.

ED data, such as those collected in the VEMD, are very useful in identifying **new or emerging problems**.

- Surveillance data on fall-related injury (which tends not to provide very precise and detailed information) cannot answer all questions in regard to preventing falls among children. **Different roles** should be allocated to the various data sources currently available.

Hospitalisations data are most promising for **monitoring** of fall-related injury, especially if relevant indicators are defined primarily in terms of diagnoses, rather than external causes of injury.

ED data and deaths data in the NCIS, as well as hospital separations data will be useful for **informing** falls prevention initiatives. For specific falls prevention initiatives, information available from research and other sources should be utilised. Population surveys will be useful to obtain information on exposure to risk factors.

**The transition to ICD-10(-AM) may result in a break in the time series for both deaths and hospitalisations, but ICD-10-AM will probably expand coding categories for hospital separations data.**

- For both deaths and hospitalisation data, transition to ICD-10 will result in a break of comparable data in the time-series, if fall-related injury continues to be defined in terms of ICD external cause codes. This is because there are no equivalents for the two ICD-9 E-codes E888 (Other or unspecified fall) and E887 (Fracture, cause unspecified), which currently account for one in five cases.
- The introduction of the third version of ICD-10-AM will expand coding categories. If the draft current at the time of writing is implemented, then it will be able to distinguish horse-related fall injuries, falls involving in-line skates, skateboards and folding scooters, etc. The third version of ICD-10-AM will also distinguish between different types of playground equipment.
- The application of ICD-10-AM to deaths data is now a relevant option because many of the external cause categories that are in ICD-10-AM, but not in ICD-10, are at least as relevant to mortality as they are to morbidity.

**Inclusion of 'extra' fall-related cases have some impact on deaths, but very little on hospital separations.**

- The ICD-9(-CM) E-code range E880–E888 is traditionally seen as accidental fall codes, but **other E-codes also relate to falls**. These are E804 (Fall in, on, or from railway train); E833 (Fall on stairs or ladders in water transport); E834 (Other fall from one level to another in water transport); E835 (Other and unspecified fall in water transport); E843 (Fall in, on, or from aircraft); E929.3 (Late effects of accidental fall); E957 (Suicide and self-inflicted injuries by jumping from high place); E968.1 (Assault by pushing from a high place); and E987 (Falling from high place, undetermined whether accidentally or purposely inflicted). This Report assessed whether inclusion of these 'extra' fall-related E-codes have an impact on measuring the extent of fall-related injury in children.
- **Deaths** coded to these 'extra' fall-related codes contributed less than 9% to the extent of fall-related injury for the period 1979–1998. The majority of these were due to falls in, on, or from a railway train. In 1997/98, **hospital separations** coded to these 'extra' fall-related E-codes made up less than 1% of all fall-related hospitalisations in children. Most of the 'extra' falls were coded to E910.6 or E910.7 (i.e. drowning and submersion following fall into swimming pool or into natural water).

Some fall-related cases could not be identified with ICD-9(-CM) external cause codes. For example, falls from horses could not be separated from other types of injury events involving animals or animal-drawn vehicles. The same holds for falls from bicycles or falls from motorcycles. The contribution of these types of falls to the extent of fall-related injury could therefore not be investigated in Sections 2 and 3 of this Report. Data coded to NDS-IS (such as VEMD data) have a similar limitation.

# 6 Conclusions

**It is necessary to target fall-related injury research and interventions.**

- This Report identified **specific clusters** of fall-related injury that warrant attention and intervention, e.g. among 5–9 year olds a large proportion of fall-related is associated with playground equipment.
- A systematic approach to describing these clusters is provided by a **fall-related injury matrix**, with four action areas forming the rows and three childhood age groups the columns (Table 6.1). Relevant clusters are listed within each of the resulting cells.

**Table 6.1: Proposed matrix for fall-related injury in children**

Action area	Age group		
	0–4 years	5–9 years	10–14 years
Furniture/nursery items	Nursery furniture Beds Chairs Tables Baby walkers Bunk beds	Bunk beds	Bunk beds
Recreation/sports		Small wheeled equipment (skate boards, in-line skates) Bicycles Play equipment, including trampolines Sporting activities and specific sports	Small wheeled equipment (skate boards, in-line skates) Bicycles Play equipment, including trampolines Sporting activities and specific sports
Structural aspects of the environment	Stairs and steps	Stairs and steps	
Other	Falls from heights resulting in death	Falls from heights resulting in death	Falls from heights resulting in death

- It is necessary to keep a **strategic oversight** on what work is being done on specific clusters of fall-related injury and whether work in these areas is progressing.

Much of the information necessary for the design and implementation of initiatives to prevent fall-related injury is not found in surveillance data and additional and complementary approaches are needed. Such approaches include case control studies, surveys of risk behaviour, etc.

The body of knowledge about fall-related injury is increasing and a number of developments in this regard is also taking place.

Current research and developments regarding some of the clusters listed in Table 6.1 include:

**Playgrounds:**

- A revision of Australian Standards for playgrounds is underway.
- A case-control study to determine the relationships between fall height, the impact absorbing qualities of playground under-surfacing and the risk of upper limb fracture in children is being carried out by MUARC (Contact persons: Joan Ozanne-Smith and J.Wenzel. More information is available at <http://www.general.monash.edu.au/muarc/projects/>).
- The Injury Surveillance and Control Unit of SA Department of Human Services has completed a detailed case series on children who sustained injuries while playing on monkey bars. (Contact person: Peter Thompson. The name of the article is "Monkey bars – the leading cause of playground injury". Unpublished study. 2001).

**Nursery furniture:**

- The NSW Department of Fair Trading has introduced a requirement that baby walkers sold in NSW must comply with the US ASTM standard. It is possible that this regulation will also be implemented in other States and Territories.
- An in-depth study on injury related to baby walkers was also recently completed by the Injury Surveillance and Control Unit of SA Department of Human Services. (Contact person: Peter Thompson. The name of the article is "Baby walker injury – the predicted outcomes of mandatory baby walker regulations". Unpublished study. 2001).

**Small wheeled equipment:**

- An observational study to determine the level of wrist guard, helmet, knee and elbow pad use by Victorian in-line skaters at various types of skating locations by MUARC is being conducted. (Contact persons: Shauna Sherker. More information is available at <http://www.general.monash.edu.au/muarc/projects/>).
- Development of an Australian Standard for folding scooters is underway.

**Consumer products:**

- MUARC is undertaking research into the role that consumer products play in regard to injuries among children aged 0–14 years and to investigate how injuries to children from consumer products can be reduced. (Contact persons: Wendy Watson. More information is available at <http://www.general.monash.edu.au/muarc/projects/>).

**Sports and sporting activities:**

- A MUARC study aimed to determine the complete sport and recreation injury experience, including participation, within a well-defined population has been conducted. (Contact persons: Erin Cassell. More information is available at <http://www.general.monash.edu.au/muarc/projects/>).

**Trampolines:**

- Development of an Australian Standard is underway.

**General:**

- MUARC has been commissioned to provide overview data for unintentional injuries to children under fifteen years of age for the purpose of identifying key areas for further investigation and research. (Contact persons: Erin Cassell. More information is available at <http://www.general.monash.edu.au/muarc/projects/>).
- At the time of writing, data from the NCIS were becoming available. These data can contribute to better understanding of deaths due to falls, particularly in regard to the height of falls.
- MUARC and the Queensland Injury Surveillance Unit regularly publish descriptive data on various issues related to childhood falls. (These reports and fact sheets are available at <http://www.general.monash.edu.au/muarc/hazard/hazidx.htm> and <http://www.qisu.qld.gov.au/home.htm>).

## The impact of fall-related injury with more severe outcomes needs to be assessed.

- This Report provided evidence that a small proportion of more severe cases resulted in a significant burden among hospitalised cases. It is important to consider the public health importance of these cases. Table 6.2 provides a summary of the state of play in this regard.

**Table 6.2: (Estimated) frequency, relevant data sources to enumerate the frequency and inform intervention, and public health importance of different types of falls**

Type of fall	Frequency <sup>(a)</sup>	Relevant data sources	Public health importance <sup>(b)</sup>
All falls	+++++	None available and unlikely that such a source will become available	Low/nil
Falls where injury was sustained	++++	Population surveys	Low
Falls presenting for treatment of injury	+++(+)	ED data and or GP sources, NHS surveys	Some/ ? Moderate
Falls with severe outcomes	++	Hospitalisation or mortality data	? Moderate/high
Falls with fatal outcomes	+	Mortality data	Unknown

(a) Indicates relative frequency as estimated by authors

(b) As subjectively judged by authors in terms of burden of disease

- Further examination of more severe cases are needed. This is because the definition of severe cases is not clear, the impact of these cases is not well understood, and we need to determine whether the mechanism leading to more severe cases differ from those resulting in minor cases. More research into these issues may provide very useful insight for prevention of fall-related injury.
- Two examples of such work are research on the cost of childhood injury currently underway at MUARC and work on the application of severity measures to hospital separations data by RCIS. These projects will provide additional insight into the impact of various types of fall-related injury.
- Priorities for action on fall-related injury need to be reassessed when these and other data become available.

## Data available for monitoring the incidence of fall-related injury can be improved in specific ways.

- A **flag for identifying new cases** in hospital separations data should be introduced or, alternatively, the 'Date the injury occurred' could be added as a variable to national hospital separations data. The latter suggestion is a practice followed in New Zealand and have proven to be useful in estimating incidence cases in the absence of a flag for identifying new cases. The ability to distinguish between new and repeat cases among hospitalisations will be a major step forward and will improve the ability of hospital separations data to be used for monitoring the incidence of fall-related injury.
- It is desirable to have **national deaths data coded to ICD-10-AM**. This will enhance deaths data currently available on fall-related injury in children.
- A **reliable indicator** for monitoring fall-related injury in children that is independent of service delivery and that is not defined in terms of ICD external cause codes should be developed. Fracture of the radius and ulna might be considered as falls resulting in a large number of such cases. Among hospitalised children aged 0–14 years in 1997/98, 75.3% of radius and ulna fractures were due to falls as identified by the ICD-9 E-code range E880–E888.

# References

- Ashby K and Corbo M 2000. Hazard No 44: Child fall injuries: an overview. Clayton: Monash University Accident Research Centre.
- Australian Bureau of Statistics Australian Demographic Statistics. Canberra: Australian Bureau of Statistics.
- Australian Sports Commission 1993. Sport - a great investment. Canberra: Australian Sports Commission.
- Australian Institute of Health and Welfare 1999. Australian hospital statistics 1997-98. In: Australian Institute of Health and Welfare (Ed.) Canberra: Australian Institute of Health and Welfare.
- Bordeaux S and Harrison J 1998. Australian Injury Prevention Bulletin No 23: Injury mortality Australia 1995. Adelaide: Australian Institute of Health and Welfare.
- Britt H, Sayer P, Miller C and *et al.* 1999. Bettering the evaluation and care of health: a study of general practice activity. Six month interim report. Australian Institute for Health and Welfare and University of Sydney.
- Day L, Valuri G and Ozanne-Smith J 1995. General practice injury surveillance in the Latrobe Valley. Clayton: Monash University Accident Research Centre.
- Department of Health and Aged Care 2000. National Injury Prevention Action Plan: Priorities for 2001-2003.
- Harrison JE (In Press). Measuring and characterising injury in Australia. Canberra: Australian Institute for Health and Welfare.
- Langley J 1992. The role of surveillance in reducing morbidity and mortality from injuries. *Morbidity and Mortality Weekly Report Supplement* 41: 181-191.
- Mathers C, Penm R, Carter R and Stevenson C 1999. Health system costs of injury, poisoning, and musculoskeletal disorders in Australia, 1993-94. Canberra: Australian Institute of Health and Welfare.
- Stokes M, Ozanne-Smith J, Harrison J and Steenkamp M 2000. Validation of an injury surveillance epidemiological data system used within emergency departments. *Injury Control and Safety Promotion* 7(4): 219-232.
- Victorian Injury Surveillance and Applied Research System 2000. Victorian Emergency Minimum Dataset (VEMD) User Manual 1 (Version 5). Melbourne: Department of Human Services.
- WHO Collaborating Center on Injury Surveillance 2001. International Classification of External Causes of Injuries. Data Dictionary Version 1.0. Amsterdam: Consumer Safety Institute.



# Appendices

## Appendix A1: Tables on deaths due to accidental falls among children (E880–E888); Australia 1979–1998

**Table A1.1: Counts, age-specific and age-standardised rates for deaths due to accidental falls (E880–E888) in males aged 0–14 years by year of registration and by age group; Australia 1979–1998**

Year of death registration	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1979	6	1.0	2	0.3	2	0.3	10	0.6
1980	3	0.5	2	0.3	4	0.6	9	0.5
1981	5	0.9	2	0.3	4	0.6	11	0.6
1982	5	0.9	2	0.3	5	0.7	12	0.6
1983	6	1.0	4	0.7	4	0.6	14	0.7
1984	2	0.3	0	..	6	0.9	8	0.4
1985	5	0.8	0	..	1	0.1	6	0.3
1986	3	0.5	1	0.2	3	0.5	7	0.4
1987	3	0.5	0	..	1	0.2	4	0.2
1988	1	0.2	2	0.3	3	0.5	6	0.3
1989	2	0.3	1	0.2	4	0.6	7	0.4
1990	4	0.6	0	..	3	0.5	7	0.4
1991	2	0.3	1	0.2	2	0.3	5	0.3
1992	4	0.6	1	0.2	1	0.2	6	0.3
1993	5	0.8	4	0.6	2	0.3	11	0.6
1994	1	0.2	1	0.2	2	0.3	4	0.2
1995	2	0.3	1	0.2	5	0.8	8	0.4
1996	2	0.3	1	0.2	4	0.6	7	0.4
1997	0	..	2	0.3	2	0.3	4	0.2
1998	2	0.3	0	..	0	..	2	0.1

**Table A1.2: Counts, age-specific and age-standardised rates for deaths due to accidental falls (E880–E888) in females aged 0–14 years by year of registration and by age group; Australia 1979–1998**

Year of death registration	0–4		5–9		10–14		0–14	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1979	4	0.7	2	0.3	1	0.2	7	0.4
1980	5	0.9	1	0.2	1	0.2	7	0.4
1981	1	0.2	2	0.3	1	0.2	4	0.2
1982	3	0.5	1	0.2	1	0.2	5	0.3
1983	5	0.9	0	..	1	0.2	6	0.3
1984	4	0.7	1	0.2	0	..	5	0.3
1985	3	0.5	1	0.2	1	0.2	5	0.3
1986	0	..	0	..	0	..	0	..
1987	3	0.5	0	..	1	0.2	4	0.2
1988	2	0.3	0	..	1	0.2	3	0.2
1989	2	0.3	0	..	2	0.3	4	0.2
1990	2	0.3	1	0.2	1	0.2	4	0.2
1991	1	0.2	1	0.2	0	..	2	0.1
1992	3	0.5	2	0.3	1	0.2	6	0.3
1993	1	0.2	1	0.2	0	..	2	0.1
1994	0	..	0	..	0	..	0	..
1995	1	0.2	2	0.3	1	0.2	4	0.2
1996	0	..	1	0.2	0	..	1	0.1
1997	4	0.6	2	0.3	1	0.2	7	0.4
1998	0	..	0	..	1	0.2	1	0.1

**Table A1.3: Counts, rates, and male to female rate ratios for deaths due to accidental falls (E880–E888) in children by year of registration and by age group; Australia 1979–1998**

Year of death registration	0–4 years		5–9 years		10–14 years		0–14 years		M:F rate ratio
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate	
1979	10	0.9	4	0.3	3	0.2	17	0.5	1.4
1980	8	0.7	3	0.2	5	0.4	16	0.4	1.2
1981	6	0.5	4	0.3	5	0.4	15	0.4	2.7
1982	8	0.7	3	0.2	6	0.4	17	0.5	2.2
1983	11	0.9	4	0.3	5	0.4	20	0.6	2.2
1984	6	0.5	1	0.1	6	0.4	13	0.3	1.3
1985	8	0.7	1	0.1	2	0.2	11	0.3	1.1
1986	3	0.3	1	0.1	3	0.2	7	0.2	0.0
1987	6	0.5	0	..	2	0.2	8	0.2	1.0
1988	3	0.2	2	0.2	4	0.3	9	0.2	1.9
1989	4	0.3	1	0.1	6	0.5	11	0.3	1.7
1990	6	0.5	1	0.1	4	0.3	11	0.3	1.7
1991	3	0.2	2	0.2	2	0.2	7	0.2	2.4
1992	7	0.5	3	0.2	2	0.2	12	0.3	0.9
1993	6	0.5	5	0.4	2	0.2	13	0.3	5.2
1994	1	0.1	1	0.1	2	0.2	4	0.1	0.0
1995	3	0.2	3	0.2	6	0.5	12	0.3	1.9
1996	2	0.2	2	0.2	4	0.3	8	0.2	6.6
1997	4	0.3	4	0.3	3	0.2	11	0.3	0.5
1998	2	0.2	0	..	1	0.1	3	0.1	2.0

**Table A1.4: Counts for deaths due to accidental falls (E880–E888) in children aged 0–14 years by year of death registration and by external cause code; Australia 1979–1998**

Year of death registration	ICD-9 External Cause code							
	E880	E882	E883	E884	E885	E886	E887	E888
1979	1	5	0	9	1	0	1	0
1980	1	5	0	9	0	0	0	1
1981	1	3	0	6	1	1	0	3
1982	1	2	1	12	0	0	0	1
1983	3	8	2	5	0	1	0	1
1984	1	3	0	8	1	0	0	0
1985	1	3	0	6	0	0	1	0
1986	1	1	0	5	0	0	0	0
1987	0	2	0	2	1	0	0	3
1988	0	3	0	4	1	0	0	1
1989	2	5	0	2	2	0	0	0
1990	0	4	2	4	1	0	0	0
1991	0	2	1	2	0	1	0	1
1992	2	5	0	4	1	0	0	0
1993	2	1	1	5	1	1	1	1
1994	0	1	0	2	0	0	1	0
1995	0	2	0	8	0	0	0	2
1996	0	2	0	5	1	0	0	0
1997	0	4	1	2	1	0	1	2
1998	0	1	0	1	0	0	0	1

Please note that there were no deaths coded to E881 (Falls on or from ladders or scaffolding) in children aged 0–14 years for the years considered.

**Table A1.5: Counts and rates for deaths due to other falls from one level to another (E884) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998**

Year of death registration	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1979	3	0.3	3	0.2	3	0.2	9	0.2
1980	5	0.4	2	0.2	2	0.2	9	0.3
1981	1	0.1	3	0.2	2	0.2	6	0.2
1982	4	0.4	3	0.2	5	0.4	12	0.3
1983	2	0.2	2	0.2	1	0.1	5	0.1
1984	4	0.3	1	0.1	3	0.2	8	0.2
1985	5	0.4	0	..	1	0.1	6	0.2
1986	2	0.2	1	0.1	2	0.2	5	0.1
1987	1	0.1	0	..	1	0.1	2	0.1
1988	1	0.1	2	0.2	1	0.1	4	0.1
1989	1	0.1	0	..	1	0.1	2	0.1
1990	3	0.2	1	0.1	0	..	4	0.1
1991	0	..	1	0.1	1	0.1	2	0.1
1992	3	0.2	0	..	1	0.1	4	0.1
1993	2	0.2	3	0.2	0	..	5	0.1
1994	1	0.1	0	..	1	0.1	2	0.1
1995	2	0.2	2	0.2	4	0.3	8	0.2
1996	1	0.1	2	0.2	2	0.2	5	0.1
1997	1	0.1	0	..	1	0.1	2	0.1
1998	0	..	0	..	1	0.1	1	<0.1

**Table A1.6: Counts and rates for deaths due to falls from or out of a building or other structure (E882) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998**

Year of death registration	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1979	4	0.4	1	0.1	0	..	5	0.1
1980	2	0.2	1	0.1	2	0.2	5	0.1
1981	2	0.2	1	0.1	0	..	3	0.1
1982	1	0.1	0	..	1	0.1	2	0.1
1983	5	0.4	0	..	3	0.2	8	0.2
1984	0	..	0	..	3	0.2	3	0.1
1985	2	0.2	0	..	1	0.1	3	0.1
1986	0	..	0	..	1	0.1	1	<0.1
1987	2	0.2	0	..	0	..	2	0.1
1988	1	0.1	0	..	2	0.2	3	0.1
1989	2	0.2	1	0.1	2	0.2	5	0.1
1990	2	0.2	0	..	2	0.2	4	0.1
1991	1	0.1	0	..	1	0.1	2	0.1
1992	1	0.1	3	0.2	1	0.1	5	0.1
1993	0	..	0	..	1	0.1	1	<0.1
1994	0	..	0	..	1	0.1	1	<0.1
1995	0	..	0	..	2	0.2	2	0.1
1996	0	..	0	..	2	0.2	2	0.1
1997	2	0.2	1	0.1	1	0.1	4	0.10
1998	1	0.1	0	..	0	..	1	<0.1

**Table A1.7: Counts and rates for deaths due to remaining fall mechanisms (E880, E883, E885–E888) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998**

Year of death registration	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1979	3	0.3	0	..	0	..	3	0.1
1980	1	0.1	0	..	1	0.1	2	0.1
1981	3	0.3	0	..	3	0.2	6	0.2
1982	3	0.3	0	..	0	..	3	0.1
1983	4	0.3	2	0.2	1	0.1	7	0.2
1984	2	0.2	0	..	0	..	2	0.1
1985	1	0.1	1	0.1	0	..	2	0.1
1986	1	0.1	0	..	0	..	1	<0.1
1987	3	0.3	0	..	1	0.1	4	0.1
1988	1	0.1	0	..	1	0.1	2	0.1
1989	1	0.1	0	..	3	0.2	4	0.1
1990	1	0.1	0	..	2	0.2	3	0.1
1991	2	0.2	1	0.1	0	..	3	0.1
1992	3	0.2	0	..	0	..	3	0.1
1993	4	0.3	2	0.2	1	0.1	7	0.18
1994	0	..	1	0.1	0	..	1	<0.1
1995	1	0.1	1	0.1	0	..	2	0.1
1996	1	0.1	0	..	0	..	1	<0.1
1997	1	0.1	3	0.2	1	0.1	5	0.1
1998	1	0.1	0	..	0	..	1	<0.1

Please note that there were no deaths coded to E881 (Falls on or from ladders or scaffolding) in children aged 0–14 years for the years considered.

**Table A1.8: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in males by year of death registration and by State/Territory; Australia 1979–1998**

Year of death registration	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1979	4	0.7	1	0.2	2	0.7	1	0.6	0	..	1	1.7	0	..	1	6.0
1980	4	0.6	1	0.2	2	0.7	1	0.6	0	..	1	1.7	0	..	0	..
1981	4	0.6	3	0.7	2	0.7	1	0.5	1	0.6	0	..	0	..	0	..
1982	3	0.4	4	0.8	2	0.6	1	0.6	1	0.6	0	..	0	..	1	4.7
1983	1	0.2	7	1.5	2	0.6	3	1.5	0	..	1	1.9	0	..	0	..
1984	2	0.3	2	0.4	2	0.6	1	0.5	1	0.7	0	..	0	..	0	..
1985	1	0.2	1	0.2	3	0.9	1	0.6	0	..	0	..	0	..	0	..
1986	2	0.3	3	0.6	1	0.3	1	0.5	0	..	0	..	0	..	0	..
1987	1	0.2	0	..	2	0.6	0	..	1	0.7	0	..	0	..	0	..
1988	4	0.6	0	..	1	0.3	0	..	0	..	0	..	0	..	1	4.1
1989	6	0.9	0	..	1	0.3	0	..	0	..	0	..	0	..	0	..
1990	4	0.6	0	..	2	0.6	1	0.5	0	..	0	..	0	..	0	..
1991	2	0.3	0	..	2	0.6	0	..	0	..	1	1.8	0	..	0	..
1992	1	0.1	3	0.6	1	0.3	0	..	0	..	0	..	1	2.9	0	..
1993	5	0.8	1	0.2	2	0.6	1	0.5	2	1.3	0	..	0	..	0	..
1994	2	0.3	0	..	1	0.3	0	..	1	0.6	0	..	0	..	0	..
1995	5	0.7	1	0.2	1	0.3	0	..	0	..	1	1.8	0	..	0	..
1996	2	0.3	0	..	3	0.8	1	0.5	0	..	0	..	0	..	1	4.2
1997	1	0.1	2	0.4	0	..	1	0.5	0	..	0	..	0	..	0	..
1998	1	0.2	1	0.2	0	..	0	..	0	..	0	..	0	..	0	..



**Table A1.9: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in females by year of death registration and by State/Territory; Australia 1979–1998**

Year of death registration	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1979	3	0.5	2	0.4	0	..	0	..	0	..	1	1.7	1	2.8	0	..
1980	3	0.5	1	0.2	0	..	1	0.7	1	0.7	0	..	0	..	1	5.1
1981	2	0.3	0	..	1	0.3	0	..	1	0.7	0	..	0	..	0	..
1982	1	0.2	3	0.7	0	..	0	..	1	0.6	0	..	0	..	0	..
1983	3	0.5	1	0.2	1	0.4	0	..	0	..	1	2.0	0	..	0	..
1984	1	0.2	1	0.2	3	1.0	0	..	0	..	0	..	0	..	0	..
1985	2	0.3	1	0.2	2	0.7	0	..	0	..	0	..	0	..	0	..
1986	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
1987	2	0.3	1	0.2	0	..	0	..	0	..	1	1.9	0	..	0	..
1988	3	0.5	0	..	0	..	0	..	0	..	0	..	0	..	0	..
1989	1	0.2	1	0.2	2	0.6	0	..	0	..	0	..	0	..	0	..
1990	1	0.2	2	0.4	0	..	0	..	0	..	0	..	0	..	1	4.2
1991	1	0.2	0	..	0	..	0	..	0	..	1	1.9	0	..	0	..
1992	3	0.5	0	..	2	0.6	0	..	1	0.7	0	..	0	..	0	..
1993	2	0.3	0	..	0	..	0	..	0	..	0	..	0	..	0	..
1994	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
1995	1	0.2	1	0.2	0	..	0	..	1	0.7	1	2.0	0	..	0	..
1996	1	0.2	0	..	0	..	0	..	0	..	0	..	0	..	0	..
1997	1	0.2	2	0.4	1	0.3	0	..	1	0.7	0	..	1	3.0	1	3.9
1998	0	..	0	..	0	..	0	..	0	..	0	..	0	..	1	4.3

**Table A1.10: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in all children by year of death registration and by State/Territory; Australia 1979–1998**

Year of death registration	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1979	7	0.6	3	0.3	2	0.3	1	0.3	0	..	2	1.7	1	1.4	1	3.1
1980	7	0.6	2	0.2	2	0.3	2	0.6	1	0.4	1	0.9	0	..	1	2.5
1981	6	0.5	3	0.3	3	0.5	1	0.3	2	0.6	0	..	0	..	0	..
1982	4	0.3	7	0.8	2	0.3	1	0.3	2	0.6	0	..	0	..	1	2.4
1983	4	0.3	8	0.9	3	0.5	3	0.8	0	..	2	1.0	0	..	0	..
1984	3	0.2	3	0.3	5	0.8	1	0.3	1	0.3	0	..	0	..	0	..
1985	3	0.2	2	0.2	5	0.8	1	0.3	0	..	0	..	0	..	0	..
1986	2	0.2	3	0.3	1	0.2	1	0.3	0	..	0	..	0	..	0	..
1987	3	0.2	1	0.1	2	0.3	0	..	1	0.3	1	0.9	0	..	0	..
1988	7	0.6	0	..	1	0.1	0	..	0	..	0	..	0	..	1	2.1
1989	7	0.6	1	0.1	3	0.5	0	..	0	..	0	..	0	..	0	..
1990	5	0.4	2	0.2	2	0.3	1	0.3	0	..	0	..	0	..	1	2.0
1991	3	0.2	0	..	2	0.3	0	..	0	..	2	1.8	0	..	0	..
1992	4	0.3	3	0.3	3	0.4	0	..	1	0.3	0	..	1	1.5	0	..
1993	7	0.5	1	0.1	2	0.3	1	0.3	2	0.7	0	..	0	..	0	..
1994	2	0.2	0	..	1	0.1	0	..	1	0.3	0	..	0	..	0	..
1995	6	0.5	2	0.2	1	0.1	0	..	1	0.3	2	1.9	0	..	0	..
1996	3	0.2	0	..	3	0.4	1	0.3	0	..	0	..	0	..	1	2.2
1997	2	0.2	4	0.4	1	0.1	1	0.2	1	0.3	0	..	1	1.5	1	1.9
1998	1	0.1	1	0.1	0	..	0	..	0	..	0	..	0	..	1	2.1

## Appendix A2: Tables on hospitalisations due to falls among children; Australia 1993/94–1997/98

**Table A2.1: Counts, age-specific and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by age group; Australia 1993/94–1997/98**

Data year	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1993/94	3,965	596.3	5,597	853.0	4,884	747.3	14,446	732.1
1994/95	3,908	586.1	5,686	862.4	5,017	759.8	14,611	735.9
1995/96	4,107	615.5	5,704	856.1	4,992	748.1	14,803	739.9
1996/97	4,247	637.5	5,879	874.7	5,222	777.9	15,348	763.3
1997/98	4,179	631.6	5,895	871.5	5,436	809.4	15,510	770.5

**Table A2.2: Counts, age-specific and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by age group; Australia 1993/94–1997/98**

Data year	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate
1993/94	2,947	467.0	3,990	638.5	2,391	386.1	9,328	498.1
1994/95	2,852	450.9	3,920	624.8	2,320	369.9	9,092	482.7
1995/96	3,095	488.8	4,255	671.3	2,461	387.6	9,811	516.9
1996/97	3,214	508.9	4,305	673.4	2,415	377.7	9,934	521.2
1997/98	3,065	488.5	4,433	689.7	2,393	373.7	9,891	518.5

**Table A2.3: Counts, age-specific and age-standardised rates as well as male to female rate ratio for hospitalisations due to accidental falls (E880–E888) in all children by data year and by age group; Australia 1993/94–1997/98**

Data year	0–4		5–9		10–14		0–14		M:F rate ratio
	Count	Age-specific rate	Count	Age-specific rate	Count	Age-specific rate	Count	Age-standardised rate	
1993/94	6,912	533.3	9,587	748.4	7,275	571.6	23,774	618.1	1.5
1994/95	6,760	520.3	9,606	746.5	7,337	569.8	23,703	612.6	1.5
1995/96	7,202	553.8	9,959	766.0	7,453	572.4	24,614	631.2	1.4
1996/97	7,461	574.9	10,184	776.6	7,637	582.7	25,282	645.2	1.5
1997/98	7,244	561.9	10,328	782.9	7,829	596.8	25,401	647.6	1.5

**Table A2.4: Counts for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	422	104	635	68	6,772	1,948	882	1,134	2,481
1994/95	452	81	599	78	6,770	2,080	1,118	1,097	2,336
1995/96	405	71	617	62	7,161	2,101	1,142	1,032	2,212
1996/97	494	92	725	89	7,151	2,079	1,497	1,010	2,211
1997/98	423	78	661	107	7,128	2,185	1,947	1,004	1,977

**Table A2.5: Counts for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	346	45	270	44	4,619	1,484	292	629	1,599
1994/95	304	43	273	44	4,709	1,362	320	604	1,433
1995/96	323	53	283	71	5,230	1,430	370	597	1,454
1996/97	332	45	301	59	5,241	1,479	419	589	1,469
1997/98	334	38	310	72	5,243	1,391	554	531	1,418

**Table A2.6: Counts for hospitalisations due to accidental falls (E880–E888) in all children aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	768	149	905	112	11,391	3,432	1,174	1,763	4,080
1994/95	756	124	872	122	11,479	3,442	1,438	1,701	3,769
1995/96	728	124	900	133	12,391	3,531	1,512	1,629	3,666
1996/97	826	137	1,026	148	12,392	3,558	1,916	1,599	3,680
1997/98	757	116	971	179	12,371	3,576	2,501	1,535	3,395

**Table A2.7: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	21.5	5.3	32.1	3.4	343.8	98.6	44.5	57.3	125.7
1994/95	22.9	4.1	30.2	3.9	341.9	104.6	55.9	55.0	117.6
1995/96	20.4	3.6	30.9	3.1	359.0	104.9	56.5	51.3	110.4
1996/97	24.8	5.0	36.1	4.4	357.0	103.2	73.6	49.8	109.9
1997/98	21.3	3.9	32.9	5.3	355.5	108.5	95.5	49.6	98.2

**Table A2.8: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	18.5	2.4	14.4	2.3	246.9	79.2	15.6	33.6	85.3
1994/95	16.2	2.3	14.5	2.3	250.5	72.2	16.9	32.0	76.0
1995/96	17.1	2.8	15.0	3.7	276.2	75.1	19.3	31.3	76.5
1996/97	17.6	2.4	15.8	3.1	275.6	77.4	21.7	30.7	77.0
1997/98	17.7	2.0	16.3	3.7	275.6	72.7	28.6	27.6	74.2

**Table A2.9: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in all children aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98**

Data year	ICD-9 External Cause code								
	E880 (Stairs, steps)	E881 (Ladders, etc.)	E882 (From/out of building / structure)	E883 (Into hole, etc.)	E884 (One level to another)	E885 (Same level)	E886 (Same level – collision)	E887 (#, cause unspec.)	E888 (Other/ unspec. fall)
1993/94	20.0	3.9	23.5	2.9	296.6	89.2	30.4	45.8	106.0
1994/95	19.6	3.2	22.6	3.1	297.4	88.8	36.9	43.8	97.3
1995/96	18.8	3.2	23.1	3.4	318.7	90.4	38.4	41.5	93.9
1996/97	21.3	3.5	26.2	3.7	317.3	90.6	48.3	40.5	93.9
1997/98	19.6	3.0	24.8	4.5	316.5	91.0	62.9	38.9	86.5

**Table A2.10: External causes (4<sup>th</sup>-digit level of detail) of hospitalisations due to accidental falls among children aged 0–14 years: Counts and percentages by sex; Australia, 1997/98**

Accidental falls	E-code*	Males								Females							
		0–4 years		5–9 years		10–14 years		Ages 0–14 years		0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
<i>Fall on or from stairs or steps</i>	E880																
Fall on/from escalator	E880.0	4	0.1	7	0.1	2	<0.1	13	0.1	5	0.2	2	<0.1	1	<0.1	8	0.1
Fall from footpath kerb	E880.1	4	0.1	2	<0.1	0	..	6	<0.1	3	0.1	2	<0.1	2	0.1	7	0.1
Fall from stairs/steps other	E880.9	240	5.7	93	1.6	71	1.3	404	2.6	188	6.1	73	1.6	58	2.4	319	3.2
<b>Subtotal:</b>		<b>248</b>	<b>5.9</b>	<b>102</b>	<b>1.7</b>	<b>73</b>	<b>1.3</b>	<b>423</b>	<b>2.7</b>	<b>196</b>	<b>6.4</b>	<b>77</b>	<b>1.7</b>	<b>61</b>	<b>2.5</b>	<b>334</b>	<b>3.4</b>
<i>Fall on or from ladders or scaffolding</i>	E881																
Fall from ladder	E881.0	31	0.7	26	0.4	19	0.3	76	0.5	16	0.5	15	0.3	5	0.2	36	0.4
Fall from scaffolding	E881.1	1	<0.1	0	..	1	<0.1	2	<0.1	1	<0.1	1	<0.1	0	..	2	<0.1
<b>Subtotal:</b>		<b>32</b>	<b>0.8</b>	<b>26</b>	<b>0.4</b>	<b>20</b>	<b>0.4</b>	<b>78</b>	<b>0.5</b>	<b>17</b>	<b>0.6</b>	<b>16</b>	<b>0.4</b>	<b>5</b>	<b>0.2</b>	<b>38</b>	<b>0.4</b>
<i>Fall from building/structure</i>	E882	210	5.0	266	4.5	185	3.4	661	4.3	136	4.4	120	2.7	54	2.3	310	3.1
<b>Subtotal:</b>		<b>210</b>	<b>5.0</b>	<b>266</b>	<b>4.5</b>	<b>185</b>	<b>3.4</b>	<b>661</b>	<b>4.3</b>	<b>136</b>	<b>4.4</b>	<b>120</b>	<b>2.7</b>	<b>54</b>	<b>2.3</b>	<b>310</b>	<b>3.1</b>
<i>Fall into hole or other opening in surface</i>	E883																
Dive/jump into water	E883.0	3	0.1	14	0.2	65	1.2	82	0.5	4	0.1	17	0.4	31	1.3	52	0.5
Fall into well	E883.1	1	<0.1	1	<0.1	0	..	2	<0.1	0	..	0	..	0	..	0	..
Fall into storm drain/manhole	E883.2	0	..	1	<0.1	1	<0.1	2	<0.1	1	<0.1	0	..	1	<0.1	2	<0.1
Fall into other hole/opening	E883.9	2	<0.1	7	0.1	12	0.2	21	0.1	6	0.2	4	0.1	7	0.3	17	0.2
<b>Subtotal:</b>		<b>6</b>	<b>0.1</b>	<b>23</b>	<b>0.4</b>	<b>78</b>	<b>1.4</b>	<b>107</b>	<b>0.7</b>	<b>11</b>	<b>0.4</b>	<b>21</b>	<b>0.5</b>	<b>39</b>	<b>1.6</b>	<b>71</b>	<b>0.7</b>
<i>Other fall from one level to another</i>	E884																
Fall from playground equipment	E884.0	528	12.6	1,570	26.6	406	7.5	2,504	16.1	383	12.5	1,411	31.8	243	10.2	2,037	20.6
Fall from cliff	E884.1	2	<0.1	13	0.2	15	0.3	30	0.2	1	<0.1	0	..	9	0.4	10	0.1

Continued

**Table A2.10 (continued): External causes (4<sup>th</sup>-digit level of detail) of hospitalisations due to accidental falls among children aged 0–14 years: Counts and percentages by sex; Australia, 1997/98**

Accidental falls	E-code*	Males								Females							
		0–4 years		5–9 years		10–14 years		Ages 0–14 years		0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
Fall from chair	E884.2	422	10.1	141	2.4	55	1.0	618	4.0	367	12.0	137	3.1	50	2.1	554	5.6
Fall from tree	E884.3	75	1.8	569	9.7	299	5.5	943	6.1	35	1.1	222	5.0	105	4.4	362	3.7
Fall involving bed	E884.4	363	8.7	215	3.6	58	1.1	636	4.1	267	8.7	193	4.4	55	2.3	515	5.2
Fall from trampoline	E884.5	180	4.3	288	4.9	101	1.9	569	3.7	139	4.5	344	7.8	110	4.6	593	6.0
Fall involving wheelchair	E884.6	4	0.1	8	0.1	9	0.2	21	0.1	2	0.1	4	0.1	6	0.3	12	0.1
Fall involving commode	E884.7	3	0.1	1	<0.1	1	<0.1	5	<0.1	2	0.1	1	<0.1	1	<0.1	4	<0.1
Other fall from 1 level to another	E884.9	738	17.7	583	9.9	481	8.8	1,802	11.6	617	20.1	379	8.6	160	6.7	1,156	11.7
<b>Subtotal:</b>		<b>2,315</b>	<b>55.4</b>	<b>3,388</b>	<b>57.5</b>	<b>1,425</b>	<b>26.2</b>	<b>7,128</b>	<b>46.0</b>	<b>1,813</b>	<b>59.2</b>	<b>2,691</b>	<b>60.7</b>	<b>739</b>	<b>30.9</b>	<b>5,243</b>	<b>53.0</b>
<i>Fall on same level (slip, trip, stumble)</i>	E885	598	14.3	746	12.7	841	15.5	2,185	14.1	377	12.3	529	11.9	485	20.3	1,391	14.1
<b>Subtotal:</b>		<b>598</b>	<b>14.3</b>	<b>746</b>	<b>12.7</b>	<b>841</b>	<b>15.5</b>	<b>2,185</b>	<b>14.1</b>	<b>377</b>	<b>12.3</b>	<b>529</b>	<b>11.9</b>	<b>485</b>	<b>20.3</b>	<b>1,391</b>	<b>14.1</b>
<i>Fall on same level from collision, pushing or shoving, by or with another person</i>	E886																
Same level, another person (collision, push, shove): in sports	E886.0	12	0.3	275	4.7	1,387	25.5	1,674	10.8	4	0.1	110	2.5	279	11.7	393	4.0
Same level, another person (collision, push, shove): other/unspecified	E886.9	42	1.0	108	1.8	123	2.3	273	1.8	19	0.6	70	1.6	72	3.0	161	1.6
<b>Subtotal:</b>		<b>54</b>	<b>1.3</b>	<b>383</b>	<b>6.5</b>	<b>1,510</b>	<b>27.8</b>	<b>1,947</b>	<b>12.6</b>	<b>23</b>	<b>0.8</b>	<b>180</b>	<b>4.1</b>	<b>351</b>	<b>14.7</b>	<b>554</b>	<b>5.6</b>
#, cause unspecified	E887	145	3.5	281	4.8	578	10.6	1,004	6.5	82	2.7	211	4.8	238	9.9	531	5.4
Other & unspecified fall	E888	571	13.7	680	11.5	726	13.4	1,977	12.7	410	13.4	587	13.2	421	17.6	1,418	14.3
<b>All accidental falls</b>		<b>4,179</b>	<b>100%</b>	<b>5,895</b>	<b>100%</b>	<b>5,436</b>	<b>100%</b>	<b>15,510</b>	<b>100%</b>	<b>3,065</b>	<b>100%</b>	<b>4,432</b>	<b>100%</b>	<b>2,393</b>	<b>100%</b>	<b>9,890</b>	<b>100%</b>

Note: 4<sup>th</sup>-digit E-code was not reported for one case. \* 4<sup>th</sup>-digit E-code for accidental falls (E880–E888) were reported only during financial years 1996–97 and 1997–98.

**Table A2.11: External causes of hospitalisations due to accidental falls among children aged 0–14: age-specific and age-adjusted rates by age group and sex; Australia, 1997/98**

Accidental falls	E-code*	Males					Females				
		0–4 years	5–9 years	10–14 years	Ages 0–14 years		0–4 years	5–9 years	10–14 years	Ages 0–14 years	
		Age-specific rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-adjusted Rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-adjusted Rate
<i>Fall on or from stairs or steps</i>	E880										
Fall on/from escalator	E880.0	0.6	1.0	0.3	0.6	0.6	0.8	0.3	0.2	0.4	0.4
Fall from footpath kerb	E880.1	0.6	0.3	0.0	0.3	0.3	0.5	0.3	0.3	0.4	0.4
Fall from stairs/steps other	E880.9	36.3	13.7	10.6	20.1	20.3	30.0	11.4	9.1	16.7	16.9
<b>Subtotal:</b>		<b>37.5</b>	<b>15.1</b>	<b>10.9</b>	<b>21.0</b>	<b>21.2</b>	<b>31.2</b>	<b>12.0</b>	<b>9.5</b>	<b>17.5</b>	<b>17.6</b>
<i>Fall on or from ladders or scaffolding</i>	E881										
Fall from ladder	E881.0	4.7	3.8	2.8	3.8	3.8	2.5	2.3	0.8	1.9	1.9
Fall from scaffolding	E881.1	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.1
<b>Subtotal:</b>		<b>4.8</b>	<b>3.8</b>	<b>3.0</b>	<b>3.9</b>	<b>3.9</b>	<b>2.7</b>	<b>2.5</b>	<b>0.8</b>	<b>2.0</b>	<b>2.0</b>
<i>Fall from building/structure</i>	E882	31.7	39.3	27.5	32.9	32.9	21.7	18.7	8.4	16.2	16.3
<b>Subtotal:</b>		<b>31.7</b>	<b>39.3</b>	<b>27.5</b>	<b>32.9</b>	<b>32.9</b>	<b>21.7</b>	<b>18.7</b>	<b>8.4</b>	<b>16.2</b>	<b>16.3</b>
<i>Fall into hole or other opening in surface</i>	E883										
Dive/jump into water	E883.0	0.5	2.1	9.7	4.1	4.0	0.6	2.6	4.8	2.7	2.7
Fall into well	E883.1	0.2	0.1	0.0	0.1		0.0	0.0	0.0	0.0	
Fall into storm drain/manhole	E883.2	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.1	0.1
Fall into other hole/opening	E883.9	0.3	1.0	1.8	1.0	1.0	1.0	0.6	1.1	0.9	0.9
<b>Subtotal:</b>		<b>0.9</b>	<b>3.4</b>	<b>11.6</b>	<b>5.3</b>	<b>5.3</b>	<b>1.8</b>	<b>3.3</b>	<b>6.1</b>	<b>3.7</b>	<b>3.7</b>
<i>Other fall from one level to another</i>	E884										
Fall from playground equipment	E884.0	79.8	232.1	60.5	124.6	124.6	61.0	219.5	38.0	106.6	106.7
Fall from cliff	E884.1	0.3	1.9	2.2	1.5	1.5	0.2	0.0	1.4	0.5	0.5

Continued



**Table A2.11 (continued): External causes of hospitalisations due to accidental falls among children aged 0–14 years: age-specific and age-adjusted rates by age group and sex; Australia, 1997/98**

Accidental falls	E-code*	Males					Females					
		0–4 years		5–9 years		10–14 years	Ages 0–14 years		0–4 years		Ages 0–14 years	
		Age-specific rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-adjusted Rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-specific rate	Age-adjusted Rate
Fall from chair	E884.2	63.8	20.8	8.2	30.8	31.1	58.5	21.3	7.8	29.0	29.4	
Fall from tree	E884.3	11.3	84.1	44.5	46.9	46.7	5.6	34.5	16.4	18.9	18.9	
Fall involving bed	E884.4	54.9	31.8	8.6	31.6	31.9	42.6	30.0	8.6	27.0	27.2	
Fall from trampoline	E884.5	27.2	42.6	15.0	28.3	28.4	22.2	53.5	17.2	31.0	31.1	
Fall involving wheelchair	E884.6	0.6	1.2	1.3	1.0	1.0	0.3	0.6	0.9	0.6	0.6	
Fall involving commode	E884.7	0.5	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	
Other fall from 1 level to another	E884.9	111.5	86.2	71.6	89.7	89.9	98.3	59.0	25.0	60.5	61.0	
<b>Subtotal:</b>		<b>349.9</b>	<b>500.9</b>	<b>212.2</b>	<b>354.7</b>	<b>355.5</b>	<b>288.9</b>	<b>418.6</b>	<b>115.4</b>	<b>274.4</b>	<b>275.6</b>	
<i>Fall on same level (slip, trip, stumble)</i>	E885	90.4	110.3	125.2	108.7	108.5	60.1	82.3	75.7	72.8	72.7	
<b>Subtotal:</b>		<b>90.4</b>	<b>110.3</b>	<b>125.2</b>	<b>108.7</b>	<b>108.5</b>	<b>60.1</b>	<b>82.3</b>	<b>75.7</b>	<b>72.8</b>	<b>72.7</b>	
<i>Fall on same level from collision, pushing or shoving, by or with another person</i>	E886											
Same level, another person (collision, push, shove): in sports	E886.0	1.8	40.7	206.5	83.3	82.0	0.6	17.1	43.6	20.6	20.3	
Same level, another person (collision, push, shove): other/unspecified	E886.9	6.3	16.0	18.3	13.6	13.5	3.0	10.9	11.2	8.4	8.4	
<b>Subtotal:</b>		<b>8.2</b>	<b>56.6</b>	<b>224.8</b>	<b>96.9</b>	<b>95.5</b>	<b>3.7</b>	<b>28.0</b>	<b>54.8</b>	<b>29.0</b>	<b>28.6</b>	
<i>#, cause unspecified</i>	E887	21.9	41.5	86.1	50.0	49.6	13.1	32.8	37.2	27.8	27.6	
<i>Other &amp; unspecified fall</i>	E888	86.3	100.5	108.1	98.4	98.2	65.3	91.3	65.8	74.2	74.2	
<b>All accidental falls</b>		<b>631.6</b>	<b>871.5</b>	<b>809.4</b>	<b>771.8</b>	<b>770.5</b>	<b>488.5</b>	<b>689.5</b>	<b>373.7</b>	<b>517.7</b>	<b>518.4</b>	

Note: 4<sup>th</sup>-digit E-code was not reported for one case. \* 4<sup>th</sup>-digit E-code for accidental falls (E880–E888) were reported only during financial years 1996–97 and 1997–98.

**Table A2.12: Principal diagnosis of fall-related injuries in males aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 codes	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
<b>Head and face</b>									
# of the skull	800–804	271	6.5	150	2.5	236	4.3	657	4.2
Intracranial injury excluding skull #	850–854	932	22.3	585	9.9	597	11.0	2,114	13.6
Open wound of head and face	870–873	844	20.2	254	4.3	111	2.0	1,209	7.8
<b>All head and face injuries</b>		<b>2,047</b>	<b>49.0</b>	<b>989</b>	<b>16.8</b>	<b>944</b>	<b>17.4</b>	<b>3,980</b>	<b>25.7</b>
<b>Neck and trunk</b>									
# of vertebral column without mention of spinal cord injury (SCI)	805	6	0.1	12	0.2	25	0.5	43	0.3
# of vertebral column with mention of SCI	806	0	..	0	..	2	<0.1	2	<0.1
# of rib(s), sternum, larynx, and trachea	807	5	0.1	3	0.1	3	0.1	11	0.1
Sprains and strains of other and unspecified parts of back	847	5	0.1	12	0.2	31	0.6	48	0.3
Traumatic pneumothorax and haemothorax	860	0	..	1	<0.1	0	..	1	<0.1
Injury to heart and lung	861	0	..	0	..	1	<0.1	1	<0.1
Injury to other and unspecified internal organs	862–869	7	0.2	41	0.7	33	0.6	81	0.5
Open wound of neck	874	2	<0.1	1	<0.1	0	..	3	<0.1
Open wound of chest (wall)	875	0	..	0	..	1	<0.1	1	<0.1
Open wound of back	876	1	<0.1	2	<0.1	1	<0.1	4	<0.1
<b>All neck and trunk injuries</b>		<b>26</b>	<b>0.6</b>	<b>72</b>	<b>1.2</b>	<b>97</b>	<b>1.8</b>	<b>195</b>	<b>1.3</b>
<b>Upper limb and shoulder region</b>									
# of clavicle	810	18	0.4	18	0.3	37	0.7	73	0.5
# of scapula	811	0	..	0	..	1	<0.1	1	<0.1
# of humerus	812	419	10.0	861	14.6	260	4.8	1,540	9.9
# of radius and ulna	813	955	22.9	3,225	54.7	2,721	50.1	6,901	44.5
# of carpal bone(s)	814	2	<0.1	22	0.4	47	0.9	71	0.5
# of hand bones	815–817	17	0.4	66	1.1	228	4.2	311	2.0
Dislocation of shoulder	831	1	<0.1	1	<0.1	14	0.3	16	0.1
Dislocation of elbow	832	11	0.3	37	0.6	35	0.6	83	0.5
Dislocation of wrist	833	1	<0.1	5	0.1	1	<0.1	7	<0.1
Dislocation of finger	834	1	<0.1	8	0.1	8	0.1	17	0.1
Sprains & strains of shoulder and upper arm	840	1	<0.1	0	<0.1	1	<0.1	2	<0.1
Sprains and strains of elbow and forearm	841	2	<0.1	1	<0.1	1	<0.1	4	<0.1
Sprains and strains of wrist and hand	842	1	<0.1	1	<0.1	3	0.1	5	<0.1
Open wound of upper limb	880–887	13	0.3	44	0.7	28	0.5	85	0.5
<b>All upper limb and shoulder region injuries</b>		<b>1,442</b>	<b>34.5</b>	<b>4,289</b>	<b>72.8</b>	<b>3,385</b>	<b>62.3</b>	<b>9,116</b>	<b>58.8</b>

**Table A2.12 (continued): Principal diagnosis of fall-related injuries in males aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 codes	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
<b>Lower limb and pelvic region</b>									
# of pelvis	808	0	..	1	<0.1	8	0.1	9	0.1
# neck of femur	820	10	0.2	6	0.1	25	0.5	41	0.3
# other/unspecified parts of femur	821	240	5.7	62	1.1	68	1.3	370	2.4
# of patella	822	0	..	1	<0.1	20	0.4	21	0.1
# of tibia and fibula	823	138	3.3	136	2.3	174	3.2	448	2.9
# of ankle	824	34	0.8	55	0.9	264	4.9	353	2.3
# of one or more ankle, foot bones or other #s	825–829	10	0.2	18	0.3	46	0.8	74	0.5
Dislocation of hip	835	1	<0.1	3	0.1	7	0.1	11	0.1
Dislocation of knee	836	0	..	2	<0.1	19	0.3	21	0.1
Dislocation of ankle	837	0	..	1	<0.1	1	<0.1	2	<0.1
Dislocation of foot	838	0	..	3	0.1	2	<0.1	5	<0.1
Sprains and strains of hip and thigh	843	0	..	2	<0.1	6	0.1	8	0.1
Sprains and strains of knee and leg	844	3	0.1	3	0.1	30	0.6	36	0.2
Sprains and strains of ankle and foot	845	1	<0.1	0	..	8	0.1	9	0.1
Sprains and strains of sacroiliac region	846	0	..	1	<0.1	0	..	1	<0.1
Open wound of buttock	877	0	..	3	0.1	3	0.1	6	<0.1
Open wound of genital region	878	13	0.3	13	0.2	5	0.1	31	0.2
Open wound of lower limb	890–897	12	0.3	87	1.5	113	2.1	212	1.4
<b>All lower limb and pelvic region injuries</b>		<b>462</b>	<b>11.1</b>	<b>397</b>	<b>6.7</b>	<b>799</b>	<b>14.7</b>	<b>1,658</b>	<b>10.7</b>
<b>Injuries not specified by body region</b>									
Ill-defined and multiple #s of upper limb, also with ribs and sternum	818–819	0	..	2	<0.1	2	<0.1	4	<0.1
Other, multiple, and ill-defined dislocations	839	1	<0.1	4	0.1	4	0.1	9	0.1
Other and ill-defined sprains and strains	848	1	<0.1	1	<0.1	1	<0.1	3	<0.1
Open wound of other and unspecified sites, except limbs	879	3	0.1	4	0.1	8	0.1	15	0.1
Injury to blood vessels	900–904	0	..	0	..	1	<0.1	1	<0.1
Superficial injury	910–919	29	0.7	13	0.2	17	0.3	59	0.4
Contusion with intact skin surface	920–924	125	3.0	53	0.9	58	1.1	236	1.5
Crushing injury	925–929	1	<0.1	0	..	0	..	1	<0.1
Effects of foreign body entering through orifice	930–939	0	..	0	..	0	..	0	..
Burns	940–949	0	..	1	<0.1	0	..	1	<0.1
Injury to nerves and spinal cord	950–957	4	0.1	2	<0.1	13	0.2	19	0.1
Certain traumatic complications and unspecified injuries	958–959	36	0.9	65	1.1	107	2.0	208	1.3
Poisoning by drugs, medicinal and biological substances	960–979	0	..	0	..	0	..	0	..
Toxic effects of substances chiefly non-medical as to source	980–989	0	..	1	<0.1	0	<0.1	1	<0.1
Other and unspecified effects of external causes	990–995	1	<0.1	0	..	0	..	1	<0.1
Complications of surgical and medical care nec	996–999	1	<0.1	2	<0.1	0	..	3	<0.1
<b>All injuries not specified by body region</b>		<b>202</b>	<b>4.8</b>	<b>148</b>	<b>2.5</b>	<b>211</b>	<b>3.9</b>	<b>561</b>	<b>3.6</b>
<b>All principal diagnoses</b>		<b>4,179</b>	<b>100</b>	<b>5,895</b>	<b>100</b>	<b>5,436</b>	<b>100</b>	<b>15,510</b>	<b>100</b>

**Table A2.13: Principal diagnosis of fall-related injuries in females aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 codes	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
<b>Head and face</b>									
# of the skull	800–804	187	6.1	67	0.9	81	0.8	335	4.3
Intracranial injury excluding skull #	850–854	822	26.8	378	5.2	167	1.6	1,367	17.5
Open wound of head and face	870–873	479	15.6	184	2.5	30	0.3	693	8.9
<b>All head and face injuries</b>		<b>1,488</b>	<b>48.5</b>	<b>629</b>	<b>8.7</b>	<b>278</b>	<b>2.7</b>	<b>2,395</b>	<b>30.6</b>
<b>Neck and trunk</b>									
# of vertebral column without mention of spinal cord	805	2	0.1	14	0.2	21	0.2	37	0.5
# of vertebral column with mention of spinal cord inj	806	0	..	0	..	2	<0.1	2	<0.1
# of rib(s), sternum, larynx, and trachea	807	3	0.1	1	<0.1	3	<0.1	7	0.1
Sprains and strains of other and unspecified parts of back	847	4	0.1	6	0.1	11	0.1	21	0.3
Traumatic pneumothorax and haemothorax	860	0	..	0	..	1	<0.1	1	<0.1
Injury to heart and lung	861	0	..	0	..	0	..	0	..
Injury to other and unspecified internal organs	862–869	4	0.1	16	0.2	10	0.1	30	0.4
Open wound of neck	874	2	0.1	0	..	0	..	2	<0.1
Open wound of chest (wall)	875	0	..	1	<0.1	1	<0.1	2	<0.1
Open wound of back	876	0	..	1	<0.1	2	<0.1	3	<0.1
<b>All neck and trunk injuries</b>		<b>15</b>	<b>0.5</b>	<b>39</b>	<b>0.5</b>	<b>51</b>	<b>0.5</b>	<b>105</b>	<b>1.3</b>
<b>Upper limb and shoulder region</b>									
# of clavicle	810	8	0.3	9	0.1	12	0.1	29	0.4
# of scapula	811	0	..	1	<0.1	1	<0.1	2	<0.1
# of humerus	812	409	13.3	784	10.8	144	1.4	1,337	17.1
# of radius and ulna	813	693	22.6	2,455	33.9	1,216	11.8	4,364	55.7
# of carpal bone(s)	814	1	<0.1	17	0.2	23	0.2	41	0.5
# of hand bones	815–817	7	0.2	44	0.6	93	0.9	144	1.8
Dislocation of shoulder	831	2	0.1	1	<0.1	5	<0.1	8	0.1
Dislocation of elbow	832	5	0.2	40	0.6	25	0.2	70	0.9
Dislocation of wrist	833	0	..	3	<0.1	1	<0.1	4	0.1
Dislocation of finger	834	1	<0.1	4	0.1	4	<0.1	9	0.1
Sprains & strains of shoulder and upper arm	840	1	<0.1	1	<0.1	1	<0.1	3	<0.1
Sprains and strains of elbow and forearm	841	1	<0.1	0	..	2	<0.1	3	<0.1
Sprains and strains of wrist and hand	842	1	<0.1	1	<0.1	3	<0.1	5	0.1
Open wound of upper limb	880–887	9	0.3	13	0.2	8	0.1	30	0.4
<b>All upper limb and shoulder injuries</b>		<b>1,138</b>	<b>37.1</b>	<b>3,373</b>	<b>46.6</b>	<b>1,538</b>	<b>14.9</b>	<b>6,049</b>	<b>77.3</b>

Continued

**Table A2.13 (continued): Principal diagnosis of fall-related injuries in females aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 codes	0–4 years		5–9 years		10–14 years		Ages 0–14 years	
		Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
<b>Lower limb and pelvic region</b>									
# of pelvis	808	0	..	3	<0.1	0	..	3	<0.1
# neck of femur	820	8	0.3	10	0.1	13	0.1	31	0.4
# other/unspecified parts of femur	821	108	3.5	28	0.4	22	0.2	158	2.0
# of patella	822	0	..	2	<0.1	10	0.1	12	0.2
# of tibia and fibula	823	59	1.9	68	0.9	64	0.6	191	2.4
# of ankle	824	32	1.0	58	0.8	159	1.5	249	3.2
# of one or more ankle, foot bones or other #s	825–829	4	0.1	7	0.1	27	0.3	38	0.5
Dislocation of hip	835	4	0.1	2	<0.1	1	<0.1	7	0.1
Dislocation of knee	836	0	..	2	<0.1	19	0.2	21	0.3
Dislocation of ankle	837	0	..	1	<0.1	0	<0.1	1	<0.1
Dislocation of foot	838	1	<0.1	0	..	0	..	1	<0.1
Sprains and strains of hip and thigh	843	2	0.1	2	<0.1	2	<0.1	6	0.1
Sprains and strains of knee and leg	844	0	..	2	<0.1	13	0.1	15	0.2
Sprains and strains of ankle and foot	845	0	..	1	<0.1	6	0.1	7	0.1
Sprains and strains of sacroiliac region	846	0	..	0	..	2	<0.1	2	<0.1
Open wound of buttock	877	0	..	2	<0.1	0	..	2	<0.1
Open wound of genital region	878	28	0.9	34	0.5	6	0.1	68	0.9
Open wound of lower limb	890–897	14	0.5	36	0.5	26	0.3	76	1.0
<b>All lower limb and pelvic region injuries</b>		<b>260</b>	<b>8.5</b>	<b>258</b>	<b>3.6</b>	<b>370</b>	<b>3.6</b>	<b>888</b>	<b>11.3</b>
<b>Injuries not specified by body region</b>									
Ill-defined and multiple #s of upper limb, also with ribs and sternum	818–819	0	..	3	<0.1	2	<0.1	5	0.1
Other, multiple, and ill-defined dislocations	839	3	0.1	3	<0.1	0	..	6	0.1
Other and ill-defined sprains and strains	848	1	<0.1	0	..	0	..	1	<0.1
Open wound of other and unspecified sites, except limbs	879	10	0.3	18	0.2	6	0.1	34	0.4
Injury to blood vessels	900–904	2	0.1	0	..	2	<0.1	4	0.1
Superficial injury	910–919	15	0.5	11	0.2	8	0.1	34	0.4
Contusion with intact skin surface	920–924	88	2.9	40	0.6	48	0.5	176	2.2
Crushing injury	925–929	0	..	0	..	0	..	0	..
Effects of foreign body entering through orifice	930–939	1	<0.1	0	..	0	..	1	<0.1
Burns	940–949	0	..	1	<0.1	0	..	1	<0.1
Injury to nerves and spinal cord	950–957	0	..	5	0.1	5	<0.1	10	0.1
Certain traumatic complications and unspecified injuries	958–959	42	1.4	53	0.7	83	0.8	178	2.3
Poisoning by drugs, medicinal and biological substances	960–979	0	..	0	..	1	<0.1	1	<0.1
Toxic effects of substances chiefly non-medical as to source	980–989	0	..	0	..	0	..	0	<0.1
Other and unspecified effects of external causes	990–995	2	0.1	0	..	0	..	2	<0.1
Complications of surgical and medical care not elsewhere classified	996–999	0	..	0	..	1	<0.1	1	<0.1
<b>All injuries not specified by body region</b>		<b>164</b>	<b>5.4</b>	<b>134</b>	<b>1.8</b>	<b>156</b>	<b>1.5</b>	<b>454</b>	<b>5.8</b>
<b>All principal diagnoses</b>		<b>3,065</b>	<b>100</b>	<b>4,433</b>	<b>100</b>	<b>2,363</b>	<b>100</b>	<b>9,891</b>	<b>100</b>

**Table A2.14: Principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex; Australia 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 code	Count	Males				Females				Children			
			Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	
# of radius and ulna	813	6,901	44.5	5,957	0.9	4,364	44.1	3,531	0.8	11,265	44.3	9,488	0.8	
# other/unspec. Parts of femur	821	370	2.4	4,186	11.3	158	1.6	1,386	8.8	528	2.1	5,572	10.6	
# of humerus	812	1,540	9.9	2,077	1.3	1,337	13.5	1,728	1.3	2,877	11.3	3,805	1.3	
Intracranial injury excluding skull #	850–854	2,114	13.6	1,650	0.8	1,367	13.8	965	0.7	3,481	13.7	2,615	0.8	
# of the skull	800–804	657	4.2	1,015	1.5	335	3.4	638	1.9	992	3.9	1,653	1.7	
# of tibia and fibula	823	448	2.9	997	2.2	191	1.9	374	2	639	2.5	1,371	2.1	
# of ankle	824	353	2.3	627	1.8	249	2.5	435	1.7	602	2.4	1,062	1.8	
Open wound of head and face	870–873	1,209	7.8	500	0.4	693	7	280	0.4	1,902	7.5	780	0.4	
# neck of femur	820	41	0.3	355	8.7	31	0.3	273	8.8	72	0.3	628	8.7	
Injury to other and unspecified internal organs	862–869	81	0.5	440	5.4	30	0.3	136	4.5	111	0.4	576	5.2	
Contusion with intact skin surface	920–924	236	1.5	223	0.9	176	1.8	192	1.1	412	1.6	415	1	
Open wound of lower limb	890–897	212	1.4	309	1.5	76	0.8	104	1.4	288	1.1	413	1.4	
Certain traumatic complications and unspecified injuries	958–959	208	1.3	206	1	178	1.8	158	0.9	386	1.5	364	0.9	
# of vertebral column without mention of SCI	805	43	0.3	169	3.9	37	0.4	114	3.1	80	0.3	283	3.5	
# of hand bones	815–817	311	2	130	0.4	144	1.5	63	0.4	455	1.8	193	0.4	
# of one or more ankle, foot bones or other #s	825–829	74	0.5	89	1.2	38	0.4	56	1.5	112	0.4	145	1.3	
Open wound of upper limb	880–887	85	0.5	102	1.2	30	0.3	39	1.3	115	0.5	141	1.2	
Dislocation of elbow	832	83	0.5	64	0.8	70	0.7	55	0.8	153	0.6	119	0.8	
Dislocation of hip	835	11	0.1	53	4.8	7	0.1	58	8.3	18	0.1	111	6.2	
Open wound of genital region	878	31	0.2	31	1	68	0.7	62	0.9	99	0.4	93	0.9	
# of patella	822	21	0.1	53	2.5	12	0.1	17	1.4	33	0.1	70	2.1	
Open wound of other and unspecified sites, except limbs	879	15	0.1	26	1.7	34	0.3	36	1.1	49	0.2	62	1.3	
Sprains & strains of knee & leg	844	36	0.2	40	1.1	15	0.2	21	1.4	51	0.2	61	1.2	
Superficial injury	910–919	59	0.4	34	0.6	34	0.3	24	0.7	93	0.4	58	0.6	
# of clavicle	810	73	0.5	40	0.5	29	0.3	14	0.5	102	0.4	54	0.5	
Sprains/strains of other & unspecified parts of back	847	48	0.3	33	0.7	21	0.2	16	0.8	69	0.3	49	0.7	
# of rib(s), sternum, larynx, and trachea	807	11	0.1	24	2.2	7	0.1	23	3.3	18	0.1	47	2.6	
# of pelvis	808	9	0.1	40	4.4	3	0	4	1.3	12	0	44	3.7	
# of carpal bone(s)	814	71	0.5	30	0.4	41	0.4	14	0.3	112	0.4	44	0.4	
Dislocation of knee	836	21	0.1	24	1.1	21	0.2	18	0.9	42	0.2	42	1	

Continued

**Table A2.14 (continued): Principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex; Australia 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 code	Count	Males				Females				Children			
			Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	
Other, multiple, and ill-defined dislocations	839	9	0.1	18	2	6	0.1	16	2.7	15	0.1	34	2.3	
Injury to nerves and spinal cord	950–957	19	0.1	21	1.1	10	0.1	13	1.3	29	0.1	34	1.2	
# of vertebral column with mention of SCI	806	2	0	14	7	2	0	10	5	4	0	24	6	
Sprains & strains of hip & thigh	843	8	0.1	14	1.8	6	0.1	8	1.3	14	0.1	22	1.6	
Open wound of neck	874	3	0	20	6.7	2	0	1	0.5	5	0	21	4.2	
Open wound of buttock	877	6	0	15	2.5	2	0	3	1.5	8	0	18	2.3	
Traumatic pneumothorax and haemothorax	860	1	0	11	11	1	0	4	4	2	0	15	7.5	
Dislocation of shoulder	831	16	0.1	10	0.6	8	0.1	1	0.1	24	0.1	11	0.5	
Sprains/strains of ankle & foot	845	9	0.1	4	0.4	7	0.1	6	0.9	16	0.1	10	0.6	
Dislocation of finger	834	17	0.1	6	0.4	9	0.1	2	0.2	26	0.1	8	0.3	
Dislocation of wrist	833	7	0	3	0.4	4	0	3	0.8	11	0	6	0.5	
# of scapula	811	1	0	3	3	2	0	2	1	3	0	5	1.7	
Ill-defined & multiple #s of upper limb, with ribs & sternum	818–819	4	0	3	0.8	5	0.1	2	0.4	9	0	5	0.6	
Dislocation of foot	838	5	0	5	1	1	0	0	0	6	0	5	0.8	
Sprains/strains of elbow/forearm	841	4	0	2	0.5	3	0	2	0.7	7	0	4	0.6	
Open wound of back	876	4	0	2	0.5	3	0	2	0.7	7	0	4	0.6	
Sprains/strains of shoulder and upper arm	840	2	0	3	1.5	3	0	0	0	5	0	3	0.6	
Other and ill-defined sprains/strains	848	3	0	2	0.7	1	0	1	1	4	0	3	0.8	
Injury to blood vessels	900–904	1	0	0	0	4	0	3	0.8	5	0	3	0.6	
Dislocation of ankle	837	2	0	1	0.5	1	0	1	1	3	0	2	0.7	
Toxic effects of substances chiefly non-medical as to source	980–989	1	0	2	2	0	0	0	0	1	0	2	2	
Sprains/strains of sacroiliac region	846	1	0	0	0	2	0	1	0.5	3	0	1	0.3	
Injury to heart and lung	861	1	0	1	1	0	0	0	0	1	0	1	1	
Open wound of chest (wall)	875	1	0	0	0	2	0	1	0.5	3	0	1	0.3	
Crushing injury	925–929	1	0	1	1	0	0	0	0	1	0	1	1	
Effects of foreign body entering through orifice	930–939	0	0	0	0	1	0	1	1	1	0	1	1	
Burns	940–949	1	0	0	0	1	0	1	1	2	0	1	0.5	
Poisoning by drugs, medicinal and biological substances	960–979	0	0	0	0	1	0	0	0	1	0	0	0	

Continued

**Table A2.14 (continued): Principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex; Australia 1997/98**

Principal diagnosis (Chapter 17 groups)	ICD-9 code	Males				Females				Children			
		Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS	Count	Per cent	LOS	ALOS
Other and unspecified effects of external causes	990–995	1	0	1	1	2	0	3	1.5	3	0	4	1.3
Complications of surgical and medical care not elsewhere classified	996–999	3	0	5	1.7	1	0	7	7	4	0	12	3
Intracranial injury excluding skull #	850–854	2,114	13.6	1,650	0.8	1,367	13.8	965	0.7	3,481	13.7	2,615	0.8
Traumatic pneumothorax and haemothorax	860	1	<0.1	11	11.0	1	<0.1	4	4.0	2	<0.1	15	7.5
Injury to heart and lung	861	1	<0.1	1	1.0	0	..	0	..	1	<0.1	1	1.0
Injury to other and unspecified internal organs	862–869	81	0.5	440	5.4	30	0.3	136	4.5	111	0.4	576	5.2
Open wound of head and face	870–873	1,209	7.8	500	0.4	693	7.0	280	0.4	1,902	7.5	780	0.4
Open wound of neck	874	3	<0.1	20	6.7	2	<0.1	1	0.5	5	<0.1	21	4.2
Open wound of chest (wall)	875	1	<0.1	0	..	2	<0.1	1	0.5	3	<0.1	1	0.3
Open wound of back	876	4	<0.1	2	0.5	3	<0.1	2	0.7	7	<0.1	4	0.6
Open wound of buttock	877	6	<0.1	15	2.5	2	<0.1	3	1.5	8	<0.1	18	2.3
Open wound of genital region	878	31	0.2	31	1.0	68	0.7	62	0.9	99	0.4	93	0.9
Open wound of other and unspecified sites, except limbs	879	15	0.1	26	1.7	34	0.3	36	1.1	49	0.2	62	1.3
Open wound of upper limb	880–887	85	0.5	102	1.2	30	0.3	39	1.3	115	0.5	141	1.2
Open wound of lower limb	890–897	212	1.4	309	1.5	76	0.8	104	1.4	288	1.1	413	1.4
Injury to blood vessels	900–904	1	<0.1	0	..	4	<0.1	3	0.8	5	<0.1	3	0.6
Superficial injury	910–919	59	0.4	34	0.6	34	0.3	24	0.7	93	0.4	58	0.6
Contusion with intact skin surface	920–924	236	1.5	223	0.9	176	1.8	192	1.1	412	1.6	415	1.0
Crushing injury	925–929	1	<0.1	1	1.0	0	..	0	..	1	<0.1	1	1.0
Effects of foreign body entering through orifice	930–939	0	..	0	..	1	<0.1	1	1.0	1	<0.1	1	1.0
Burns	940–949	1	<0.1	0	..	1	<0.1	1	1.0	2	<0.1	1	0.5
Injury to nerves and spinal cord	950–957	19	0.1	21	1.1	10	0.1	13	1.3	29	0.1	34	1.2
Certain traumatic complications and unspecified injuries	958–959	208	1.3	206	1.0	178	1.8	158	0.9	386	1.5	364	0.9
Poisoning by drugs, medicinal and biological substances	960–979	0	..	0	..	1	<0.1	0	..	1	<0.1	0	..
Toxic effects of substances chiefly non-medical as to source	980–989	1	<0.1	2	2.0	0	..	0	..	1	<0.1	2	2.0
Other and unspecified effects of external causes	990–995	1	<0.1	1	1.0	2	<0.1	3	1.5	3	<0.1	4	1.3
Complications of surgical and medical care not elsewhere classified	996–999	3	<0.1	5	1.7	1	<0.1	7	7.0	4	<0.1	12	3.0
<b>All principal diagnoses</b>		<b>15,510</b>	<b>100%</b>	<b>19,692</b>	<b>1.3</b>	<b>9,891</b>	<b>100%</b>	<b>10,929</b>	<b>1.1</b>	<b>25,401</b>	<b>100%</b>	<b>30,621</b>	<b>1.2</b>



**Table A2.15: Specific fall-related injuries diagnosed in children aged 0–14 years: Counts by age group and sex; Australia, 1997/98**

Specific mechanisms of falls and resulting injury for patient was admitted	Males				Females			
	0–4 years	5–9 years	10–14 years	Ages 0–14 years	0–4 years	5–9 years	10–14 years	Ages 0–14 years
<b>Fall on/from escalator</b>								
# of the skull	2	1	1	4	0	0	0	0
# of humerus	1	1	1	3	0	1	0	1
# of radius and ulna	0	2	0	2	0	1	0	1
# of tibia and fibula	1	1	0	2	4	0	0	4
# of one or more ankle, foot bones or other #s	0	1	0	1	0	0	0	0
Other principal diagnoses	0	1	0	1	1	0	1	2
<b>Principal diagnosis subtotal:</b>	<b>4</b>	<b>7</b>	<b>2</b>	<b>13</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>8</b>
<b>Fall from footpath kerb</b>								
# of humerus	0	2	0	2	0	0	0	0
Open wound of head and face	1	0	0	1	3	1	0	4
# of the skull	1	0	0	1	0	0	0	0
Intracranial injury excluding skull #	1	0	0	1	0	0	0	0
Injury to nerves and spinal cord	1	0	0	1	0	0	0	0
Other principal diagnoses	0	0	0	0	0	1	2	3
<b>Principal diagnosis subtotal:</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>7</b>
<b>Fall from stairs/steps other</b>								
Intracranial injury excluding skull #	88	13	9	110	73	16	4	93
# of radius and ulna	17	45	28	90	16	26	23	65
Open wound of head and face	52	6	2	60	36	4	1	41
# of the skull	28	6	3	37	28	3	1	32
Contusion with intact skin surface	21	2	0	23	12	2	3	17
Other principal diagnoses	34	21	29	84	23	22	26	71
<b>Principal diagnosis subtotal:</b>	<b>240</b>	<b>93</b>	<b>71</b>	<b>404</b>	<b>188</b>	<b>73</b>	<b>58</b>	<b>319</b>
<b>Fall from ladder</b>								
# of radius and ulna	11	15	13	39	4	7	3	14
# of the skull	9	2	1	12	0	0	0	0
# of humerus	1	4	2	7	2	4	0	6
Intracranial injury excluding skull #	3	1	0	4	7	0	1	8
Open wound of head and face	2	0	1	3	1	0	0	1
Other principal diagnoses	5	4	2	11	2	4	1	7
<b>Principal diagnosis subtotal:</b>	<b>31</b>	<b>26</b>	<b>19</b>	<b>76</b>	<b>16</b>	<b>15</b>	<b>5</b>	<b>36</b>
<b>Fall from scaffolding</b>								
Intracranial injury excluding skull #	1	0	0	1	0	1	0	1
# of pelvis	0	0	1	1	0	0	0	0
# of the skull	0	0	0	0	1	0	0	1
Other principal diagnoses	0	0	0	0	0	0	0	0
<b>Principal diagnosis subtotal:</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>

Continued

**Table A2.15 (continued): Specific fall-related injuries diagnosed in children aged 0–14 years: Counts by age group and sex; Australia, 1997/98**

Specific falls and their injuries	Males				Females			
	0–4 years	5–9 years	10–14 years	Ages 0–14 years	0–4 years	5–9 years	10–14 years	Ages 0–14 years
<b>Fall from building/structure</b>								
# of radius and ulna	43	114	90	247	13	55	19	87
Intracranial injury excluding skull #	58	44	17	119	48	16	5	69
# of humerus	22	31	6	59	9	16	6	31
# of the skull	32	16	8	56	24	9	1	34
Open wound of head and face	14	9	2	25	11	6	2	19
Other principal diagnoses	41	52	62	155	31	18	21	70
<b>Principal diagnosis subtotal:</b>	<b>210</b>	<b>266</b>	<b>185</b>	<b>661</b>	<b>136</b>	<b>120</b>	<b>54</b>	<b>310</b>
<b>Dive/jump into water</b>								
Intracranial injury excluding skull #	2	1	13	16	0	2	4	6
Open wound of head and face	0	5	8	13	0	5	3	8
# of vertebral column without mention of spinal cord	0	0	10	10	0	1	10	11
# of radius and ulna	0	3	6	9	0	0	0	0
Certain traumatic complications and unspecified injuries	0	1	6	7	0	4	2	6
Other principal diagnoses	1	4	22	27	4	5	12	21
<b>Principal diagnosis subtotal:</b>	<b>3</b>	<b>14</b>	<b>65</b>	<b>82</b>	<b>4</b>	<b>17</b>	<b>31</b>	<b>52</b>
<b>Fall into well</b>								
Intracranial injury excluding skull #	1	1	0	2	0	0	0	0
Other principal diagnoses	0	0	0	0	0	0	0	0
<b>Principal diagnosis subtotal:</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Fall into storm drain/manhole</b>								
# of tibia and fibula	0	1	0	1	0	0	0	0
Sprains and strains of knee and leg	0	0	1	1	0	0	0	0
Open wound of lower limb	0	0	0	0	1	0	1	2
Other principal diagnoses	0	0	0	0	0	0	0	0
<b>Principal diagnosis subtotal:</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>
<b>Fall into other hole/opening</b>								
# of radius and ulna	0	3	2	5	0	2	2	4
Open wound of lower limb	0	0	5	5	0	0	0	0
# of tibia and fibula	0	1	1	2	0	0	1	1
# of humerus	0	0	1	1	1	0	0	1
# of one or more ankle, foot bones or other #s	0	0	1	1	0	0	0	0
Other principal diagnoses	2	3	2	7	5	2	4	11
<b>Principal diagnosis subtotal:</b>	<b>2</b>	<b>7</b>	<b>12</b>	<b>21</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>17</b>

Continued

**Table A2.15 (continued): Specific fall-related injuries diagnosed in children aged 0–14 years: Counts by age group and sex; Australia, 1997/98**

Specific falls and their injuries	Males				Females			
	0–4 years	5–9 years	10–14 years	Ages 0–14 years	0–4 years	5–9 years	10–14 years	Ages 0–14 years
<b>Fall from playground equipment</b>								
# of radius and ulna	196	1,062	259	1,517	171	912	137	1,220
# of humerus	101	286	34	421	96	294	26	416
Intracranial injury excluding skull #	66	77	40	183	49	66	25	140
Open wound of head and face	59	22	10	91	19	22	2	43
# of tibia and fibula	32	24	13	69	11	17	12	40
Other principal diagnoses	74	99	50	223	37	100	41	178
<b>Principal diagnosis subtotal:</b>	<b>528</b>	<b>1,570</b>	<b>406</b>	<b>2,504</b>	<b>383</b>	<b>1,411</b>	<b>243</b>	<b>2,037</b>
<b>Fall from cliff</b>								
# of radius and ulna	0	5	7	12	1	0	1	2
# of the skull	0	3	1	4	0	0	1	1
Intracranial injury excluding skull #	1	2	1	4	0	0	2	2
# of humerus	1	1	0	2	0	0	1	1
Open wound of head and face	0	0	1	1	0	0	0	0
Other principal diagnoses	0	2	5	7	0	0	4	4
<b>Principal diagnosis subtotal:</b>	<b>2</b>	<b>13</b>	<b>15</b>	<b>30</b>	<b>1</b>	<b>0</b>	<b>9</b>	<b>10</b>
<b>Fall from chair</b>								
# of radius and ulna	118	66	31	215	86	68	29	183
Intracranial injury excluding skull #	116	28	5	149	122	14	6	142
# of humerus	53	24	7	84	55	28	2	85
Open wound of head and face	62	9	0	71	35	6	0	41
# of the skull	21	2	0	23	12	3	0	15
Other principal diagnoses	52	12	12	76	57	18	13	88
<b>Principal diagnosis subtotal:</b>	<b>422</b>	<b>141</b>	<b>55</b>	<b>618</b>	<b>367</b>	<b>137</b>	<b>50</b>	<b>554</b>
<b>Fall from tree</b>								
# of radius and ulna	33	308	150	491	9	117	61	187
Intracranial injury excluding skull #	10	60	37	107	5	14	5	24
# of humerus	11	77	13	101	8	29	7	44
# of the skull	3	22	8	33	1	4	1	6
Open wound of head and face	8	13	10	31	5	12	1	18
Other principal diagnoses	10	89	81	180	7	46	30	83
<b>Principal diagnosis subtotal:</b>	<b>75</b>	<b>569</b>	<b>299</b>	<b>943</b>	<b>35</b>	<b>222</b>	<b>105</b>	<b>362</b>
<b>Fall involving bed</b>								
# of radius and ulna	84	102	26	212	49	93	29	171
Intracranial injury excluding skull #	106	37	11	154	89	42	6	137
Open wound of head and face	53	20	6	79	26	12	2	40
# of humerus	38	28	3	69	41	26	5	72
# of the skull	24	8	4	36	15	4	0	19
Other principal diagnoses	58	20	8	86	47	16	13	76
<b>Principal diagnosis subtotal:</b>	<b>363</b>	<b>215</b>	<b>58</b>	<b>636</b>	<b>267</b>	<b>193</b>	<b>55</b>	<b>515</b>

Continued

**Table A2.15 (continued): Specific fall-related injuries diagnosed in children aged 0–4 years: Counts by age group and sex; Australia, 1997/98**

Specific falls and their injuries	Males				Females			
	0–4 years	5–9 years	10–14 years	Ages 0–14 years	0–4 years	5–9 years	10–14 years	Ages 0–14 years
<b>Fall from trampoline</b>								
# of radius and ulna	74	153	60	287	54	157	52	263
# of humerus	31	64	8	103	34	106	13	153
Intracranial injury excluding skull #	22	12	6	40	13	13	5	31
# of tibia and fibula	16	13	2	31	11	13	5	29
Open wound of head and face	17	12	2	31	11	10	1	22
Other principal diagnoses	20	34	23	77	16	45	34	95
<b>Principal diagnosis subtotal:</b>	<b>180</b>	<b>288</b>	<b>101</b>	<b>569</b>	<b>139</b>	<b>344</b>	<b>110</b>	<b>593</b>
<b>Fall involving wheelchair</b>								
Intracranial injury excluding skull #	1	5	3	9	0	1	0	1
Open wound of head and face	2	1	1	4	1	1	0	2
# of tibia and fibula	0	1	2	3	0	0	1	1
# other/unspecified parts of femur	0	1	2	3	0	0	1	1
# of humerus	1	0	1	2	1	0	2	3
Other principal diagnoses	0	0	0	0	0	2	2	4
<b>Principal diagnosis subtotal:</b>	<b>4</b>	<b>8</b>	<b>9</b>	<b>21</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>12</b>
<b>Fall involving commode</b>								
Intracranial injury excluding skull #	1	0	0	1	0	1	0	1
Open wound of head and face	1	0	0	1	1	0	0	1
Open wound of lower limb	0	1	0	1	0	0	0	0
Contusion with intact skin surface	1	0	0	1	0	0	0	0
# of pelvis	0	0	1	1	0	0	0	0
Other principal diagnoses	0	0	0	0	1	0	1	2
<b>Principal diagnosis subtotal:</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>4</b>
<b>Other fall from 1 level to another</b>								
# of radius and ulna	124	291	259	674	94	182	70	346
Intracranial injury excluding skull #	241	86	66	393	251	52	14	317
# of humerus	68	80	20	168	66	81	18	165
# of the skull	98	15	10	123	79	2	2	83
Open wound of head and face	81	27	8	116	39	7	1	47
Other principal diagnoses	126	84	118	328	88	55	55	198
<b>Principal diagnosis subtotal:</b>	<b>738</b>	<b>583</b>	<b>481</b>	<b>1,802</b>	<b>617</b>	<b>379</b>	<b>160</b>	<b>1,156</b>
<b>Fall on same level (slip, trip, stumble)</b>								
# of radius and ulna	80	360	437	877	63	256	252	571
Open wound of head and face	235	65	22	322	153	39	7	199
Intracranial injury excluding skull #	109	98	104	311	72	66	33	171
# of humerus	25	80	38	143	25	83	20	128
# other/unspecified parts of femur	72	15	16	103	14	2	5	21
Other principal diagnoses	77	128	224	429	50	83	168	301
<b>Principal diagnosis subtotal:</b>	<b>598</b>	<b>746</b>	<b>841</b>	<b>2,185</b>	<b>377</b>	<b>529</b>	<b>485</b>	<b>1,391</b>

Continued

**Table A2.15 (continued): Specific fall-related injuries diagnosed in children aged 0–4 years: Counts by age group and sex; Australia, 1997/98**

Specific falls and their injuries	Males				Females			
	0–4 years	5–9 years	10–14 years	Ages 0–14 years	0–4 years	5–9 years	10–14 years	Ages 0–14 years
<b>Same level, another person (collision, push, shove): in sports</b>								
# of radius and ulna	5	157	652	814	1	81	165	247
Intracranial injury excluding skull #	1	27	191	219	1	5	20	26
# of ankle	1	3	97	101	0	2	24	26
# of humerus	0	20	74	94	1	4	6	11
# of tibia and fibula	1	14	59	74	0	3	8	11
Other principal diagnoses	4	54	314	372	1	15	56	72
<b>Principal diagnosis subtotal:</b>	<b>12</b>	<b>275</b>	<b>1,387</b>	<b>1,674</b>	<b>4</b>	<b>110</b>	<b>279</b>	<b>393</b>
<b>Same level, another person (collision, push, shove): other/unspecified</b>								
# of radius and ulna	8	44	66	118	4	34	42	80
Intracranial injury excluding skull #	7	18	22	47	3	13	6	22
# of humerus	2	15	7	24	4	12	1	17
# of tibia and fibula	5	6	5	16	1	1	1	3
Open wound of head and face	8	6	2	16	2	3	0	5
Other principal diagnoses	12	19	21	52	5	7	22	34
<b>Principal diagnosis subtotal:</b>	<b>42</b>	<b>108</b>	<b>123</b>	<b>273</b>	<b>19</b>	<b>70</b>	<b>72</b>	<b>161</b>
<b>#, cause unspecified</b>								
# of radius and ulna	51	164	215	430	40	142	86	268
# of the skull	7	31	138	176	7	18	54	79
# of hand bones	12	24	111	147	5	17	44	66
# of humerus	20	28	19	67	11	22	15	48
# of tibia and fibula	12	11	15	38	6	2	5	13
Other principal diagnoses	43	23	80	146	13	10	34	57
<b>Principal diagnosis subtotal:</b>	<b>145</b>	<b>281</b>	<b>578</b>	<b>1,004</b>	<b>82</b>	<b>211</b>	<b>238</b>	<b>531</b>
<b>Other &amp; unspecified fall</b>								
# of radius and ulna	109	332	419	860	87	322	244	653
Open wound of head and face	223	49	22	294	124	55	7	186
Intracranial injury excluding skull #	96	74	71	241	88	55	31	174
# of humerus	33	113	25	171	46	73	20	139
# of hand bones	2	16	33	51	2	9	16	27
Other principal diagnoses	108	96	156	360	63	73	103	239
<b>Principal diagnosis subtotal:</b>	<b>571</b>	<b>680</b>	<b>726</b>	<b>1,977</b>	<b>410</b>	<b>587</b>	<b>421</b>	<b>1,418</b>
<b>All principal diagnoses</b>	<b>4,179</b>	<b>5,895</b>	<b>5,436</b>	<b>15,510</b>	<b>3,065</b>	<b>4,432</b>	<b>2,393</b>	<b>9,890</b>

**Table A2.16: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98**

Data year	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1993/94	4,585	692.23	1,093	657.43	3,359	927.49	1,443	729.7	1,217	786.82	277	505.88	178	515.28	214	878.47
1994/95	4,502	676.21	1,166	658.43	3,544	961.24	1,414	709.6	1,289	834.36	283	517.59	203	590.46	195	801.59
1995/96	4,721	704.22	1,147	650.3	3,641	968.23	1,301	647.7	1,218	788.48	342	631.42	216	627.52	210	832.47
1996/97	4,705	698.09	1,088	635.48	4,001	1053.54	1,480	730.2	1,355	881.27	328	608.58	203	588.19	185	725.83
1997/98	5,135	761.12	1,145	665.25	3,840	1004.88	1,444	710.5	1,119	730.50	365	687.31	184	547.62	184	706.56

**Table A2.17: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98**

Data year	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1993/94	2,987	474.56	1,953	424.05	2,215	650.36	912	489.0	780	531.61	187	355.82	138	416.67	156	678.19
1994/95	2,821	445.85	1,968	427.26	2,197	633.20	889	472.5	769	525.54	205	393.23	124	375.40	119	512.76
1995/96	3,184	499.33	1,928	417.29	2,404	679.82	943	497.0	789	540.45	270	523.17	136	412.36	157	661.31
1996/97	3,144	490.58	1,948	421.23	2,542	709.76	986	516.5	833	574.25	233	453.17	128	388.42	120	501.64
1997/98	3,157	492.50	2,067	446.57	2,433	673.32	951	497.3	773	535.98	218	437.07	141	437.07	151	620.2

**Table A2.18: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in children aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98**

Data year	NSW		Victoria		Queensland		WA		SA		Tasmania		ACT		NT	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
1993/94	7,572	586.19	5,126	543.48	5,574	793.13	2,355	612.8	1,997	662.47	464	432.40	316	466.99	370	781.61
1994/95	7,323	563.92	5,149	545.52	5,741	802.02	2,303	594.4	2,058	683.69	488	456.66	327	484.93	314	661.54
1995/96	7,905	604.30	5,082	536.46	6,045	828.18	2,244	574.4	2,007	667.61	612	578.41	352	522.13	367	749.89
1996/97	7,849	596.83	5,039	530.86	6,543	886.38	2,466	626.3	2,188	731.79	561	532.53	331	490.53	305	617.19
1997/98	8,292	630.1	5,306	558.49	6,273	843.54	2,395	606.8	1,892	635.71	583	564.23	325	493.46	335	665.06

## Appendix A3: Tables on ED presentations to VISAR hospitals due to falls among children

*The data presented here in this Section came from the Victorian Emergency Minimum Dataset (VEMD) and forms part of the Victorian Injury Surveillance and Applied Research System. The data were provided on request by Maria Corbo and Mark Sinclair-Stokes, both from Monash University Accident Research Centre.*

**Table A3.1: Counts and proportions for ED presentations due to falls among males aged 0–14 years by data year and by age group; Victoria 1996/97–1998/99**

Year of ED presentations	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
1996/97	3,021	32.2%	3,081	32.6%	3,403	31.9%	9,505	32.2%
1997/98	3,017	32.1%	3,011	31.9%	3,498	32.8%	9,526	32.3%
1998/99	3,351	35.7%	3,357	35.5%	3,775	35.4%	10,483	35.5%

**Table A3.2: Counts and proportions for ED presentations due to falls among females aged 0–14 years by data year and by age group; Victoria 1996/97–1998/99**

Year of ED presentations	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
1996/97	2,343	32.9%	2,437	32.0%	2,246	30.9%	7,026	31.9%
1997/98	2,274	31.9%	2,406	31.6%	2,513	34.5%	7,193	32.7%
1998/99	2,508	35.2%	2,775	36.4%	2,520	34.6%	7,803	35.4%

**Table A3.3: Counts and proportions for ED presentations due to falls among children aged 0–14 years by data year and by age group; Victoria 1996/97–1998/99**

Year of ED presentations	0–4 years		5–9 years		10–14 years		0–14 years	
	Count	Per cent	Count	Per cent	Count	Per cent	Count	Per cent
1996/97	5,364	32.5%	5,518	32.3%	5,649	31.5%	16,531	32.1%
1997/98	5,291	32.0%	5,417	31.7%	6,011	33.5%	16,719	32.4%
1998/99	5,859	35.5%	6,132	35.9%	6,295	35.1%	18,286	35.5%

## Appendix A4: Extracts from VEMD User manual

### List of data items available in the VEMD data set in alphabetical order:

*(Victorian Injury Surveillance and Applied Research System 2000)*

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Activity When Injured</li><li>• Ambulance Case Number</li><li>• Arrival Date</li><li>• Arrival Time</li><li>• Arrival Transport Mode</li><li>• Body Region</li><li>• Campus Code</li><li>• Compensable Status</li><li>• Country of Birth</li><li>• Date of birth</li><li>• Departure Date</li><li>• Departure status</li><li>• Departure Time</li><li>• Departure Transport Mode</li><li>• Description of Injury Event</li><li>• Diagnosis - Additional Diagnoses 1 and 2 .</li><li>• Diagnosis - Primary Diagnosis</li><li>• DVA Number</li><li>• Escort Source</li><li>• First Seen By Doctor Date</li><li>• First Seen By Doctor Time</li><li>• First Seen By Treating Nurse Date</li><li>• First Seen By Treating Nurse Time</li><li>• Human Intent</li><li>• Indigenous Status</li><li>• Injury Cause</li><li>• Inpatient Bed Request</li><li>• Inpatient Bed Request Date</li><li>• Inpatient Bed Request Time</li><li>• Locality</li></ul> | <ul style="list-style-type: none"><li>• Medicare Number</li><li>• Medicare Suffix</li><li>• Nature of Main Injury</li><li>• Ongoing Care Communication</li><li>• Patient Identifier</li><li>• Place Where Injury Occurred</li><li>• Postcode</li><li>• Preferred Language</li><li>• Procedure</li><li>• Reason for Transfer</li><li>• Referred By</li><li>• Referred to on Departure</li><li>• Sex</li><li>• Transfer destination</li><li>• Transfer Source</li></ul> |
|---|---|



### **Code list for 'Injury Cause' in the VEMD**

*(Victorian Injury Surveillance and Applied Research System 2000)*

- 1 Motor vehicle - driver
- 2 Motor vehicle - passenger
- 3 Motorcycle - driver
- 4 Motorcycle - passenger
- 5 Pedal cyclist - rider or passenger
- 6 Pedestrian
- 7 Horse related (fall from, struck or bitten by)
- 8 Other transport-related circumstance
- 9 Fall - low (same level or <1 metre, or no information on height)
- 10 Fall - high (>1 metre)
- 11 Submersion or drowning - swimming pool
- 12 Submersion or drowning - other
- 13 Other threat to breathing (includes strangulation, asphyxiation)
- 14 Fire, flames, smoke
- 15 Scalds (hot drink, food, water, other fluid, steam, gas or vapour)
- 16 Contact burn (hot object or substance)
- 17 Poisoning – medication

# List of Tables

Table 2.1: External causes of deaths from falls among children aged 0–14 years: case counts and proportions by sex; Australia 1979–1998.....	4
Table 2.2: Deaths due to all external causes in males, females and children aged 0–14 years: case counts and proportions; Australia 1979–1998 .....	6
Table 2.3: Five-year average case counts and age-standardised rates for males, females and children aged 0–14 years; Australia 1979–1998 .....	7
Table 2.4: Case counts, proportions and male to female ratio for five-year age groups for children aged 0–14 years; Australia 1979–98.....	7
Table 2.5: Mechanism of childhood deaths from falls: proportions by age group and sex; Australia 1979–1998.....	9
Table 2.6: Falls coded to E884 ( <i>fall from one level to another</i> ): case counts and proportions by age group and subcategory; Australia 1979–1998.....	11
Table 2.7: Number of deaths in children coded to 'extra' fall codes; Australia 1979–98.....	15
Table 2.8: Comparison of ICD-9 and ICD-10 external cause codes relating to falls.....	18
Table 3.1: External causes of hospital separations due to falls among children aged 0–14 years: case counts and proportions by sex; Australia 1997/98.....	21
Table 3.2: All external causes of hospitalisations in children aged 0–14 years: case counts and proportions by sex; Australia 1997/98 .....	23
Table 3.3: Hospitalisations due to accidental falls among children aged 0–14 years: case counts and proportions by age group and sex; Australia, 1997/98 .....	25
Table 3.4: Mechanisms for hospitalisations due to accidental falls among children aged 0–14 years: case counts and proportions; Australia 1997/98 .....	28
Table 3.5: Place of occurrence of accidental fall resulting in hospitalisation in children aged 0–14 years: case counts and proportions by age group; Australia 1997/98 (excluding SA).....	35
Table 3.6: Fall-related injuries diagnosed in children aged 0–14 years: case counts and proportions by body region and sex; Australia 1997/98.....	36
Table 3.7: Principal diagnosis group for hospitalised children with a LOS of three days or more, by age group; Australia 1997/98 .....	40
Table 3.8: Selected principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex and ranked by length of stay; Australia 1997/98.....	41
Table 3.9: Principal procedures performed for hospitalisations due to accidental falls: case counts and proportions by age group; Australia 1997/98.....	42
Table 3.10: Mode of separation for children aged 0–14 years admitted because of accidental falls; Australia 1997/98.....	42
Table 3.11: Number of hospitalisations in children coded to 'extra' fall codes, Australia 1997/98.....	48
Table 3.12: Case counts of 'extra' falls; Australia 1993/94–1997/98.....	48

Table 3.13: Comparison of ICD-9-CM and ICD-10-AM fall-related codes.....	52
Table 4.1: Types of falls among ED presentations for children aged 0–14; Victoria 1996/97–1998/99.....	54
Table 4.2: ED visits due to external causes in children aged 0–14 years: case counts and proportions by sex; Victoria 1996/97–1998/99.....	55
Table 4.3: Place of occurrence of falls resulting in ED visits in children aged 0–14 years: case numbers and proportions by age group; Victoria 1997/98.....	59
Table 4.4: Fall-related injuries diagnosed in children aged 0–14 years: case counts, proportions by body region and age group; Victoria 1997/98.....	60
Table 4.5: Fall-related injuries diagnosed in children aged 0–14 years: case counts and proportions by age group; Victoria 1997/98.....	61
Table 4.6: Mode of separation for fall-related ED presentations by children aged 0–14 years: counts and proportions; Victoria 1997/98.....	61
Table 4.7: Fall-related fractures diagnosed in children aged 0–14 years: multi-axial coding of structured narrative, counts and proportions, Victoria 1997/98.....	64
Table 4.8: Circumstances reported in fall-related injury event narratives that lead to fractures in children ranked by frequency of occurrence (case counts and proportions by age group); Victoria 1997/98.....	65
Table 6.1: Proposed matrix for fall-related injury in children.....	72
Table 6.2: (Estimated) frequency, relevant data sources to enumerate the frequency and inform intervention, and public health importance of different types of falls.....	74
Table A1.1: Counts, age-specific and age-standardised rates for deaths due to accidental falls (E880–E888) in males aged 0–14 years by year of registration and by age group; Australia 1979–1998.....	76
Table A1.2: Counts, age-specific and age-standardised rates for deaths due to accidental falls (E880–E888) in females aged 0–14 years by year of registration and by age group; Australia 1979–1998.....	77
Table A1.3: Counts, rates, and male to female rate ratios for deaths due to accidental falls (E880–E888) in children by year of registration and by age group; Australia 1979–1998.....	78
Table A1.4: Counts for deaths due to accidental falls (E880–E888) in children aged 0– 14 years by year of death registration and by external cause code; Australia 1979–1998.....	79
Table A1.5: Counts and rates for deaths due to other falls from one level to another (E884) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998.....	80
Table A1.6: Counts and rates for deaths due to falls from or out of a building or other structure (E882) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998.....	81
Table A1.7: Counts and rates for deaths due to remaining fall mechanisms (E880, E883, E885–E888) in children aged 0–14 years by year of death registration and by age group; Australia 1979–1998.....	82

Table A1.8: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in males by year of death registration and by State/Territory; Australia 1979–1998 .....	83
Table A1.9: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in females by year of death registration and by State/Territory; Australia 1979–1998 .....	84
Table A1.10: Counts and age-standardised rates for deaths due to accidental falls (E880–E888) in all children by year of death registration and by State/Territory; Australia 1979–1998 .....	85
Table A2.1: Counts, age-specific and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by age group; Australia 1993/94–1997/98 .....	86
Table A2.2: Counts, age-specific and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by age group; Australia 1993/94–1997/98 .....	86
Table A2.3: Counts, age-specific and age-standardised rates as well as male to female rate ratio for hospitalisations due to accidental falls (E880–E888) in all children by data year and by age group; Australia 1993/94–1997/98.....	86
Table A2.4: Counts for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98.....	87
Table A2.5: Counts for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98.....	87
Table A2.6: Counts for hospitalisations due to accidental falls (E880–E888) in all children aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98 .....	87
Table A2.7: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98 .....	88
Table A2.8: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98 .....	88
Table A2.9: Age-standardised rates for hospitalisations due to accidental falls (E880–E888) in all children aged 0–14 years by data year and by external cause code; Australia 1993/94–1997/98 .....	88
Table A2.10: External causes (4 <sup>th</sup> -digit level of detail) of hospitalisations due to accidental falls among children aged 0–14 years: Counts and percentages by sex; Australia, 1997/98.....	89-90
Table A2.11: External causes of hospitalisations due to accidental falls among children aged 0–14: age-specific and age-adjusted rates by age group and sex; Australia, 1997/98 .....	91-92
Table A2.12: Principal diagnosis of fall-related injuries in males aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98.....	93-94
Table A2.13: Principal diagnosis of fall-related injuries in females aged 0–14 years: Counts and column percentages by age group; Australia, 1997/98.....	95-96

Table A2.14: Principal diagnosis of fall-related injuries in children aged 0–14 years: Counts, column percentages, length of stay, and average length of stay by sex; Australia 1997/98 .....	97-99
Table A2.15: Specific fall-related injuries diagnosed in children aged 0–14 years: Counts by age group and sex; Australia, 1997/98 .....	100-104
Table A2.16: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in males aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98 .....	105
Table A2.17: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in females aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98 .....	105
Table A2.18: Counts and age-standardised rates for hospitalisations due to accidental falls (E880–E888) in children aged 0–14 years by data year and by State/Territory; Australia 1993/94–1997/98 .....	105
Table A3.1: Counts and proportions for ED presentations due to falls among males aged 0–14 years by data year and by age group; Victoria 1996/97– 1998/99 .....	106
Table A3.2: Counts and proportions for ED presentations due to falls among females aged 0–14 years by data year and by age group; Victoria 1996/97– 1998/99 .....	106
Table A3.3: Counts and proportions for ED presentations due to falls among children aged 0–14 years by data year and by age group; Victoria 1996/97– 1998/99 .....	106

# List of Figures

Figure 2.1: Age-specific death rates due to accidental falls for males and females of all ages, averaged for the years 1979–1998; Australia .....	5
Figure 2.2: Age-standardised death rates from fall-related injury for males and females aged 0–14 years; Australia 1979–1998.....	6
Figure 2.3: Age-specific death rates due to accidental falls for three male age groups between 0–14 years; Australia 1979–1998.....	8
Figure 2.4: Age-specific death rates due to accidental falls for three female age groups between 0–14 years; Australia 1979–1998.....	8
Figure 2.5: Mechanism of childhood deaths due to accidental falls by age group; Australia 1979–1998 .....	10
Figure 2.6: Case counts for mechanism of fall-related deaths in children aged 0–14 years; Australia 1979–1998.....	11
Figure 2.7: Age-standardised rates averaged for five-year periods for mechanisms of falls among children aged 0–14 years; Australia 1979–1998 .....	12
Figure 2.8: Age-specific rates averaged for five-year periods for deaths coded to E884 (Other falls from one level to another) in children by age group; Australia 1979–1998.....	13
Figure 2.9: Age-specific rates averaged for five-year periods for deaths coded to E882 (Fall from/out of building/other structure) in children by age group; Australia 1979–98 .....	13
Figure 2.10: Death rates from fall-related injury in children aged 0–14 years by State and Territory; Australia 1979–1998.....	14
Figure 2.11: Trends in deaths rates due to falls among children for selected States and Australia; 1979–1998 .....	14
Figure 2.12: Age-standardised rates for 'extra' falls among children; Australia 1979–98.....	15
Figure 3.1: Age-specific rates of hospitalisations due to accidental falls by sex; Australia 1997/98.....	22
Figure 3.2: Age-standardised rates for hospitalisations due to accidental falls among children aged 0–14 years by sex; Australia, 1993/94–1997/98.....	24
Figure 3.3: Age-specific rates for hospitalisations due to accidental falls among males aged 0–14 years; Australia 1993/94–1997/98.....	25
Figure 3.4: Age-specific rates for hospitalisations due to accidental falls in females aged 0–14 years; Australia 1993/94–1997/98 .....	26
Figure 3.5: Proportions for fall mechanisms as defined by three-digit E-codes in children by age group; Australia 1997/98.....	29
Figure 3.6: Proportions for selected fall mechanisms as identified by fourth-digit E-codes by age group and sex; Australia 1997/98 .....	30
Figure 3.7: Trends in age-specific rates for fall mechanisms as identified by three-digit E-codes in children aged 0–14 years; Australia 1993/94–1997/98 .....	31

Figure 3.8: Trends in age-specific rates for mechanisms coded to E884 in children aged 0–14 years by age group; Australia 1993/94–1997/98 .....	32
Figure 3.9: Trends in mechanism coded to E886.0: age-standardised rates by State and Territory; Australia 1993/94–1997/98.....	33
Figure 3.10: Trends in mechanism coded to E886.0: age-standardised rates by age group; Australia 1993/94–1997/98.....	33
Figure 3.11: Trends in male age-specific rates for fall mechanisms E880–E885, E886.9, E887 and E888 as identified by three-digit E-codes in children aged 0–14 years; Australia 1993/94–1997/98 .....	34
Figure 3.12: Principal diagnosis in cases hospitalised for accidental falls among children aged 0–14 years by age group and sex; Australia 1997/98.....	37
Figure 3.13: Principal diagnosis in cases hospitalised for accidental falls among children aged 0–14 years by age group and sex; Australia 1997/98.....	38
Figure 3.14: Distribution of bed days for hospital separations due to accidental falls among children aged 0–14 years; Australia 1997/98 .....	39
Figure 3.15: Estimated incident cases and actual separations for accidental falls among children 0–14 years of age: age standardised rates; Australia 1993/94–1997/98.....	43
Figure 3.16: Hospitalisations due to accidental falls among males aged 0–14 years by State or Territory of residence; Australia 1997/98 .....	44
Figure 3.17: Hospitalisations due to accidental falls among females aged 0–14 years by State or Territory of residence; Australia 1997/98.....	45
Figure 3.18: Hospitalisations due to accidental falls among children aged 0–14 years by State or Territory of residence and by age group; Australia 1997/98.....	45
Figure 3.19: Trends in hospitalisations due to accidental falls among children aged 0–14 years by State or Territory of residence; Australia 1993/94–1997/98 .....	46
Figure 3.20: Age-specific rates for hospitalisations due to 'extra' falls among males, females, and children aged 0–4, 5–9 and 10–14 years; Australia 1997/98 .....	47
Figure 4.1: Case counts of ED visits due to falls among children aged 0–14 years by sex; Victoria 1996/97–1998/99 .....	56
Figure 4.2: Proportions for ED presentations due to falls among males aged 0–14 years by age group; Victoria 1996/97–1998/99 .....	57
Figure 4.3: Proportions for ED presentations due to falls among females aged 0–14 years by age group; Victoria 1996/97–1998/99 .....	57
Figure 4.4: Proportions of types of falls among ED presentations in children aged 0–14 years by age group; Victoria 1997/98 .....	58

# INJURY RESEARCH & STATISTICS

This is a statistical report on fall-related injury among children aged 0–14 years. It describes the epidemiology of childhood falls resulting in death and hospital admission, as well as the profile of cases seen at emergency departments in a large number of Victorian hospitals. The report discusses the strengths and weaknesses of the three data sources used in regard to injury surveillance of fall-related injury among children. It also highlights the impact of the transition to ICD-10(-AM).

It will be relevant to those interested in childhood injury, including community practitioners, health planners and administrators, academic researchers and the public.