

2 Health system costs of injury and poisoning

Injuries and poisoning may be classified in terms of the type of injury (such as fracture of leg, laceration of skin) or in terms of the external cause of the injury (such as motor vehicle accident, assault). Health system costs of injuries and poisoning are estimated in Section 3.1 for various types of injury and then in the following sections according to the external causes of injury. The classification of injuries by type and by external cause is described in Appendix A. As noted in Section 1.1, some of the health system costs of injury will also manifest as musculoskeletal condition diagnoses and be included in the cost estimates for musculoskeletal disorders given in Chapter 3.

2.1 Injury costs by type of injury

Figure 2 shows the estimated health system costs associated with specific types of injury in 1993–94. Fractures account for an estimated \$713 million (or 27% of total injury costs), followed by dislocations, sprains and strains (\$495 million) and traumatic complications, late effects of injury and unspecified injuries (\$320 million). Table 2 summarises estimated costs for the various types of injury by health sector.

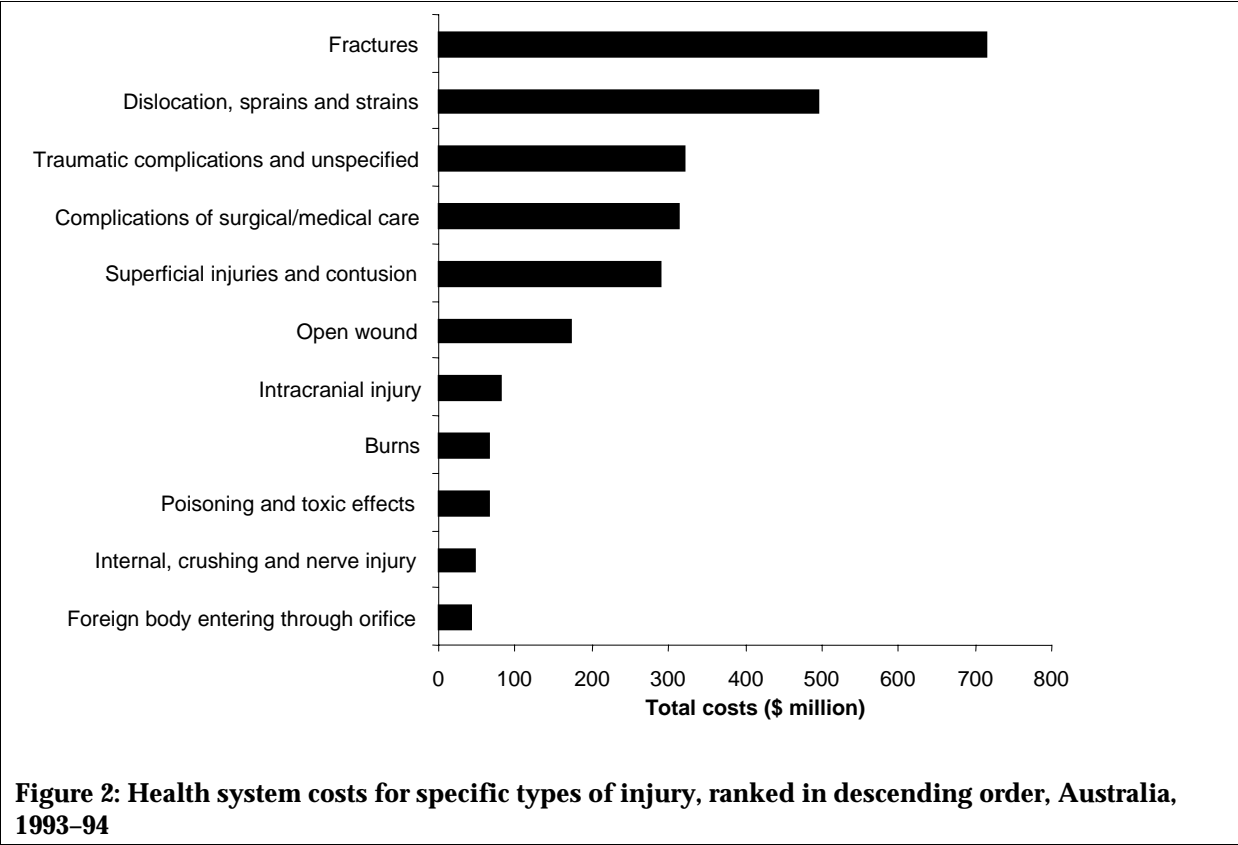


Table 2: Injury and poisoning: health system costs by type of injury and health sector, 1993–94 (\$ million)

ICD-9 chapter	Total costs	Hospitals ^(a)	Medical	Pharmaceuticals	Allied health	Nursing homes	Other ^(b)
Fractures	713.0	510.6	68.6	9.6	9.7	69.2	45.2
Dislocation, sprains and strains	495.4	235.7	112.6	29.9	91.8	1.7	23.7
Intracranial injury, excl. skull fracture	80.9	63.1	6.3	1.0	0.6	2.6	7.3
Internal injuries ^(c)	47.3	39.2	2.1	0.4	0.3	1.1	4.1
Open wound	171.2	119.7	20.1	9.4	2.7	5.4	14.0
Superficial injuries and contusion	289.2	154.8	74.0	21.1	21.3	4.3	13.8
Foreign body entering via orifice	42.3	25.3	10.9	3.5	—	0.5	2.0
Burns	65.6	50.8	7.8	3.0	—	0.7	3.2
Poisoning and toxic effects of substances	64.0	52.0	2.9	1.4	0.1	4.2	3.3
Complications of surgical and medical care	312.5	250.6	19.1	9.2	4.6	14.6	14.5
Traumatic complications, late effects	320.0	161.2	68.3	38.6	28.5	8.1	15.2
Total injury and poisoning	2,601.3	1,663.0	392.6	127.3	159.7	112.4	146.3

(a) Includes public hospital non-inpatient services and medical services for private patients in hospitals.

(b) Includes research and other institutional, non-institutional and administration expenditure. Does not include public health services, community health services, ambulances, or medical aids and appliances.

(c) Internal injury of chest, abdomen, pelvis and blood vessels, crushing injuries, and nerve injuries (including spinal cord).

Table 3: Injury and poisoning: estimated health services utilisation by type of injury and health sector, 1993–94

	Hospitals			Medical services			Drugs
	Admissions ('000)	ALOS ^(a) (days)	Non-inpatient services ('000)	GP ('000)	Specialist ('000)	Total ('000)	Prescriptions ('000)
Fractures	120	7.2	1,366	915	607	1,522	353
Dislocation, sprains and strains	27	2.8	2,677	2,309	890	3,199	1,372
Intracranial injury, excluding skull fracture	25	2.9	160	126	37	163	21
Internal injuries ^(b)	9	19.5	47	40	23	63	19
Open wound	48	2.8	561	548	68	616	384
Superficial injuries and contusion	6	1.6	289	251	58	309	222
Foreign body entering via orifice	15	3.4	2,022	1,690	544	2,234	885
Burns	7	7.7	257	268	32	300	160
Poisoning and toxic effects of substances	32	2.6	92	63	51	115	46
Complications of surgical and medical care	58	7.5	51	401	203	604	382
Traumatic complications, late effects	21	4.9	1,828	1,636	598	2,234	1,628
Total injury and poisoning	368	5.2	9,351	8,247	3,110	11,358	5,473

(a) Average length of stay.

(b) Internal injury of chest, abdomen, pelvis and blood vessels, crushing injuries, and nerve injuries (including spinal cord).

Table 3 summarises estimated utilisation of hospitals, doctors and drugs for the various types of injury. In total they accounted for an estimated 368,000 hospital admissions, 11.4 million medical services and 5.5 million prescriptions in 1993–94. Fractures were the leading injury cause of hospital admissions, whereas dislocations, sprains and strains were the leading injury cause of non-inpatient visits and medical consultations. More detailed estimates of expenditure for the major injury groups shown in Table 1 are given in Tables C.2 and C.3 (Appendix C), disaggregated by health sector.

2.2 Injury costs by external cause

Figure 3 shows the estimated health system costs associated with specific external causes of injury in 1993–94. Accidental falls account for an estimated \$806 million (or 31% of total injury costs), followed by adverse effects of medical treatment (\$401 million). The latter category includes surgical and medical misadventure, as well as adverse effects of drugs in therapeutic use, as reported in the health system data used in costing injuries (see Appendix A). Road traffic accidents are the third leading cause of injury costs, accounting for \$370 million or 14% of total injury costs. Table 4 summarises estimated costs for external causes of injury by health sector. More detailed estimates of expenditure for the major external causes are given in Appendix C, disaggregated by health sector, age and sex.

Table 5 summarises estimated utilisation of hospitals, doctors and drugs for external causes of injury. Accidental falls is the leading injury contributor to hospital admissions, medical services and pharmaceutical prescriptions.

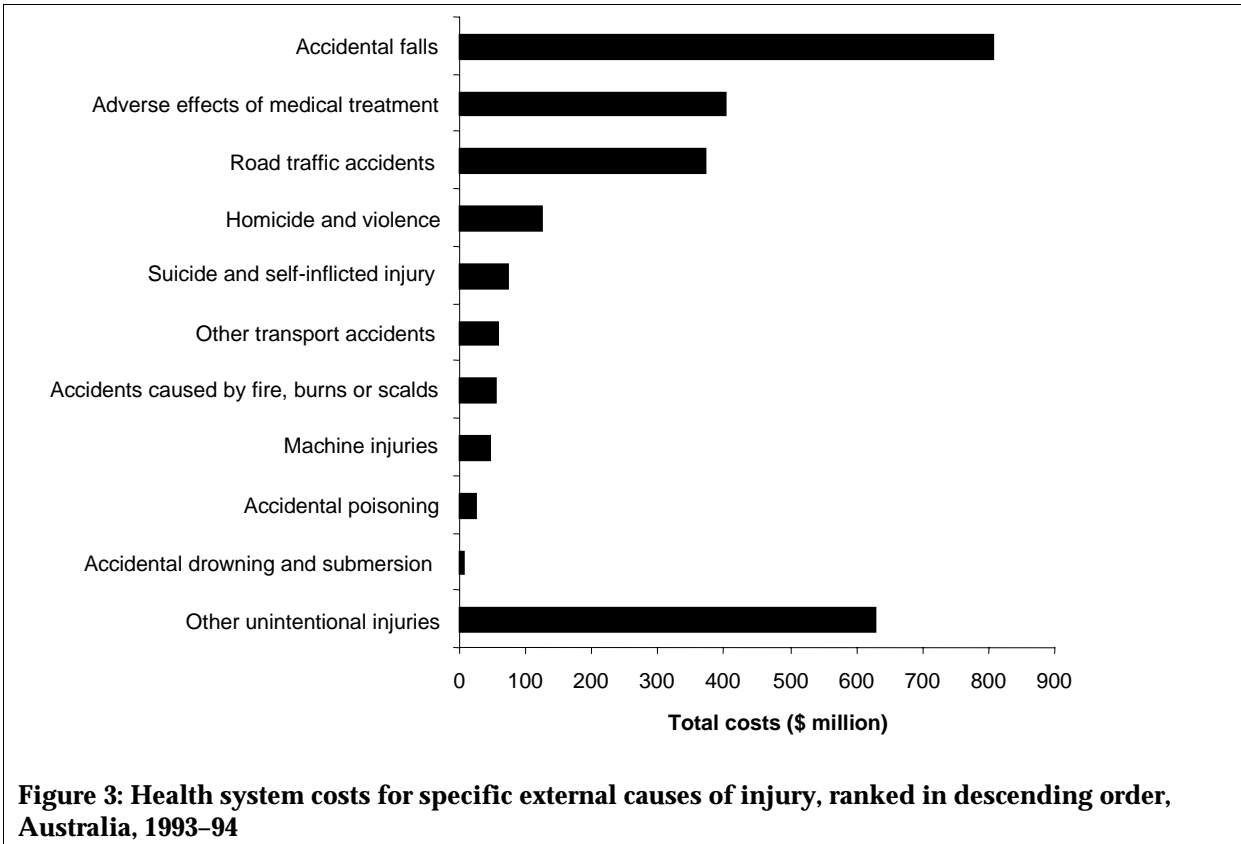


Figure 3: Health system costs for specific external causes of injury, ranked in descending order, Australia, 1993–94

Table 4: External causes of injury: health system costs by health sector, 1993–94 (\$ million)

ICD-9 chapter	Total costs	Hospitals ^(a)	Medical	Pharmaceuticals	Allied health	Nursing homes	Other ^(b)
Unintentional injuries							
Road traffic accidents	370	231	56	16	27	4	37
Other transport accidents	58	37	10	3	4	0	3
Poisoning	26	20	1	1	0	2	1
Accidental falls	806	498	112	32	48	76	39
Fire, burns or scalds	55	41	8	3	0	1	3
Accidental drowning	6	3	1	0	0	0	1
Machine injuries	44	27	8	2	4	0	3
Adverse effects of medical treatment ^(c)	401	298	38	23	7	17	18
Other unintentional injuries	627	379	124	36	52	5	30
Intentional injuries							
Suicide and self-inflicted injury	72	48	11	4	5	2	4
Homicide and violence	124	72	24	7	12	1	7
Unspecified injuries							
	13	9	0	0	0	4	1
Total injury and poisoning	2,601	1,663	393	127	160	112	146

(a) Includes public hospital non-inpatient services and medical services for private patients in hospitals.

(b) Includes research expenditure and other institutional, non-institutional and administration expenditure. Does not include public health services, community health services, ambulances, or medical aids and appliances.

(c) Includes surgical and medical misadventure, and adverse effects of drugs in therapeutic use.

Table 5: External causes of injury: estimated health services utilisation by sector, 1993–94

	Hospitals			Medical services			Drugs
	Admissions ('000)	ALOS (days)	Non-inpatient services ('000)	GP ('000)	Specialist ('000)	Total ('000)	Prescriptions ('000)
Unintentional injuries							
Road traffic accidents	41	5.7	1,374	1,143	419	1,562	679
Other transport accidents	8	4.6	258	198	73	272	110
Poisoning	14	2.2	38	26	20	46	17
Accidental falls	99	7.2	2,660	2,268	885	3,153	1,376
Fire, burns or scalds	5	7.8	257	268	32	300	160
Accidental drowning	1	2.3	25	19	7	26	9
Machine injuries	6	3.2	182	157	57	214	102
Adverse effects of medical treatment ^(a)	62	7.5	603	876	437	1,313	960
Other unintentional injuries	93	2.7	3,099	2,562	904	3,466	1,604
Intentional injuries							
Suicide and self-inflicted injury	17	3.3	252	223	97	321	145
Homicide and violence	19	2.8	603	506	179	685	310
Unspecified injuries							
	3	14.0	0	0	0	0	0
Total injury and poisoning	368	5.2	9,351	8,247	3,110	11,358	5,473

(a) Includes surgical and medical misadventure, and adverse effects of drugs in therapeutic use.

Hospital and nursing home expenditure accounts for 73% of total health system expenditure on injury, significantly higher than their share (58%) of health system expenditure for all diseases and injury.

Table 6 shows the estimated health care costs for external causes of injury by sex in 1993–94, ranked in descending order of the male/female cost ratio. The overall male/female sex ratio of health care costs is 1.20, but the pattern of injury costs is quite different for the two sexes. Costs for females are higher than those for males for falls, predominantly in older females, adverse effects of medical treatment, again predominantly in older females, and suicide and self-inflicted injury.

Male costs substantially exceed those of females for machine injuries (with a sex ratio of 9.3) and for homicide and violence (2.2), and are around 50% higher than those of females for other major external causes of injury.

Table 6: Health care costs of injuries by external cause and sex, Australia, 1993–94 (\$ million)

External cause	Males	Females	Male/female ratio
Machine injuries	40	4	9.27
Other transport accidents	41	16	2.52
Homicide and violence	89	40	2.20
Other unintentional injuries	421	214	1.97
Accidental drowning	3	2	1.56
Fire, burns or scalds	33	23	1.44
Road traffic accidents	218	152	1.43
Poisoning	13	13	1.04
Adverse effects of medical treatment	194	207	0.93
Suicide and self-inflicted injury	35	38	0.92
Accidental falls	334	471	0.71
Total injury and poisoning	1,420	1,181	1.20

2.3 Injury costs and impact

Table 7 shows male and female health system costs by external cause in 1993–94, together with numbers of deaths and years of life lost to age 75 in 1994.

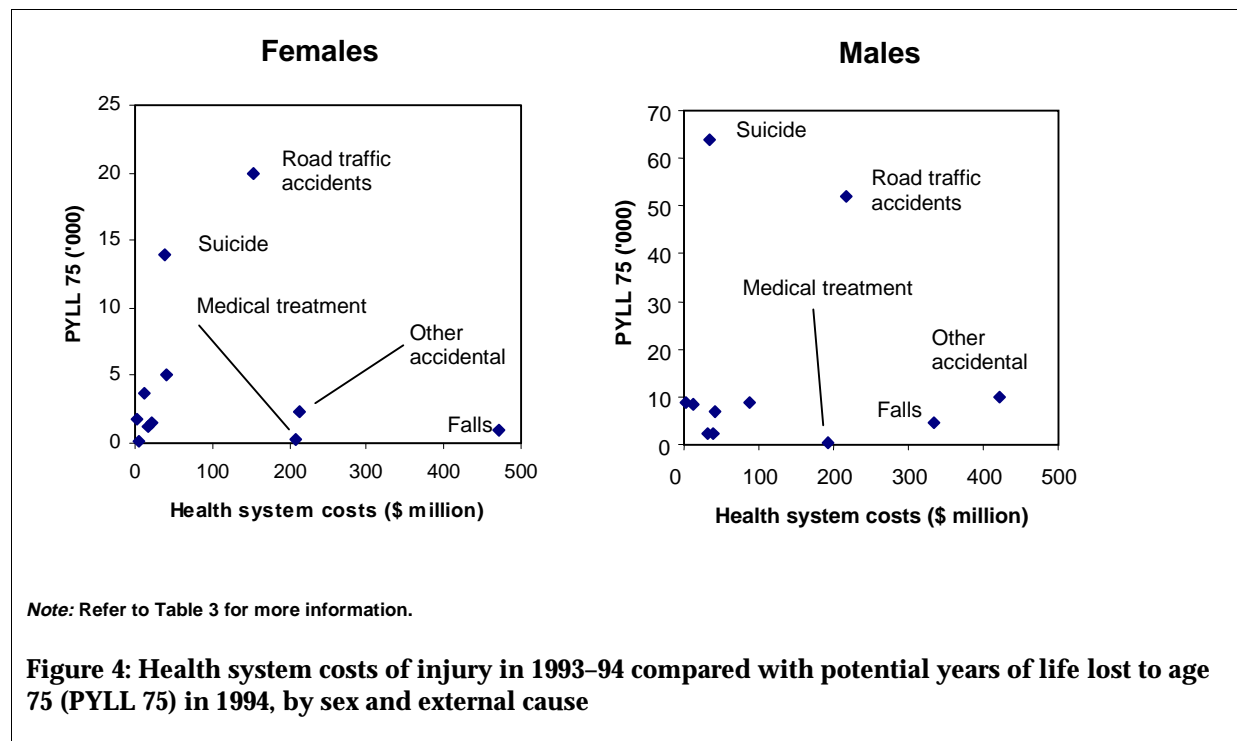
Suicide and road traffic accidents stand out from all other external causes in terms of deaths and potential years of life lost to age 75 compared with health system expenditures (Figure 4). In particular, the health system costs associated with suicide and self-harm are quite low (accounting for less than 3% of injury costs) whereas suicide accounts for nearly 45% of potential years of life lost before age 75 due to injury and poisoning.

At the other extreme, falls and adverse effects of medical care are the two leading causes of health system costs for both males and females, but account for very few deaths. In particular, in 1994 only 51 deaths were recorded as due to complications of medical care or adverse effects of drugs in therapeutic use. Both the costs and the deaths for these causes are based on the principal diagnosis and underlying cause of death as reported and coded in health system data and death registration data respectively.

Table 7: External causes of injury: health system costs by sex, 1993–94 (\$ million) and numbers of deaths and potential years of life lost to age 75 (PYLL 75) by sex, 1994

ICD-9 chapter	Males				Females		
	Total costs	Total costs	Deaths 1994	PYLL 75 1994	Total costs	Deaths 1994	PYLL 75 1994
Unintentional injuries							
Road traffic accidents	370	218	1,379	51,835	152	600	19,966
Other transport accidents	58	41	183	6,961	16	35	1,234
Poisoning	26	13	211	8,506	13	115	3,746
Accidental falls	806	334	441	4,547	471	545	972
Fire, burns or scalds	55	33	86	2,479	23	58	1,441
Accidental drowning	6	3	209	8,949	2	41	1,826
Machine injuries	44	40	73	2,219	4	4	199
Adverse effects of medical treatment ^(a)	401	194	28	417	207	23	256
Other unintentional injuries	635	421	338	9,927	214	98	2,223
Intentional injuries							
Suicide and self-inflicted injury	72	35	1,891	63,844	38	454	13,994
Homicide and violence	129	89	220	8,781	40	122	5,016
Total injury and poisoning	2,601	1,420	5,059	168,464	1,181	2,095	50,875

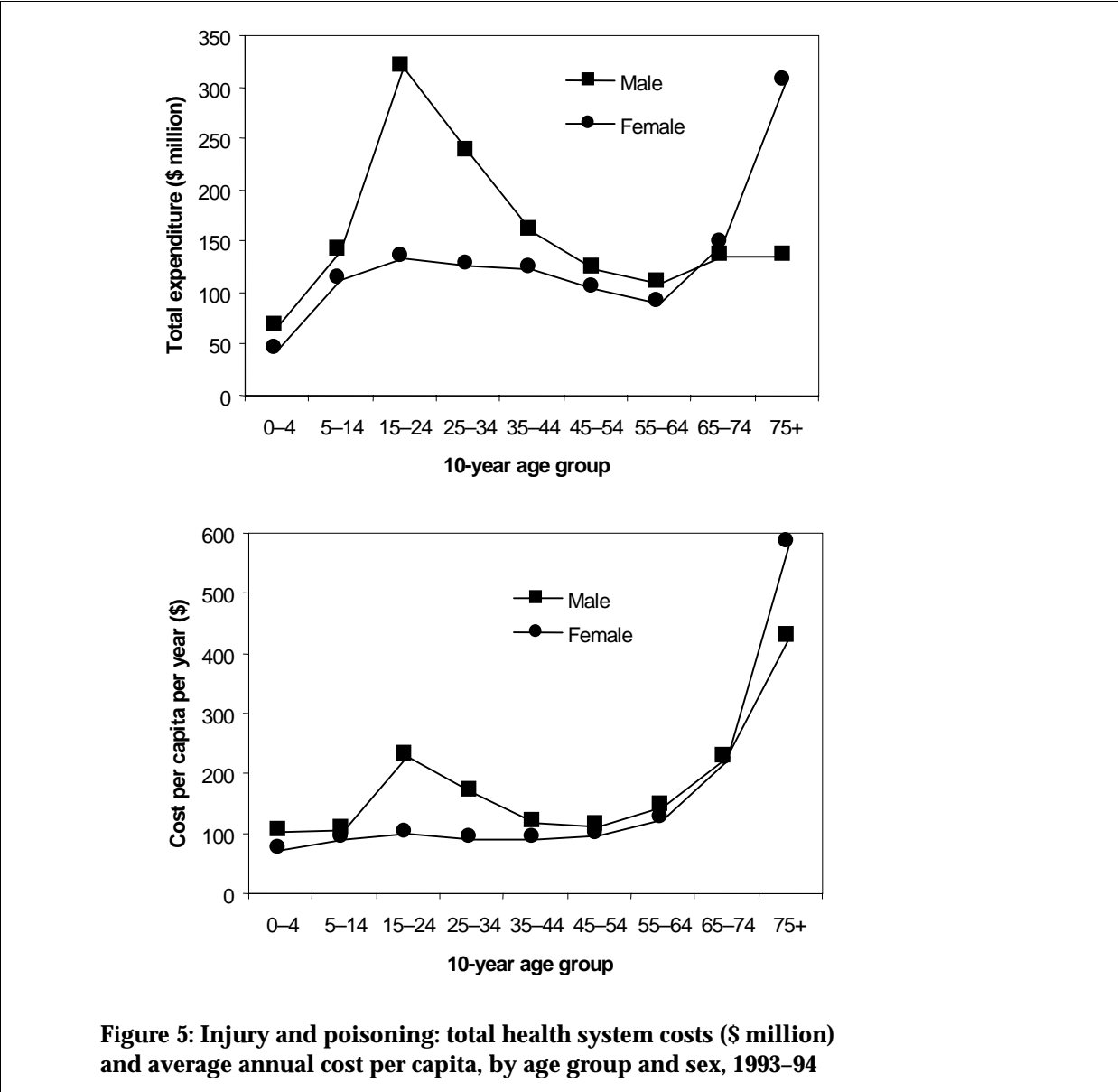
(a) Includes surgical and medical misadventure, and adverse effects of drugs in therapeutic use.



2.4 Injury costs by age and sex

Figure 5 illustrates the age–sex distribution of total expenditure and per-capita health system expenditure on injuries in 1993–94. Total expenditure rises from childhood to peak in the 15–24 age group and then declines before rising steeply at older ages, particularly for females, and plateaus around \$100 to \$150 million dollars for each 10-year age group between ages 30 and 70 for both males and females. Per capita expenditure is similar for males and females at most ages, apart from the male excess in the age range 15–24 years and the female excess in the oldest age range, 75 years and over.

Figure 6 shows the age–sex distributions of total health system costs for selected external causes of injury. Figure 7 shows similar distributions for health system costs per capita. It should be emphasised that the per capita costs relate to the total Australian population, not just those suffering injuries.



Of particular note in these tables is the very large contribution of accidental falls to total and per capita injury costs at older ages, particularly among older women. Detailed information on total costs and health services utilisation by health sector, age, sex and external cause are provided in Tables C.8 to C.19 (Appendix C).

2.5 Most costly injuries at different ages

Figure 8 shows the relative contributions of selected external causes to total health system costs of injury at various ages: for children aged 0–14 years, young adults aged 15–24 years, adults aged 25–64 years and older adults aged 65 years and over. The ‘Other’ category in each of these graphs includes a large number of external causes including accidents due to natural and environmental factors, inhalation or ingestion of foreign bodies, and striking against or being struck by an object.

Accidental falls make a very substantial contribution to total health system costs of injury among children and older people, but are less important than road traffic accidents among young adults aged 15–24 years. Adverse effects of medical treatment make a significant contribution among adults aged 25–64 years and among older people. Together, accidental falls and adverse effects of medical treatment account for 90% of all injury costs for people aged 65 years and over.

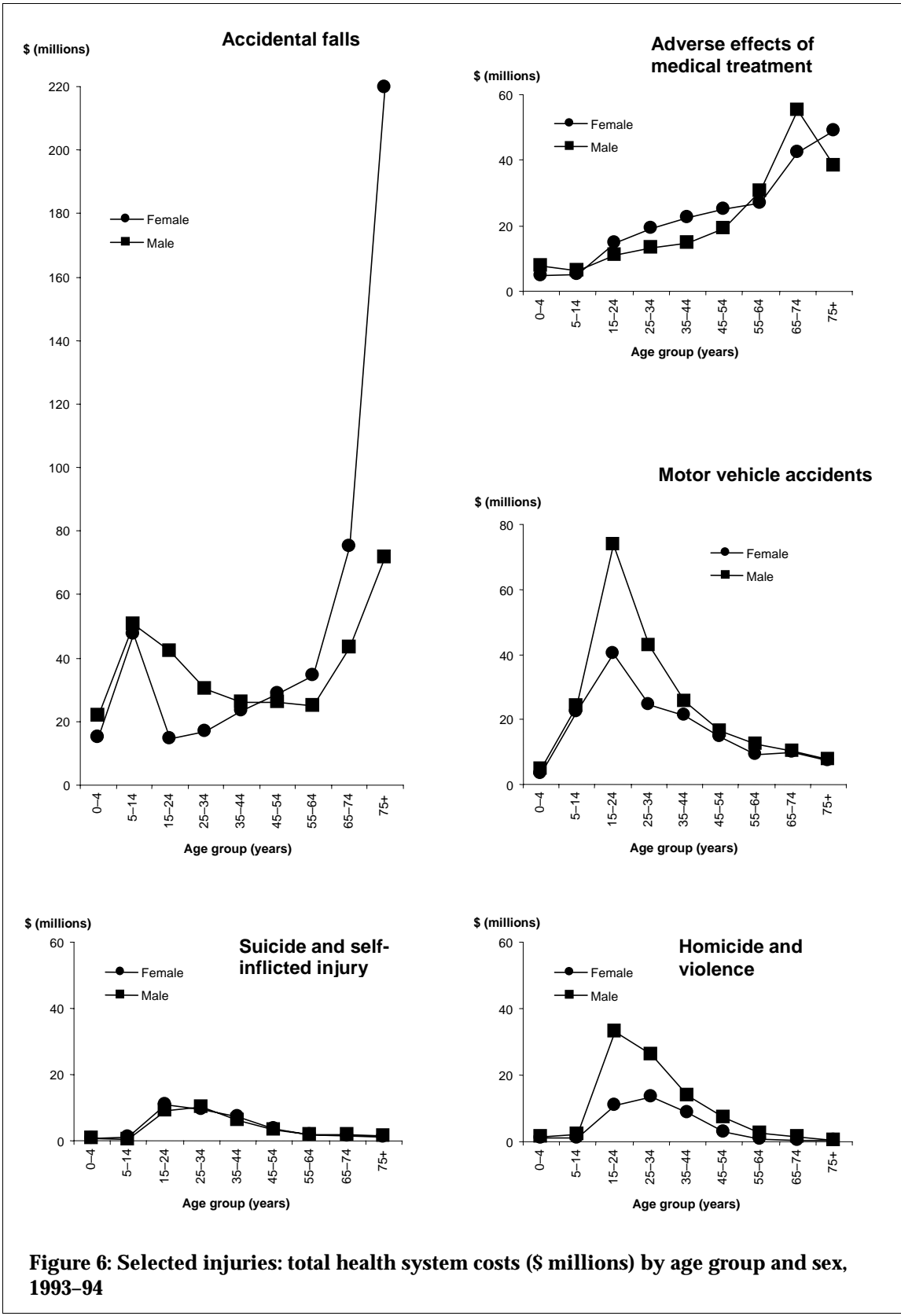


Figure 6: Selected injuries: total health system costs (\$ millions) by age group and sex, 1993-94

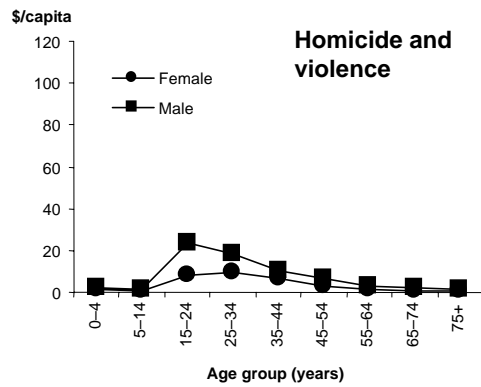
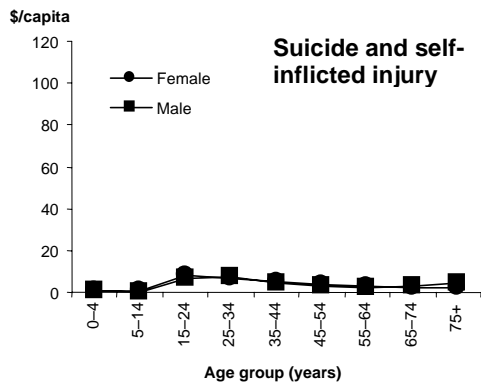
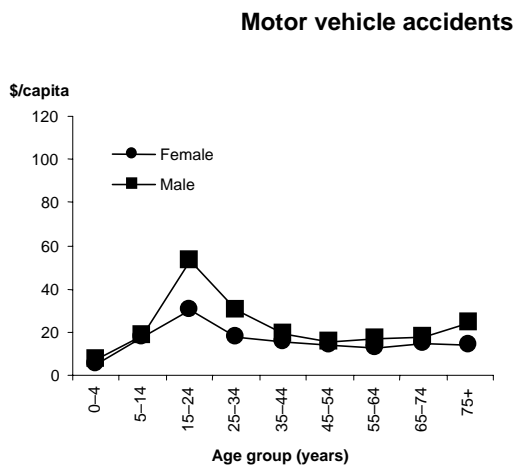
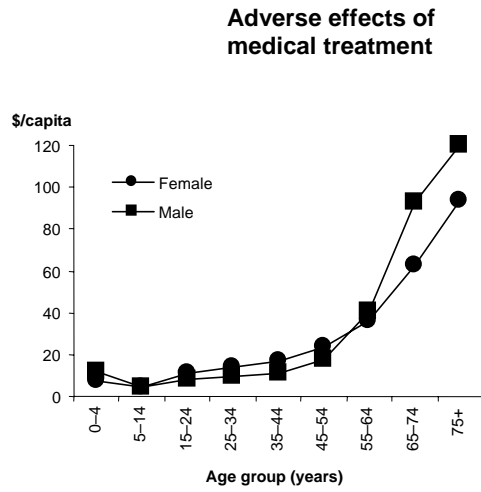
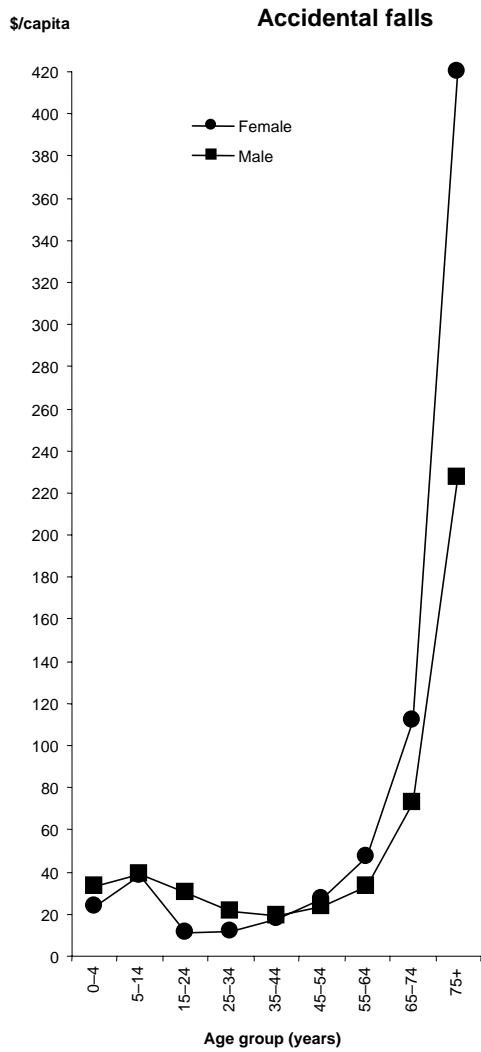
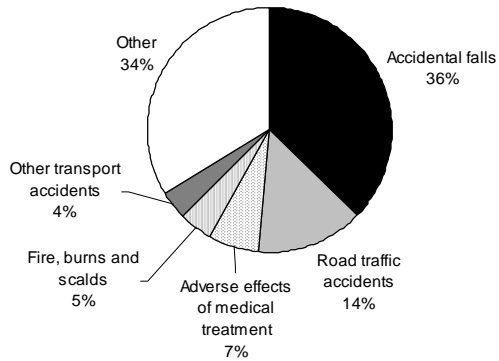
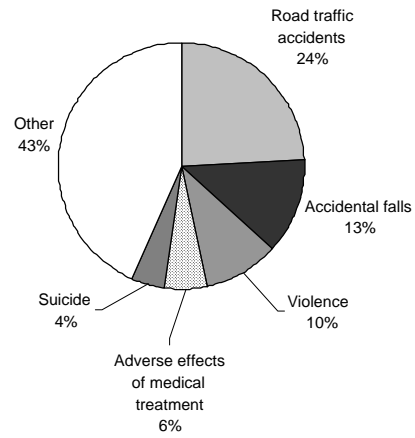


Figure 7: Selected injuries: per capita health system costs by age group and sex, 1993-94

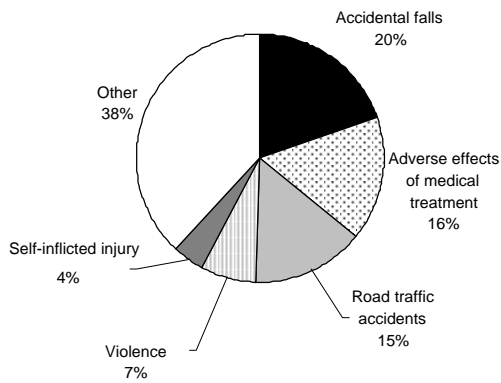
Ages 0–14
\$363 million



Ages 15–24
\$451 million



Ages 25–64
\$1,067 million



Ages 65 and over
\$722 million

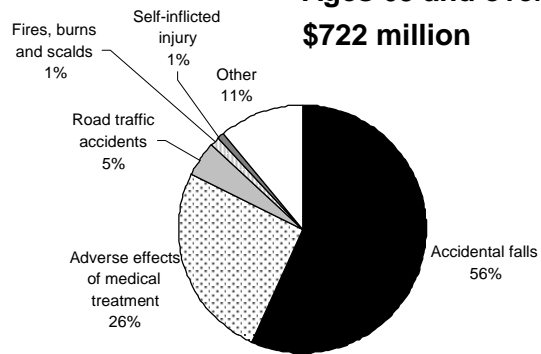


Figure 8: Contribution of selected external causes to total health system costs of injury at various ages: 0–14, 15–24, 25–64 and 65 years and over, Australia, 1993–94