Chapter 7
Work–related traumatic deaths of bystanders

7.1 INTRODUCTION

Poorly controlled hazards arising from work can affect members of the general public as well as workers. Consideration of the circumstances surrounding the deaths of members of the public provides an insight into another aspect of the breakdown in the control of hazards in the work setting. In addition, they reflect one of the adverse effects of work on the general community. Bystanders were defined as persons who were not working but who were fatally injured directly as a result of someone else's work activity. The bystander group was divided into two categories — workplace bystanders and road bystanders. These groups are considered separately in this Chapter. Fatality rates were calculated using the whole Australian population (obtained from annual ABS population surveys[242]) as the source of yearly and four-year denominators.

7.2 WORKPLACE BYSTANDERS

7.2.1 INTRODUCTION

Workplace bystanders were defined as any person who was not working and who was fatally injured, whose injuries resulted substantially/directly from an activity classifiable as 'work' and whose injuries did not result from a road vehicle traffic incident on a public road or from an incident that occurred while the person was a passenger on any form of land-based public transport. Note that persons who were working were not considered bystanders even if they were killed as a result of the activities of another worker. Instead, they were classed as working deaths.

Basically, this category covered bystanders fatally injured as a result of workplace

activities not associated with public roads or public transport. Exceptions to this definition were:

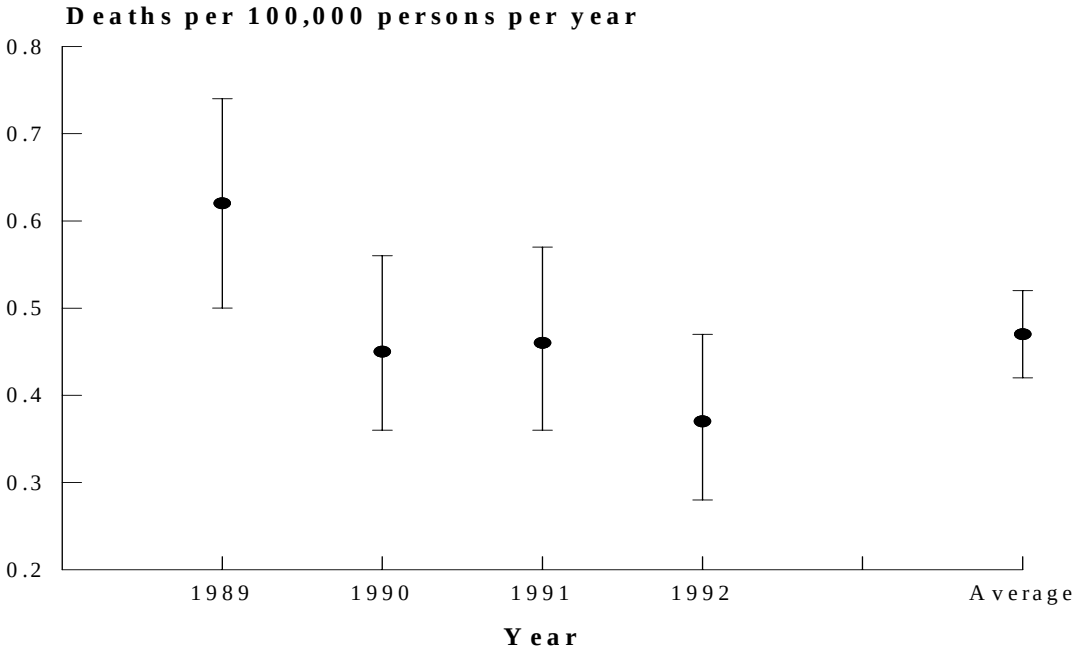
- persons not working but fatally injured in a road vehicle traffic incident whilst travelling as passengers in the cabin (the working area) of a truck;
- persons fatally injured whilst passengers on any form of public transport but where the persons were travelling in the cabin or other working area of the vehicle (including aircraft), or;
- persons who were fatally injured when struck by a vehicle being used for work in an area that could be deemed a defined workplace but still on a public road (eg a reversing garbage truck picking up rubbish).

7.2.2 RESULTS

There were 325 persons who died during the study period and who met the study definitions of workplace bystanders, giving a rate for the Australian population of 0.47 deaths per 100,000 persons per year. (Another nine persons died as bystanders to home duties, but they are not included in the results presented here.) There was a slight decline in the rate over the four years of the study (Figure 7.1).

There were more males than females (64% versus 36%, respectively) and this discrepancy was even more marked for children less than five years of age, most of whom were injured on farms. The mean age was 24.4 years with a range of one to 96 years. One-third of all fatally injured bystanders (102 persons) were under five years and 148 (46%) were under 15. The rate of workplace bystander deaths of children under five years was at least four times higher than for any other age group. Beyond the age of four years, the rate was fairly steady (Figure 7.2 and Table 7.1).

Fig 7.1 Workplace bystander deaths Rate[1] (CI)[2]. Australia, 1989 to 1992



1: Incidence rates - based on annual populations surveys.
2: 95% confidence interval.

Table 7.1 Workplace bystander deaths Number, percent, rate[1] (CI[2]) per year Australia, 1989 to 1992

Year	Number	%	Rate	CI
1989	105	32.3	0.62	*0.50-0.74*
1990	77	23.7	0.45	*0.36-0.56*
1991	79	24.3	0.46	*0.36-0.57*
1992	64	19.7	0.37	*0.28-0.47*
Total	**325**	**100.0**	**0.47**	***0.42-0.52***

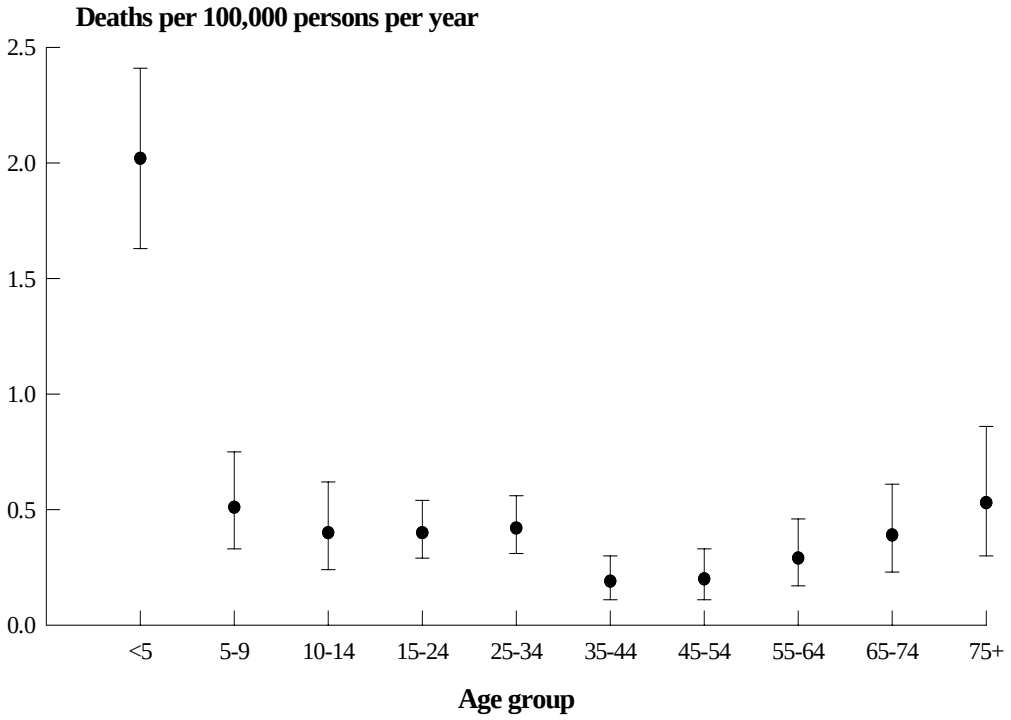
1: Incidence rates — deaths per 100,000 persons per year — based on ABS population surveys.
2: 95% confidence interval.

PLACE

Two hundred and seventeen (67%) of the deaths resulted from fatal incidents that occurred in rural areas. The remainder occurred either in urban areas (95: 29%) or on the urban-rural fringe (11: 3.4%), with the place of the fatal incident unknown in two instances. Fatal incidents occurred in rural workplaces (nearly all of which were farms)

for 137 deaths (42%) and in a farmhouse in another eight instances. The farm-related incidents are described in more detail below. Public roads were another common area for fatal bystander incidents, with 63 deaths (20%). Most of these fatal incidents involved persons travelling as passengers in the cabin of working vehicles. Twenty-six deaths (8.0%) resulted from incidents that occurred in a home, and smaller numbers in a trade or service area, industrial or construction area, or a mine or quarry. Eleven of the deaths (3.4%) resulted from incidents that occurred in public hospitals, where the persons died due to a clear failure of systems and/or breach of appropriate work practices in the health care setting (Table 7.2).

Fig 7.2 Age of bystanders - workplace deaths Rate[1] (CI)[2]. Australia, 1989 to 1992



1: Incidence rates - based on annual population surveys.
2: 95% confidence interval.

Looking at the place of incident in more detail, the most common places where people were injured were public or private roadways (22%), paddocks or fields (17%) and dams (14%), but most areas recognised as a workplace had at least one fatal incident

(Table 7.3). Vehicles were also confirmed as playing an important role in workplace bystander deaths, as they do in the deaths of workers (Table 7.4).

Table 7.2 Level one place of fatal incident – workplace bystander deaths Number and percent. Australia, 1989 to 1992

Place of fatal incident	Subset of workplace bystanders		All workplace bystanders	
	Number	% [1]	Number	% [2]
Home (includes farmhouse)			26	8.0
Residential institution			5	1.5
School, other institution, or public administrative area			2	0.6
Hospital or other health service			11	3.4
Recreation area			5	1.5
Sports or athletics area			-	-
Street or highway (public roads)			63	19.4
Shop	11	52.4		
Commercial eating place	1	4.8		
Amusement, drinking place	3	14.3		
Bus or railway station	2	9.5		
Other trade area	4	19.0		
Total trade or service area	**21**	**100.0**	21	7.5
Construction site	3	30.0		
Factory plant	3	30.0		
General industrial area	3	30.0		
Other industrial area	1	10.0		
Total industrial or construction area	**10**	**100.0**	10	3.1
Underground mine or quarry	1	17.7		
Open mine or quarry	2	33.3		
Other mine or quarry	3	50.0		
Total mine or quarry	**6**	**100.0**	6	1.9
Farm or rural workplace (excluding farmhouse)			137	42.2
Other specified place (includes bushland, open water, etc)			39	12.0
Total			**325**	**100.0**

1: Percent relating to the subset of workplace bystanders fatally injured in incidents which occurred in the specific place.
2: Percent relating to all fatally injured workplace bystanders.

Table 7.3 Level two place[1] of fatal incident - workplace bystander deaths Number and percent. Australia, 1989 to 1992

Place of fatal incident	Subset of workplace bystanders		All workplace bystanders	
	Number	% [2]	Number	% [3]
Room			25	7.7
Specialised structures (silo, tank, pylon)	6	33.3		
In or around a structure being erected, demolished or renovated	4	22.2		
Tunnel or trench	2	11.1		
Shed	2	11.1		
Workshop	2	11.1		
Animal shelter or stable	1	5.6		
Structure unspecified	1	5.6		
Total structure	**18**	**100.0**	18	5.5
Part of building or structure			4	1.2
Roadway (public and other)	71	40.0		
Paddock or field	56	30.0		
Car park	6	3.2		
Driveway	7	3.7		
Garden	7	3.7		
Railway tracks and surrounds (excludes railway station and crossing)	10	5.3		
Footpath or path	4	2.1		
Factory yard	2	1.1		
Stock yard or other outdoor animal enclosure	2	1.1		
Railway crossing	1	0.5		
Playground with play equipment	1	0.5		
Production area	1	0.5		
Part of grounds, site or street unspecified	19	10.1		
Total parts of grounds, site, street	**187**	**100.0**	187	57.5
Dam	46	66.7		
River, creek, lake or reservoir	7	10.1		
Swimming pool	6	8.7		
Beach	6	8.7		
Sea, surf, bay or ocean	1	1.4		
Wharf or jetty	1	1.4		
Body of water unspecified	2	1.4		
Total body of water and surrounds	**69**	**100.0**	69	21.2
Residual interior and exterior categories			22	6.8
Total			**325**	**100.0**

1: Based on Level 2 of NDSIS place variables.
2: Percent relating to the subset of workplace bystanders fatally injured in incidents that occurred in the specific place.
3: Percent relating to all fatally injured workplace bystanders.

Table 7.4 Level three place of fatal incident - workplace bystander deaths Number and percent[1]. Australia, 1989 to 1992

Place of fatal incident	Number n=325	%
On board cars, trucks or bikes	83	25.5
On board an aircraft	22	6.8
On board an other mobile vehicle nec (eg excavator, backhoe)	25	7.7
On board a tractor	9	2.8
On board a boat	3	0.9
On a forklift	1	0.3
On a horse	1	0.3

1: Percentage of deaths within each place group.

MECHANISM

The most common mechanism involved in workplace bystander deaths was vehicular incidents (36%), which mainly involved persons travelling as passengers in work vehicles, but also included incidents involving aircraft. Drowning (21%) mainly involved young children in farm dams. Other of the more common specific mechanisms were being hit by moving objects (15%), being accidentally or deliberately injured by a weapon (5.5%), being hit by falling objects (4.6%) and falling from a height (4.0%) (Figure 7.3 and Table 7.5).

Fig 7.3 Mechanism of the fatal incident - workplace bystander deaths
Percent. Australia, 1989 to 1992

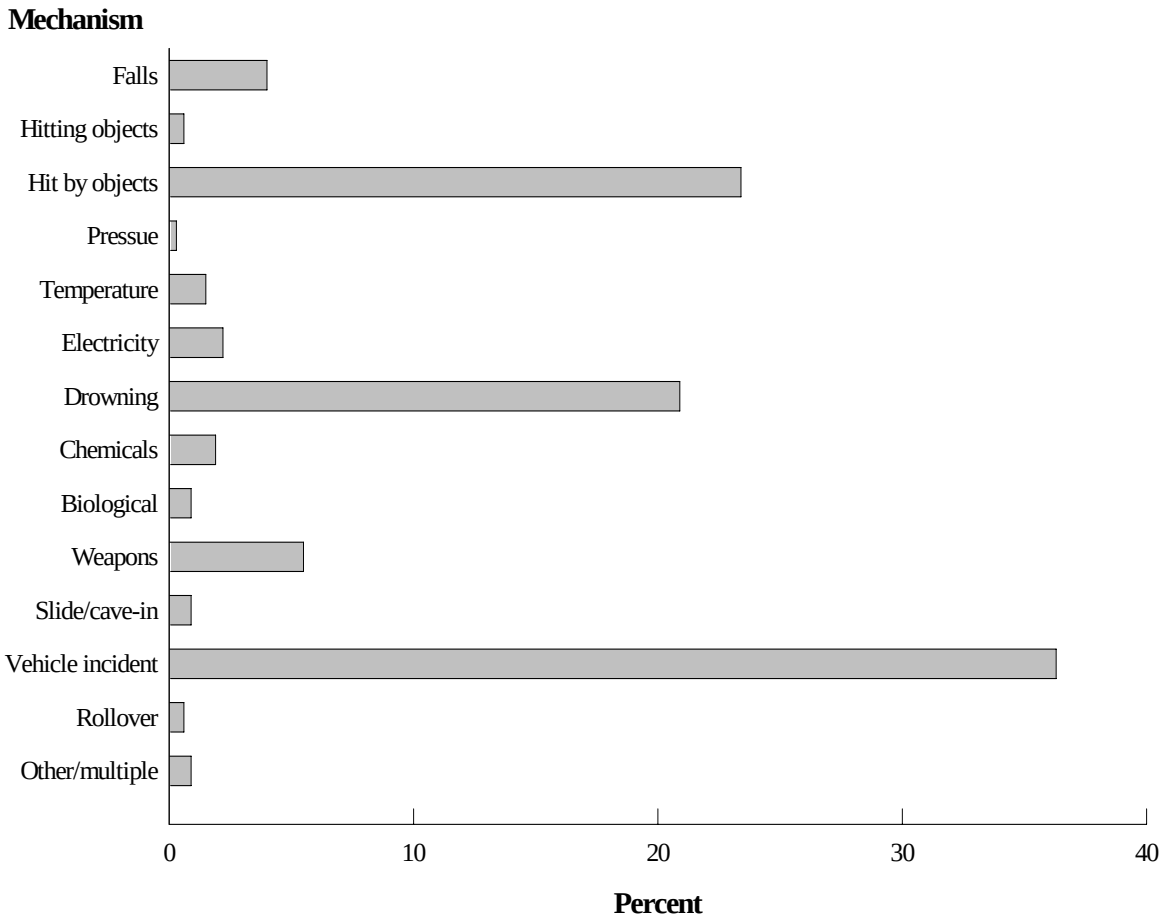


Table 7.5 Mechanism of the fatal incident - workplace bystander deaths Number and percent. Australia, 1989 to 1992

Mechanism of fatal incident	Subset of workplace bystanders		All workplace bystanders	
	Number	% [1]	Number	% [2]
Falls			13	4.0
Hitting objects with part of body			12	0.6
Hit by falling objects	15	19.7		
Bitten by animals	1	1.3		
Hit by animals	3	3.9		
Hit by person	2	2.6		
Trapped by moving machinery	1	1.3		
Trapped between objects	4	5.8		
Hit by moving objects	50	65.8		
Total hit by moving objects	**76**	**100.0**	76	23.4
Sound and pressure			1	0.3
Contact with heat or cold			5	1.5
Contact with electricity			7	2.2
Drowning			68	20.9
Explosion			-	-
Chemical other substances			6	1.9
Biological factors			3	0.9
Weapons			18	5.5
Slide or cave-in			3	0.9
Vehicle incident			118	36.3
Rollover			2	0.6
Other and multiple			3	0.9
Total			**325**	**100.0**

1: Percent relating to the subset of workplace bystanders fatally injured in incidents which occurred in the specific place.
2: Percent relating to all fatally injured workplace bystanders.

AGENCY

The most common agencies were environmental agencies (41%) and vehicles of some sort (eg cars, trucks, aircraft) (48%) (Figure 7.4 and Table 7.6).

Fig 7.4 Agency of the fatal incident - workplace bystander deaths
Percent. Australia, 1989 to 1992

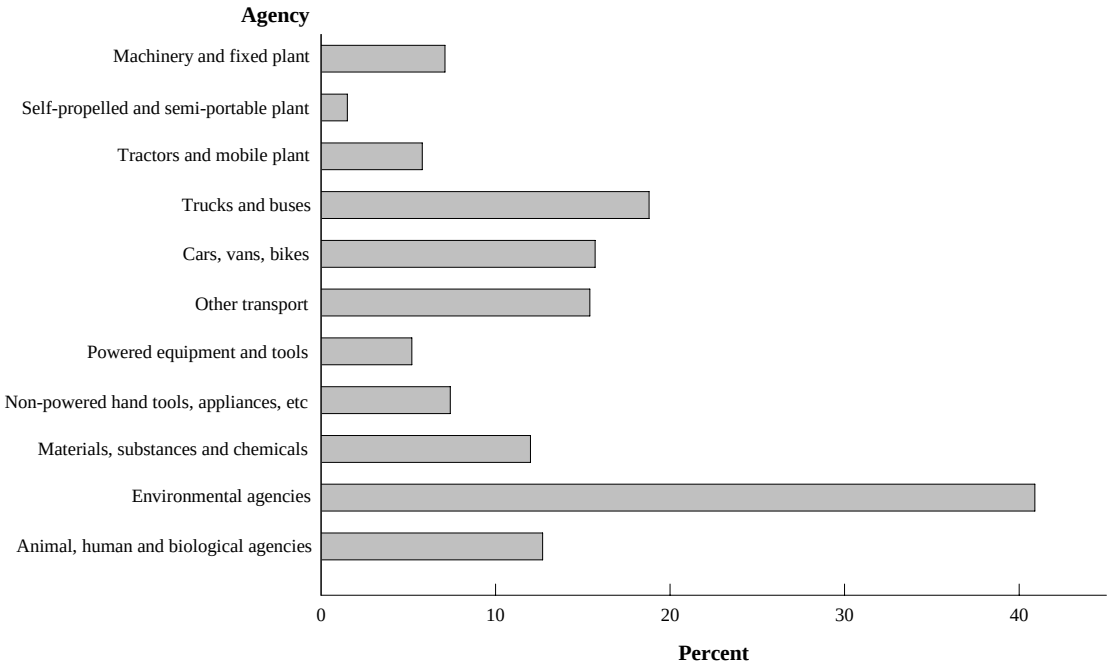


Table 7.6 Agency of fatal incident - workplace bystander deaths Number and percent[1]. Australia, 1989 to 1992

Agency of incident	Percent n = 325
Machinery and fixed plant	7.1
Self propelled and semi portable plant	1.5
Tractors and other mobile plant	5.8
Trucks and buses	18.8
Cars, vans, bikes etc	15.7
Other transport (rail, air, water)	15.4
Powered equipment and tools	5.2
Non-powered hand tools, appliances and equipment	7.4
Materials, substances and chemicals	12.0
Environmental agencies	40.9
Animal, human and biological agencies	12.7

1: Percentage of deaths with each agency group involved. Percentages do not add to 100 because each incident may have had up to three relevant agencies recorded.

JURISDICTION

All jurisdictions had some workplace bystander deaths, although there were only three in the Australian Capital Territory. At a national level, workplace bystander deaths were 10% of all the main work-related deaths (working, commuting, workplace bystander and road bystander). This proportion varied between jurisdictions, from 8% (Western Australia) to 23% (Northern Territory) (Figure 7.5 and Table 7.7).

Fig 7.5 Classification of deaths by jurisdiction
Working, commuting and bystander deaths
Percent. Australia, 1989 to 1992

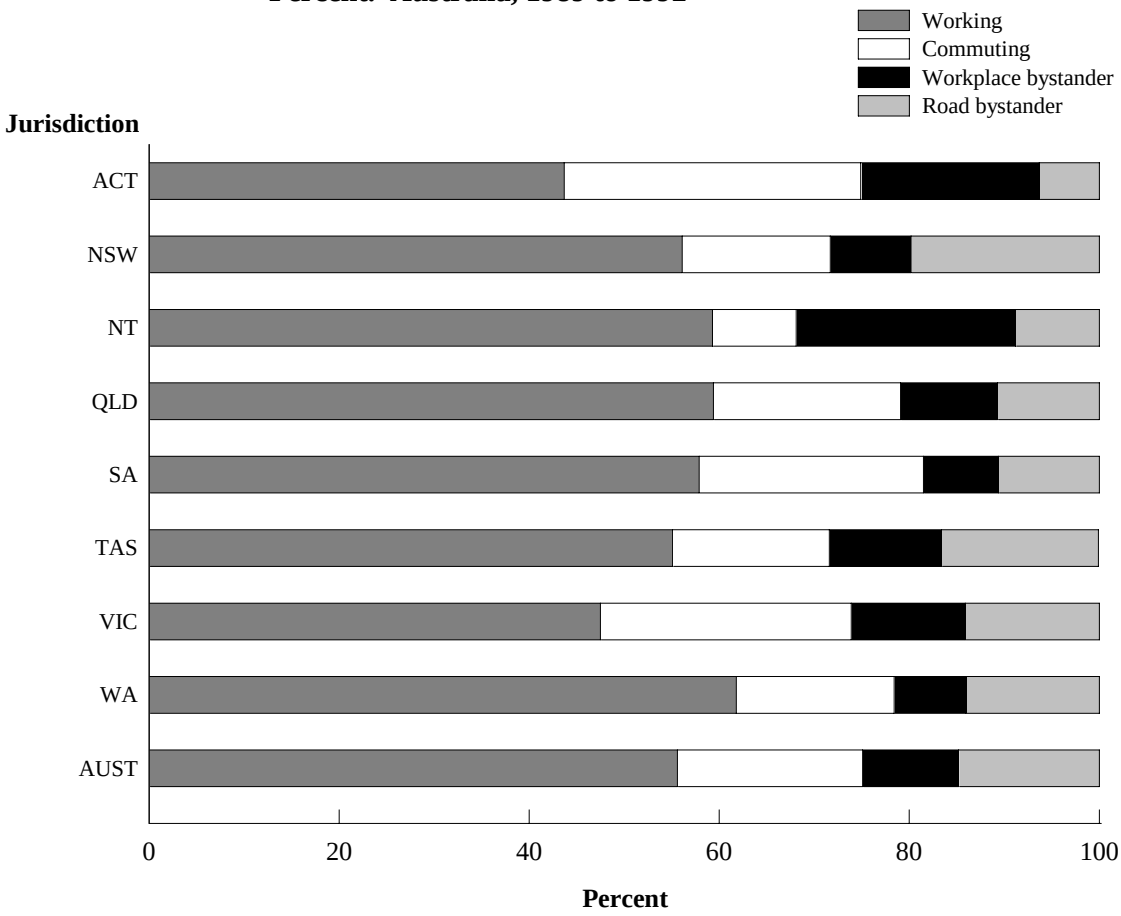


Table 7.7 Classification of deaths by jurisdiction
Number and percent[1]. Australia, 1989 to 1992

Jurisdiction	Working		Commuting		Workplace bystander		Road bystander		Total work-related	
	n	%	n	%	n	%	n	%	n	%
ACT	7	43.8	5	31.3	3	18.8	1	6.3	16	100.0
NSW	580	56.1	161	15.6	88	8.5	205	19.8	1,034	100.0
NT	54	59.3	8	8.8	21	23.1	8	8.8	91	100.0
QLD	427	59.4	142	19.7	73	10.2	77	10.7	719	100.0
SA	125	57.9	51	23.6	17	7.9	23	10.6	216	100.0
TAS	70	55.1	21	16.5	15	11.8	21	16.5	127	100.0
VIC	338	47.5	188	26.4	85	12.0	100	14.1	711	100.0
WA	186	61.8	50	16.6	23	7.6	42	14.0	301	100.0
Australia	**1,787**	**55.6**	**626**	**19.5**	**325**	**10.1**	**477**	**14.8**	**3,215**	**100.0**

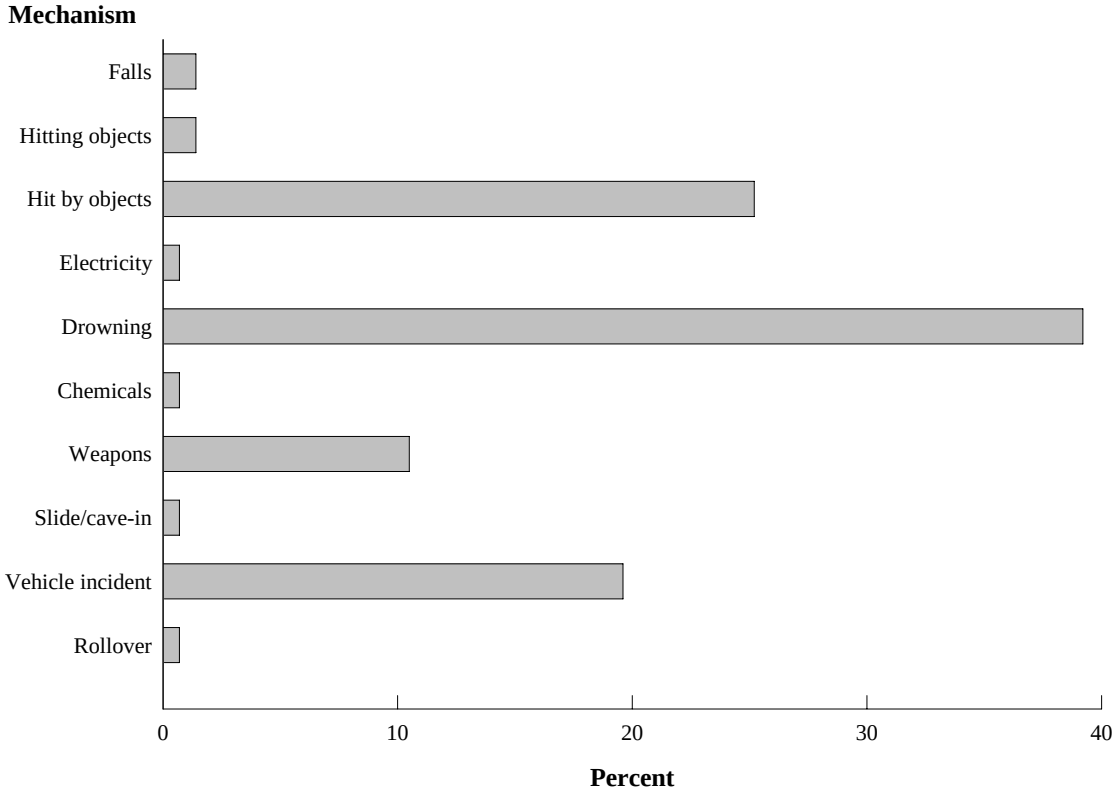
1: Percentages are based on the total number of deaths in each jurisdiction.

7.2.3 BYSTANDER DEATHS ON FARMS

One hundred and forty three (47%) of the bystander death incidents were associated with farm work and nearly all of these occurred on a farm. Ninety-two (64%) of these farm bystanders were children aged less than 15 years, and 68 (48%) were children less than five years. Almost three quarters of the farm bystanders were male (73%).

Drowning was the major mechanism involved in the deaths of young bystanders on farms, accounting for 42 (46%) of the deaths of children less than 15. Of the children less than five, 39 (57%) drowned and 22 (31%) were hit by moving objects (usually by tractors or farm vehicles). Overall, the common mechanisms were drowning (39%), being hit by moving objects (25%: usually mobile mechanical equipment), vehicle incidents (20%) and incidents involving weapons (11%) (Figure 7.6).

Fig 7.6 Mechanism of the fatal incident - deaths associated with farm work
Workplace bystander deaths. Percent. Australia, 1989 to 1992



The more common places for the fatal bystander incidents to occur were dams (30%), paddocks (26%) and roadways (13%).

The common agents involved in the fatal incidents were dams (29%: accounting for most of the drowning incidents), motor vehicles (20%: children or adults being run over by vehicles, again often after falling from the vehicle), tractors (13%: children being run over by tractors, often after falling from them), and motor cycles or trail bikes (9%). More detail about farm-related bystander incidents is available elsewhere[276-278].

7.3 ROAD BYSTANDERS

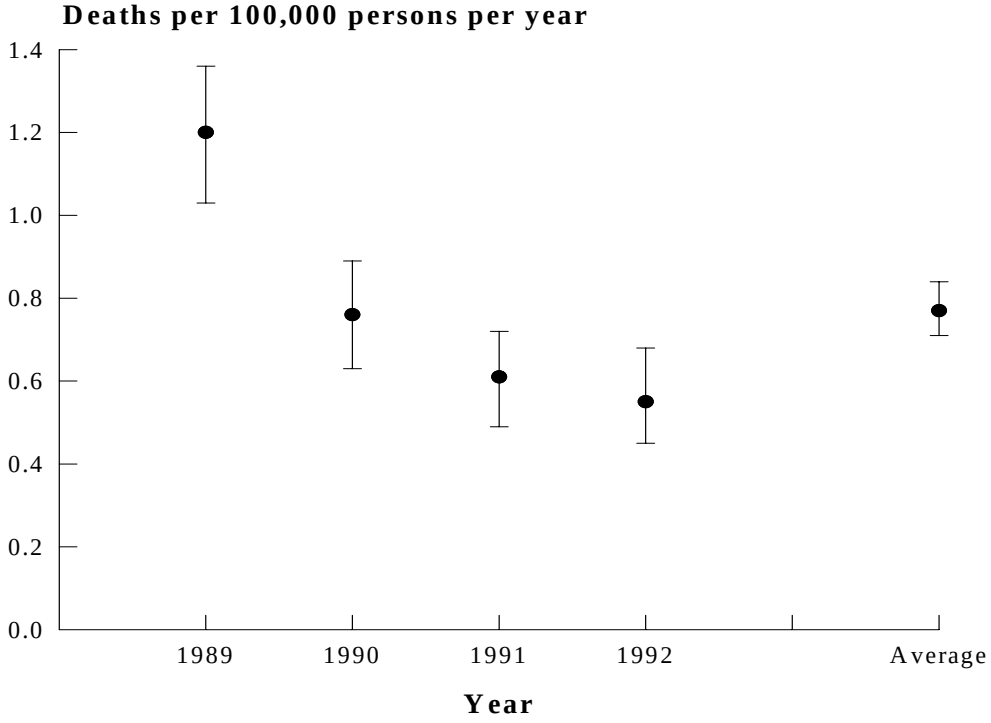
7.3.1 INTRODUCTION

Road bystanders were defined as persons not working but who received fatal injuries in a motor vehicle incident on a public road as a result of a work-related exposure. If a working / commuting vehicle was involved, the incident was only included if the working vehicle was considered 'at fault' in the incident. On the basis of this definition, some persons classified as workplace bystanders could be considered road bystanders. These were persons who were travelling as passengers in the cabin of a working vehicle and who were classified as bystanders in the workplace, since they were essentially in the workplace of the working person operating the vehicle. However, these deceased persons otherwise met the study definitions of a road bystander and have been included in this analysis.

7.3.2 RESULTS

There were 532 persons who died during the four–year period of the study in circumstances that satisfied the study definitions of road bystanders. Four hundred and seventy-seven (90%) of the deaths were coded primarily as road bystanders and the remaining 55 (10%) were primarily coded as workplace bystanders. This gave a rate of death of 0.77 persons per 100,000 persons per year. This rate fell during each year of the study (Figure 7.7 and Table 7.8).

Fig 7.7 Road bystander deaths
Rate[1] (CI)[2]. Australia, 1989 to 1992



1: Incidence rates - based on annual population surveys.
2: 95% confidence interval.

Table 7.8 Road bystander deaths
Number, percent, rate[1] (CI[2]) per year
Australia, 1989 to 1992

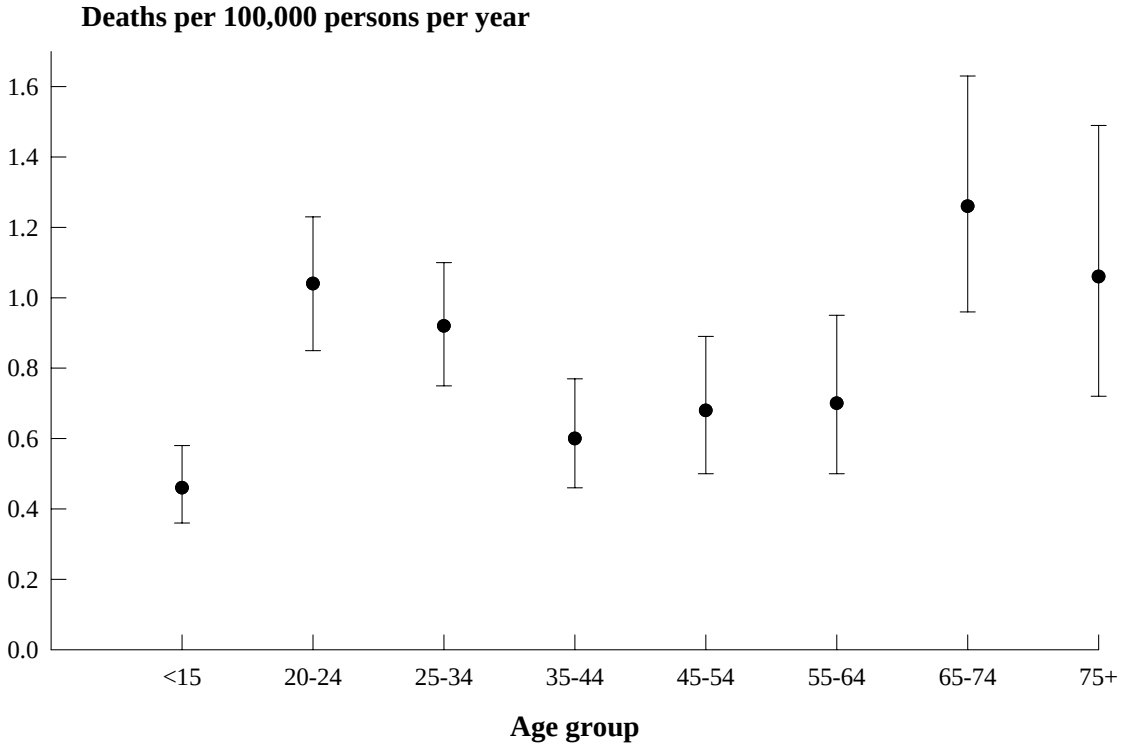
Year	Number	%	Rate	CI
1989	201	37.8	1.20	*1.03-1.36*
1990	129	24.3	0.76	*0.63-0.89*
1991	105	19.7	0.61	*0.49-0.72*
1992	97	18.2	0.55	*0.45-0.68*
Total	**532**	**100.0**	**0.77**	***0.71-0.84***

1: Incidence rates — deaths per 100,000 persons per year — based on ABS population surveys.
2: 95% confidence interval.

Amongst road bystanders, there were slightly more men than women (56% versus 44%, respectively) and the mean age was 37.2 years, ranging from 0 to 91 years. The rate of

injury was highest in the elderly, lowest in children and showed a moderate peak around 20 years of age (Figure 7.8).

Fig 7.8 Age of bystanders - road deaths Rate[1](CI)[2]. Australia, 1989 to 1992



1: Incidence rates - based on annual population surveys.
2: 95% confidence interval.

DUTY CONTEXT

The remainder of this analysis concentrates on the working persons in charge of the 'at fault' vehicle at the time of the fatal incident. Four hundred and forty one (83%) persons died as a result of the activity of working persons, and 79 (15%) as a result of the activity of commuters. Another 12 deaths (2%) involved work-related exposures where no specific person was present. Two of these involved work activity of several persons on or next to the road, and the remaining 10 involved incidents where farm animals had strayed onto the road.

Fourteen deaths (12 incidents) involved a high-speed police car chase where the deceased person or their vehicle was struck by the pursuing police car (five deaths) or the car that was being pursued (nine deaths, seven incidents).

INDUSTRY AND OCCUPATION

For 310 deaths, the person working at the time of the incident was employed in the transport industry, and for 363 deaths the working persons were truck drivers (296) or bus drivers (67). Therefore, for 82% of deaths due to working persons, the persons operating the working vehicle were professional drivers. In contrast, the drivers of commuting vehicles involved in fatal road bystander incidents had an industry and occupation distribution closer to that of the working community (Tables 7.9 and 7.10).

ALCOHOL AND DRUGS

In 19 (3.7%) of the 520 deaths where the other person was working or commuting, the blood alcohol level of the other person was known to have been equal to or greater than 0.05 g/100ml (ranging from 0.068 to 0.266 g/100ml — seven of the deaths occurred in three incidents, so in fact the high blood alcohol values are from only 15 persons). However, blood alcohol levels were not available in the coronial file for 268 (51%) of the 520 deaths where a specific working or commuting person was involved, so the 3.7% figure for alcohol involvement should be considered a minimum value. (The 19 bystander deaths from the 15 incidents involving high blood alcohol of the working or commuting drivers represented 7.5% of incidents for which blood alcohol levels were available.)

Table 7.9 Road bystander deaths by industry of the working person Number and percent. Australia, 1989 to 1992

Industry	Working		Commuting		Total[1]	
	Number	%	Number	%	Number	%
Agriculture	11	2.5	3	3.8	23	4.3
Forestry and logging	2	0.5	-	-	2	0.4
Fishing and hunting	-	-	-	-	-	-
Mining	3	0.7	6	7.6	9	1.7
Manufacturing	7	1.6	12	15.2	20	3.8
Electricity, gas and water	2	0.5	2	2.5	5	0.9
Construction	10	2.3	8	10.1	18	3.4
Wholesale and retail trades	19	4.3	13	16.5	32	6.0
Transport and storage	310	70.1	5	6.3	315	59.2
Communication	5	1.1	-	-	5	0.9
Finance, property and business services	6	1.4	4	5.1	10	1.9
Public administration	6	1.4	-	-	7	1.3
Defence	5	1.1	1	1.3	6	1.1
Community services	27	6.1	6	7.6	33	6.2
Recreation, personal and other services	7	1.6	4	5.1	11	2.1
Not known / not relevant	21	4.8	15	19.0	36	6.8
Total	**441**	**100.0**	**79**	**100.0**	**532**	**100.0**

1: Includes an additional 12 deaths where no specific other person could be identified.

Table 7.10 Road bystander deaths by occupation of the working person Number and percent. Australia, 1989 to 1992

Occupation	Working		Commuting		Total[1]	
	Number	%	Number	%	Number	%
Managers and administrators	8	1.8	7	8.9	18	3.4
Professionals	2	0.5	-	-	2	0.4
Para-professionals	20	4.5	2	2.5	22	4.2
Tradespersons	3	0.7	20	25.3	23	4.3
Clerks	2	0.5	5	6.3	7	1.3
Salespersons and personal service workers	7	1.6	6	7.6	85	2.4
Plant/machine operators and drivers[2]	378	85.7	10	12.7	388	72.9
Labourers and related workers	17	3.9	19	24.1	36	6.8
Not known / not relevant	4	0.9	10	12.7	23	0.4
Total	**441**	**100.0**	**79**	**100.0**	**532**	**100.0**

1: Includes an additional 12 deaths where no specific other person could be identified.
2: Plant/machine operators and drivers included: 296 truck drivers; 67 bus drivers; and five car drivers.

Commuters who contributed to road bystander deaths had a much higher proportion of high blood alcohol readings — 11.4% in total or 19.6% of those with blood alcohol readings. This compares with 2.3% in total or 4.9% of those with blood alcohol readings for working persons. The alcohol was consumed at work, during work-related social functions or while driving.

Sixty-one deaths resulted from incidents where the working person appeared to be affected by drugs. These deaths occurred in only seven incidents, with 55 of the deaths occurring in only two incidents (one involving a bus, and the other a bus and a semi-trailer). These seven incidents are likely to be an underestimate of the involvement of drugs, because comprehensive toxicology results were only available for a minority of the involved working drivers. The identified drugs were ephedrine, pseudoephedrine and cannabis.

PLACE OF INCIDENT

For 277 (52%) of the deaths, the fatal incident occurred on a freeway or highway, usually in a rural area. Another 53 (10%) resulted from incidents on other non-urban roads. Most of the remainder of the deaths (196: 37%) resulted from incidents on urban roads.

Deaths primarily related to trucks and buses resulted from incidents in rural areas. One third of the deaths related to working persons resulted from incidents that occurred in urban areas, compared with two thirds of commuter-related deaths.

MECHANISM

Sixty (11%) of the road bystanders were pedestrians and the remainder were drivers or passengers of motor vehicles. There was a marked difference in the mechanism distribution for incidents involving working and commuting vehicles, with 24 (30%) of the commuting vehicle deaths involving pedestrians, as opposed to 36 (8.2%) deaths involving working vehicles or exposures. The type of incident also varied with the age of the person. Although vehicle incidents were the main mechanism for all age groups, pedestrian incidents were much more common in those less than 15 years (28%), and those 75 years or older (25%), compared to all road bystanders (11%).

AGENCY

Trucks and buses were involved in 83% of the working vehicle deaths but only 8.9% of the commuting vehicles deaths, for a total of 70% overall (Table 7.10).

Table 7.11 Road bystander deaths by agency of the incident Number and percent[1]. Australia, 1989 to 1992

Agency of incident	Status of worker involved			
	Working n = 441	Commuting n = 79	Other n = 12	Total n = 532
Machinery and fixed plant	0.2	-	-	0.2
Self propelled and semi portable plant	0.5	-	-	0.4
Tractors and other mobile plant	3.2	-	-	2.6
Trucks and buses	83.0	8.9	8.3	70.3
Cars, vans, bikes etc	65.8	98.7	91.7	71.2
Other transport (rail, air, water)	0.9	-	-	0.8
Powered equipment and tools	-	-	-	-
Non-powered hand tools, appliances and equipment	0.2	1.3	-	0.4
Materials, substances and chemicals	3.0	1.3	-	2.6
Environmental agencies	3.6	3.8	8.3	3.8
Animal, human and biological agencies	0.5	-	83.3	2.3

1: Percentage of deaths with each agency group involved. Percents do not add to 100 because each incident may have had more than one relevant agency.

JURISDICTION

All jurisdictions had some road bystander deaths, although there was only one in the Australian Capital Territory. At a national level, road bystander deaths were 15% of all the main work-related deaths (working, commuting, workplace bystander and road bystander). This proportion varied between jurisdictions, from 6% (Australian Capital Territory) to 20% (New South Wales) (Figure 7.5 and Table 7.7).

MULTIPLE INCIDENTS

The 532 persons died in 399 separate incidents. Three hundred and forty four incidents involved the death of only one road bystander, although in 29 of these the involved worker or commuter was also killed. The remaining 55 incidents resulted in the death of two or more road bystanders, with ten of these incidents also involving the death of at least one other worker or commuter. Three incidents involving long distance passenger buses resulted in 62 bystander deaths in total (one of these incidents also involved a semi-trailer) (Table 7.12). The number of incidents fell during the four years of the study, though not as markedly as the number of deaths (because the three major bus incidents occurred in the first two years of the study) (Table 7.13).

FAMILY INVOLVEMENT

Of the 55 deaths where the road bystander was travelling in the cabin of the working vehicle, 20 (36%) were of persons travelling in vehicles operated by family members. Usually, the incident involved a child and/or wife travelling with the father/husband who was driving a semi-trailer in a rural area and lost control of the vehicle.

Table 7.12 Number of deaths in road bystander incidents Australia, 1989 to 1992

Number of persons killed per incident	Incidents		Total persons	
	Number	%	Number	%
1	344	86.2	344	64.7
2	40	10.0	80	15.0
3	7	1.8	21	3.9
4	1	0.3	4	0.8
5	3	0.8	15	2.8
6	1	0.3	6	1.1
11	1	0.3	11	2.1
19	1	0.3	19	3.6
32	1	0.3	32	6.0
All incidents	**399**	**100.0**	**532**	**100.0**

1: 29 of the incidents in which only one road bystander was killed involved the death of at least one other worker or commuter.
2: 10 of the incidents in which more than one road bystander was killed involved the death of at least one other worker or commuter.

Table 7.13 Road bystander incidents - single and multiple deaths Number and percent per year. Australia, 1989 to 1992

Year	Single		Multiple		Total	
	Number	%	Number	%	Number	%
1989	107	31.1	19	34.5	126	31.6
1990	85	24.7	14	25.5	99	24.8
1991	80	23.3	12	21.8	92	23.1
1992	72	20.9	10	18.2	82	20.6
Total	**344**	**100.0**	**55**	**100.0**	**399**	**100.0**

RECURRING CIRCUMSTANCES

The main circumstances that surrounded the incidents were losing control of heavy vehicles, causing them to cross to the wrong side of the road and collide with other vehicles, run into the back of other vehicles, or run off the road and overturn. There was insufficient information in the coronial files to definitely identify all the key factors leading to all these incidents. However, as with many fatal incidents in which truck

drivers were killed, one or more of excess speed, fatigue and limited visibility at night were commonly identified or suspected. Mechanical faults, and problems with the securing of loads, also occurred, but much less commonly.

Ten deaths resulted from vehicles colliding with farm animals (cattle, sheep or horses). Usually, the animals had escaped through inadequate fencing, but at least one incident involved cattle being herded down a road and not adequately kept off the road at night. All the identified incidents with police cars involved a police car pursuing another vehicle at high speed.

7.4 DISCUSSION

Over the four years of the study, 802 persons (477 road bystanders, 270 workplace bystanders, and 55 who could be considered either workplace or road bystanders) died as bystanders to the work of others. That is, about 200 members of the general public received fatal injuries each year (or four persons each week) as a result of exposure to the work activities of other people.

7.4.1 WORKPLACE BYSTANDER DEATHS

The main characteristics of incidents resulting in workplace bystander deaths were:

- children less than 15 made up almost half of the cases;
- incidents involving farms and farm work accounted for over a third of all deaths;
- motor vehicle incidents on public roads (where the person was travelling in the cabin of the working vehicle) accounted for about one sixth of all deaths; and
- many of the incidents involved family members of the workers, such as family members travelling in the cabin of working vehicles, falling from and/or being hit by working vehicles, or drowning in farm dams.

These results reinforce the importance of controlling work-related hazards for all persons who could reasonably be expected to be exposed to them. This is especially so for children, who require close supervision and appropriate protection whenever they enter a worksite. Farms provide particular difficulties in this regard, as the separation of work and home is difficult to make. Also, social and economic factors can make it difficult for parents to perform the farm work without taking the children with them or leaving them relatively unsupervised at times.

7.4.2 ROAD BYSTANDERS

In examining the road bystander category, the intention was to include persons who died as a result of injuries received in vehicle incidents on public roads as a result of someone else's work activity. Examples included persons hit by a semi-trailer or struck by a police car involved in a chase. These situations are of interest because they represent an area of occupational health and safety not well covered and which is, in essence, no different to bystander deaths that occur in typical workplaces. The results presented here demonstrate the predominance of professional drivers, and truck drivers in particular, as the involved working parties in the road bystander deaths.

The OHS implications of fatal motor vehicle incidents on the road are not straightforward. Those incidents where the working vehicle made the major contribution to a fatal incident (ie the working vehicle was 'at fault' in the incident, such as when the driver fell asleep or there was mechanical failure) require consideration from an OHS point of view and in assessing the impact of work on community health. In contrast, those incidents where the working vehicle was the 'innocent' party (eg a non-worker overtaking on a bend and running into a log truck)

are important more from a public health point of view. There are clearly still OHS implications in such incidents for working persons exposed to such risks on the road. However, the situation is different to incidents causing the death of persons classed as bystanders in the workplace, and it does not seem appropriate to class the deceased non-workers as bystanders to work if the only contribution that the working vehicle made was to be on the road at the time of the incident.

Of the 20,110 persons who died in the four–year period 1989 to 1992 and for whom there were files in the coronial system, 2,226 (11.1%) were non-working persons killed in motor vehicle incidents that involved a working vehicle. Most of these (1,640: 73.7%) were incidents where the working vehicle was considered not to have been at fault, and for a small number (54: 2.4%) it was not clear whether or not the working vehicle was at fault. The remaining 532 true road bystanders (23.9%), killed in incidents where the working vehicle was considered to have been 'at fault', were the primary focus in this category. This represents about 133 persons per year (or two to three persons each week). Some of the incidents, such as two bus crashes where there was major loss of life, were the subject of detailed coronial investigations which included consideration of some of the work-related factors (ie fatigue, drug use). However, **none** of these incidents were recorded on the relevant OHS agency list of work-related deaths (see Chapter 10), suggesting that the fatal incidents were dealt with largely as police matters only. The death of road bystanders is therefore an important aspect of the effect of work-exposures on the general community, but one that is not being recognised and probably not being appropriately addressed because it is not covered routinely by the OHS community.

7.5 CONCLUSIONS

Work-related fatal injury of non-workers was a significant cause of death in Australia in the four-year period 1989 to 1992. Non-working people of all ages sustained fatal injuries as a result of work exposures, and most occupations and industries were involved in at least a few fatal incidents. However, recurrent features of the fatal incidents were the deaths of children, the involvement of working family members, the involvement of the agricultural and road transport industries, and the occurrence on farms and public roads.