Chapter 8
Home duties deaths

8.1 INTRODUCTION

Unpaid domestic work in and around the home is increasingly seen as being as important to society as paid employment. There are similarities between the tasks that are performed regardless of any remuneration involved. Domestic food preparation and clean-up, housework, gardening, building and car maintenance, and home improvements all have parallels in the employed sector, and indeed many household tasks are being more commonly performed under a loose contractual arrangement by persons retained on a casual basis.

Improving the safety of the home environment for both paid and unpaid home workers was one of the recommendations made in the "Better Health Outcomes for Australians" publication[239]. Included in this recommendation were the activities performed by the home handyperson. For instance, electrical and plumbing work performed around a person's own home are specific examples of domestic activities that are sometimes performed by individuals who may or may not have the detailed knowledge of a professional tradesperson. Individuals who perform what could be considered as 'specialist tasks' may inadvertently be putting themselves and possibly other persons who reside in the home at risk if they do not perform the task satisfactorily or in a safe manner through lack of experience and / or expert knowledge.

One of the concerns outlined in the "Better Health Outcomes for Australians" publication was that messages regarding safety received in their work environment might not be translated to the home environment by individuals performing work tasks

around the home. The publication states that if the 'safety culture' that may have been established in the workplace could be transferred to the domestic environment then, potentially, the number of home injuries could be reduced.

Injuries commonly occur at home[60], but there is very limited information available on the circumstances surrounding fatal or non-fatal injury in domestic settings. A consideration of non-fatal injuries in the domestic setting using the Victorian Injury Surveillance System is one of the few sources of such information for Australia[279, 280]. Without this information it is difficult to know what occupational health and safety approaches may be appropriate to the domestic setting. It is also not possible to easily identify areas for prevention activities. For these reasons, deaths of persons who were fatally injured whilst performing unpaid domestic work were included in this study. This Chapter presents study results on home duties fatalities, with the aim of identifying areas in the home environment that could be targeted for prevention activities.

8.2 METHOD

Fatal incidents involving unpaid workers in domestic situations ("home duties" deaths) were identified and examined in detail, using the same approach as used for other work-related deaths in this study. As described in more detail in the Methods Chapter, the group of interest comprised persons who were performing duties at home (or in someone else's home) in an unpaid capacity and that might conceivably be performed by someone in a paid capacity. There was some unavoidable arbitrariness to the inclusions and exclusions, but the working definition used was based on that used in a recent survey by the Australian Bureau of Statistics (ABS), although it was not as broad as the ABS definition[240]. Home duties included were all food and drink preparation and clean-up; laundry, ironing and clothes care; other housework (such as cleaning, dusting,

polishing, vacuuming, etc); gardening and grounds care (gardening, lawn care, pool care, pet/animal care); home maintenance (including home improvement and car care); some aspects of the care or minding of children or others; and other domestic activities (such as household paperwork, bills, etc). Only persons 15 years and over were included. Fatal incidents during formal volunteer work, and whilst travelling on public roads, were excluded from this group.

Rates were calculated using two approaches. One approach used the Australian population data published annually by the Australian Bureau of Statistics[281]. Only persons fifteen years or older were included. Age and gender-specific rates were calculated by dividing the number of deceased persons by the number of persons in the appropriate age or gender group in the Australian population during the study period. These rates are expressed as deaths per million persons per year. The second approach used the population data but also took account of information on the amount of time spent undertaking various activities at home. This allowed rates to be determined incorporating information on exposure to various home duties tasks. This exposure information was obtained from two ABS time-use survey publications[282, 283] that presented time-use survey data collected in 1992. The survey collected information on the amount of time spent on various activities during a week. One publication provided information for all persons, separately by sex and combined, but not by age[282]. Another provided information separately by age and sex, but not combined[283]. By combining age and sex-specific information, denominators for males, females and persons, overall and by age, were produced. The final denominators were determined by multiplying the population by the number of hours spent per week in a given activity and by 52 (the number of weeks in a year). The resulting rates are expressed as deaths per million persons per year per hour of activity. Activity-specific denominator information was

only available for broad categories. Exposure-based rates for specific categories were calculated using the denominators for the whole relevant broad category, and therefore likely to under-estimate the true rate for specific categories. Only rates based on three or more deaths are reported. Confidence intervals have been calculated in the same way as for other parts of this thesis, based on the Poisson distribution.

Other coding was as described in the Methods Chapter (Chapter 3).

8.3 RESULTS

There were 296 persons aged 15 years and over who were fatally injured while undertaking active tasks in an unpaid and informal capacity in their own home or in someone else's home during the four-year period 1989 to 1992 (another two persons less than 15 years were excluded). That is, an average of 74 deaths each year. Seventy eight per cent of persons lived in the place where the incident occurred. The overall rate of death on a population basis was 5.53 deaths per 1,000,000 persons per year. Taking into account time spent undertaking home duties, this was a rate of 17.7 deaths per 1,000,000 persons per year per hour of home duties activity. There was no consistent pattern in the rates over the four years of the study, with population rates varying between 4.89 and 6.26 deaths per 1,000,000 persons per year.

8.3.1 GENDER

The vast majority of the home duties deaths were of males — 247 (83.4%) as against 49 females (16.7%). The overall rate of death for males was about five times higher than females on a population basis, and ten times higher when time spent undertaking home duties activity was taken into account (Table 8.1).

Table 8.1 Home duties persons by sex. Number, percent and rate (CI) Australia, 1989 to 1992

Activity	Number	%	Rate[1]	CI[2]	Rate[3]	CI
Males	247	83.4	9.32	*8.16 – 10.49*	45.2	*39.5 – 50.8*
Females	49	16.7	1.81	*1.37 – 2.45*	4.3	*3.2 – 5.7*
Total	**296**	**100.0**	**5.53**	***4.90 – 6.15***	**17.7**	***15.7 – 19.7***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour of home duties activity: based on ABS population data and time-use survey.

8.3.2 AGE

All ages from 15 years upwards had a considerable number of deaths, although the proportion of total deaths increased in the older age groups. This relationship to age was clearer in the population-based rates, with a strong increase in fatality rate as age increased. However, a different picture was seen when the time spent undertaking home duties activities was also taken into account. These rates showed a J-shaped relationship, with rates falling in the middle-age range and then increasing sharply from age 55 years (Figures 8.1 – 8.3 and Table 8.2). Most women (82%) were 55 years or older, and 45% were 75 years or older. This contrasted with men, of whom 56% were 55 years or older and only 19% were 75 years or older (see Tables 8.3 and 8.4).

Fig 8.1 Age of home duties persons - by sex
Number. Australia, 1989 to 1992

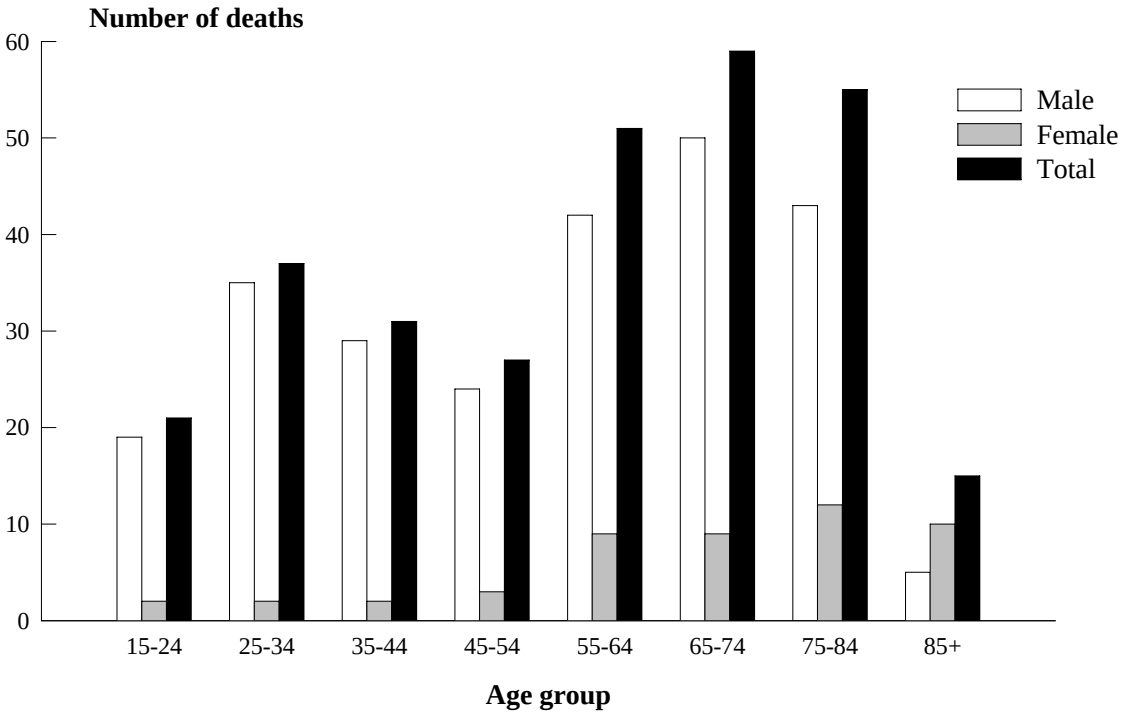
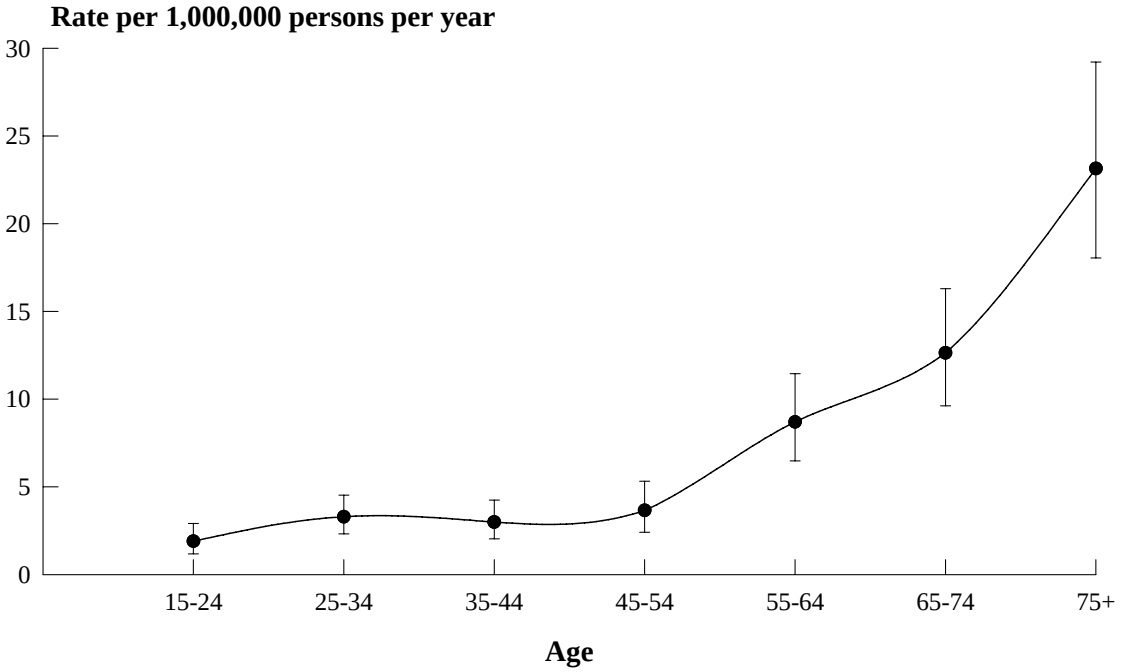
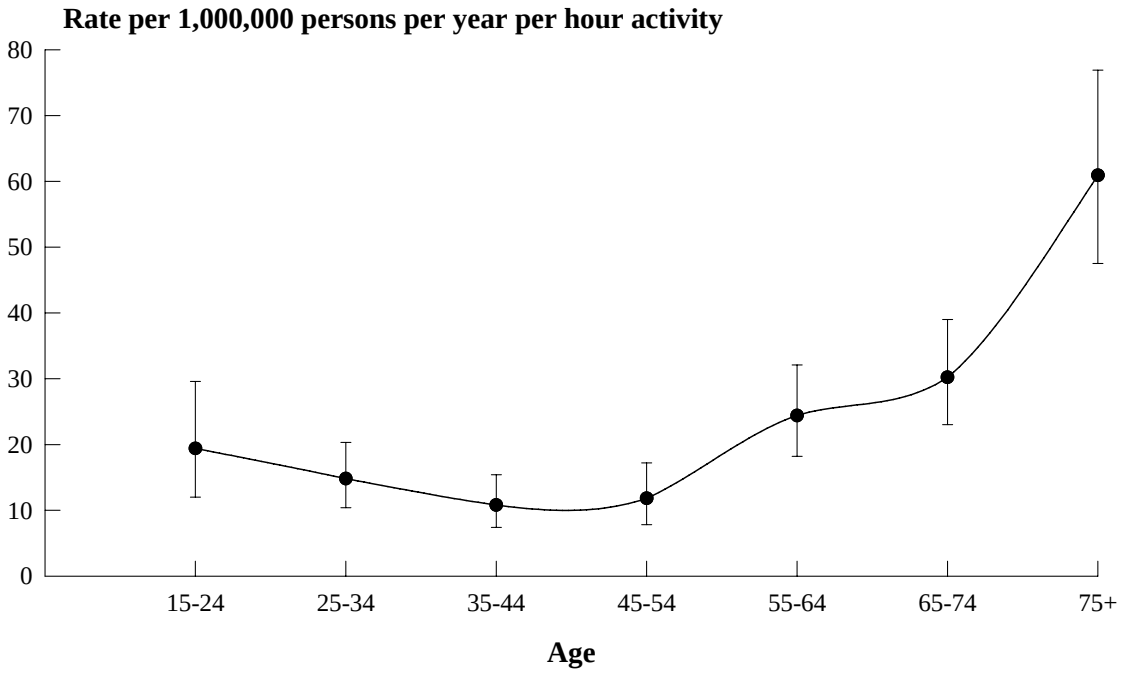


Fig 8.2 Age of home duties persons
Rate[1](CI[2]). Australia, 1989 to 1992



1: Incidence rates - deaths per 1,000,000 persons per year - based on 1991 Census.
2: 95% confidence interval.

Fig 8.3 Age of home duties persons
Rate[1](CI[2]) - activity based. Australia, 1989 to 1992



1: Incidence rates - deaths per 1,000,000 persons per year - based on ABS survey data.
2: 95% confidence interval.

Table 8.2 Home duties persons by age. Number, percent and rate (CI) Australia, 1989 to 1992

Age	Number	%	Rate[1]	CI[2]	Rate[3]	CI[2]
15-24	21	7.1	1.90	*1.18 - 2.91*	19.4	*12.0 - 29.6*
25-34	37	12.5	3.29	*2.32 - 4.53*	14.8	*10.4 - 20.3*
35-44	31	10.5	2.99	*2.04 - 4.25*	10.8	*7.4 - 15.4*
45-54	27	9.1	3.66	*2.41 - 5.32*	11.8	*7.8 - 17.2*
55-64	51	17.2	8.70	*6.48 - 11.45*	24.4	*18.2 - 32.1*
65-74	59	19.9	12.63	*9.61 - 16.29*	30.2	*23.0 - 39.0*
75+	70	23.7	23.14	*18.05 - 29.22*	60.9	*47.5 - 76.9*
Total	**296**	**100.0**	**5.53**	*4.90 - 6.15*	**17.7**	*15.7 - 19.7*

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour of home duties activity: based on ABS population data and time-use survey.

Table 8.3 Home duties persons by main activities by age – males only Number, percent and rate (CI). Australia, 1989 to 1992

Age	Number	%	Rate[1]	CI[2]	Rate[3]	CI[2]
Housework						
15-24	3	13.0	0.53	*0.11 - 1.57*	12.6	*2.5 - 37.0*
25-34	10	43.5	1.77	*0.85 - 3.26*	21.9	*10.5 - 40.3*
35-44	0	0.0	-		-	
45-54	1	4.3	-		-	
55-64	2	8.7	-		-	
65-74	1	4.3	-		-	
75+	6	26.1	5.31	*1.95 - 11.59*	29.7	*10.9 - 64.8*
Total	**23**	**100.0**	**0.87**	***0.55 - 1.30***	**9.9**	***6.3 - 14.9***
Grounds / animal care						
15-24	4	5.2	0.71	*0.20 - 1.82*	370.3	*101.8 - 944.4*
25-34	6	7.8	1.06	*0.39 - 2.32*	69.1	*25.3 - 150.8*
35-44	8	10.4	1.53	*0.67 - 3.03*	46.9	*20.5 - 92.7*
45-54	12	15.6	3.17	*1.64 - 5.55*	66.0	*34.1 - 115.5*
55-64	12	15.6	4.08	*2.11 - 7.14*	42.4	*21.9 - 74.3*
65-74	18	23.4	8.32	*4.95 - 13.13*	67.6	*40.2 - 106.6*
75+	17	22.1	15.04	*8.76 - 24.07*	139.7	*81.4 - 223.5*
Total	**77**	**100.0**	**2.91**	***2.30 - 3.63***	**40.5**	***32.0 - 50.6***
Home maintenance						
15-24	10	7.2	1.78	*0.85 - 3.28*	102.9	*49.4 - 189.3*
25-34	16	11.6	2.83	*1.61 - 4.60*	67.0	*38.1 - 108.8*
35-44	21	15.2	4.03	*2.49 - 6.16*	104.7	*64.8 - 160.1*
45-54	11	8.0	2.91	*1.45 - 5.21*	45.8	*22.9 - 82.1*
55-64	28	20.3	9.52	*6.33 - 13.78*	165.1	*109.7 - 238.8*
65-74	29	21.0	13.40	*8.97 - 19.23*	205.0	*137.1 - 294.0*
75+	23	16.7	20.35	*12.92 - 30.53*	557.1	*353.6 - 835.6*
Total	**138**	**100.0**	**5.21**	***4.34 - 6.08***	**110.6**	***92.1 - 129.0***
All activities						
15-24	19	7.7	3.38	*2.03 - 5.29*	55.0	*33.0 - 85.9*
25-34	35	14.2	6.20	*4.32 - 8.62*	44.8	*31.2 - 62.3*
35-44	29	11.7	5.56	*3.72 - 7.98*	34.4	*23.0 - 49.4*
45-54	24	9.7	6.35	*4.07 - 9.44*	32.7	*21.0 - 48.6*
55-64	42	17.0	14.29	*10.31 - 19.32*	57.4	*41.4 - 77.6*
65-74	50	20.2	23.11	*17.15 - 30.46*	69.1	*51.2 - 91.0*
75+	48	19.4	42.48	*31.33 - 56.29*	131.5	*97.0 - 174.2*
Total	**247**	**100.0**	**9.32**	***8.16 - 10.49***	**45.2**	***39.5 - 50.8***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour worked per week in specified activity: based on ABS population data and time-use survey.

Table 8.4 Home duties persons by main activities by age – females only Number, percent and rate (CI). Australia, 1989 to 1992

Age	Number	%	Rate[1]	CI[2]	Rate[3]	CI[2]
Housework						
15-24	1	4.3	-		-	
25-34	0	0.0	-		-	
35-44	0	0.0	-		-	
45-54	1	4.3	-		-	
55-64	4	17.4	1.37	*0.38 - 3.49*	3.4	*0.9 - 8.8*
65-74	2	8.7	-		-	
75+	15	65.2	7.91	*4.43 - 13.03*	21.9	*12.4 - 36.0*
Total	**23**	**100.0**	**0.85**	***0.54 - 1.27***	**2.4**	***1.5 - 3.6***
Grounds / animal care						
15-24	0	0.0	-		-	
25-34	1	5.9	-		-	
35-44	2	11.8	-		-	
45-54	1	5.9	-		-	
55-64	1	5.9	-		-	
65-74	6	35.3	2.39	*0.88 - 5.23*	37.7	*13.8 - 82.3*
75+	6	35.3	3.17	*1.16 - 6.91*	65.8	*24.1 - 143.8*
Total	**17**	**100.0**	**0.63**	***0.37 - 1.00***	**11.2**	***6.5 - 17.9***
Home maintenance						
15-24	1	33.3	-		-	
25-34	0	0.0	-		-	
35-44	0	0.0	-		-	
45-54	1	33.3	-		-	
55-64	0	0.0	-		-	
65-74	1	33.3	-		-	
75+	0	0.0	-		-	
Total	**3**	**100.0**	**0.11**	***0.02 - 0.32***	**9.9**	***2.0 - 29.0***
All activities						
15-24	2	4.1	-		-	
25-34	2	4.1	-		-	
35-44	2	4.1	-		-	
45-54	3	6.1	0.83	*0.17 - 2.44*	1.9	*0.4 - 5.7*
55-64	9	18.4	3.08	*1.40 - 5.86*	6.6	*3.0 - 12.6*
65-74	9	18.4	3.59	*1.64 - 6.82*	7.3	*3.3 - 13.9*
75+	22	44.9	11.61	*7.28 - 17.57*	27.8	*17.5 - 42.1*
Total	**49**	**100.0**	**1.81**	***1.34 - 2.39***	**4.3**	***3.2 - 5.7***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour worked per week in specified activity: based on ABS population data and time-use survey.

8.3.3 MAIN ACTIVITIES

The most common broad activity at the time of the fatal incidents was home maintenance (48%), followed by grounds and animal care (32%) and housework (16%). The population rates reflected these proportions, since they were all based on the same denominator, with the home maintenance : grounds care : housework ratio being 3:2:1. However, the exposure-based rates had much greater differences between activities, with ratios of 22:6:1. At a more specific level, the most common activities at the time of the fatal incidents were home repairs and maintenance (26%), gardening and lawn care (19%), car care (11%); food and drink preparation (10%), home improvements (9%) and cleaning grounds (6%). Again, the population rates reflected these proportions. Food and drink preparation was relatively much less important when exposure was taken into account, with the highest time-use rates being for home repairs, car care, home improvements and gardening (Table 8.5).

Table 8.5 Home duties persons by main activities – all persons Number, percent and rate (CI). Australia, 1989 to 1992

Activity	Number	%	Rate[1]	CI[2]	Rate[3]	CI[2]
Food and drink preparation	29	9.8	0.54	*0.36 - 0.78*	2.5	*1.7 - 3.6*
Laundry	7	2.4	0.13	*0.05 - 0.27*	0.6	*0.2 - 1.2*
Other	10	3.4	0.19	*0.09 - 0.34*	0.9	*0.4 - 1.6*
All housework	**46**	**15.5**	**0.86**	***0.63 - 1.15***	**3.9**	***2.9 - 5.3***
Gardening	56	18.9	1.05	*0.79 - 1.36*	16.1	*12.1 - 20.9*
Cleaning grounds	18	6.1	0.34	*0.20 - 0.53*	5.2	*3.1 - 8.1*
Pets	10	3.4	0.19	*0.09 - 0.34*	2.9	*1.4 - 5.3*
Other	10	3.4	0.19	*0.09 - 0.34*	2.9	*1.4 - 5.3*
All grounds / animal care	**94**	**31.8**	**1.75**	***1.42 - 2.15***	**27.0**	***21.8 - 33.0***
Home repairs	77	26.0	1.44	*1.13 - 1.80*	49.3	*38.9 - 61.6*
Home improvements	28	9.5	0.52	*0.35 - 0.76*	17.9	*11.9 - 25.9*
Car care	31	10.5	0.58	*0.39 - 0.82*	19.8	*13.5 - 28.2*
Other	5	1.6	0.09	*0.03 - 0.22*	3.2	*1.0 - 7.5*
All home maintenance	**141**	**47.6**	**2.63**	***2.20 - 3.07***	**90.2**	***75.3 - 105.1***
Other	**13**	**4.4**	**0.24**	***0.13 - 0.41***	**-**	
Not known	**2**	**0.7**	**-**		**-**	
Total	**296**	**100.0**	**5.53**	***4.90 - 6.15***	**17.7**	***15.7 - 19.7***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour worked in specified activity: based on ABS population data and time-use survey.

In terms of the type of activity being undertaken at the time of the fatal incident, there were strong relationships between sex and activity, and weaker relationships between age and activity. Rates of death for activities were strongly related to both age and sex.

For men, maintenance was the predominant activity at the time of the fatal incident, involved in 56% of male deaths overall, with grounds and animal care involved in another 31% of male deaths. For women, housework was the most commonly involved activity (47%), with grounds and animal care involved in another 35% of female deaths.

Proportionately few men were involved in housework deaths, and very few women were involved in home maintenance deaths. Men had far higher rates of death than women for most activities, whether only on the basis of population, or also taking into account time spent performing activities. Only for housework were the male and female rates similar, and even for this activity the males rates were four times higher when time spent on housework was taken into account (Table 8.6).

Table 8.6 Home duties persons by main activities – males and females separately. Number, percent and rate (CI) Australia, 1989 to 1992

Sex and activity	Number	%	Rate[1]	CI[2]		Rate[3]	CI[2]	
Males								
Housework	23	9.3	0.87	*0.55*	*1.30*	9.9	*6.3*	*14.9*
Grounds and animal care	77	31.2	2.91	*2.30*	*3.63*	40.5	*32.0*	*50.6*
Home maintenance	138	55.9	5.21	*4.34*	*6.08*	110.6	*92.1*	*129.0*
Other and unknown	9	3.6	0.34	*0.15*	*0.65*	-		
Total	**247**	**100.0**	**9.32**	***8.16***	***10.49***	**45.2**	***39.5***	***50.8***
Females								
Housework	23	46.9	0.85	*0.55*	*1.30*	2.4	*1.5*	*3.6*
Grounds and animal care	17	34.7	0.63	*0.37*	*1.03*	11.2	*6.5*	*17.9*
Home maintenance	3	6.1	0.11	*0.02*	*0.33*	9.9	*2.0*	*29.0*
Other and unknown	6	12.2	0.22	*0.08*	*0.49*	-		
Total	**49**	**100.0**	**1.81**	***1.37***	***2.45***	**4.3**	***3.2***	***5.7***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour worked in specified activity: based on ABS population data and time-use survey.

Home maintenance was the predominant involved activity for nearly all age groups below 75 years, although 45-54 years and 75-84 years also had a similar proportion of fatally injured persons performing grounds care. Above 75 years, housework became increasingly dominant, whilst grounds care and maintenance became less dominant. Population rates for grounds care and maintenance increased with age, in a similar pattern to that seen for all activities combined. There was no such clear relationship with housework, but persons over 75 years still had a far higher rate of death than younger persons. Time-based rates were less consistent between activities, with no consistent trend with age for housework, a reverse J-shaped distribution for grounds care and a J-shaped distribution for maintenance. The smoother pattern seen for all activities reflected the combined effect of these activity-specific rates (Tables 8.7 and 8.8).

Table 8.7 Home duties persons by main activities by age Percent of age group. Australia, 1989 to 1992

Activity	Number	Housework	Grounds	Maint.	Other	Total
15-24	21	19.0	19.0	52.4	9.5	100.0
25-34	37	27.0	18.9	43.2	10.8	100.0
35-44	31	0.0	32.3	67.7	0.0	100.0
45-54	27	7.4	48.1	44.4	0.0	100.0
55-64	51	11.8	25.5	54.9	7.8	100.0
65-74	59	5.1	40.7	50.8	3.4	100.0
75-84	55	21.8	36.4	38.2	3.6	100.0
85+	15	60.0	20.0	13.3	6.7	100.0
Total	**296**	**15.5**	**31.8**	**47.6**	**5.1**	**100.0**

Table 8.8 Home duties persons by main activities by age – persons Number, percent and rate (CI). Australia, 1989 to 1992

Age	Number	%	Rate[1]	CI[2]	Rate[3]	CI[2]
Housework						
15-24	4	8.7	0.36	*0.10 - 0.92*	4.2	*1.2 - 10.8*
25-34	10	21.7	0.89	*0.43 - 1.63*	4.8	*2.3 - 8.9*
35-44	0	0.0	-		-	
45-54	2	4.3	-		-	
55-64	6	13.0	1.02	*0.38 - 2.24*	4.2	*1.5 - 9.1*
65-74	3	6.5	0.64	*0.13 - 1.88*	2.2	*0.4 - 6.6*
75+	21	45.7	6.94	*5.38 - 13.28*	24.0	*14.9 - 36.7*
Total	**46**	**100.0**	**0.86**	***0.63 - 1.15***	**3.9**	***2.9 - 5.3***
Grounds / animal care						
15-24	4	4.3	0.36	*0.10 - 0.92*	370.3	*101.8 - 944.4*
25-34	7	7.4	0.62	*0.25 - 1.28*	53.8	*21.5 - 110.8*
35-44	10	10.6	0.97	*0.46 - 1.78*	33.5	*16.1 - 61.6*
45-54	13	13.8	1.76	*0.93 - 3.01*	38.9	*20.6 - 66.4*
55-64	13	13.8	2.22	*1.18 - 3.79*	28.8	*15.3 - 49.2*
65-74	24	25.5	5.14	*3.30 - 7.64*	56.4	*36.2 - 83.9*
75+	23	24.5	7.60	*4.83 - 11.40*	106.1	*67.3 - 159.1*
Total	**94**	**100.0**	**1.75**	***1.42 - 2.15***	**27.0**	***21.8 - 33.0***
Home maintenance						
15-24	11	7.8	1.00	*0.50 - 1.79*	85.7	*42.8 - 153.4*
25-34	16	11.3	1.42	*0.81 - 2.31*	50.9	*28.9 - 82.7*
35-44	21	14.9	2.03	*1.26 - 3.10*	77.9	*48.2 - 119.0*
45-54	12	8.5	1.63	*0.84 - 2.84*	41.6	*21.5 - 72.8*
55-64	28	19.9	4.78	*3.17 - 6.91*	141.6	*94.1 - 204.9*
65-74	30	21.3	6.42	*4.32 - 9.16*	162.3	*109.3 - 231.5*
75+	23	16.3	7.60	*4.83 - 11.40*	397.9	*252.6 - 596.8*
Total	**141**	**100.0**	**2.63**	***2.20 - 3.07***	**90.2**	***75.3 - 105.1***
All activities						
15-24	21	7.1	1.90	*1.18 - 2.91*	19.4	*12.0 - 29.6*
25-34	37	12.5	3.29	*2.32 - 4.53*	14.8	*10.4 - 20.3*
35-44	31	10.5	2.99	*2.04 - 4.25*	10.8	*7.4 - 15.4*
45-54	27	9.1	3.66	*2.41 - 5.32*	11.8	*7.8 - 17.2*
55-64	51	17.2	8.70	*6.48 - 11.45*	24.4	*18.2 - 32.1*
65-74	59	19.9	12.63	*9.61 - 16.29*	30.2	*23.0 - 39.0*
75+	70	23.6	23.14	*18.05 - 29.22*	60.9	*47.5 - 76.9*
Total	**296**	**100.0**	**5.53**	***4.90 - 6.15***	**17.7**	***15.7 - 19.7***

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.
3: Deaths per 1,000,000 persons per year per hour worked in specified activity: based on ABS population data and time-use survey.

8.3.4 JURISDICTION

The number of home duties deaths in each jurisdiction roughly followed the Australian population distribution, with the largest numbers in New South Wales, Victoria and Queensland. This was reflected in the rates, which were similar in all jurisdiction except the Northern Territory, but the higher rate there was based on only five deaths over the four years (Table 8.9).

Table 8.9 Jurisdiction of home duties incidents Number, percent and rate (CI). Australia, 1989 to 1992

Jurisdiction	Number	%	Rate[1]	CI[2]
ACT	4	1.4	4.59	*1.26 - 11.69*
NSW	95	32.1	5.17	*4.18 - 6.31*
NT	5	1.7	10.54	*3.37 - 24.67*
QLD	46	15.5	5.08	*3.72 - 6.78*
SA	25	8.5	5.48	*3.55 - 8.09*
TAS	8	2.7	5.61	*2.46 - 11.08*
VIC	85	28.7	6.15	*4.91 - 7.61*
WA	28	9.5	5.62	*3.73 - 8.13*
Australia	**296**	**100.0**	**5.53**	**4.90 - 6.15**

1: Deaths per 1,000,000 persons per year: based on ABS population data.
2: 95% confidence interval.

8.3.5 PLACE

Home duties incidents occurred in many different locations, with the most common locations being the garden (26%), kitchen (8%), paddock or field (7%), garage or carport (7%), roof (6%) and shed (6%) (Table 8.10).

Table 8.10 Place of home duties incidents. Number and percent. Australia, 1989 to 1992

Place	Number	%[1]	Number	%[2]
Kitchen	24	44.4		8.1
Living dining area	10	18.5		3.4
Bedroom	5	9.3		1.7
Laundry	4	7.4		1.4
Attic	3	5.6		1.0
Hall foyer	2	3.7		0.7
Room unspecified	6	11.1		2.0
Total room	**54**	**100.0**	**54**	**18.2**
Garage carport	21	42.0		7.1
Shed	17	34.0		5.7
Structure being erected/demolished/renovated	5	10.0		1.7
Workshop	3	6.0		1.0
Animal shelter stable	1	2.0		0.3
Specialized structures eg silo, tank, pylon	1	2.0		0.3
Structure unspecified	2	4.0		0.7
Total structure	**50**	**100.0**	**50**	**16.9**
Roof	19	38.0		6.4
Stairs / ladders	16	32.0		5.4
Verandah balcony	7	14.0		2.4
Area beneath a building, etc	6	12.0		2.0
Part of building unspecified	2	4.0		0.7
Total part of building	**50**	**100.0**	**50**	**16.9**
Garden	76	58.9		25.7
Paddock or field	21	16.3		7.1
Driveway	11	8.5		3.7
Footpath path	5	3.9		1.7
Roadway sealed	4	3.1		1.4
Roadway	1	0.8		0.3
Racecourse race track	1	0.8		0.3
Part of grounds, site, street unspecified	10	7.8		3.4
Total part of grounds, site or street	**129**	**100.0**	**129**	**43.6**
Other			**13**	**4.4**
Total			**296**	**100.0**

1: Percentage of the relevant sub-group.
2: Percentage of the total.

8.3.6 MECHANISM

As for working deaths, up to two mechanisms were coded for each home duties incident. Since only 2.4% of home duties cases had two mechanisms coded, the information presented here describes only the primary mechanism.

The most common mechanisms of the fatal incidents were falls from a height (28%), contact with electricity (19%), being hit by falling objects (12%) and contact with heat (12%). In younger age groups, contact with electricity was by far the largest single mechanism (45% of deaths in the age group), whereas falls (44%) and contact with hot objects (this category covered being burnt in fires) (27%) were the most common mechanisms in the older age groups. However, the absolute rates were highest in the oldest age group for all mechanisms (Tables 8.11 and 8.12).

Table 8.11 Home duties fatal incidents – mechanism Number and percent. Australia, 1989 to 1992

Mechanism	Number	%
Fall - total	97	32.8
Fall - from a height	*84*	*28.4*
Fall - same level	*13*	*4.4*
Hitting object	1	0.3
Hit by falling object	36	12.2
Bitten / hit by animal	10	3.4
Hit by moving object	19	6.4
Contact heat or cold	38	12.8
Contact electricity	57	19.3
Drowning	6	2.0
Explosion	1	0.3
Chemicals, other substances	8	2.7
Bites / stings	3	1.0
Weapons	3	1.0
Rollover	17	5.7
Total	**296**	**100.0**

1: Percentage of deaths with each mechanism group involved.

Table 8.12 Home duties fatal incidents – mechanism by age Percent. Australia, 1989 to 1992

Mechanism	Age				
	15 - 34 n = 58	35 - 54 n = 58	55 - 74 n = 110	75+ n = 70	Total n = 296
Fall - from a height	5.2	19.0	41.8	34.3	28.4
Fall - same level	1.7	0.0	4.5	10.0	4.4
Hit by falling object	12.1	15.5	13.6	7.1	12.2
Bitten / hit by animal	1.7	6.9	4.5	0.0	3.4
Hit by moving object	8.6	3.4	7.3	5.7	6.4
Contact heat or cold	15.5	3.4	5.5	27.1	12.2
Contact electricity	44.8	31.0	7.3	7.1	19.3
Rollover	5.2	12.1	5.5	1.4	5.7
Other	5.2	8.6	10.0	7.1	8.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

8.3.7 AGENCY OF INCIDENT

As with work-related deaths, the focus of the analysis was the agency of incident, rather than the agency of the injury, although these were often the same. Up to three agencies of incident could be coded for each incident, Of home duties deaths, 42% had only one agency coded, 44% had two agencies coded and 14% had three agencies coded. The percentages for each agency refer to the percentage of all deaths in which that agency was involved. Since each death could have more than one agency involved, the total percentages can add up to more than 100.

There were just over 100 different agencies involved at least once in the fatal incidents. The largest broad categories of agencies involved were environmental agencies (39%), non-powered tools and equipment (36%), material and substances (22%), machinery and fixed plant (18%) and powered equipment (15%). Common specific agencies were ladders (18%), roofs (7%), manual lifting equipment (mainly car jacks – 7%), tractors (5%) and portable electric cables (5%) (Table 8.13).

Table 8.13 Key agencies involved in home duties incidents Number and percent[1]. Australia, 1989 to 1992

Agency	Number	%
Machinery and fixed plant	53	17.9
Self propelled and semi-portable plant	7	2.4
Tractors and other mobile plant	21	7.1
Trucks and buses	2	0.7
Cars, vans, bikes etc	32	10.8
Powered equipment and tools	44	14.9
Non-powered hand tools, appliances and equipment	107	36.1
Materials, substances and chemicals[2]	65	22.0
Environmental agencies[3]	114	38.5
Animal, human and biological agencies	20	6.8

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.
2: Includes toxic gases.
3: Includes water, rough or slippery terrain, holes in the ground, and unstable walls and buildings.

8.3.8 PATHOPHYSIOLOGICAL CAUSE OF DEATH

Cause of death was defined as the pathophysiological cause of death. In a minority of cases, the injured person died not directly from the injuries received, but from a pathological process that occurred as a result of the injuries. Pulmonary embolism, sepsis and fat embolism were examples. These cases had the cause of death coded to the pathological process, not the original injuries.

The most common pathophysiological cause of death was head injuries (23%). The majority of other home duties deaths resulted from electrocutions (19%) and mechanical asphyxia (10%). Medical complications of injuries were responsible for 15% of deaths. The considerable number of deaths due to medical complications obscures the true spectrum of injury sustained in the incident, so there is benefit in examining the main injury or injuries that ultimately led to death. This was done by determining the main injury or injuries involved in the 43 persons who died from medical complications and

the two persons with unknown cause of death. The predominant injuries in persons who died of medical complications were head injuries (23%), burns (19%), chest injuries (14%), abdominal injuries (12%) and neck injuries (12%). Including the injuries of persons who died from medical complications doubled the number of deaths associated with a fractured cervical spine, and increased the number of persons with trunk injuries by 50%. Inclusion of these injuries showed that the main injury types were head injuries (27%), electrocution (20%) mechanical asphyxia (10%), trunk injuries (10%) and burns (9%). The main medical complications resulting from the injuries were bronchopneumonia and respiratory failure (35%), pulmonary embolism (23%) and septicaemia (16%) (Table 8.14).

Table 8.14 Pathophysiological cause of death and main injuries Home duties. Number and percent. Australia, 1989 to 1992

Cause of death / injury	Cause of death[1]		Injuries[2]	
	Number	%	Number	%
Head injury	69	23.3	79	26.7
Neck fracture / dislocation	5	1.7	10	3.4
Trunk injury	19	6.4	29	9.8
Other injuries	4	1.4	8	2.7
Multiple injuries	19	6.4	20	6.8
Mechanical asphyxia	29	9.8	30	10.1
Drowning	5	1.7	6	2.0
Electrocution	55	18.6	57	19.3
Burns	18	6.1	26	8.8
Chemical asphyxia / anoxia	14	4.7	14	4.7
Envenomation	8	2.7	8	2.7
Other	6	2.0	8	2.7
Medical complications	43	14.5	0	0.0
Not known	2	0.7	1	0.3
Total	**296**	**100.0**	**296**	**100.0**

1: The primary condition responsible for the death.
2: The main injury or injuries leading to death.

The deceased person died at the scene of the incident in 53% of the home duties deaths — death was instantaneous or virtually so for 40%, at the scene before assistance for 13%, and at the scene during assistance for one person. One percent of persons died

during transit to hospital, 43% in hospital, 1% from long term complications and for 2% the time of death was not known.

8.3.9 BLOOD ALCOHOL

Information on blood alcohol levels was available for 150 (51%) of the home duties deaths. For 21 (14%) of these deaths with available blood alcohol levels, the blood alcohol was greater than zero, and for 17 (11%) the blood alcohol was 0.05 g/100ml or greater (ranging from 0.051 to 0.254 g/100 ml). Raised blood alcohol levels appeared to have contributed to at least 15 home duties deaths (although formal blood alcohol levels were only available for 14 of these) — 5.1% of all home duties deaths (based on all 15 deaths where alcohol appeared to have contributed) and 9.3% of home duties deaths for which blood alcohol levels were available (based on the 14 persons for whom blood alcohol was available and alcohol appeared to have contributed). Since blood alcohol levels were not available for about 49% of home duties deaths, it is likely that alcohol contributed to somewhere between 9% and 10% of home duties deaths (Table 8.15). Drugs did not seem to play a role in any of the home duties deaths, although information on drug levels was only available for 68 (23%) of the deceased persons.

8.3.10 EXTERNAL CAUSE CODES

The most common External Cause code categories were falls (30%), with falls from a ladder (13%), falls from a building or structure (6%), and other falls (10%) all being important single External Cause code categories of death. Contact with electricity (19%), fire/flames (11%) and being hit by falling objects (10%) also comprised a considerable proportion of deaths (Table 8.16).

Table 8.15 Home duties deaths - blood alcohol level Number and percent. Australia, 1989 to 1992

Blood alcohol level	Number	%
Zero	129	43.6
0.010 – 0.049	4	1.4
0.050 – 0.100	5	1.7
0.100 – 0.149	4	1.4
0.150 – 0.199	6	2.0
0.200 – 0.249	1	0.3
0.250 – 0.299	1	0.3
Not measured[1]	143	48.3
Not known[2]	3	1.0
Total	296	100.0

1: No blood alcohol level estimated.
2: Blood alcohol level estimated but result not known.

8.3.10 EXTERNAL CAUSE CODES

The most common External Cause code categories were falls (30%), with falls from a ladder (13%), falls from a building or structure (6%), and other falls (10%) all being important single External Cause code categories of death. Contact with electricity (19%), fire/flames (11%) and being hit by falling objects (10%) also comprised a considerable proportion of deaths (Table 8.16).

8.3.11 TIME, DAY AND MONTH OF INCIDENT

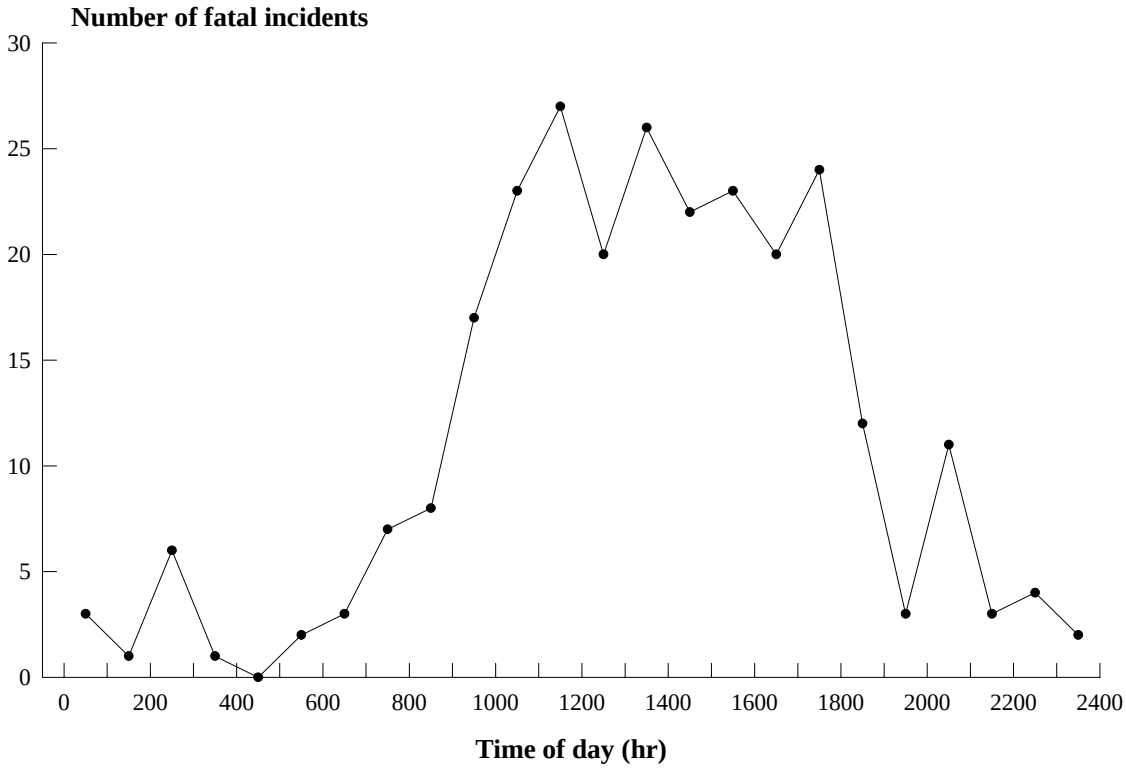
TIME OF DAY

The time at which the incident occurred was available for 268 (90.5%) fatal incidents. The vast majority of incidents occurred in daylight hours, between 0700 and 1900, with no definite peaks during this time (Figure 8.4).

Table 8.16 External cause codes for home duties deaths Number and percent. Australia, 1989 to 1992

Activity	Number	%
MVTAs	8	2.7
MV nonTAs	10	3.4
Other RVAs	2	0.7
Accidental poisoning	7	2.4
Falls	89	30.1
Fires / flames	32	10.8
Environmental factors	12	4.1
Submersion/suffocation	7	2.4
Falling objects	29	9.8
Strike/struck by	4	1.4
Machinery accidents	18	6.1
Cutting/piercing	4	1.4
Pressure vessels	2	0.7
Firearm missile	1	0.3
Explosives	1	0.3
Hot/corrosives	1	0.3
Electricity	56	18.9
Late effects of accidents	3	1.0
Uncertain intent	1	0.3
Unknown	9	3.0
Total	**296**	**100.0**

Fig 8.4 Time of fatal incident - home duties deaths Number. Australia, 1989 to 1992



WEEKLY AND MONTHLY VARIATION

There was no clear pattern in the number of deaths spread over the calendar year, although the number ranged from 16 to 37 per month. There was very little variation in the number of incidents during the week, varying only from 37 to 47, compared to an expected frequency of 41 (ie one seventh of 286: the 296 cases minus the 10 incidents for which the day was not known). However, the weekend days averaged 46 (45 on Saturday and 47 on Sunday), compared with a daily average of 39 on Monday to Friday inclusive.

8.3.12 COMMON SCENARIOS

There were a number of similar scenarios that repeatedly resulted in death. These included the following situations:

- persons (usually male) performing maintenance on cars which were inadequately supported and/ or chocked, and which rolled or fell onto the deceased persons causing death through crush asphyxia or head injuries whilst they were under the car. Usually these persons were working alone and so there was no-one nearby to assist in lifting the car quickly enough to possibly save the person.
- persons (usually male) climbing ladders that were not adequately braced, who suffered a fatal injury (usually to the head) when the ladder slipped or the person lost their balance, causing them to fall. This was a common occurrence in elderly persons.
- persons killed in fires started as a result of them leaving the stove turned on after cooking or leaving something cooking whilst they fell asleep.

- persons (usually male) performing maintenance on the home with faulty equipment or without ensuring the relevant electrical circuits had been isolated. As a result, the deceased received a fatal electric shock.

Of persons killed in the 51 ladder-related incidents, 23 were involved in maintenance (18) or painting (5), nine were pruning, eight were cleaning gutters, five were building, and four deaths occurred in other circumstances. All except four of the ladder deaths were due to falls from a height, and three of the remainder occurred due to electrocution when live wires were contacted while on a ladder.

There were 57 electrocution deaths, including 14 during the use of powered equipment, 13 while repairing electrical equipment and 12 during other maintenance activity.

8.4 DISCUSSION

Fatal injuries involving home duties were found to occur at a rate of about five per million persons per year. Males predominated, both in terms of absolute numbers and gender-specific rates. This probably reflects the activities undertaken by men and women in the home. Population-based rates were much higher in men for all activities except housework, but these rates do not take into account the amount of time spent on these activities. That is, they do not take into account exposure to specific hazards. Rates based on exposure showed that, compared to women, men had four times the risk of being fatally injured while undertaking housework, four times the risk while gardening, and ten times the risk while involved in maintenance. This suggests that men are undertaking higher-risk specific tasks than women when involved in these broad activities. For example, men may be more likely than women to climb a ladder when gardening. An alternative explanation for these results is that men undertake similar specific tasks as women but are more likely to be injured performing that task.

That is, they are more "careless". There was no evidence available to rigorously assess this possibility, but men undertaking higher-risk specific tasks seems a more likely explanation for the study findings.

Rates increased from age 55 years onwards, especially for women. Almost half the women were 75 years of age or older, and most of these were killed when they either fell, or were burned, while doing housework such as cooking or carrying meals or carrying laundry. The higher rates of fatal injury in older persons probably reflect several factors operating at the same time. Studies of all injuries in the home have identified higher rates of injury (commonly as a result of falls) in elderly persons, especially women[284-286]. They do not separately examine whether older persons are more likely to be involved in an incident, more likely to be injured in an incident, or both. Since the current study only included fatal injuries, the higher rates in older persons may reflect those two factors, and/or may result from older persons being more likely to be seriously injured in a given incident, or more likely to die as a result of injuries of a given severity, or both. Probably all these factors contribute to the observed higher rates of death in older persons. Interestingly, the finding of an age-related increase in risk are similar to those for work-related deaths of workers. As mentioned elsewhere in this thesis, the age-related increase in fatality rates for workers has also not been explained, with suggestion that at least some of the relationship is due to under-estimation of the denominator (the number of elderly persons working). This is clearly not a factor in the calculation of the home duties rates, since there is no age-related incentive for persons not to be included in the ABS surveys on which denominator data are based.

The high proportion of incidents involving falls from ladders and involving electricity is not surprising, given the frequent exposure to these hazards and the significant risk they pose. The number of incidents involving car maintenance is less expected, although there are clearly significant risks involved, especially if cars are not appropriately supported when people are working under or around them. There were no exposure data available specifically for car maintenance activity, as it was included in the home maintenance activity group. However, it is likely that much more time is spent on general home maintenance than on car maintenance, and therefore that car maintenance is even a higher risk activity than suggested by these results.

There are few comparable studies of fatal or non-fatal injuries occurring in the circumstances of interest to this analysis. Most studies address all injuries occurring in the home (all, or nearly all, of which were non-fatal) or concentrate on home injuries in the elderly, especially those due to falls. However, some of these studies provide relevant results. As in this study, the majority of home injuries have been found to occur to males, although the proportion involving males was much higher in this study than in studies of all home injuries. Similarly, the rate of injury has been found to be much higher in males, especially taking into account time spent at home (rates in other studies have not been determined based on time spent conducting specific activities). These studies usually showed an increased rate of injury with increasing age after age 60 or 70 years, and generally an increased rate in women compared to men after age 60 or 70 years. Falls were usually the predominant incident mechanism, as in this study. However, these falls were commonly less than one metre, whereas the falls in this study were generally from a greater height. Electricity rarely featured in the incidents in other studies, in contrast to this study's findings. Fire was also less common in other studies. Where the place of incident was mentioned, the more common places varied, with the

garden, garage, kitchen and living and sleeping areas all having 10% or more of incidents in one or more studies. As expected, injuries identified in other studies tended to be more minor, involving lacerations or sprain/strains, and to predominantly involve the upper or lower limbs. The differences between these findings and those of the current study are all consistent with the other studies covering entirely, or predominantly, non-fatal injuries, and these other studies including all injury circumstances rather than just those involving home duties as defined for this study[279, 280, 284-288].

8.5 METHODOLOGICAL LIMITATIONS

As with the main work-related deaths analysis, the comprehensive data collection used for the study makes it likely that the enumeration of home duties deaths was complete or virtually so. The available denominator data were collected in 1992, and so should be appropriate for the current analysis, which covered 1989 to 1992. The availability of information on time spent in various activities allowed activity-specific rates to be calculated using appropriate denominator data summarising the period at risk. Even more detailed task-specific exposure data would have allowed a more in-depth assessment of specific risks, but the available data still allowed a more precise assessment of risk associated with various home duties activities than is possible for occupational activities.

The relatively small number of deaths of women made assessment of their risks difficult for all activities except housework. Similarly, low numbers made assessment of risks for some age-sex-activity combinations too imprecise to be useful.

8.6 CONCLUSIONS

Fatal injury of persons engaged in unpaid domestic work activities (home duties) was a significant cause of death in Australia in the four-year period 1989 to 1992. Contributing to the prevention of such deaths due to is the ultimate aim of the analysis reported here. The recurrence of similar circumstances surrounding many independent fatal incidents indicates areas where preventative interventions might be usefully targeted. For example, the securing of ladders, awareness of electrical safety and appropriate support of cars being worked on could all usefully be the subject of prevention programs. The first two of these have strong parallels with paid working activity, where electrocutions and falls (many from ladders) make up a sizeable minority of work-related traumatic deaths. Prevention approaches used in the workplace to improve safety in these and other areas may well have components that could be transferred appropriately to the domestic setting.