

# Chapter 9

## Employment arrangements

### 9.1 INTRODUCTION

There are a number of characteristics of self-employment that suggest that self-employed workers might experience a lower level of occupational health and safety and so be at increased risk of work-related injury compared to employees. These characteristics include work arrangements that reward faster or cheaper completion of tasks; complex vertical and horizontal work arrangements with other workers involved in the same task; different regulatory control of self-employed workers; less resources to expend on OHS; and decreased level of organisation with other self-employed workers<sup>289, 290</sup>.

Self-employed persons also tend to be employed in industries with a higher risk of injury (such as agriculture and construction) and to work long hours<sup>291</sup>. Such factors might lead to a higher measured rate of injury in self-employed persons, but not reflect a higher risk of injury in a self-employed person compared to an employee doing a similar task for the same number of hours in the same industry.

The distinction between factors specific to self-employed workers and factors related to the jobs self-employed workers tend to do is important. The former suggest an inherent increased risk of work-related injury in self-employed persons compared with employees, whereas the latter identify a high risk in self-employed persons because of the type of work they perform rather than the way they perform the work or the particular circumstances in which they perform it.

The aim of this analysis was to determine if the rates of work-related fatal injury differed between employees and self-employed persons, based on data collected for this study.

## **9.2 METHODS**

There are several approaches to the description of the working arrangements of workers. The most commonly used approach to describe the employment arrangements is to categorise workers primarily as employees (or wage and salary earners), self-employed persons or unpaid family helpers. These descriptions can be important from an occupational health and safety perspective because they indirectly indicate who may have been responsible for making the major decisions on the work done and the way it was conducted. Self-employed persons would usually be responsible for these decisions, whereas most employees would usually not be (unless they were senior).

Employment arrangements can be examined from a practical viewpoint or a legal viewpoint. In both approaches, persons working for themselves are described as being self-employed, and persons working for someone else are described as being employees. In the practical approach, persons who work as employees of their own company are described as self-employed, because to all intents and purposes they make their own decisions on what work is done and how it is performed. However, from a legal perspective, persons employed by their own company are employees. Employees and unpaid family helpers have the same definitions in both settings. The coding of employment arrangement was assigned by members of the study team, based on the information in the files.

Both definitions of self-employed were incorporated into the study. However, available denominator data for 1989 to 1992 were based on the legal approach. This means that, although the practical definition is more useful when determining who is responsible for making day-to-day decisions relevant to occupational health and safety, rates can only be directly determined using the legal definitions, because the appropriate denominator data are only available for the latter group.

In addition to using the denominators based on the legal definition, approximate industry-specific denominators based on the practical approach were developed. A one-off survey conducted by the ABS in 1998 provided information on practical employment arrangements (as defined above)<sup>292</sup>. The information included the number of employed persons (excluding unpaid family helpers), divided into five groups. Three of these groups comprised employees, and two comprised owner-managers of incorporated and unincorporated enterprises. By combining the first three groups as “employees” and the last two as “self-employed”, a close match to the practical definition of these terms was achieved. This information was available using the Australian and New Zealand Standard Industrial Classification (ANZSIC)<sup>293</sup>, rather than the Australian Standard Industrial Classification (ASIC)<sup>247</sup> that was in use during the period covered by the study. Using ANZSIC-ASIC concordance information<sup>293</sup> to group the data as per the ASIC coding frame, the proportions of the employed labour force (excluding unpaid family helpers) comprised by the employee and self-employed groups were calculated for each industry and overall. These 1998 proportions were applied to the industry-specific denominator data covering the years 1989 to 1992, to produce industry-specific denominator data for employees and self-employed persons that were suitable for calculating estimated rates for the study using the practical definition of self-employed. Occupation data were coded using the Australian Standard

Classification of Occupations (ASCO)<sup>248</sup>. It was not possible to derive occupation-specific denominator data based on the practical definition of self-employed.

Because the rates based on the legal definition are considered to be more accurate than those based on the practical definition, most of the presented results are those based on the legal definition. However, since the practical definition is thought to be more relevant to consideration of OHS issues, the main rate information based on the practical definition is also presented, and most of the information on the number of deaths is based on the practical definition.

As for other analyses in this thesis, denominator data were only available for workers who were also members of the Employed Civilian Labour Force (ECLF), although information on the deaths of other workers (eg the military and workers under 15 years) was collected for the study. Therefore, again as elsewhere, results presented as numbers of deaths of workers include all working persons identified as cases, not just those who were in the ECLF. However, results presented as rates of death of workers include only those deceased workers who were members of the ECLF and are expressed as deaths per 100,000 working persons per year. Standardisation of overall rates by industry and occupation was conducted<sup>264</sup>.

### 9.3 RESULTS

Of the 1,787 workers fatally injured as a result of work, about one quarter were self-employed when defined on a practical basis. Around two thirds were employees. On a legal basis, about one fifth of the workers were self-employed and three quarters were employees (Table 9.1).

**Table 9.1 Working arrangement of working persons - working deaths  
Number and percent. Australia, 1989 to 1992**

Employment arrangement	Practical		Legal	
	Number	%	Number	%
Employee	1,188	66.5	1,357	75.6
Self employed	479	26.8	379	21.2
Unpaid	28	1.6	28	1.6
Other / unknown	92	5.2	23	1.3
<b>Total</b>	<b>1,787</b>	<b>100.0</b>	<b>1,787</b>	<b>100.0</b>

In terms of the ECLF, self-employed persons were most commonly employed in the trades, agriculture and construction industries. In contrast, employees were most commonly employed in community services, trades and manufacturing. For the five industry groups with the highest risk of work-related fatalities (see Chapter 5), much greater proportions of the self-employed workforce compared to the employee workforce worked in agriculture, construction and forestry and fishing, a much lower proportion in mining, and a similar proportion in transport and storage. Of the fatally injured self-employed workers, nearly half worked in agriculture, and 14% worked in each of construction and transport and storage industries. For employees, fatally injured workers were mainly employed in the transport and storage, construction, manufacturing and mining industries (Table 9.2).

In terms of occupations, self-employed persons in the ECLF were most commonly employed as managers and administrators (many of whom were farmers), and tradespersons. Approximately equal proportions of employees were employed as clerical officers, salespersons, labourers, tradespersons or professionals. For the three occupation groups with the highest risk of work-related fatalities (see Chapter 5), a much greater proportion of the self-employed workforce compared to the employee workforce worked as managers and administrators, a much larger proportion of employees worked as labourers, and a similar proportion worked as plant and machinery operators and drivers. Of the fatally injured self-employed workers, half worked as managers and administrators (86% of these were farmers) and one fifth were plant and machinery operators and drivers (60% of these were heavy vehicle drivers). For employees, fatally injured workers were mainly employed as plant and machinery operators and drivers (43% of these were heavy vehicle drivers) or as labourers (Table 9.3).

**Table 9.2 Industry by employment arrangement<sup>1</sup> - working deaths  
Workforce size<sup>2</sup> (percent) and work-related deaths (number and percent)  
Australia, 1989 to 1992**

Industry	Employee			Self employed			Total <sup>3</sup>		
	Percent workforce	Number deaths	Percent deaths	Percent workforce	Number deaths	Percent deaths	Percent workforce	Number deaths	Percent deaths
Agriculture	2.1	90	7.6	20.9	205	42.8	5.1	334	18.7
Forestry, logging, fishing and hunting	0.3	60	5.1	0.9	41	8.6	0.4	104	5.8
Mining	1.4	126	10.6	0.2	12	2.5	1.2	138	7.7
Manufacturing	16.7	126	10.6	6.1	12	2.5	15.1	141	7.9
Electricity, gas and water	1.6	29	2.4	0.0	0	-	1.4	29	1.6
Construction	5.4	161	13.6	17.8	69	14.4	7.3	234	13.1
Wholesale and retail trades	20.5	76	6.4	22.6	33	6.9	20.8	118	6.6
Transport and storage	4.9	248	20.9	5.9	67	14.0	5.1	370	20.7
Communication	2.0	13	1.1	0.2	0	-	1.8	13	0.7
Finance, property and business services	11.7	33	2.8	10.7	14	2.9	11.5	48	2.7
Public admin and defence	5.3	93	7.8	0.0	0	0.0	4.5	93	5.2
Community services	20.7	66	5.6	4.8	3	0.6	18.2	71	4.0
Recreation, personal and other services	7.3	61	5.1	9.9	20	4.2	7.7	85	4.8
Not known	-	6	0.5	-	3	0.6	-	9	0.5
<b>Total</b>	<b>100.0</b>	<b>1,188</b>	<b>100.0</b>	<b>100.0</b>	<b>479</b>	<b>100.0</b>	<b>100.0</b>	<b>1,787</b>	<b>100.0</b>

1: Practical employment arrangement

2: Number of persons in ECLF for each employment arrangement group (n= 6,512,536 for employees; n = 1,127,405 for self-employed; n = 7,708,303 for total workforce)

3: The total number of fatalities and the total workforce size are greater than the sums of the employee and self-employed categories because unpaid family helpers and persons with other or unknown employment arrangements are also included in the total numbers but are not shown separately in the table.

**Table 9.3 Occupation by employment arrangement<sup>1</sup>- working deaths  
Workforce size<sup>2</sup> (percent) and work-related deaths (number and percent)  
Australia, 1989 to 1992**

Occupation	Employee			Self employed			Total <sup>3</sup>		
	Percent workforce	Number deaths	Percent deaths	Percent workforce	Number deaths	Percent deaths	Percent workforce	Number deaths	Percent deaths
Managers and administrators	7.1	60	5.1	33.0	223	46.6	11.0	295	16.5
Professional	13.8	46	3.9	10.4	12	2.5	13.2	60	3.4
Para-professional	6.9	125	10.5	1.7	21	4.4	6.0	148	8.3
Tradespersons	14.3	183	15.4	22.2	65	13.6	15.4	252	14.1
Clerical workers	18.5	19	1.6	7.8	0	-	17.0	19	1.1
Salespersons	15.8	32	2.7	10.1	10	2.1	15.0	47	2.6
Plant / machinery operators and drivers	7.5	384	32.3	7.4	94	19.6	7.4	539	30.2
Labourers	16.2	335	28.2	7.2	54	11.3	15.0	422	23.6
Not known	-	4	0.3	-	0	-	-	5	0.3
<b>Total</b>	<b>100.0</b>	<b>1,188</b>	<b>100.0</b>	<b>100.0</b>	<b>479</b>	<b>100.0</b>	<b>100.0</b>	<b>1,787</b>	<b>100.0</b>

1: Practical employment arrangement

2: Number of persons in ECLF for each employment arrangement group (n= 6,495,300 for employees; n = 1,163,900 for self-employed; n = 7,725,325 for total workforce)

3: The total number of fatalities and the total workforce size are greater than the sums of the employee and self-employed categories because unpaid family helpers and persons with other or unknown employment arrangements are also included in the total numbers but are not shown separately in the table.

The rate results were similar regardless of whether the practical or legal definitions were used. On a crude basis, the rate of death was about 70% higher in self-employed workers compared to employees. However, this result was biased by the higher proportion of self-employed persons in many of the high-risk industries. Once standardised by differences in industry distribution of the workforce, the rates for self-employed workers and employees were very similar. Industry-specific rates showed that self-employed persons did not have a consistently higher rate of death than employees. Compared to the fatality rates for employees, the self-employed fatality rate was markedly higher in the mining industry and considerably lower in the construction industry. Unpaid family helpers had a similar fatality rate (18.2 deaths per 100,000 persons per year) to the employed and self-employed persons in the agriculture industry, which is the only industry where there was more than one death of an unpaid family helper (Table 9.4).

A somewhat different picture was provided by the occupation rates. Self-employed persons had much higher fatality rates (more than double the corresponding rates for employees) for three major occupation groups, and only a clearly lower rate in the trades occupation group. Standardisation by occupation still left a 40% higher rate in the self-employed (Table 9.5).

**Table 9.4 Industry by employment arrangement<sup>1</sup> - working deaths Rate<sup>2</sup> (CI<sup>3</sup>). Australia, 1989 to 1992**

Industry	Employee		Self-employed		Total		Ratio <sup>4</sup>
	Rate	95% CI	Rate	95% CI	Rate	95% CI	
Agriculture	22.2	18.2 – 26.1	19.0	16.2 – 21.8	20.6	18.4 – 22.9	0.9
Forestry, logging, fishing and hunting	95.7	73.5 – 122.4	93.4	65.9 – 128.8	94.5	76.2 – 112.8	1.0
Mining	33.5	27.6 – 39.3	144.3	74.5 – 252.5	36.1	30.1 – 42.1	4.3
Manufacturing	3.0	2.5 – 3.6	2.2	0.8 – 4.8	3.0	2.5 – 3.5	0.7
Electricity, gas and water	6.5	4.3 – 9.5	-	-	6.8	4.5 – 9.7	-
Construction	13.5	11.6 – 15.4	5.2	3.8 – 7.1	10.4	9.1 – 11.8	0.4
Wholesale and retail trades	1.7	1.4 – 2.1	2.2	1.4 – 3.3	1.8	1.5 – 2.2	1.2
Transport and storage	23.9	21.3 – 26.6	19.1	14.2 – 25.1	23.0	20.6 – 25.3	0.8
Communication	2.4	1.3 – 4.2	-	-	2.4	1.3 – 4.1	-
Finance, property and business services	1.2	0.9 – 1.7	1.7	0.7 – 3.3	1.3	1.0 – 1.8	1.3
Public admin and defence	3.2	2.4 – 4.3	-	-	3.2	2.4 – 4.3	-
Community services	1.2	0.9 – 1.6	1.4	0.3 – 4.1	1.2	1.0 – 1.6	1.1
Recreation, personal and other services	3.5	2.7 – 4.4	3.4	1.9 – 5.6	3.5	2.8 – 4.4	1.0
Legal definition							
<b>Overall</b>	<b>5.0</b>	<b>4.7 – 5.2</b>	<b>8.4</b>	<b>7.5 – 9.2</b>	<b>5.5</b>	<b>5.3 – 5.8</b>	<b>1.7</b>
<b>Adjusted<sup>5</sup></b>	<b>5.8</b>		<b>6.0</b>				<b>1.0</b>
Practical definition							
<b>Overall</b>	<b>4.6</b>	<b>4.3 – 4.9</b>	<b>7.9</b>	<b>7.2 – 8.6</b>			<b>1.7</b>
<b>Adjusted<sup>5</sup></b>	<b>5.5</b>	<b>-</b>	<b>5.2</b>	<b>-</b>			<b>0.9</b>

1: The industry-specific rates are based on the legal definition. Overall and adjusted rates are provided using both the legal and the practical definitions.

2: Incidence rates — deaths per 100,000 persons per year — based on ECLF.

3: 95% confidence interval.

4: Ratio of the rate for self-employed persons to the rate for employees

5: Rates from each employment arrangement group have been adjusted by the national industry distribution (nine cases {or 0.5% of 1,709} for whom industry was not known have been distributed proportionately across industries for each employment arrangement group).

**Table 9.5 Occupation by employment arrangement<sup>1</sup>- working deaths  
Rate<sup>2</sup> (CI<sup>3</sup>). Australia, 1989 to 1992**

Occupation	Employee		Self-employed		Total	Ratio <sup>d</sup>	
	Rate	95% CI	Rate	95% CI			
Managers and administrators	5.0	4.0 – 6.1	12.2	10.4 – 13.9	8.4	7.5 – 9.4	2.4
Professional	1.4	1.1 – 1.9	1.4	0.6 – 3.0	1.4	1.1 – 1.8	1.0
Para-professional	6.3	5.1 – 7.4	18.5	10.4 – 30.5	6.8	5.7 – 8.0	3.0
Tradespersons	5.6	4.8 – 6.3	3.9	2.8 – 5.3	5.3	4.6 – 5.9	0.7
Clerical workers	0.4	0.2 – 0.6	-	-	0.4	0.0 – 0.6	-
Salespersons	0.9	0.6 – 1.2	2.1	1.0 – 3.9	1.0	0.7 – 1.4	2.4
Plant / machinery operators and drivers	22.7	20.6 – 24.9	20.8	16.3 – 26.3	22.4	20.4 – 24.3	0.9
Labourers	7.8	7.0 – 8.7	14.0	10.3 – 18.6	8.7	7.8 – 9.5	1.8
Legal definition							
<b>Overall</b>	<b>5.0</b>	<b>4.7 – 5.2</b>	<b>8.1</b>	<b>7.3 – 8.9</b>	<b>5.5</b>	<b>5.3 – 5.8</b>	<b>1.6</b>
<b>Adjusted<sup>e</sup></b>	<b>5.1</b>	<b>-</b>	<b>7.2</b>	<b>-</b>			<b>1.4</b>

1: All rates are based on the legal definition.

2: Incidence rates — deaths per 100,000 persons per year — based on ECLF.

3: 95% confidence interval.

4: Ratio of the rate for self-employed persons to the rate for employees

5: Rates from each employment arrangement group have been adjusted by the national occupation distribution (five cases {or 0.3% of 1,709} for whom occupation was not known have been distributed proportionately across occupation for each employment arrangement group).

## 9.4 DISCUSSION

There was no strong evidence in the industry-based results of a different risk for self-employed workers as opposed to employees. The difference in the crude (unadjusted) rates was largely accounted for by variations in the industry distribution for the different employment arrangement groups. Only mining had a markedly higher rate for self-employed persons compared to employees, and this was probably due to the fact that workers in higher risk mining sub-sectors tended to be self-employed. For example, six of the 12 self-employed miners were opal miners, compared with two of the 126 miners who were employees, and the fatality rate in the sub-sector that includes opal mining was more than twice that of the mining industry overall (80 deaths per 100,000 person per year versus 36 deaths per 100,000 persons per year). In the construction industry, where the rate for self-employed was 60% lower than for employees, the reverse applied. Only six of the 69 self-employed construction industry workers were employed in non-building construction, compared with 46 of the 161 employees, and the fatality rate for the non-building construction sub-sector was twice that of the construction industry overall (21 deaths per 100,000 person per year versus 10 deaths per 100,000 persons per year).

The interpretation of the occupation-based results is less straightforward, but leads to similar conclusions. Although denominator data stratified by employment arrangement were not available for specific occupation sub-groups, within the major occupation groups in which self-employed persons had higher rates of death, self-employed persons had a much higher proportion of fatalities in occupation sub-groups known to have higher rates. These were mostly occupations that were usually found in higher risk industries. Examples where the self-employed persons had higher proportions of deaths in high-risk occupation sub-groups included farmers in the managers and administrators

group, ship's officers in the para-professionals group, and farm hands and agricultural labourers in the labourers group. In contrast, for tradespersons, where employees had a higher rate of death, a greater proportion of the employee deaths occurred to workers in high-risk occupation sub-groups such as structural steel workers and power line workers. Therefore, the fact that the fatality rates of employees and self-employed persons were not the same, even when standardised by occupation or examined on an occupation-specific basis, is more likely to reflect an inability to take into account differences between employment arrangement groups at the specific occupation level, rather than any inherent difference in fatal injury risk between the two groups.

These results reflect the fact that, even within an industry sector or broad occupation group, there are different levels of risk. So, standardisation on the basis of broad industry or occupation category does not control completely for variations in risk in sub-groups. It was not possible to separately examine the rates of employees and self-employed workers in industry sub-sectors and specific occupation sub-groups, because the required denominator data were not available. Similarly, it was not possible to examine rates based on hours worked because the required denominator data were not available.

The results from this study are largely consistent with relevant findings from other studies. Those that have quoted crude rates have consistently found higher rates in the self employed, with the ratio of self-employed to employee rates being 1.6 in New Zealand<sup>68</sup> and North Carolina<sup>294</sup>, 2.0 in the United Kingdom<sup>295</sup>, and 2.6 in the United States<sup>296</sup>, compared to the Australian figure in this study of 1.7. The ratio will be affected by the relative distribution in the employee and self-employed groups of persons employed in the different industries and occupations, so similar ratios in

different countries would not necessarily be expected. That the ratios are similar suggests that these distributions are also similar, as could be expected in similarly industrialised nations.

Also, as in this study, where industry-specific rates have been determined in other studies, self-employed workers have not been found to have a consistently higher rate of work-related traumatic death than employees. The only reasonably consistent finding has been that self-employed persons in the construction industry have a lower fatality rate than employees in the same industry<sup>92, 295, 297</sup>. This is generally attributed to employees being more likely to be employed in occupations or areas of higher risk within the construction industry, as was found in this study, where trades occupations (most of which are in the construction industry) had a 44% higher rate in employees compared with self-employed persons.

Even when self-employed persons do not have a higher fatality rate than employees, it has been argued<sup>290</sup> that industries with a higher level of self-employed persons have a lower level of OHS overall because of the characteristics of self-employment mentioned in the introduction. These characteristics can affect all workers working on a project (such as in agriculture, mining and construction), thereby increasing the risk for all workers. This effect does not even have to be on the same project, but could operate through competitive pressures within an industry. For example, willingness of self-employed persons to work to unsafe deadlines in the transport industry can exert pressure on companies to set unrealistic deadlines for their employed drivers. This can result in a lower level of OHS for all in the industry sector, rather than just for the self-employed workers, even though the problem arose from factors associated with self-

employment. The extent to which this hypothesis was true for the period covered by this study is not known.

## **9.5 METHODOLOGICAL CONSIDERATIONS**

There are some limitations to the analysis presented here. It is possible that the industry-specific and standardised rates determined in this study using the legal definition of self-employment under-estimate the true difference between self-employed persons and wage-salary earners, because this meant that some persons who were self-employed for practical purposes were assigned to the employee category. Although this presumably occurs to a similar extent with the denominator data used to calculate rates, the result of this would be to decrease any apparent difference between the groups. Given that 21% of the fatally injured workers who were practically self-employed were considered to be legally employees, it is unlikely to have obscured major differences in the rates.

Rates based on the practical definition of self-employment should theoretically provide a better insight into the true relationship of employment arrangement and OHS.

However, the estimated rates for this study using the practical definition are considered less reliable than those based on the legal definition because they rely partly on information about Labour Force characteristics in 1998, six years after the end of the study period. It is likely that the proportions of employee and self-employed persons in 1998 were similar to those during the study period, although the proportion of the workforce who were practically self-employed but legally employees probably rose over that time<sup>291, 298</sup>. Regardless, the results were similar whether the practical or the

legal definition was used, and the rates based on the legal definition are likely to be accurate as they are based on numerator and denominator data from the study period.

For most cases, employment arrangement could be coded with confidence. However, for some fatally injured workers, there were difficulties identifying the employment arrangement of the person. The main difficulty arose from whether, on a practical basis, the person should be considered to have been an employee or a self-employed person. This was the problem for 82 (89%) of the 92 persons with unknown practical employment arrangement. The problem was much smaller when making this distinction on a legal basis, with 76 (83%) of the 92 persons with an unknown practical employment arrangement able to be classified as employees on a legal basis.

## **9.6 CONCLUSION**

This analysis has shown that there is no strong evidence of an increased fatality rate in self-employed persons compared with employees, once differences in industry and occupation are taken into account. The higher rates in self-employed persons that have been reported are based on unadjusted analyses that were biased as a result of self-employed workers being more likely to be employed in industries and occupations with an inherently higher risk of work-related traumatic death. More detailed analysis of specific industry and occupation sub-groups would provide greater insight into this issue.