Workplace injuries and workforce trends

Prepared by the
Institute for Employment Research
for the Health and Safety Executive

CONTRACT RESEARCH REPORT
281/2001

HSE
Health & Safety Executive

Workplace injuries and workforce trends

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Some jobs carry a greater risk of injury than others. If a job involves heavy manual labour then a greater risk of injury may be associated with it when compared with, say, a sedentary office job. The risk of workplace injury is clearly related to the job. However, previous research into the incidence of workplace injuries has also shown that some individuals appear to be more likely than others to suffer a workplace injury. This study is an attempt to unravel this puzzle using a statistical technique that can identify the risk of workplace injury associated with the affects of specific personal characteristics from those which relate to the nature of the job.

The Health and Safety Executive (HSE) has published the main messages from the research report on the internet (www.hse.gov.uk/keyart.pdf).

This report and the work it describes were funded by HSE. Its contents, including any opinions and/or conclusions expressed, are those of the author alone and do not necessarily reflect HSE policy.

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First published 2001

ISBN 0 7176 1829 3

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Acknowledgements

We wish to acknowledge the contribution made to this report by Mr Graham Stevens, research coordinator at the Health and Safety Executive. His inquisitive remarks and thoughtful comments helped us to improve on earlier drafts. All remaining errors of fact or misinterpretation remain the responsibility of the authors.

We are grateful to Lynne Conaghan for her careful attention to detail in the production of this document.

Summary

Some jobs carry a greater risk of workplace injury than others. For example, if a job involves heavy manual work then a greater risk of injury may be associated with it compared with, say, a sedentary office job. The risk of workplace injury is clearly related to the nature of a job. However, previous research (Stevens, 1992) into the incidence of workplace injuries has also shown that some individuals appear to be more likely than others to suffer a workplace injury. In particular, higher than average injury rates are found among men and young workers. The problem we face here is that this association does not imply causation. Much of the research on workplace injuries which precedes this study is unable to determine whether some groups of individuals who experience high injury rates are themselves 'accident prone', or are more likely to be employed in 'high risk' jobs. In this study we attempt to unravel this puzzle using a statistical technique that can identify the risk of workplace injury associated with the effects of specific personal characteristics from those which relate to the nature of the job.

It is more than just curiosity which motivates this research. The shift away from agriculture and manufacturing to an economy dominated by the service sector has undoubtedly been the greatest change in the structure of British employment over the last century. In 1991 agriculture, mining and quarrying accounted for only 4% of all employment, compared with 8% in 1951 and 14% in 1901. Accompanying this shift has been the continuing increase in the female employment rates. In 1991 46% of working age women were in employment, compared with 35% in 1951 and 32% in 1901. In recent years these changes have been coupled with changes in working patterns. There are now more workers in part-time jobs and in self-employment. All of these changes can affect the overall rate of workplace injury. Using projections of workforce trends up to 2006 in conjunction with a detailed breakdown of workplace injury rates in the 1990s we estimate how these continuing trends may impact upon future workplace injury rates. We do this by drawing upon our analysis of the factors associated with the risk of injury.

In line with previous research, some expected results are confirmed in this study. These are the:

- much higher than average risks of workplace injury in certain sectors, notably mining and quarrying;

- higher than average risks of workplace injury in 'blue-collar', as opposed to 'white-collar', occupations;

- workplace injury rates for men are higher than rates for women;

- the risk of experiencing a 'reportable' workplace injury appears to be lower in smaller workplaces, a finding which was previously thought to be due to lower levels of reporting of workplace injuries by employers in smaller workplaces.

The present study sheds further light on these earlier findings and reveals a number of new and interesting relationships:

- the higher risk of workplace injury observed for males is not wholly attributable to the higher risk occupations (manual jobs) in which men work. Even after adjusting for these effects men are more likely to experience workplace injury than women;

- sectoral variations in accident rates are apparent from year to year. Despite this, we note that persons working in the construction sector do not experience a higher rate of injury from those who are in health and social work;

- certain occupations have a high relative risk of injury. These are:
  skilled metal & vehicles trades;
  unskilled transport occupations.

- workers employed in small workplaces (1-10 employees) have lower injury rates than those in larger workplaces, regardless of whether or not the accident is deemed 'reportable';

- the higher risk of workplace injury observed in the construction sector is associated with the high risk occupations which predominate in this sector. After taking account of occupational structure, the construction sector appears no less risky than the health and social work sector;

- workers are most likely to suffer a workplace injury during the first 12 months of employment, particularly the first 6 months in a new job. The risk of workplace injury declines as workers gain experience and job tenure increases. The growth in the use of temporary workers on short term contracts may expose a greater proportion of workers to accidents at work.

These findings suggest that the overall level of workplace injuries may be expected to rise. While employment in certain 'high risk' occupations is set to continue to decline, other trends may offset the downward influence this will exert on injury rates. To test this hypothesis we make use of a detailed forecast of employment by occupation, industry, and gender to project the change in injury rates associated with changes in occupational and sectoral structure of employment. On this basis alone we would expect a significant increase in injury rates, particularly for women and associated with the growth of their employment in personal service occupations (catering, hotel work, caring, etc). Other factors not incorporated in this projection, particularly the growth in temporary employment and the general shortening of job tenure will undoubtedly add further to the increasing risk and incidence of workplace injury.

Workplace Injuries and Workforce Trends

1. Introduction

1.1 This report presents findings from a detailed analysis of self-reported workplace injuries. The analysis covers a four year period and is based upon responses to questions in the Labour Force Survey (LFS).

1.2 In the Winter quarter (December, January and February) of each year since 1993/94, a set of questions has been included on the Labour Force Survey which enquire whether or not a respondent has had any accident at work, or in the course of their work, in the preceding year which resulted in injury. Via a statistical analysis of the responses arising from this and related questions, an assessment is made of the extent to which various characteristics of individuals and their jobs contribute towards the relative risk of workplace injury. On the basis of this analysis, and by utilising additional information on the changing composition of employment, we assess how the changing composition of the workforce is likely to affect future trends in workplace injury rates.

1.3 The study we have undertaken makes use of complex multivariate statistical techniques to enable us to 'separate out' the various influences on the risk of a workplace injury associated with, say, types of occupation, sector and level of qualification, or with age and length of time in a job. Because of the significant correlations between these groups of characteristics, it is often difficult to pinpoint with certainty which factors contribute most to variation in the relative risk of a workplace injury. For example, it seems reasonable to hypothesise that rates of injury are higher in the construction sector because of the type of work people undertake in this sector. After 'adjusting' for the effect of high risk occupations on the sectoral rate it is of interest to see if *any* sector specific effect remains to be identified. Similarly, it has been argued elsewhere (Stevens, 1992) that the higher rate of workplace injuries reported by men probably results from occupation-specific differences and the concentration of men in occupations which have a higher risk of workplace injury.

1.4 Statistical reports derived from complex procedures are notoriously unreadable and, to many readers with an interest in the subject matter but not the statistical detail, they may appear confusing and difficult to interpret. The detail of this work is, therefore, relegated to an appendix. In its place we present a more graphically-orientated approach to the interpretation of these findings, comparing and contrasting both the traditional approach (cross-tabulation of injury rates with certain variables of interest) with the results obtained from the multivariate analysis.

1.5 The plan of this report is as follows. Section Two covers the main data issues, including the definition of workplace injury rates, the nature of the information on workplace injury rates collected in the Labour Force Survey and problems stemming from the reporting period used in the LFS. Section Three presents

information on trends in injury rates over the four year period covered by this investigation. Section Four introduces the findings from the multivariate analysis, while Section Five concludes with details of the methodology applied in developing a forecast of injury rates from the situation prevailing in the mid 1990s to the middle of the next decade, based upon some of the key findings from our analysis.

2. Data Issues

2.1 There exist two official sources of information on workplace injuries. Under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 (RIDDOR), employers have a duty to report injuries resulting in an absence from normal work for more than three days. Not all workplace injuries have to be reported[1]. The main exception is the non-reporting of road traffic accidents involving people travelling in the course of their work, as these are covered by road traffic legislation. In 1990 the Health and Safety Executive (HSE) sponsored a set of detailed questions covering workplace injury on the Labour Force Survey (LFS). Analysis of these data (Employment Gazette, 1992) confirmed concerns expressed by the HSE that non-fatal injuries are substantially under-reported by employers in official statistics derived from the 1985 reporting requirement.

2.2 Since 1993 a set of specially commissioned questions on workplace injuries has been included in the Winter quarter (December to February) of the Labour Force Survey (LFS). The LFS is a rich data source providing information on individuals' jobs as well as their personal characteristics. The breadth of the information covered in the LFS makes it a useful source from which to gain a better understanding of the factors associated with the risk of an individual suffering a workplace injury. The questions relating to workplace injuries collect information on the preceding 12 month period. These estimates are likely to underestimate the actual number of accidents occurring in a 12 month period due to both recall error and the fact that information is only collected on one injury per respondent.

2.3 Survey respondents are asked whether they had been injured in a work-related accident in the previous 12 months, whether any such injury was caused by a road traffic accident and how soon after the accident they were able to return to work. The information collected from these questions can be used to compute injury rates from all work-related accidents and injury rates resulting from 'reportable' work-related accidents. 'Reportable' work-related accidents are non-road accidents resulting in over 3 days of absence from normal work.

2.4 Employer-provided information on a work-related injury reported under RIDDOR collects detailed information on the kind of accident that occurred and the nature of injuries sustained. This information is not collected in the LFS, so the analysis presented here is restricted to an examination of the

[1] See *Health and Safety Statistics 1995/96* for a complete list of the exceptions that apply.

correlations which exist between the occurrence of a work-related accident, the characteristics associated with an individual's job and their personal characteristics. Previous research in this area suggests that there are features of particular jobs (occupation, sector etc) and personal characteristics of individuals (age, gender etc) that contribute to the probability of an individual experiencing a workplace injury. The specific relationship between various features of jobs and personal characteristics and the extent to which they separately contribute to the risk of workplace injury is termed the 'risk factor' associated with that feature or characteristic.

2.5 The LFS is a quarterly household survey[2] covering approximately 60,000 households in the United Kingdom. Each quarter, information is collected from approximately 65,000 workers either by personal interview, a telephone interview or through a proxy respondent. Around one-third of all workers recorded in the LFS provided information through a proxy respondent. The quality of information provided by proxy respondents is considered to be of a generally acceptable level. However, in some areas it has been shown that proxy respondents under-report the incidence of events and that such under-reporting is evident over fairly short recall periods (Arulampalam *et al*., 1998). Due to the length of the recall period required in response to the accident questions and the nature of the information required the issue of proxy response will need to be addressed in any statistical modelling work.

2.6 Many LFS respondents will not have remained in the same job over the 12 month period used in the recording of work-related accidents. Workers sustaining an injury may be more or less likely to have changed jobs after an accident (or even changed status of economic activity) than other workers. To compute injury rates by a range of characteristics requires considerable recoding of the data to identify the job in which an accident occurred.[3] Due to the detailed information on job characteristics required in the statistical modelling, in section 4, it is necessary to restrict the sample to workers who suffered a workplace injury in their current main job.

2.7 Injury rates are calculated as the number of people who had a work-related accident that resulted in an injury in the preceding 12 months as a proportion of all people currently in employment. Using information in the LFS it is possible to identify whether an accident occurred in an individual's current main job, current second job, a different job three months ago or their last job if the person is not currently in employment but has been in the previous 12 months. This provides a fairly accurate estimate of injury rates by job characteristics.

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2 Prior to 1992 the LFS was conducted annually from 1984 and bi-annually between 1975 and 1983.

3 If a respondent sustained an injury in a job other than their current main or second job they are required to indicate which job they were doing at the time of their injury. It is possible to identify employment characteristics of some of the previous jobs in other sections of the LFS.

3. Trends in injury rates Winter 1993/94 –Winter 1996/97

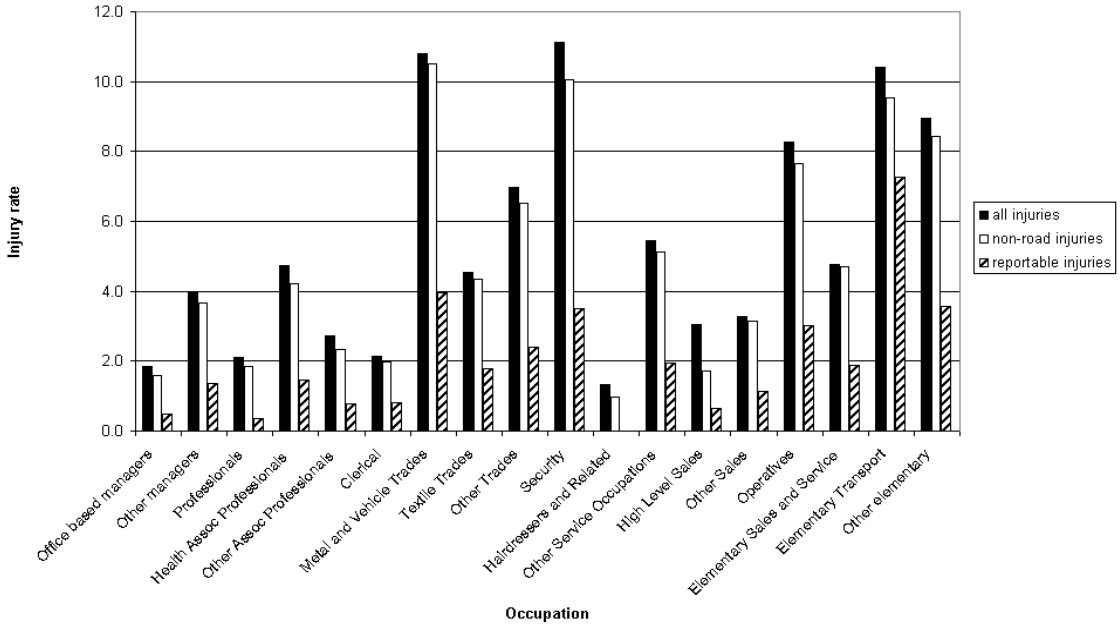
3.1 This section focuses on trends in the unadjusted injury rates recorded in the LFS between Winter 1993/94 and Winter 1996/97. The term 'unadjusted' is used to describe the injury rate recorded via the LFS for particular groups of workers, before any adjustment is made for the interactions between 'risk factors'. Variations in injury rates across seven dimensions are explored: three relate to individual characteristics (gender, age and level of education), three are employment-related variables (workplace size, industrial sector, occupation) and region of residence. Injury rates are computed separately for all workplace injuries, workplace injuries excluding road traffic accidents and reportable workplace injuries for workers living in Great Britain. This section uses weighted data and begins by looking at the variations in injury rates according to the three measures of injury employed. The number of workplace injuries recorded for some of the sub-groups are very small (see Appendix 1 for the actual number of injuries recorded for each group in the unweighted data). Consequently, changes in injury rates for some sub-groups over this four year period can appear to be volatile.

3.2 Unadjusted differentials in injury rates take no account of differences between groups which arise due to the characteristics of individuals who occupy these groups. For example, if men are more likely to be employed in high risk occupations than women, a higher male injury rate may be an artefact of this difference in the structure of employment rather than an inherent difference between men and women in the risk of workplace injury they face. The statistical modelling in the next section is designed to identify and separate the risk factors associated with personal and employment characteristics.

3.3 Injury rates are typically expressed as the number of injuries per thousand employed persons. Overall injury rates (Table 3.1), injury rates excluding road traffic accidents (Table 3.2) and reportable injury rates (Table 3.3) recorded in the LFS show a slight downward trend over the four years 1993/94 to 1996/97, with the highest injury rates (according to all three measures) observed in 1993/94.

3.4 The vast majority of all workplace injuries do not result from road traffic accidents (92 per cent in 1996/97). Figure 3.1 shows injury rates by occupation according to the type of injury (all workplace injuries, workplace injuries excluding road traffic accidents and reportable workplace injuries). The number of workplace injuries resulting from road traffic accidents as a proportion of all workplace injuries varies between occupations. The proportion of all workplace injuries resulting from a road traffic accident is above average in security occupations, other associate professionals, office based managers, professional occupations and health associate professionals. A particularly high proportion of workplace injuries in high level sales occupations result from road traffic accidents. This probably reflects the fact that this occupation group is dominated by sales representatives, many of whom are likely to be exposed to a higher risk of road traffic accidents because of the nature of their work.

Figure 3.1: Workplace injury rates



Source: Labour Force Survey, Winter 1996/97

3.5 One third of all workplace injuries in 1996/97 are estimated to be reportable under RIDDOR and 37 per cent of all workplace injuries excluding road traffic accidents are reportable. The proportion of non-road workplace injuries that are reportable varies between industries and occupation groups. Workers in hotels & restaurants have the lowest share of injuries that are reportable (23 per cent) in contrast with the highest share found in health & social work (43 per cent). Only 19 per cent of non-road workplace injuries suffered by professionals are reportable compared with three quarters of all workplace injuries suffered by workers in elementary transport occupations.

3.6 Comparisons with RIDDOR statistics shows that *actual* reporting rates also vary significantly by sector. Assuming that the LFS-based rates give a reasonably accurate representation of the industrial distribution of workplace injuries, reporting rates vary from about 80 per cent in the utilities to 10 per cent in finance and business (HSE, 1996 p.52).

3.7 Men appear nearly twice as likely to suffer any type of workplace injury than women. This finding is common across all four years.

3.8 Workers aged 16-19 or over 60 years are the least likely to suffer an injury, age variations in reportable workplace injuries are shown in Figure 3.2. The highest injury rates are found amongst workers aged 20-24 years. After the age of 25 injury rates generally decline with age. There appears to be a general downward trend in injury rates within age groups (injury rates in the 55-59 age group are not stable across the four years but no discernible trend is visible).

Table 3.1: All workplace injury rates

	1993/94	1994/95	1995/96	1996/97
All	4.7	4.5	4.2	4.4
Gender				
Male	5.9	5.6	5.4	5.5
Female	3.2	3.1	2.8	3.1
Age Group				
16-19 years	4.9	4.3	3.7	4.7
20-24 years	5.8	5.3	5.4	5.9
25-24 years	5.3	5.2	4.6	4.8
35-44 years	4.6	4.5	4.2	4.3
45-54 years	4.2	4.2	3.9	3.9
55-59 years	4.0	3.4	4.4	4.1
60+ years	2.7	2.8	2.6	2.9
Qualifications				
Degree and above	2.2	2.3	2.0	2.1
O level to degree	5.0	4.8	4.6	4.8
Up to O level	5.9	5.9	5.1	5.9
None	4.7	4.2	4.2	4.1
Region of Residence				
England	4.6	4.5	4.2	4.4
Wales	5.2	4.4	4.9	4.7
Scotland	4.8	4.2	3.8	4.1
Workplace Size				
1-10	3.9	3.5	3.3	3.7
11-24	4.3	4.6	4.0	4.3
25 or more	5.1	4.9	4.6	4.8
Occupation				
Office based managers	1.8	2.1	1.8	1.9
Other managers	4.0	4.0	3.5	4.0
Professionals	2.6	2.7	2.4	2.1
Health associate professionals	4.7	4.8	4.4	4.7
Other associate professionals	3.7	2.9	2.4	2.7
Clerical	2.1	2.5	1.7	2.1
Metal and vehicle trades	11.6	9.1	11.6	10.8
Textile trades	4.9	3.8	3.3	4.5
Other trades	8.3	7.2	7.9	7.0
Security	13.1	10.5	10.6	11.1
Hairdressers and related	0.9	2.1	2.8	1.3
Other service occupations	5.3	5.2	4.9	5.4
High level sales	2.2	3.6	2.0	3.0
Other sales	3.6	3.6	3.1	3.3
Operatives	7.6	7.5	7.7	8.3
Elementary sales and service	4.6	4.5	3.7	4.8
Elementary transport	11.7	11.2	11.6	10.4
Other elementary	8.7	8.7	7.6	9.0
Industry Sector				
Agriculture etc	6.3	5.7	5.8	5.5
Mining	11.1	4.9	6.2	10.0
Manufacturing	5.8	5.6	5.4	5.5
Elect, gas & water	4.8	4.1	5.0	3.8
Construction	6.9	5.7	6.5	5.8
Trade	4.2	4.2	3.6	4.0
Hotels & restaurants	4.5	4.5	4.6	5.0
Transport	6.0	6.3	5.7	6.8
Financial services	2.4	2.2	2.1	2.2
Public admin & educ	4.0	4.0	3.7	3.7
Health & social work	4.8	4.6	4.4	4.5
Community work	4.3	4.6	3.3	3.8
Private households	4.2	2.3	2.3	2.5
Extra territorial	0.0	2.5	0.0	0.0

Source: Labour Force Surveys (Winter quarters)

Table 3.2: Workplace injury rates excluding road traffic accidents

	1993/94	1994/95	1995/96	1996/97
All	4.4	4.2	4.0	4.1
Gender				
Male	5.6	5.2	5.0	5.1
Female	3.0	2.9	2.7	2.9
Age Group				
16-19 years	4.7	4.0	3.6	4.4
20-24 years	5.5	4.8	5.0	5.5
25-24 years	5.0	4.7	4.1	4.4
35-44 years	4.3	4.2	3.9	4.0
45-54 years	4.0	3.9	3.7	3.6
55-59 years	3.8	3.1	4.2	3.9
60+ years	2.7	2.7	2.4	2.7
Qualifications				
Degree and above	1.9	2.1	1.8	1.8
O level to degree	4.7	4.4	4.3	4.4
Up to O level	5.6	5.5	4.8	5.5
None	4.5	3.9	4.0	3.9
Region of Residence				
England	4.3	4.1	3.9	4.1
Wales	5.0	4.2	4.6	4.2
Scotland	4.7	4.1	3.6	3.8
Workplace Size				
1-10	3.7	3.2	3.1	3.3
11-24	4.2	4.3	3.8	4.1
25 or more	4.8	4.6	4.3	4.4
Occupation				
Office based managers	1.5	1.8	1.4	1.6
Other managers	3.8	3.7	3.2	3.7
Professionals	2.4	2.5	2.2	1.9
Health associate professionals	4.5	4.4	4.1	4.2
Other associate professionals	3.4	2.5	2.3	2.3
Clerical	2.1	2.3	1.7	2.0
Metal and vehicle trades	11.2	8.9	11.2	10.5
Textile trades	4.9	3.8	3.3	4.3
Other trades	7.8	6.9	7.5	6.5
Security	11.8	9.7	9.4	10.1
Hairdressers and related	0.7	1.7	2.1	1.0
Other service occupations	5.1	4.8	4.7	5.1
High level sales	1.6	2.6	1.8	1.7
Other sales	3.4	3.4	3.0	3.2
Operatives	7.2	6.9	7.1	7.6
Elementary sales and service	4.4	4.4	3.6	4.7
Elementary transport	10.6	10.5	11.6	9.5
Other elementary	8.2	8.0	7.2	8.4
Industry Sector				
Agriculture etc	6.0	5.5	5.5	5.4
Mining	10.3	4.5	6.2	9.7
Manufacturing	5.6	5.4	5.2	5.3
Elect, gas & water	4.6	3.9	4.8	3.5
Construction	6.6	5.3	6.1	5.4
Trade	4.0	3.9	3.4	3.6
Hotels & restaurants	4.3	4.3	4.4	4.9
Transport	5.3	5.5	4.9	5.9
Financial services	2.1	1.8	1.9	2.1
Public admin & educ	3.7	3.7	3.4	3.3
Health & social work	4.6	4.3	4.2	4.1
Community work	4.1	4.1	3.0	3.5
Private households	4.0	2.3	2.3	2.0
Extra territorial	0.0	2.5	0.0	0.0

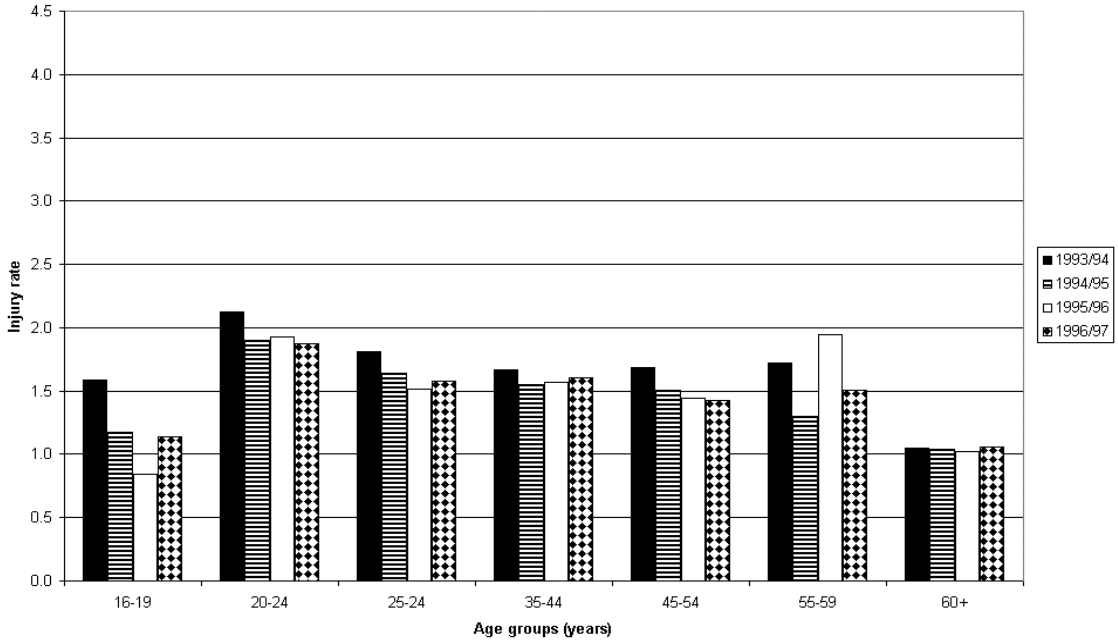
Source: Labour Force Surveys (Winter quarters)

Table 3.3: Reportable workplace injury rates

	1993/94	1994/95	1995/96	1996/97
All	1.7	1.5	1.5	1.5
Gender				
Male	2.2	1.9	1.9	1.9
Female	1.1	1.0	1.1	1.1
Age Group				
16-19 years	1.6	1.2	0.8	1.1
20-24 years	2.1	1.9	1.9	1.9
25-24 years	1.8	1.6	1.5	1.6
35-44 years	1.7	1.5	1.6	1.6
45-54 years	1.7	1.5	1.4	1.4
55-59 years	1.7	1.3	1.9	1.5
60+ years	1.0	1.0	1.0	1.1
Qualifications				
Degree and above	0.5	0.4	0.4	0.4
O level to degree	1.7	1.6	1.6	1.6
Up to O level	2.4	2.3	2.1	2.2
None	2.2	1.6	1.8	1.6
Region of Residence				
England	1.6	1.5	1.5	1.5
Wales	2.0	1.6	1.9	1.9
Scotland	2.1	1.7	1.6	1.6
Workplace Size				
1-10	1.2	1.0	1.1	1.1
11-24	1.6	1.4	1.1	1.3
25 or more	2.0	1.8	1.7	1.7
Occupation				
Office based managers	0.5	0.4	0.4	0.5
Other managers	1.2	1.1	0.8	1.4
Professionals	0.7	0.6	0.5	0.3
Health associate professionals	1.6	1.6	1.9	1.5
Other associate professionals	1.3	0.6	0.9	0.8
Clerical	0.8	0.7	0.6	0.8
Metal and vehicle trades	4.3	3.0	4.1	4.0
Textile trades	2.0	1.1	0.9	1.8
Other trades	2.9	2.6	3.0	2.4
Security	3.8	3.2	4.0	3.5
Hairdressers and related	0.2	0.3	0.2	0.0
Other service occupations	2.2	2.0	1.7	1.9
High level sales	0.4	1.1	0.6	0.7
Other sales	1.3	1.2	1.2	1.1
Operatives	3.3	3.3	3.1	3.0
Elementary sales and service	1.7	2.0	1.8	1.9
Elementary transport	5.9	5.3	6.8	7.3
Other elementary	3.9	3.4	2.7	3.6
Industry Sector				
Agriculture etc	2.0	2.0	2.2	2.2
Mining	4.2	0.6	2.8	3.4
Manufacturing	2.2	2.1	1.9	1.9
Elect, gas & water	2.2	1.5	1.5	1.5
Construction	3.0	2.2	2.7	2.0
Trade	1.4	1.3	1.3	1.4
Hotels & restaurants	1.2	1.6	1.3	1.1
Transport	2.2	2.4	2.2	2.4
Financial services	0.7	0.6	0.7	0.7
Public admin & educ	1.2	1.1	1.1	1.2
Health & social work	2.1	1.7	1.8	1.8
Community work	1.9	1.5	1.0	1.3
Private households	1.5	1.1	1.3	0.5
Extra territorial	0.0	0.0	0.0	0.0

Source: Labour Force Surveys (Winter quarters)

Figure 3.2: Reportable workplace injury rates by age

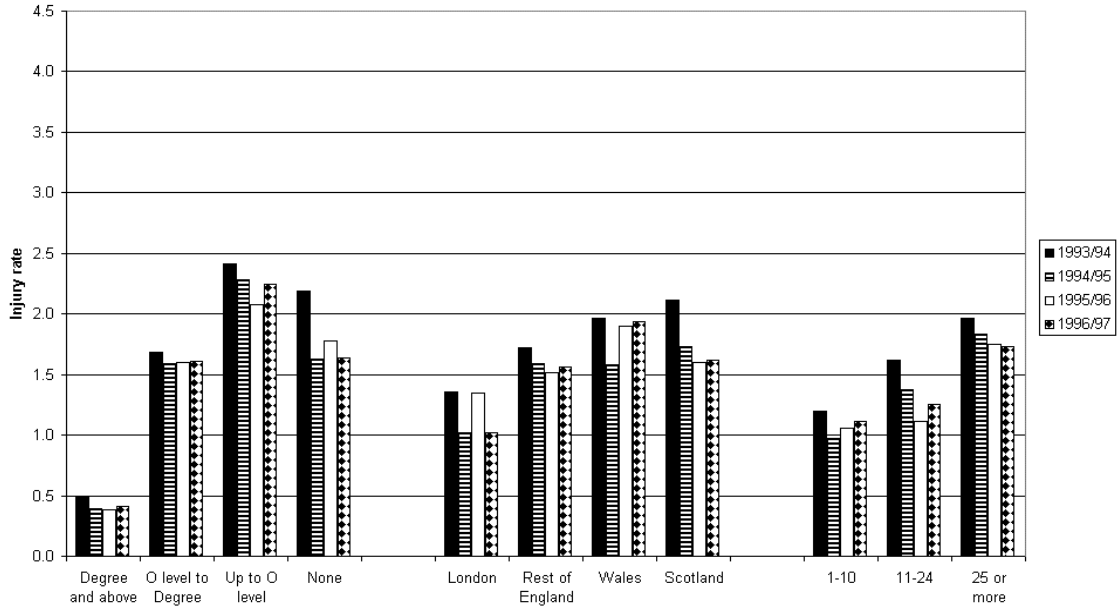


Source: Labour Force Surveys (Winter quarters)

3.9 Unsurprisingly, highly qualified workers are less likely to suffer a workplace injury than workers with lower levels of qualifications. Workers with no qualifications have lower injury rates than those with low level qualifications (for reportable injury rates by level of qualification see Figure 3.3). This could result from the fact that workers with no qualifications are concentrated in the older age groups, given that few young people now leave school with no qualifications. Workers with intermediate level qualifications (O level (or equivalent) up to first degree) are three times as likely to suffer a reportable workplace injury and twice as likely to have any work-related accident than highly qualified workers (first degree or above). These differentials are relatively stable over time.

3.10 Regional differentials in work-related injuries fluctuate over time (Figure 3.3). Workers living in London are least likely to have a work-related injury or a reportable workplace injury in all four years. Workers in workplaces 25 or more employees are more likely, than workers in smaller workplaces, to suffer any type of work-related injury (Figure 3.3 and Tables 3.1, 3.2 and 3.3).

Figure 3.3: Reportable workplace injury rates by level of education, region of residence and workplace size

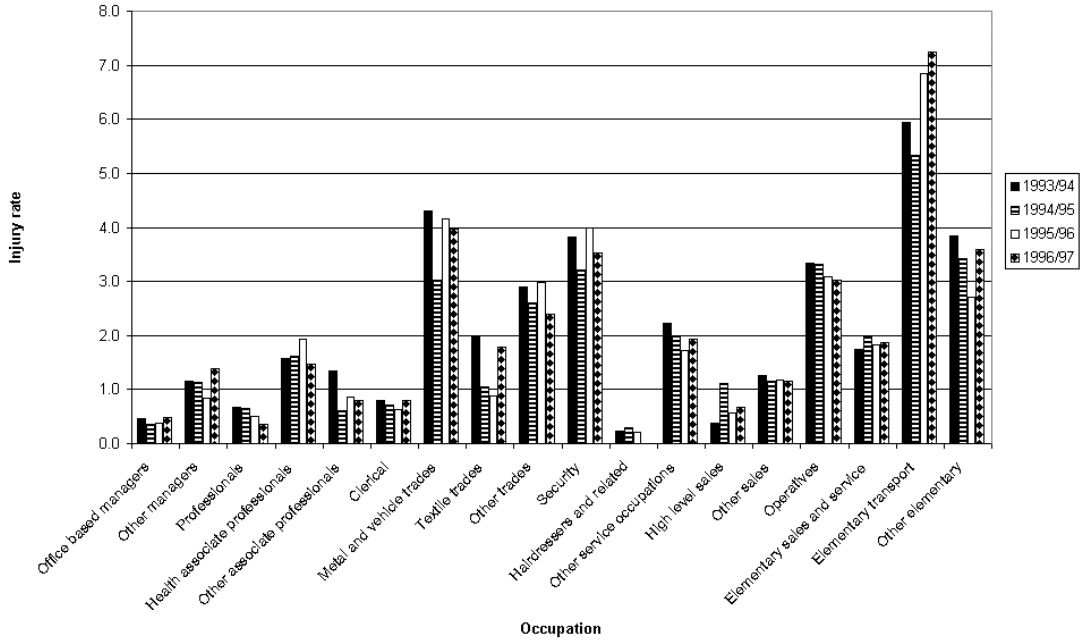


Source: Labour Force Surveys (Winter quarters)

3.11 Different risks of injury are associated with occupation groups. Workers in security, elementary transport, metal & vehicle trades, other elementary occupations, other trades and operatives are most likely to have a work-related injury (Figure 3.4). The high injury rates found amongst workers in elementary transport occupations are not just a result of the higher exposure to road traffic accidents, given that occupation group records the highest reportable workplace injury rates (road traffic accidents are not reportable) (Table 3.3). The lowest injury rates are found in occupations which can largely be described as 'office jobs' (office based managers, clerical occupations, sales, professionals, hairdressers etc).

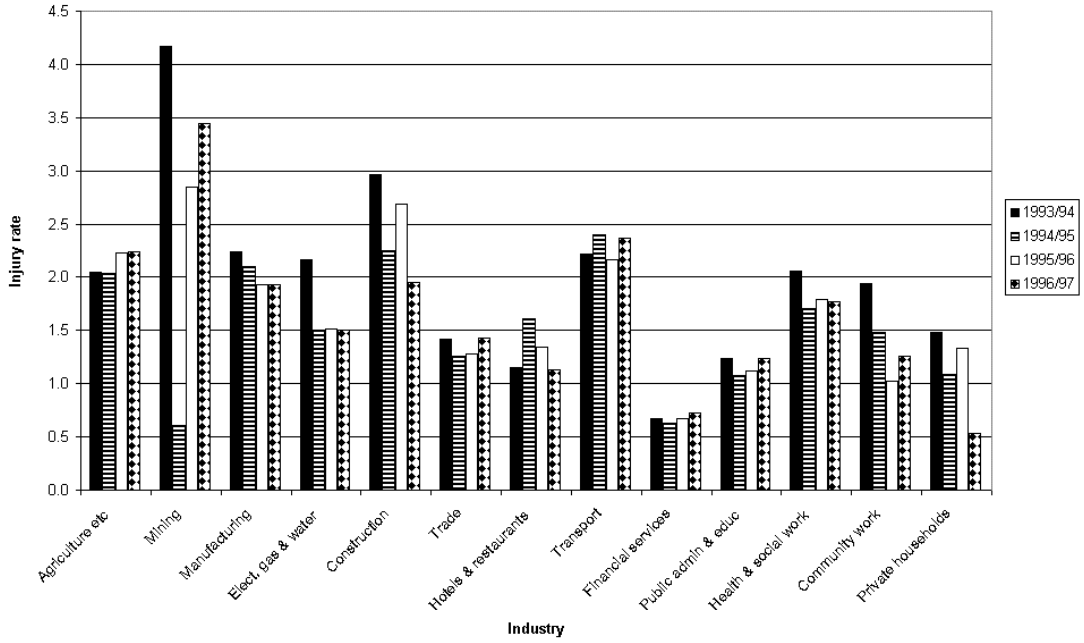
3.12 Some industrial sectors, particularly those involving heavy manual work, are known to have higher injury rates (Figure 3.5 and Tables 3.1, 3.2 and 3.3). Construction, transport, agriculture and manufacturing have the highest injury rates (all and reportable injuries). Injury rates are high and very volatile in the mining and quarrying sector a result which could derive from the small sample of workers employed in this sector. Work-related injuries are least likely to occur in financial services.

Figure 3.4: Reportable workplace injury rates by occupation



Source: Labour Force Surveys (Winter quarters)

Figure 3.5: Reportable workplace injury rates by industry of employment



Source: Labour Force Surveys (Winter quarters)

3.13 Official statistics on injury rates do not usually report rates by job tenure. There are a number of reasons why this information is of interest. Changes in injury rates as job tenure increases can show how experience affects the risk of injury. Recent trends in job tenure, indicating a continuing decline in average job tenure, have implications for future trends in injury rates. If injury rates are higher for employees with shorter job tenures than for employees with longer job tenures, a fall in average job tenure may lead to an increase in injury rates.

3.14 One of the reasons why injury rates are not reported by job tenure using LFS data is that the information collected on job tenure is not necessarily related to the job in which the recorded injury occurred. In the LFS job tenure is only recorded for an individual's main job at the time of the survey. For this reason injury rates can only be calculated in relation to an individual's main job at the time of the survey. These rates differ therefore from the rates computed in tables 3.1, 3.2 and 3.3[4].

3.15 Table 3.4 shows the injury rates (all workplace injuries) by job tenure. With the exception of individuals with job tenure less than one year, injury rates fall as job tenure increases. The relatively low injury rates in the two shortest categories of job tenure are likely to reflect differences in exposure to workplace accidents. The question covering workplace injuries in the LFS refers to the last 12 months. Individuals who have experienced a workplace accident in their current job and have been in their current job for less than 12 months consequently have a shorter time for which they are at risk of suffering a workplace injury.

Table 3.4: Injury rates (all workplace injuries) by job tenure

Job tenure	Injury rate
Less than 6 months	2.0
6-11 months	3.7
12 months to less than 5 years	4.2
5 years to less than 20 years	3.5
20 years or more	3.2

3.16 We explore this issue of 'exposure time' further via a detailed analysis of injury rates for those who have been employed in their current job for less than one year. Table 3.5 shows their injury rates by the length of job tenure.

[4] The sample used for the statistical modelling is also restricted in this way.

Table 3.5: Injury rates adjusted for time spent in a job

Job tenure (months)	Workplace injuries	Workers	Injury rate	Adjustment for time exposure		
				Adjustment factor	12 month equivalent injuries	12 month equivalent injury rate
<1	7	681	1.0	x24	168	24.7
1	17	1134	1.5	x12	204	18.0
2	20	1033	1.9	x6	120	11.6
3	26	1348	1.9	x4	104	7.7
4	28	1330	2.1	x3	84	6.3
5	40	1286	3.1	x2.4	96	7.5
6	36	984	3.7	x2	72	7.3
7	31	852	3.6	x1.7	53	6.2
8	39	870	4.5	x1.5	59	6.7
9	28	790	3.5	x1.3	36	4.6
10	26	760	3.4	x1.2	32	4.1
11	24	680	3.5	x1.1	26	3.9
<12	322	11748	2.7	x1	1054	9.0

The right hand side of Table 3.5 shows the affect of adjusting injury rates for the time spent in a job (exposure). The adjustment used is fairly crude but illustrates the point well. The adjustment process computes the 'equivalent 12 month injury rate' based on the assumption that individuals in each tenure group would sustain the same injury rate for a full 12 month period. For example, one percent of individuals who have been in their current job for less than 1 month suffer a workplace injury. The final column shows that if this group of workers continued to sustain this rate of workplace injury over a full 12 month approximately one-quarter would suffer a workplace injury, compared with an annual rate of 4.2 per cent recorded among workers who have been in their job between 12 months and five years. This illustrates well the very high risk of suffering a workplace injury during the first month of employment. The steady decline in the annualised workplace injury rate illustrates how the risk of workplace injury declines with work experience along with the very high risks in the first few months of employment.

3.17 Hours of work is another variable which needs to be adjusted for differences in exposure to workplace injuries. The growth in part-time jobs, many of which are for a low number of weekly hours, means that variation in injury rates by hours of work is particularly of interest from a policy perspective. In this section we consider injury rates (all workplace injuries) 1996/97 for illustrative purposes only. Table 3.6 shows the injury rates unadjusted for time spent in employment (exposure).

Table 3.6: Injury rates (all workplace injuries) by usual weekly hours of work

Usual weekly hours of work	Injury rate
0-15	1.5
16-29	2.4
30-49	3.8
50-59	4.5
60+	5.0

These raw injury rates show that the risk of workplace injury increases with hours of work. This result is not surprising because it reflects the greater exposure faced by individuals who work longer hours.

3.18 One way of adjusting these rates to reflect exposure is to compute the equivalent rate for a set number of hours. We do this by computing the average number of hours for each category (the mid-point) and computing the adjustment factor required to estimate the equivalent risk of individuals working a 39.5 hour week. Table 3.7 shows the results from this adjustment process.

Table 3.7: Injury rates adjusted for weekly hours spent in a job

Usual weekly hours of work	Average in band	Raw injury rate	Adjustment factor	Equivalent injury rate
0-15	7.5	1.5	5.3	8.0
16-29	22.5	2.4	1.8	4.3
30-49	39.5	3.8	1.0	3.8
50-59	54.5	4.5	0.7	3.2
60+	64.5	5.0	0.6	3.0

The results from the 'exposure adjusted' injury rates show that individuals who work a low number of weekly hours have particularly high injury rates and that equivalent injury rates fall as the number of weekly hours worked increases.

4. Statistical analysis of workplace injuries

4.1 The preceding section illustrates some of the interesting variations that exist when workplace injury statistics are analysed by various characteristics of the workforce. Some of these variations are well established from earlier research (eg the variation in injury rates by industry of employment and the variation by workplace size). Others are revealed in more detail than has previously been

the case (eg the variation in injury rates by occupation, hours of work and job tenure).

4.2 A problem underlies these variations, in that it is not clear what *separate and additional* contribution is made to our understanding of variations by using these different dimensions to analyse injury rates. For example, is the variation by industry of employment simply a consequence of the different occupational structure of various industries, with so-called 'high risk' sectors reflecting a preponderance of 'high risk' occupations within them? Is the difference in injury rates between men and women a consequence of the fact that men tend to predominate in manual occupations which carry a higher risk of workplace injury?

4.3 To answer these questions we employ a multivariate statistical technique which allows us to estimate the separate systematic influence of these factors on the 'risk' of a workplace injury. The concept of 'risk' is fundamental to the interpretation of the results presented in this section. Before presenting these results, we describe what, in technical terms, we mean by risk and how we estimate risk factors within a multivariate statistical model.

4.4 Most people are familiar with the concept of risk as a probability. If, for example, out of a workforce of 20 million persons, 1 million had experienced some form of workplace injury in the preceding year, this could be represented as a 1 in 20 'risk' of a workplace injury. If all workplace injuries occurred as random events, everyone in employment would therefore be exposed to this same degree of risk. However, there is clearly not a uniform exposure to the risk of workplace injury. Some people work in jobs which carry a much greater risk of workplace injury than would be implied by the 1:20 average risk. Others may have personal characteristics which make them more 'risk prone'. Correspondingly, some people may face a much lower risk of workplace injury than the average.

4.5 To detect these 'relative' risk factors we examine a large body of data which tells us whether or not an individual has experienced a workplace injury in the preceding 12 months *and* contains details about the nature of each individual's job and relevant personal characteristics. Multivariate statistical modelling is a technique for determining the separate 'contribution' that each piece of information about an individual's job or their personal characteristics makes to the observed pattern of workplace injuries. These contributions to our understanding of risk factors are expressed as 'relative risk' – relative to a baseline or reference category. For example, from Table 3.1 it can be seen that the 'risk' of injury in a small workplace is 3.7 per cent or about 1 in 27, whereas in a workplace of 25 employees or more the risk appears to be higher at 4.8 per cent or approximately 1 in 21. Another way of expressing this is to say that, relative to a small workplace, persons employed in workplaces with 25 or more employees experience a 30 per cent higher risk of workplace injury. All of the results presented in this section are portrayed in this manner, showing the 'raw' or 'unadjusted' relative risks and contrasting these with the adjusted relative risks which are derived from the multivariate statistical model

and which take account of the separate contributions made simultaneously to the overall risk from a wide range of characteristics describing individuals and their jobs.

4.6 The technique we have employed for multivariate analysis is termed *logistic regression*. For technical reasons, risks are modelled as the logarithm of the odds[5] of workplace injury. The modelling strategy we adopted involved a variety of stages in which we sought first to detect specific occupational influences on the risk of workplace injury using a very detailed set of occupational categories. Having identified 'risky' occupations, the occupational categories were then merged to eliminate unnecessary detail while retaining the essential differences between occupations in terms of their separate contribution to the risk of an injury. A wide range of personal and job-related characteristics were then added to this basic model, including age, gender, workplace size, qualifications, region of residence, industry sector, hours worked, type of employment contract. In addition, in earlier models we included a number of other variables which we thought would influence the relative risk of injury. These variables included long term health problems, disabilities and second job holding, but were found to be statistically insignificant and were omitted from the final model.

4.7 The full results from these modelling procedures are presented in Appendix Two. Workplace injuries are defined in two ways. First, 'all injuries' are defined to include any positive response to the workplace injury question (filtering out those accidents which would be classified as road traffic accidents). Second, 'reportable injuries' are defined as those injuries for which the injured person was away from work for more than three working days, given that such accidents are, in theory, reported under the regulations for the Reporting of Injuries, Diseases and Dangerous Occurrences (RIDDOR).

4.8 In the following set of charts the 'adjusted' differentials in relative risks, derived from the coefficients in the logistic regressions[6], are represented as black bars. These represent the separate risk factors associated with particular characteristics having taken account of all other risk factors in our statistical model. Where these 'adjusted' differentials were found to be statistically insignificant at the 5 per cent level the bars are shaded grey[7]. The unadjusted relative risks are shown as white bars. These unadjusted risks are derived from the crosstabulations shown in the preceding section. The first set of charts show the relative risks for all workplace injuries.

4.9 Figure 4.1 shows the relative risk of injury by gender, age and employment tenure. Looking first at the two bars on the left hand side of this chart, these

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5 Representing p as the risk of a workplace injury, $p/(1-p)$ is the odds of an injury.

6 Taking the exponential of the coefficients from the regression results, subtracting 1 and then multiplying by 100 gives the percentage difference in the risk of injury relative to the reference category.

7 In other words, a bar which is shaded grey denotes that there is no significant difference between the category it represents and the 'reference' category.

show the 'adjusted' and unadjusted' relative risk of workplace injury reported by men (there are no bars shown for women, given that they are the reference category). Even after controlling for differences in characteristics and employment between men and women we identify a significant difference in their relative risk of injury. Although nearly one-quarter of the difference in risk experienced by men is due to these other factors, there remains a 20 per cent higher risk of workplace injury among men compared with women. We find no significant difference in the risk of having a workplace injury among workers aged over 25 years. Workers aged 16-24 have just over 20 per cent higher risk of injury than these older workers.

4.10 The length of time in a job (tenure) remains significant in the adjusted series. For employees who have been in their current job for less than one year the relative risk of injury has been adjusted to reflect differences in exposure. The LFS question asked workers to report any workplace injury that occurred within the preceding 12 months. Workers who have been employed in their current main job for less than 12 months are consequently reporting accidents over a shorter period of time. The adjustment uses the average job tenure for the two groups who are in their current job for less than 12 months (less than 6 months: 2.8 months; 6-11 months: 8.3 months) to adjust for exposure (multiplying their relative risk by $^{12}/_{2.8}$ and $^{12}/_{8.3}$ respectively). The results show that as tenure increases the risk of workplace injury declines; as employees become more experienced in their job they are less likely to suffer a workplace injury. Workers are most at risk of suffering a workplace injury in the first 6 months of their employment. Workers who have been employed between 6 and 12 months are approximately 40 per cent less likely to suffer an injury than this group, and workers employed in the same job for at least 20 years are 66 per cent less likely to suffer an injury.

4.11 Level of qualification remains a significant influence on the risk of suffering a workplace injury after controlling for other factors. Workers with intermediate and low level qualifications face a higher risk of workplace injury relative to those with high level qualifications and no qualifications. The low risk of workplace injuries amongst highly qualified workers observed in the unadjusted series is found to be insignificantly different from workers with no qualifications once adjustments have been made (Figure 4.2). Figure 4.2 also shows the relative risk of workplace injury by workplace size. Workers in small workplaces (1-10 employees) have a significantly lower risk of workplace injury than workers in larger workplaces.

4.12 There appears to be no difference in the risk of workplace injury between employees and self-employed, (Figure 4.3). Workers living in Scotland have a lower risk of workplace injury relative to England and Wales. This differential increases after adjustments have been made.

4.13 The exposure to risk of injury in terms of weekly hours of work has an expected and significant influence on the risk of workplace injury (Figure 4.4). Figure 4.4 shows injury rates which have been adjusted to reflect exposure. An individual who works 10 hours per week is at risk for only one-third of the

time of an individual working 30 hours. To adjust the relative risks we have computed the equivalent risk of injury associated with working a 39.5 hour week for each of the hour bands. The adjustment shows that individuals working less than 30 hours per week have higher equivalent injury rates, particularly individuals working less than 16 hours, than individuals working longer hours.

4.14 Whether a worker is employed on a temporary or permanent basis has no significantly influence on the risk of workplace injury. However, this is likely to be due to the high percentage of temporary workers who have been employed in their current job for less than one year (57 per cent). The higher risk of workplace injury associated with short job tenure will be picked up by the tenure variable. Workers in the private sector have a significant lower risk of workplace injury than workers in the public sector. Private sector workers have around a 20 per cent lower risk of workplace injury relative to public sector workers (Figure 4.4).

4.15 Considerable variation in the relative risk of injury exists between occupation groups (Figure 4.5). Adjusting the relative risk of injury for other factors (such as gender, hours of work, level of qualification, industry, etc) in some cases increases the risk of injury attributable to occupation (including textile trades, other sales, elementary sales & service) and in others decreases the risk (security, health associate professionals, operatives and elementary transport occupations). However, there remains a wide range of variation in the adjusted relative risk of injury between occupation groups. The adjusted relative risks show that workers employed in metal & vehicle trades have nearly a 500 per cent higher risk of workplace injury than workers in clerical occupations (the reference category), even after adjusting for the differences in risk found between men and women. Other occupations with a high relative risk of workplace injury include security, other elementary occupations, elementary transport occupations, operatives and elementary sales & service occupations. These occupation groups have a risk of injury 250 per cent or more higher than the risk associated with clerical occupations.

4.16 Figure 4.6 shows the unadjusted and adjusted relative risks of workplace injury by industry. In contrast to the occupation effects when other factors are controlled for the relative risk of injury attributable to industry of employment is considerably reduced in all industries. Relative to workers in financial services only four sectors have a 50 per cent or more higher risk of workplace injury (mining, agriculture, hotels & restaurants and health & social work). Although the unadjusted relative risks show that workers in construction have more than 150 per cent higher risk of workplace injury than workers in financial services the difference in risk between these industrial sectors is found to be insignificant in the adjusted risks.

4.17 The following analysis relates to the relative risk of reportable workplace injuries between sub-groups in terms unadjusted and adjusted relative risks. Contrasts are made, where relevant, with the above analysis of relative risks of all workplace injuries.

Figure 4.1: Relative risk of injury by gender, age and tenure

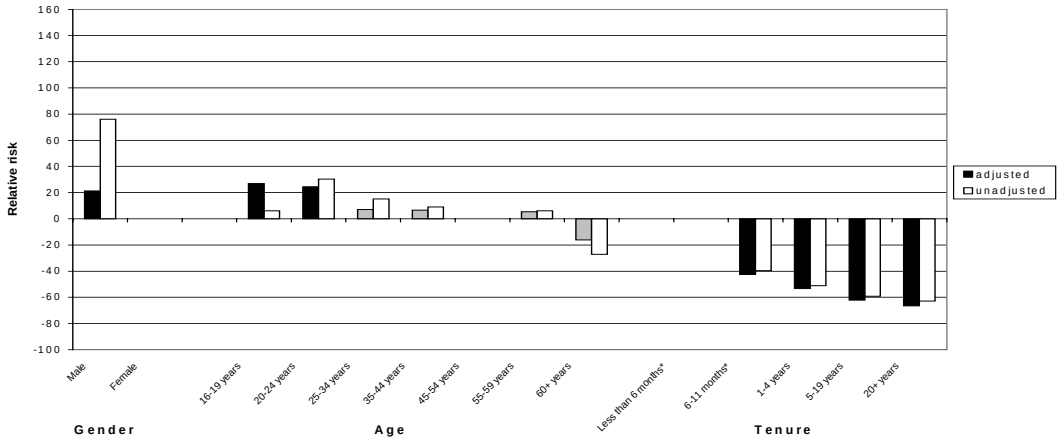


Figure 4.2: Relative risk of injury by qualification level

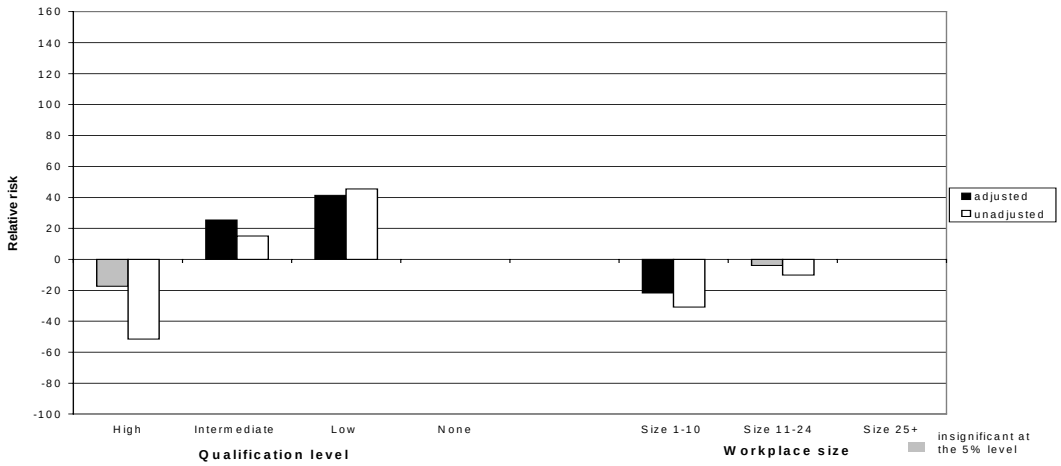
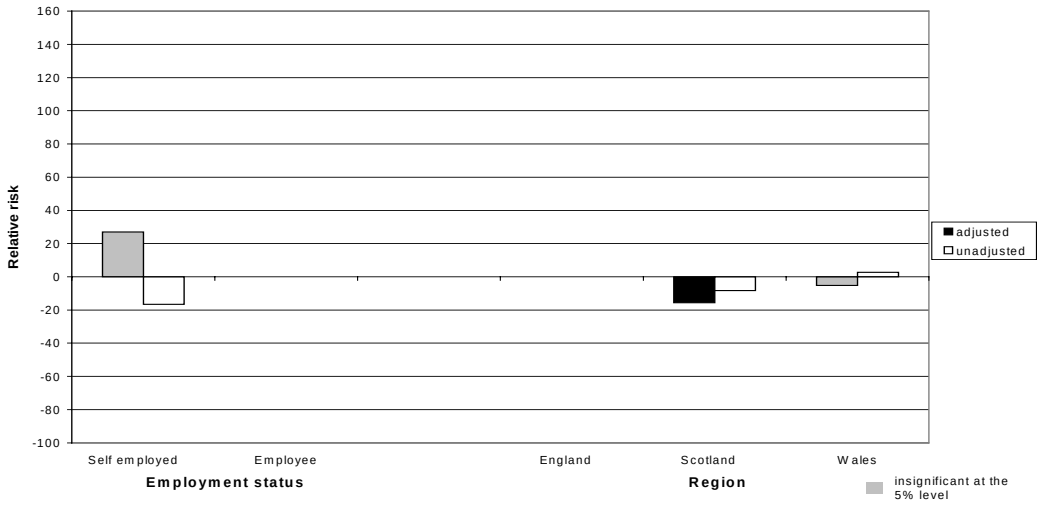


Figure 4.3: Relative risk of injury by region of residence



Source: Labour Force Survey, Winter 1996/97

Figure 4.4: Relative risk of injury by weekly hours, contract, status and sector

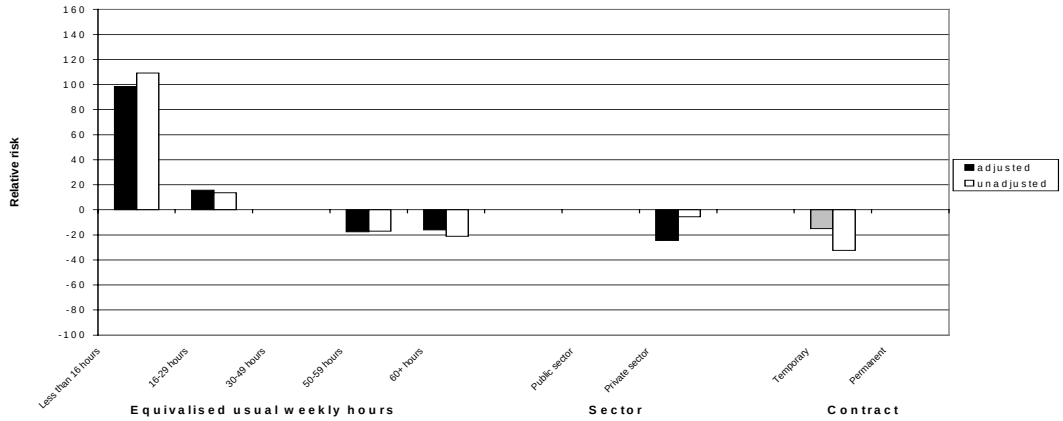


Figure 4.5: Relative risk of injury by occupation

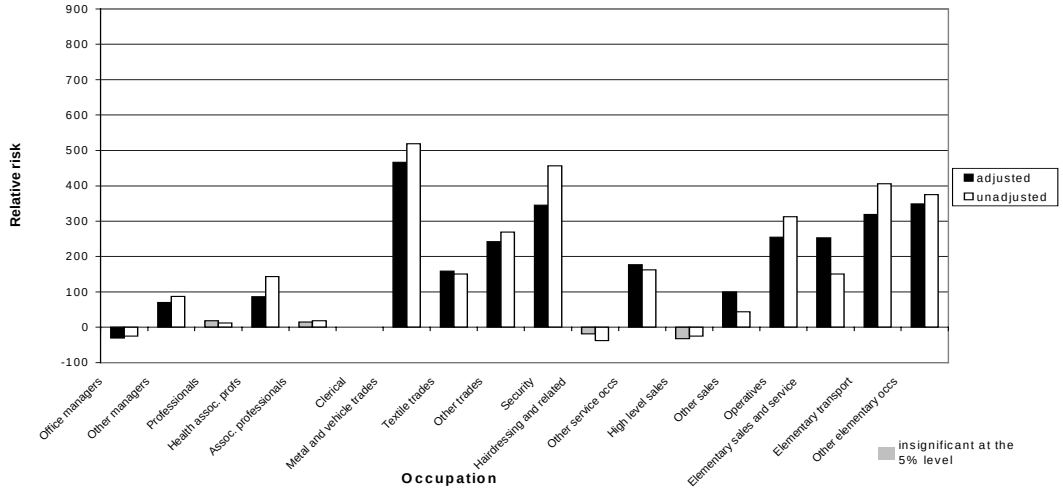
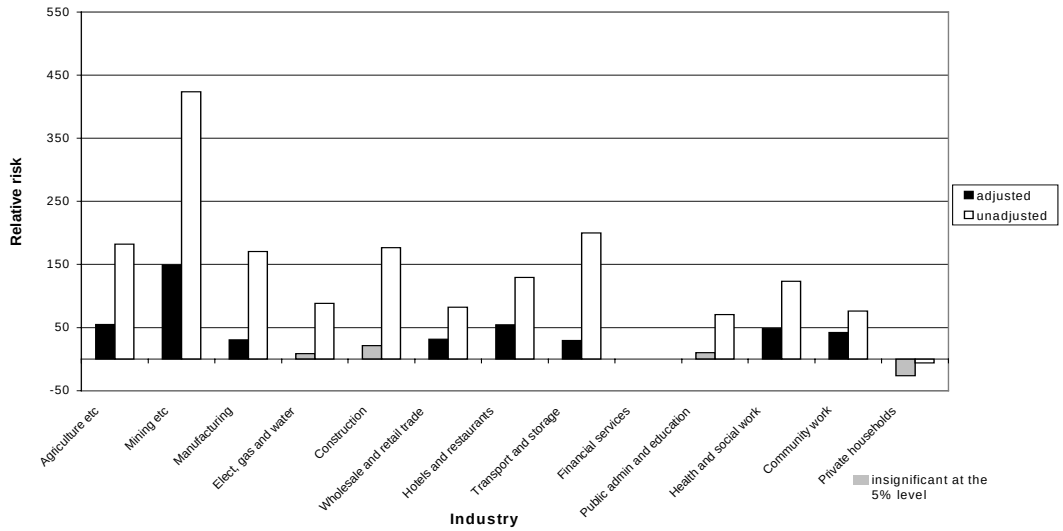


Figure 4.6: Relative risk of injury by industry and workplace size



Source: Labour Force Survey, Winter 1996/97

4.18 After adjusting for other factors, men continue to face a higher risk of reportable injury than women (35 per cent higher) (Figure 4.7). The relative risk of injury between men and women is higher for reportable workplace injuries than for all workplace injuries. There is no statistically significant variation in the adjusted relative risk of reportable workplace injury between age groups (Figure 4.7). Job tenure under 12 months has been adjusted for time exposure (described in 4.10 above). Reportable workplace injury rates are highest for workers who have been employed in their current job for less than 12 months. Workers who have been employed in their current job for more than one year are approximately 60 per cent less likely to suffer a reportable workplace injury (Figure 4.7).

4.19 High level qualifications are associated with lower risks of reportable workplace injury and low level qualifications with higher risks relative to intermediate level and no qualifications (Figure 4.8). The reason why workers with low level qualifications have higher risk of injury than workers with no qualifications is unclear. Smaller workplaces (1-24 workers) are associated with a lower risk of reportable workplace injury relative to larger workplaces (25+ workers). As this finding is based on self-reporting it is not due to under-reporting of workplace injuries by employers in small workplaces as was previously thought.

4.20 There appears to be no difference in the risk of reportable workplace injury between employees and self-employed workers. Although the unadjusted data shows regional variation in the relative risk of reportable workplace injury there is no statistically significant regional variation in the adjusted relative risks (Figure 4.9).

4.21 Figure 4.10 shows the adjusted and unadjusted relative risks in reportable workplace injuries by hours of work, contract type and sector. Relative risks by equivalised hours of work once again shows the high risk associated with individuals working less than 30 hours per week, particularly less than 16 hours. Workers in the private sector have a lower adjusted risk of reportable workplace injury relative to pubic sector workers. In contrast to risk of all workplace injuries, temporary workers have a significantly lower risk (60 per cent lower) of reportable workplace injury relative to workers on permanent contracts. However, as noted earlier, the majority of temporary workers have been employed in their current job for less than one year (57 per cent). The risk of workplace injury is particularly high for this group but will be picked up by the tenure variables.

4.22 The very high risk of reportable workplace injury faced by workers in elementary transport occupations remains after adjustments for other factors have been made (Figure 4.11). Workers in this occupation group face a 675 per cent higher risk of reportable workplace injury relative to workers in clerical occupations, and around 300 per cent higher risk than workers in metal & vehicle trades and other elementary occupations (the second highest risk occupations). The lowest risks of reportable workplace injury are found

Figure 4.7: Relative risk of reportable injury by gender, age and tenure

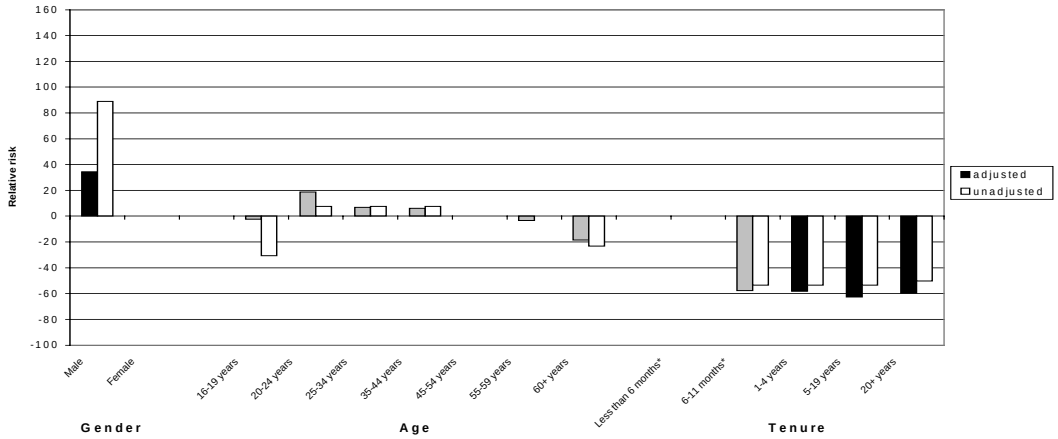


Figure 4.8: Relative risk of reportable injury by level of qualification

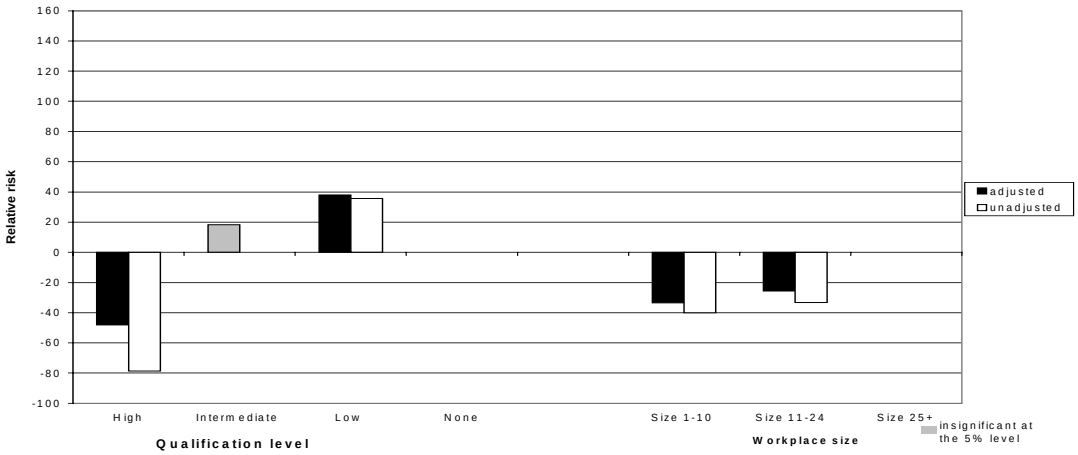
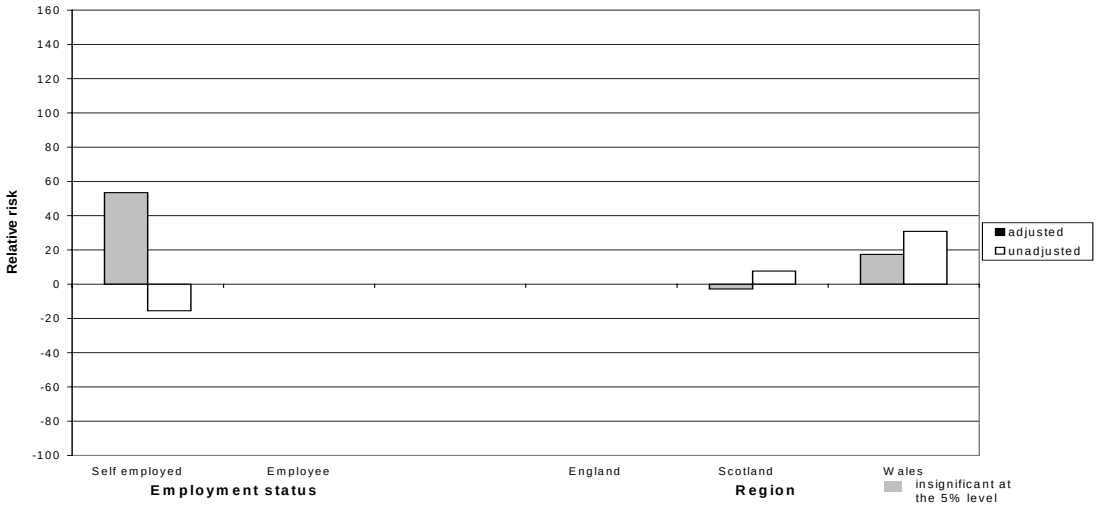


Figure 4.9: Relative risk of reportable injury by region of residence



Source: Labour Force Survey, Winter 1996/97

Figure 4.10: Relative risk of reportable injury by hours, contract, status and sector

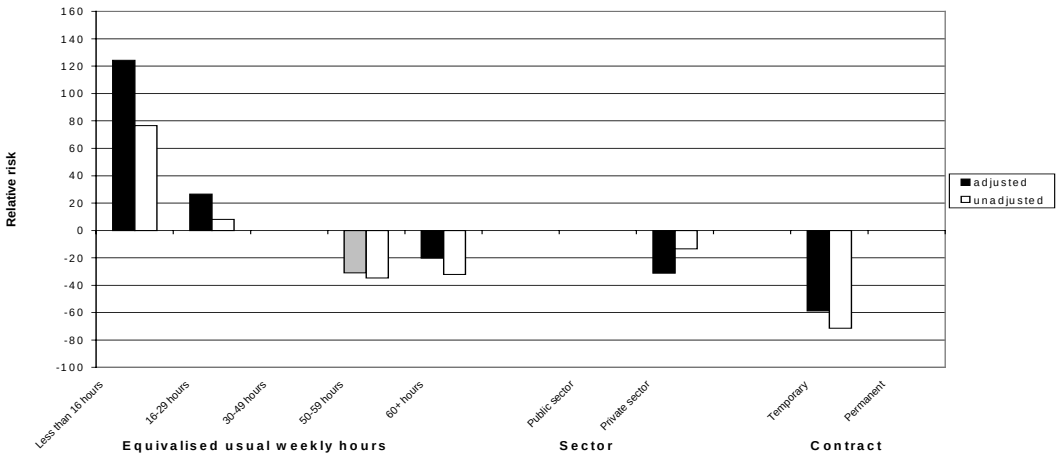


Figure 4.11: Relative risk of reportable injury by occupation

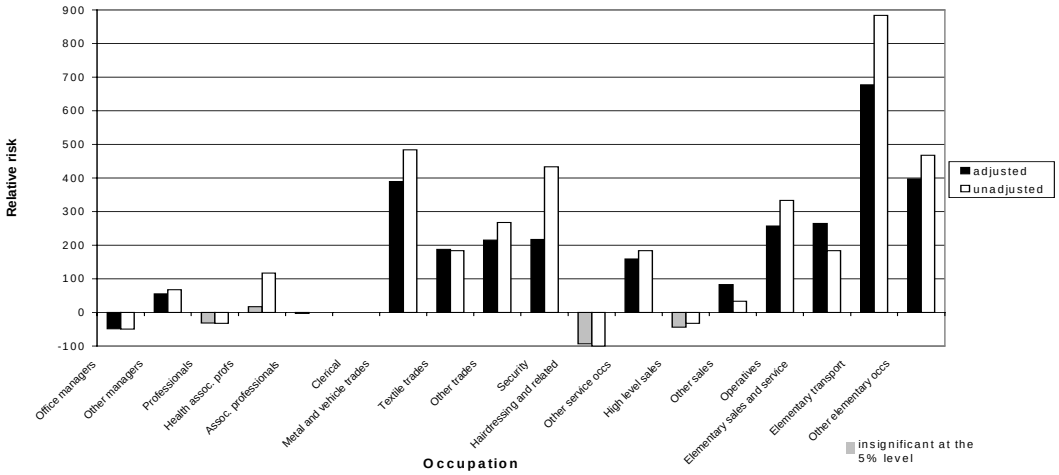
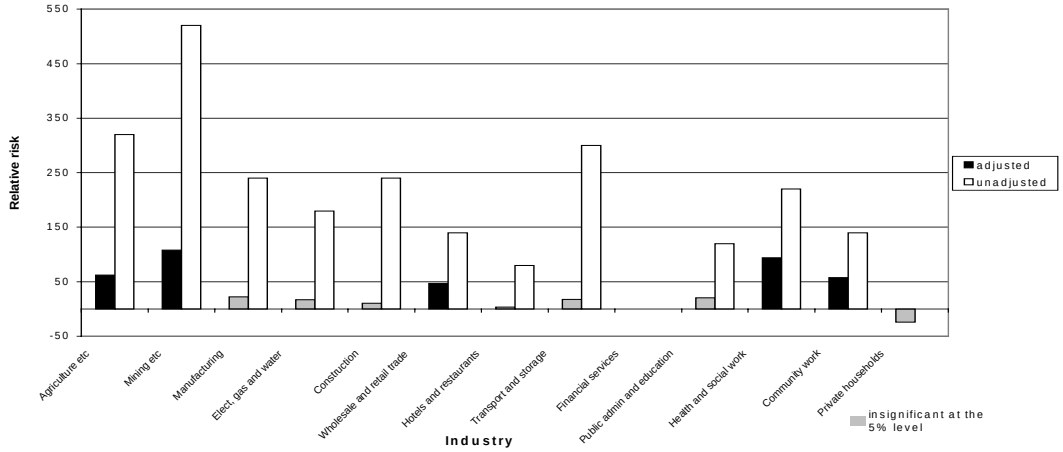


Figure 4.12: Relative risk of reportable injury by industry and workplace size



Source: Labour Force Survey, Winter 1996/97

among office managers, followed by professionals, health associate professionals, associate professionals clerical workers, hairdressing & related occupations and high level sales occupations.

4.23 The relative risk of reportable workplace injury observed in the unadjusted data between industrial sectors (Figure 4.12) nearly disappears in the adjusted relative risks. Mining, agriculture, wholesale & retail trade, health & social work and community work are the only industrial sectors that have a higher risk of reportable workplace injury than financial services. No industrial sector has a statistically significant lower risk of reportable workplace injury relative to financial services. The variations in relative risks in the unadjusted data can, therefore, be attributed to other factors such as occupation, gender, qualifications, hours of work.

4.24 Injury rates for small sub-groups can vary year-by-year. To validate our findings for 1996/97 we repeated the regression analysis using 1995/96 data. The results from these regressions can be found in Appendix Two. Although there was some variation in relative risks, most notably in small sub-groups such as mining, the overall pattern remains largely unchanged.

4.25 In all the regressions we included a variable indicating whether information was provided via a proxy respondent. This was generally found to have a negative and significant effect. This result has not been included in the charts but can be found in Appendix Two.

4.26 It may be the case that the influence of some factors vary between men and women. In the analysis reported above we included men and women in the same model with a variable identifying individual's gender. To see whether the risk of injury is influenced by different factors for men and women, we repeated the above analysis for men and women separately (regression results can be found in Appendix Two).

4.27 In the comparisons between the separate influences on the relative risk of all workplace injuries for men and women in 1996/97 we found that:

- age was insignificant for women, but men aged 16-24 and 35-44 years had a significant higher risk of workplace injury relative to men aged 45-54 years;

- women working in the private sector have lower risks of workplace injury than women working in the public sector. The difference between private and public sector is not statistically significant for men;

- the range of injury risks by occupation for women relative to clerical occupations is much wider than for men. Women working in clerical occupations have the lowest risk of injury while for men three occupation groups (office managers, associate professionals and high level sales occupations) have lower risks of injury compared with men

in clerical occupations. This may be due to differences in the types of jobs men do in clerical occupations compared with women;

- women in textile trades have a high risk of injury compared with women in clerical occupations. For men there is no statistically significant difference in the risk associated with working in textile trades or clerical occupations. Women in other elementary occupations have the highest risk of workplace injury while men in metal & vehicle trades face the highest risk;

- there is no statistically significant variation in the risk of workplace injury for women employed in different industrial sectors. Relative to men employed in financial services men working in mining, agriculture, community work, hotels & restaurants and manufacturing have a 50 per cent or more higher risk of workplace injury;

- small workplaces (1-10 workers) are associated with a lower risk of injury for men but workplace size does not effect the relative risk of injury among women.

4.28 Finally, we included a number of interactive terms into the regressions (small workplace (1-10 workers) and agriculture sector; small workplace (1-10 workers) and construction sector; small workplace (1-10 workers) and hotels & restaurants; female and public administration and education sector; male and aged 16-24 years. None of these terms were found to have an additional affect on the relative risk of workplace injury or reportable workplace injury.

5. Forecasting workplace injuries, 1996-2006

5.1 The preceding results indicate that changes in the structure of employment are most likely to impact upon overall workplace injury rates. Given the wide variation in injury rates by occupation, trends in occupational structure are likely to impact upon the national total of workplace injuries. This is an important issue, in that the observation of a downward trend in injury rates may simply be a result of changes in the structure of employment rather than the outcome of policies and practices designed to safeguard individuals at their workplaces.

5.2 To gain some indication of the future movement of all workplace injuries, we make use of a detailed forecast of employment by occupation, industry and gender made by the Institute for Employment Research. Employment forecasts are developed by the IER in considerable detail, providing projections of employment by gender, occupation and industry sector. Based upon the findings in Sections 3 and 4, key dimensions are identified for the production of this forecast. Eleven occupational categories are utilised, described in Table 5.1. These categories separately distinguish most of the occupational groups shown in Figure 4.11 which have significant and varied risks of workplace injury associated with them. Eleven industrial categories

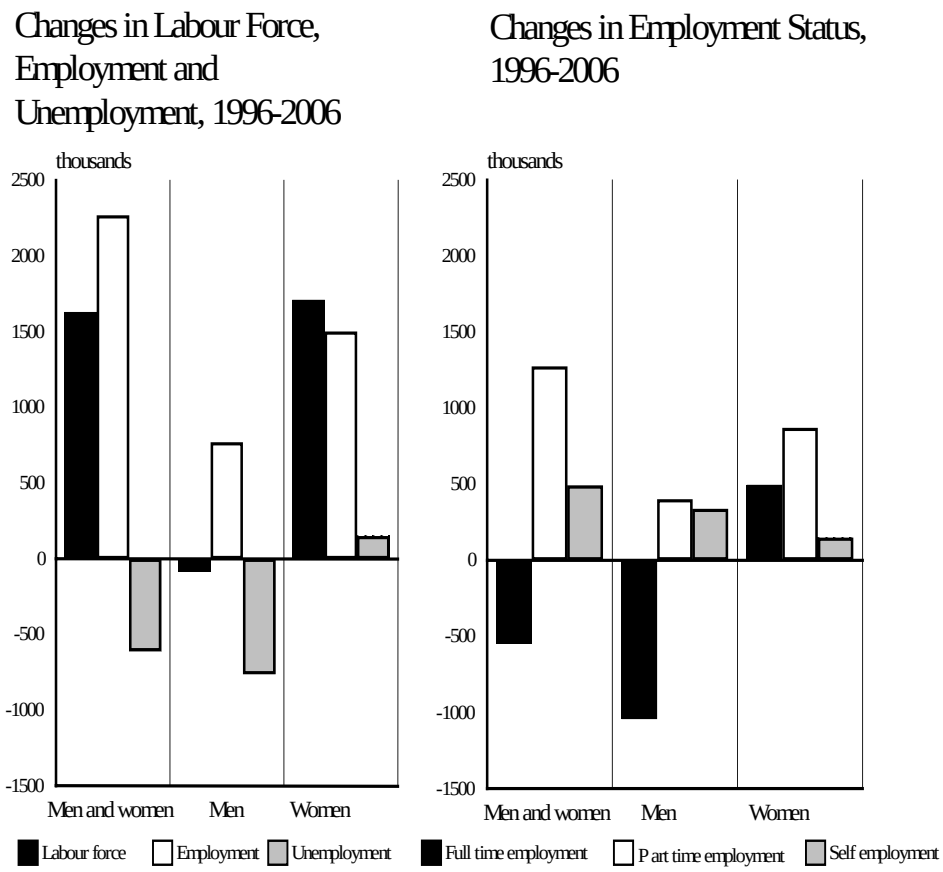
are defined for this forecast (see Table 5.2) again distinguishing sectors which have significant and varying risks of workplace injury.

5.3 The projection of employment utilised for this forecast of workplace injuries is described in detail in Lindley and Wilson (1998). This projection is based upon a fairly neutral set of assumptions regarding the exchange rate, public expenditure plans and fiscal change. GDP is projected to continue to grow throughout this period, but at a lower rate than was observed in the 1990s. Figure 5.1 shows the main changes in the labour force, employment and unemployment, and by status in employment for men and women, projected from 1996 to 2006.

5.4 An important feature of this projection is the change in the composition of employment by industry and occupation. Employment in distribution, transport, business and miscellaneous services is expected to increase significantly over this ten year period, with a decline in the level of employment in agriculture, utilities and manufacturing. Occupational changes are most evident in the 'white collar' occupations and personal service occupations.

5.5 A number of factors which have been shown as important in delineating the risk of workplace injury are not explicitly modelled in this forecast. In particular, changes in working hours towards more part-time working will tend to reduce overall injury rates (even though the 'exposure risk' is greater). Any continuing decline in job tenure will have an opposite influence on trends in injury rates. While we have insufficient data to model these influences directly, it seems likely that they may have a significant effect on the overall estimates given in this report.

Figure 5.1



Source: IER Estimates

5.6 In developing a forecast of workplace injuries, *no account has been taken of future changes in injury rates*. These rates have been determined from the four Labour Force Surveys interrogated in this study, providing an average view of LFS-based injury rates prevailing in the period 1993/94 to 1996/97. This represents a conservative view of changes in injury rates, given that both RIDDOR and the LFS reveal a continuing decline in reportable non-fatal injuries over the first half of the current decade. Under this assumption the projection of workplace injuries reveals only the expected effect of changes in the structure and level of employment over the ten year period.

5.7 Table 5.3 indicates that, assuming no change in injury rates, reported injuries are expected to rise between 1996 and 2006. There are two main reasons for this. First, the continuing expansion of employment in 'white collar' occupations more than offsets the decline in employment in the primary and manufacturing sector. While injury rates are higher in the latter sectors, the scale of the expansion in employment in white collar occupations is such that this more than outweighs the decline in employment in elementary occupations. Second, the growth of employment in personal service occupations and the associated risks of injury in this occupational area contribute significantly to the forecast increase in reportable injuries,

especially for women. Details of the forecast changes by occupational group and gender are given in Table 5.4.

Table 5.1: Occupational categories used for forecasting workplace injuries

Occupational category	SOC90 Sub-major groups
Management, professional, clerical and technical	1.1 – 4.2
Skilled engineering trades	5.2
Construction and other skilled trades	5.1, 5.3
Protective service occupations	6.1
Personal service occupations	6.2
Buyers, brokers and sales representatives	7.1
Other sales occupations	7.2
Industrial plant and machine operators, assemblers	8.1
Drivers and mobile machine operators	8.2
Other occupations in agriculture, forestry and fishing	9.1
Other elementary occupations (exc. Agriculture)	9.2

Table 5.2: Industrial categories used for forecasting workplace injuries

Industrial category	SIC92 Sections
Agriculture, forestry and fishing	A, B
Mining and quarrying	C
Manufacturing, electricity gas and water supply	D, E
Construction	F
Wholesale and retail trade, motor vehicle repair	G
Hotels and restaurants	H
Transport, storage and communication	I
Financial intermediation, real estate, renting and business activities	J, K
Public administration, education	L, M
Health and social work	N
Other community, personal services, private households	O, P, Q

Table 5.3: Estimated and forecast workplace injuries, for all workplace injuries, all workplace injuries excluding road traffic accidents and reportable injuries

(thousands)

	All workplace injuries	Workplace injuries (exc. road accidents	Reportable injuries
Estimated[1] number of workplace injuries, 1996	1,092.6	1,022.6	378.8
Forecast[2] number of workplace injuries, 2006	1,152.6	1,078.3	395.4

Notes: (1) Applying average rates recorded in 1993/94 to 1996/67 LFS, disaggregated by gender, industry and occupation, to 1996 estimates of employment (Lindley and Wilson, 1998).

(2) Applying same injury rates as in (1) above to forecast of employment by industry and occupation (Lindley and Wilson, 1998).

Table 5.4: Forecast change in reportable injuries, 1996-2006 by occupation groups and gender

(thousands)

	Forecast change in reportable injuries, 1996-2006		
Occupation groups	**Males**	**Females**	**Total**
1.1 – 4.2	+5.1	+5.9	+11.0
5.2	-4.2	+0.3	-3.9
5.1, 5.3	-4.5	-0.8	-5.3
6.1	+0.7	+0.5	+1.2
6.2	+4.8	+11.2	+16.0
7.1	-0.6	+0.3	-0.3
7.2	+0.4	+1.6	+2.0
8.1	+1.5	+0.6	+2.1
8.2	+0.4	+0.2	+0.6
9.1	-1.5	-	-1.5
9.2	+0.6	-5.2	-4.6
Total	+2.8	+14.6	+17.4

5.8 Finally, we show in Table 5.5 the forecast change in reportable workplace injuries by countries of Great Britain. In Wales and Scotland the forecast changes in reportable workplace injuries which derive from the effect of changing employment structure are negligible, reflecting the fact that most of the rapid growth in 'white collar' occupations is located in the South East of the country.

Table 5.5: Estimated and forecast reportable injuries, 1996 and 2006 by country and gender

(thousands)

		Males	Females	Total
1996				
	England	220.9	100.3	321.2
	Wales	13.0	5.9	18.9
	Scotland	24.8	13.9	38.7
	Great Britain	258.7	120.1	378.8
2006				
	England	225.2	112.2	337.4
	Wales	12.8	6.4	19.2
	Scotland	23.4	15.4	38.8
	Great Britain	261.4	134.0	395.4
Forecast change 1996-2006				
	England	+4.3	+11.9	+16.2
	Wales	-0.2	+0.5	+0.3
	Scotland	-1.4	+1.5	+0.1
	Great Britain	+2.8	+14.7	+17.5

5.9 In conclusion, we show that, if there is no decline in injury rates by occupation and industry sector over the ten year period 1996 to 2006, we would expect workplace injuries to rise by more than 5 per cent. We have also shown that a higher risk of workplace injury is associated with shorter working hours and lower job tenure. Trends towards these factors are likely to contribute further to higher overall levels of workplace injury.

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APPENDIX 1

Table AI: Number of workplace injuries (unweighted)

	1993/94	1994/95	1995/96	1996/97
All	2912	2770	2613	2663
Gender				
Male	1976	1868	1783	1778
Female	936	902	830	885
Age Group				
16-19 years	153	140	123	157
20-24 years	341	294	292	293
25-24 years	858	810	707	739
35-44 years	705	690	642	652
45-54 years	592	594	571	552
55-59 years	169	148	191	174
60+ years	94	94	87	96
Qualifications				
Degree and above	179	197	175	185
O level to degree	1677	1591	1538	1612
Up to O level	511	539	490	514
None	533	436	403	341
Region of Residence				
England	2484	2395	2248	2300
Wales	152	131	140	133
Scotland	276	244	225	230
Workplace Size				
1-10 workers	463	410	390	412
11-24 workers	313	337	295	311
25 or more workers	1820	1739	1624	1664
Occupation				
Office based managers	107	129	108	110
Other managers	155	151	132	145
Professionals	165	174	164	133
Health associate professionals	85	84	76	81
Other associate professionals	149	117	96	119
Clerical	196	233	163	194
Metal and vehicle trades	176	129	162	154
Textile trades	35	25	19	26
Other trades	488	411	430	375
Security	151	125	125	125
Hairdressers and related	4	9	11	4
Other service occupations	253	249	248	273
High level sales	23	37	22	31
Other sales	140	136	126	132
Operatives	442	440	457	453
Elementary sales and service	150	141	114	141
Elementary transport	30	29	26	22
Other elementary	157	148	132	144
Industry Sector				
Agriculture etc	75	67	65	59
Mining	31	14	17	24
Manufacturing	704	656	637	628
Elect, gas & water	28	22	24	15
Construction	302	244	267	236
Trade	417	408	349	386
Hotels & restaurants	116	123	128	132
Transport	227	243	223	250
Financial services	197	188	178	192
Public admin & educ	343	336	306	304
Health & social work	322	315	301	307
Community work	131	143	108	119
Private households	18	8	9	9
Extra territorial	0	1	0	0

Source: Labour Force Surveys (Winter quarters)

Table AII: Number of non-road workplace injuries (unweighted)

	1993/94	1994/95	1995/96	1996/97
All	2747	2570	2446	2457
Gender				
Male	1855	1722	1659	1632
Female	892	848	787	825
Age Group				
16-19 years	149	130	120	149
20-24 years	323	269	275	272
25-24 years	802	739	643	677
35-44 years	662	645	608	606
45-54 years	558	561	541	502
55-59 years	161	135	181	163
60+ years	92	91	78	88
Qualifications				
Degree and above	159	178	159	160
O level to degree	1579	1474	1439	1483
Up to O level	484	501	460	480
None	514	410	383	325
Region of Residence				
England	2335	2208	2102	2127
Wales	146	125	134	119
Scotland	266	237	210	211
Workplace Size				
1-10 workers	440	373	365	371
11-24 workers	301	314	277	291
25 or more workers	1724	1637	1525	1553
Occupation				
Office based managers	91	109	87	95
Other managers	145	141	120	133
Professionals	154	161	149	118
Health associate professionals	81	77	72	72
Other associate professionals	136	102	92	102
Clerical	191	216	155	180
Metal and vehicle trades	170	125	156	150
Textile trades	35	25	19	25
Other trades	463	393	411	349
Security	136	116	112	113
Hairdressers and related	3	7	8	3
Other service occupations	247	233	239	257
High level sales	17	27	19	18
Other sales	134	128	121	127
Operatives	419	405	421	419
Elementary sales and service	145	139	112	139
Elementary transport	27	27	26	20
Other elementary	148	137	125	136
Industry Sector				
Agriculture etc	71	65	61	57
Mining	29	13	17	23
Manufacturing	678	630	614	602
Elect, gas & water	27	21	23	14
Construction	289	226	250	219
Trade	396	380	326	350
Hotels & restaurants	113	118	124	129
Transport	200	212	193	218
Financial services	175	162	158	178
Public admin & educ	314	310	284	272
Health & social work	313	294	286	280
Community work	124	129	100	106
Private households	17	8	9	7
Extra territorial	0	1	0	0

Source: Labour Force Surveys (Winter quarters)

Table AIII: Number of reportable workplace injuries (unweighted)

	1993/94	1994/95	1995/96	1996/97
All	1064	954	940	919
Gender				
Male	727	653	626	617
Female	337	301	314	302
Age Group				
16-19 years	49	38	28	39
20-24 years	125	108	105	95
25-24 years	288	258	238	245
35-44 years	257	242	145	239
45-54 years	235	215	208	201
55-59 years	74	57	83	64
60+ years	36	36	33	36
Qualifications				
Degree and above	40	35	36	37
O level to degree	560	535	536	547
Up to O level	212	210	198	195
None	248	170	168	137
Region of Residence				
England	888	805	791	774
Wales	57	46	55	54
Scotland	119	103	94	91
Workplace Size				
1-10 workers	142	115	125	126
11-24 workers	117	101	81	91
25 or more workers	698	654	627	609
Occupation				
Office based managers	27	22	24	29
Other managers	45	44	32	50
Professionals	42	42	36	24
Health associate professionals	28	28	34	25
Other associate professionals	52	25	35	35
Clerical	73	67	59	72
Metal and vehicle trades	66	44	57	55
Textile trades	14	7	5	10
Other trades	174	148	163	129
Security	43	39	48	40
Hairdressers and related	1	1	1	0
Other service occupations	108	99	86	99
High level sales	4	12	6	7
Other sales	50	44	49	47
Operatives	194	198	186	168
Elementary sales and service	58	62	55	55
Elementary transport	15	14	15	15
Other elementary	69	58	48	58
Industry Sector				
Agriculture etc	24	24	25	24
Mining	12	2	8	8
Manufacturing	270	245	229	219
Elect, gas & water	12	8	8	6
Construction	132	96	110	80
Trade	139	124	125	138
Hotels & restaurants	31	44	37	29
Transport	83	92	84	87
Financial services	55	57	57	61
Public admin & educ	104	93	95	102
Health & social work	139	118	123	122
Community work	57	47	34	39
Private households	6	4	5	2
Extra territorial	0	0	0	0

Source: Labour Force Surveys (Winter quarter)

APPENDIX 2

Logistic Regression Results

Variable labels

Gender

MALE	male
REFERENCE	*female*

Age

A16_19	aged 16-19 years
A20_24	aged 20-24 years
A25_34	aged 25-34 years
A35_44	aged 35-44 years
REFERENCE	*aged 45-54 years*
A55_59	aged 55-59 years
A60PLUS	aged 60+ years

Qualifications

Q_DEGREE	degree and above
Q_OUP	O lev to below degree
Q_TOO	Under O lev
REFERENCE	*no qualifications*
Q_NA	quals - no answer

Occupations

O_OFFICE	office managers
O_MAN	other managers
O_PROF	professionals
REFERENCE	*clerical*
O_HEALTH	health assoc. prof
O_ASSOC	other assoc. prof
O_METAL	metal and vehicle
O_TEXT	textile
O_TRADE	other trades
O_SEC	security
O_HAIR	hairdressers and related
O_SERV	other service
O_HSALE	high level sales
O_SALE	other sales
O_OPER	operatives
O_ELEMS	elementary sales
O_ELEMT	elementary transport
O_ELEMO	other elementary
O_NA	occupation not available

Sectors

S_AG	agri, forestry
S_MINE	mining
S_MAN	manufacturing
S_ELEC	elec, gas and water
S_CONST	construction
S_WHOLE	wholesale and retail
S_HOTEL	hotels and restaurants
S_TRANS	transport and storage
REFERENCE	*financial services*
S_PUBLIC	public admin
S_HEALTH	health and social work
S_COMM	other community
S_PRIV	private household
S_ET	extra territorial
S_OUT	outside UK
S_NA	industry sector not available

Workplace size

WP1_10	workplace size 1 - 10
WP11_24	workplace size 11 - 24
REFERENCE	*workplace size 25 or more*
WP_NA	workplace size not known

Weekly usual hours of work

HRS_1	hrs 0 - 15
HRS_2	hrs 16 - 29
REFERENCE	*hrs 30 - 49*
HRS_4	hrs 50 - 59
HRS_5	hrs 60+
HRS_NA	hrs - not known

Employment tenure

REFERENCE	*less than 6 months*
TEN2	6 - 12 months
TEN3	1 - 5 years
TEN4	5 - 20 years
TEN5	20 + years
TEN_NA	job tenure not known

Employment status

REFERENCE	*employee*
E_SE	self employed

Region of residence

REFERENCE	*region - England*
R_SCOT	region - Scotland
R_WALES	region - Wales

Type of response

REFERENCE	*Proxy respondent*
NOT_PROX	Not proxy response

Public/private sector

SECT_PRI	sector - private
REFERENCE	*sector - public*
SECT_NA	sector - no answer / not applicable

Type of job contract

REFERENCE	*permanent*
J_TEMP	temporary
J_NA	job type not known

All non-road workplace injuries (Winter 1996/97)

Logistic Regression
Winter 1996/97
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2

Model A : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1

```
      Total number of cases:      63393 (Unweighted)
      Number of selected cases:   63393
      Number of unselected cases: 0

      Number of selected cases:                 63393
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 63393

Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELA

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   19395.829

* Constant is included in the model.

Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 6 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood    18056.150
Goodness of Fit      64555.190
Cox & Snell - R^2         .021
Nagelkerke - R^2          .021

                     Chi-Square    df Significance

 Model                 1339.679    65        .0000
 Block                 1339.679    65        .0000
 Step                  1339.679    65        .0000


---------------------- Variables in the Equation --------------------

Variable            B      S.E.      Sig     Exp(B)
MALE            .1919     .0611    .0017     1.2115
A16_19          .2380     .1206    .0484     1.2687
A20_24          .2189     .0894    .0144     1.2447
A25_34          .0674     .0666    .3116     1.0697
A35_44          .0641     .0650    .3245     1.0662
A55_59          .0516     .0960    .5909     1.0529
A60PLUS        -.1751     .1238    .1572      .8394
Q_DEGREE       -.1916     .1225    .1179      .8256
Q_OUP           .2261     .0713    .0015     1.2537
Q_TOO           .3457     .0791    .0000     1.4129
```

Q_NA	-.3991	.3670	.2768	.6709
O_OFFICE	-.3646	.1571	.0203	.6945
O_MAN	.5302	.1262	.0000	1.6992
O_PROF	.1712	.1397	.2203	1.1868
O_HEALTH	.6195	.1666	.0002	1.8580
O_ASSOC	.1410	.1399	.3134	1.1514
O_METAL	1.7339	.1316	.0000	5.6627
O_TEXT	.9503	.2310	.0000	2.5866
O_TRADE	1.2290	.1141	.0000	3.4178
O_SEC	1.4928	.1447	.0000	4.4494
O_HAIR	-.2104	.5996	.7257	.8103
O_SERV	1.0169	.1199	.0000	2.7645
O_HSALE	-.3916	.2938	.1826	.6760
O_SALE	.6937	.1452	.0000	2.0010
O_OPER	1.2668	.1097	.0000	3.5494
O_ELEMS	1.2594	.1327	.0000	3.5235
O_ELEMT	1.4312	.2608	.0000	4.1838
O_ELEMO	1.5013	.1385	.0000	4.4875
O_NA	-3.0677	6.5110	.6375	.0465
S_AG	.4388	.1816	.0157	1.5509
S_MINE	.9133	.2424	.0002	2.4925
S_MAN	.2666	.1039	.0103	1.3056
S_ELEC	.0826	.2897	.7755	1.0861
S_CONST	.1948	.1235	.1147	1.2150
S_WHOLE	.2747	.1120	.0142	1.3161
S_HOTEL	.4332	.1392	.0019	1.5423
S_TRANS	.2590	.1199	.0308	1.2956
S_PUBLIC	.0977	.1285	.4470	1.1027
S_HEALTH	.3940	.1294	.0023	1.4830
S_COMM	.3521	.1385	.0110	1.4221
S_PRIV	-.3064	.4263	.4723	.7361
S_ET	-3.9547	5.2275	.4493	.0192
S_OUT	-3.5175	6.6221	.5953	.0297
S_NA	.5842	1.0405	.5745	1.7936
WP1_10	-.2439	.0697	.0005	.7836
WP11_24	-.0407	.0710	.5670	.9601
WP_NA	-.1858	.1306	.1549	.8304
HRS_1	-.9828	.1184	.0000	.3743
HRS_2	-.4411	.0855	.0000	.6433
HRS_4	.1638	.0652	.0120	1.1780
HRS_5	.3365	.0819	.0000	1.4001
HRS_NA	-.0399	.2227	.8578	.9609
TEN2	.5674	.1158	.0000	1.7636
TEN3	.6975	.0970	.0000	2.0086
TEN4	.4864	.1004	.0000	1.6265
TEN5	.3669	.1210	.0024	1.4433
TEN_NA	.3971	.6008	.5087	1.4874
E_SE	.2391	.3931	.5430	1.2701
R_SCOT	-.1700	.0776	.0284	.8437
R_WALES	-.0532	.1012	.5995	.9482
NOT_PROX	.2167	.0485	.0000	1.2420
SECT_PRI	-.2787	.0821	.0007	.7568
SECT_NA	-.5597	.3338	.0936	.5714
J_TEMP	-.1608	.1099	.1434	.8515
J_NA	-.4505	.3971	.2567	.6373
Constant	-4.9166	.1838	.0000	

All reportable workplace injuries (Winter 1996/97)

Logistic Regression
Winter 1996/97
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2

Model B : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1
and if goback = 1 or 2 or 8

```
Total number of cases:      63393 (Unweighted)
Number of selected cases:   63393
Number of unselected cases: 0
Number of selected cases:   63393
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 63393



Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELB

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   8854.9627

* Constant is included in the model.


Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 7 because
Log Likelihood decreased by less than .01 percent.

 -2 Log Likelihood     8183.400
 Goodness of Fit      68081.582
 Cox & Snell - R^2         .011
 Nagelkerke - R^2          .011

                     Chi-Square    df Significance

 Model                  671.563    65        .0000
 Block                  671.563    65        .0000
 Step                   671.563    65        .0000

---------------------- Variables in the Equation -----------------------
Variable           B      S.E.     Sig    Exp(B)

MALE           .2959     .1025    .0039    1.3443
A16_19        -.0237     .2173    .9130     .9765
A20_24         .1713     .1477    .2462    1.1869
A25_34         .0662     .1069    .5361    1.0684
A35_44         .0599     .1027    .5599    1.0617
A55_59        -.0328     .1514    .8283     .9677
```

A60PLUS	-.2057	.1907	.2808	.8141
Q_DEGREE	-.6573	.2362	.0054	.5183
Q_OUP	.1673	.1096	.1269	1.1821
Q_TOO	.3220	.1206	.0076	1.3799
Q_NA	-.8882	.7181	.2161	.4114
O_OFFICE	-.6665	.2801	.0174	.5135
O_MAN	.4364	.2065	.0346	1.5471
O_PROF	-.3878	.2683	.1483	.6785
O_HEALTH	.1515	.2740	.5803	1.1636
O_ASSOC	-.0375	.2349	.8730	.9632
O_METAL	1.5872	.2115	.0000	4.8899
O_TEXT	1.0549	.3562	.0031	2.8716
O_TRADE	1.1455	.1831	.0000	3.1441
O_SEC	1.1520	.2328	.0000	3.1644
O_HAIR	-2.7497	3.5148	.4340	.0639
O_SERV	.9506	.1890	.0000	2.5872
O_HSALE	-.5778	.5222	.2685	.5611
O_SALE	.5981	.2377	.0119	1.8187
O_OPER	1.2720	.1753	.0000	3.5681
O_ELEMS	1.2935	.2040	.0000	3.6456
O_ELEMT	2.0500	.3204	.0000	7.7681
O_ELEMO	1.6034	.2134	.0000	4.9699
O_NA	-3.4419	10.0472	.7319	.0320
S_AG	.4830	.2865	.0918	1.6209
S_MINE	.7342	.3993	.0659	2.0838
S_MAN	.2041	.1793	.2549	1.2264
S_ELEC	.1576	.4444	.7228	1.1707
S_CONST	.0986	.2103	.6393	1.1036
S_WHOLE	.3832	.1892	.0428	1.4669
S_HOTEL	.0314	.2635	.9053	1.0319
S_TRANS	.1642	.2017	.4156	1.1784
S_PUBLIC	.1870	.2154	.3852	1.2057
S_HEALTH	.6637	.2133	.0019	1.9421
S_COMM	.4564	.2285	.0458	1.5783
S_PRIV	-.2763	.7320	.7058	.7586
S_ET	-3.8892	8.5569	.6495	.0205
S_OUT	-3.3414	10.7908	.7568	.0354
S_NA	1.8186	1.0601	.0863	6.1634
WP1_10	-.4089	.1177	.0005	.6644
WP11_24	-.2974	.1250	.0173	.7427
WP_NA	-.2515	.2178	.2483	.7777
HRS_1	-.8599	.1961	.0000	.4232
HRS_2	-.3517	.1357	.0096	.7035
HRS_4	-.0144	.1111	.8972	.9857
HRS_5	.2847	.1345	.0343	1.3293
HRS_NA	.0796	.3431	.8166	1.0828
TEN2	.2612	.2089	.2113	1.2984
TEN3	.5861	.1659	.0004	1.7969
TEN4	.4742	.1693	.0051	1.6068
TEN5	.5517	.1956	.0048	1.7362
TEN_NA	-3.1331	5.4513	.5655	.0436
E_SE	.4276	.7203	.5527	1.5336
R_SCOT	-.0279	.1197	.8154	.9724
R_WALES	.1593	.1490	.2851	1.1727
NOT_PROX	.1189	.0772	.1237	1.1263
SECT_PRI	-.3716	.1282	.0037	.6896
SECT_NA	-1.9005	1.0081	.0594	.1495
J_TEMP	-.8839	.2527	.0005	.4132
J_NA	-.5615	.7290	.4412	.5704
Constant	-5.6160	.3007	.0000	

All non-road workplace injuries (Winter 1995/96)

Logistic Regression

Winter 1995/96
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2

Model A : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1

```
Total number of cases:      64022 (Unweighted)
      Number of selected cases:   64022
      Number of unselected cases: 0

      Number of selected cases:                 64022
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 64022


Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1



Dependent Variable..   MODELA

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   19738.407

* Constant is included in the model.


Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 6 because
Log Likelihood decreased by less than .01 percent.

 -2 Log Likelihood    18288.473
 Goodness of Fit      64113.270
 Cox & Snell - R^2         .022
 Nagelkerke - R^2          .022

                     Chi-Square    df Significance

 Model                 1449.934    65        .0000
 Block                 1449.934    65        .0000
 Step                  1449.934    65        .0000
```

---------- Variables in the Equation ----------

Variable	B	S.E.	Sig	Exp(B)
MALE	.2373	.0621	.0001	1.2678
A16_19	.1327	.1254	.2900	1.1419
A20_24	.1516	.0867	.0803	1.1637
A25_34	-.0170	.0656	.7954	.9831
A35_44	-.0053	.0635	.9336	.9947
A55_59	.0924	.0902	.3059	1.0968
A60PLUS	-.3294	.1275	.0098	.7194
Q_DEGREE	-.4393	.1205	.0003	.6445
Q_OUP	.0966	.0665	.1462	1.1015
Q_TOO	.1065	.0754	.1574	1.1124
Q_NA	-.1224	.4646	.7921	.8848
O_OFFICE	-.5634	.1681	.0008	.5693
O_MAN	.4739	.1298	.0003	1.6063
O_PROF	.3557	.1350	.0084	1.4272
O_HEALTH	.4887	.1703	.0041	1.6302
O_ASSOC	.2830	.1404	.0439	1.3271
O_METAL	1.8265	.1327	.0000	6.2123
O_TEXT	.6051	.2659	.0229	1.8314
O_TRADE	1.3991	.1133	.0000	4.0517
O_SEC	1.4475	.1455	.0000	4.2524
O_HAIR	.5020	.4007	.2102	1.6520
O_SERV	.9540	.1213	.0000	2.5961
O_HSALE	-.0975	.2690	.7170	.9071
O_SALE	.9192	.1450	.0000	2.5072
O_OPER	1.2568	.1112	.0000	3.5141
O_ELEMS	.9884	.1411	.0000	2.6870
O_ELEMT	1.8139	.2361	.0000	6.1342
O_ELEMO	1.2825	.1441	.0000	3.6057
O_NA	-.3876	1.0166	.7030	.6787
S_AG	.7006	.1771	.0001	2.0150
S_MINE	.4956	.2720	.0685	1.6415
S_MAN	.2948	.1068	.0058	1.3429
S_ELEC	.4969	.2370	.0360	1.6435
S_CONST	.4147	.1225	.0007	1.5140
S_WHOLE	.3025	.1170	.0097	1.3533
S_HOTEL	.6925	.1418	.0000	1.9987
S_TRANS	.2486	.1247	.0462	1.2822
S_PUBLIC	.2978	.1292	.0212	1.3469
S_HEALTH	.6306	.1315	.0000	1.8788
S_COMM	.3607	.1447	.0126	1.4343
S_PRIV	.0329	.3989	.9342	1.0335
S_ET	-3.8335	5.1876	.4599	.0216
S_OUT	-3.3315	6.7643	.6224	.0357
S_NA	.2141	1.0414	.8371	1.2387
WP1_10	-.2440	.0697	.0005	.7835
WP11_24	-.0667	.0716	.3517	.9355
WP_NA	-.0362	.1237	.7698	.9644
HRS_1	-1.0674	.1221	.0000	.3439
HRS_2	-.5387	.0892	.0000	.5835
HRS_4	.2391	.0632	.0002	1.2700
HRS_5	.2917	.0816	.0004	1.3387
HRS_NA	-.1330	.2871	.6431	.8754
TEN2	.2706	.1163	.0200	1.3107
TEN3	.4599	.0923	.0000	1.5840
TEN4	.3102	.0946	.0010	1.3636
TEN5	.2362	.1139	.0381	1.2664
TEN_NA	.3924	.5252	.4549	1.4806
E_SE	-.1486	.3159	.6382	.8619
R_SCOT	-.2038	.0779	.0089	.8156
R_WALES	.0583	.0954	.5411	1.0600
NOT_PROX	.4548	.0499	.0000	1.5759

SECT_PRI	-.1943	.0807	.0161	.8234
SECT_NA	-.1519	.3220	.6370	.8591
J_TEMP	-.2958	.1201	.0138	.7440
J_NA	-.2372	.3200	.4585	.7888
Constant	-4.9003	.1819	.0000	

All reportable workplace injuries (Winter 1995/96)

Logistic Regression

Winter 1995/96
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2

Model B : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1
and if goback = 1 or 2 or 8

```
Total number of cases:      64022 (Unweighted)
      Number of selected cases:   64022
      Number of unselected cases: 0

      Number of selected cases:                 64022
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 64022


Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1


Dependent Variable..   MODELB

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   9190.3503

* Constant is included in the model.


Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 7 because
Log Likelihood decreased by less than .01 percent.

 -2 Log Likelihood     8458.000
 Goodness of Fit      65105.909
 Cox & Snell - R^2         .011
 Nagelkerke - R^2          .011

                     Chi-Square    df Significance

 Model                  732.350    65        .0000
 Block                  732.350    65        .0000
 Step                   732.350    65        .0000

---------------------- Variables in the Equation --------------------

Variable           B      S.E.     Sig   Exp(B)

MALE           .1464     .1019   .1508   1.1576
A16_19        -.4228     .2507   .0917    .6552
A20_24         .0995     .1395   .4760   1.1046
A25_34        -.0817     .1048   .4357    .9216
```

A35_44	.0529	.0994	.5945	1.0544
A55_59	.2427	.1347	.0716	1.2747
A60PLUS	-.2564	.1971	.1931	.7738
Q_DEGREE	-.7635	.2195	.0005	.4660
Q_OUP	.0519	.1034	.6161	1.0532
Q_TOO	.1579	.1144	.1674	1.1711
Q_NA	-.1692	.7261	.8157	.8443
O_OFFICE	-.6408	.2973	.0311	.5269
O_MAN	.3054	.2305	.1853	1.3571
O_PROF	.2477	.2408	.3035	1.2811
O_HEALTH	.6114	.2603	.0188	1.8429
O_ASSOC	.4657	.2269	.0401	1.5931
O_METAL	1.8783	.2158	.0000	6.5421
O_TEXT	.4283	.4782	.3704	1.5347
O_TRADE	1.4967	.1850	.0000	4.4667
O_SEC	1.7339	.2308	.0000	5.6627
O_HAIR	-.2800	1.0502	.7897	.7558
O_SERV	.9729	.1991	.0000	2.6455
O_HSALE	-.1213	.4741	.7980	.8857
O_SALE	1.0360	.2350	.0000	2.8181
O_OPER	1.4658	.1794	.0000	4.3308
O_ELEMS	1.2440	.2157	.0000	3.4693
O_ELEMT	2.3369	.3164	.0000	10.3487
O_ELEMO	1.2234	.2360	.0000	3.3987
O_NA	.8492	1.0184	.4044	2.3378
S_AG	.9430	.2835	.0009	2.5675
S_MINE	.6389	.3963	.1070	1.8943
S_MAN	.1749	.1760	.3203	1.1911
S_ELEC	.3179	.3919	.4173	1.3742
S_CONST	.6093	.1959	.0019	1.8391
S_WHOLE	.3257	.1926	.0908	1.3850
S_HOTEL	.4516	.2483	.0690	1.5708
S_TRANS	.3203	.1980	.1058	1.3775
S_PUBLIC	.0136	.2126	.9488	1.0137
S_HEALTH	.6242	.2119	.0032	1.8667
S_COMM	.2493	.2397	.2983	1.2832
S_PRIV	.4844	.5351	.3653	1.6233
S_ET	-4.0830	8.3991	.6269	.0169
S_OUT	-3.1480	10.9888	.7745	.0429
S_NA	-3.2719	8.6605	.7056	.0379
WP1_10	-.4283	.1156	.0002	.6516
WP11_24	-.4365	.1290	.0007	.6463
WP_NA	.0188	.2075	.9276	1.0190
HRS_1	-.9322	.1954	.0000	.3937
HRS_2	-.5441	.1411	.0001	.5803
HRS_4	.1288	.1028	.2100	1.1375
HRS_5	-.0576	.1462	.6937	.9440
HRS_NA	.0052	.4203	.9901	1.0052
TEN2	.3686	.2152	.0867	1.4458
TEN3	.7340	.1715	.0000	2.0833
TEN4	.6488	.1734	.0002	1.9132
TEN5	.4287	.2014	.0333	1.5352
TEN_NA	1.3207	.6219	.0337	3.7459
E_SE	-.0972	.6073	.8729	.9074
R_SCOT	-.0039	.1155	.9731	.9961
R_WALES	.1542	.1477	.2964	1.1667
NOT_PROX	.4322	.0799	.0000	1.5407
SECT_PRI	-.2715	.1243	.0289	.7622
SECT_NA	-.5413	.5973	.3648	.5820
J_TEMP	-.3783	.2125	.0750	.6850
J_NA	-.4918	.6161	.4247	.6115
Constant	-5.9552	.3038	.0000	

All non-road workplace injuries – males (Winter 1996/97)

Logistic Regression
Winter 1996/97
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2
and if sex = 1 (male)

Model A : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1

```
      Total number of cases:      33767 (Unweighted)
      Number of selected cases:   33767
      Number of unselected cases: 0

      Number of selected cases:                 33767
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 33767

Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELA

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   12286.686

* Constant is included in the model.

Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 6 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood    11397.998
Goodness of Fit      34381.180
Cox & Snell - R^2         .026
Nagelkerke - R^2          .026

                     Chi-Square    df Significance

 Model                  888.688    64        .0000
 Block                  888.688    64        .0000
 Step                   888.688    64        .0000


---------------------- Variables in the Equation -----------------------

Variable           B      S.E.     Sig     Exp(B)

A16_19         .3505     .1536   .0225     1.4198
A20_24         .3936     .1094   .0003     1.4824
A25_34         .1216     .0841   .1481     1.1293
A35_44         .1648     .0812   .0425     1.1792
A55_59        -.0113     .1216   .9261      .9888
A60PLUS       -.1621     .1466   .2687      .8503
Q_DEGREE      -.4870     .1666   .0035      .6145
```

Q_OUP	.2238	.0893	.0123	1.2508
Q_TOO	.3905	.0998	.0001	1.4778
Q_NA	-.6053	.4639	.1919	.5459
O_OFFICE	-.8666	.2155	.0001	.4204
O_MAN	.0386	.1629	.8128	1.0393
O_PROF	-.2772	.1934	.1518	.7579
O_HEALTH	.4155	.3661	.2564	1.5151
O_ASSOC	-.5123	.1972	.0094	.5991
O_METAL	1.2628	.1564	.0000	3.5354
O_TEXT	.1464	.4087	.7202	1.1576
O_TRADE	.7102	.1430	.0000	2.0343
O_SEC	1.0544	.1807	.0000	2.8703
O_HAIR	-4.0182	7.7587	.6045	.0180
O_SERV	.6846	.2001	.0006	1.9830
O_HSALE	-1.0502	.3781	.0055	.3499
O_SALE	.1832	.2343	.4342	1.2011
O_OPER	.7897	.1410	.0000	2.2028
O_ELEMS	.8403	.2126	.0001	2.3170
O_ELEMT	.9460	.2743	.0006	2.5754
O_ELEMO	.9324	.1705	.0000	2.5407
O_NA	-4.0613	8.7353	.6420	.0172
S_AG	.6405	.2088	.0022	1.8974
S_MINE	1.0326	.2599	.0001	2.8083
S_MAN	.4190	.1310	.0014	1.5205
S_ELEC	.2854	.3017	.3441	1.3303
S_CONST	.3292	.1467	.0248	1.3898
S_WHOLE	.3191	.1434	.0261	1.3758
S_HOTEL	.4568	.2023	.0240	1.5791
S_TRANS	.3439	.1472	.0195	1.4105
S_PUBLIC	.2446	.1788	.1713	1.2771
S_HEALTH	.3791	.2168	.0804	1.4610
S_COMM	.5921	.1774	.0008	1.8077
S_PRIV	.2742	.6056	.6508	1.3154
S_ET	-3.9818	6.1915	.5202	.0187
S_OUT	-3.3971	7.1909	.6366	.0335
S_NA	.8074	1.0529	.4432	2.2421
WP1_10	-.2926	.0896	.0011	.7463
WP11_24	-.0656	.0927	.4793	.9365
WP_NA	-.2443	.1537	.1120	.7833
HRS_1	-1.3261	.2623	.0000	.2655
HRS_2	-.4221	.1780	.0177	.6556
HRS_4	.1266	.0715	.0767	1.1350
HRS_5	.2827	.0892	.0015	1.3266
HRS_NA	-.0573	.2551	.8221	.9443
TEN2	.5361	.1484	.0003	1.7093
TEN3	.7088	.1240	.0000	2.0315
TEN4	.5480	.1272	.0000	1.7298
TEN5	.4362	.1473	.0031	1.5469
TEN_NA	.6675	.6128	.2760	1.9493
E_SE	-.1810	.3995	.6505	.8345
R_SCOT	-.1754	.0963	.0686	.8391
R_WALES	-.0465	.1258	.7120	.9546
NOT_PROX	.2202	.0566	.0001	1.2464
SECT_PRI	-.1793	.1158	.1217	.8359
SECT_NA	-.0455	.3489	.8963	.9555
J_TEMP	-.2440	.1522	.1090	.7835
J_NA	.0619	.4044	.8783	1.0639
Constant	-4.5163	.2502	.0000	

Reportable workplace injuries – males (Winter 1996/97)

Logistic Regression
Winter 1995/96
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2
and if sex = 1 (male)

Model B : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1
and if goback = 1 or 2 or 8

```
      Total number of cases:      33767 (Unweighted)
      Number of selected cases:   33767
      Number of unselected cases: 0

      Number of selected cases:                 33767
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 33767

Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELB

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   5726.359

* Constant is included in the model.

Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 8 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood     5264.725
Goodness of Fit      34712.425
Cox & Snell - R^2         .014
Nagelkerke - R^2          .014

                     Chi-Square    df Significance

 Model                  461.634    64        .0000
 Block                  461.634    64        .0000
 Step                   461.634    64        .0000


---------------------- Variables in the Equation -----------------------

Variable           B      S.E.       Sig     Exp(B)

A16_19         .0824     .2626     .7538     1.0858
A20_24         .1094     .1842     .5525     1.1157
A25_34         .0910     .1324     .4918     1.0953
A35_44         .1520     .1263     .2290     1.1641
A55_59        -.2072     .1998     .2997      .8128
A60PLUS       -.2200     .2270     .3324      .8025
```

Q_DEGREE	-.8099	.3216	.0118	.4449
Q_OUP	.1464	.1364	.2833	1.1576
Q_TOO	.4092	.1500	.0064	1.5056
Q_NA	-5.0760	6.5900	.4411	.0062
O_OFFICE	-1.3896	.3656	.0001	.2492
O_MAN	-.3696	.2508	.1406	.6910
O_PROF	-1.5982	.4145	.0001	.2023
O_HEALTH	-.4918	.6525	.4510	.6115
O_ASSOC	-.9442	.3154	.0028	.3890
O_METAL	.9372	.2317	.0001	2.5528
O_TEXT	-.0045	.6135	.9941	.9955
O_TRADE	.4353	.2074	.0358	1.5455
O_SEC	.3761	.2738	.1697	1.4565
O_HAIR	-5.2340	21.1386	.8044	.0053
O_SERV	.2095	.3122	.5022	1.2331
O_HSALE	-2.3625	1.0170	.0202	.0942
O_SALE	-.5025	.4335	.2464	.6050
O_OPER	.6052	.2023	.0028	1.8317
O_ELEMS	.5551	.3188	.0816	1.7421
O_ELEMT	1.3299	.3342	.0001	3.7806
O_ELEMO	.8189	.2460	.0009	2.2681
O_NA	-4.9908	22.0325	.8208	.0068
S_AG	.7423	.3274	.0234	2.1007
S_MINE	.7178	.4425	.1048	2.0498
S_MAN	.3606	.2249	.1089	1.4341
S_ELEC	.3413	.4654	.4633	1.4068
S_CONST	.1739	.2514	.4890	1.1899
S_WHOLE	.2947	.2442	.2274	1.3427
S_HOTEL	.3138	.3608	.3844	1.3686
S_TRANS	.2486	.2460	.3123	1.2823
S_PUBLIC	.5068	.2939	.0847	1.6599
S_HEALTH	.6517	.3529	.0648	1.9188
S_COMM	.7537	.2875	.0087	2.1248
S_PRIV	.0825	1.0342	.9364	1.0860
S_ET	-4.8394	16.7570	.7727	.0079
S_OUT	-4.1766	19.3202	.8288	.0154
S_NA	2.0681	1.0851	.0567	7.9095
WP1_10	-.5046	.1542	.0011	.6037
WP11_24	-.3324	.1632	.0417	.7172
WP_NA	-.2775	.2570	.2801	.7576
HRS_1	-.9458	.4081	.0205	.3884
HRS_2	-.2576	.2800	.3575	.7729
HRS_4	-.0525	.1194	.6598	.9488
HRS_5	.1343	.1487	.3667	1.1437
HRS_NA	-.1466	.4201	.7271	.8636
TEN2	.2264	.2578	.3799	1.2541
TEN3	.5587	.2046	.0063	1.7485
TEN4	.4453	.2076	.0319	1.5610
TEN5	.4055	.2355	.0852	1.5000
TEN_NA	-4.2342	10.6242	.6902	.0145
E_SE	.0260	.7299	.9716	1.0263
R_SCOT	-.0476	.1497	.7505	.9535
R_WALES	.2645	.1768	.1348	1.3028
NOT_PROX	.1166	.0896	.1931	1.1237
SECT_PRI	-.1898	.1799	.2914	.8272
SECT_NA	-1.4372	1.0207	.1591	.2376
J_TEMP	-.9042	.3306	.0062	.4048
J_NA	-.0268	.7411	.9712	.9736
Constant	-4.8290	.3918	.0000	

All non-road workplace injuries – females (Winter 1996/97)

Logistic Regression
Winter 1996/97
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2
and if sex = 2 (female)

Model A : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1

```
      Total number of cases:      29626 (Unweighted)
      Number of selected cases:   29626
      Number of unselected cases: 0

      Number of selected cases:                 29626
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 29626

Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELA

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   6929.5289

* Constant is included in the model.

Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 7 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood     6528.944
 Goodness of Fit      29293.029
 Cox & Snell - R^2         .013
 Nagelkerke - R^2          .013

                     Chi-Square    df Significance

 Model                  400.585    64        .0000
 Block                  400.585    64        .0000
 Step                   400.585    64        .0000


---------------------- Variables in the Equation -----------
Variable            B      S.E.      Sig      Exp (B)
A16_19          .0304     .2027    .8808      1.0309
A20_24         -.2061     .1610    .2005       .8137
A25_34         -.0922     .1120    .4106       .9119
A35_44         -.1561     .1107    .1585       .8555
A55_59          .2124     .1573    .1769      1.2367
A60PLUS        -.1431     .2380    .5476       .8666
Q_DEGREE        .2448     .1886    .1942      1.2774
Q_OUP           .2850     .1219    .0194      1.3297
Q_TOO           .2671     .1324    .0437      1.3062
```

Q_NA	.0794	.5982	.8945	1.0826
O_OFFICE	-.0026	.2299	.9910	.9974
O_MAN	.8566	.2216	.0001	2.3552
O_PROF	.3702	.2090	.0766	1.4480
O_HEALTH	.7658	.1980	.0001	2.1508
O_ASSOC	.6807	.1980	.0006	1.9753
O_METAL	-3.8610	10.0863	.7019	.0210
O_TEXT	1.6600	.3065	.0000	5.2593
O_TRADE	1.4773	.3549	.0000	4.3810
O_SEC	1.7433	.3446	.0000	5.7163
O_HAIR	.5813	.6220	.3500	1.7884
O_SERV	1.2557	.1563	.0000	3.5103
O_HSALE	.4036	.4682	.3886	1.4973
O_SALE	.8975	.2030	.0000	2.4534
O_OPER	1.5986	.2148	.0000	4.9460
O_ELEMS	1.4950	.1753	.0000	4.4595
O_ELEMT	-3.0984	19.6179	.8745	.0451
O_ELEMO	2.3776	.2789	.0000	10.7793
O_NA	-1.7376	13.9767	.9011	.1759
S_AG	-.4042	.4452	.3640	.6675
S_MINE	.7192	1.0332	.4863	2.0529
S_MAN	-.2338	.2023	.2477	.7915
S_ELEC	-3.9257	5.8783	.5042	.0197
S_CONST	-.7021	.5953	.2383	.4955
S_WHOLE	.1959	.1857	.2913	1.2164
S_HOTEL	.2432	.2000	.2240	1.2753
S_TRANS	.0959	.2404	.6901	1.1006
S_PUBLIC	-.2268	.1910	.2351	.7971
S_HEALTH	.1864	.1758	.2889	1.2049
S_COMM	-.0901	.2306	.6960	.9139
S_PRIV	-.8094	.6072	.1825	.4451
S_ET	-4.6172	16.3252	.7773	.0099
S_OUT	-3.5514	29.8928	.9054	.0287
S_NA	-2.7080	12.7901	.8323	.0667
WP1_10	-.1988	.1126	.0775	.8197
WP11_24	-.0181	.1116	.8710	.9821
WP_NA	-.1303	.2602	.6166	.8779
HRS_1	-.8907	.1390	.0000	.4104
HRS_2	-.4313	.1013	.0000	.6496
HRS_4	.3077	.1603	.0549	1.3604
HRS_5	.6602	.2144	.0021	1.9351
HRS_NA	-.0965	.4629	.8349	.9080
TEN2	.6209	.1857	.0008	1.8606
TEN3	.6509	.1563	.0000	1.9174
TEN4	.3131	.1654	.0583	1.3677
TEN5	.1654	.2299	.4720	1.1798
TEN_NA	-3.8548	9.7445	.6924	.0212
E_SE	4.0477	4.4317	.3611	57.2650
R_SCOT	-.1456	.1317	.2690	.8645
R_WALES	-.0684	.1712	.6894	.9339
NOT_PROX	.2228	.0952	.0193	1.2496
SECT_PRI	-.3735	.1194	.0018	.6883
SECT_NA	-4.7207	4.1650	.2570	.0089
J_TEMP	-.0648	.1599	.6853	.9373
J_NA	-4.5153	4.4326	.3084	.0109
Constant	-4.7217	.2812	.0000	

Reportable workplace injuries – females (Winter 1996/97)

Logistic Regression
Winter 1996/97
main filter: if age>=16
and if uresmc < 20
and if inecaca = 1 or 2
and if sex = 2 (female)

Model B : dependant variable = 1 if accdnt = 1
and if road = 2
and if wchjb = 1
and if goback = 1or 2 or 8

```
      Total number of cases:      29626 (Unweighted)
      Number of selected cases:   29626
      Number of unselected cases: 0

      Number of selected cases:                 29626
      Number rejected because of missing data:  0
      Number of cases included in the analysis: 29626

Dependent Variable Encoding:

Original       Internal
Value          Value
     .00       0
    1.00       1

Dependent Variable..   MODELB

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   3055.6738

* Constant is included in the model.

Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 9 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood     2801.633
Goodness of Fit      30914.272
Cox & Snell - R^2         .009
Nagelkerke - R^2          .009

                    Chi-Square    df Significance

 Model                  254.041    64        .0000
 Block                  254.041    64        .0000
 Step                   254.041    64        .0000

---------------------- Variables in the Equation -----------

Variable           B      S.E.     Sig      Exp(B)
A16_19        -.3513     .4105   .3922       .7038
A20_24         .2070     .2520   .4113      1.2300
A25_34        -.0573     .1868   .7590       .9443
A35_44        -.1461     .1821   .4225       .8641
A55_59         .2358     .2360   .3178      1.2659
A60PLUS       -.2285     .3643   .5304       .7957
Q_DEGREE      -.4150     .3583   .2467       .6603
Q_OUP          .2656     .1894   .1610      1.3042
```

Q_TOO	.1035	.2111	.6239	1.1091
Q_NA	.4513	.7416	.5428	1.5704
O_OFFICE	-.0792	.4320	.8545	.9239
O_MAN	1.2980	.3626	.0003	3.6621
O_PROF	.5713	.3778	.1305	1.7706
O_HEALTH	.5982	.3364	.0754	1.8189
O_ASSOC	.8360	.3478	.0162	2.3070
O_METAL	-4.6906	26.8618	.8614	.0092
O_TEXT	2.2218	.5010	.0000	9.2238
O_TRADE	1.2213	.7536	.1051	3.3918
O_SEC	2.0800	.5204	.0001	8.0043
O_HAIR	-3.5583	9.5973	.7108	.0285
O_SERV	1.5900	.2649	.0000	4.9039
O_HSALE	1.2266	.6213	.0483	3.4096
O_SALE	1.0303	.3350	.0021	2.8018
O_OPER	1.6263	.4003	.0000	5.0849
O_ELEMS	1.9013	.2860	.0000	6.6947
O_ELEMT	-3.4824	52.8436	.9475	.0307
O_ELEMO	3.0095	.4414	.0000	20.2774
O_NA	-1.8422	35.9518	.9591	.1585
S_AG	-.9520	.8193	.2453	.3860
S_MINE	1.9910	1.0555	.0592	7.3228
S_MAN	-.5247	.3744	.1610	.5917
S_ELEC	-4.7698	15.6390	.7604	.0085
S_CONST	-.0121	.7474	.9871	.9880
S_WHOLE	.5123	.3068	.0949	1.6691
S_HOTEL	-.5149	.3998	.1977	.5976
S_TRANS	-.2957	.4437	.5051	.7440
S_PUBLIC	-.3977	.3291	.2269	.6719
S_HEALTH	.3296	.3001	.2719	1.3905
S_COMM	-.1811	.4012	.6517	.8344
S_PRIV	-.8252	1.0471	.4306	.4381
S_ET	-5.6796	42.8003	.8944	.0034
S_OUT	-4.1602	80.2421	.9587	.0156
S_NA	-3.6946	33.0114	.9109	.0249
WP1_10	-.3006	.1848	.1039	.7404
WP11_24	-.2511	.1961	.2003	.7779
WP_NA	-.4281	.4700	.3624	.6518
HRS_1	-.7684	.2333	.0010	.4638
HRS_2	-.3329	.1622	.0401	.7168
HRS_4	.0493	.3110	.8740	1.0505
HRS_5	1.1431	.3178	.0003	3.1366
HRS_NA	.6400	.6000	.2862	1.8964
TEN2	.3816	.3580	.2864	1.4646
TEN3	.6333	.2856	.0266	1.8838
TEN4	.4829	.2959	.1027	1.6208
TEN5	.9435	.3557	.0080	2.5690
TEN_NA	-4.7478	25.9716	.8549	.0087
E_SE	4.6401	11.2678	.6805	103.5500
R_SCOT	.0059	.2014	.9766	1.0059
R_WALES	-.0778	.2794	.7807	.9252
NOT_PROX	.1251	.1538	.4161	1.1333
SECT_PRI	-.5625	.1943	.0038	.5698
SECT_NA	-5.5944	11.1130	.6147	.0037
J_TEMP	-.8684	.3948	.0279	.4196
J_NA	-5.2362	11.2690	.6422	.0053
Constant	-5.7960	.4862	.0000	

APPENDIX 3

Male, GB

Reportable Injury Rate (exc. Road accidents)

Industry sections	SOC sub-major group 1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	All
A+B	2.1	2.5	2.8	*	*	*	29.2	3.0	4.4	3.1	2.3	2.6
C	0.8	3.7	7.3	*	*	*	*	3.5	3.3	*	2.1	2.8
D+E	1.0	2.7	3.4	*	*	0.7	1.7	3.8	3.6	4.6	3.9	2.4
F	0.8	3.6	2.9	*	3.8	*	4.0	2.4	2.8	*	4.0	2.6
G	1.1	1.4	2.8	2.5	2.6	0.7	1.3	2.1	3.6	4.6	1.7	1.6
H	0.9	9.8	1.9	7.9	1.1	*	*	4.9	*	*	3.5	1.5
I	1.3	2.2	5.2	1.3	3.9	*	*	2.6	3.1	*	4.5	2.7
J+K	0.4	2.2	3.4	1.8	3.6	0.8	1.1	3.5	4.3	10.1	1.8	0.8
L+M	0.7	1.8	5.3	4.3	2.3	*	*	*	2.0	7.2	2.5	1.7
N	0.8	*	1.3	*	4.2	*	*	5.5	4.0	*	4.6	1.7
O,P+Q	1.4	1.4	3.3	3.1	1.1	*	*	1.7	6.2	*	4.5	2.1
All	0.9	2.6	3.2	3.6	2.1	0.7	1.3	3.6	3.4	3.3	3.5	2.0

Female, GB

Reportable Injury Rate (exc. road accidents)

Industry sections	SOC sub-major group 1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	All
A+B	0.6	*	0.9	*	*	*	*	*	*	0.9	5.1	0.8
C	2.4	*	*	*	*	*	*	*	*	*	*	2.1
D+E	0.4	0.7	1.4	*	0.9	0.6	0.4	2.0	1.9	*	1.2	1.0
F	0.6	8.5	*	*	*	*	*	11.8	*	*	1.2	0.7
G	0.6	5.2	1.3	6.0	1.2	0.9	1.2	2.7	3.5	*	2.3	1.1
H	0.9	*	*	*	1.1	*	1.4	*	10.8	*	1.5	1.2
I	0.4	*	*	5.0	2.7	*	0.8	3.8	2.9	*	3.0	0.9
J+K	0.5	6.9	2.1	3.7	3.0	0.9	0.5	1.6	4.0	*	0.8	0.6
L+M	0.5	*	2.6	4.7	1.3	*	*	*	10.1	*	1.8	0.8
N	1.2	*	*	*	2.7	*	*	*	3.5	11.1	2.5	1.9
O,P+Q	0.8	*	*	1.7	0.3	*	1.0	2.5	*	15.4	0.9	0.8
All	0.7	1.8	1.3	4.3	1.8	0.7	1.2	2.0	3.6	3.2	1.7	1.1

Note: * = estimated number of injuries too small for reporting

Male, GB, 1996

Reportable Injury excluding road

Industry Sections	SOC sub-major group											
	1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	Total
A+B	4706.8	146.7	261.3	*	*	*	308.8	1408.2	30.7	3515.5	*	10378.0
C	169.7	262.6	572.3	*	*	*	*	295.6	290.2	*	127.1	1717.6
D+E	9503.1	13743.6	17957.6	*	*	491.8	268.3	13733.7	11982.1	*	8500.2	76180.3
F	2393.7	4761.1	20120.6	*	162.9	*	76.3	2020.2	2088.3	*	4721.6	36344.8
G	9871.0	2050.0	8600.2	318.6	2122.8	789.8	3113.1	2689.3	4555.1	*	1475.1	35585.1
H	3263.7	521.4	288.2	515.7	1042.5	*	*	445.6	*	*	2304.3	8381.4
I	4189.6	1850.5	8429.3	200.4	1022.8	*	*	5356.3	6514.9	*	4522.0	32085.6
J+K	5601.4	1205.4	3494.9	1176.6	1966.2	949.7	121.0	2134.0	2725.3	*	1124.2	20498.7
L+M	5176.8	444.9	2406.1	6190.5	826.5	*	*	*	757.5	*	1875.9	17678.1
N	2994.5	*	356.8	*	1584.5	*	*	1071.2	843.2	*	1703.9	8554.1
O,P+Q	5065.1	273.5	1087.2	921.6	401.2	*	*	618.4	2541.8	*	2117.0	13025.7
Total	52935.3	25259.7	63574.5	9323.4	9129.5	2231.2	3887.6	29772.6	32329.2	3515.5	28471.1	260429.5

Male, GB, 2006

Reportable Injury excluding road

Industry Sections	SOC sub-major group											
	1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	Total
A+B	4451.3	167.6	330.9	*	*	*	399.0	2078.0	40.5	2046.7	*	9514.0
C	143.2	153.6	331.6	*	*	*	*	211.3	208.5	*	84.4	1132.6
D+E	10031.0	10627.3	15659.2	*	*	298.8	247.3	13431.0	11305.2	*	8025.6	69625.4
F	2846.8	4267.9	19766.7	*	246.3	*	78.2	2200.7	2205.4	*	5016.0	36628.0
G	10427.9	1996.8	8812.0	459.0	3496.3	588.5	3464.5	3194.9	5229.7	*	1713.6	39383.2
H	3808.3	649.8	390.6	947.2	2192.1	*	*	677.6	*	*	3432.9	12098.5
I	4347.3	1450.5	7051.2	233.5	1340.5	*	*	5250.2	6197.7	*	4327.4	30198.2
J+K	7486.5	1241.5	3793.9	1791.7	3273.4	726.1	138.4	2549.8	3240.4	*	1296.7	25538.4
L+M	4749.3	258.2	1482.5	5344.3	790.5	*	*	*	516.3	*	1241.6	14382.8
N	3025.6	*	275.0	*	1908.6	*	*	917.3	711.3	*	1413.2	8251.0
O,P+Q	6710.4	280.5	1185.8	1246.6	689.9	*	*	761.9	3065.0	*	2503.7	16443.9
Total	58027.6	21093.8	59079.4	10022.3	13937.6	1613.4	4327.4	31272.8	32719.9	2046.7	29055.1	263196.0

Note: * = estimated number of injuries too small for reporting

Female, GB, 1996

Reportable Injury excluding road

Industry Sections	SOC sub-major group 1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	Total
A+B	278.8	*	7.2	*	*	*	*	*	*	330.4	*	616.4
C	162.9	*	*	*	*	*	*	*	*	*	*	162.9
D+E	2085.9	149.0	3429.7	*	403.6	118.4	106.6	5325.8	493.7	*	581.7	12694.5
F	864.1	94.1	*	*	*	*	*	342.2	*	*	59.0	1359.4
G	4375.8	209.1	579.5	271.9	2103.7	354.4	11765.7	1635.4	211.0	*	914.7	22421.1
H	2410.5	*	*	*	3361.7	*	547.1	*	50.5	*	3592.5	9962.3
I	885.6	*	*	98.6	736.8	*	71.0	1025.8	79.9	*	572.6	3470.4
J+K	7518.8	103.1	300.2	189.8	5236.2	503.5	148.3	504.3	124.1	*	724.2	15352.6
L+M	6728.4	*	296.8	1876.4	2456.1	*	*	*	216.2	*	3528.2	15102.1
N	18293.9	*	*	*	12697.7	*	*	*	136.9	*	3974.5	35103.0
O,P+Q	2623.4	*	*	56.0	440.2	*	129.7	570.2	*	*	657.3	4476.7
Total	46228.2	555.2	4613.5	2492.7	27436.0	976.3	12768.4	9403.8	1312.2	330.4	14604.7	120721.3

Female, GB, 2006

Reportable Injury excluding road

Industry sections	SOC sub-major group 1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	Total
A+B	227.1	*	6.2	*	*	*	*	*	*	332.3	*	565.6
C	131.5	*	*	*	*	*	*	*	*	*	*	131.5
D+E	1885.6	174.2	2654.7	*	454.4	116.0	88.4	4902.1	474.3	*	286.3	11035.9
F	1183.6	175.3	*	*	*	*	*	513.6	*	*	40.4	1913.0
G	4803.5	326.1	580.8	353.1	3209.6	446.6	13342.9	1926.9	274.0	*	374.6	25638.3
H	2368.1	*	*	*	4624.2	*	574.0	*	58.5	*	4501.1	12125.9
I	964.9	*	*	136.7	1107.7	*	72.6	1209.4	95.5	*	490.7	4077.6
J+K	9433.2	182.7	355.1	281.8	9309.0	689.9	191.1	733.9	187.5	*	551.3	21915.5
L+M	7640.4	*	261.4	2101.1	3167.4	*	*	*	240.6	*	1142.3	14553.1
N	20425.1	*	*	*	16147.4	*	*	*	148.3	*	1610.5	38331.3
O,P+Q	3067.9	*	*	80.0	661.6	*	146.2	691.2	*	*	384.4	5031.3
Total	52130.9	858.3	3858.2	2952.8	38681.2	1252.5	14415.3	9977.2	1478.6	332.3	9381.8	135318.9

Note: * = estimated number of injuries too small for reporting

GB, Change in Employment 1996 - 2006												
Males	**SOC sub-major group**											
	1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	**Total**
Agriculture etc.	-12353	844	2462	359	199	-35	309	22249	221	-47352	0	-33097
Mining, quarrying	-3188	-2966	-3301	-46	26	-326	-19	-2388	-2483	0	-2062	-16753
Manufacturing, utilities	55139	-116792	-66697	4617	8315	-28118	-1233	-7967	-18742	0	-12078	-183556
Construction	53959	-13659	-12030	1520	2170	-2211	47	7530	4110	0	7284	48720
Wholesale, retail, repair	49995	-3697	7658	5549	52367	-27235	27803	24645	18532	0	14332	169949
Hotels, restaurants	57888	1317	5481	5442	107331	-50	2622	4743	4583	0	32105	221462
Transport communications	12198	-18140	-26290	2552	8062	-2588	-433	-4006	-10388	0	-4321	-43354
Financial services	536358	1679	8715	34761	36161	-27448	1644	11716	11974	0	9562	625122
Public admin, education	-64383	-10299	-17423	-19684	-1581	-3108	-1023	-11217	-12259	0	-25751	-166728
Health, social work	3899	-4662	-6532	377	7764	-789	-424	-2812	-3319	0	-6338	-12836
Community, other	117774	492	2953	10571	25892	-991	684	8574	8387	0	8635	182971
Total	807286	-165883	-105004	46018	246706	-92899	29977	51067	616	-47352	21368	791900

GB, Change in Employment 1996 – 2006												
Females	**SOC sub-major group**											
	1.1 - 4.2	5.2	5.1, 5.3	6.1	6.2	7.1	7.2	8.1	8.2	9.1	9.2	**Total**
Agriculture etc.	-8577	43	-114	5	331	11	-60	173	1	203	0	-7984
Mining, quarrying	-1286	0	-33	-1	-22	-4	-18	-84	-9	0	-124	-1581
Manufacturing, utilities	-48355	3477	-55387	-25	5936	-364	-4397	-21270	-1026	0	-23911	-145322
Construction	51763	953	4647	87	4966	2187	1158	1448	154	0	-1498	65865
Wholesale, retail, repair	71182	2232	98	1357	90506	9803	131322	10880	1812	0	-23941	295251
Hotels, restaurants	-4893	139	-129	125	113436	92	1970	924	74	0	60434	172172
Transport communications	22545	415	-523	758	13730	1750	206	4880	528	0	-2736	41553
Financial services	419024	1155	2642	2495	135597	20681	9388	14288	1593	0	-20366	586497
Public admin, education	194793	244	-1341	4774	56713	570	-209	1070	242	0	-130016	126840
Health, social work	172897	283	-1973	180	127573	179	-806	1234	325	0	-93634	206258
Community, other	56821	193	43	1416	75496	666	1570	4899	606	0	-29518	112192
Total	925914	9134	-52070	11171	624262	35571	140124	18442	4300	203	-265310	1451741

Printed and published by the Health and Safety Executive
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ISBN 0-7176-1829-3