**Manuscript**

**Changing patterns of occupational mortality in the countries of the United Kingdom, 1991-2011: A**

**comparative analysis of linked census-mortality records**

Srinivasa Vittal Katikireddi [1] \* Alastair H Leyland [1]

Martin McKee [2] Kevin Ralston [3] David Stuckler [4]

[1] MRC/CSO Social & Public Health Sciences Unit, University of Glasgow, 200 Renfield Street, Glasgow, G2 3QB.

[2] London School of Hygiene & Tropical Medicine, 15-17 Tavistock Place, London, WC1H 9SH.

[3] School of Social & Political Science, University of Edinburgh, Chrystal MacMillan Building, 15A George Square, Edinburgh, EH8 9LD.

[4] Dondena Research Centre and Department of Policy Analysis and Public Management, University of Bocconi, Via Roentgen, 20136 Milano.

\*Corresponding author e-mail: [vittal.katikireddi@glasgow.ac.uk](mailto:vittal.katikireddi@glasgow.ac.uk)

Words: 3,172

**Abstract**

**Background**

Recent, detailed assessments of occupational mortality rates are lacking. We provide up-to-date assessments of mortality by occupation across the United Kingdom.

**Methods**

We analysed representative samples of working age adults (aged 20-59 years), using linked census and death records. Self-reported main occupation was coded into 60+ groups in the 2001 census, with follow-up for death until the end of 2011. Comparable occupation data were available for Scotland in 1991 and used to assess trends over time. All-cause mortality rates (per 100,000 person- years) were calculated, stratified by sex and age-standardised.

**Findings**

Over three-fold differences in occupational mortality rates were seen during 4.51 million person- years of follow-up. Among men in England, health professionals had the lowest mortality (224.7,

95%CI 145.3-304.1), with managers and teachers also having low rates. The highest mortality occurred in elementary construction jobs (701.3, 95%CI 593.1-809.4), housekeeping jobs and factory workers. Among women, teachers and business professionals experienced low mortality, with factory workers and those in the garment trade having high rates. Mortality rates have generally fallen, but stagnated or even increased amongst women in some occupations, such as cleaners. Simulation models suggest if occupational mortality rates in England/Wales applied to Scotland, there would be 631 fewer men and 273 fewer women of working age dying in Scotland every year.

**Interpretation**

Occupational mortality rates show large differences throughout the UK. The known excess mortality in Scotland is concentrated amongst disadvantaged groups, some experiencing increases in absolute mortality.

**Funding**

Chief Scientist Office, Medical Research Council, Wellcome Trust

248/250

**Research in context**

Evidence before this study

We searched the Medline and Embase databases in May 2015 using terms including ‘occupation’,

‘job’, ‘mortality’ and ‘deaths’ to identify studies which reported occupational mortality rates. Technological and societal developments have brought about major changes in the nature of many occupations in recent decades yet our understanding of occupational patterns of mortality in the United Kingdom still relies largely on studies done in the 1980s. Internationally, occupational mortality rates have been reported in South Korea and New Zealand but these studies are based on relatively few occupational categories. No recent studies which report detailed occupational mortality were identified. Similarly, occupational mortality rates across the UK have not been compared in recent decades.

Added value of this study

Mortality rates continue to show very large variation between occupations amongst the working age population of the UK. Among men, health professionals, managers and teachers had particularly low age-standardised mortality rates. The highest mortality occurred in elementary construction jobs, housekeeping jobs and factory workers. Among women, teachers and business professionals experienced low mortality, with factory workers and those in the garment trade having high mortality rates. Most occupational groups have experienced reduced mortality rates over time but this was not the case for all groups, with some occupations that had high mortality rates in the

1990s experiencing little improvement or even increased mortality rates. Among those doing the

same jobs, mortality was generally higher in Scotland than England/Wales, but excess Scottish deaths were concentrated amongst those with the highest mortality risk.

Implications of all the available evidence

Mortality rates show over three-fold differences between occupations amongst the working age population of the UK. While most occupational groups have experienced improvements, some have experienced increased mortality – reasons for this require urgent investigation.

Among those doing the same jobs, mortality was generally higher in Scotland than England/Wales, but excess Scottish deaths were concentrated amongst those with the highest mortality risk.

**Background**

Work has been long established as a fundamental determinant of health.1 Following the UK’s second ever census, mortality rates by occupation were first calculated in the UK in 1851.2 Since then, regular decennial reports provided updated estimates of occupational mortality rates, with the last published in the 1970s.3-5 Similar analyses from other countries are also rare, with existing research typically based on very broad occupational categories.6 7 Recent and ongoing changes in the labour market make a reassessment of mortality by occupation timely. In particular, there is growing concern that trends in the job market (such as the rise of ‘zero hours’ contracts) could have adverse

impacts on health and health inequalities.8-10 It cannot be assumed that the patterns identified in the

1970s, that still underpin our contemporary understanding, continue to apply in the 21st century.

There has been a discernible shift away from a focus on occupational mortality, with more recent research on inequalities in health focussing on where people live, using area-based deprivation measures (such as the Index of Multiple Deprivation). This is exemplified by images of large differences in life expectancy within a single city, such as Glasgow, or in the populations living close to stations on the London underground.11 12 Some research does use social class13 14 but while this is based on occupation, it indicates the social position of an individual rather than their specific occupation.15 Social class therefore often combines relatively heterogeneous groups into typically fewer than eight categories.16 17 What research on mortality by occupation exists has reported on proportional mortality ratios, which identify the causes of death that are over-represented in different groups.18 19 While such research is helpful in detecting which diseases are most likely to present in different groups, it does not provide information on how absolute mortality rates differ between occupations and is therefore of little use to inform policy choices.20 Furthermore, those seeking employment have little contemporary information on the health risks they may face.

There are large differences in health among the countries of the United Kingdom (UK).21 Mortality rates in Scotland are consistently higher than elsewhere in the UK, a phenomenon that cannot be accounted for by socioeconomic deprivation.22 Existing research has suggested that this excess mortality appears to occur across the socioeconomic spectrum, but studies so far have relied on broad classifications of social class, household socioeconomic position or area-based deprivation.23-26

In this paper, we describe mortality rates by detailed occupational groups in each part of the UK for the first time in over three decades, looking at how they have changed over time and whether they differ among countries within the UK.

**Methods**

**Data Sources**

We studied representative populations of working age adults (aged 20-59 years at baseline) in the UK. Three different data sources were used for different parts of the United Kingdom: the ONS Longitudinal Study (LS) provides a 1% sample of respondents to the 2001 census in England/Wales; the Scottish Longitudinal Study (SLS) provides a 5.3% sample of Scotland’s census respondents for both 2001 and 2011; and the Northern Ireland Mortality Study (NIMS) includes 100% of the

Northern Irish population responding to the 2001 census. We analyse census data linked to mortality

records to create a cohort. Deaths were identified through administrative record linkage to national registers. For England/Wales and Scotland, deaths from throughout the UK were available from the Office for National Statistics and National Records Scotland. As the follow-up process for deaths in Northern Ireland differed, with deaths occurring outside of Northern Ireland unavailable, we report deaths for Northern Ireland in supplementary analyses. Patterns by occupational group were broadly similar for Northern Ireland but observed mortality rates were lower due to under-ascertainment of deaths. For all three datasets, the researchers had access to no identifiable individual level data, with all data derived from linkages that were anonymised prior to handover.

**Exposure Measures**

Occupation was self-reported in the 2001 census, in response to the question “What is the full title

of your main job?” The Standard Occupational Classification (SOC) 2000 codes are used by statistical agencies in the UK and elsewhere to classify occupations into meaningful groups, based on comparable levels of training, prestige and economic reward.27 The SOC coding system is hierarchical in nature, with the most refined classification provided by four digit unit groups (consisting of 371 categories). These are nested in 81 minor groups (defined by 3 digit codes) which lie within 25 sub major groups (defined by two digit codes). At the top of the hierarchy are nine major groups, which are defined by a single code. In order to gain adequate statistical power to investigate mortality

rates by occupation, we amalgamated these codes into three digit SOC codes and, where appropriate, combined them further. Those not reporting an occupation were categorised as a separate group for the analysis. Due to disclosure control restrictions, we are unable to report occupational groups that include fewer than ten deaths during the follow-up period. When this criterion was not met, we combined groups within the hierarchical categories. We sought to ensure that comparable occupational groups were used for analysis across all three datasets and that as detailed codes as possible were used. Employment status (at the time of the census) by occupational group could not be considered within the analysis for disclosure control reasons and due to differences in coding of variables. Therefore, the exposure measure is based on the person’s self- reported last main job, rather than the job an individual was actually carrying out on the date of the census. The classification used for categorising occupation is detailed in Appendix 1.

**Statistical Analysis**

Due to data security restrictions, analysis was conducted separately for each dataset on a standalone computer within each UK country. For all three datasets, occupational groups were categorised on the basis of responses in the 2001 census. Each sample was followed up for all-cause mortality until the end of 2011. We calculated directly age-standardised mortality rates, stratified by sex. The standard population used was the WHO European standard population of 2013. To assess trends

over time, we assessed occupational mortality rates for the 1991 census sample in Scotland,

followed up until the end of 2001.

Since the role of chance could not be directly tested within a single statistical model across the multiple datasets, we used a Monte Carlo simulation to derive P values and 95% confidence intervals (CIs) for the difference in mortality rates over time and between England/Wales and Scotland.

10,000 simulated occupation-specific mortality rates based on the mean and standard error of the age-standardised rate for each occupation in England/Wales and Scotland were carried out. These

simulated rates were compared across countries for each simulation, noting the proportion of times that rates in Scotland were higher than in England/Wales and the 2.5% and 97.5% quantiles of the difference in rates.

Lastly, in order to help interpret the public health importance of our findings, we carried out a simulation of the number of expected deaths in England/Wales and Scotland under different scenarios. To do so, we first retrieved information on the age-sex structure of these countries. We then created a baseline scenario in which we calculated the number of people that would be expected to be in each occupational group; assuming the person-years observed in each of our country samples were reflected across the working age population of their respective countries in

2001. We then applied mortality rates for each occupational group within each country to calculate

the number of expected deaths per year within each country under this baseline scenario. Following this, we modelled anticipated deaths under two alternative scenarios: first, by applying the occupation-specific mortality rates for England/Wales to Scotland and, second, applying the occupation-specific mortality rates for Scotland to England/Wales. These two scenarios provide estimates of how many deaths could be averted within Scotland if occupation-specific mortality rates for England/Wales applied and how many excess deaths there would be if England/Wales experienced Scottish rates, respectively. To estimate 95% confidence intervals (CI), we carried out Monte Carlo modelling with 10,000 samples.

**Role of the funding source**

The funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

**Results**

The LS and SLS provided 4.51 million person-years of follow-up for the investigation of occupational mortality rates (2.31 million person-years for females). There were very large differences in occupational mortality rates in all parts of the UK, with more than three-fold differences between the lowest and highest observed rates in both men and women in all three datasets. The largest differences in occupational mortality rates were seen in Scotland.

Patterns of occupational mortality

Table 1a reports the mortality rates by occupation for England and Wales in men. The patterns of high and low occupational mortality rates were broadly similar across the UK (Web Supplement Tables 1 and 2), given the imprecise estimation of rates within specific groups. For men, health professionals (comprising medical doctors, dentists, psychologists, pharmacists, opticians and vets) had the lowest mortality rates in all three datasets. The business and public services professionals (including lawyers, architects and accountants) also had very low mortality, followed by different groups of managerial staff. Out of the intermediate skilled jobs, those working in electrical trades (including electricians, telecommunications engineers and computer engineers) had relatively low mortality compared to other jobs of a similar skill level. The highest mortality rates were seen amongst unskilled construction workers and those working in factories or similar settings (i.e.

elementary process plant jobs which include packers, canners, fillers and labourers in foundries). Elementary personal services occupations, which include hospital/hotel porters, kitchen and catering assistants and bar staff, also had very high mortality rates. Occupational groups that included large numbers of people and tended to have high mortality rates were goods storage occupations (which includes dockers, as well as other goods handling occupations), process operatives (people involved in the processing of goods, such as food, drink, rubber, plastics etc.) and transport drivers and operatives (e.g. drivers of heavy goods vehicles, taxis and buses). Administrative and sales jobs had intermediate mortality rates. The highest mortality rates overall occurred in men who reported

never having had a job.

Among women, the lower mortality rates resulted in some variability in the ranking of some smaller occupational groups across the three datasets. The groups that had low mortality rates within England, as well as Northern Ireland and Scotland, included business and public services professionals, teachers and corporate managers and directors (Table 1b and Supplementary File). Nurses and allied health professionals had relatively low mortality, while administrative jobs tended to have intermediate mortality rates. Of the intermediate skilled jobs, childcare and related personal services had relatively low mortality rates when compared to jobs of a similar skill level. The highest mortality rates occurred in factory workers, including those working in the textile and garment

trade. As with men, elementary process plant occupations had high mortality rates. Of the larger occupational groups, assemblers and routine operatives (e.g. assemblers of electrical products, inspectors and routine testers), elementary cleaning occupations and elementary personal services occupations had high mortality rates. Those reporting an occupation had lower mortality rates than those who did not.

Comparison across UK geographies and trends over time

Mortality rates in Northern Ireland could not be directly compared to other parts of the UK due to under-ascertainment of mortality in the study data. However, the relative ranking of occupations was generally comparable to other geographies. It was possible to report some specific occupational mortality rates from Northern Ireland that could not be ascertained in other geographies for disclosure control reasons. For example, research professionals were found to have relatively low mortality rates in both men and women in Northern Ireland (Supplementary File, Table 3).

Mortality rates in Scotland tended to be slightly higher in many occupations (Figures 1a and 1b, for men and women respectively). Among both men and women, mortality rates did not seem to differ systematically between Scotland and England/Wales for more highly skilled jobs. In contrast, lower skilled occupations with high mortality rates tended to have even higher mortality rates in Scotland. However, given the relatively small sample size for many categories, few specific occupational groups recorded a statistically significant difference.

Assessment of trends within Scotland showed that men and women in most occupational groups had experienced falls (Tables 2a and 2b). However, this was not universally the case, with mortality rates increasing amongst some occupations. Three occupational groups (assemblers and routine operatives, elementary cleaning occupations and those reporting no job) which had high mortality rates in 1991 experienced a rise over time in women which did not appear to be due to chance. For example, age-standardised death rates amongst women reporting their occupation as a cleaner in

1991 was 336.8 deaths per 100,000 person years (95% CI 291.6-382.0) which rose to 425.7 in 2001 (95% CI 371.0-480.5).

Our simulation analyses (Tables 3a and b), which applied mortality rates from England/Wales to the population of Scotland, found a total of 630.9 (95% CI 284.8-979.2) excess deaths in men and 272.6 (95% CI 26-512.6) excess deaths in women amongst the working age population of Scotland per year. If Scottish occupational mortality rates applied across England/Wales, there would be 6,084.8 (95% CI 3,007.6-9,174.7) more expected deaths in men and 2,273.2 more deaths (95% CI -164.7-

4688) in women each year.

**Discussion**

Over three-fold differences in occupational mortality rates exist in the UK. In men, health professionals, managers and teachers had particularly low mortality rates while those working in elementary agricultural, construction and housekeeping jobs had high mortality rates. In women, teachers and business professionals experienced low mortality, with factory workers and those working in the garment trade having high mortality rates. When comparing Scotland to England/Wales, we found that mortality rates were often even higher amongst health- disadvantaged occupational groups in Scotland but no consistent differences were seen amongst people in the most health-advantaged occupations. Simulation models suggest that there are 631 excess deaths (630.9, 95% CI 284.8-979.2) in men and 273 in women (272.6, 95% CI 26.0-512.6) every year in Scotland’s working age population. We studied trends over a twenty year period in Scotland and found mortality rates have fallen in most occupations but have remained stagnant or even increased amongst women in some occupational groups.

Our study has a number of important strengths. We have analysed three nationally representative administrative datasets. Furthermore, we have been able to compare trends in occupational mortality over time, due to the availability of similarly categorised occupational information within Scotland. The use of linked data avoids the potential for numerator-denominator bias, a known problem as reports of occupation from death certificates and self-report can differ. Our large sample has allowed us to investigate occupational categories in greater detail than is usually possible. However, there are several limitations which should be noted. First, our exposure variable was

based on self-reported main occupation at a single time point. This therefore reflects a respondent’s perceived main occupation but may not reflect their occupation at that or other specific times. Our analysis was not able to investigate the role of employment status – at least in part due to the challenges in carrying out parallel analyses within three different safe settings which made pooling

of data impossible. Although our study is very large, the low risk of mortality in working age precludes investigation of cause-specific mortality outcomes within the available administrative data samples. Lastly, due to the lack of comparability of outcome ascertainment within Northern Ireland, it is a matter of concern that we were unable to compare the rates there to other parts of the UK.

While our study is the first to consider occupational mortality rates in the UK for over three decades, other research has investigated whether specific causes of death are over-represented within some occupations through the reporting of proportional mortality ratios.18 19 This approach has the

advantage of not requiring information on the number of people within each occupational group

and facilitates the early identification of potential work-related hazards. However, it does not inform policies to help particular occupational groups.28 There is research on occupational mortality rates from other countries but it has generally used broad occupational groups. Holmes and colleagues reported occupational mortality rates in New Zealand men according to the nine broadest SOC categories, finding an approximately two-fold difference between the highest and lowest rates.6

Similarly, Lee et al reported occupational mortality rates for the nine most aggregated SOC codes in South Korea and again found an approximate doubling of mortality rates between the lowest and highest groups.7 Our study provides a much more fine-grained picture of occupational mortality than has hitherto been presented in recent decades.

The labour market has changed radically since the publication of the last assessment of occupational mortality rates in the UK over three decades ago, with workers today experiencing very different health outcomes. While, historically, occupational health has focused on risks arising from specific physical, chemical and environmental hazards, many current health risks are likely to be mediated by mechanisms affecting psychological, social and material resources. Monitoring changes in occupational mortality rates is necessary to inform policy responses to address new health risks that arise in response to upcoming changes in the labour market, including the likely reduction in availability of unskilled jobs as a consequence of increasing automation.29 Occupational mortality rates are valuable in guiding prioritisation of scarce health and other resources. Furthermore,

interest is growing in the implementation of workplace-based interventions to improve health30 31,

but the choice of which workplaces to target has not been informed by a systematic assessment of need – a gap that our study fills. We have identified specific large occupational groups which may benefit from targeted prevention approaches – for example, interventions targeted at male transport drivers and female cleaners.

Our study has particular relevance to Scottish policymakers. There has been considerable concern that health outcomes in Scotland are poorer than elsewhere in Western Europe.32 33 The results of this paper suggest that the poorer health outcomes experienced in Scotland arise as a consequence of excess mortality amongst the most disadvantaged in society, rather than the whole Scottish population experiencing a generally higher mortality risk. Our study echoes recent findings which suggest excess mortality in Scotland is particularly concentrated amongst people living in the most disadvantaged areas.34 Efforts to address Scotland’s ‘sick man of Europe’ status need to focus on meeting health needs amongst those experiencing the full spectrum of socioeconomic disadvantage.

Future research that investigates the specific causes of death at the detailed occupational level will be valuable. Investigating the inter-relationship between occupational group and employment status will help understand the implications of increasing precariousness of work.8 9 Our study has

identified very poor, and potentially even worsening, mortality risks for some specific occupational groups. This should be a matter of great concern, stimulating further research to understand what is happening.

Figure 1: Bubble graph showing occupational mortality rates in England and Scotland, 2001-2011 for a) men and b) women \*

\*Each bubble is proportional to the size of the employment group in England

**Contributors**

SVK and DS conceived the idea for the study. All authors contributed to study design. SVK led the analysis, with input from AHL and KR. All authors contributed to the interpretation of results. SVK drafted the manuscript and all authors critically revised the paper. All authors read and approved the final manuscript.

**Funding**

This study received no specific funding. SVK is funded by a NRS Senior Clinical Fellowship (SCAF/15/02). SVK and AHL are funded by the Medical Research Council (MC\_UU\_12017/13 & MC\_UU\_12017/15) and Scottish Government Chief Scientist Office (SPHSU13 & SPHSU15). DS is funded by the Wellcome Trust Investigator Award (100709/Z/12/Z) and the European Research Council (HRES-313590). The funders had no influence over the study design, conduct, reporting or decision to submit the manuscript for publication.

**Declarations of interest**

SVK and AL have received grants from the Medical Research Council and Scottish Government Chief Scientist Office, SVK has also received support from a NHS Research Scotland Senior Clinical Fellowship, and DS has received support from the European Research Council and Wellcome Trust. We declare no financial relationships with any organisations that might have an interest in the submitted work, and no other relationships or activities that could appear to have influenced the submitted work.

**Data sharing**

The ONS Longitudinal Study, Scottish Longitudinal Study and Northern Ireland Mortality Study are available to researchers by application from the data holders.

**Ethical approval**

Not required.

**Acknowledgements**

The help provided by the staff of the Longitudinal Studies Centre – Scotland (LSCS) is acknowledged. The LSCS is supported by the ESRC/JISC, the Scottish Funding Council, the Chief Scientist’s office and the Scottish Government. The authors alone are responsible for the interpretation of the data. Census output is Crown copyright, and is reproduced with the permission of the Controller of HMSO and the Queen’s Printer for Scotland.

The permission of the Office for National Statistics to use the Longitudinal Study is gratefully acknowledged, as is the help provided by staff of the Centre for Longitudinal Study Information & User Support (CeLSIUS). CeLSIUS is supported by the ESRC Census of Population Programme (Award Ref: ES/K000365/1). The authors alone are responsible for the interpretation of the data.

This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

The help provided by the staff of the Northern Ireland Mortality Study (NIMS) and the NILS Research Support Unit is acknowledged. The NIMS is funded by the Health and Social Care Research and Development Division of the Public Health Agency (HSC R&D Division) and NISRA. The NILS-RSU is funded by the ESRC and the Northern Ireland Government. The authors alone are responsible for the interpretation of the data and any views or opinions presented are solely those of the author and do not necessarily represent those of NISRA/NILS.

**Table 1a: Occupational mortality rates in England in males**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employment group** | **Rank** | **SOC**  **code\*** | **Person-**  **Years** | **EASR** | **95% CI** |
| Health professionals  Business and Public Service Professionals  Functional Managers  Financial Institution And Office Managers  Corporate Managers and Directors  Teaching Professionals  Production Managers  Protective Service Occupations  Information And Communication Technology Professionals  Business And Finance Associate Professionals  Science And Engineering Technicians  Managers In Distribution, Storage And Retailing  Engineering Professionals Draughtspersons And Building Inspectors Health Associate Professionals  Transport Associate Professionals  Public Service And Other Associate Professionals  Protective Service Officers  Managers And Proprietors In Other Service Industries  Electrical Trades  Social Welfare Associate Professionals Leisure And Travel Service Occupations Administrative Occupations: Finance Secretarial And Related Occupations  Culture, Media and Sports Occupations  IT Service Delivery Occupations  Sales And Related Associate Professionals  Sales Related Occupations  Administrative Occupations: Government And Related  Organisations  Customer Service Occupations Elementary Administration Occupations Skilled Trades not elsewhere classified  Metal Machining, Fitting And Instrument Making Trades  Agricultural Trades  Printing Trades  Healthcare And Related Personal Services Administrative Occupations: Records Construction Trades  Plant And Machine Operatives  Sales Assistants And Retail Cashiers  Food Preparation Trades  Transport Drivers And Operatives  Building Trades  Managers and Proprietors in Agriculture and Services  Vehicle Trades  Administrative Occupations: General | 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46 | 221  24  113  115  11  231  112  331  213  353  311  116  212  312  321  351  356  117  123  524  323  621  412  421  34  313  354  712  411  721  921  549  522  511  542  611  413  531  812  711  543  821  532  12  523  415 | 12873  41276  61089  21375  13934  36736  55718  28834  31489  25992  23177  44677  35715  5009  9248  5078  13681  6365  36544  41849  5084  6145  23118  4784  32202  10582  26967  9552  11250  8397  22354  9553  42963  23913  7140  11400  20129  71558  38091  33239  23061  82677  23344  23348  23097  16102 | **224.7**  **228.1**  **233.2**  **234.2**  **250.4**  **261.7**  **264.6**  **264.6**  **267.4**  **268.6**  **269.9**  **276.6**  **281.8**  **282.1**  **287.5**  **290.1**  **308.6**  **323.4**  **332.5**  **332.5**  **333.8**  **344.6**  **347**  **348.3**  **350.2**  **350.2**  **361.6**  **368**  **373.1**  **385.3**  **389**  **391.4**  **400.1**  **402.1**  **402.9**  **413.3**  **417.5**  **418.7**  **423.3**  **428.7**  **438.6**  **445**  **445.9**  **449.9**  **455.5**  **461.2** | 145.3-304.1  182.4-273.8  193.5-272.9  169.7-298.7  174.6-326.1  209.9-313.4  218.7-310.5  189.6-339.6  186.9-347.9  198.3-338.9  199.0-340.7  226.2-326.9  226.1-337.6  136.5-427.8  171.3-403.6  116.5-463.6  211.8-405.3  188.1-458.7  278.1-387.0  275.8-389.2  166.4-501.2  165.3-523.9  264.9-429.2  186.8-509.8  272.6-427.7  169.0-531.5  284.9-438.2  250.7-485.3  267.6-478.6  197.5-573.2  305.4-472.6  258.6-524.1  341.7-458.4  324.7-479.4  244.1-561.7  287.4-539.1  318.4-516.6  370.3-467.2  359.9-486.7  331.3-526.2  335.4-541.7  401.2-488.9  360.1-531.7  364.1-535.7  358.1-553.0  341.5-580.9 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hairdressers And Related Occupations  Assemblers And Routine Operatives  Construction Operatives  Process Operatives  Elementary Goods Storage Occupations  Elementary Security Occupations  Mobile Machine Drivers And Operatives  Elementary Sales Occupations  Metal Forming, Welding And Related Trades  Housekeeping Occupations Textiles And Garments Trades Elementary Cleaning Occupations  Administrative Occupations: Communications Elementary Agricultural Occupations Elementary Personal Services Occupations Elementary Process Plant Occupations Elementary Construction Occupations | 47  48  49  50  51  52  53  54  55  56  57  58  59  60  61  62  63 | 622  813  814  811  914  924  822  925  521  623  541  923  414  911  922  913  912 | 2755  25176  16247  30195  37887  15272  14661  3571  16479  5202  3809  20096  2204  8101  21359  32513  22988 | **492.4**  **501.3**  **505.3**  **529.3**  **538.8**  **544.1**  **555.7**  **555.8**  **562.9**  **566.9**  **569.2**  **591.5**  **603.9**  **622.9**  **650**  **671.6**  **701.3** | 225.9-759.0  409.7-592.9  399.2-611.3  444.5-614.2  458.8-618.7  433.2-655.0  435.3-676.1  208.5-903.0  450.6-675.2  401.5-723.3  330.3-808.2  487.2-695.7  245.9-962.0  441.2-804.7  509.8-790.1  576.3-767.0  593.1-809.4 |
| No occupation reported  All those reporting an occupation§ |  |  | 39614  1457772 | **1189.1**  **384** | 1014.3-1363.9  373.7-394.3 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See

Web Appendix for details.

§Note that this includes not only SOC categories listed, but also small occupational groups that have been suppressed for disclosure control (equating to a total of 1.2% of all person-years). Therefore, person-years for the SOC codes listed do not total to the last two rows.

Source: ONS Longitudinal Study

**Table 1b: Occupational mortality rates in England in females**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employment group** | **Rank** | **SOC**  **code\*** | **Person-**  **Years** | **EASR** | **95% CI** |
| Culture, Media and Sports Occupations Business and Public Service Professionals Teaching Professionals  Science, Research, Engineering and Technology  Professionals  Business and Public Service Associate Professionals  Science and Technology Associate Professionals  Childcare And Related Personal Services  Corporate Managers and Directors Hairdressers And Related Occupations Health professionals  Food Preparation Trades  Secretarial And Related Occupations Elementary Sales Occupations Elementary Goods Storage Occupations Leisure And Travel Service Occupations  Managers And Proprietors In Other Service Industries  Customer Service Occupations Health Associate Professionals Administrative Occupations: General Social Welfare Associate Professionals Agricultural Trades  Printing Trades  Administrative Occupations: Government And Related  Organisations  Administrative Occupations: Finance  Sales Related Occupations Transport Drivers And Operatives Healthcare And Related Personal Services Elementary Security Occupations  Sales Assistants And Retail Cashiers  Housekeeping Occupations  Elementary Personal Services Occupations Administrative Occupations: Records Process Operatives  Elementary Cleaning Occupations Skilled Metal and Electrical Trades Administrative Occupations: Communications Skilled Trades not elsewhere classified Elementary Administration Occupations Assemblers And Routine Operatives  Managers and Proprietors in Agriculture and Services  Elementary Process Plant Occupations  Textiles And Garments Trades  Plant And Machine Operatives | 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43 | 34  24  231  21  35  31  612  11  622  221  543  421  925  914  621  123  721  321  415  323  511  542  411  412  712  821  611  924  711  623  922  413  811  923  52  414  549  921  813  12  913  541  812 | 26903  25728  79871  13446  64710  15796  55829  106025  21910  10099  18319  112533  6775  7984  12344  23180  25489  58260  76601  13795  4776  3557  21080  72532  9852  6560  88120  16424  137985  8417  59492  37807  17107  65159  4745  6727  4170  12940  34561  23892  30212  3810  8707 | **133**  **158.8**  **179.8**  **180.4**  **188.1**  **203.1**  **203.6**  **208.5**  **209.3**  **212.5**  **216.7**  **217.5**  **218.3**  **219.5**  **221.8**  **226.8**  **229.9**  **230.3**  **233.1**  **235.6**  **251.1**  **256.4**  **263**  **264.1**  **265.3**  **279.3**  **289.8**  **301.2**  **305.2**  **305.5**  **313.9**  **332.7**  **345.8**  **352.3**  **367.1**  **367.5**  **380**  **383.4**  **386.1**  **396.6**  **404.7**  **482.7**  **516.8** | 78.4-187.7  103.8-213.9  151.8-207.7  81.9-278.8  146.0-230.2  127.4-278.8  156.8-250.4  178.1-238.9  141.7-276.9  107.2-317.8  152.6-280.9  191.5-243.5  92.8-343.9  103.5-335.6  115.5-328.1  162.4-291.1  152.6-307.2  190.8-269.8  198.2-268.0  153.1-318.1  113.6-388.5  104.2-408.6  192.0-333.9  223.1-305.1  156.1-374.6  132.3-426.3  254.7-324.9  222.3-380.2  274.9-335.5  204.3-406.7  265.3-362.6  271.0-394.3  258.8-432.7  310.9-393.8  184.0-550.1  233.1-502.0  174.5-585.4  275.1-491.7  324.3-447.9  317.6-475.5  333.6-475.7  265.5-699.9  370.3-663.3 |
| No occupation reported  All those reporting an occupation§ |  |  | 83370  1485036 | 587.1  263.2 | 522.9-651.2  254.7-271.6 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See

Web Appendix for details.

§Note that this includes not only SOC categories listed, but also small occupational groups that have been suppressed for disclosure control (equating to a total of 2.0% of all person-years). Therefore, person-years for the SOC codes listed do not total to the last two rows.

Source: ONS Longitudinal Study

**Table 2a: Differences in occupational mortality rates in Scotland between 1991-2001 and 2001-2011 in men**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **1991 follow-up period** | | **2001 follow-up period** | | **Difference in mortality rates over time §** | | |
| **Employment group** | **SOC**  **code\*** | **EASR** | **95% CI** | **EASR** | **95% CI** | **Difference in rates** | **95% CI** | **p value** |
| Corporate Managers and Directors  Production Managers  Functional Managers  Financial Institution And Office Managers Managers In Distribution, Storage And Retailing Protective Service Officers  Managers and Proprietors in Agriculture and Services  Managers And Proprietors In Other Service Industries  Natural and Social Science Professionals  Engineering Professionals  Information And Communication Technology Professionals  Health professionals  Teaching Professionals  Research Professional  Business and Public Services Professionals  Science And Engineering Technicians  Draughtspersons And Building Inspectors  IT Service Delivery Occupations  Health Associate Professionals  Social Welfare Associate Professionals  Protective Service Occupations  Culture, Media and Sports Occupations  Transport Associate Professionals  Business And Finance Associate Professionals  Sales And Related Associate Professionals  Public Service And Other Associate Professionals  Administrative Occupations: Government And Related  Organisations  Administrative Occupations: Finance  Administrative Occupations: Records  Administrative Occupations: Communications | 11  112  113  115  116  117  12  123  211  212  213  221  231  232  24  311  312  313  321  323  331  34  351  353  354  356  411  412  413  414 | **511.6**  **245.8**  **457.8**  **335.0**  **343.9**  **393.3**  **398.9**  **397.2**  **339.8**  **340.6**  **551.7**  **300.6**  **298.5**  **309.0**  **456.2**  **284.7**  **754.7**  **551.9**  **551.9**  **469.3**  **545.0**  **339.8**  **418.5**  **442.5**  **512.5**  **364.5**  **556.2**  **846.0** | 274.6-748.7  176.3-315.2  334.6-581.0  192.4-477.6  234.5-453.2  152.6-634.0  263.2-534.7  298.9-495.5  61.3-618.4  229.0-452.1  61.6-1041.7  140.7-460.5  220.0-377.0  214.2-403.8  304.8-607.7  95.1-474.2  388.9-1120.4  193.4-910.3  371.6-732.2  289.0-649.7  291.9-798.0  183.6-495.9  285.0-551.9  292.7-592.3  330.4-694.6  207.9-521.0  389.5-722.8  167.8-1524.1 | **244.2**  **243.2**  **261.3**  **320.9**  **362.9**  **436.2**  **353.1**  **333.4**  **332.6**  **214.1**  **145**  **219.3**  **328**  **217.9**  **314.3**  **494.2**  **224.1**  **438**  **372.1**  **385.7**  **306.8**  **339.3**  **228.5**  **234.7**  **379.4**  **520.9**  **303.4**  **346.2**  **724.4** | 116.6-371.7  181.5-304.9  171.7-350.8  191.3-450.5  252.0-473.7  165.2-707.2  242.1-464.2  240.8-426.0  233.7-431.5  80.8-347.4  49.8-240.2  158.0-280.6  25.6-630.4  149.3-286.6  206.1-422.4  211.8-776.7  0-455.6  219.5-656.5  141.1-603.1  254.7-516.8  186.7-426.9  135.6-543.0  124.6-332.5  140.3-329.1  241.8-517.0  342.6-699.3  161.0-445.7  220.0-472.4  38.5-1410.3 | -268.0  -3.1  -196.0  -13.8  19.1  41.0  -45.0  -64.1  -7.9  -341.1  -156.3  -79.1  -91.2  -141.2  205.5  -315.8  -179.3  -164.9  -162.9  -203.7  -110.7  -185.5  -62.1  9.8  -61.5  -209.3  -119.4 | ( -538.1, -1.1) ( -95.4, 90.0)  ( -345.0,-42.7) ( -209.2,180.8) ( -135.4,173.9) ( -327.8,397.6) ( -218.1,131.9) ( -199.7, 72.7)  ( -154.4,141.6) ( -843.2,164.5) ( -341.8, 29.9)  ( -177.9, 20.9)  ( -206.7, 23.2) ( -325.3, 44.1)  ( -134.7,541.7)  ( -743.8,116.6) ( -615.0,245.4) ( -383.8, 52.8)  ( -380.8, 53.1)  ( -525.9,123.2) ( -297.9, 81.6)  ( -346.4,-21.4) ( -260.1,141.7)  ( -247.9,265.8) ( -274.6,150.2) ( -421.5, 3.8)  (-1089.5,841.0) | 0.049  0.943  0.014  0.883  0.808  0.816  0.612  0.359  0.908  0.186  0.102  0.124  0.124  0.129  0.233  0.144  0.422  0.142  0.141  0.225  0.244  0.026  0.538  0.935  0.575  0.054  0.809 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Administrative Occupations: General  Secretarial And Related Occupations  Agricultural Trades  Metal Forming, Welding And Related Trades  Metal Machining, Fitting And Instrument Making Trades  Vehicle Trades Electrical Trades Construction Trades Building Trades  Textiles And Garments Trades  Printing Trades  Food Preparation Trades  Skilled Trades not elsewhere classified Healthcare And Related Personal Services Animal Care Services  Leisure And Travel Service Occupations  Housekeeping Occupations  Sales Assistants And Retail Cashiers  Sales Related Occupations Customer Service Occupations Process Operatives  Plant And Machine Operatives Assemblers And Routine Operatives Construction Operatives  Transport Drivers And Operatives  Mobile Machine Drivers And Operatives Elementary Agricultural Occupations Elementary Construction Occupations Elementary Process Plant Occupations Elementary Goods Storage Occupations Elementary Administration Occupations Elementary Personal Services Occupations Elementary Cleaning Occupations Elementary Security Occupations  No job reported | 415  421  511  521  522  523  524  531  532  541  542  543  549  611  613  621  623  711  712  721  811  812  813  814  821  822  911  912  913  914  921  922  923  924  1000 | **338.1**  **446.8**  **657.4**  **556.4**  **473.9**  **403.8**  **535.7**  **571.5**  **313.9**  **640.5**  **289.4**  **452.0**  **515.2**  **623.0**  **331.3**  **573.4**  **575.9**  **560.1**  **611.0**  **533.2**  **643.8**  **860.7**  **574.1**  **814.6**  **614.1**  **612.0**  **819.8**  **722.9**  **777.7**  **672.3**  **1493.8** | 142.1-534.0  352.1-541.4  507.9-807.0  456.5-656.3  304.1-643.7  315.8-491.7  457.4-613.9  431.7-711.3  107.7-520.1  438.5-842.5  76.2-502.7  212.7-691.3  195.4-835.0  379.8-866.3  159.1-503.4  379.5-767.2  456.2-695.7  450.5-669.7  438.6-783.5  399.3-667.2  569.5-718.0  676.7-1044.8  404.1-744.2  656.0-973.3  462.5-765.7  481.0-742.9  610.0-1029.6  488.1-957.7  586.9-968.6  502.8-841.9  1390.6-1597.1 | **430.3**  **446.7**  **506.7**  **431**  **351**  **461.6**  **501.3**  **513.1**  **638.2**  **484.9**  **461.3**  **434.4**  **1124.8**  **721**  **567.8**  **444**  **509.1**  **246.7**  **475.6**  **520.5**  **630**  **623**  **503.2**  **559**  **571.9**  **936.9**  **829.1**  **618.8**  **545**  **723.5**  **769.7**  **739.8**  **1241.5** | 242.3-618.3  349.7-543.6  370.0-643.4  344.1-517.9  230.8-471.2  371.3-552.0  425.3-577.4  380.0-646.2  314.9-961.6  351.0-618.8  219.2-703.5  265.5-603.4  127.1-2122.5  376.6-1065.3  317.5-818.1  282.7-605.4  303.4-714.7  49.3-444.2  359.3-592.0  410.3-630.7  474.9-785.1  472.0-773.9  440.1-566.3  410.4-707.7  389.7-754.2  771.4-1102.5  665.8-992.4  486.1-751.5  390.3-699.7  519.7-927.3  605.3-934.1  560.2-919.3  1131.4-1351.6 | 91.4  -0.4  -151.2  -125.5  -124.2  59.1  -34.1  -58.2  325.1  -156.7  172  -18  203.5  -55.5  112.0  -63.9  -98.6  -41  18.9  88.7  -141  -302.6  -1.4  122.3  215.2  6.5  -275.6  1.2  -7.3  68.9  -251.8 | ( -181.2,363.9)  ( -135.0,136.2) ( -357.5, 52.5)  ( -258.8, 5.4)  ( -329.3, 81.6) ( -66.4,186.0) ( -142.5, 75.3)  ( -248.1,135.8)  ( -66.7,704.2) ( -392.8, 87.0)  ( -144.5,493.2) ( -313.7,275.6)  ( -267.5,675.1) ( -399.8,291.1) ( -122.5,343.4) ( -353.1,215.6)  ( -265.9, 67.3)  ( -197.5,114.3) ( -209.1,252.6) ( -116.0,292.0) ( -238.6,-44.3)  ( -541.1,-64.0) ( -251.4,246.3) ( -105.8,351.2) ( -9.9,438.8)  ( -182.0,190.6) ( -534.9,-14.3)  ( -310.8,311.8) ( -258.7,243.7) ( -179.5,319.2)  ( -401.9,-99.1) | 0.5  0.998  0.142  0.063  0.238  0.366  0.545  0.551  0.101  0.197  0.291  0.908  0.393  0.763  0.35  0.656  0.237  0.612  0.88  0.393  0.005  0.014  0.997  0.288  0.061  0.939  0.037  0.985  0.955  0.582  0.002 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences over time, Monte Carlo simulation was used to estimate the difference between the rate in 2001-2011 and 1991-2001. 95% CI and p values were calculated using this method as well.

Source: Scottish Longitudinal Study

**Table 2b: Differences in occupational mortality rates in Scotland between 1991-2001 and 2001-2011 in women**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **1991 follow-up** | | **2001 follow-up** | | **Difference in mortality rates over time §** | | |
| **Employment group** | **SOC**  **code\*** | **EASR** | **95% CI** | **EASR** | **95% CI** | **Difference in rates** | **95% CI** | **p value** |
| Corporate managers and directors  Managers and Proprietors in Agriculture and Services Managers And Proprietors In Other Service Industries Science, research, engineering and technology professionals Health professionals  Teaching Professionals  Business and public service professionals Science and technology associate professionals Health Associate Professionals  Therapists  Social Welfare Associate Professionals  Protective Service Occupations  Culture, media and sports occupations  Business and public service associate professionals Administrative Occupations: Government And Related Organisations  Administrative Occupations: Finance Administrative Occupations: Records Administrative Occupations: Communications Administrative Occupations: General Secretarial And Related Occupations Agricultural Trades  Skilled metal and electrical trades Textiles And Garments Trades Printing Trades  Food Preparation Trades  Healthcare And Related Personal Services  Childcare And Related Personal Services  Leisure And Travel Service Occupations  Hairdressers And Related Occupations  Housekeeping Occupations | 11  12  123  21  221  231  24  31  321  322  323  331  34  35  411  412  413  414  415  421  511  52  541  542  543  611  612  621  622  623 | **194.3**  **385.8**  **303.6**  **258.8**  **220.2**  **220.6**  **332.3**  **241.6**  **356.4**  **339.5**  **278.4**  **221.7**  **211.7**  **210**  **313.5**  **246.2**  **206.2**  **405.6**  **756.3**  **300.6**  **287.6**  **198.8**  **257.6**  **323.4** | 121.6-267.1  242.6-528.9  178.4-428.8  15.5-502.1  164.2-276.3  80.4-360.8  116.3-548.4  176.6-306.6  168.5-544.3  31.9-647.2  150.6-406.3  140.6-302.8  149.1-274.3  128.2-291.8  124.8-502.2  174.8-317.5  159.9-252.6  142.2-669.0  156.5-1356.1  194.5-406.7  221.0-354.2  96.2-301.4  35.7-479.5  140.8-505.9 | **178.1**  **235.9**  **242.8**  **428.6**  **214.8**  **159.6**  **200.8**  **220.4**  **241.3**  **148.2**  **202.3**  **569.5**  **202.5**  **200.1**  **237.5**  **249.1**  **222.2**  **273**  **226.4**  **223.2**  **117.9**  **387.3**  **478.1**  **329.9**  **422.2**  **283.7**  **232.3**  **228**  **355.5**  **254.1** | 131.2-225.0  147.0-324.8  147.5-338.1  24.0-833.3  63.4-366.3  122.0-197.1  109.4-292.1  100.4-340.5  186.4-296.3  27.5-268.9  109.5-295.1  41.8-1097.2  82.5-322.5  130.9-269.3  153.7-321.4  190.3-307.8  147.1-297.3  117.6-428.4  176.8-276.0  180.0-266.4  15.0-220.8  80.4-694.3  200.0-756.2  37.5-622.3  298.7-545.6  237.0-330.4  155.8-308.8  99.4-356.6  185.2-525.7  128.5-379.7 | -15.6  -148.4  -61.1  -45  -60.6  -21.3  -114.8  -0.3  -154.9  -135.5  -77.5  16.3  37.8  12.7  -37.6  -19.1  16.8  71.7  -428.7  121.1  -4.2  33.3  -29.2  -70.3 | ( -101.6, 70.9) ( -316.4, 17.8) ( -216.2, 95.9)  ( -336.0,247.5) ( -129.8, 6.6)  ( -189.4,147.6) ( -361.4,131.4) ( -84.2, 83.0)  ( -358.6, 54.4) ( -469.7,203.3)  ( -221.5, 69.6)  ( -99.9,130.1) ( -47.9,124.9) ( -98.8,124.6)  ( -279.3,209.9) ( -107.2, 68.8) ( -45.8, 81.3)  ( -302.6,463.2) (-1105.6,229.5) ( -40.3,284.4)  ( -86.1, 78.1) ( -93.5,160.8)  ( -283.9,225.3)  ( -290.4,148.4) | 0.725  0.082  0.438  0.764  0.079  0.8  0.366  0.991  0.143  0.413  0.302  0.777  0.39  0.82  0.755  0.666  0.607  0.708  0.211  0.144  0.926  0.615  0.825  0.536 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sales Assistants And Retail Cashiers  Sales Related Occupations Customer Service Occupations Process Operatives  Plant And Machine Operatives Assemblers And Routine Operatives Transport Drivers And Operatives Elementary Agricultural Occupations Elementary Process Plant Occupations Elementary Goods Storage Occupations Elementary Administration Occupations Elementary Personal Services Occupations Elementary Cleaning Occupations Elementary Security Occupations  No job reported | 711  712  721  811  812  813  821  911  913  914  921  922  923  924  1000 | **279**  **372.2**  **330.5**  **481.4**  **285.8**  **436**  **425.1**  **363.4**  **521.3**  **313.8**  **306.7**  **336.8**  **145.7**  **596.7** | 231.1-326.9  136.9-607.6  194.3-466.6  140.7-822.1  206.6-364.9  112.1-760.0  49.6-800.5  229.9-496.9  195.1-847.5  60.6-567.0  238.7-374.7  291.6-382.0  26.3-265.1  557.4-636.0 | **307.9**  **185.5**  **157.9**  **337.6**  **662.9**  **493.7**  **256.8**  **466.8**  **528.3**  **354.4**  **345.7**  **425.7**  **338.7**  **694.7** | 264.4-351.3  46.3-324.7  82.7-233.1  218.2-457.0  320.1-1005.6  399.3-588.0  51.6-461.9  338.3-595.3  189.3-867.3  180.3-528.4  276.3-415.0  371.0-480.5  177.8-499.7  627.5-761.9 | 28.7  -187.1  7.2  184.9  206.4  -177.1  101.5  4.5  41.2  38.3  88.3  193.2  97.6 | ( -34.4, 94.3) ( -467.2, 88.6)  ( -172.5,185.3) ( -302.2,666.9) ( 81.9,330.6)  ( -570.1,196.0)  ( -84.4,286.1) ( -465.2,477.1) ( -265.1,348.1) ( -58.4,135.2)  ( 18.2,158.5) ( -12.4,397.4)  ( 18.2,174.4) | 0.38  0.182  0.935  0.465  0.001  0.367  0.287  0.982  0.782  0.443  0.013  0.066  0.015 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences over time, Monte Carlo simulation was used to estimate the difference between the rate in 2001-2011 and 1991-2001. 95% CI and p values were calculated using this method as well. Simulated 95% CI are indicated using brackets.

Source: Scottish Longitudinal Study

**Table 3a: Expected change in deaths in Scotland among working age men if occupational mortality rates for England applied §**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC**  **code\*** | **Difference between**  **rates in England and**  **Scotland** | **95% CI** | **p value** | **Expected change in deaths in Scotland** | **95% CI** |
| Corporate managers and directors  Production Managers  Functional Managers  Financial Institution And Office Managers Managers In Distribution, Storage And Retailing Protective Service Officers  Managers and proprietors in agriculture and services  Managers And Proprietors In Other Service Industries  Engineering Professionals  Information And Communication Technology Professionals  Health professionals  Teaching Professionals  Business and public service professionals  Science And Engineering Technicians  Draughtspersons And Building Inspectors  IT Service Delivery Occupations  Health Associate Professionals  Social Welfare Associate Professionals  Protective Service Occupations  Culture, media and sports occupations  Transport Associate Professionals  Business And Finance Associate Professionals  Sales And Related Associate Professionals  Public Service And Other Associate Professionals  Administrative Occupations: Government And Related Organisations  Administrative Occupations: Finance Administrative Occupations: Records Administrative Occupations: Communications Administrative Occupations: General Agricultural Trades  Metal Forming, Welding And Related Trades | 11  112  113  115  116  117  12  123  212  213  221  231  24  311  312  313  321  323  331  34  351  353  **354**  356  411  412  413  414  415  511  521 | 6.1  21  -28.2  -86.1  -87.1  -111.1  97  -1.2  -51.2  52.4  79.2  42.8  10.2  -43.4  -213.3  127.4  -148  -36.9  -122.7  42.7  -49.1  39.1  **126.1**  -69.6  -148.4  43.6  70.6  -122.7  29.7  -45  54.9 | (-142.4,154.7) ( -57.1, 97.0)  (-125.3, 71.0) (-234.6, 57.8) (-206.9, 33.7)  (-410.2,182.7) ( -42.3,237.5)  (-109.9,105.3) (-164.8, 61.9)  (-103.8,208.8) ( -45.4,202.4) ( -35.7,123.6) ( -71.6, 91.9)  (-171.1, 87.7) (-535.7,104.8) (-164.7,429.7) (-400.1, 98.7)  (-327.4,251.1) (-276.2, 29.6)  (-101.2,186.2) (-324.3,229.2) ( -86.0,163.8)  **( 4.7,249.5)** (-236.4, 95.3) (-358.3, 60.7)  (-120.3,210.0) ( -89.8,231.4)  (-888.1,655.2) (-189.4,254.2) (-166.9, 77.8)  (-123.7,232.7) | 0.936  0.595  0.567  0.245  0.154  0.478  0.169  0.986  0.38  0.51  0.21  0.293  0.815  0.513  0.19  0.41  0.236  0.798  0.114  0.555  0.708  0.537  **0.043**  0.413  0.156  0.609  0.39  0.756  0.796  0.479  0.555 | 0.6  8.4  -11.8  -11.6  -22.8  -6.2  20.5  -0.4  -15.1  10.5  10.4  14  3.7  -11.1  -13.9  11.5  -13.4  -2.4  -41.4  8.9  -3.6  7.4  **26.8**  -10.3  -17.5  7.2  14.5  -3  3.7  -16.8  10.7 | ( -14.9, 16.2) ( -22.9, 38.8) ( -52.5, 29.8) ( -31.7, 7.8)  ( -54.2, 8.8) ( -23.0, 10.3) ( -8.9, 50.2)  ( -32.7, 31.3) ( -48.6, 18.3) ( -20.7, 41.8) ( -6.0, 26.6)  ( -11.7, 40.4) ( -26.2, 33.7) ( -43.8, 22.4) ( -34.9, 6.8)  ( -14.8, 38.7) ( -36.1, 8.9)  ( -21.1, 16.2) ( -93.2, 10.0) ( -21.2, 38.9) ( -23.5, 16.6) ( -16.3, 31.1) **( 1.0, 53.0)**  ( -35.0, 14.1)  ( -42.3, 7.2) ( -19.7, 34.5) ( -18.5, 47.6) ( -21.7, 16.0) ( -23.8, 32.0) ( -62.2, 29.0)  ( -24.1, 45.3) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Metal Machining, Fitting And Instrument Making Trades  Vehicle Trades Electrical Trades Construction Trades Building Trades Printing Trades  Food Preparation Trades  Skilled Trades n. e. c.  Healthcare And Related Personal Services Leisure And Travel Service Occupations Housekeeping Occupations  Sales Assistants And Retail Cashiers  Sales Related Occupations Customer Service Occupations Process Operatives  Plant And Machine Operatives Assemblers And Routine Operatives Construction Operatives  Transport Drivers And Operatives  Mobile Machine Drivers And Operatives Elementary Agricultural Occupations Elementary Construction Occupations Elementary Process Plant Occupations Elementary Goods Storage Occupations Elementary Administration Occupations Elementary Personal Services Occupations Elementary Cleaning Occupations Elementary Security Occupations  No occupation reported  TOTAL | 522  523  **524**  531  532  542  543  549  611  621  623  711  712  721  811  812  813  814  821  822  911  **912**  913  914  921  922  923  924 | -31.1  105.8  **-128**  -82.5  -67.3  -237.5  -47.8  -72.5  -19.6  -376.9  -1  -15.7  -140.2  137.5  53  -97.6  -127.8  -117.3  -58.2  -3.1  50.3  **-235**  -156.6  -80.3  -154.3  -72.9  -179.1  -196  -51 | (-134.7, 74.8) ( -47.1,257.7) **(-235.2,-21.2)** (-171.4, 8.1)  (-223.5, 92.8) (-605.4,125.6) (-212.8,120.7) (-349.0,200.5) (-232.7,190.2) (-761.4, 11.0)  (-302.1,298.9) (-205.1,173.5) (-378.6, 96.6)  (-137.8,409.0) ( -87.7,196.2) (-224.4, 30.7) (-309.8, 55.0) (-301.5, 66.4) (-135.7, 17.5)  (-196.8,184.4) (-207.5,308.6) **(-432.6,-36.7)** (-345.0, 32.9)  (-234.9, 70.1) (-329.9, 21.3)  (-322.8,174.7) (-375.5, 16.9) (-406.6, 12.6)  (-262.0,154.1) | 0.56  0.18  **0.019**  0.073  0.407  0.188  0.587  0.611  0.858  0.059  0.996  0.869  0.245  0.327  0.478  0.139  0.161  0.207  0.132  0.982  0.708  **0.022**  0.107  0.308  0.088  0.565  0.072  0.07  0.634 | -13  22.4  **-57.9**  -58.3  -15.3  -13.1  -12.1  -4.9  -2.4  -25  -0.1  -4.4  -12.3  15.2  14.2  -32.4  -33.6  -23.8  -48.1  -0.6  7  **-60.4**  -40.3  -25.4  -29  -16.6  -37.2  -29.1  -52.4  -630.9 | ( -56.2, 31.2) ( -10.0, 54.6) **(-106.3, -9.6)** (-121.2, 5.7) ( -50.8, 21.1) ( -33.4, 6.9)  ( -53.6, 30.4) ( -23.4, 13.5) ( -29.0, 23.7) ( -50.4, 0.7)  ( -21.3, 21.1) ( -57.4, 48.5) ( -33.2, 8.5)  ( -15.2, 45.1) ( -23.6, 52.7) ( -74.5, 10.2) ( -81.3, 14.4) ( -61.2, 13.5)  (-112.1, 14.4) ( -38.3, 35.9) ( -29.1, 43.3)  **(-111.1, -9.4)**  ( -88.7, 8.5) ( -74.2, 22.1) ( -61.9, 4.0)  ( -73.4, 39.7) ( -78.0, 3.5) ( -60.3, 1.9)  (-269.1,158.3)  (-979.2,-284.8) |

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences between Scotland and England, Monte Carlo simulation was used to estimate the difference between the rate in Scotland and England. 95% CI and p values were calculated using this method as well. Simulated 95% CI are indicated using brackets.

Source: ONS Longitudinal Study and Scottish Longitudinal Study

**Table 3b: Expected change in deaths in Scotland among working age women if occupational mortality rates for England applied §**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC**  **code\*** | **Difference between rates in England and Scotland** | **95% CI** | **p value** | **Expected**  **change in deaths in Scotland** | **95% CI** |
| Corporate managers and directors  Managers and proprietors in agriculture and services Managers And Proprietors In Other Service Industries Science, research, engineering and technology professionals Health professionals  Teaching Professionals  Business and public service professionals Science and technology associate professionals Health Associate Professionals  Social Welfare Associate Professionals  Culture, media and sports occupations  Business and public service associate professionals  Administrative Occupations: Government And Related Organisations  Administrative Occupations: Finance Administrative Occupations: Records Administrative Occupations: Communications Administrative Occupations: General Secretarial And Related Occupations Agricultural Trades  Skilled metal and electrical trades Textiles And Garments Trades Printing Trades  Food preparation trades  Healthcare And Related Personal Services  Childcare And Related Personal Services  Leisure And Travel Service Occupations Hairdressers And Related Occupations Housekeeping Occupations  Sales Assistants And Retail Cashiers  Sales Related Occupations | 11  **12**  123  21  221  231  24  31  321  323  34  35  411  412  **413**  414  415  421  511  52  541  542  **543**  611  612  621  622  623  711  712 | 30.4  **160.0**  -16.4  -251.6  -1.3  20.4  -42.4  -17.2  -10.5  33.6  -68.9  -11.4  25.1  14.8  **111.2**  91.5  6.0  -5.8  133.7  -18.6  8.1  -73.1  **-204.7**  6.6  -28.7  -5.5  -146.1  50.4  -2.3  79.8 | ( -25.6, 86.9) **( 41.4,276.3)** (-132.4, 98.0)  (-669.6,158.7) (-190.8,185.0) ( -26.9, 67.1)  (-150.1, 63.8) (-154.8,123.6) ( -79.6, 57.4)  ( -91.7,159.7) (-200.1, 61.9) ( -92.6, 66.8)  ( -84.9,132.0) ( -55.5, 87.2)  **( 12.5,207.3)**  (-114.7,293.8) ( -56.2, 68.5)  ( -56.8, 45.3) ( -38.5,302.4)  (-378.7,336.4) (-339.6,360.7) (-396.8,251.1) **(-343.7,-67.0)**  ( -51.4, 65.8)  (-119.6, 60.3) (-172.5,166.9) (-330.2, 37.2)  (-112.1,211.4) ( -55.1, 50.6)  ( -98.6,256.1) | 0.293  **0.009**  0.77  0.229  0.985  0.393  0.445  0.802  0.763  0.603  0.311  0.787  0.658  0.687  **0.028**  0.382  0.857  0.821  0.134  0.914  0.965  0.667  **0.004**  0.823  0.538  0.948  0.118  0.538  0.927  0.372 | 23.4  **35**  -2.9  -29.6  -0.1  15  -10.2  -2.5  -6.9  6.6  -11.2  -6.2  6.5  8.7  **38.1**  7.8  4.5  -4.7  5.5  -0.6  0.3  -2  **-43.6**  6  -12.2  -0.7  -27.6  4.9  -3.2  6.2 | ( -19.7, 66.8)  **( 9.1, 60.4)**  ( -23.7, 17.5) ( -78.8, 18.7) ( -22.6, 22.0) ( -19.9, 49.6) ( -36.2, 15.4) ( -22.3, 17.8) ( -52.7, 38.0) ( -18.1, 31.5) ( -32.5, 10.1) ( -50.5, 36.4) ( -22.0, 34.2) ( -32.7, 51.4) **( 4.3, 70.9)**  ( -9.8, 25.1)  ( -42.4, 51.6) ( -46.4, 37.0) ( -1.6, 12.5)  ( -13.1, 11.6) ( -12.7, 13.5) ( -11.1, 7.0)  **( -73.2,-14.3)** ( -46.6, 59.7) ( -51.1, 25.8) ( -22.8, 22.1) ( -62.4, 7.0)  ( -10.9, 20.5) ( -76.1, 69.9)  ( -7.7, 19.9) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Customer Service Occupations  Process Operatives  Plant And Machine Operatives Assemblers And Routine Operatives Transport Drivers And Operatives Elementary Process Plant Occupations Elementary Goods Storage Occupations Elementary Administration Occupations Elementary Personal Services Occupations Elementary Cleaning Occupations Elementary Security Occupations  No occupation reported  TOTAL | 721  811  812  813  821  913  914  921  922  **923**  924 | 71  8.8  -144.9  -108.3  21.9  -61.7  -310.8  29.3  -31  **-73.9**  -38.8  **-108.3** | ( -37.2,180.1) (-133.6,154.6) (-517.4,223.1) (-221.2, 1.7)  (-231.8,271.1) (-206.0, 84.7) (-668.4, 53.6)  (-179.7,236.0) (-115.1, 52.4) **(-143.5, -3.3)**  (-218.7,137.4)  **(-199.7,-16.3)** | 0.189  0.908  0.438  0.055  0.858  0.406  0.091  0.779  0.476  **0.042**  0.677  **0.019** | 19.7  1.6  -6  -46  1.1  -13.2  -13.5  2.9  -21.5  **-63.5**  -2.8  **-135.3**  -272.6 | ( -10.3, 49.9) ( -23.7, 27.4) ( -21.3, 9.2)  ( -93.9, 0.7) ( -11.6, 13.5) ( -44.1, 18.1) ( -29.1, 2.3)  ( -17.6, 23.1) ( -79.8, 36.3) **(-123.3, -2.8)** ( -16.1, 10.1)  **(-249.6,-20.4)**  (-512.6,-26) |

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences between Scotland and England, Monte Carlo simulation was used to estimate the difference between the rate in Scotland and England. 95% CI and p values were calculated using this method as well. Simulated 95% CI are indicated using brackets.

Source: ONS Longitudinal Study and Scottish Longitudinal Study

**Figure 1: Bubble graph showing occupational mortality rates in England and Scotland, 2001-2011 for a) men and b) women \***

\*Each bubble is proportional to the size of the employment group in England

**References**

1. Hunter D. The diseases of occupations. 5th ed: The English Universities Press Ltd 1974.

2. Office of Population Censuses and Surveys. The Registrar General's decennial supplement for

England and Wales, 1970-1972. London: Her Majesty's Stationery Office, 1978.

3. Roman E, Beral V, Inskip H. Occupational mortality among women in England and Wales. *BMJ*

1985;291(6489):194-96. doi: 10.1136/bmj.291.6489.194

4. Fox AJ, Adelstein AM. Occupational mortality: work or way of life? *J Epidemiol Community Health*

1978;32(2):73-78. doi: 10.1136/jech.32.2.73

5. Moser KA, Goldblatt PO. Occupational mortality of women aged 15-59 years at death in England and Wales. *J Epidemiol Community Health* 1991;45(2):117-24. doi: 10.1136/jech.45.2.117

6. Holmes E, Davies A, Wright C, et al. Mortality rates according to occupation in New Zealand males:

2001–2005. *Clinical Correspondence* 2011

7. Lee H-E, Kim H-R, Chung YK, et al. Mortality rates by occupation in Korea: a nationwide, 13-year follow-up study. *Occup Environ Med* 2016 doi: 10.1136/oemed-2015-103192

8. Benach J, Vives A, Amable M, et al. Precarious Employment: Understanding an Emerging Social

Determinant of Health. *Annu Rev Public Health* 2014;35(1):229-53. doi:

doi:10.1146/annurev-publhealth-032013-182500

9. Benach J, Vives A, Tarafa G, et al. What should we know about precarious employment and health in 2025? framing the agenda for the next decade of research. *Int J Epidemiol* 2016;45(1):232-

38. doi: 10.1093/ije/dyv342

10. Katikireddi SV, Niedzwiedz CL, Popham F. Employment status and income as potential mediators of educational inequalities in population mental health. *Eur J Public Health* 2016;26(5):814-

16. doi: 10.1093/eurpub/ckw126

11. McCartney G. Illustrating health inequalities in Glasgow. *J Epidemiol Community Health*

2011;65(1):94-94.

12. Cheshire J. Featured Graphic. Lives on the Line: Mapping Life Expectancy along the London Tube

Network. *Environment and Planning A* 2012;44(7):1525-28. doi: doi:10.1068/a45341

13. Galobardes B, Shaw M, Lawlor DA, et al. Indicators of socioeconomic position (part 1). *J Epidemiol Community Health* 2006;60(1):7-12. doi: 10.1136/jech.2004.023531

14. Galobardes B, Shaw M, Lawlor DA, et al. Indicators of socioeconomic position (part 2). *J Epidemiol Community Health* 2006;60(2):95-101. doi: 10.1136/jech.2004.028092

15. Rose D, Pevalin DJ, O'Reilly K. The National Statistics Socio-economic Classification: origins, development and use: Palgrave Macmillan Basingstoke 2005.

16. Krieger N, Williams DR, Moss NE. Measuring Social Class in US Public Health Research: Concepts,

Methodologies, and Guidelines. *Annu Rev Public Health* 1997;18:341-78.

17. Bartley M. Health Inequality: An introduction to concepts, theories and methods. 2nd ed.

Cambridge: Polity 2017.

18. Coggon D, Harris EC, Brown T, et al. Occupational mortality in England and Wales, 1991–2000: Office for National Statistics, 2009.

19. Coggon D, Harris EC, Brown T, et al. Work-related mortality in England and Wales, 1979-2000.

*Occup Environ Med* 2010;67(12):816-22. [published Online First: 2010/06/25]

20. Frohlich KL, Potvin L. Transcending the known in public health practice: the inequality paradox: the population approach and vulnerable populations. *Am J Public Health* 2008;98(2):216-21. [published Online First: 2008/01/04]

21. Young H, Grundy E, O'Reilly D, et al. Self-rated health and mortality in the UK: results from the first comparative analysis of the England and Wales, Scotland, and Northern Ireland Longitudinal Studies. *Popul Trends* 2010(139):11.

22. Walsh D, McCartney G, Collins C, et al. History, politics and vulnerability: explaining excess mortality in Scotland and Glasgow. *Glasgow Centre for Population Health/NHS Health Scotland* 2016

23. McCartney G, Russ TC, Walsh D, et al. Explaining the excess mortality in Scotland compared with

England: pooling of 18 cohort studies. *J Epidemiol Community Health* 2014 doi:

10.1136/jech-2014-204185

24. Hanlon P, Lawder R, Buchanan D, et al. Why is mortality higher in Scotland than in England and Wales? Decreasing influence of socioeconomic deprivation between 1981 and 2001 supports the existence of a ‘Scottish Effect’. *J Public Health (Oxf)* 2005;27(2):199-204.

25. McCartney G, Shipley M, Hart C, et al. Why Do Males in Scotland Die Younger than Those in

England? Evidence from Three Prospective Cohort Studies. *PLoS ONE* 2012;7(7):e38860. doi:

10.1371/journal.pone.0038860

26. Popham F, Boyle PJ. Is there a ‘Scottish effect’ for mortality? Prospective observational study of

census linkage studies. *J Public Health (Oxf)* 2011;33(3):453-58. doi: 10.1093/pubmed/fdr023

27. Office for National Statistics. Standard occupational classification 2000. London: The Stationery

Office 2000.

28. Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd ed. London: Lippincott Williams & Wilkins 2008.

29. Spence P. Whole industries will be wiped out by new technology, warns Bank of England's Mark

Carney. *The Telegraph* 2016.

30. Maes L, Van Cauwenberghe E, Van Lippevelde W, et al. Effectiveness of workplace interventions in Europe promoting healthy eating: a systematic review. *Eur J Public Health* 2012;22(5):677-

83. doi: 10.1093/eurpub/ckr098

31. Malik SH, Blake H, Suggs LS. A systematic review of workplace health promotion interventions for increasing physical activity. *British Journal of Health Psychology* 2014;19(1):149-80. doi:

10.1111/bjhp.12052

32. McCartney G, Walsh D, Whyte B, et al. Has Scotland always been the ‘sick man’ of Europe? An

observational study from 1855 to 2006. *Eur J Public Health* 2011 doi: 10.1093/eurpub/ckr136

33. Ministerial Task Force on Health Inequalities. Equally Well Review 2013. Edinburgh: The Scottish

Government, 2014.

34. Schofield L, Walsh D, Munoz-Arroyo R, et al. Dying younger in Scotland: Trends in mortality and deprivation relative to England and Wales, 1981–2011. *Health & Place* 2016;40:106-15. doi: <http://dx.doi.org/10.1016/j.healthplace.2016.05.007>

Figure 1a

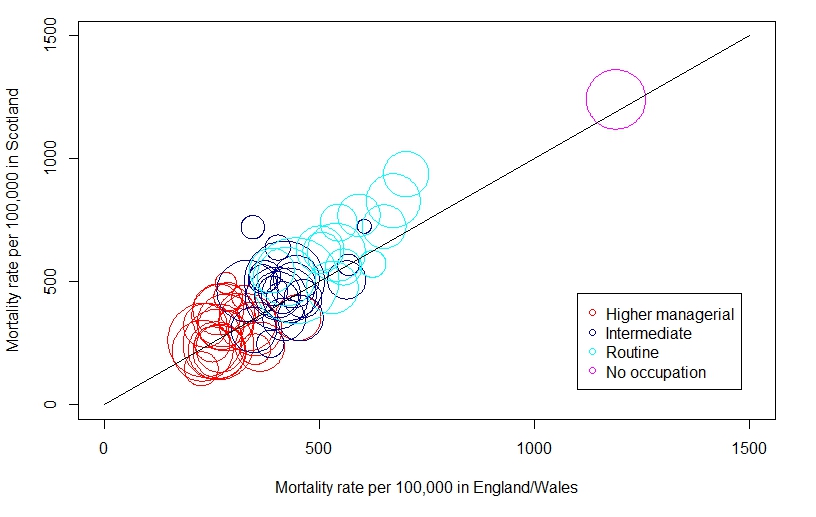
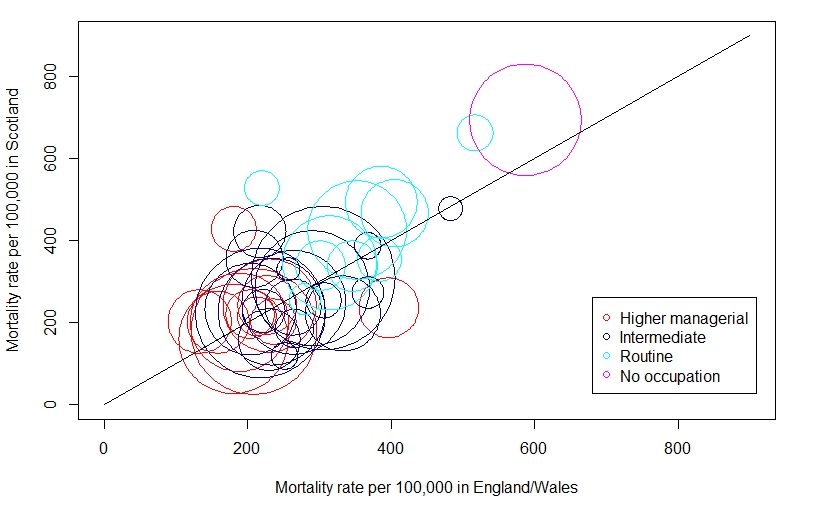


Figure1b 

**Necessary Additional Data**

[**Click here to download Necessary Additional Data: Appendix v2a.docx**](http://ees.elsevier.com/thelancetpublichealth/download.aspx?id=170021&amp;guid=a3938ffc-b1e4-4993-a653-3111e0b5adfb&amp;scheme=1)

**Appendix Table 1: Classification of Occupational Classification (SOC) codes**

In order to adhere to disclosure control guidelines and ensure adequate statistical power, the classification of SOC codes was modified. In general, the most disaggregated three digit codes possible were reported separately.

The below table indicates which SOC codes were used. For some specific categories, additional SOC codes were grouped together and are indicated by numbers in the table below. For example, SOC code 11 in males included SOC codes 111, 114 and 118, but SOC codes 112, 113, 115, 116 and 117 were coded separately.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Major Group** | **Sub-Major Group** | **Minor Group** | **Unit Group** | **Group Title** | **Men** | **Women** |
| **1** |  |  |  | **MANAGERS, DIRECTORS AND SENIOR OFFICIALS** |  |  |
|  |  |  |  |  |  |  |
|  | **11** |  |  | **CORPORATE MANAGERS AND DIRECTORS** | 111, 114, 118 | X |
|  |  | **111** |  | **Chief Executives and Senior Officials** |  |  |
|  |  |  | 1111 | Senior officials in national government |  |  |
|  |  |  | 1112 | Directors and chief executives of major organisations |  |  |
|  |  |  | 1113 | Senior officials in local government |  |  |
|  |  |  | 1114 | Senior officials of special interest organisations |  |  |
|  |  | **112** |  | **Production Managers** | X |  |
|  |  |  | 1121 | Production, works and maintenance managers |  |  |
|  |  |  | 1122 | Managers in construction |  |  |
|  |  |  | 1123 | Managers in mining and energy |  |  |
|  |  | **113** |  | **Functional Managers** | X |  |
|  |  |  | 1131 | Financial managers and chartered secretaries |  |  |
|  |  |  | 1132 | Marketing and sales managers |  |  |
|  |  |  | 1133 | Purchasing managers |  |  |
|  |  |  | 1134 | Advertising and public relations managers |  |  |
|  |  |  | 1135 | Personnel, training and industrial relations managers |  |  |
|  |  |  | 1136 | Information and communication technology managers |  |  |
|  |  |  | 1137 | Research and development managers |  |  |
|  |  | **114** |  | **Quality And Customer Care Managers** |  |  |
|  |  |  | 1141 | Quality assurance managers |  |  |
|  |  |  | 1142 | Customer care managers |  |  |
|  |  | **115** |  | **Financial Institution And Office Managers** | X |  |
|  |  |  | 1151 | Financial institution managers |  |  |
|  |  |  | 1152 | Office managers |  |  |
|  |  | **116** |  | **Managers In Distribution, Storage And Retailing** | X |  |
|  |  |  | 1161 | Transport and distribution managers |  |  |
|  |  |  | 1162 | Storage and warehouse managers |  |  |
|  |  |  | 1163 | Retail and wholesale managers |  |  |
|  |  | **117** |  | **Protective Service Officers** | X |  |
|  |  |  | 1171 | Officers in armed forces |  |  |
|  |  |  | 1172 | Police officers (inspectors and above) |  |  |
|  |  |  | 1173 | Senior officers in fire, ambulance, prison and related services |  |  |
|  |  |  | 1174 | Security managers |  |  |
|  |  | **118** |  | **Health And Social Services Managers** |  |  |
|  |  |  | 1181 | Hospital and health service managers |  |  |
|  |  |  | 1182 | Pharmacy managers |  |  |
|  |  |  | 1183 | Healthcare practice managers |  |  |
|  |  |  | 1184 | Social services managers |  |  |
|  |  |  | 1185 | Residential and day care managers |  |  |
|  |  |  |  |  |  |  |
|  | **12** |  |  | **MANAGERS AND PROPRIETORS IN AGRICULTURE AND SERVICES** | 121+122 | 121+122 |
|  |  |  |  |  |  |  |
|  |  | **121** |  | **Managers In Farming, Horticulture, Forestry And Fishing** |  |  |
|  |  |  | 1211 | Farm managers |  |  |
|  |  |  | 1212 | Natural environment and conservation managers |  |  |
|  |  |  | 1219 | Managers in animal husbandry, forestry and fishing n.e.c. |  |  |
|  |  | **122** |  | **Managers And Proprietors In Hospitality And Leisure Services** |  |  |
|  |  |  | 1221 | Hotel and accommodation managers |  |  |
|  |  |  | 1222 | Conference and exhibition managers |  |  |
|  |  |  | 1223 | Restaurant and catering managers |  |  |
|  |  |  | 1224 | Publicans and managers of licensed premises |  |  |
|  |  |  | 1225 | Leisure and sports managers |  |  |
|  |  |  | 1226 | Travel agency managers |  |  |
|  |  | **123** |  | **Managers And Proprietors In Other Service Industries** | X | X |
|  |  |  | 1231 | Property, housing and land managers |  |  |
|  |  |  | 1232 | Garage managers and proprietors |  |  |
|  |  |  | 1233 | Hairdressing and beauty salon managers and proprietors |  |  |
|  |  |  | 1234 | Shopkeepers and wholesale/retail dealers |  |  |
|  |  |  | 1235 | Recycling and refuse disposal managers |  |  |
|  |  |  | 1239 | Managers and proprietors in other services n.e.c. |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  | **PROFESSIONAL OCCUPATIONS** |  |  |
|  | **21** |  |  | **SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS** |  | X |
|  |  | **211** |  | **Natural and Social Science Professionals** | X |  |
|  |  |  | 2111 | Chemists |  |  |
|  |  |  | 2112 | Biological scientists and biochemists |  |  |
|  |  |  | 2113 | Physicists, geologists and meteorologists |  |  |
|  |  | **212** |  | **Engineering Professionals** | X |  |
|  |  |  | 2121 | Civil engineers |  |  |
|  |  |  | 2122 | Mechanical engineers |  |  |
|  |  |  | 2123 | Electrical engineers |  |  |
|  |  |  | 2124 | Electronics engineers |  |  |
|  |  |  | 2125 | Chemical engineers |  |  |
|  |  |  | 2126 | Design and development engineers |  |  |
|  |  |  | 2127 | Production and process engineers |  |  |
|  |  |  | 2128 | Planning and quality control engineers |  |  |
|  |  |  | 2129 | Engineering professionals n.e.c. |  |  |
|  |  | **213** |  | **Information And Communication Technology Professionals** | X |  |
|  |  |  | 2131 | IT strategy and planning professionals |  |  |
|  |  |  | 2132 | Software professionals |  |  |
|  | 22 |  |  | **HEALTH PROFESSIONALS** |  |  |
|  |  | **221** |  | **Health professionals** | X | X |
|  |  |  | 2211 | Medical practitioners |  |  |
|  |  |  | 2212 | Psychologists |  |  |
|  |  |  | 2213 | Pharmacists/pharmacologists |  |  |
|  |  |  | 2214 | Ophthalmic opticians |  |  |
|  |  |  | 2215 | Dental practitioners |  |  |
|  |  |  | 2216 | Veterinarians |  |  |
|  | **23** |  |  | **TEACHING AND RESEARCH PROFESSIONALS** |  |  |
|  |  | **231** |  | **Teaching Professionals** | X | X |
|  |  |  | 2311 | Higher education teaching professionals |  |  |
|  |  |  | 2312 | Further education teaching professionals |  |  |
|  |  |  | 2313 | Education officers, school inspectors |  |  |
|  |  |  | 2314 | Secondary education teaching professionals |  |  |
|  |  |  | 2315 | Primary and nursery education teaching professionals |  |  |
|  |  |  | 2316 | Special needs education teaching professionals |  |  |
|  |  |  | 2317 | Registrars and senior administrators of educational establishments |  |  |
|  |  |  | 2319 | Teaching professionals n.e.c. |  |  |
|  |  | **232** |  | **Research Professional** | X | X |
|  |  |  | 2321 | Scientific researchers |  |  |
|  |  |  | 2322 | Social science researchers |  |  |
|  |  |  | 2329 | Researchers n.e.c. |  |  |
|  | 24 |  |  | BUSINESS AND PUBLIC SERVICE PROFESSIONALS | X | X |
|  |  | **241** |  | **Legal Professionals** |  |  |
|  |  |  | 2411 | Solicitors and lawyers, judges and coroners |  |  |
|  |  |  | 2419 | Legal professionals n.e.c. |  |  |
|  |  | **242** |  | **Business And Statistical Professionals** |  |  |
|  |  |  | 2421 | Chartered and certified accountants |  |  |
|  |  |  | 2422 | Management accountants |  |  |
|  |  |  | 2423 | Management consultants, actuaries, economists and statisticians |  |  |
|  |  | **243** |  | **Architects, Town Planners, Surveyors** |  |  |
|  |  |  | 2431 | Architects |  |  |
|  |  |  | 2432 | Town planners |  |  |
|  |  |  | 2433 | Quantity surveyors |  |  |
|  |  |  | 2434 | Chartered surveyors (not quantity surveyors) |  |  |
|  |  | **244** |  | **Public Service Professionals** |  |  |
|  |  |  | 2441 | Public service administrative professionals |  |  |
|  |  |  | 2442 | Social workers |  |  |
|  |  |  | 2443 | Probation officers |  |  |
|  |  |  | 2444 | Clergy |  |  |
|  |  | **245** |  | **Librarians And Related Professionals** |  |  |
|  |  |  | 2451 | Librarians |  |  |
|  |  |  | 2452 | Archivists and curators |  |  |
|  |  |  |  |  |  |  |
| 3 |  |  |  | **ASSOCIATE PROFESSIONAL AND TECHNICAL OCCUPATIONS** |  |  |
|  |  |  |  |  |  |  |
|  | **31** |  |  | **SCIENCE AND TECHNOLOGY ASSOCIATE PROFESSIONALS** |  | X |
|  |  | **311** |  | **Science And Engineering Technicians** | X |  |
|  |  |  | 3111 | Laboratory technicians |  |  |
|  |  |  | 3112 | Electrical/electronics technicians |  |  |
|  |  |  | 3113 | Engineering technicians |  |  |
|  |  |  | 3114 | Building and civil engineering technicians |  |  |
|  |  |  | 3115 | Quality assurance technicians |  |  |
|  |  |  | 3119 | Science and engineering technicians n.e.c. |  |  |
|  |  | **312** |  | **Draughtspersons And Building Inspectors** | X |  |
|  |  |  | 3121 | Architectural technologists and town planning technicians |  |  |
|  |  |  | 3122 | Draughtspersons |  |  |
|  |  |  | 3123 | Building inspectors |  |  |
|  |  | **313** |  | **IT Service Delivery Occupations** | X |  |
|  |  |  | 3131 | IT operations technicians |  |  |
|  |  |  | 3132 | IT user support technicians |  |  |
|  | 32 |  |  | HEALTH AND SOCIAL WELFARE ASSOCIATE PROFESSIONALS |  |  |
|  |  | **321** |  | **Health Associate Professionals** | X | X |
|  |  |  | 3211 | Nurses |  |  |
|  |  |  | 3212 | Midwives |  |  |
|  |  |  | 3213 | Paramedics |  |  |
|  |  |  | 3214 | Medical radiographers |  |  |
|  |  |  | 3215 | Chiropodists |  |  |
|  |  |  | 3216 | Dispensing opticians |  |  |
|  |  |  | 3217 | Pharmaceutical dispensers |  |  |
|  |  |  | 3218 | Medical and dental technicians |  |  |
|  |  | **322** |  | **Therapists** | X | X |
|  |  |  | 3221 | Physiotherapists |  |  |
|  |  |  | 3222 | Occupational therapists |  |  |
|  |  |  | 3223 | Speech and language therapists |  |  |
|  |  |  | 3229 | Therapists n.e.c. |  |  |
|  |  | **323** |  | **Social Welfare Associate Professionals** | X | X |
|  |  |  | 3231 | Youth and community workers |  |  |
|  |  |  | 3232 | Housing and welfare officers |  |  |
|  | 33 |  |  | PROTECTIVE SERVICE OCCUPATIONS |  |  |
|  |  | **331** |  | **Protective Service Occupations** | X | X |
|  |  |  | 3311 | NCOs and other ranks |  |  |
|  |  |  | 3312 | Police officers (sergeant and below) |  |  |
|  |  |  | 3313 | Fire service officers (leading fire officer and below) |  |  |
|  |  |  | 3314 | Prison service officers (below principal officer) |  |  |
|  |  |  | 3319 | Protective service associate professionals n.e.c. |  |  |
|  | 34 |  |  | CULTURE, MEDIA AND SPORTS OCCUPATIONS | X | X |
|  |  | **341** |  | **Artistic And Literary Occupations** |  |  |
|  |  |  | 3411 | Artists |  |  |
|  |  |  | 3412 | Authors, writers |  |  |
|  |  |  | 3413 | Actors, entertainers |  |  |
|  |  |  | 3414 | Dancers and choreographers |  |  |
|  |  |  | 3415 | Musicians |  |  |
|  |  |  | 3416 | Arts officers, producers and directors |  |  |
|  |  | **342** |  | **Design Associate Professionals** |  |  |
|  |  |  | 3421 | Graphic designers |  |  |
|  |  |  | 3422 | Product, clothing and related designers |  |  |
|  |  | **343** |  | **Media Associate Professionals** |  |  |
|  |  |  | 3431 | Journalists, newspaper and periodical editors |  |  |
|  |  |  | 3432 | Broadcasting associate professionals |  |  |
|  |  |  | 3433 | Public relations officers |  |  |
|  |  |  | 3434 | Photographers and audio-visual equipment operators |  |  |
|  |  | **344** |  | **Sports And Fitness Occupations** |  |  |
|  |  |  | 3441 | Sports players |  |  |
|  |  |  | 3442 | Sports coaches, instructors and officials |  |  |
|  |  |  | 3443 | Fitness instructors |  |  |
|  |  |  | 3449 | Sports and fitness occupations n.e.c. |  |  |
|  | 35 |  |  | BUSINESS AND PUBLIC SERVICE ASSOCIATE PROFESSIONALS |  | X |
|  |  | **351** |  | **Transport Associate Professionals** | X |  |
|  |  |  | 3511 | Air traffic controllers |  |  |
|  |  |  | 3512 | Aircraft pilots and flight engineers |  |  |
|  |  |  | 3513 | Ship and hovercraft officers |  |  |
|  |  |  | 3514 | Train drivers |  |  |
|  |  | **352** |  | **Legal Associate Professionals** | X |  |
|  |  |  | 3520 | Legal associate professionals |  |  |
|  |  | **353** |  | **Business And Finance Associate Professionals** | X |  |
|  |  |  | 3531 | Estimators, valuers and assessors |  |  |
|  |  |  | 3532 | Brokers |  |  |
|  |  |  | 3533 | Insurance underwriters |  |  |
|  |  |  | 3534 | Finance and investment analysts/advisers |  |  |
|  |  |  | 3535 | Taxation experts |  |  |
|  |  |  | 3536 | Importers, exporters |  |  |
|  |  |  | 3537 | Financial and accounting technicians |  |  |
|  |  |  | 3539 | Business and related associate professionals n.e.c. |  |  |
|  |  | **354** |  | **Sales And Related Associate Professionals** | X |  |
|  |  |  | 3541 | Buyers and purchasing officers |  |  |
|  |  |  | 3542 | Sales representatives |  |  |
|  |  |  | 3543 | Marketing associate professionals |  |  |
|  |  |  | 3544 | Estate agents, auctioneers |  |  |
|  |  | **355** |  | **Conservation Associate Professionals** | X |  |
|  |  |  | 3551 | Conservation and environmental protection officers |  |  |
|  |  |  | 3552 | Countryside and park rangers |  |  |
|  |  | **356** |  | **Public Service And Other Associate Professionals** | X |  |
|  |  |  | 3561 | Public service associate professionals |  |  |
|  |  |  | 3562 | Personnel and industrial relations officers |  |  |
|  |  |  | 3563 | Vocational and industrial trainers and instructors |  |  |
|  |  |  | 3564 | Careers advisers and vocational guidance specialists |  |  |
|  |  |  | 3565 | Inspectors of factories, utilities and trading standards |  |  |
|  |  |  | 3566 | Statutory examiners |  |  |
|  |  |  | 3567 | Occupational hygienists and safety officers (health and safety) |  |  |
|  |  |  | 3568 | Environmental health officers |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  | ADMINISTRATIVE AND SECRETARIAL OCCUPATIONS |  |  |
| 4 |  |  |  |  |  |  |
|  | 41 |  |  | ADMINISTRATIVE OCCUPATIONS |  |  |
|  |  | **411** |  | **Administrative Occupations: Government And Related Organisations** | X | X |
|  |  |  | 4111 | Civil Service executive officers |  |  |
|  |  |  | 4112 | Civil Service administrative officers and assistants |  |  |
|  |  |  | 4113 | Local government clerical officers and assistants |  |  |
|  |  |  | 4114 | Officers of non-governmental organisations |  |  |
|  |  | **412** |  | **Administrative Occupations: Finance** | X | X |
|  |  |  | 4121 | Credit controllers |  |  |
|  |  |  | 4122 | Accounts and wages clerks, book-keepers, other financial clerks |  |  |
|  |  |  | 4123 | Counter clerks |  |  |
|  |  | **413** |  | **Administrative Occupations: Records** | X | X |
|  |  |  | 4131 | Filing and other records assistants/clerks |  |  |
|  |  |  | 4132 | Pensions and insurance clerks |  |  |
|  |  |  | 4133 | Stock control clerks |  |  |
|  |  |  | 4134 | Transport and distribution clerks |  |  |
|  |  |  | 4135 | Library assistants/clerks |  |  |
|  |  |  | 4136 | Database assistants/clerks |  |  |
|  |  |  | 4137 | Market research interviewers |  |  |
|  |  | **414** |  | **Administrative Occupations: Communications** | X | X |
|  |  |  | 4141 | Telephonists |  |  |
|  |  |  | 4142 | Communication operators |  |  |
|  |  | **415** |  | **Administrative Occupations: General** | X | X |
|  |  |  | 4150 | General office assistants/clerks |  |  |
|  | 42 |  |  | SECRETARIAL AND RELATED OCCUPATIONS |  |  |
|  |  | **421** |  | **Secretarial And Related Occupations** | X | X |
|  |  |  | 4211 | Medical secretaries |  |  |
|  |  |  | 4212 | Legal secretaries |  |  |
|  |  |  | 4213 | School secretaries |  |  |
|  |  |  | 4214 | Company secretaries |  |  |
|  |  |  | 4215 | Personal assistants and other secretaries |  |  |
|  |  |  | 4216 | Receptionists |  |  |
|  |  |  | 4217 | Typists |  |  |
|  |  |  |  |  |  |  |
| 5 |  |  |  | SKILLED TRADES OCCUPATIONS |  |  |
|  |  |  |  |  |  |  |
|  | 51 |  |  | SKILLED AGRICULTURAL TRADES |  |  |
|  |  | **511** |  | **Agricultural Trades** | X | X |
|  |  |  | 5111 | Farmers |  |  |
|  |  |  | 5112 | Horticultural trades |  |  |
|  |  |  | 5113 | Gardeners and groundsmen/groundswomen |  |  |
|  |  |  | 5119 | Agricultural and fishing trades n.e.c. |  |  |
|  | 52 |  |  | SKILLED METAL AND ELECTRICAL TRADES |  | X |
|  |  | **521** |  | **Metal Forming, Welding And Related Trades** | X |  |
|  |  |  | 5211 | Smiths and forge workers |  |  |
|  |  |  | 5212 | Moulders, core makers, die casters |  |  |
|  |  |  | 5213 | Sheet metal workers |  |  |
|  |  |  | 5214 | Metal plate workers, shipwrights, riveters |  |  |
|  |  |  | 5215 | Welding trades |  |  |
|  |  |  | 5216 | Pipe fitters |  |  |
|  |  | **522** |  | **Metal Machining, Fitting And Instrument Making Trades** | X |  |
|  |  |  | 5221 | Metal machining setters and setter-operators |  |  |
|  |  |  | 5222 | Tool makers, tool fitters and markers-out |  |  |
|  |  |  | 5223 | Metal working production and maintenance fitters |  |  |
|  |  |  | 5224 | Precision instrument makers and repairers |  |  |
|  |  | **523** |  | **Vehicle Trades** | X |  |
|  |  |  | 5231 | Motor mechanics, auto engineers |  |  |
|  |  |  | 5232 | Vehicle body builders and repairers |  |  |
|  |  |  | 5233 | Auto electricians |  |  |
|  |  |  | 5234 | Vehicle spray painters |  |  |
|  |  | **524** |  | **Electrical Trades** | X |  |
|  |  |  | 5241 | Electricians, electrical fitters |  |  |
|  |  |  | 5242 | Telecommunications engineers |  |  |
|  |  |  | 5243 | Lines repairers and cable jointers |  |  |
|  |  |  | 5244 | TV, video and audio engineers |  |  |
|  |  |  | 5245 | Computer engineers, installation and maintenance |  |  |
|  |  |  | 5249 | Electrical/electronics engineers n.e.c. |  |  |
|  | 53 |  |  | SKILLED CONSTRUCTION AND BUILDING TRADES |  | X |
|  |  | **531** |  | **Construction Trades** | X |  |
|  |  |  | 5311 | Steel erectors |  |  |
|  |  |  | 5312 | Bricklayers, masons |  |  |
|  |  |  | 5313 | Roofers, roof tilers and slaters |  |  |
|  |  |  | 5314 | Plumbers, heating and ventilating engineers |  |  |
|  |  |  | 5315 | Carpenters and joiners |  |  |
|  |  |  | 5316 | Glaziers, window fabricators and fitters |  |  |
|  |  |  | 5319 | Construction trades n.e.c. |  |  |
|  |  | **532** |  | **Building Trades** | X |  |
|  |  |  | 5321 | Plasterers |  |  |
|  |  |  | 5322 | Floorers and wall tilers |  |  |
|  |  |  | 5323 | Painters and decorators |  |  |
|  | 54 |  |  | TEXTILES, PRINTING AND OTHER SKILLED TRADES |  |  |
|  |  | **541** |  | **Textiles And Garments Trades** | X | X |
|  |  |  | 5411 | Weavers and knitters |  |  |
|  |  |  | 5412 | Upholsterers |  |  |
|  |  |  | 5413 | Leather and related trades |  |  |
|  |  |  | 5414 | Tailors and dressmakers |  |  |
|  |  |  | 5419 | Textiles, garments and related trades n.e.c. |  |  |
|  |  | **542** |  | **Printing Trades** | X | X |
|  |  |  | 5421 | Originators, compositors and print preparers |  |  |
|  |  |  | 5422 | Printers |  |  |
|  |  |  | 5423 | Bookbinders and print finishers |  |  |
|  |  |  | 5424 | Screen printers |  |  |
|  |  | **543** |  | **Food Preparation Trades** | X | X |
|  |  |  | 5431 | Butchers, meat cutters |  |  |
|  |  |  | 5432 | Bakers, flour confectioners |  |  |
|  |  |  | 5433 | Fishmongers, poultry dressers |  |  |
|  |  |  | 5434 | Chefs, cooks |  |  |
|  |  | **549** |  | **Skilled Trades n. e. c.** | X | X |
|  |  |  | 5491 | Glass and ceramics makers, decorators and finishers |  |  |
|  |  |  | 5492 | Furniture makers, other craft woodworkers |  |  |
|  |  |  | 5493 | Pattern makers (moulds) |  |  |
|  |  |  | 5494 | Musical instrument makers and tuners |  |  |
|  |  |  | 5495 | Goldsmiths, silversmiths, precious stone workers |  |  |
|  |  |  | 5496 | Floral arrangers, florists |  |  |
|  |  |  | 5499 | Hand craft occupations n.e.c. |  |  |
|  |  |  |  |  |  |  |
| 6 |  |  |  | PERSONAL SERVICE OCCUPATIONS |  |  |
|  |  |  |  |  |  |  |
|  | 61 |  |  | CARING PERSONAL SERVICE OCCUPATIONS |  |  |
|  |  | **611** |  | **Healthcare And Related Personal Services** | X | X |
|  |  |  | 6111 | Nursing auxiliaries and assistants |  |  |
|  |  |  | 6112 | Ambulance staff (excluding paramedics) |  |  |
|  |  |  | 6113 | Dental nurses |  |  |
|  |  |  | 6114 | Houseparents and residential wardens |  |  |
|  |  |  | 6115 | Care assistants and home carers |  |  |
|  |  | **612** |  | **Childcare And Related Personal Services** | X | X |
|  |  |  | 6121 | Nursery nurses |  |  |
|  |  |  | 6122 | Childminders and related occupations |  |  |
|  |  |  | 6123 | Playgroup leaders/assistants |  |  |
|  |  |  | 6124 | Educational assistants |  |  |
|  |  | **613** |  | **Animal Care Services** | X | X |
|  |  |  | 6131 | Veterinary nurses and assistants |  |  |
|  |  |  | 6139 | Animal care occupations n.e.c. |  |  |
|  | 62 |  |  | LEISURE AND OTHER PERSONAL SERVICE OCCUPATIONS |  |  |
|  |  | **621** |  | **Leisure And Travel Service Occupations** | X | X |
|  |  |  | 6211 | Sports and leisure assistants |  |  |
|  |  |  | 6212 | Travel agents |  |  |
|  |  |  | 6213 | Travel and tour guides |  |  |
|  |  |  | 6214 | Air travel assistants |  |  |
|  |  |  | 6215 | Rail travel assistants |  |  |
|  |  |  | 6219 | Leisure and travel service occupations n.e.c. |  |  |
|  |  | **622** |  | **Hairdressers And Related Occupations** | X | X |
|  |  |  | 6221 | Hairdressers, barbers |  |  |
|  |  |  | 6222 | Beauticians and related occupations |  |  |
|  |  | **623** |  | **Housekeeping Occupations** | X | X |
|  |  |  | 6231 | Housekeepers and related occupations |  |  |
|  |  |  | 6232 | Caretakers |  |  |
|  |  | **629** |  | **Personal Services Occupations n. e. c.** | X | X |
|  |  |  | 6291 | Undertakers and mortuary assistants |  |  |
|  |  |  | 6292 | Pest control officers |  |  |
|  |  |  |  |  |  |  |
| 7 |  |  |  | SALES AND CUSTOMER SERVICE OCCUPATIONS |  |  |
|  |  |  |  |  |  |  |
|  | 71 |  |  | SALES OCCUPATIONS |  |  |
|  |  | **711** |  | **Sales Assistants And Retail Cashiers** | X | X |
|  |  |  | 7111 | Sales and retail assistants |  |  |
|  |  |  | 7112 | Retail cashiers and check-out operators |  |  |
|  |  |  | 7113 | Telephone salespersons |  |  |
|  |  | **712** |  | **Sales Related Occupations** | X | X |
|  |  |  | 7121 | Collector salespersons and credit agents |  |  |
|  |  |  | 7122 | Debt, rent and other cash collectors |  |  |
|  |  |  | 7123 | Roundsmen/women and van salespersons |  |  |
|  |  |  | 7124 | Market and street traders and assistants |  |  |
|  |  |  | 7125 | Merchandisers and window dressers |  |  |
|  |  |  | 7129 | Sales related occupations n.e.c. |  |  |
|  | 72 |  |  | CUSTOMER SERVICE OCCUPATIONS |  |  |
|  |  | **721** |  | **Customer Service Occupations** | X | X |
|  |  |  | 7211 | Call centre agents/operators |  |  |
|  |  |  | 7212 | Customer care occupations |  |  |
|  |  |  |  |  |  |  |
| 8 |  |  |  | PROCESS, PLANT AND MACHINE OPERATIVES |  |  |
|  |  |  |  |  |  |  |
|  | 81 |  |  | PROCESS, PLANT AND MACHINE OPERATIVES |  |  |
|  |  | **811** |  | **Process Operatives** | X | X |
|  |  |  | 8111 | Food, drink and tobacco process operatives |  |  |
|  |  |  | 8112 | Glass and ceramics process operatives |  |  |
|  |  |  | 8113 | Textile process operatives |  |  |
|  |  |  | 8114 | Chemical and related process operatives |  |  |
|  |  |  | 8115 | Rubber process operatives |  |  |
|  |  |  | 8116 | Plastics process operatives |  |  |
|  |  |  | 8117 | Metal making and treating process operatives |  |  |
|  |  |  | 8118 | Electroplaters |  |  |
|  |  |  | 8119 | Process operatives n.e.c. |  |  |
|  |  | **812** |  | **Plant And Machine Operatives** | X | X |
|  |  |  | 8121 | Paper and wood machine operatives |  |  |
|  |  |  | 8122 | Coal mine operatives |  |  |
|  |  |  | 8123 | Quarry workers and related operatives |  |  |
|  |  |  | 8124 | Energy plant operatives |  |  |
|  |  |  | 8125 | Metal working machine operatives |  |  |
|  |  |  | 8126 | Water and sewerage plant operatives |  |  |
|  |  |  | 8129 | Plant and machine operatives n.e.c. |  |  |
|  |  | **813** |  | **Assemblers And Routine Operatives** | X | X |
|  |  |  | 8131 | Assemblers (electrical products) |  |  |
|  |  |  | 8132 | Assemblers (vehicles and metal goods) |  |  |
|  |  |  | 8133 | Routine inspectors and testers |  |  |
|  |  |  | 8134 | Weighers, graders, sorters |  |  |
|  |  |  | 8135 | Tyre, exhaust and windscreen fitters |  |  |
|  |  |  | 8136 | Clothing cutters |  |  |
|  |  |  | 8137 | Sewing machinists |  |  |
|  |  |  | 8138 | Routine laboratory testers |  |  |
|  |  |  | 8139 | Assemblers and routine operatives n.e.c. |  |  |
|  |  | **814** |  | **Construction Operatives** | X | X |
|  |  |  | 8141 | Scaffolders, stagers, riggers |  |  |
|  |  |  | 8142 | Road construction operatives |  |  |
|  |  |  | 8143 | Rail construction and maintenance operatives |  |  |
|  |  |  | 8149 | Construction operatives n.e.c. |  |  |
|  | 82 |  |  | TRANSPORT AND MOBILE MACHINE DRIVERS AND OPERATIVES |  |  |
|  |  | **821** |  | **Transport Drivers And Operatives** | X | X |
|  |  |  | 8211 | Heavy goods vehicle drivers |  |  |
|  |  |  | 8212 | Van drivers |  |  |
|  |  |  | 8213 | Bus and coach drivers |  |  |
|  |  |  | 8214 | Taxi, cab drivers and chauffeurs |  |  |
|  |  |  | 8215 | Driving instructors |  |  |
|  |  |  | 8216 | Rail transport operatives |  |  |
|  |  |  | 8217 | Seafarers (merchant navy); barge, lighter and boat operatives |  |  |
|  |  |  | 8218 | Air transport operatives |  |  |
|  |  |  | 8219 | Transport operatives n.e.c. |  |  |
|  |  | **822** |  | **Mobile Machine Drivers And Operatives** | X | X |
|  |  |  | 8221 | Crane drivers |  |  |
|  |  |  | 8222 | Fork-lift truck drivers |  |  |
|  |  |  | 8223 | Agricultural machinery drivers |  |  |
|  |  |  | 8229 | Mobile machine drivers and operatives n.e.c. |  |  |
|  |  |  |  |  |  |  |
| 9 |  |  |  | ELEMENTARY OCCUPATIONS |  |  |
|  |  |  |  |  |  |  |
|  | 91 |  |  | ELEMENTARY TRADES, PLANT AND STORAGE RELATED OCCUPATIONS |  |  |
|  |  | **911** |  | **Elementary Agricultural Occupations** | X | X |
|  |  |  | 9111 | Farm workers |  |  |
|  |  |  | 9112 | Forestry workers |  |  |
|  |  |  | 9119 | Fishing and agriculture related occupations n.e.c. |  |  |
|  |  | **912** |  | **Elementary Construction Occupations** | X | X |
|  |  |  | 9121 | Labourers in building and woodworking trades |  |  |
|  |  |  | 9129 | Labourers in other construction trades n.e.c. |  |  |
|  |  | **913** |  | **Elementary Process Plant Occupations** | X | X |
|  |  |  | 9131 | Labourers in foundries |  |  |
|  |  |  | 9132 | Industrial cleaning process occupations |  |  |
|  |  |  | 9133 | Printing machine minders and assistants |  |  |
|  |  |  | 9134 | Packers, bottlers, canners, fillers |  |  |
|  |  |  | 9139 | Labourers in process and plant operations n.e.c. |  |  |
|  |  | **914** |  | **Elementary Goods Storage Occupations** | X | X |
|  |  |  | 9141 | Stevedores, dockers and slingers |  |  |
|  |  |  | 9149 | Other goods handling and storage occupations n.e.c. |  |  |
|  | 92 |  |  | ELEMENTARY ADMINISTRATION AND SERVICE OCCUPATIONS |  |  |
|  |  | **921** |  | **Elementary Administration Occupations** | X | X |
|  |  |  | 9211 | Postal workers, mail sorters, messengers, couriers |  |  |
|  |  |  | 9219 | Elementary office occupations n.e.c. |  |  |
|  |  | **922** |  | **Elementary Personal Services Occupations** | X | X |
|  |  |  | 9221 | Hospital porters |  |  |
|  |  |  | 9222 | Hotel porters |  |  |
|  |  |  | 9223 | Kitchen and catering assistants |  |  |
|  |  |  | 9224 | Waiters, waitresses |  |  |
|  |  |  | 9225 | Bar staff |  |  |
|  |  |  | 9226 | Leisure and theme park attendants |  |  |
|  |  |  | 9229 | Elementary personal services occupations n.e.c. |  |  |
|  |  | **923** |  | **Elementary Cleaning Occupations** | X | X |
|  |  |  | 9231 | Window cleaners |  |  |
|  |  |  | 9232 | Road sweepers |  |  |
|  |  |  | 9233 | Cleaners, domestics |  |  |
|  |  |  | 9234 | Launderers, dry cleaners, pressers |  |  |
|  |  |  | 9235 | Refuse and salvage occupations |  |  |
|  |  |  | 9239 | Elementary cleaning occupations n.e.c. |  |  |
|  |  | **924** |  | **Elementary Security Occupations** | X | X |
|  |  |  | 9241 | Security guards and related occupations |  |  |
|  |  |  | 9242 | Traffic wardens |  |  |
|  |  |  | 9243 | School crossing patrol attendants |  |  |
|  |  |  | 9244 | School mid-day assistants |  |  |
|  |  |  | 9245 | Car park attendants |  |  |
|  |  |  | 9249 | Elementary security occupations n.e.c. |  |  |
|  |  | **925** |  | **Elementary Sales Occupations** | X | X |
|  |  |  | 9251 | Shelf fillers |  |  |
|  |  |  | 9259 | Elementary sales occupations n.e.c. |  |  |

**Appendix Table 2a: Occupational mortality rates in Scotland in men**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Person-Years** | **EASR** | **Low 95% CI** | **High 95% CI** | **Rank** |
| Corporate managers and directors | 11 | 5312 | **244.2** | 116.6 | 371.7 | 9 |
| Production Managers | 112 | 20347 | **243.2** | 181.5 | 304.9 | 8 |
| Functional Managers | 113 | 21323 | **261.3** | 171.7 | 350.8 | 11 |
| Financial Institution And Office Managers | 115 | 6876 | **320.9** | 191.3 | 450.5 | 15 |
| Managers In Distribution, Storage And Retailing | 116 | 13312 | **362.9** | 252 | 473.7 | 23 |
| Protective Service Officers | 117 | 2858 | **436.2** | 165.2 | 707.2 | 30 |
| Managers and proprietors in agriculture and services | 12 | 10763 | **353.1** | 242.1 | 464.2 | 22 |
| Managers And Proprietors In Other Service Industries | 123 | 15127 | **333.4** | 240.8 | 426 | 18 |
| Engineering Professionals | 212 | 14990 | **332.6** | 233.7 | 431.5 | 17 |
| Information And Communication Technology Professionals | 213 | 10171 | **214.1** | 80.8 | 347.4 | 2 |
| Health professionals | 221 | 6685 | **145** | 49.8 | 240.2 | 1 |
| Teaching Professionals | 231 | 16617 | **219.3** | 158 | 280.6 | 4 |
| Research Professional | 232 | 2740 | **328** | 25.6 | 630.4 | 16 |
| Business and public service professionals | 24 | 18640 | **217.9** | 149.3 | 286.6 | 3 |
| Science And Engineering Technicians | 311 | 13016 | **314.3** | 206.1 | 422.4 | 14 |
| Draughtspersons And Building Inspectors | 312 | 3318 | **494.2** | 211.8 | 776.7 | 38 |
| IT Service Delivery Occupations | 313 | 4575 | **224.1** | 0 | 455.6 | 5 |
| Health Associate Professionals | 321 | 4593 | **438** | 219.5 | 656.5 | 31 |
| Social Welfare Associate Professionals | 323 | 3278 | **372.1** | 141.1 | 603.1 | 24 |
| Protective Service Occupations | 331 | 17173 | **385.7** | 254.7 | 516.8 | 26 |
| Culture, media and sports occupations | 34 | 10630 | **306.8** | 186.7 | 426.9 | 13 |
| Transport Associate Professionals | 351 | 3690 | **339.3** | 135.6 | 543 | 19 |
| Business And Finance Associate Professionals | 353 | 9666 | **228.5** | 124.6 | 332.5 | 6 |
| Sales And Related Associate Professionals | 354 | 10799 | **234.7** | 140.3 | 329.1 | 7 |
| Public Service And Other Associate Professionals | 356 | 7539 | **379.4** | 241.8 | 517 | 25 |
| Administrative Occupations: Government And Related Organisations | 411 | 6005 | **520.9** | 342.6 | 699.3 | 45 |
| Administrative Occupations: Finance | 412 | 8347 | **303.4** | 161 | 445.7 | 12 |
| Administrative Occupations: Records | 413 | 10452 | **346.2** | 220 | 472.4 | 20 |
| Administrative Occupations: Communications | 414 | 1241 | **724.4** | 38.5 | 1410.3 | 56 |
| Administrative Occupations: General | 415 | 6396 | **430.3** | 242.3 | 618.3 | 27 |
| Secretarial And Related Occupations | 421 |  |  |  |  |  |
| Agricultural Trades | 511 | 18949 | **446.7** | 349.7 | 543.6 | 33 |
| Metal Forming, Welding And Related Trades | 521 | 9910 | **506.7** | 370 | 643.4 | 41 |
| Metal Machining, Fitting And Instrument Making Trades | 522 | 21221 | **431** | 344.1 | 517.9 | 28 |
| Vehicle Trades | 523 | 10771 | **351** | 230.8 | 471.2 | 21 |
| Electrical Trades | 524 | 22986 | **461.6** | 371.3 | 552 | 35 |
| Construction Trades | 531 | 35967 | **501.3** | 425.3 | 577.4 | 39 |
| Building Trades | 532 | 11551 | **513.1** | 380 | 646.2 | 43 |
| Textiles And Garments Trades | 541 |  |  |  |  |  |
| Printing Trades | 542 | 2804 | **638.2** | 314.9 | 961.6 | 53 |
| Food Preparation Trades | 543 | 12822 | **484.9** | 351 | 618.8 | 37 |
| Skilled Trades n. e. c. | 549 | 3415 | **461.3** | 219.2 | 703.4 | 34 |
| Healthcare And Related Personal Services | 611 | 6333 | **434.4** | 265.5 | 603.4 | 29 |
| Animal Care Services | 613 | 479 | **1124.8** | 127.1 | 2122.5 | 61 |
| Leisure And Travel Service Occupations | 621 | 3368 | **721** | 376.6 | 1065.3 | 54 |
| Hairdressers And Related Occupations | 622 |  |  |  |  |  |
| Housekeeping Occupations | 623 | 3591 | **567.8** | 317.5 | 818.1 | 48 |
| Sales Assistants And Retail Cashiers | 711 | 14228 | **444** | 282.7 | 605.4 | 32 |
| Sales Related Occupations | 712 | 4458 | **509.1** | 303.4 | 714.7 | 42 |
| Customer Service Occupations | 721 | 5608 | **246.7** | 49.3 | 444.2 | 10 |
| Process Operatives | 811 | 13674 | **475.6** | 359.3 | 592 | 36 |
| Plant And Machine Operatives | 812 | 16897 | **520.5** | 410.3 | 630.7 | 44 |
| Assemblers And Routine Operatives | 813 | 13354 | **630** | 474.9 | 785.1 | 52 |
| Construction Operatives | 814 | 10330 | **623** | 472 | 773.9 | 51 |
| Transport Drivers And Operatives | 821 | 42023 | **503.2** | 440.1 | 566.3 | 40 |
| Mobile Machine Drivers And Operatives | 822 | 9897 | **559** | 410.4 | 707.7 | 47 |
| Elementary Agricultural Occupations | 911 | 7130 | **571.9** | 389.7 | 754.2 | 49 |
| Elementary Construction Occupations | 912 | 13061 | **936.9** | 771.4 | 1102.5 | 60 |
| Elementary Process Plant Occupations | 913 | 13085 | **829.1** | 665.8 | 992.4 | 59 |
| Elementary Goods Storage Occupations | 914 | 16057 | **618.8** | 486.1 | 751.5 | 50 |
| Elementary Administration Occupations | 921 | 9548 | **545** | 390.3 | 699.7 | 46 |
| Elementary Personal Services Occupations | 922 | 11572 | **723.5** | 519.7 | 927.3 | 55 |
| Elementary Cleaning Occupations | 923 | 10567 | **769.7** | 605.3 | 934.1 | 58 |
| Elementary Security Occupations | 924 | 7543 | **739.8** | 560.2 | 919.3 | 57 |
| Elementary Sales Occupations | 925 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| No occupation reported |  | 52255 | **1241.5** | 1131.4 | 1351.6 |  |
| All those reporting an occupation§ |  | 680710 | **437.3** | 421.2 | 453.5 |  |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix Table 1 for details.

§Note that this includes not only SOC categories listed, but also small occupational groups that have been suppressed for disclosure control (equating to a total of 1.5% of all person-years). Therefore, person-years for the SOC codes listed do not total to the last two rows.

Source: Scottish Longitudinal Study

**Appendix Table 2b: Occupational mortality rates in Scotland in women**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Person-Years** | **EASR** | **Low 95% CI** | **High 95% CI** | **Rank** |
| Corporate managers and directors | 11 | 39799 | **178.1** | 131.2 | 225 | 5 |
| Managers and proprietors in agriculture and services | 12 | 11323 | **235.9** | 147 | 324.8 | 18 |
| Managers And Proprietors In Other Service Industries | 123 | 9257 | **242.8** | 147.5 | 338.1 | 21 |
| Science, research, engineering and technology professionals | 21 | 6091 | **428.6** | 24 | 833.3 | 37 |
| Health professionals | 221 | 6144 | **214.8** | 63.4 | 366.3 | 11 |
| Teaching Professionals | 231 | 38283 | **159.6** | 122 | 197.1 | 4 |
| Research Professional | 232 |  |  |  |  |  |
| Business and public service professionals | 24 | 12492 | **200.8** | 109.4 | 292.1 | 8 |
| Science and technology associate professionals | 31 | 7445 | **220.4** | 100.4 | 340.5 | 12 |
| Health Associate Professionals | 321 | 34289 | **241.3** | 186.4 | 296.3 | 20 |
| Therapists | 322 | 4924 | **148.2** | 27.5 | 268.9 | 2 |
| Social Welfare Associate Professionals | 323 | 10220 | **202.3** | 109.5 | 295.1 | 9 |
| Protective Service Occupations | 331 | 2481 | **569.5** | 41.8 | 1097.2 | 42 |
| Culture, media and sports occupations | 34 | 8413 | **202.5** | 82.5 | 322.5 | 10 |
| Business and public service associate professionals | 35 | 28254 | **200.1** | 130.9 | 269.3 | 7 |
| Administrative Occupations: Government And Related Organisations | 411 | 13429 | **237.5** | 153.7 | 321.4 | 19 |
| Administrative Occupations: Finance | 412 | 30513 | **249.1** | 190.3 | 307.8 | 22 |
| Administrative Occupations: Records | 413 | 17717 | **222.2** | 147.1 | 297.3 | 13 |
| Administrative Occupations: Communications | 414 | 4428 | **273** | 117.6 | 428.4 | 25 |
| Administrative Occupations: General | 415 | 39050 | **226.4** | 176.8 | 276 | 15 |
| Secretarial And Related Occupations | 421 | 42318 | **223.2** | 180 | 266.4 | 14 |
| Agricultural Trades | 511 | 2138 | **117.9** | 15 | 220.8 | 1 |
| Skilled metal and electrical trades | 52 | 1786 | **387.3** | 80.4 | 694.3 | 34 |
| Skilled construction and building trades | 53 |  |  |  |  |  |
| Textiles And Garments Trades | 541 | 1931 | **478.1** | 200 | 756.2 | 39 |
| Printing Trades | 542 | 1446 | **329.9** | 37.5 | 622.3 | 28 |
| Food Preparation Trades | 543 | 11025 | **422.2** | 298.7 | 545.6 | 35 |
| Skilled Trades n. e. c. | 549 |  |  |  |  |  |
| Healthcare And Related Personal Services | 611 | 46928 | **283.7** | 237 | 330.4 | 26 |
| Childcare And Related Personal Services | 612 | 22117 | **232.3** | 155.8 | 308.8 | 17 |
| Leisure And Travel Service Occupations | 621 | 6846 | **228** | 99.4 | 356.6 | 16 |
| Hairdressers And Related Occupations | 622 | 9776 | **355.5** | 185.2 | 525.7 | 33 |
| Housekeeping Occupations | 623 | 5033 | **254.1** | 128.5 | 379.7 | 23 |
| Sales Assistants And Retail Cashiers | 711 | 71571 | **307.9** | 264.4 | 351.3 | 27 |
| Sales Related Occupations | 712 | 4023 | **185.5** | 46.3 | 324.7 | 6 |
| Customer Service Occupations | 721 | 14348 | **157.9** | 82.7 | 233.1 | 3 |
| Process Operatives | 811 | 9176 | **337.6** | 218.2 | 457 | 29 |
| Plant And Machine Operatives | 812 | 2135 | **662.9** | 320.1 | 1005.6 | 43 |
| Assemblers And Routine Operatives | 813 | 21991 | **493.7** | 399.3 | 588 | 40 |
| Transport Drivers And Operatives | 821 | 2587 | **256.8** | 51.6 | 461.9 | 24 |
| Elementary Agricultural Occupations | 911 |  |  |  |  |  |
| Elementary Process Plant Occupations | 913 | 11075 | **466.8** | 338.3 | 595.3 | 38 |
| Elementary Goods Storage Occupations | 914 | 2256 | **528.3** | 189.3 | 867.3 | 41 |
| Elementary Administration Occupations | 921 | 5060 | **354.4** | 180.3 | 528.4 | 32 |
| Elementary Personal Services Occupations | 922 | 35905 | **345.7** | 276.3 | 415 | 31 |
| Elementary Cleaning Occupations | 923 | 44486 | **425.7** | 371 | 480.5 | 36 |
| Elementary Security Occupations | 924 | 3801 | **338.7** | 177.8 | 499.7 | 30 |
| Elementary Sales Occupations | 925 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| No occupation reported |  | 64710 | **694.7** | 627.5 | 761.9 |  |
| All those reporting an occupation§ |  | 716950 | **277** | 264.4 | 289.6 |  |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix Table 1 for details.

§Note that this includes not only SOC categories listed, but also small occupational groups that have been suppressed for disclosure control (equating to a total of 1.6% of all person-years). Therefore, person-years for the SOC codes listed do not total to the last two rows.

Source: Scottish Longitudinal Study

**Appendix Table 3a: Occupational mortality rates in Northern Ireland in men**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Person-Years** | **EASR** | **Low 95% CI** | **High 95% CI** | **Rank** |
| Corporate managers and directors | 11 | 380331 | 232.7 | 216.7 | 248.7 | 6 |
| Managers and proprietors in agriculture and services | 12 | 55930 | 348.9 | 297.7 | 400 | 25 |
| Managers And Proprietors In Other Service Industries | 123 | 89047 | 257.8 | 227.1 | 288.4 | 9 |
| Natural and Social Science Professionals | 211 | 11302 | 317.8 | 215.6 | 419.9 | 14 |
| Engineering Professionals | 212 | 64710 | 199.5 | 158.6 | 240.4 | 3 |
| Information And Communication Technology Professionals | 213 | 47305 | 243 | 140.3 | 345.7 | 7 |
| Health professionals | 221 | 40230 | 136.8 | 97.7 | 176 | 1 |
| Teaching Professionals | 231 | 126477 | 203.1 | 180.9 | 225.4 | 4 |
| Research Professional | 232 | 14439 | 257.6 | 155.9 | 359.3 | 8 |
| Business and public service professionals | 24 | 107453 | 181.9 | 155.3 | 208.4 | 2 |
| Associate professional and technical occupations | 3 | 514830 | 284.7 | 267.8 | 301.6 | 10 |
| Administrative Occupations: Government And Related Organisations | 411 | 110582 | 338.2 | 304.7 | 371.6 | 19 |
| Administrative Occupations: Finance | 412 | 58421 | 338.8 | 284.6 | 393 | 20 |
| Administrative Occupations: Records | 413 | 44727 | 315.1 | 254.2 | 376 | 13 |
| Administrative Occupations: Communications | 414 | 5381 | 398.4 | 213.8 | 582.9 | 35 |
| Administrative Occupations: General | 415 | 93181 | 345.5 | 299.4 | 391.6 | 24 |
| Secretarial And Related Occupations | 421 | 8339 | 221.9 | 115.4 | 328.4 | 5 |
| Agricultural Trades | 511 | 174085 | 286.8 | 262.5 | 311.1 | 11 |
| Metal Forming, Welding And Related Trades | 521 | 62668 | 418.4 | 360.6 | 476.2 | 41 |
| Metal Machining, Fitting And Instrument Making Trades | 522 | 128242 | 349.1 | 315.2 | 383 | 26 |
| Vehicle Trades | 523 | 70657 | 334 | 284.1 | 383.9 | 17 |
| Electrical Trades | 524 | 140711 | 318.2 | 285.5 | 351 | 15 |
| Construction Trades | 531 | 300939 | 340.9 | 316.9 | 364.8 | 22 |
| Building Trades | 532 | 103712 | 407.1 | 365.2 | 449 | 38 |
| Textiles And Garments Trades | 541 | 10779 | 336.8 | 224.5 | 449.2 | 18 |
| Printing Trades | 542 | 11865 | 350.6 | 227.9 | 473.2 | 27 |
| Food Preparation Trades | 543 | 81829 | 417.9 | 359.9 | 476 | 40 |
| Skilled Trades n. e. c. | 549 | 30695 | 380 | 294.6 | 465.4 | 34 |
| Healthcare And Related Personal Services | 611 | 32005 | 406.9 | 327.6 | 486.3 | 37 |
| Childcare And Related Personal Services | 612 | 3058 | 471.1 | 158.7 | 783.6 | 47 |
| Animal Care Services | 613 | 2704 | 613.9 | 291.5 | 936.3 | 51 |
| Leisure And Travel Service Occupations | 621 | 11486 | 427.3 | 274.6 | 579.9 | 42 |
| Hairdressers And Related Occupations | 622 | 6260 | 321.5 | 136.1 | 506.9 | 16 |
| Housekeeping Occupations | 623 | 22329 | 358.7 | 291.7 | 425.7 | 30 |
| Sales Assistants And Retail Cashiers | 711 | 101906 | 350.8 | 297.3 | 404.3 | 28 |
| Sales Related Occupations | 712 | 27734 | 302.2 | 238.9 | 365.5 | 12 |
| Customer Service Occupations | 721 | 14179 | 411.7 | 234.8 | 588.6 | 39 |
| Process Operatives | 811 | 136199 | 405 | 367.1 | 442.8 | 36 |
| Plant And Machine Operatives | 812 | 109011 | 339.4 | 300.7 | 378 | 21 |
| Assemblers And Routine Operatives | 813 | 71774 | 370.2 | 314.3 | 426.2 | 31 |
| Construction Operatives | 814 | 63498 | 353.2 | 306.7 | 399.7 | 29 |
| Transport Drivers And Operatives | 821 | 282078 | 373 | 350.6 | 395.3 | 32 |
| Mobile Machine Drivers And Operatives | 822 | 64764 | 437.8 | 386.1 | 489.4 | 43 |
| Elementary Agricultural Occupations | 911 | 41969 | 448.9 | 378.6 | 519.2 | 45 |
| Elementary Construction Occupations | 912 | 122572 | 521.8 | 481.2 | 562.4 | 49 |
| Elementary Process Plant Occupations | 913 | 90871 | 539.4 | 486.2 | 592.7 | 50 |
| Elementary Goods Storage Occupations | 914 | 100886 | 438.6 | 393.3 | 484 | 44 |
| Elementary Administration Occupations | 921 | 52375 | 344.1 | 286.3 | 402 | 23 |
| Elementary Personal Services Occupations | 922 | 66949 | 638.6 | 562.8 | 714.4 | 52 |
| Elementary Cleaning Occupations | 923 | 55962 | 468.4 | 410.3 | 526.4 | 46 |
| Elementary Security Occupations | 924 | 54217 | 504.9 | 449.4 | 560.4 | 48 |
| Elementary Sales Occupations | 925 | 9258 | 373.5 | 169.8 | 577.1 | 33 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix Table 1 for details.

Source: Northern Ireland Mortality Study

**Appendix Table 3b: Occupational mortality rates in Northern Ireland in women**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Person-Years** | **EASR** | **Low 95% CI** | **High 95% CI** | **Rank** |
| Corporate managers and directors | 11 | 212609 | 166.1 | 145.8 | 186.5 | 7 |
| Managers and proprietors in agriculture and services | 12 | 50035 | 229.6 | 183.5 | 275.6 | 23 |
| Managers And Proprietors In Other Service Industries | 123 | 50206 | 210.6 | 172 | 249.3 | 16 |
| Science, research, engineering and technology professionals | 21 | 29248 | 154.8 | 82.4 | 227.3 | 5 |
| Health professionals | 221 | 33077 | 94.5 | 45 | 144.1 | 1 |
| Teaching Professionals | 231 | 271711 | 133.7 | 120 | 147.4 | 2 |
| Research Professional | 232 | 13904 | 205.1 | 84.6 | 325.6 | 15 |
| Business and public service professionals | 24 | 68042 | 144.8 | 108.3 | 181.3 | 3 |
| Associate professionals and technical occupations | 3 | 533249 | 176.9 | 163.7 | 190.1 | 9 |
| Administrative Occupations: Government And Related Organisations | 411 | 117934 | 197.9 | 170.3 | 225.4 | 14 |
| Administrative Occupations: Finance | 412 | 193982 | 195.7 | 172.7 | 218.6 | 13 |
| Administrative Occupations: Records | 413 | 87098 | 172.8 | 141 | 204.6 | 8 |
| Administrative Occupations: Communications | 414 | 22074 | 285.5 | 215 | 356 | 34 |
| Administrative Occupations: General | 415 | 270682 | 222.6 | 202 | 243.2 | 18 |
| Secretarial And Related Occupations | 421 | 274263 | 186.4 | 169.2 | 203.5 | 11 |
| Agricultural Trades | 511 | 14029 | 239.3 | 160.5 | 318.1 | 26 |
| Skilled metal and electrical trades | 52 | 14197 | 302.8 | 209.7 | 395.8 | 37 |
| Skilled construction and building trades | 53 | 6231 | 278.7 | 148.9 | 408.4 | 33 |
| Textiles And Garments Trades | 541 | 13885 | 331 | 249.2 | 412.9 | 40 |
| Printing Trades | 542 | 6202 | 180.8 | 73.7 | 287.9 | 10 |
| Food Preparation Trades | 543 | 93290 | 249.5 | 215.9 | 283.1 | 27 |
| Skilled Trades n. e. c. | 549 | 7858 | 336.5 | 194.3 | 478.7 | 41 |
| Healthcare And Related Personal Services | 611 | 269033 | 227.3 | 208.9 | 245.7 | 21 |
| Childcare And Related Personal Services | 612 | 145457 | 158.3 | 134 | 182.7 | 6 |
| Leisure And Travel Service Occupations | 621 | 26611 | 219.9 | 145.9 | 293.9 | 17 |
| Hairdressers And Related Occupations | 622 | 77852 | 229.8 | 180.4 | 279.2 | 24 |
| Housekeeping Occupations | 623 | 28147 | 256.1 | 202.7 | 309.4 | 29 |
| Sales Assistants And Retail Cashiers | 711 | 473183 | 233.9 | 218.2 | 249.7 | 25 |
| Sales Related Occupations | 712 | 15244 | 154.3 | 86.2 | 222.4 | 4 |
| Customer Service Occupations | 721 | 36599 | 226.6 | 133 | 320.2 | 19 |
| Process Operatives | 811 | 124130 | 319 | 288 | 349.9 | 38 |
| Plant And Machine Operatives | 812 | 32976 | 293 | 226.8 | 359.3 | 36 |
| Assemblers And Routine Operatives | 813 | 192729 | 323.9 | 298.3 | 349.5 | 39 |
| Transport Drivers And Operatives | 821 | 11733 | 290.8 | 177.4 | 404.3 | 35 |
| Elementary Agricultural Occupations | 911 | 8532 | 192.8 | 96.5 | 289.1 | 12 |
| Elementary Process Plant Occupations | 913 | 79215 | 339.2 | 298.5 | 379.8 | 42 |
| Elementary Goods Storage Occupations | 914 | 12120 | 227.2 | 130.4 | 323.9 | 20 |
| Elementary Administration Occupations | 921 | 28668 | 276.3 | 208.8 | 343.9 | 31 |
| Elementary Personal Services Occupations | 922 | 194105 | 267.7 | 243.1 | 292.3 | 30 |
| Elementary Cleaning Occupations | 923 | 253449 | 276.8 | 258.3 | 295.2 | 32 |
| Elementary Security Occupations | 924 | 36509 | 253.5 | 206.2 | 300.8 | 28 |
| Elementary Sales Occupations | 925 | 17610 | 228.2 | 139.2 | 317.1 | 22 |

EASR = European age-standardised mortality rates

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix Table 1 for details.

Source: Northern Ireland Mortality Study

**Appendix Table 4a: Expected change in deaths in England among working age men if occupational mortality rates for Scotland applied §**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Difference between England and Scotland** | **95% CI** | **p value** | **Expected change in deaths in England** | **95% CI** |
| Corporate managers and directors | 11 | 6.1 | (-142.4,154.7) | 0.936 | -8.7 | (-220.1, 202.6) |
| Production Managers | 112 | 21 | ( -57.1, 97.0) | 0.595 | -119.4 | (-551.9, 325.0) |
| Functional Managers | 113 | -28.2 | (-125.3, 71.0) | 0.567 | 176.2 | (-443.1, 781.4) |
| Financial Institution And Office Managers | 115 | -86.1 | (-234.6, 57.8) | 0.245 | 188 | (-126.2, 512.1) |
| Managers In Distribution, Storage And Retailing | 116 | -87.1 | (-206.9, 33.7) | 0.154 | 397.3 | (-153.9, 944.1) |
| Protective Service Officers | 117 | -111.1 | (-410.2,182.7) | 0.478 | 72.2 | (-118.7, 266.6) |
| Managers and proprietors in agriculture and services | 12 | 97 | ( -42.3,237.5) | 0.169 | -231.3 | (-566.1, 100.8) |
| Managers And Proprietors In Other Service Industries | 123 | -1.2 | (-109.9,105.3) | 0.986 | 4.5 | (-393.0, 410.2) |
| Engineering Professionals | 212 | -51.2 | (-164.8, 61.9) | 0.38 | 186.8 | (-225.9, 600.9) |
| Information And Communication Technology Professionals | 213 | 52.4 | (-103.8,208.8) | 0.51 | -168.6 | (-671.4, 333.6) |
| Health professionals | 221 | 79.2 | ( -45.4,202.4) | 0.21 | -104.1 | (-266.0, 59.7) |
| Teaching Professionals | 231 | 42.8 | ( -35.7,123.6) | 0.293 | -160.6 | (-463.8, 134.1) |
| Business and public service professionals | 24 | 10.2 | ( -71.6, 91.9) | 0.815 | -43.1 | (-387.2, 301.7) |
| Science And Engineering Technicians | 311 | -43.4 | (-171.1, 87.7) | 0.513 | 102.6 | (-207.5, 405.0) |
| Draughtspersons And Building Inspectors | 312 | -213.3 | (-535.7,104.8) | 0.19 | 109.1 | ( -53.6, 274.0) |
| IT Service Delivery Occupations | 313 | 127.4 | (-164.7,429.7) | 0.41 | -137.7 | (-464.3, 177.9) |
| Health Associate Professionals | 321 | -148 | (-400.1, 98.7) | 0.236 | 139.7 | ( -93.2, 377.8) |
| Social Welfare Associate Professionals | 323 | -36.9 | (-327.4,251.1) | 0.798 | 19.2 | (-130.4, 169.9) |
| Protective Service Occupations | 331 | -122.7 | (-276.2, 29.6) | 0.114 | 361.2 | ( -87.1, 813.1) |
| Culture, media and sports occupations | 34 | 42.7 | (-101.2,186.2) | 0.555 | -140.5 | (-612.2, 332.8) |
| Transport Associate Professionals | 351 | -49.1 | (-324.3,229.2) | 0.708 | 25.4 | (-118.9, 168.1) |
| Business And Finance Associate Professionals | 353 | 39.1 | ( -86.0,163.8) | 0.537 | -103.8 | (-434.8, 228.1) |
| Sales And Related Associate Professionals | 354 | 126.1 | ( 4.7,249.5) | 0.043 | -347.3 | (-687.0, -13.1) |
| Public Service And Other Associate Professionals | 356 | -69.6 | (-236.4, 95.3) | 0.413 | 97.3 | (-133.2, 330.2) |
| Administrative Occupations: Government And Related Organisations | 411 | -148.4 | (-358.3, 60.7) | 0.156 | 170.5 | ( -69.7, 411.6) |
| Administrative Occupations: Finance | 412 | 43.6 | (-120.3,210.0) | 0.609 | -103 | (-495.7, 284.0) |
| Administrative Occupations: Records | 413 | 70.6 | ( -89.8,231.4) | 0.39 | -145.1 | (-475.7, 184.6) |
| Administrative Occupations: Communications | 414 | -122.7 | (-888.1,655.2) | 0.756 | 27.6 | (-147.4, 199.9) |
| Administrative Occupations: General | 415 | 29.7 | (-189.4,254.2) | 0.796 | -48.8 | (-417.9, 311.4) |
| Agricultural Trades | 511 | -45 | (-166.9, 77.8) | 0.479 | 109.8 | (-189.9, 407.6) |
| Metal Forming, Welding And Related Trades | 521 | 54.9 | (-123.7,232.7) | 0.555 | -92.4 | (-391.5, 208.1) |
| Metal Machining, Fitting And Instrument Making Trades | 522 | -31.1 | (-134.7, 74.8) | 0.56 | 136.3 | (-328.3, 590.9) |
| Vehicle Trades | 523 | 105.8 | ( -47.1,257.7) | 0.18 | -249.4 | (-607.8, 111.2) |
| Electrical Trades | 524 | -128 | (-235.2,-21.2) | 0.019 | 547.2 | ( 90.5,1005.3) |
| Construction Trades | 531 | -82.5 | (-171.4, 8.1) | 0.073 | 602.6 | ( -58.9,1252.2) |
| Building Trades | 532 | -67.3 | (-223.5, 92.8) | 0.407 | 160.4 | (-221.2, 532.8) |
| Printing Trades | 542 | -237.5 | (-605.4,125.6) | 0.188 | 173.2 | ( -91.6, 441.4) |
| Food Preparation Trades | 543 | -47.8 | (-212.8,120.7) | 0.587 | 112.7 | (-284.3, 501.1) |
| Skilled Trades n. e. c. | 549 | -72.5 | (-349.0,200.5) | 0.611 | 70.7 | (-195.6, 340.5) |
| Healthcare And Related Personal Services | 611 | -19.6 | (-232.7,190.2) | 0.858 | 22.8 | (-221.4, 270.9) |
| Leisure And Travel Service Occupations | 621 | -376.9 | (-761.4, 11.0) | 0.059 | 236.5 | ( -6.9, 477.7) |
| Housekeeping Occupations | 623 | -1 | (-302.1,298.9) | 0.996 | 0.5 | (-158.8, 160.4) |
| Sales Assistants And Retail Cashiers | 711 | -15.7 | (-205.1,173.5) | 0.869 | 53.1 | (-588.7, 696.3) |
| Sales Related Occupations | 712 | -140.2 | (-378.6, 96.6) | 0.245 | 136.7 | ( -94.2, 369.3) |
| Customer Service Occupations | 721 | 137.5 | (-137.8,409.0) | 0.327 | -117.9 | (-350.7, 118.1) |
| Process Operatives | 811 | 53 | ( -87.7,196.2) | 0.478 | -163.3 | (-604.8, 270.3) |
| Plant And Machine Operatives | 812 | -97.6 | (-224.4, 30.7) | 0.139 | 379.7 | (-119.2, 872.6) |
| Assemblers And Routine Operatives | 813 | -127.8 | (-309.8, 55.0) | 0.161 | 328.6 | (-141.5, 796.5) |
| Construction Operatives | 814 | -117.3 | (-301.5, 66.4) | 0.207 | 194.6 | (-110.1, 500.2) |
| Transport Drivers And Operatives | 821 | -58.2 | (-135.7, 17.5) | 0.132 | 491.7 | (-147.5,1145.9) |
| Mobile Machine Drivers And Operatives | 822 | -3.1 | (-196.8,184.4) | 0.982 | 4.6 | (-276.1, 294.6) |
| Elementary Agricultural Occupations | 911 | 50.3 | (-207.5,308.6) | 0.708 | -41.6 | (-255.3, 171.7) |
| Elementary Construction Occupations | 912 | -235 | (-432.6,-36.7) | 0.022 | 551.7 | ( 86.1,1015.5) |
| Elementary Process Plant Occupations | 913 | -156.6 | (-345.0, 32.9) | 0.107 | 519.9 | (-109.2,1145.3) |
| Elementary Goods Storage Occupations | 914 | -80.3 | (-234.9, 70.1) | 0.308 | 310.8 | (-271.1, 908.8) |
| Elementary Administration Occupations | 921 | -154.3 | (-329.9, 21.3) | 0.088 | 352.3 | ( -48.7, 753.1) |
| Elementary Personal Services Occupations | 922 | -72.9 | (-322.8,174.7) | 0.565 | 159 | (-380.9, 704.0) |
| Elementary Cleaning Occupations | 923 | -179.1 | (-375.5, 16.9) | 0.072 | 367.5 | ( -34.7, 770.6) |
| Elementary Security Occupations | 924 | -196 | (-406.6, 12.6) | 0.07 | 305.6 | ( -19.6, 634.1) |
| No occupation reported |  | -51 | (-262.0,154.1) | 0.634 | 206.2 | (-623.3,1059.6) |
|  |  |  |  |  |  |  |
| TOTAL |  |  |  |  | 6085.8 | (3007.6,9174.7) |

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences between Scotland and England, Monte Carlo simulation was used to estimate the difference between the rate in Scotland and England. 95% CI and p values were calculated using this method as well. Simulated 95% CI are indicated using brackets.

Source: ONS Longitudinal Study and Scottish Longitudinal Study

**Appendix Table 4b: Expected change in deaths in England among working age women if occupational mortality rates for Scotland applied §**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Employment group** | **SOC code\*** | **Difference between England and Scotland** | **95% CI** | **p value** | **Expected change in deaths in England** | **95% CI** |
| Corporate managers and directors | 11 | 30.4 | ( -25.6, 86.9) | 0.293 | -318.7 | (-910.7, 268.6) |
| Managers and proprietors in agriculture and services | 12 | 160 | ( 41.4,276.3) | 0.009 | -377.9 | (-652.7, -97.8) |
| Managers And Proprietors In Other Service Industries | 123 | -16.4 | (-132.4, 98.0) | 0.77 | 37.6 | (-224.6, 303.4) |
| Science, research, engineering and technology professionals | 21 | -251.6 | (-669.6,158.7) | 0.229 | 334.5 | (-211.0, 890.3) |
| Health professionals | 221 | -1.3 | (-190.8,185.0) | 0.985 | 1.2 | (-184.7, 190.6) |
| Teaching Professionals | 231 | 20.4 | ( -26.9, 67.1) | 0.393 | -160.7 | (-529.7, 212.4) |
| Business and public service professionals | 24 | -42.4 | (-150.1, 63.8) | 0.445 | 108 | (-162.2, 381.9) |
| Science and technology associate professionals | 31 | -17.2 | (-154.8,123.6) | 0.802 | 26.9 | (-193.0, 241.9) |
| Health Associate Professionals | 321 | -10.5 | ( -79.6, 57.4) | 0.763 | 60.2 | (-330.8, 458.5) |
| Social Welfare Associate Professionals | 323 | 33.6 | ( -91.7,159.7) | 0.603 | -45.8 | (-217.9, 125.1) |
| Culture, media and sports occupations | 34 | -68.9 | (-200.1, 61.9) | 0.311 | 183.4 | (-164.6, 532.3) |
| Business and public service associate professionals | 35 | -11.4 | ( -92.6, 66.8) | 0.787 | 73 | (-427.3, 592.2) |
| Administrative Occupations: Government And Related Organisations | 411 | 25.1 | ( -84.9,132.0) | 0.658 | -52.4 | (-275.1, 177.0) |
| Administrative Occupations: Finance | 412 | 14.8 | ( -55.5, 87.2) | 0.687 | -106.3 | (-625.1, 397.8) |
| Administrative Occupations: Records | 413 | 111.2 | ( 12.5,207.3) | 0.028 | -415.8 | (-774.9, -46.9) |
| Administrative Occupations: Communications | 414 | 91.5 | (-114.7,293.8) | 0.382 | -60.8 | (-195.4, 76.3) |
| Administrative Occupations: General | 415 | 6 | ( -56.2, 68.5) | 0.857 | -45.5 | (-518.5, 426.0) |
| Secretarial And Related Occupations | 421 | -5.8 | ( -56.8, 45.3) | 0.821 | 64 | (-503.7, 632.2) |
| Agricultural Trades | 511 | 133.7 | ( -38.5,302.4) | 0.134 | -63.1 | (-142.8, 18.2) |
| Skilled metal and electrical trades | 52 | -18.6 | (-378.7,336.4) | 0.914 | 8.7 | (-157.9, 177.7) |
| Textiles And Garments Trades | 541 | 8.1 | (-339.6,360.7) | 0.965 | -3 | (-135.9, 128.0) |
| Printing Trades | 542 | -73.1 | (-396.8,251.1) | 0.667 | 25.7 | ( -88.3, 139.6) |
| Food preparation trades | 543 | -204.7 | (-343.7,-67.0) | 0.004 | 370.9 | ( 121.5, 622.7) |
| Healthcare And Related Personal Services | 611 | 6.6 | ( -51.4, 65.8) | 0.823 | -57.5 | (-573.5, 448.0) |
| Childcare And Related Personal Services | 612 | -28.7 | (-119.6, 60.3) | 0.538 | 158.2 | (-332.9, 660.3) |
| Leisure And Travel Service Occupations | 621 | -5.5 | (-172.5,166.9) | 0.948 | 6.7 | (-203.7, 210.5) |
| Hairdressers And Related Occupations | 622 | -146.1 | (-330.2, 37.2) | 0.118 | 316.6 | ( -80.5, 715.5) |
| Housekeeping Occupations | 623 | 50.4 | (-112.1,211.4) | 0.538 | -41.9 | (-176.0, 93.3) |
| Sales Assistants And Retail Cashiers | 711 | -2.3 | ( -55.1, 50.6) | 0.927 | 31.7 | (-689.8, 751.5) |
| Sales Related Occupations | 712 | 79.8 | ( -98.6,256.1) | 0.372 | -77.8 | (-249.5, 96.0) |
| Customer Service Occupations | 721 | 71 | ( -37.2,180.1) | 0.189 | -178.9 | (-453.9, 93.8) |
| Process Operatives | 811 | 8.8 | (-133.6,154.6) | 0.908 | -15 | (-261.6, 225.9) |
| Plant And Machine Operatives | 812 | -144.9 | (-517.4,223.1) | 0.438 | 124.8 | (-192.1, 445.5) |
| Assemblers And Routine Operatives | 813 | -108.3 | (-221.2, 1.7) | 0.055 | 370.3 | ( -5.9, 755.9) |
| Transport Drivers And Operatives | 821 | 21.9 | (-231.8,271.1) | 0.858 | -14.2 | (-175.9, 150.4) |
| Elementary Process Plant Occupations | 913 | -61.7 | (-206.0, 84.7) | 0.406 | 184.3 | (-253.2, 615.3) |
| Elementary Goods Storage Occupations | 914 | -310.8 | (-668.4, 53.6) | 0.091 | 245.3 | ( -42.4, 527.7) |
| Elementary Administration Occupations | 921 | 29.3 | (-179.7,236.0) | 0.779 | -37.5 | (-302.0, 230.0) |
| Elementary Personal Services Occupations | 922 | -31 | (-115.1, 52.4) | 0.476 | 182.3 | (-308.0, 677.2) |
| Elementary Cleaning Occupations | 923 | -73.9 | (-143.5, -3.3) | 0.042 | 476 | ( 21.1, 924.3) |
| Elementary Security Occupations | 924 | -38.8 | (-218.7,137.4) | 0.677 | 63 | (-223.2, 355.2) |
| No occupation reported |  | -108.3 | (-199.7,-16.3) | 0.019 | 892.8 | ( 134.7,1646.4) |
|  |  |  |  |  |  |  |
| TOTAL |  |  |  |  | 2273.2 | (-164.7,4688) |

\*Standard Occupational Classification (SOC) codes have been modified for disclosure control purposes. See Web Appendix for details.

§ To assess differences between Scotland and England, Monte Carlo simulation was used to estimate the difference between the rate in Scotland and England. 95% CI and p values were calculated using this method as well. Simulated 95% CI are indicated using brackets.

Source: ONS Longitudinal Study and Scottish Longitudinal Study