

# Mesothelioma Occupation Statistics

Male and female deaths aged 16-74 in Great Britain  
2002-2010

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## Introduction

Mesothelioma is a formally rare form of cancer that principally affects the pleura (the external lining of the lung) and the peritoneum (the lining of the lower digestive tract) [1]. Many cases of mesothelioma are diagnosed at an advanced stage as symptoms are non specific and appear late in the development of the disease [2]. It is almost always fatal with most of those affected usually dying within twelve months of diagnosis [3]. Asbestos is responsible for causing the vast majority of mesothelioma cases in GB. There are currently about five times as many deaths in men as there are in women each year. This is largely a reflection of the fact that past asbestos exposures that caused many of these deaths tended to occur in occupational settings, and in jobs mainly held by men rather than women. Although still caused by asbestos, a minority of currently occurring female deaths are directly attributable to occupational exposures [4]. The continuing increase in annual mesothelioma deaths is a consequence of the effect of past exposures and the long latency period of the disease (i.e. the time between initial exposure to asbestos and the manifestation of mesothelioma) which is typically between 30 and 40 years.

The causal link between asbestos exposure and the development of mesothelioma in humans was first reported by Wagner et al in 1960 [5] following reports of cases among asbestos workers in South Africa, and has since been confirmed by many other studies. As a consequence of the widespread use of asbestos, the incidence of mesothelioma has risen dramatically in many countries since the 1960s and rates in Great Britain are now among the highest in the world [6].

The British Mesothelioma Register was established in 1967 [1] in response to the emerging evidence about the association between asbestos and mesothelioma. By including all deaths where the cause of death on the death certificate mentions the word "mesothelioma" the register now provides a consistent series of mesothelioma mortality in Great Britain for over 4 decades [3].

The aim of this fact sheet is to provide updated mesothelioma mortality statistics by last recorded occupation of the deceased within Great Britain from 2002-2010 using data from the mesothelioma register.

## Methods

The most recent full time occupation of the deceased (i.e. the occupation at retirement or death) is routinely recorded for all deaths in Great Britain at ages 16-74. For deaths occurring since 2002 recorded occupations have been classified according to the Standard Occupational Classification 2000 (SOC2000) [7].

For deaths registered after 1 April 2011, occupations have been classified according to the Standard Occupational Classification 2010 (SOC2010) [8]. For a small number of deaths in this analysis, that occurred before the end of 2010 but were registered after 1 April 2011, occupations were recoded from SOC2010 to SOC2000 using a probability matching algorithm provided by the Office for National Statistics (ONS).

The recorded occupations for deaths occurring prior to 2002 were classified according to earlier versions of the Standard Occupational Classification. At the time of analysis, it was not possible to create a consistent set of occupational categories between these earlier classifications and SOC2000. This updated analysis is therefore restricted to the nine-year period 2002-2010.

In this analysis, mortality in the different occupational groups is represented by Proportional Mortality Ratios (PMRs) and associated 95% confidence intervals. A PMR for a particular occupation is the ratio of the observed number of deaths for that occupation to the expected number of deaths, with that ratio expressed as a percentage (i.e. multiplied by 100).

The expected number of deaths is calculated as the number of mesothelioma deaths that would have been recorded for that occupation if the proportion of mesothelioma deaths was equal to the proportion of total deaths from all causes in that occupation. Since mesothelioma incidence is also strongly related to age, the calculation also takes account of differences in the distribution of ages between occupational groups. A worked example of how the PMR is calculated for a particular occupation is given in Appendix 1.

Statistics have been calculated for both minor and unit groups of SOC2000, i.e. 3 and 4 digit codes.

# Tables

The results of these PMR calculations are presented in Tables 1-6.

Table 1 shows mesothelioma mortality for males in occupations coded to SOC2000 minor groups (3 digit codes) where the PMR was statistically significantly increased.

Table 2 shows mesothelioma mortality for males in occupations coded to SOC2000 unit groups (4 digit codes) where the PMR was statistically significantly increased.

For both tables occupations are ranked in descending order based on the lower limit of the 95% confidence interval to take account of both the extent to which the PMR is increased and its associated statistical variation. Occupations towards the top of these tables therefore constitute those that can most reliably be said to have an excess of mesothelioma deaths (compared to the average for all occupations) and are, therefore, those most likely to be reflecting an effect due to occupational asbestos exposure.

Tables 3 & 4 show mesothelioma PMRs and associated confidence intervals for males and females respectively for SOC2000 minor groups (3 digit codes).

Tables 4 & 5 show mesothelioma PMRs and associated confidence intervals for males and females respectively for SOC2000 unit groups (4 digit codes).

## Interpretive issues

Statistics have been calculated for both minor and unit groups of SOC2000, i.e. 3 and 4 digit codes. The coding of occupation is likely to be more reliable at the minor group (3 digit code) level than the unit group (4 digit code) level since the recorded information about the job title on death certificates does not always give sufficient information to accurately assign a 4 digit code.

In this analysis, an occupation with a Proportional Mortality Ratio greater than 100 indicates that the number of observed deaths was greater than the number expected. The corresponding confidence interval should be used to assess whether such an effect is likely to be due to random variation or a real effect that may be due to asbestos exposure associated with that occupation.

Proportional Mortality Ratios summarise mortality among occupational groups relative to the average level for Great Britain as a whole. They allow comparisons of the relative frequency that different occupations are recorded as the last occupation of the deceased on mesothelioma death certificates, but do not represent absolute measures of risk. Occupations with the highest PMRs and where the lower limit of the associated confidence interval are above 100 constitute those that can most reliably be said to have an excess of mesothelioma deaths compared to the average for all occupations, and are, therefore, those most likely to be reflecting an effect due to occupational asbestos exposure. The observed number of deaths in a particular occupation does not represent the actual number of deaths that are attributable to asbestos exposures in that occupation.

These analyses are limited by the fact that death certificates record only the last occupation of the deceased. A case of mesothelioma caused by work in, say, the construction industry will only be assigned to the construction work category in this analysis if the individual is still in that kind of work when they retired (or died). The long latency period of mesothelioma means that individuals may move between occupations before the onset of the disease and thus there is considerable potential for dilution of the observed difference in risk between occupations. The dilution will be even stronger for those kinds of work where there have been substantial reductions in the relevant workforce (e.g. shipyards, railway rolling stock). The occupations with the highest PMRs will be those which are genuine sources of risk, but PMRs will understate the true relative risk level. PMRs of other occupations will overstate the level of risk (if any) associated with these occupations and occupations with the lowest PMRs will be those which do not entail asbestos exposure and which are unlikely to be the final full-time occupation for individuals with asbestos exposure.

It is also important to note that occupations are recorded on mesothelioma deaths certificates for deaths at ages 16-74 as a matter of course, regardless of whether the deaths was caused by occupational exposure to asbestos. Recent research suggests that, while still caused by asbestos, a majority of currently occurring mesotheliomas among women (and a similar absolute number among men, though these constitute a smaller proportion of the larger male total) are not attributable to occupational or domestic asbestos exposures. Such deaths are therefore likely to be attributed to other sources of "environmental" asbestos exposure [4].

This evidence about non-occupational exposures is important to the interpretation of mesothelioma PMRs for women. Whilst some occupations are recorded as the last occupation on female mesothelioma deaths in appreciable numbers, very few occupations show evidence that the PMRs are increased among women.

This suggests that many of these deaths will be a reflection of environmental rather than occupational asbestos exposures. Exposures accrued indirectly during the course of work in these jobs may have contributed to causing some of these deaths, but the extent of this effect is not quantifiable.

# Tables

**Table 1: Highest risk\* occupations for males (SOC2000 3 digit codes)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
531 - Construction Trades	1811	692.0	261.7	249.8	274.0
524 - Electrical Trades	789	341.8	230.8	215.0	247.5
521 - Metal Forming, Welding And Related Trades	355	175.2	202.6	182.1	224.8
532 - Building Trades	406	243.6	166.6	150.8	183.7
814 - Construction Operatives	173	114.4	151.2	129.5	175.5
522 - Metal Machining, Fitting And Instrument Making Trades	476	339.9	140.1	127.8	153.2
311 - Science And Engineering Technicians	87	60.2	144.4	115.7	178.2
243 - Architects, Town Planners, Surveyors	85	60.7	139.9	111.8	173.0
312 - Draughtspersons And Building Inspectors	58	40.6	143.0	108.6	184.8
212 - Engineering Professionals	184	150.0	122.6	105.5	141.7
112 - Production Managers	246	208.2	118.1	103.8	133.9

\*Occupations with PMR greater than 100 and statistically significant.

**Table 2: Highest risk\* occupations for males (SOC2000 4 digit)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
5315 - Carpenters & joiners	857	210.2	407.7	380.9	435.9
5314 - Plumbers, heating & ventilating engineers	414	125.8	329.1	298.1	362.4
5241 - Electricians, electrical fitters	670	217.1	308.6	285.7	332.9
5216 - Pipe fitters	64	17.8	360.4	277.5	460.2
5214 - Metal plate workers, shipwrights, riveters	91	26.9	338.6	272.6	415.7
9129 - Labourers in other construction trades n.e.c.	55	18.5	297.1	223.8	386.7
5213 - Sheet metal workers	80	29.4	272.2	215.8	338.8
8149 - Construction operatives n.e.c.	112	46.1	243.0	200.1	292.4
8124 - Energy plant operatives	52	19.7	263.6	196.9	345.7
1122 - Managers in construction	128	56.7	225.9	188.4	268.6
5319 - Construction trades n.e.c.	390	200.4	194.7	175.8	215.0
1239 - Managers & proprietors in other services n.e.c.	184	98.5	186.8	160.8	215.8
5323 - Painters & decorators	320	181.8	176.0	157.2	196.4
3123 - Building inspectors	9	2.6	341.7	156.3	648.7
5232 - Vehicle body builders & repairers	42	19.5	215.1	155.0	290.8
5223 - Metal working production & maintenance fitters	399	234.0	170.5	154.2	188.1
2434 - Chartered surveyors (not quantity surveyors)	47	26.0	180.8	132.9	240.4
2128 - Planning & quality control engineers	25	12.3	203.0	131.4	299.7
8125 - Metal working machine operatives	347	241.7	143.6	128.9	159.5

\*Occupations with PMR greater than 100 and statistically significant, with at least 5 observed or expected cases.

**Table 3: Mesothelioma PMRs for males aged 16-74 in Great Britain 2002-2010 (SOC2000 3 digit)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
111 - Corporate Managers and Senior Officials	7	14.8	47.2	19.0	97.3
112 - Production Managers	246	208.2	118.1	103.8	133.9
113 - Functional Managers	130	151.6	85.8	71.7	101.9
114 - Quality And Customer Care Managers	16	9.8	164.0	93.7	266.3
115 - Financial Institution And Office Managers	39	73.4	53.1	37.8	72.6
116 - Managers In Distribution, Storage And Retailing	78	137.2	56.9	44.9	71.0
117 - Protective Service Officers	31	41.2	75.2	51.1	106.7
118 - Health And Social Services Managers	14	14.7	95.0	52.0	159.5
119 - Managers In Farming, Horticulture, Forestry And Fishing	4	9.2	43.3	11.8	110.8
122 - Managers And Proprietors In Hospitality And Leisure Services	62	156.6	39.6	30.4	50.8
123 - Managers And Proprietors In Other Service Industries	310	294.3	105.3	93.9	117.7
211 - Science Professionals	28	31.9	87.7	58.3	126.8
212 - Engineering Professionals	184	150.0	122.6	105.5	141.7
213 - Information And Communication Technology Professionals	12	35.7	33.6	17.4	58.7
221 - Health Professionals	20	46.0	43.4	26.5	67.1
231 - Teaching Professionals	123	184.7	66.6	55.3	79.5
232 - Research Professionals	18	12.2	148.0	87.7	233.8
241 - Legal Professionals	11	25.2	43.7	21.8	78.1
242 - Business And Statistical Professionals	22	43.3	50.8	31.8	76.9
243 - Architects, Town Planners, Surveyors	85	60.7	139.9	111.8	173.0
244 - Public Service Professionals	31	36.8	84.3	57.3	119.7
245 - Librarians And Related Professionals	2	6.6	30.5	3.7	110.3
311 - Science And Engineering Technicians	87	60.2	144.4	115.7	178.2
312 - Draughtspersons And Building Inspectors	58	40.6	143.0	108.6	184.8
313 - IT Service Delivery Occupations	7	9.6	73.1	29.4	150.7
321 - Health Associate Professionals	18	38.4	46.9	27.8	74.1
322 - Therapists	6	4.4	135.4	49.7	294.8
323 - Social Welfare Associate Professionals	15	16.8	89.2	50.0	147.2
331 - Protective Service Occupations	147	164.2	89.5	75.6	105.2
341 - Artistic And Literary Occupations	41	59.8	68.5	49.2	93.0
342 - Design Associate Professionals	25	17.6	142.0	91.9	209.6
343 - Media Associate Professionals	25	40.8	61.3	39.7	90.5
344 - Sports And Fitness Occupations	4	8.6	46.3	12.6	118.7
351 - Transport Associate Professionals	45	44.4	101.4	73.9	135.6
352 - Legal Associate Professionals	1	4.5	22.2	0.6	123.9
353 - Business And Finance Associate Professionals	64	80.8	79.2	61.0	101.1
354 - Sales And Related Associate Professionals	69	121.0	57.0	44.4	72.1
355 - Conservation Associate Professionals	6	5.3	113.3	41.6	246.7
356 - Public Service And Other Associate Professionals	58	56.8	102.1	77.5	132.0
411 - Administrative Occupations: Government and Related Organisations	73	102.4	71.3	55.9	89.6
412 - Administrative Occupations: Finance	41	120.3	34.1	24.5	46.3
413 - Administrative Occupations: Records	33	54.7	60.3	41.5	84.6
414 - Administrative Occupations: Communications	10	14.1	70.9	34.0	130.3

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
415 - Administrative Occupations: General	31	66.8	46.4	31.5	65.9
421 - Secretarial And Related Occupations	6	11.1	53.9	19.8	117.4
511 - Agricultural Trades	93	233.9	39.8	32.1	48.7
521 - Metal Forming, Welding And Related Trades	355	175.2	202.6	182.1	224.8
522 - Metal Machining, Fitting And Instrument Making Trades	476	339.9	140.1	127.8	153.2
523 - Vehicle Trades	90	136.9	65.8	52.9	80.8
524 - Electrical Trades	789	341.8	230.8	215.0	247.5
531 - Construction Trades	1811	692.0	261.7	249.8	274.0
532 - Building Trades	406	243.6	166.6	150.8	183.7
541 - Textiles And Garments Trades	26	42.5	61.1	39.9	89.6
542 - Printing Trades	36	70.9	50.8	35.6	70.3
543 - Food Preparation Trades	31	135.6	22.9	15.5	32.5
549 - Skilled Trades n. e. c.	69	64.6	106.8	83.1	135.2
611 - Healthcare And Related Personal Services	36	62.3	57.8	40.5	80.0
612 - Childcare And Related Personal Services	2	2.1	95.7	11.6	345.6
613 - Animal Care Services	0	3.8	0.0	0.0	98.3
621 - Leisure And Travel Service Occupations	18	37.6	47.8	28.3	75.6
622 - Hairdressers And Related Occupations	6	12.6	47.7	17.5	103.8
623 - Housekeeping Occupations	66	80.7	81.8	63.3	104.1
629 - Personal Services Occupations n. e. c.	6	11.0	54.7	20.1	119.0
711 - Sales Assistants And Retail Cashiers	31	56.6	54.8	37.2	77.8
712 - Sales Related Occupations	41	68.6	59.7	42.9	81.0
721 - Customer Service Occupations	2	6.3	32.0	3.9	115.5
811 - Process Operatives	87	191.5	45.4	36.4	56.0
812 - Plant And Machine Operatives	555	540.1	102.8	94.4	111.7
813 - Assemblers And Routine Operatives	78	132.4	58.9	46.6	73.5
814 - Construction Operatives	173	114.4	151.2	129.5	175.5
821 - Transport Drivers And Operatives	474	817.0	58.0	52.9	63.5
822 - Mobile Machine Drivers And Operatives	75	132.5	56.6	44.5	71.0
911 - Elementary Agricultural Occupations	16	67.3	23.8	13.6	38.6
912 - Elementary Construction Occupations	257	313.1	82.1	72.4	92.8
913 - Elementary Process Plant Occupations	201	302.0	66.5	57.7	76.4
914 - Elementary Goods Storage Occupations	154	217.5	70.8	60.0	82.9
921 - Elementary Administration Occupations	60	112.0	53.6	40.9	68.9
922 - Elementary Personal Services Occupations	27	82.8	32.6	21.5	47.4
923 - Elementary Cleaning Occupations	65	135.3	48.0	37.1	61.2
924 - Elementary Security Occupations	81	169.9	47.7	37.9	59.3
925 - Elementary Sales Occupations	2	4.2	47.3	5.7	170.8

**Table 4: Mesothelioma PMRs for females aged 16-74 in Great Britain 2002-2010 (SOC2000 3 digit)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
111 - Corporate Managers and Senior Officials	1	2.0	49.4	1.3	275.3
112 - Production Managers	6	5.4	111.4	40.9	242.4
113 - Functional Managers	12	8.3	144.3	74.6	252.1
114 - Quality And Customer Care Managers	2	0.7	288.6	34.9	1042.4
115 - Financial Institution And Office Managers	13	13.0	100.3	53.4	171.6
116 - Managers In Distribution, Storage And Retailing	15	15.0	99.7	55.8	164.4
117 - Protective Service Officers	0	0.4	0.0	0.0	847.2
118 - Health And Social Services Managers	10	8.8	114.2	54.7	209.9
119 - Managers In Farming, Horticulture, Forestry And Fishing	3	1.0	299.4	61.7	875.0
122 - Managers And Proprietors In Hospitality And Leisure Services	23	30.1	76.4	48.4	114.6
123 - Managers And Proprietors In Other Service Industries	31	30.1	103.2	70.1	146.4
211 - Science Professionals	2	1.8	109.6	13.3	395.8
212 - Engineering Professionals	0	0.6	0.0	0.0	666.7
213 - Information And Communication Technology Professionals	3	1.5	196.9	40.6	575.4
221 - Health Professionals	4	4.7	85.6	23.3	219.3
231 - Teaching Professionals	68	70.6	96.3	74.8	122.1
232 - Research Professionals	2	1.3	150.4	18.2	543.5
241 - Legal Professionals	2	1.8	110.6	13.4	399.5
242 - Business And Statistical Professionals	2	1.3	154.1	18.7	556.7
243 - Architects, Town Planners, Surveyors	1	0.5	191.8	4.9	1068.4
244 - Public Service Professionals	9	9.0	100.4	45.9	190.5
245 - Librarians And Related Professionals	6	4.6	129.5	47.5	281.8
311 - Science And Engineering Technicians	13	4.8	269.1	143.3	460.2
312 - Draughtspersons And Building Inspectors	1	1.7	59.8	1.5	333.0
313 - IT Service Delivery Occupations	2	1.8	112.4	13.6	406.1
321 - Health Associate Professionals	55	68.0	80.9	60.9	105.3
322 - Therapists	7	5.5	128.4	51.6	264.5
323 - Social Welfare Associate Professionals	8	8.9	90.3	39.0	178.0
331 - Protective Service Occupations	4	2.6	155.2	42.3	397.5
341 - Artistic And Literary Occupations	5	7.9	63.0	20.5	147.1
342 - Design Associate Professionals	7	2.5	277.0	111.4	570.7
343 - Media Associate Professionals	7	3.3	212.9	85.6	438.7
344 - Sports And Fitness Occupations	0	1.3	0.0	0.0	290.6
351 - Transport Associate Professionals	1	0.1	915.7	23.2	5102.1
352 - Legal Associate Professionals	0	1.0	0.0	0.0	368.9
353 - Business And Finance Associate Professionals	7	4.5	154.5	62.1	318.4
354 - Sales And Related Associate Professionals	13	7.8	167.5	89.2	286.5
355 - Conservation Associate Professionals	0	0.2	0.0	0.0	2226.0
356 - Public Service And Other Associate Professionals	6	7.5	79.5	29.2	173.0
411 - Administrative Occupations: Government and Related Organisations	25	35.4	70.5	45.6	104.1
412 - Administrative Occupations: Finance	54	52.9	102.1	76.7	133.3
413 - Administrative Occupations: Records	26	18.4	141.7	92.5	207.6
414 - Administrative Occupations: Communications	5	11.1	45.2	14.7	105.5



SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
415 - Administrative Occupations: General	68	54.9	123.8	96.2	157.0
421 - Secretarial And Related Occupations	130	118.8	109.4	91.4	130.0
511 - Agricultural Trades	2	6.1	32.7	4.0	118.2
521 - Metal Forming, Welding And Related Trades	1	0.9	113.0	2.9	629.6
522 - Metal Machining, Fitting And Instrument Making Trades	2	1.0	192.8	23.3	696.5
523 - Vehicle Trades	0	0.2	0.0	0.0	1666.3
524 - Electrical Trades	1	1.0	95.7	2.4	533.1
531 - Construction Trades	2	0.7	293.6	35.6	1060.7
532 - Building Trades	0	0.5	0.0	0.0	708.3
541 - Textiles And Garments Trades	15	11.7	128.6	72.0	212.1
542 - Printing Trades	8	5.2	152.7	65.9	301.0
543 - Food Preparation Trades	25	34.3	72.9	47.2	107.6
549 - Skilled Trades n. e. c.	14	8.0	176.0	96.2	295.3
611 - Healthcare And Related Personal Services	96	110.8	86.7	70.2	105.8
612 - Childcare And Related Personal Services	21	20.7	101.3	62.7	154.8
613 - Animal Care Services	1	1.0	95.5	2.4	532.1
621 - Leisure And Travel Service Occupations	10	8.2	121.7	58.3	223.8
622 - Hairdressers And Related Occupations	13	14.9	87.4	46.5	149.5
623 - Housekeeping Occupations	13	14.3	90.8	48.3	155.2
629 - Personal Services Occupations n. e. c.	1	0.4	239.4	6.1	1333.9
711 - Sales Assistants And Retail Cashiers	107	98.5	108.7	89.1	131.3
712 - Sales Related Occupations	4	6.5	61.9	16.9	158.6
721 - Customer Service Occupations	1	4.0	25.3	0.6	140.9
811 - Process Operatives	12	27.4	43.8	22.6	76.4
812 - Plant And Machine Operatives	9	11.8	76.5	35.0	145.2
813 - Assemblers And Routine Operatives	53	60.7	87.3	65.4	114.1
814 - Construction Operatives	0	0.1	0.0	0.0	3103.7
821 - Transport Drivers And Operatives	1	5.2	19.3	0.5	107.7
822 - Mobile Machine Drivers And Operatives	0	0.3	0.0	0.0	1149.8
911 - Elementary Agricultural Occupations	2	4.2	47.4	5.7	171.3
912 - Elementary Construction Occupations	0	0.3	0.0	0.0	1367.3
913 - Elementary Process Plant Occupations	80	37.7	212.1	168.1	263.9
914 - Elementary Goods Storage Occupations	4	5.3	76.1	20.7	194.9
921 - Elementary Administration Occupations	18	8.5	212.5	125.9	335.8
922 - Elementary Personal Services Occupations	29	53.9	53.9	36.1	77.3
923 - Elementary Cleaning Occupations	119	119.8	99.4	82.3	118.9
924 - Elementary Security Occupations	12	16.8	71.4	36.9	124.7
925 - Elementary Sales Occupations	0	0.9	0.0	0.0	412.4

**Table 5: Mesothelioma PMRs for males aged 16-74 in Great Britain 2002-2010 (SOC2000 4 digit)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
1111 - Senior officials in national government	2	3.8	52.0	6.3	187.7
1112 - Directors & chief executives of major organisations	1	1.7	60.0	1.5	334.1
1113 - Senior officials in local government	3	6.2	48.4	10.0	141.5
1114 - Senior officials of special interest organisations	1	3.1	32.2	0.8	179.5
1121 - Production, works & maintenance managers	113	141.7	79.7	65.7	95.9
1122 - Managers in construction	128	56.7	225.9	188.4	268.6
1123 - Managers in mining & energy	5	9.9	50.7	16.5	118.3
1131 - Financial managers & chartered secretaries	9	22.7	39.6	18.1	75.1
1132 - Marketing & sales managers	87	75.2	115.8	92.7	142.8
1133 - Purchasing managers	9	7.0	127.7	58.4	242.4
1134 - Advertising & public relations managers	0	4.6	0.0	0.0	79.9
1135 - Personnel, training & industrial relations managers	8	14.0	57.2	24.7	112.7
1136 - Information & communication technology managers	14	25.4	55.2	30.2	92.6
1137 - Research & development managers	3	2.6	113.4	23.4	331.3
1141 - Quality assurance managers	11	7.2	153.0	76.4	273.7
1142 - Customer care managers	5	2.6	194.8	63.2	454.5
1151 - Financial institution managers	27	48.1	56.1	37.0	81.7
1152 - Office managers	12	25.3	47.4	24.5	82.7
1161 - Transport & distribution managers	30	50.2	59.7	40.3	85.3
1162 - Storage & warehouse managers	23	33.8	68.0	43.1	102.1
1163 - Retail & wholesale managers	25	53.2	47.0	30.4	69.4
1171 - Officers in armed forces	17	20.3	83.9	48.9	134.3
1172 - Police officers (inspectors & above)	4	7.8	51.1	13.9	130.8
1173 - Senior officers in fire, ambulance, prison & related services	8	6.7	118.6	51.2	233.7
1174 - Security managers	2	6.4	31.3	3.8	113.2
1181 - Hospital & health service managers	2	4.1	48.9	5.9	176.6
1182 - Pharmacy managers	0	0.2	0.0	0.0	1684.9
1183 - Healthcare practice managers	0	0.6	0.0	0.0	578.3
1184 - Social services managers	3	2.1	139.8	28.8	408.5
1185 - Residential & day care managers	9	7.6	117.9	53.9	223.8
1211 - Farm managers	2	5.8	34.3	4.2	123.9
1212 - Natural environment & conservation managers	0	0.6	0.0	0.0	576.2
1219 - Managers in animal husbandry, forestry & fishing n.e.c.	2	2.8	72.2	8.7	260.6
1221 - Hotel & accommodation managers	18	25.6	70.3	41.7	111.2
1222 - Conference & exhibition managers	2	1.1	181.2	21.9	654.4
1223 - Restaurant & catering managers	10	31.9	31.4	15.1	57.7
1224 - Publicans & managers of licensed premises	25	81.9	30.5	19.7	45.0
1225 - Leisure & sports managers	7	14.4	48.7	19.6	100.3
1226 - Travel agency managers	0	1.7	0.0	0.0	217.8
1231 - Property, housing & land managers	31	18.5	167.6	113.9	237.9
1232 - Garage managers & proprietors	17	21.5	79.2	46.1	126.8
1233 - Hairdressing & beauty salon managers & proprietors	0	0.9	0.0	0.0	433.8

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
1234 - Shopkeepers & wholesale/retail dealers	69	141.3	48.8	38.0	61.8
1235 - Recycling & refuse disposal managers	9	13.7	65.5	30.0	124.3
1239 - Managers & proprietors in other services n.e.c.	184	98.5	186.8	160.8	215.8
2111 - Chemists	16	14.5	110.2	63.0	178.9
2112 - Biological scientists & biochemists	4	10.6	37.6	10.3	96.3
2113 - Physicists, geologists & meteorologists	8	6.8	118.3	51.1	233.2
2121 - Civil engineers	36	57.6	62.5	43.8	86.5
2122 - Mechanical engineers	38	23.6	161.0	114.0	221.0
2123 - Electrical engineers	12	5.1	234.7	121.3	410.0
2124 - Electronics engineers	1	2.0	49.3	1.2	274.9
2125 - Chemical engineers	11	5.8	190.2	95.0	340.3
2126 - Design & development engineers	27	19.2	140.4	92.6	204.3
2127 - Production & process engineers	6	5.8	104.1	38.2	226.5
2128 - Planning & quality control engineers	25	12.3	203.0	131.4	299.7
2129 - Engineering professionals n.e.c.	28	18.6	150.3	99.9	217.2
2131 - IT strategy & planning professionals	7	14.0	49.9	20.1	102.8
2132 - Software professionals	5	21.7	23.1	7.5	53.8
2211 - Medical practitioners	13	27.3	47.7	25.4	81.5
2212 - Psychologists	1	1.6	63.6	1.6	354.1
2213 - Pharmacists/pharmacologists	3	7.6	39.7	8.2	116.1
2214 - Ophthalmic opticians	1	1.7	57.9	1.5	322.8
2215 - Dental practitioners	2	6.0	33.2	4.0	120.1
2216 - Veterinarians	0	1.9	0.0	0.0	194.1
2311 - Higher education teaching professionals	15	25.3	59.4	33.2	97.9
2312 - Further education teaching professionals	35	38.0	92.1	64.2	128.1
2313 - Education officers, school inspectors	1	3.6	27.4	0.7	152.9
2314 - Secondary education teaching professionals	58	87.6	66.2	50.3	85.6
2315 - Primary & nursery education teaching professionals	10	17.9	55.8	26.8	102.7
2316 - Special needs education teaching professionals	2	1.7	114.9	13.9	414.9
2317 - Registrars & senior administrators of educational establishments	0	4.0	0.0	0.0	93.0
2319 - Teaching professionals n.e.c.	2	6.6	30.4	3.7	110.0
2321 - Scientific researchers	11	7.5	146.8	73.3	262.7
2322 - Social science researchers	1	2.1	48.0	1.2	267.7
2329 - Researchers n.e.c.	6	2.6	231.5	84.9	503.8
2411 - Solicitors & lawyers, judges & coroners	11	23.7	46.4	23.2	83.1
2419 - Legal professionals n.e.c.	0	1.5	0.0	0.0	243.3
2421 - Chartered & certified accountants	3	26.8	11.2	2.3	32.7
2422 - Management accountants	0	0.1	0.0	0.0	3481.3
2423 - Management consultants, actuaries, economists & statisticians	19	16.4	115.8	69.7	180.8
2431 - Architects	17	18.7	90.7	52.8	145.2
2432 - Town planners	3	2.2	136.3	28.1	398.4
2433 - Quantity surveyors	18	13.8	130.4	77.3	206.0
2434 - Chartered surveyors (not quantity surveyors)	47	26.0	180.8	132.9	240.4
2441 - Public service administrative professionals	1	1.8	56.9	1.4	317.2
2442 - Social workers	10	10.3	97.1	46.6	178.6

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
2443 - Probation officers	1	2.9	34.4	0.9	191.8
2444 - Clergy	19	21.8	87.1	52.5	136.1
2451 - Librarians	2	4.5	44.3	5.4	160.1
2452 - Archivists & curators	0	2.0	0.0	0.0	180.9
3111 - Laboratory technicians	11	12.7	86.4	43.1	154.5
3112 - Electrical/electronics technicians	9	5.6	161.6	73.9	306.9
3113 - Engineering technicians	15	10.0	149.8	83.9	247.1
3114 - Building & civil engineering technicians	6	1.9	313.9	115.2	683.2
3115 - Quality assurance technicians	2	1.0	195.8	23.7	707.5
3119 - Science & engineering technicians n.e.c.	44	29.0	151.8	110.3	203.8
3121 - Architectural technologists & town planning technicians	4	2.9	139.9	38.1	358.1
3122 - Draughtspersons	45	35.1	128.3	93.6	171.7
3123 - Building inspectors	9	2.6	341.7	156.3	648.7
3131 - IT operations technicians	5	8.4	59.2	19.2	138.2
3132 - IT user support technicians	2	1.1	177.1	21.4	639.8
3211 - Nurses	12	26.0	46.2	23.9	80.7
3212 - Midwives	0	0.0	0.0	0.0	9592.2
3213 - Paramedics	2	2.0	98.1	11.9	354.5
3214 - Medical radiographers	0	1.1	0.0	0.0	334.6
3215 - Chiropodists	0	1.7	0.0	0.0	220.1
3216 - Dispensing opticians	0	0.2	0.0	0.0	1575.9
3217 - Pharmaceutical dispensers	0	0.5	0.0	0.0	748.6
3218 - Medical & dental technicians	4	6.8	58.4	15.9	149.6
3221 - Physiotherapists	1	1.0	97.8	2.5	545.1
3222 - Occupational therapists	1	0.5	219.9	5.6	1225.1
3223 - Speech & language therapists	0	0.0	0.0	0.0	27254.9
3229 - Therapists n.e.c.	4	2.9	136.1	37.1	348.4
3231 - Youth & community workers	3	4.1	74.0	15.3	216.3
3232 - Housing & welfare officers	12	12.8	94.1	48.6	164.3
3311 - NCOs & other ranks	48	58.6	81.9	60.4	108.6
3312 - Police officers (sergeant & below)	46	61.3	75.1	55.0	100.1
3313 - Fire service officers (leading fire officer & below)	32	19.9	161.1	110.2	227.4
3314 - Prison service officers (below principal officer)	15	17.9	83.7	46.9	138.1
3319 - Protective service associate professionals n.e.c.	6	6.6	91.3	33.5	198.6
3411 - Artists	13	12.8	101.7	54.2	174.0
3412 - Authors, writers	8	12.6	63.5	27.4	125.2
3413 - Actors, entertainers	12	12.0	100.4	51.9	175.4
3414 - Dancers & choreographers	1	0.3	308.1	7.8	1716.6
3415 - Musicians	3	17.5	17.1	3.5	50.1
3416 - Arts officers, producers & directors	4	4.7	85.6	23.3	219.1
3421 - Graphic designers	12	9.3	128.8	66.5	225.0
3422 - Product, clothing & related designers	13	8.3	156.8	83.5	268.2
3431 - Journalists, newspaper & periodical editors	5	15.0	33.4	10.9	78.0
3432 - Broadcasting associate professionals	4	3.9	102.4	27.9	262.1
3433 - Public relations officers	1	2.6	38.4	1.0	214.1
3434 - Photographers & audio-visual equipment operators	15	19.3	77.6	43.4	128.0

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
3441 - Sports players	3	4.1	73.4	15.1	214.5
3442 - Sports coaches, instructors & officials	1	3.2	31.5	0.8	175.6
3443 - Fitness instructors	0	0.7	0.0	0.0	554.9
3449 - Sports & fitness occupations n.e.c	0	0.7	0.0	0.0	523.6
3511 - Air traffic controllers	3	2.0	147.3	30.4	430.5
3512 - Aircraft pilots & flight engineers	5	5.8	86.7	28.2	202.4
3513 - Ship & hovercraft officers	22	19.8	111.0	69.5	168.0
3514 - Train drivers	15	16.8	89.5	50.1	147.6
3520 - Legal associate professionals	1	4.5	22.2	0.6	123.9
3531 - Estimators, valuers & assessors	22	15.5	142.2	89.1	215.3
3532 - Brokers	9	18.8	48.0	21.9	91.1
3533 - Insurance underwriters	3	4.5	66.6	13.7	194.6
3534 - Finance & investment analysts/advisers	12	21.6	55.5	28.7	97.0
3535 - Taxation experts	0	4.8	0.0	0.0	76.8
3536 - Importers, exporters	1	4.1	24.5	0.6	136.6
3537 - Financial & accounting technicians	0	1.3	0.0	0.0	280.3
3539 - Business & related associate professionals n.e.c.	17	10.3	165.5	96.4	264.9
3541 - Buyers & purchasing officers	11	17.2	64.1	32.0	114.7
3542 - Sales representatives	54	89.6	60.3	45.3	78.6
3543 - Marketing associate professionals	3	7.2	42.0	8.7	122.6
3544 - Estate agents, auctioneers	1	7.1	14.0	0.4	78.1
3551 - Conservation & environmental protection officers	3	2.4	123.1	25.4	359.9
3552 - Countryside & park rangers	3	2.9	105.0	21.6	306.8
3561 - Public service associate professionals	1	7.2	14.0	0.4	77.9
3562 - Personnel & industrial relations officers	5	6.0	83.0	27.0	193.7
3563 - Vocational & industrial trainers & instructors	19	17.4	109.3	65.8	170.7
3564 - Careers advisers & vocational guidance specialists	1	1.2	82.6	2.1	460.1
3565 - Inspectors of factories, utilities & trading standards	3	3.9	76.1	15.7	222.3
3566 - Statutory examiners	7	6.3	110.4	44.4	227.4
3567 - Occupational hygienists & safety officers (health & safety)	20	10.5	191.2	116.8	295.3
3568 - Environmental health officers	2	4.3	46.7	5.7	168.6
4111 - Civil Service executive officers	2	6.2	32.0	3.9	115.8
4112 - Civil Service administrative officers & assistants	52	57.8	89.9	67.2	117.9
4113 - Local government clerical officers & assistants	16	33.6	47.6	27.2	77.3
4114 - Officers of non-governmental organisations	3	4.8	62.7	12.9	183.2
4121 - Credit controllers	0	3.0	0.0	0.0	122.0
4122 - Accounts & wages clerks, book-keepers, other financial clerks	34	96.7	35.2	24.4	49.1
4123 - Counter clerks	7	20.6	34.0	13.7	70.1
4131 - Filing & other records assistants/clerks	10	10.8	93.0	44.6	171.0
4132 - Pensions & insurance clerks	4	8.0	50.1	13.7	128.3
4133 - Stock control clerks	14	19.8	70.8	38.7	118.8
4134 - Transport & distribution clerks	3	13.1	22.9	4.7	67.0
4135 - Library assistants/clerks	0	1.0	0.0	0.0	375.9
4136 - Database assistants/clerks	2	1.8	112.3	13.6	405.6
4137 - Market research interviewers	0	0.4	0.0	0.0	973.0

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
4141 - Telephonists	5	5.1	98.6	32.0	230.0
4142 - Communication operators	5	9.0	55.3	18.0	129.1
4150 - General office assistants/clerks	31	66.8	46.4	31.5	65.9
4211 - Medical secretaries	2	0.2	1057.1	128.0	3818.6
4212 - Legal secretaries	0	0.5	0.0	0.0	782.5
4213 - School secretaries	0	0.3	0.0	0.0	1200.2
4214 - Company secretaries	0	4.6	0.0	0.0	79.5
4215 - Personal assistants & other secretaries	0	2.8	0.0	0.0	133.0
4216 - Receptionists	4	2.4	169.9	46.3	434.9
4217 - Typists	0	0.4	0.0	0.0	946.9
5111 - Farmers	26	97.3	26.7	17.5	39.2
5112 - Horticultural trades	3	8.6	34.9	7.2	101.9
5113 - Gardeners & groundsman/groundswomen	58	104.3	55.6	42.2	71.9
5119 - Agricultural & fishing trades n.e.c.	6	23.7	25.3	9.3	55.1
5211 - Smiths & forge workers	3	9.5	31.7	6.5	92.7
5212 - Moulders, core makers, die casters	4	10.1	39.5	10.8	101.1
5213 - Sheet metal workers	80	29.4	272.2	215.8	338.8
5214 - Metal plate workers, shipwrights, riveters	91	26.9	338.6	272.6	415.7
5215 - Welding trades	113	81.6	138.5	114.1	166.5
5216 - Pipe fitters	64	17.8	360.4	277.5	460.2
5221 - Metal machining setters & setter-operators	22	48.3	45.6	28.6	69.0
5222 - Tool makers, tool fitters & markers-out	28	36.8	76.0	50.5	109.8
5223 - Metal working production & maintenance fitters	399	234.0	170.5	154.2	188.1
5224 - Precision instrument makers & repairers	27	20.8	130.0	85.6	189.1
5231 - Motor mechanics, auto engineers	43	104.4	41.2	29.8	55.5
5232 - Vehicle body builders & repairers	42	19.5	215.1	155.0	290.8
5233 - Auto electricians	1	4.1	24.4	0.6	136.2
5234 - Vehicle spray painters	4	8.8	45.3	12.3	115.9
5241 - Electricians, electrical fitters	670	217.1	308.6	285.7	332.9
5242 - Telecommunications engineers	45	51.7	87.1	63.5	116.5
5243 - Lines repairers & cable jointers	5	8.7	57.4	18.6	133.9
5244 - TV, video & audio engineers	9	12.7	71.1	32.5	134.9
5245 - Computer engineers, installation & maintenance	6	6.8	88.1	32.3	191.7
5249 - Electrical/electronics engineers n.e.c.	54	44.9	120.3	90.4	157.0
5311 - Steel erectors	20	18.8	106.2	64.9	164.1
5312 - Bricklayers, masons	74	86.3	85.8	67.3	107.7
5313 - Roofers, roof tilers & slaters	42	36.2	115.9	83.6	156.7
5314 - Plumbers, heating & ventilating engineers	414	125.8	329.1	298.1	362.4
5315 - Carpenters & joiners	857	210.2	407.7	380.9	435.9
5316 - Glaziers, window fabricators & fitters	14	14.3	97.7	53.4	164.0
5319 - Construction trades n.e.c.	390	200.4	194.7	175.8	215.0
5321 - Plasterers	52	41.6	124.9	93.3	163.8
5322 - Floorers & wall tilers	34	20.2	168.3	116.6	235.2
5323 - Painters & decorators	320	181.8	176.0	157.2	196.4
5411 - Weavers & knitters	5	9.2	54.2	17.6	126.4
5412 - Upholsterers	14	11.9	117.6	64.3	197.2

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
5413 - Leather & related trades	3	10.6	28.2	5.8	82.5
5414 - Tailors & dressmakers	1	8.2	12.2	0.3	68.1
5419 - Textiles, garments & related trades n.e.c.	3	2.6	116.4	24.0	340.1
5421 - Originators, composers & print preparers	6	10.1	59.5	21.8	129.4
5422 - Printers	25	52.8	47.3	30.6	69.9
5423 - Bookbinders & print finishers	4	6.5	61.7	16.8	158.0
5424 - Screen printers	1	1.5	66.7	1.7	371.7
5431 - Butchers, meat cutters	7	41.8	16.7	6.7	34.5
5432 - Bakers, flour confectioners	4	19.8	20.2	5.5	51.8
5433 - Fishmongers, poultry dressers	3	5.4	55.8	11.5	162.9
5434 - Chefs, cooks	17	68.6	24.8	14.4	39.7
5491 - Glass & ceramics makers, decorators & finishers	10	14.6	68.3	32.7	125.6
5492 - Furniture makers, other craft woodworkers	39	21.8	178.7	127.1	244.3
5493 - Pattern makers (moulds)	6	4.5	134.4	49.3	292.6
5494 - Musical instrument makers & tuners	0	1.8	0.0	0.0	200.4
5495 - Goldsmiths, silversmiths, precious stone workers	3	5.2	58.2	12.0	170.2
5496 - Floral arrangers, florists	0	2.2	0.0	0.0	167.7
5499 - Hand craft occupations n.e.c.	11	14.5	76.0	38.0	136.1
6111 - Nursing auxiliaries & assistants	2	8.2	24.4	3.0	88.2
6112 - Ambulance staff (excluding paramedics)	10	13.4	74.6	35.8	137.2
6113 - Dental nurses	0	0.1	0.0	0.0	4569.9
6114 - Houseparents & residential wardens	1	3.2	31.3	0.8	174.3
6115 - Care assistants & home carers	23	37.4	61.4	39.0	92.2
6121 - Nursery nurses	0	0.2	0.0	0.0	2378.6
6122 - Childminders & related occupations	0	0.3	0.0	0.0	1285.9
6123 - Playgroup leaders/assistants	0	0.1	0.0	0.0	3048.9
6124 - Educational assistants	2	1.5	130.9	15.9	473.0
6131 - Veterinary nurses & assistants	0	0.3	0.0	0.0	1251.3
6139 - Animal care occupations n.e.c.	0	3.5	0.0	0.0	106.7
6211 - Sports & leisure assistants	8	9.3	86.4	37.3	170.2
6212 - Travel agents	1	4.7	21.1	0.5	117.7
6213 - Travel & tour guides	1	1.7	58.6	1.5	326.3
6214 - Air travel assistants	1	2.2	45.2	1.1	251.8
6215 - Rail travel assistants	4	10.7	37.4	10.2	95.8
6219 - Leisure & travel service occupations n.e.c.	3	9.0	33.2	6.8	96.9
6221 - Hairdressers, barbers	6	11.8	50.7	18.6	110.3
6222 - Beauticians & related occupations	0	0.7	0.0	0.0	503.1
6231 - Housekeepers & related occupations	1	2.2	45.7	1.2	254.7
6232 - Caretakers	65	78.5	82.8	63.9	105.6
6291 - Undertakers & mortuary assistants	4	8.6	46.3	12.6	118.5
6292 - Pest control officers	2	2.3	85.9	10.4	310.3
7111 - Sales & retail assistants	26	47.6	54.6	35.7	80.0
7112 - Retail cashiers & check-out operators	4	8.1	49.6	13.5	127.0
7113 - Telephone salespersons	1	0.9	110.1	2.8	613.5
7121 - Collector salespersons & credit agents	10	11.2	89.5	42.9	164.5
7122 - Debt, rent & other cash collectors	7	9.1	76.6	30.8	157.8

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
7123 - Roundsmen/women & van salespersons	11	22.6	48.6	24.3	87.0
7124 - Market & street traders & assistants	8	14.7	54.4	23.5	107.1
7125 - Merchandisers & window dressers	1	1.3	76.5	1.9	426.0
7129 - Sales related occupations n.e.c.	4	9.7	41.3	11.3	105.8
7211 - Call centre agents/operators	1	1.3	74.7	1.9	416.5
7212 - Customer care occupations	1	4.9	20.3	0.5	113.3
8111 - Food, drink & tobacco process operatives	17	60.2	28.2	16.4	45.2
8112 - Glass & ceramics process operatives	3	11.1	26.9	5.6	78.8
8113 - Textile process operatives	3	15.7	19.1	3.9	55.7
8114 - Chemical & related process operatives	30	48.3	62.1	41.9	88.7
8115 - Rubber process operatives	5	10.2	49.1	15.9	114.6
8116 - Plastics process operatives	5	14.4	34.7	11.3	80.9
8117 - Metal making & treating process operatives	14	21.2	66.0	36.1	110.7
8118 - Electroplaters	5	4.9	102.8	33.4	239.9
8119 - Process operatives n.e.c.	5	5.4	92.6	30.1	216.1
8121 - Paper & wood machine operatives	27	32.5	83.0	54.7	120.8
8122 - Coal mine operatives	35	152.5	23.0	16.0	31.9
8123 - Quarry workers & related operatives	7	14.9	47.1	18.9	97.0
8124 - Energy plant operatives	52	19.7	263.6	196.9	345.7
8125 - Metal working machine operatives	347	241.7	143.6	128.9	159.5
8126 - Water & sewerage plant operatives	1	10.0	10.0	0.3	55.8
8129 - Plant & machine operatives n.e.c.	86	68.9	124.9	99.9	154.3
8131 - Assemblers (electrical products)	3	15.6	19.2	4.0	56.1
8132 - Assemblers (vehicles & metal goods)	14	35.0	40.0	21.9	67.1
8133 - Routine inspectors & testers	40	45.6	87.8	62.7	119.5
8134 - Weighers, graders, sorters	0	4.8	0.0	0.0	76.1
8135 - Tyre, exhaust & windscreen fitters	0	4.3	0.0	0.0	85.3
8136 - Clothing cutters	2	2.8	71.3	8.6	257.4
8137 - Sewing machinists	10	10.2	98.5	47.2	181.1
8138 - Routine laboratory testers	0	2.0	0.0	0.0	181.2
8139 - Assemblers & routine operatives n.e.c.	9	12.0	74.9	34.3	142.2
8141 - Scaffolders, staggers, riggers	50	29.5	169.7	126.0	223.8
8142 - Road construction operatives	8	31.3	25.6	11.0	50.4
8143 - Rail construction & maintenance operatives	3	7.6	39.5	8.1	115.3
8149 - Construction operatives n.e.c.	112	46.1	243.0	200.1	292.4
8211 - Heavy goods vehicle drivers	180	348.0	51.7	44.4	59.9
8212 - Van drivers	98	140.1	69.9	56.8	85.2
8213 - Bus & coach drivers	50	107.2	46.6	34.6	61.5
8214 - Taxi, cab drivers & chauffeurs	77	116.6	66.0	52.1	82.5
8215 - Driving instructors	18	18.4	98.0	58.1	154.9
8216 - Rail transport operatives	16	34.7	46.2	26.4	74.9
8217 - Seafarers (merchant navy); barge, lighter & boat operatives	21	35.2	59.6	36.9	91.1
8218 - Air transport operatives	6	6.4	94.0	34.5	204.6
8219 - Transport operatives n.e.c.	8	10.3	77.6	33.5	153.0
8221 - Crane drivers	14	30.6	45.8	25.1	76.9
8222 - Fork-lift truck drivers	40	59.8	66.9	47.8	91.1



SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
8223 - Agricultural machinery drivers	1	2.6	39.0	1.0	217.3
8229 - Mobile machine drivers & operatives n.e.c.	20	39.6	50.6	30.9	78.1
9111 - Farm workers	9	52.2	17.2	7.9	32.7
9112 - Forestry workers	2	8.3	24.2	2.9	87.3
9119 - Fishing & agriculture related occupations n.e.c.	5	6.8	73.7	23.9	172.0
9121 - Labourers in building & woodworking trades	202	294.5	68.6	59.4	78.7
9129 - Labourers in other construction trades n.e.c.	55	18.5	297.1	223.8	386.7
9131 - Labourers in foundries	9	19.8	45.5	20.8	86.3
9132 - Industrial cleaning process occupations	9	8.3	108.7	49.7	206.4
9133 - Printing machine minders & assistants	1	11.0	9.1	0.2	50.8
9134 - Packers, bottlers, canners, fillers	10	16.6	60.4	28.9	111.0
9139 - Labourers in process & plant operations n.e.c.	172	246.5	69.8	59.7	81.0
9141 - Stevedores, dockers & slingers	42	31.4	133.7	96.4	180.7
9149 - Other goods handling & storage occupations n.e.c.	112	186.1	60.2	49.5	72.4
9211 - Postal workers, mail sorters, messengers, couriers	56	106.0	52.8	39.9	68.6
9219 - Elementary office occupations n.e.c.	4	6.0	66.6	18.1	170.5
9221 - Hospital porters	16	25.1	63.7	36.4	103.5
9222 - Hotel porters	2	7.9	25.2	3.0	91.0
9223 - Kitchen & catering assistants	2	18.4	10.9	1.3	39.2
9224 - Waiters, waitresses	2	8.8	22.7	2.7	82.0
9225 - Bar staff	3	16.0	18.7	3.9	54.7
9226 - Leisure & theme park attendants	0	2.1	0.0	0.0	177.5
9229 - Elementary personal services occupations n.e.c.	2	4.4	45.4	5.5	164.0
9231 - Window cleaners	7	20.4	34.2	13.8	70.5
9232 - Road sweepers	2	11.4	17.5	2.1	63.1
9233 - Cleaners, domestics	36	58.0	62.1	43.5	86.0
9234 - Launderers, dry cleaners, pressers	2	6.6	30.5	3.7	110.1
9235 - Refuse & salvage occupations	17	37.7	45.1	26.3	72.2
9239 - Elementary cleaning occupations n.e.c.	1	1.2	81.6	2.1	454.5
9241 - Security guards & related occupations	65	145.0	44.8	34.6	57.1
9242 - Traffic wardens	2	2.4	84.8	10.3	306.2
9243 - School crossing patrol attendants	0	2.3	0.0	0.0	158.7
9244 - School mid-day assistants	1	0.1	1066.9	27.0	5944.2
9245 - Car park attendants	6	9.1	65.8	24.1	143.2
9249 - Elementary security occupations n.e.c.	7	10.9	64.1	25.8	132.1
9251 - Shelf fillers	2	2.7	73.2	8.9	264.2
9259 - Elementary sales occupations n.e.c.	0	1.5	0.0	0.0	246.6

**Table 6: Mesothelioma PMRs for females aged 16-74 in Great Britain 2002-2010 (SOC2000 4 digit)**

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
1111 - Senior officials in national government	0	0.2	0.0	0.0	1846.3
1112 - Directors & chief executives of major organisations	0	0.1	0.0	0.0	5275.3
1113 - Senior officials in local government	0	1.0	0.0	0.0	371.4
1114 - Senior officials of special interest organisations	1	0.8	131.5	3.3	732.5
1121 - Production, works & maintenance managers	5	4.4	114.2	37.1	266.5
1122 - Managers in construction	1	0.9	117.2	3.0	652.9
1123 - Managers in mining & energy	0	0.2	0.0	0.0	2363.3
1131 - Financial managers & chartered secretaries	1	1.7	57.3	1.4	319.2
1132 - Marketing & sales managers	4	2.5	158.7	43.3	406.5
1133 - Purchasing managers	1	0.2	432.9	11.0	2411.8
1134 - Advertising & public relations managers	0	0.4	0.0	0.0	985.5
1135 - Personnel, training & industrial relations managers	3	2.2	137.9	28.4	402.9
1136 - Information & communication technology managers	3	1.1	272.5	56.2	796.3
1137 - Research & development managers	0	0.2	0.0	0.0	2200.4
1141 - Quality assurance managers	1	0.2	515.5	13.0	2872.2
1142 - Customer care managers	1	0.5	200.4	5.1	1116.4
1151 - Financial institution managers	2	4.0	50.3	6.1	181.7
1152 - Office managers	11	9.0	122.5	61.1	219.1
1161 - Transport & distribution managers	4	1.1	360.2	98.1	922.1
1162 - Storage & warehouse managers	0	0.6	0.0	0.0	614.5
1163 - Retail & wholesale managers	11	13.3	82.5	41.2	147.6
1171 - Officers in armed forces	0	0.1	0.0	0.0	2798.3
1172 - Police officers (inspectors & above)	0	0.1	0.0	0.0	5519.7
1173 - Senior officers in fire, ambulance, prison & related services	0	0.1	0.0	0.0	4006.5
1174 - Security managers	0	0.1	0.0	0.0	2549.6
1181 - Hospital & health service managers	0	1.8	0.0	0.0	207.0
1182 - Pharmacy managers	1	0.1	1342.3	34.0	7478.8
1183 - Healthcare practice managers	2	1.2	164.2	19.9	593.1
1184 - Social services managers	2	0.9	220.0	26.6	794.7
1185 - Residential & day care managers	5	4.8	104.7	34.0	244.3
1211 - Farm managers	2	0.3	746.7	90.4	2697.4
1212 - Natural environment & conservation managers	0	0.0	0.0	0.0	29733.1
1219 - Managers in animal husbandry, forestry & fishing n.e.c.	1	0.7	138.6	3.5	772.0
1221 - Hotel & accommodation managers	5	6.4	78.4	25.4	182.9
1222 - Conference & exhibition managers	0	0.2	0.0	0.0	1799.6
1223 - Restaurant & catering managers	7	8.7	80.1	32.2	165.0
1224 - Publicans & managers of licensed premises	8	12.8	62.3	26.9	122.8
1225 - Leisure & sports managers	3	1.7	180.2	37.2	526.8
1226 - Travel agency managers	0	0.3	0.0	0.0	1292.7
1231 - Property, housing & land managers	3	2.1	139.7	28.8	408.3
1232 - Garage managers & proprietors	0	0.6	0.0	0.0	576.9
1233 - Hairdressing & beauty salon managers & proprietors	0	0.5	0.0	0.0	775.6
1234 - Shopkeepers & wholesale/retail dealers	18	18.3	98.3	58.3	155.4

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
1235 - Recycling & refuse disposal managers	0	0.2	0.0	0.0	2169.3
1239 - Managers & proprietors in other services n.e.c.	10	8.3	120.2	57.7	221.1
2111 - Chemists	1	0.3	313.4	7.9	1746.2
2112 - Biological scientists & biochemists	1	1.3	74.7	1.9	416.5
2113 - Physicists, geologists & meteorologists	0	0.2	0.0	0.0	2187.7
2121 - Civil engineers	0	0.1	0.0	0.0	3584.0
2122 - Mechanical engineers	0	0.0	0.0	0.0	8879.2
2123 - Electrical engineers	0	0.0	0.0	0.0	31582.4
2124 - Electronics engineers	0	0.0	0.0	0.0	70954.9
2125 - Chemical engineers	0	0.0	0.0	0.0	13764.1
2126 - Design & development engineers	0	0.0	0.0	0.0	17031.9
2127 - Production & process engineers	0	0.0	0.0	0.0	14139.6
2128 - Planning & quality control engineers	0	0.1	0.0	0.0	2603.3
2129 - Engineering professionals n.e.c.	0	0.2	0.0	0.0	2099.4
2131 - IT strategy & planning professionals	0	0.4	0.0	0.0	870.6
2132 - Software professionals	3	1.1	272.8	56.3	797.1
2211 - Medical practitioners	2	2.3	86.9	10.5	313.8
2212 - Psychologists	1	0.5	204.8	5.2	1141.1
2213 - Pharmacists/pharmacologists	1	1.2	85.8	2.2	478.2
2214 - Ophthalmic opticians	0	0.2	0.0	0.0	2300.8
2215 - Dental practitioners	0	0.4	0.0	0.0	845.0
2216 - Veterinarians	0	0.1	0.0	0.0	3109.2
2311 - Higher education teaching professionals	1	1.8	55.3	1.4	307.9
2312 - Further education teaching professionals	7	5.0	141.2	56.8	290.9
2313 - Education officers, school inspectors	0	0.6	0.0	0.0	591.1
2314 - Secondary education teaching professionals	4	11.7	34.3	9.3	87.7
2315 - Primary & nursery education teaching professionals	53	44.7	118.6	88.8	155.1
2316 - Special needs education teaching professionals	1	1.9	53.9	1.4	300.2
2317 - Registrars & senior administrators of educational establishments	0	1.8	0.0	0.0	206.9
2319 - Teaching professionals n.e.c.	2	3.2	62.0	7.5	223.8
2321 - Scientific researchers	0	0.4	0.0	0.0	842.1
2322 - Social science researchers	0	0.4	0.0	0.0	994.3
2329 - Researchers n.e.c.	2	0.5	384.4	46.5	1388.5
2411 - Solicitors & lawyers, judges & coroners	2	1.6	123.5	15.0	446.3
2419 - Legal professionals n.e.c.	0	0.2	0.0	0.0	1944.4
2421 - Chartered & certified accountants	1	0.6	164.6	4.2	917.0
2422 - Management accountants	0	0.0	0.0	0.0	59154.4
2423 - Management consultants, actuaries, economists & statisticians	1	0.7	146.2	3.7	814.8
2431 - Architects	1	0.2	481.8	12.2	2684.6
2432 - Town planners	0	0.1	0.0	0.0	2706.1
2433 - Quantity surveyors	0	0.1	0.0	0.0	6007.4
2434 - Chartered surveyors (not quantity surveyors)	0	0.1	0.0	0.0	3173.9
2441 - Public service administrative professionals	0	0.5	0.0	0.0	694.0
2442 - Social workers	7	6.1	114.3	45.9	235.5
2443 - Probation officers	0	0.6	0.0	0.0	617.9
2444 - Clergy	2	1.7	116.7	14.1	421.6

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
2451 - Librarians	6	4.3	139.7	51.3	304.1
2452 - Archivists & curators	0	0.3	0.0	0.0	1087.7
3111 - Laboratory technicians	9	2.8	318.2	145.5	604.1
3112 - Electrical/electronics technicians	0	0.2	0.0	0.0	2166.0
3113 - Engineering technicians	0	0.1	0.0	0.0	5314.6
3114 - Building & civil engineering technicians	0	0.0	0.0	0.0	22936.8
3115 - Quality assurance technicians	0	0.1	0.0	0.0	3317.3
3119 - Science & engineering technicians n.e.c.	4	1.6	244.6	66.7	626.4
3121 - Architectural technologists & town planning technicians	0	0.1	0.0	0.0	5240.3
3122 - Draughtspersons	1	1.6	63.1	1.6	351.5
3123 - Building inspectors	0	0.0	0.0	0.0	20967.9
3131 - IT operations technicians	2	1.6	121.6	14.7	439.1
3132 - IT user support technicians	0	0.1	0.0	0.0	2760.9
3211 - Nurses	52	60.9	85.4	63.8	111.9
3212 - Midwives	2	3.3	61.3	7.4	221.4
3213 - Paramedics	0	0.1	0.0	0.0	7137.3
3214 - Medical radiographers	0	1.2	0.0	0.0	317.7
3215 - Chiropodists	0	0.7	0.0	0.0	526.9
3216 - Dispensing opticians	0	0.1	0.0	0.0	4083.5
3217 - Pharmaceutical dispensers	1	1.0	96.9	2.5	540.0
3218 - Medical & dental technicians	0	0.8	0.0	0.0	477.6
3221 - Physiotherapists	1	1.6	61.0	1.5	339.7
3222 - Occupational therapists	1	1.3	77.8	2.0	433.5
3223 - Speech & language therapists	0	0.3	0.0	0.0	1092.0
3229 - Therapists n.e.c.	5	2.2	228.4	74.2	533.0
3231 - Youth & community workers	0	1.4	0.0	0.0	270.3
3232 - Housing & welfare officers	8	7.5	106.8	46.1	210.4
3311 - NCOs & other ranks	0	0.8	0.0	0.0	441.8
3312 - Police officers (sergeant & below)	3	0.9	349.6	72.1	1021.7
3313 - Fire service officers (leading fire officer & below)	0	0.1	0.0	0.0	4996.2
3314 - Prison service officers (below principal officer)	1	0.4	239.4	6.1	1333.9
3319 - Protective service associate professionals n.e.c.	0	0.4	0.0	0.0	940.5
3411 - Artists	2	2.6	78.1	9.5	282.2
3412 - Authors, writers	1	2.0	50.9	1.3	283.6
3413 - Actors, entertainers	1	1.9	53.7	1.4	299.0
3414 - Dancers & choreographers	0	0.5	0.0	0.0	787.2
3415 - Musicians	1	0.7	137.2	3.5	764.3
3416 - Arts officers, producers & directors	0	0.3	0.0	0.0	1060.8
3421 - Graphic designers	2	0.7	303.1	36.7	1095.1
3422 - Product, clothing & related designers	5	1.9	267.7	86.9	624.8
3431 - Journalists, newspaper & periodical editors	3	1.6	189.8	39.1	554.6
3432 - Broadcasting associate professionals	1	0.4	247.4	6.3	1378.2
3433 - Public relations officers	1	0.6	169.3	4.3	943.1
3434 - Photographers & audio-visual equipment operators	2	0.7	281.1	34.0	1015.4
3441 - Sports players	0	0.0	0.0	0.0	8456.3
3442 - Sports coaches, instructors & officials	0	0.8	0.0	0.0	447.7

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
3443 - Fitness instructors	0	0.4	0.0	0.0	977.2
3449 - Sports & fitness occupations n.e.c	0	0.0	0.0	0.0	15180.6
3511 - Air traffic controllers	0	0.1	0.0	0.0	6381.4
3512 - Aircraft pilots & flight engineers	0	0.0	0.0	0.0	54832.0
3513 - Ship & hovercraft officers	0	0.0	0.0	0.0	16679.5
3514 - Train drivers	1	0.0	4434.4	112.2	24706.8
3520 - Legal associate professionals	0	1.0	0.0	0.0	368.9
3531 - Estimators, valuers & assessors	0	0.5	0.0	0.0	734.8
3532 - Brokers	0	0.5	0.0	0.0	743.1
3533 - Insurance underwriters	0	0.2	0.0	0.0	1503.4
3534 - Finance & investment analysts/advisers	5	1.3	387.9	126.0	905.3
3535 - Taxation experts	0	0.6	0.0	0.0	644.1
3536 - Importers, exporters	1	0.1	955.6	24.2	5324.4
3537 - Financial & accounting technicians	0	0.4	0.0	0.0	962.6
3539 - Business & related associate professionals n.e.c.	1	0.9	106.7	2.7	594.6
3541 - Buyers & purchasing officers	2	1.8	111.9	13.6	404.3
3542 - Sales representatives	9	3.5	255.6	116.9	485.1
3543 - Marketing associate professionals	1	1.5	66.8	1.7	372.4
3544 - Estate agents, auctioneers	1	1.0	104.7	2.6	583.6
3551 - Conservation & environmental protection officers	0	0.1	0.0	0.0	3816.9
3552 - Countryside & park rangers	0	0.1	0.0	0.0	5340.4
3561 - Public service associate professionals	0	1.6	0.0	0.0	227.5
3562 - Personnel & industrial relations officers	1	2.6	38.1	1.0	212.3
3563 - Vocational & industrial trainers & instructors	3	2.1	139.7	28.8	408.2
3564 - Careers advisers & vocational guidance specialists	1	0.5	193.3	4.9	1076.8
3565 - Inspectors of factories, utilities & trading standards	1	0.1	684.4	17.3	3813.2
3566 - Statutory examiners	0	0.2	0.0	0.0	2412.8
3567 - Occupational hygienists & safety officers (health & safety)	0	0.2	0.0	0.0	1797.2
3568 - Environmental health officers	0	0.1	0.0	0.0	2802.4
4111 - Civil Service executive officers	0	2.0	0.0	0.0	183.4
4112 - Civil Service administrative officers & assistants	19	18.9	100.5	60.5	156.9
4113 - Local government clerical officers & assistants	5	13.4	37.2	12.1	86.8
4114 - Officers of non-governmental organisations	1	1.1	93.2	2.4	519.1
4121 - Credit controllers	1	2.1	48.3	1.2	269.0
4122 - Accounts & wages clerks, book-keepers, other financial clerks	38	36.6	103.7	73.4	142.3
4123 - Counter clerks	15	14.2	106.0	59.3	174.8
4131 - Filing & other records assistants/clerks	11	5.9	185.5	92.6	331.9
4132 - Pensions & insurance clerks	2	3.8	53.0	6.4	191.6
4133 - Stock control clerks	2	2.2	89.1	10.8	321.8
4134 - Transport & distribution clerks	2	1.2	167.5	20.3	605.0
4135 - Library assistants/clerks	7	1.7	419.5	168.7	864.3
4136 - Database assistants/clerks	2	3.2	62.1	7.5	224.5
4137 - Market research interviewers	0	0.3	0.0	0.0	1140.4
4141 - Telephonists	4	9.5	42.3	11.5	108.3
4142 - Communication operators	1	1.6	62.4	1.6	347.7
4150 - General office assistants/clerks	68	54.9	123.8	96.2	157.0

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
4211 - Medical secretaries	10	5.8	173.4	83.2	318.9
4212 - Legal secretaries	8	7.6	105.2	45.4	207.3
4213 - School secretaries	8	5.1	155.7	67.2	306.8
4214 - Company secretaries	3	5.6	53.6	11.1	156.8
4215 - Personal assistants & other secretaries	75	67.5	111.1	87.3	139.2
4216 - Receptionists	22	18.8	116.7	73.1	176.7
4217 - Typists	4	8.3	48.2	13.1	123.5
5111 - Farmers	1	4.0	24.8	0.6	138.2
5112 - Horticultural trades	0	0.6	0.0	0.0	597.4
5113 - Gardeners & groundsman/groundswomen	0	1.0	0.0	0.0	372.2
5119 - Agricultural & fishing trades n.e.c.	1	0.5	213.0	5.4	1186.7
5211 - Smiths & forge workers	0	0.0	0.0	0.0	10159.1
5212 - Moulders, core makers, die casters	0	0.2	0.0	0.0	2198.9
5213 - Sheet metal workers	1	0.1	1407.4	35.6	7841.4
5214 - Metal plate workers, shipwrights, riveters	0	0.0	0.0	0.0	7388.5
5215 - Welding trades	0	0.6	0.0	0.0	660.7
5216 - Pipe fitters	0	0.0	0.0	0.0	239722.6
5221 - Metal machining setters & setter-operators	0	0.3	0.0	0.0	1179.1
5222 - Tool makers, tool fitters & markers-out	0	0.1	0.0	0.0	5865.0
5223 - Metal working production & maintenance fitters	2	0.4	500.8	60.7	1809.2
5224 - Precision instrument makers & repairers	0	0.3	0.0	0.0	1407.1
5231 - Motor mechanics, auto engineers	0	0.2	0.0	0.0	2172.7
5232 - Vehicle body builders & repairers	0	0.0	0.0	0.0	17422.8
5233 - Auto electricians	0	0.0	0.0	0.0	39617.6
5234 - Vehicle spray painters	0	0.0	0.0	0.0	17475.4
5241 - Electricians, electrical fitters	0	0.4	0.0	0.0	891.0
5242 - Telecommunications engineers	1	0.3	349.9	8.9	1949.7
5243 - Lines repairers & cable jointers	0	0.0	0.0	0.0	7858.0
5244 - TV, video & audio engineers	0	0.0	0.0	0.0	12209.9
5245 - Computer engineers, installation & maintenance	0	0.0	0.0	0.0	21390.9
5249 - Electrical/electronics engineers n.e.c.	0	0.3	0.0	0.0	1469.9
5311 - Steel erectors	0	0.0	0.0	0.0	26583.1
5312 - Bricklayers, masons	1	0.0	2758.9	69.8	15371.4
5313 - Roofers, roof tilers & slaters	0	0.0	0.0	0.0	46018.3
5314 - Plumbers, heating & ventilating engineers	0	0.1	0.0	0.0	3895.6
5315 - Carpenters & joiners	0	0.1	0.0	0.0	2525.9
5316 - Glaziers, window fabricators & fitters	0	0.1	0.0	0.0	4349.8
5319 - Construction trades n.e.c.	1	0.3	336.2	8.5	1873.4
5321 - Plasterers	0	0.0	0.0	0.0	401749.6
5322 - Floorers & wall tilers	0	0.1	0.0	0.0	5529.5
5323 - Painters & decorators	0	0.5	0.0	0.0	814.1
5411 - Weavers & knitters	1	2.8	36.3	0.9	202.4
5412 - Upholsterers	0	1.0	0.0	0.0	375.6
5413 - Leather & related trades	4	1.3	311.9	85.0	798.6
5414 - Tailors & dressmakers	9	5.7	157.4	72.0	298.7
5419 - Textiles, garments & related trades n.e.c.	1	0.9	107.9	2.7	601.0

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
5421 - Originators, composers & print preparers	0	0.3	0.0	0.0	1273.6
5422 - Printers	1	1.5	64.5	1.6	359.6
5423 - Bookbinders & print finishers	7	3.2	217.9	87.6	448.9
5424 - Screen printers	0	0.2	0.0	0.0	1989.5
5431 - Butchers, meat cutters	1	0.6	171.8	4.3	957.0
5432 - Bakers, flour confectioners	2	1.8	110.0	13.3	397.5
5433 - Fishmongers, poultry dressers	0	0.7	0.0	0.0	559.9
5434 - Chefs, cooks	22	31.3	70.4	44.1	106.6
5491 - Glass & ceramics makers, decorators & finishers	7	3.2	217.3	87.4	447.7
5492 - Furniture makers, other craft woodworkers	1	0.4	259.1	6.6	1443.8
5493 - Pattern makers (moulds)	0	0.0	0.0	0.0	48185.6
5494 - Musical instrument makers & tuners	1	0.0	2865.2	72.5	15963.8
5495 - Goldsmiths, silversmiths, precious stone workers	1	0.3	319.7	8.1	1781.2
5496 - Floral arrangers, florists	4	3.3	122.4	33.3	313.3
5499 - Hand craft occupations n.e.c.	0	0.7	0.0	0.0	511.4
6111 - Nursing auxiliaries & assistants	16	25.6	62.6	35.8	101.7
6112 - Ambulance staff (excluding paramedics)	1	0.4	258.2	6.5	1438.4
6113 - Dental nurses	1	1.4	69.3	1.8	386.1
6114 - Houseparents & residential wardens	11	8.5	129.5	64.6	231.7
6115 - Care assistants & home carers	67	74.9	89.4	69.3	113.6
6121 - Nursery nurses	9	5.4	165.8	75.8	314.7
6122 - Childminders & related occupations	4	4.6	86.6	23.6	221.8
6123 - Playgroup leaders/assistants	0	1.2	0.0	0.0	305.7
6124 - Educational assistants	8	9.5	84.4	36.4	166.3
6131 - Veterinary nurses & assistants	0	0.3	0.0	0.0	1110.7
6139 - Animal care occupations n.e.c.	1	0.7	139.9	3.5	779.2
6211 - Sports & leisure assistants	2	1.1	177.0	21.4	639.6
6212 - Travel agents	3	1.3	231.7	47.8	677.2
6213 - Travel & tour guides	1	2.8	36.1	0.9	201.0
6214 - Air travel assistants	2	0.7	280.1	33.9	1012.0
6215 - Rail travel assistants	0	0.2	0.0	0.0	2126.0
6219 - Leisure & travel service occupations n.e.c.	2	2.1	93.7	11.3	338.5
6221 - Hairdressers, barbers	13	13.4	96.8	51.5	165.5
6222 - Beauticians & related occupations	0	1.4	0.0	0.0	255.5
6231 - Housekeepers & related occupations	11	9.3	118.5	59.2	212.0
6232 - Caretakers	2	5.0	39.7	4.8	143.4
6291 - Undertakers & mortuary assistants	1	0.4	249.9	6.3	1392.2
6292 - Pest control officers	0	0.0	0.0	0.0	21085.3
7111 - Sales & retail assistants	94	83.8	112.2	90.7	137.3
7112 - Retail cashiers & check-out operators	13	13.9	93.8	49.9	160.4
7113 - Telephone salespersons	0	0.8	0.0	0.0	440.7
7121 - Collector salespersons & credit agents	1	0.7	148.7	3.8	828.3
7122 - Debt, rent & other cash collectors	0	1.0	0.0	0.0	365.7
7123 - Roundsmen/women & van salespersons	0	0.4	0.0	0.0	1031.3
7124 - Market & street traders & assistants	1	1.9	52.5	1.3	292.4
7125 - Merchandisers & window dressers	2	1.1	180.4	21.8	651.8

SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	Lower	Upper
7129 - Sales related occupations n.e.c.	0	1.4	0.0	0.0	262.3
7211 - Call centre agents/operators	0	0.8	0.0	0.0	440.5
7212 - Customer care occupations	1	3.1	32.1	0.8	178.8
8111 - Food, drink & tobacco process operatives	4	15.5	25.8	7.0	66.1
8112 - Glass & ceramics process operatives	1	0.5	217.7	5.5	1213.2
8113 - Textile process operatives	3	7.4	40.8	8.4	119.2
8114 - Chemical & related process operatives	1	2.1	48.7	1.2	271.5
8115 - Rubber process operatives	0	0.4	0.0	0.0	889.8
8116 - Plastics process operatives	3	1.1	262.6	54.2	767.4
8117 - Metal making & treating process operatives	0	0.2	0.0	0.0	1961.3
8118 - Electroplaters	0	0.1	0.0	0.0	4033.7
8119 - Process operatives n.e.c.	0	0.2	0.0	0.0	1603.5
8121 - Paper & wood machine operatives	0	1.7	0.0	0.0	213.2
8122 - Coal mine operatives	0	0.1	0.0	0.0	6449.7
8123 - Quarry workers & related operatives	0	0.0	0.0	0.0	14059.6
8124 - Energy plant operatives	0	0.0	0.0	0.0	9468.0
8125 - Metal working machine operatives	4	5.0	80.3	21.9	205.7
8126 - Water & sewerage plant operatives	0	0.1	0.0	0.0	7051.9
8129 - Plant & machine operatives n.e.c.	5	4.9	102.4	33.2	238.9
8131 - Assemblers (electrical products)	3	8.0	37.6	7.7	109.8
8132 - Assemblers (vehicles & metal goods)	1	2.0	50.2	1.3	279.8
8133 - Routine inspectors & testers	5	6.2	80.3	26.1	187.5
8134 - Weighers, graders, sorters	0	0.6	0.0	0.0	663.8
8135 - Tyre, exhaust & windscreen fitters	0	0.0	0.0	0.0	25428.1
8136 - Clothing cutters	0	0.5	0.0	0.0	724.5
8137 - Sewing machinists	38	35.8	106.0	75.0	145.5
8138 - Routine laboratory testers	2	1.4	144.6	17.5	522.2
8139 - Assemblers & routine operatives n.e.c.	4	6.2	64.1	17.5	164.2
8141 - Scaffolders, staggers, riggers	0	0.0	0.0	0.0	599338.2
8142 - Road construction operatives	0	0.0	0.0	0.0	23878.0
8143 - Rail construction & maintenance operatives	0	0.0	0.0	0.0	21975.9
8149 - Construction operatives n.e.c.	0	0.1	0.0	0.0	4289.2
8211 - Heavy goods vehicle drivers	1	0.3	386.0	9.8	2150.7
8212 - Van drivers	0	1.6	0.0	0.0	234.5
8213 - Bus & coach drivers	0	0.9	0.0	0.0	406.7
8214 - Taxi, cab drivers & chauffeurs	0	1.2	0.0	0.0	299.7
8215 - Driving instructors	0	0.6	0.0	0.0	646.8
8216 - Rail transport operatives	0	0.2	0.0	0.0	1557.2
8217 - Seafarers (merchant navy); barge, lighter & boat operatives	0	0.1	0.0	0.0	4555.9
8218 - Air transport operatives	0	0.1	0.0	0.0	2845.4
8219 - Transport operatives n.e.c.	0	0.2	0.0	0.0	1995.4
8221 - Crane drivers	0	0.1	0.0	0.0	3891.7
8222 - Fork-lift truck drivers	0	0.2	0.0	0.0	2056.9
8223 - Agricultural machinery drivers	0	0.0	0.0	0.0	22985.7
8229 - Mobile machine drivers & operatives n.e.c.	0	0.0	0.0	0.0	12037.3
9111 - Farm workers	2	3.5	56.8	6.9	205.2



SOC2000 Code & Occupation description	Deaths	Expected Deaths	PMR	95% Confidence interval	
				Lower	Upper
9112 - Forestry workers	0	0.0	0.0	0.0	9521.7
9119 - Fishing & agriculture related occupations n.e.c.	0	0.7	0.0	0.0	560.6
9121 - Labourers in building & woodworking trades	0	0.2	0.0	0.0	1844.5
9129 - Labourers in other construction trades n.e.c.	0	0.1	0.0	0.0	5284.7
9131 - Labourers in foundries	0	0.1	0.0	0.0	2665.4
9132 - Industrial cleaning process occupations	1	0.6	169.2	4.3	942.7
9133 - Printing machine minders & assistants	2	1.6	128.7	15.6	465.1
9134 - Packers, bottlers, canners, fillers	12	8.9	135.1	69.8	235.9
9139 - Labourers in process & plant operations n.e.c.	65	26.6	244.7	188.9	311.9
9141 - Stevedores, dockers & slingers	0	0.0	0.0	0.0	8569.2
9149 - Other goods handling & storage occupations n.e.c.	4	5.2	76.8	20.9	196.5
9211 - Postal workers, mail sorters, messengers, couriers	8	4.9	163.9	70.8	323.0
9219 - Elementary office occupations n.e.c.	10	3.6	278.5	133.5	512.1
9221 - Hospital porters	1	0.1	1175.7	29.7	6550.3
9222 - Hotel porters	0	0.0	0.0	0.0	20271.8
9223 - Kitchen & catering assistants	23	35.8	64.2	40.7	96.3
9224 - Waiters, waitresses	0	6.9	0.0	0.0	53.7
9225 - Bar staff	4	9.2	43.4	11.8	111.1
9226 - Leisure & theme park attendants	0	0.8	0.0	0.0	483.1
9229 - Elementary personal services occupations n.e.c.	1	1.1	94.5	2.4	526.5
9231 - Window cleaners	0	0.0	0.0	0.0	11544.9
9232 - Road sweepers	0	0.1	0.0	0.0	3621.3
9233 - Cleaners, domestics	115	112.9	101.8	84.1	122.3
9234 - Launderers, dry cleaners, pressers	4	6.4	63.0	17.2	161.2
9235 - Refuse & salvage occupations	0	0.1	0.0	0.0	2571.8
9239 - Elementary cleaning occupations n.e.c.	0	0.2	0.0	0.0	1693.2
9241 - Security guards & related occupations	1	1.7	60.6	1.5	337.4
9242 - Traffic wardens	0	0.5	0.0	0.0	789.1
9243 - School crossing patrol attendants	2	2.7	73.9	8.9	266.9
9244 - School mid-day assistants	8	11.1	72.4	31.2	142.6
9245 - Car park attendants	0	0.1	0.0	0.0	2969.2
9249 - Elementary security occupations n.e.c.	1	0.8	123.5	3.1	688.2
9251 - Shelf fillers	0	0.5	0.0	0.0	682.0
9259 - Elementary sales occupations n.e.c.	0	0.4	0.0	0.0	1043.0

# Appendix

## Calculation of PMRs

To calculate the PMR for a given time period, the total number of deaths from all causes and the total number from mesothelioma in Great Britain for that period are required, broken down by age and occupation group. For each occupation the number of deaths from all causes, is divided by the total number of deaths from all causes for all occupations to give the proportion of all deaths that were amongst workers with that occupation. This proportion is multiplied by the total number of mesothelioma deaths to give the number of deaths from mesothelioma that would be expected in that occupation, under the assumption that occupation is not related to mesothelioma risk. The PMR is then the ratio of the actual number of mesothelioma cases that occurred, to this expected number, in a given occupation, expressed as a percentage. If the observed number of deaths is greater or less than the expected, then the PMR will be respectively, greater or less than 100 indicating that the observed number of mesotheliomas is greater or less than the average for all occupations.

Table 7 illustrates the calculation of a PMR for men in "occupation X". Column 3 gives the proportion of all mesothelioma deaths by age; column 2 divided by column 1. This proportion is applied to the number of deaths from all causes by age in occupation X, given in column 4, to give expected number of deaths from mesothelioma in this occupation in column 5. The total observed number of deaths (500 - not shown in table), divided by the total expected number of deaths (230 -shown in column 5) expressed as a percentage gives a PMR of 217.

**Table 7: Example of a PMR calculation**

Age group	Deaths				
	All men			Men in occupation X	
	All causes	Mesothelioma deaths	Proportion from mesothelioma	All cause deaths	Expected deaths
	(1)	(2)	(3) = (2) / (1)	(4)	(6) = (3) * (4)
16-24	16500	1	0.000061	6400	0.388
20-24	21,732	1	0.000046	7,833	0.360
25-29	18,072	5	0.000277	7,907	2.188
30-34	20,544	16	0.000779	7,770	6.051
35-39	27,300	76	0.002784	6,443	17.937
40-44	42,576	199	0.004674	6,222	29.082
45-49	61,236	402	0.006565	6,243	40.984
50-54	102,900	705	0.006851	6,391	43.787
55-59	187,416	1,145	0.006109	6,269	38.300
60-64	308,988	1,436	0.004647	5,367	24.943
65-69	433,956	1,499	0.003454	4,997	17.261
70-74	550,296	1,315	0.002390	3,729	8.911
All ages 16-74	1791516	6800		75571	230

### Confidence intervals and statistical significance

A PMR calculated for an occupational group may be greater or less than 100 by chance. Confidence intervals are used to give an indication of the uncertainty associated with each PMR due to this random variation. A 95% confidence interval is such that, if the calculation could be repeated many times with different samples of the events, then 95% of the time, the confidence interval will contain the true value of the PMR. If the lower confidence limit is greater than 100 then the PMR is said to be statistically significantly elevated at the 2.5% level. Likewise, if the upper confidence interval that is presented is lower than 100 then the PMR is said to be statistically significantly lower at the 2.5% level.

Ranking according to the value of the lower confidence interval takes into account both the degree to which the PMR is greater than 100 and the statistical uncertainty associated with it. Thus a high PMR based on few cases would have a lower rank than a similar PMR based on a larger number of cases.

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ISBN 978-0-230-24819-9

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First published 03/13.