



OCCUPATION AND MORTALITY

Asthma-related mortality in South Africa, 2013-2015

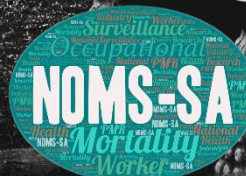
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Division of the National Health Laboratory Service



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1. Main points

- There were 6202 reported deaths due to asthma from 2013-2015.
- Main industries with significantly elevated PMRs for asthma-related deaths are agriculture in men; and manufacturing, construction and wholesale, retail, motor repair and accommodation in women.
- Major occupation groups with significantly elevated PMRs for asthma-related deaths are clerks, craft and related trade workers and elementary workers.
- Lower skilled (lower socio-economic) workers are particularly vulnerable and need special consideration.

2. Introduction

The National Occupational Mortality Surveillance South Africa (NOMS-SA) is a nation-wide, evidence-based surveillance system that measures primary and common risks associated with specific occupations and industries using mortality data from Statistics South Africa. NOMS-SA describes the relationship between work and wellbeing to inform policy development to improve worker safety and health. It can provide information for workplaces and educational activities. Surveillance of occupational mortality can enable research and prevention strategies.

This report presents the analysis of deaths involving asthma in different occupation groups and industries among those aged 15 to 65 years in South Africa. This analysis includes deaths that were registered from 2013 to 2015 by Statistics South Africa.

Occupation was defined using the South African Standard Classification of Occupations (SASCO). There are nine major occupation groups, which then divide into 42 sub-major groups. For further information on the breakdown of occupation groups, see Appendix A.

We calculated proportional mortality ratios for the population at risk of dying from asthma. The results of the analysis do not prove that the observed risk of death involving asthma is caused by occupational exposure. The findings presented here should be interpreted bearing in mind the warnings in the strengths and limitations section.

3. Asthma-related mortality by sex and age

- There were 6202 reported deaths due to asthma from 2013-2015.
- Number of reported deaths due to asthma by sex:
 - Men (3478), Women (2672), Unknown (3) and Unspecified (49).

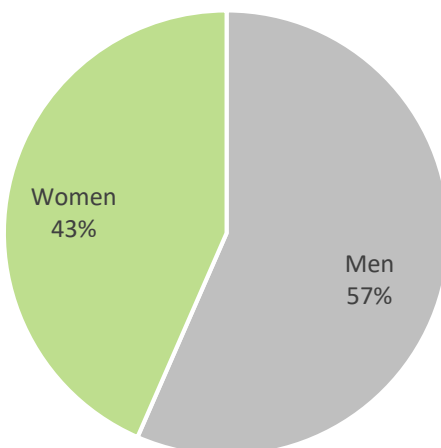


Figure 1. Percentage of deaths due to asthma by sex.

- Mean age of death due to asthma: men (51.3 years), women (48.5 years).

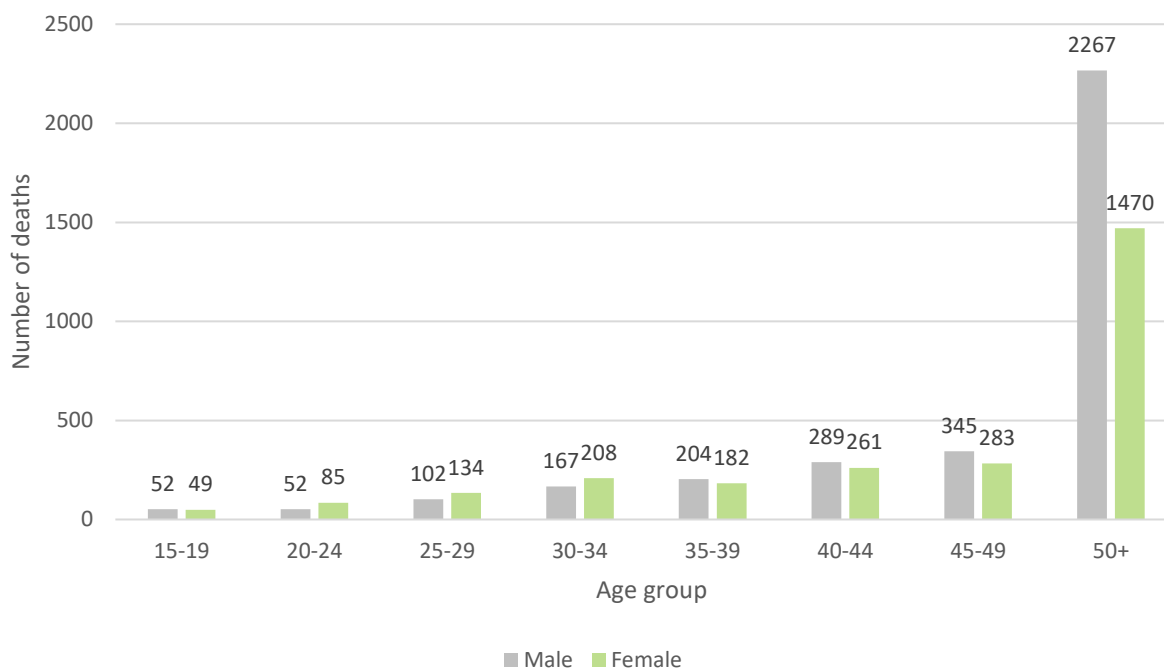


Figure 2. Asthma-related mortality by sex and age

4. Asthma-related mortality by sex and main industry

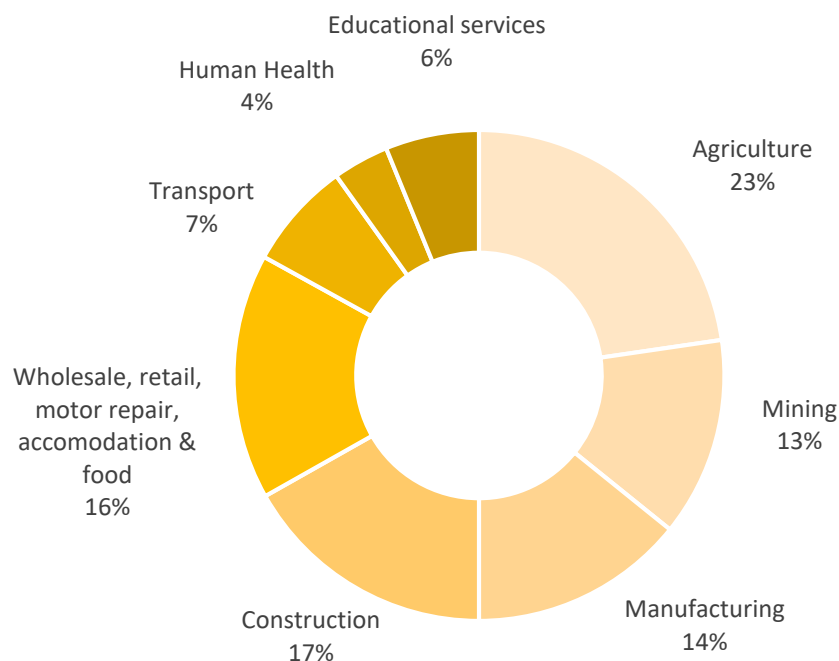


Figure 3. Percentage of asthma-related deaths by main industry.

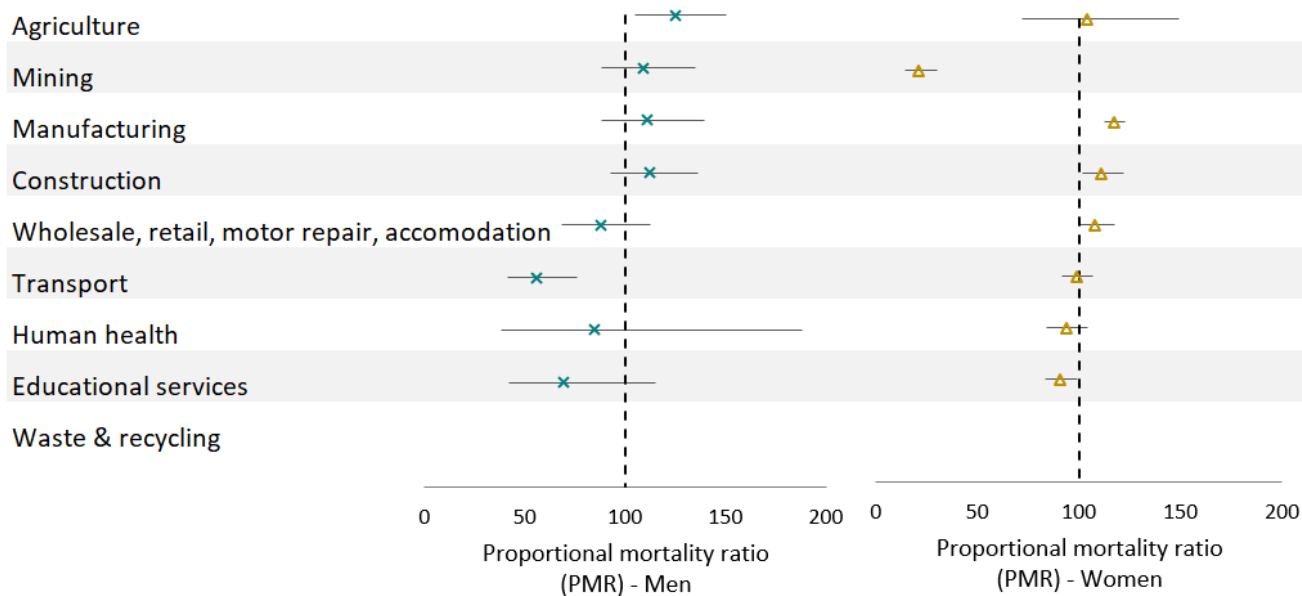


Figure 3 Asthma-related mortality by sex and main industry. Source: Statistics South Africa (See Appendix. Table 1 and 2)

- Main industries with significantly elevated PMRs for asthma-related deaths are agriculture in men; and manufacturing, construction and wholesale, retail, motor repair and accommodation in women compared to the general population.

5. Asthma-related mortality by sex and major occupation

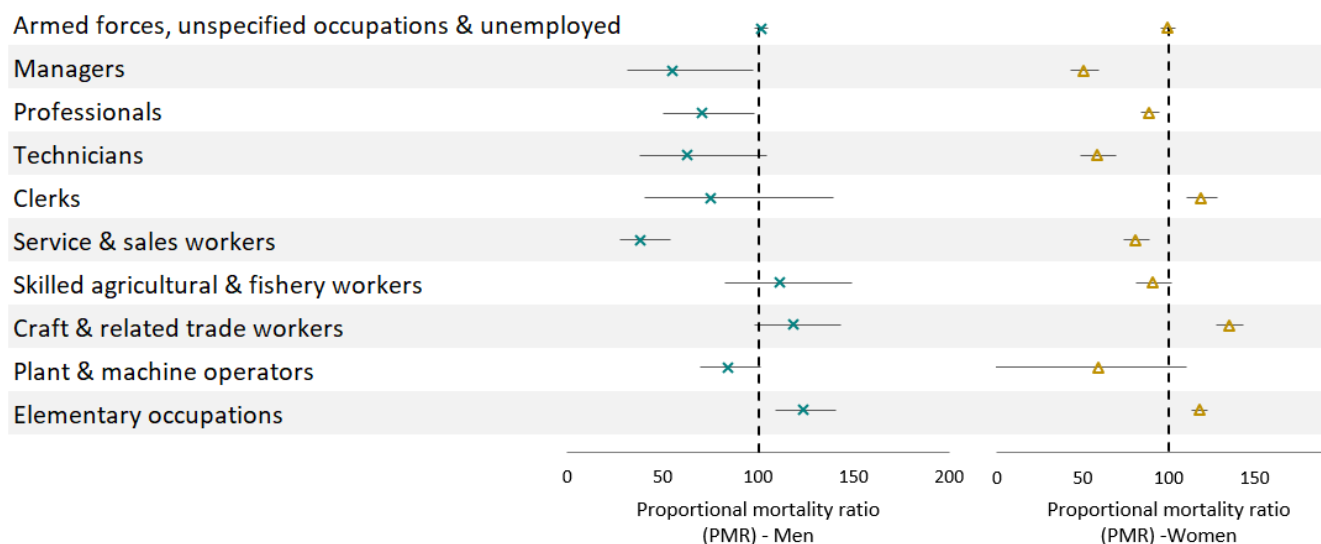


Figure 4. Asthma-related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix. Table 3 and 4)

- Men working as elementary workers had excess mortality due to asthma compared to the general population.
- Women working as clerks, craft and related trade workers and elementary workers had excess mortality due to asthma compared to the general population.

6. Asthma-related mortality by sex and sub-major occupation

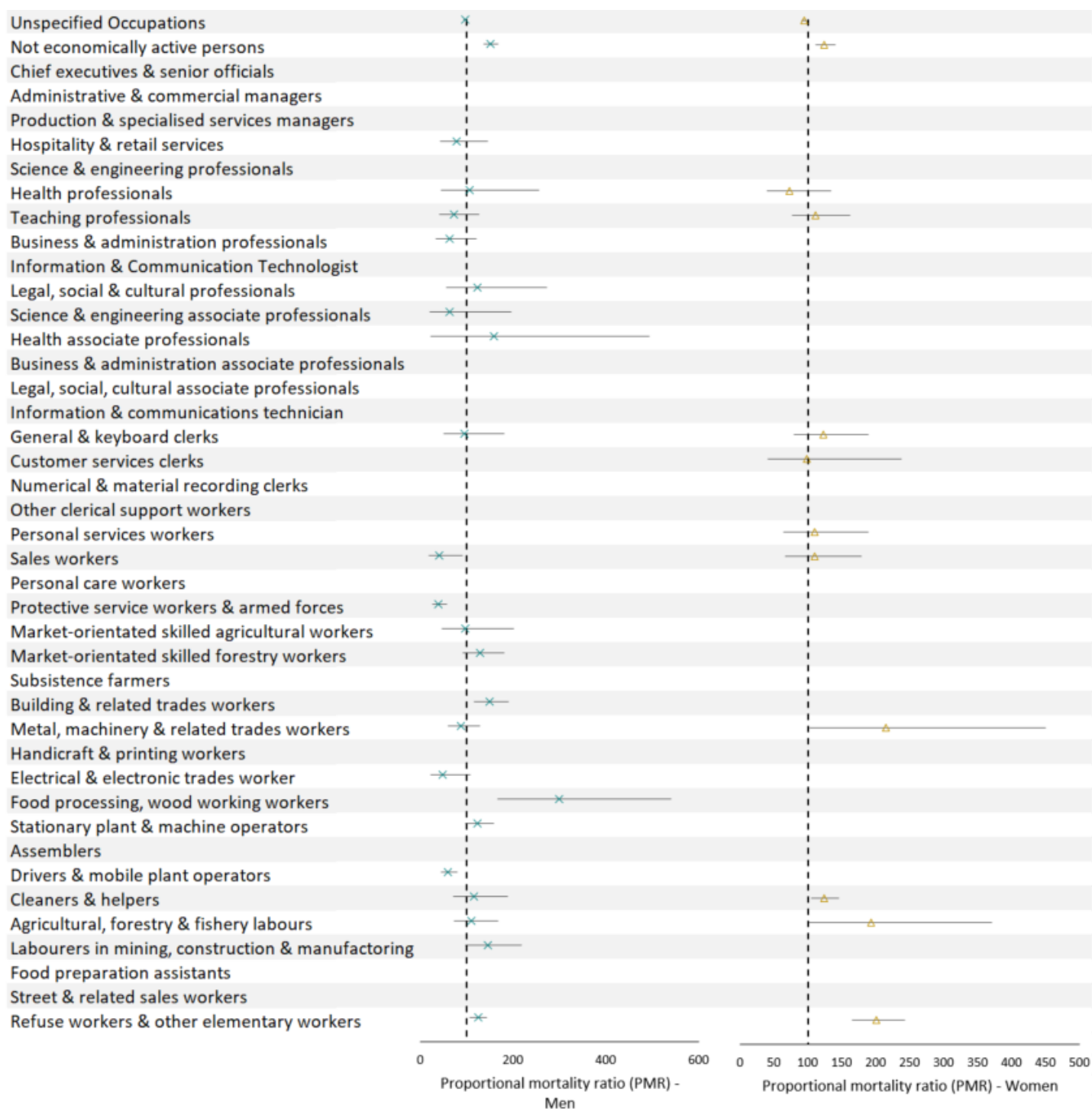


Figure 5. Asthma-related mortality by sex and sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 5 and 6)

- Men and women not economically active had significantly higher PMRs due to asthma than the general population.
- Men employed in the following sub-major occupation groups had excess mortality due to asthma compared to the general population:
 - Food processing and wood workers;
 - Elementary occupations: labourers in mining, construction and manufacturing and refuse workers and other elementary workers.
- Women employed in the following sub-major occupation groups had excess mortality due to asthma compared to the general population:
 - Plant and machine operators: metal, machinery and related trades workers
 - Elementary occupations: cleaners and helpers, agricultural, forestry and fishery labourers and refuse workers and other elementary workers.

7. Measuring the data

- NOMS-SA uses mortality data with occupation information from Statistics South Africa, which is a South African national statistical entity, who is responsible for recording vital events on an annual basis. The data brief includes only the working population (15+).
- Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths due to asthma include the following underlying cause of death codes: J45 and J46.
- The figures are based on proportional mortality ratios (PMRs). A simple and potentially useful way of portraying the burden of a specific disease within a population. PMRs are the ratio of the proportion of observed deaths in a specific occupation over the proportion of observed deaths in the total data. These were calculated to estimate where excess mortality by occupation is found. PMRs also provides a way to compare occupations. Confidence intervals that do not include 100 indicate that a PMR is significant.

$$\frac{(\text{Proportion of deaths from a particular cause in a specific group of workers})}{(\text{Proportion of deaths from that cause in the general population})} \times 100$$

8. Strengths and limitations

- PMRs can only be calculated where data on occupation or industry are available; it is not a reflection of length of employment.
- A statistically significantly elevated PMR cannot be interpreted directly as a causal relationship between the occupation and the cause of death.
- A lack of significantly increased PMRs may represent the selection of healthy workers for particular occupations and/or improved socioeconomic circumstances of selected workers than the general population.

References

1. Statistics South Africa. South African Standard Classification of Occupations (SASCO). Pretoria: Statistics South Africa; 2012. Available from: http://www.statssa.gov.za/classifications/codelists/SASCO_2012.pdf. Date accessed 6 February 2021.
2. Statistics South Africa Datasets. Mortality and Causes of Death 1997-2016. Available from: <http://nesstar.statssa.gov.za:8282/webview/>. Date accessed 6 February 2021.

Appendix

Table 1 Asthma-related deaths by industry (men)

Men					
Industry	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	118	11723	125.2966	104.61	150.07
Mining	84	9606	108.8511	87.89	134.81
Manufacturing	72	8089	110.7984	87.95	139.59
Construction	102	11302	112.3417	92.52	136.40
Wholesale, retail, motor repair, accommodation	61	8671	87.57025	68.13	112.55
Transport	41	9096	56.10859	41.31	76.20
Human health	6	884	84.48798	37.96	188.06
Educational services	15	2692	69.36049	41.81	115.05
Waste & recycling	0	52		0	0
Total	499	62115			

PMRs cannot be calculated when n<5

Table 2 Asthma-related deaths by industry (women)

Women					
Industry	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	29	3404	103.6792	72.04847	149.1966
Mining	1	571			
Manufacturing	20	2074	117.3558	75.71234	181.9041
Construction	7	767	111.0673	52.94881	232.9785
Wholesale, retail, motor repair, accommodation	44	4968	107.784	80.21003	144.8373
Transport	5	615	98.94145	41.18152	237.7137
Human health	18	2340	93.61384	58.9802	148.5846
Educational services	25	3347	90.9008	61.42204	134.5275
Waste & recycling	0	47			
Total	149	18133			

PMRs cannot be calculated when n<5

Table 3 Asthma-related deaths by major occupation (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	2874	380007	101.5733	97.93	105.36
Managers	12	2915	55.28749	31.40	97.35
Professionals	35	6681	70.35756	50.52	97.99
Technicians	15	3203	62.89535	37.92	104.33
Clerks	10	1794	74.86206	40.28	139.14
Service & sales workers	33	11551	38.36883	27.28	53.97
Skilled agricultural & fishery workers	44	5325	110.973	82.58	149.12
Craft & related trade workers	107	12108	118.6849	98.20	143.45
Plant & machine operators	110	17587	84.00113	69.68	101.26
Elementary occupations	234	25396	123.747	108.87	140.66
Total	3474	466567			

PMRs cannot be calculated when n<5

Table 4 Asthma-related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	2327	301539	99.45742	95.49736	103.5817
Managers	4	1030	50.05035	18.78445	133.357
Professionals	42	6104	88.67865	65.53502	119.9954
Technicians	7	1557	57.94203	27.62256	121.5412
Clerks	26	2828	118.4891	80.67535	174.0266
Service & sales workers	34	5428	80.72785	57.68207	112.9811
Skilled agricultural & fishery workers	8	1139	90.52126	45.26889	181.0095
Craft & related trade workers	12	1144	135.1884	76.77402	238.0481
Plant & machine operators	3	656	58.93886	19.00865	182.7478
Elementary occupations	204	22297	117.9147	102.7947	135.2587
Total	2667	343722			

PMRs cannot be calculated when n<5

Table 5 Asthma-related deaths by sub-major occupation (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	2523	350451	97.161739	93.443417	101.02802
Not economically active persons	331	29556	151.14287	135.70647	168.33514
Chief executives & senior officials	0	490			
Administrative & commercial managers	1	282			
Production & specialised services managers	1	427			
Hospitality & retail services	10	1716	78.648066	42.31648	146.1728
Science & engineering professionals	2	1132			
Health professionals	5	635	106.26778	44.230893	255.31569
Teaching professionals	12	2253	71.882866	40.822552	126.57578
Business & administration professionals	9	1917	63.36154	32.967549	121.77686
Information & Communication Technologist	1	83			
Legal, social & cultural professionals	6	661	122.50537	55.036038	272.68615
Science & engineering associate professionals	6	1278	63.36154	20.435029	196.46093
Health associate professionals	3	254			
Business & administration associate professionals	1	1057			
Legal, social, cultural associate professionals	2	458	58.934533	22.118784	157.02848
Information & communications technician	4	156			
General & keyboard clerks	9	1284	94.598188	49.220243	181.81172
Customer services clerks	1	248	54.419387	7.665429	386.34103
Numerical & material recording clerks	2	184	146.69574	36.687326	586.56878
Other clerical support workers	0	78			
Personal services workers	2	977			
Sales workers	6	1964	41.230167	18.522821	91.774718
Personal care workers	1	103			
Protective service workers & armed forces	24	8507	38.07502	25.520323	56.805988
Market-orientated skilled agricultural workers	7	981	96.301791	45.909706	202.00598
Market-orientated skilled forestry workers	33	3457	128.83086	91.588722	181.21652
Subsistence farmers	4	887			
Building & related trades workers	63	5700	149.16641	116.52731	190.94765
Metal, machinery & related trades workers	26	3985	88.054256	59.953277	129.32658
Handicraft & printing workers	1	251			
Electrical & electronic trades worker	6	1676	48.315065	21.70574	107.54507
Food processing, wood working workers	11	496	299.30663	165.75426	540.4655
Stationary plant & machine operators	62	6767	123.65191	96.404244	158.60086
Assemblers	0	27			
Drivers & mobile plant operators	48	10793	60.021161	45.231581	79.646557
Cleaners & helpers	16	1867	115.65942	70.856011	188.79274
Agricultural, forestry & fishery labourers	22	2696	110.13063	72.515026	167.25852
Labourers in mining, construction & manufacturing	23	2137	145.25418	96.524507	218.58467
Food preparation assistants	0	12			
Street & related sales workers	2	0133			
Refuse workers & other elementary workers	171	18541	124.47103	107.14554	144.59807
Total	3457	466557	100	96.721405	103.38973

PMRs cannot be calculated when n<5

Table 6 Asthma-related deaths by sub-major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	2052	273668	94.6133242	90.60688984	98.79691414
Not economically active persons	275	27871	124.5027964	110.6238524	140.1230021
Chief executives & senior officials	0	173			
Administrative & commercial managers	2	159			
Production & specialised services managers	1	96			
Hospitality & retail services	1	602			
Science & engineering professionals	0	134			
Health professionals	10	1739	72.56035209	39.04099456	134.858365
Teaching professionals	27	3068	111.0471386	76.15361933	161.9288367
Business & administration professionals	4	839			
Information & Communication Technologist	0	15			
Legal, social & cultural professionals	1	309			
Science & engineering associate professionals	4	156			
Health associate professionals	3	361			
Business & administration associate professionals	0	682			
Legal, social, cultural associate professionals	0	340			
Information & communications technician	0	18			
General & keyboard clerks	20	2065	122.2106075	78.84441846	189.429168
Customer services clerks	5	637	99.04431105	41.22433301	237.960807
Numerical & material recording clerks	0	60			
Other clerical support workers	1	66			
Personal services workers	13	1495	109.7238715	63.71122469	188.9671411
Sales workers	16	1845	109.4265169	67.03757246	178.6186784
Personal care workers	1	497			
Protective service workers & armed forces	4	1591			
Market-orientated skilled agricultural workers	7	56			
Market-orientated skilled forestry workers	1	971			
Subsistence farmers	1	112			
Building & related trades workers	1	128			
Metal, machinery & related trades workers	7	411	214.9092861	102.4531527	450.8011716
Handicraft & printing workers	0	46			
Electrical & electronic trades workers	0	44			
Food processing, wood working workers	4	515			
Stationary plant & machine operators	3	532			
Assemblers	0	8			
Drivers & mobile plant operators	0	116			
Cleaners & helpers	142	14486	123.6912068	104.9315934	145.8046539
Agricultural, forestry & fishery labourers	9	588	193.1364065	100.4905181	371.1959322
Labourers in mining, construction & manufacturing	4	543			
Food preparation assistants	1	35			
Street & related sales workers	1	171			
Refuse workers & other elementary workers	103	6473	200.7846838	165.5227373	243.5586188
Total	2724	343721			
* PMRs cannot be calculated when n<5					

