



OCCUPATION AND MORTALITY

Pneumonia Mortality in South Africa, 2011-2015

National Institute for Occupational Health

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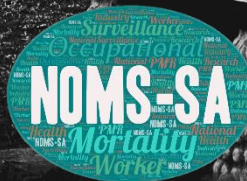
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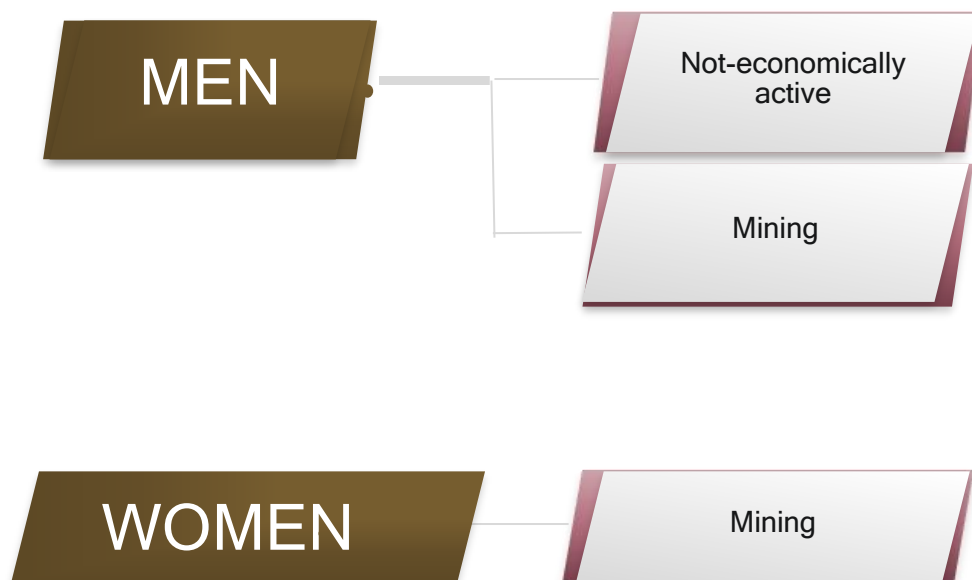


Contents

Main points	3
Introduction	4
Pneumonia disease mortality by sex and age	5
Pneumonia disease mortality by sex and main industry	6
Pneumonia disease-related mortality by sex and major occupation	7
Pneumonia disease-related mortality by sex and sub-major occupation	8
Measuring the data	10
Strengths and limitations.....	10
References	11
Appendix.....	12

Main points

- There were reported 76,225 deaths due to pneumonia from 2011 to 2015 in the 15 - 69 years age group.
- The main industry with significantly elevated proportionate mortality ratios (PMRs) for pneumonia deaths among men were mining, and those not economically active and had unspecified activities; and only mining among women.
- The major occupation group with significantly elevated PMRs for pneumonia deaths among both men and women was armed forces, unspecified occupations & unemployed.



Introduction

The National Occupational Mortality Surveillance South Africa (NOMS-SA) is a nationwide, 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 well-being 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.

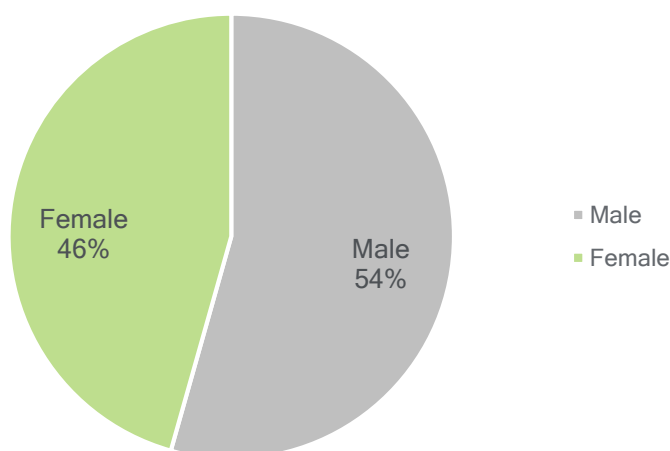
This report presents the analysis of deaths involving pneumonia disease in different occupation groups and industries among those aged 15 to 69 years in South Africa. This analysis includes deaths that were registered from 2011 to 2015 by the Statistics South Africa.

Occupation was defined using the South African Standard Classification of Occupations (SASCO). There are ten major occupation groups, which then divide into 42 sub-major groups. For further information on the breakdown of occupation groups, see Tables 1 and 2 in the Appendix section.

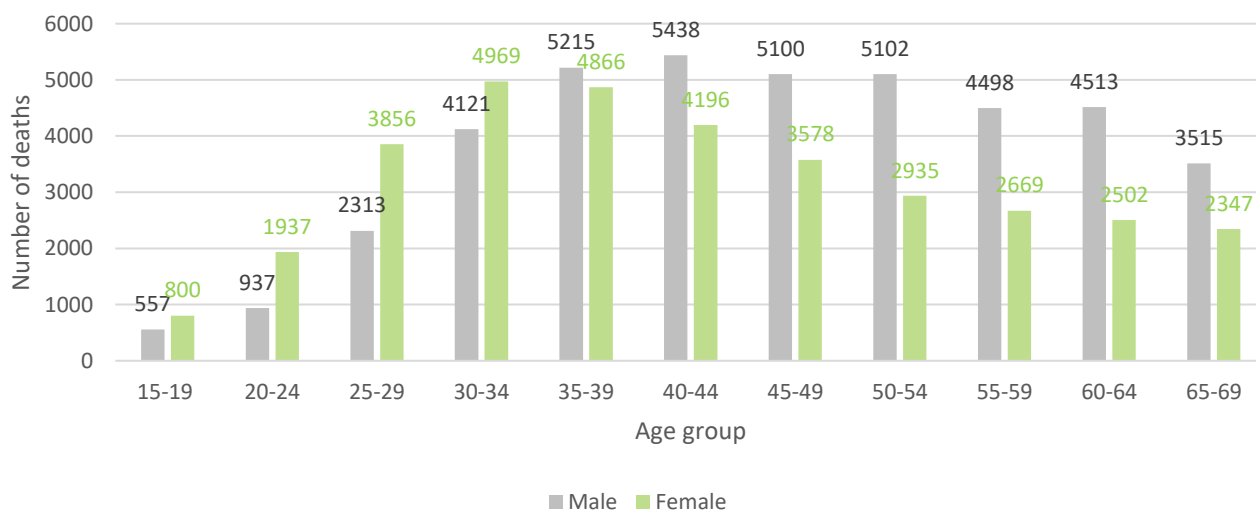
We calculated proportional mortality ratios for the population at risk of dying from pneumonia disease. The results of the analysis do not prove that the observed proportions of deaths involving pneumonia are caused by occupational exposure. The findings presented here should be interpreted considering the warnings in the strengths and limitations section.

Pneumonia disease mortality by sex and age

- There were 76,225 reported deaths due to pneumonia disease from 2011-2015 among 15 to 69-year-olds.
- Number of reported deaths due to pneumonia disease by sex:
 - Men (41,309), Women (34,655), Unspecified (261)



- Mean age of death due to pneumonia disease: men (46.6 years), women (42.2 years).



Pneumonia disease mortality by sex and main industry

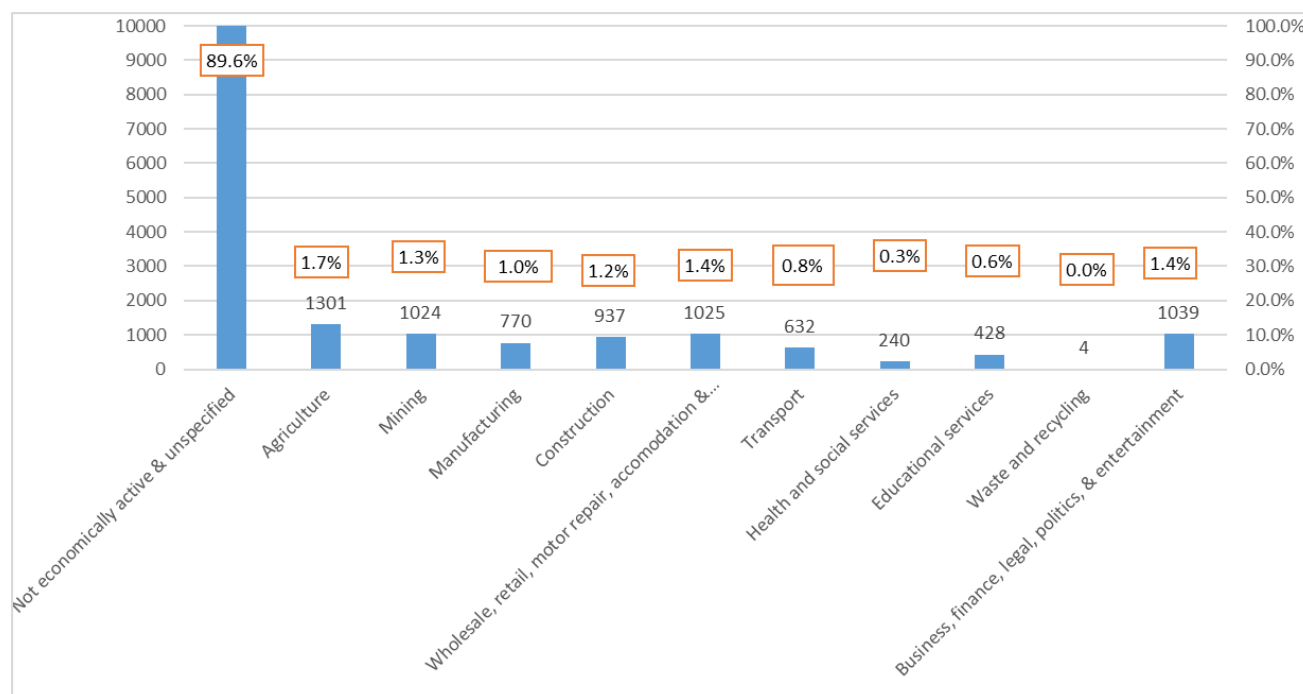


Figure 1. Percentage of pneumonia disease-related deaths by main industry.

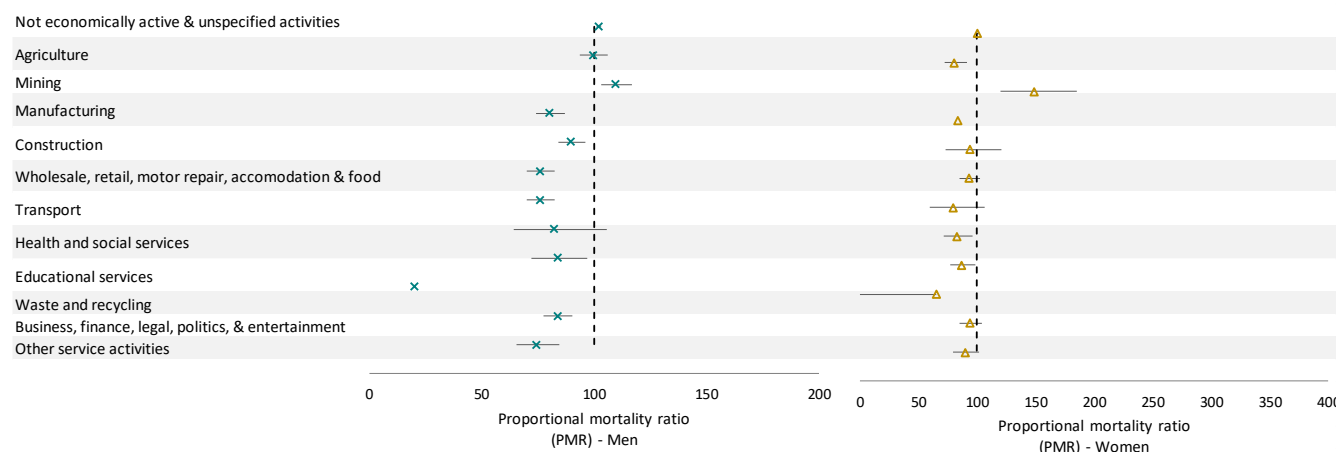


Figure 2. Pneumonia disease-related mortality by sex and main industry. Source: Statistics South Africa (See Appendix Tables 1 and 2)

- The main industries with significantly elevated PMRs for pneumonia disease-related deaths among men were not economical active and unspecified activities, and mining; and only mining in women compared to the general population. The education service industry appears protective in both men and women.

Pneumonia disease-related mortality by sex and major occupation

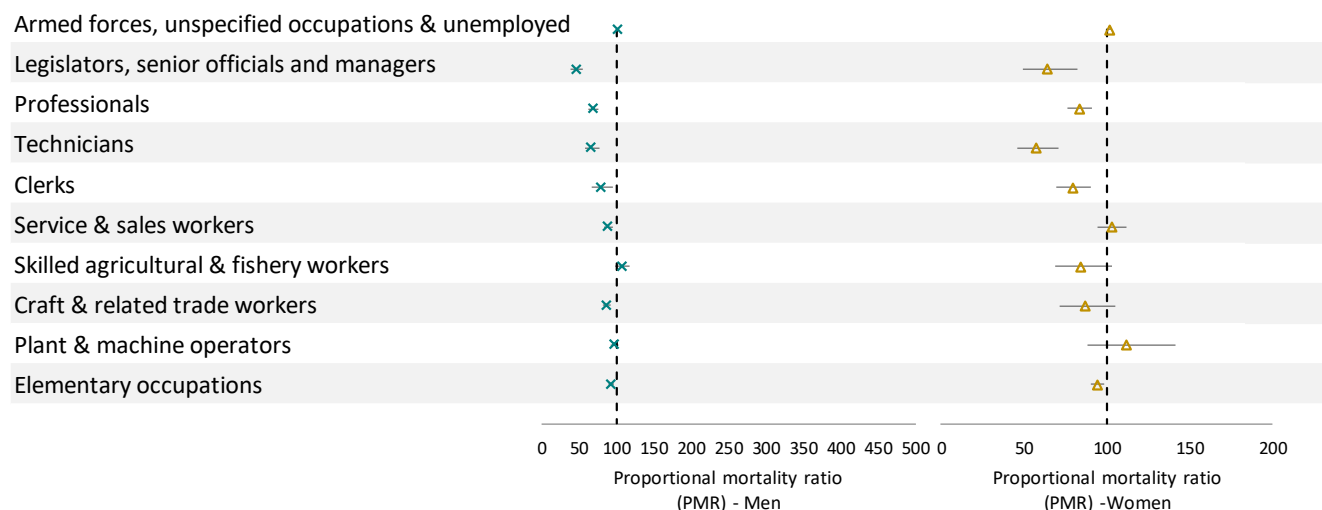


Figure 3. Pneumonia disease-related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix Tables 3 and 4)

- Men and women in the major occupation category ‘armed forces, unspecified occupations and unemployed’ had significant excess mortality due to pneumonia disease compared to the general population.
- Among men and women, working as legislators, senior officials and managers, professionals, technicians and associate professionals, clerks, or elementary occupations was protective of pneumonia disease related deaths compared to the general population.

Pneumonia disease-related mortality by sex and sub-major occupation

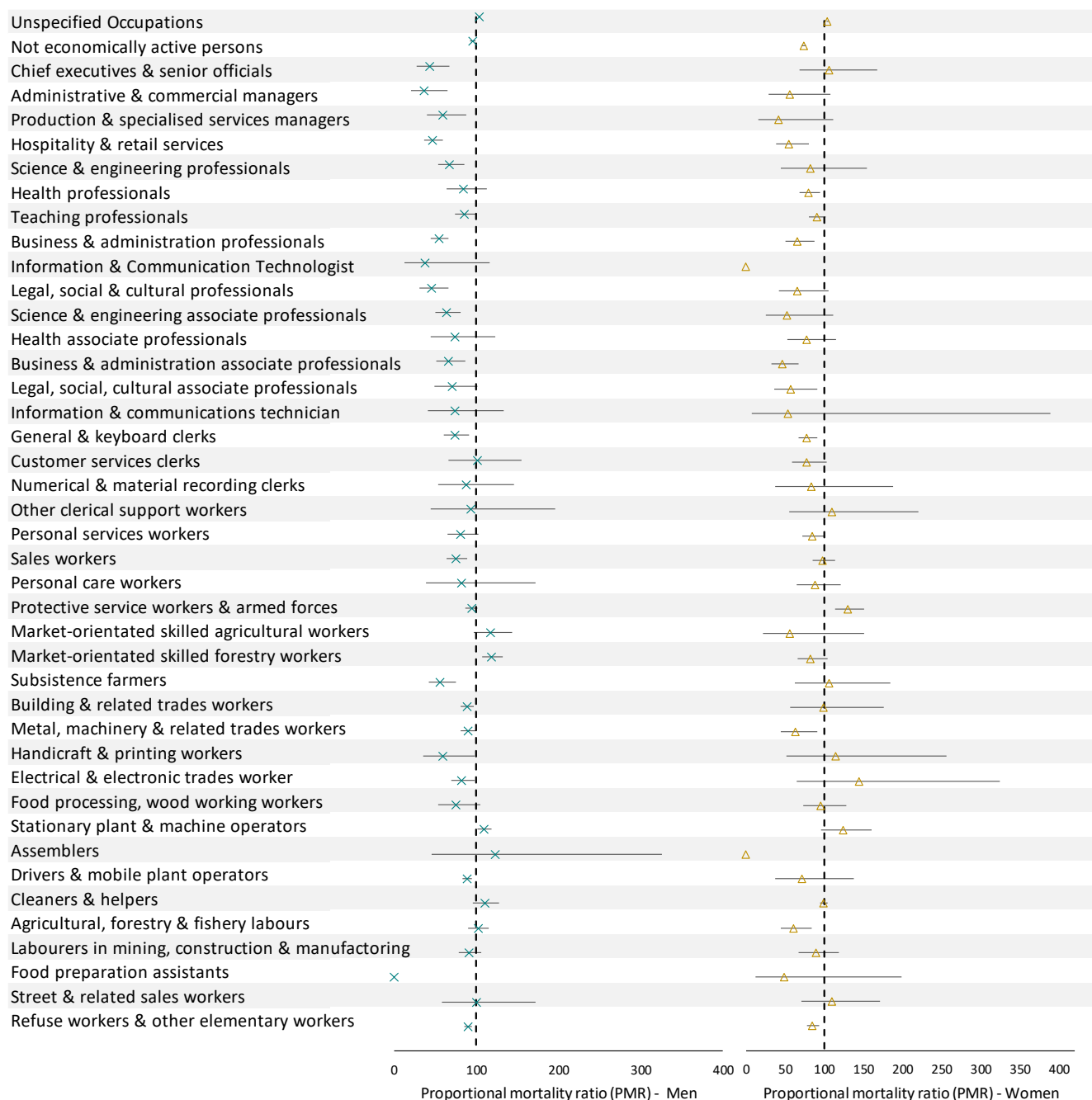


Figure 4. Pneumonia disease-related mortality by sex and sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 5 and 6)

- Men and women who had their occupations unspecified had significantly increased pneumonia related PMR.
- Men employed in the following sub-major occupation groups had excess mortality due to pneumonia disease compared to the general population.
 - Market-orientated skilled forestry workers
 - Stationary plant and machine operators
- Women employed in the protective service workers and armed forces sub-major occupation group, had significant excess mortality due to pneumonia disease compared to the general population.

Measuring the data

- NOMS-SA uses mortality data with occupation information from Statistics South Africa, which is a South African national statistical entity responsible for recording vital events on an annual basis. The data brief includes only the working population (15 - 69 years).
- Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths due to pneumonia disease include the following underlying cause of death code: J18.
- 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. Confidence intervals that do not include 100 indicate that a PMR is significant.

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

Strengths and limitations

- PMRs can only be calculated where data on occupation or industry are available; it is not a reflection of the 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. SASCO.
2. Statistics South Africa.

Appendix

Table 1 Pneumonia disease-related deaths by industry (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Not economically active & unspecified activities	35552	733993	102.2781	101.22	103.35
Agriculture	1022	21634	99.75267	93.82	106.06
Mining	939	18064	109.7646	102.96	117.01
Manufacturing	597	15710	80.24327	74.06	86.95
Construction	873	20531	89.78723	84.02	95.95
Wholesale, retail, motor repair, accomodation & food	580	16078	76.17394	70.22	82.63
Transport	585	16215	76.18147	70.25	82.61
Health and social services	62	1588	82.44259	64.28	105.74
Educational services	176	4439	83.72169	72.22	97.05
Waste and recycling	1	105	20.11042	2.83	142.77
Business, finance, legal, politics, & entertainment	659	16612	83.76719	77.61	90.41
Other service activities	242	6866	74.42554	65.62	84.42
Total	41288	871835			

Table 2 Pneumonia disease-related deaths by industry (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Not economically active & unspecified activities	32486	618321	100.7637	99.67392126	101.8654682
Agriculture	277	6557	81.02081	72.01980201	91.14677162
Mining	83	1067	149.1886	120.3102059	184.9988032
Manufacturing	172	3936	83.80991	-	-
Construction	60	1223	94.09072	73.05587537	121.1821019
Wholesale, retail, motor repair, accomodation & food	440	9064	93.1011	84.79585316	102.2197909
Transport	46	1106	79.76727	59.74748095	106.4951558
Health and social services	178	4108	83.10202	71.74806014	96.25272072
Educational services	252	5550	87.08224	76.96759861	98.52608397
Waste and recycling	3	88	65.38236	0	-
Business, finance, legal, politics, & entertainment	380	7748	94.06239	85.06472178	104.0117794
Other service activities	260	5529	90.188	79.86537419	101.8448396
Total	34637	664297			

Table 3 Pneumonia disease-related deaths by major occupation (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	34,487	710203	102.5566	101.48	103.64
Legislators, senior officials and managers	122	5520	46.67791	39.09	55.74
Professionals	410	12601	68.71784	62.38	75.70
Technicians and Associate professionals	180	5678	66.95265	57.85	77.48
Clerks	132	3488	79.92601	67.39	94.79
Service & sales workers	865	20458	89.29839	83.54	95.45
Skilled agricultural & fishery workers	499	9812	107.4073	98.38	117.26
Craft & related trade workers	951	23116	86.88774	81.54	92.59
Plant & machine operators	1504	32749	96.99302	92.21	102.02
Elementary occupations	2104	47653	93.24943	89.35	97.32
Total	41,254	871278			

Table 4 Pneumonia disease related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	30832	584122	101.2759	100.1517	102.4127
Legislators, senior officials and managers	60	1797	64.06355	49.74155	82.50926
Professionals	484	11172	83.1232	76.03798	90.86863
Technicians and Associate professionals	81	2714	57.26418	46.05782	71.19717
Clerks	225	5438	79.38732	69.66319	90.46883
Service & sales workers	531	9915	102.7566	94.37783	111.8792
Skilled agricultural & fishery workers	95	2163	84.27038	68.91946	103.0405
Craft & related trade workers	102	2255	86.78836	71.47899	105.3767
Plant & machine operators	69	1183	111.9108	88.38889	141.6924
Elementary occupations	2119	43074	94.38948	90.45488	98.49523
Total	34598	663833			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	31652	647593	103.2091	102.0783	104.3524
Not economically active persons	2869	63166	95.91051	92.46435	99.48511
Chief executives & senior officials	20	981	43.05068	27.77423	66.72952
Administrative & commercial managers	12	693	36.56512	20.76547	64.38612
Production & specialised services managers	24	863	58.72452	39.36094	87.61399
Hospitality & retail services	66	2983	46.72074	36.70558	59.46854
Science & engineering professionals	68	2132	67.35049	53.10257	85.42126
Health professionals	48	1198	84.60645	63.7589	112.2706
Teaching professionals	168	4136	85.77244	73.73522	99.77474
Business & administration professionals	97	3753	54.57732	44.72849	66.59478
Information & Communication Professionals	3	169	37.48466	12.08935	116.2262
Legal, social & cultural professionals	26	1213	45.26178	30.81727	66.47663
Science & engineering associate professionals	70	2325	63.57613	50.2984	80.35891
Health associate professionals	15	426	74.35338	44.8247	123.3343
Business & administration associate professionals	55	1748	66.44163	51.01081	86.5403
Legal, social, cultural associate professionals	29	865	70.79473	49.19646	101.8751
Information & communications technician	11	314	73.97451	40.96665	133.5776
General & keyboard clerks	89	2530	74.28284	60.34756	91.43603
Customer services clerks	21	440	100.7826	65.71051	154.574
Numerical & material recording clerks	15	360	87.98483	53.04256	145.9456
Other clerical support workers	7	158	93.55349	44.59952	196.241
Personal services workers	71	1845	81.26079	64.39618	102.542
Sales workers	132	3715	75.02986	63.26233	88.98629
Personal care workers	7	180	82.11917	39.14846	172.256
Protective service workers & armed forces	655	14718	93.97483	87.04658	101.4545
Market-orientated skilled agricultural workers	103	1846	117.8215	97.12961	142.9215
Market-orientated skilled forestry workers	349	6196	118.9414	107.0948	132.0984
Subsistence farmers	47	1770	56.07169	42.12897	74.62879
Building & related trades workers	461	11006	88.4485	80.73193	96.90264
Metal, machinery & related trades workers	317	7441	89.95949	80.58197	100.4283
Handicraft & printing workers	15	534	59.31562	35.75903	98.39032
Electrical & electronic trades worker	124	3175	82.47019	69.16007	98.34189
Food processing, wood working workers	34	960	74.7871	53.43726	104.6669
Stationary plant & machine operators	660	12707	109.6781	101.6217	118.3732
Assemblers	4	69	122.4137	45.94321	326.1659
Drivers & mobile plant operators	840	19973	88.8086	83.00137	95.02214
Cleaners & helpers	183	3492	110.6613	95.7353	127.9145
Agricultural, forestry & fishery labours	250	5176	101.9917	90.10089	115.4517
Labourers in mining, construction & manufacturing	181	4177	91.50254	79.09748	105.8531
Food preparation assistants	0	29	0	-	-
Street & related sales workers	13	275	99.82279	57.96216	171.9154
Refuse workers & other elementary workers	1475	34480	90.33245	85.83808	95.06214
Total	41286	871810			

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	28476	522883	104.446652	103.240529	105.666865
Not economically active persons	2395	61703	74.4422169	71.5197145	77.4841412
Chief executives & senior officials	19	340	107.175309	68.3615859	168.026337
Administrative & commercial managers	9	307	56.2243177	29.2539916	108.059575
Production & specialised services managers	4	183	41.9207421	15.7333198	111.695983
Hospitality & retail services	28	967	55.5330616	38.343053	80.4297178
Science & engineering professionals	10	230	83.3858239	44.8656243	154.978243
Health professionals	139	3301	80.7587031	68.3895958	95.3649171
Teaching professionals	265	5590	90.9188903	80.6054247	102.551964
Business & administration professionals	52	1496	66.6640678	50.7983055	87.485161
Information & Communication Technologist	0	34	0	-	-
Legal, social & cultural professionals	18	521	66.2605203	41.746592	105.169221
Science & engineering associate professionals	7	251	53.4865245	25.4984936	112.195189
Health associate professionals	26	638	78.1578726	53.2151518	114.791612
Business & administration associate professionals	29	1189	46.7774134	32.5064199	67.3136696
Legal, social, cultural associate professionals	18	601	57.4404844	36.1896413	91.1699901
Information & communications technician	1	35	54.7963986	7.71853417	389.017555
General & keyboard clerks	164	4006	78.5150594	67.372718	91.500161
Customer services clerks	47	1157	77.9084491	58.5358288	103.6925
Numerical & material recording clerks	6	136	84.612086	38.0123257	188.339044
Other clerical support workers	8	139	110.381235	55.2006924	220.722176
Personal services workers	129	2904	85.1948139	71.6914995	101.241519
Sales workers	179	3472	98.876566	85.4024668	114.476498
Personal care workers	40	864	88.7904606	65.1293966	121.047427
Protective service workers & armed forces	183	2675	131.204087	113.507244	151.660034
Market-orientated skilled agricultural workers	4	135	56.8258948	21.327389	151.41011
Market-orientated skilled forestry workers	78	1796	83.2929666	66.7155336	103.98955
Subsistence farmers	13	232	107.467075	62.4008144	185.080472
Building & related trades workers	12	230	100.062989	56.8261502	176.197079
Metal, machinery & related trades workers	29	874	63.6365498	44.2221204	91.5743171
Handicraft & printing workers	6	100	115.072437	51.696763	256.1411
Electrical & electronic trades workers	6	79	145.661313	65.4389405	324.229241
Food processing, wood working workers	49	972	96.682946	73.0713987	127.924088
Stationary plant & machine operators	60	925	124.402635	96.5912779	160.221666
Assemblers	0	17	0	-	-
Drivers & mobile plant operators	9	241	71.6218487	37.2654582	137.652654
Cleaners & helpers	1485	28641	99.4393637	94.5081541	104.627872
Agricultural, forestry & fishery labours	39	1225	61.0588441	44.611286	83.5703873
Labourers in mining, construction & manufacturing	47	1006	89.6024609	67.3220218	119.256683
Food preparation assistants	2	77	49.8149078	12.4582743	199.186901
Street & related sales workers	20	347	110.540285	71.3152867	171.339908
Refuse workers & other elementary workers	526	11775	85.6731803	78.6556738	93.3167751
Total	34637	664294			