

OCCUPATION AND MORTALITY

Renal disease mortality in South
Africa, 2013-2015

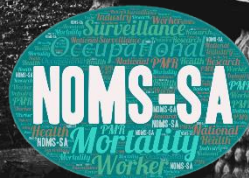
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1. Main points

- There were 16,363 reported deaths due to renal diseases from 2013-2015.
- Main industries with significantly elevated PMRs for renal diseases related deaths were transport in men and health, manufacturing and education in women.
- Major occupation groups with significantly elevated PMRs for renal diseases related deaths were professionals, clerks, plant and machine operators (men) and craft and related trade workers (women).

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 renal disease 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 renal diseases. The results of the analysis do not prove that the observed risk of death involving renal diseases is caused by occupational exposure. The findings presented here should be interpreted bearing in mind the warnings in the strengths and limitations section.

3. Renal disease-related mortality by sex and age

- There were 16,363 reported deaths due to renal diseases from 2013-2015.
- The number of reported deaths due to renal diseases by sex:
 - Men (8876), Women (7435), Unknown (3) and Unspecified (49).
 - Among specified genders, males (54.4%) had more deaths due to renal diseases compared to females (45.6%).

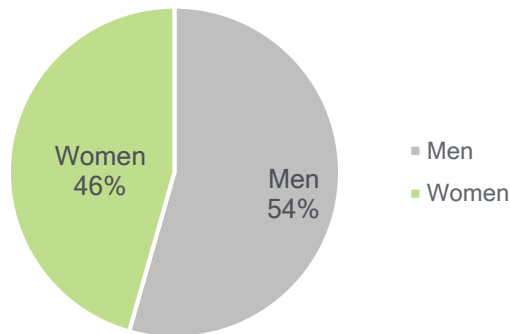


Figure 1. Percentage of deaths due to renal diseases by sex.

- Mean age of death due to renal diseases: men (46 years), women (48 years).
- Deaths due to renal diseases was highest in the age group 50+ years in both men (4650; 52.4%) and women (3762; 50.6%).

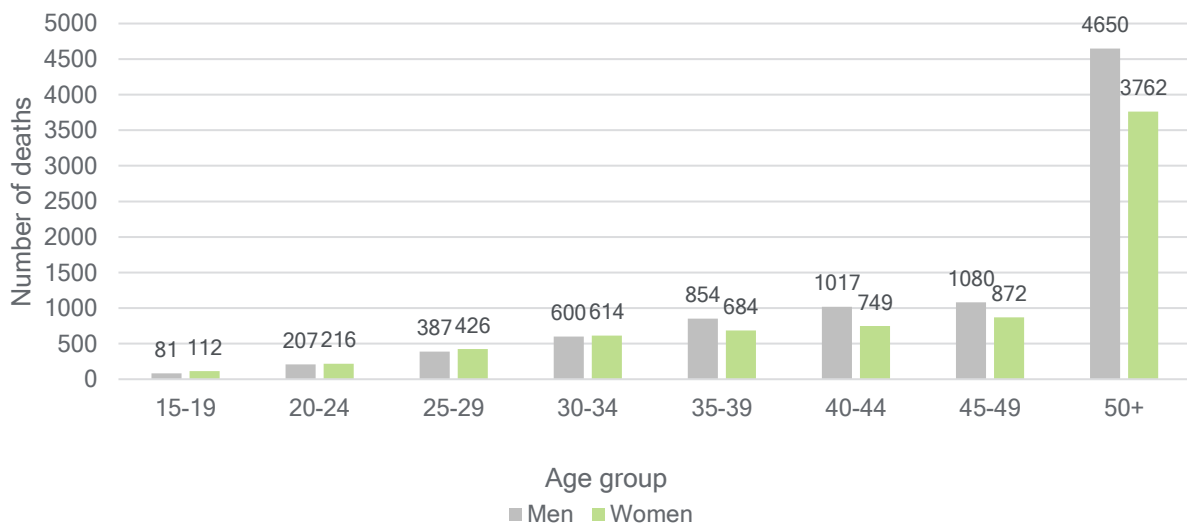


Figure 2. Renal disease-related mortality by sex and age

4. Renal disease-related mortality by main industry

- Agriculture (18.9%) and wholesale, retail and motor repair (17.0%) had the highest renal disease-related deaths, followed by construction (15.0%), mining (12.7%), manufacturing (12.6%), and transport (12.1%). Education (7.5%), human health (4.0%) and waste and recycling industries (0.1%) had the least deaths related to renal diseases.

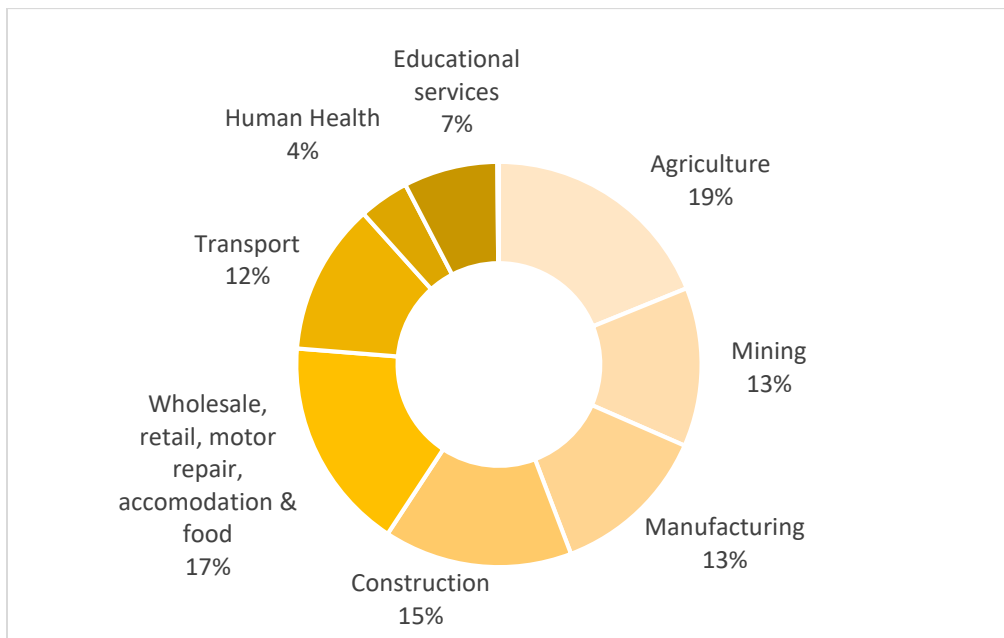


Figure 3. Percentage of renal disease-related deaths by main industry.

5. Renal disease-related mortality by sex and main industry

- Compared to the general population, the main industries with significantly elevated PMRs for renal disease-related deaths among men was the transport industry.
- In women, the main industries with significantly elevated PMRs for renal diseases related mortality were health, education and manufacturing industries.

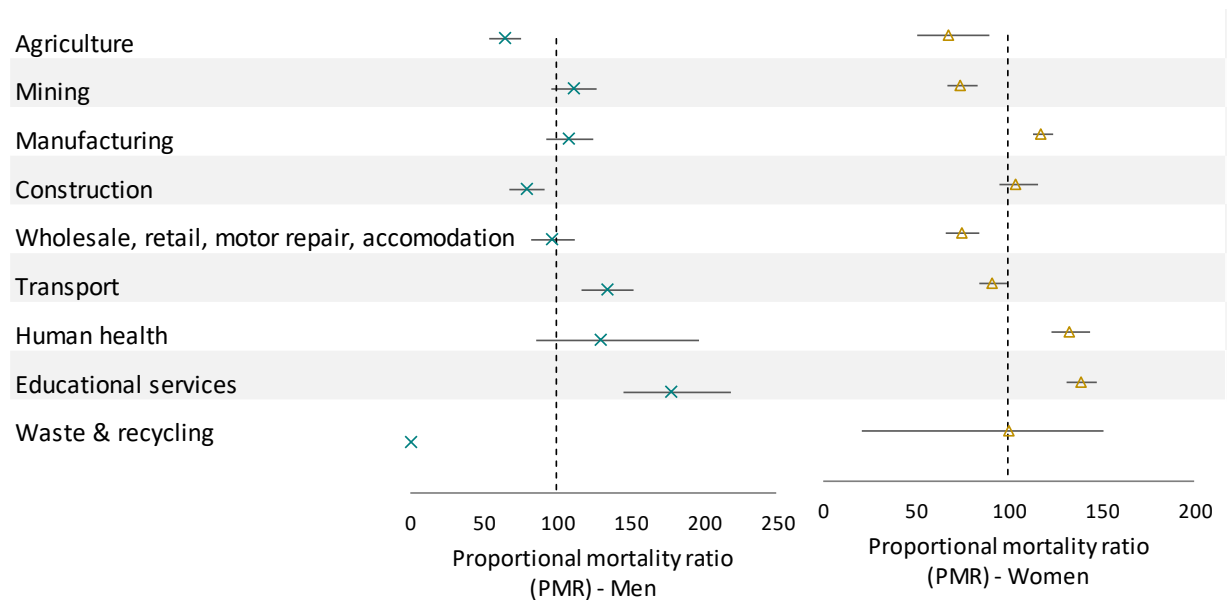


Figure 4 Renal disease-related mortality by sex and main industry. Source: Statistics South Africa (See Appendix Table 1 and 2)

6. Renal disease-related mortality by sex and major occupation

- Men working as professionals, clerks, and plant and machine operators had excess mortality due to renal diseases compared to the general population.
- Women working as professionals had elevated PMRs for renal diseases than the general population.

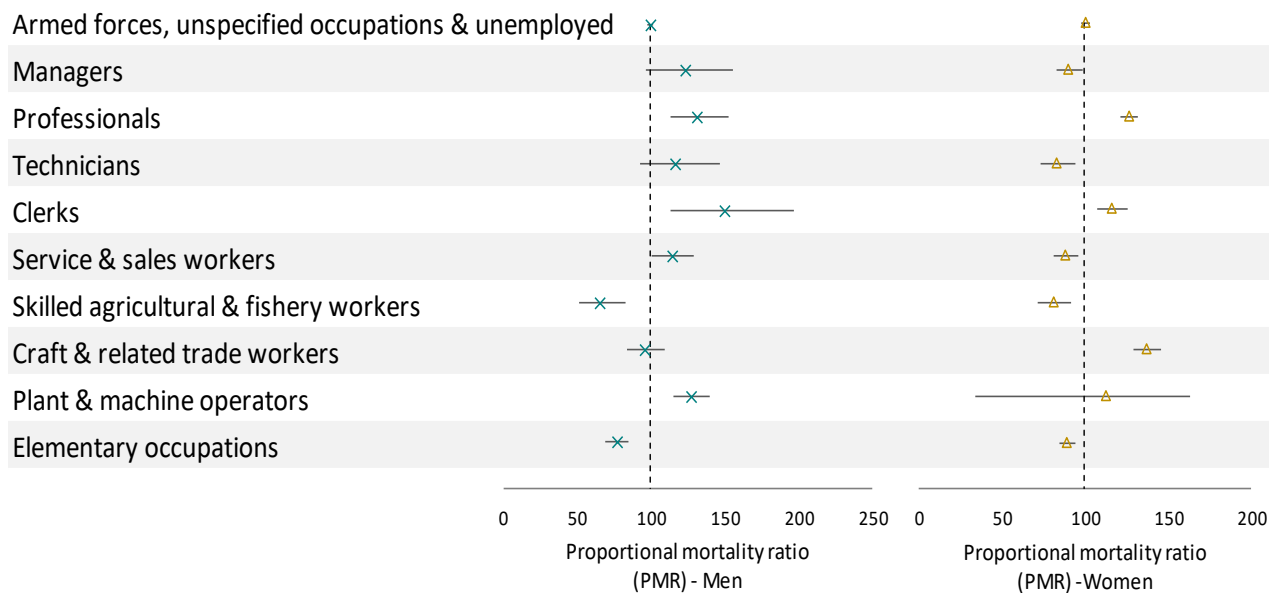


Figure 5. Renal diseases-related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix. Table 3 and 4)

7. Renal disease-related mortality by sex and sub-major occupation

- Men employed in the following sub-major occupation groups had excess mortality due to renal diseases compared to the general population.
 - Chief executives, teaching professionals, health associate professionals, general and keyboard clerks, protective services and armed forces, stationery plant and machine operators, drivers and mobile plant operators.
- Women employed in the following sub-major occupation groups had excess mortality due to renal diseases compared to the general population.
 - Teaching professionals
- Men and women who were economically not active had excess mortality due to renal diseases compared to the general population.

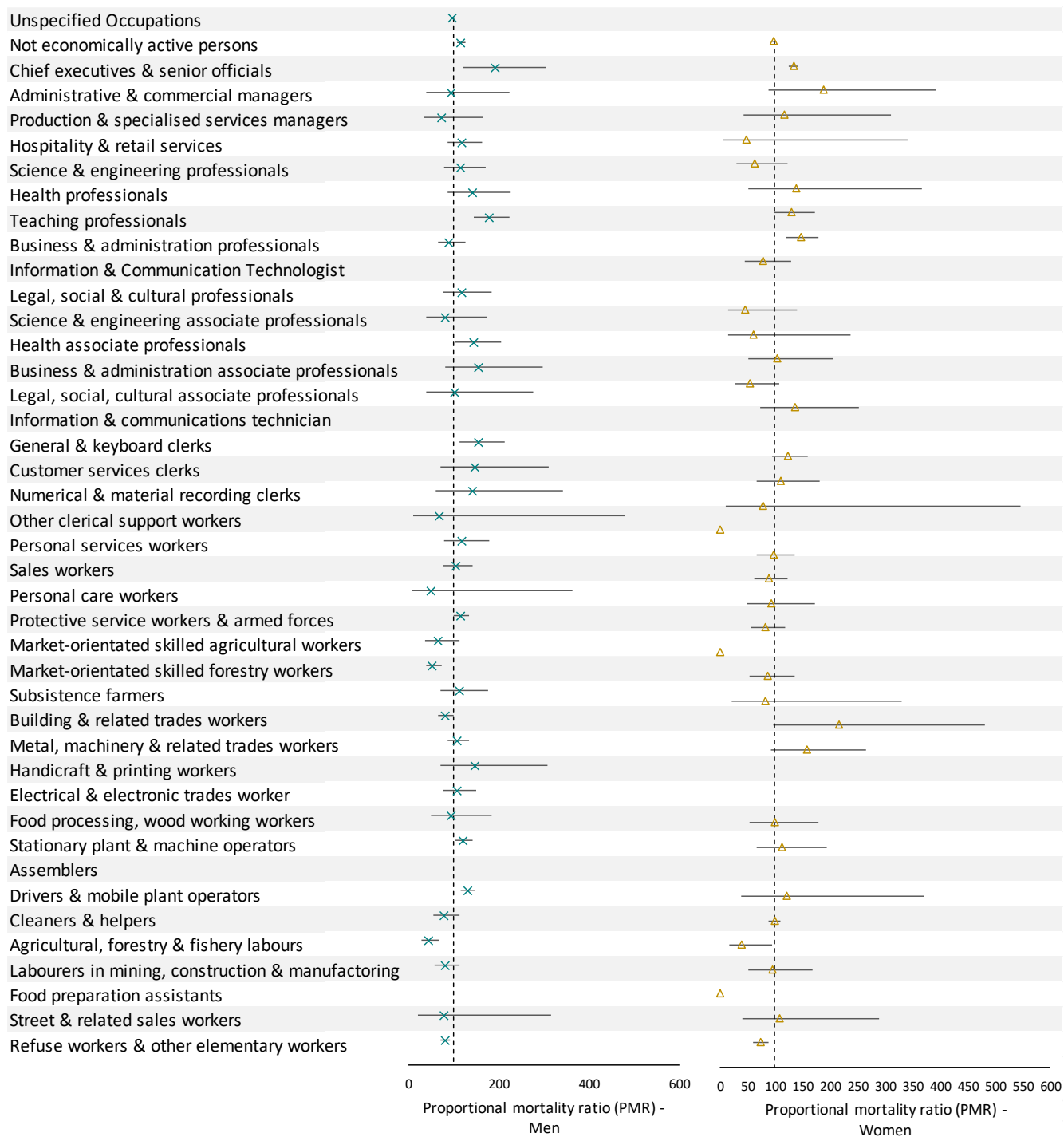


Figure 3. Renal disease-related mortality by sex and sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 5 and 6)

8. Measuring the data

- NOMS-SA uses mortality data with occupation information from Statistics South Africa, which is a South African national statistical entity, that 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 IHD include the following underlying cause of death codes: I20 to I25.
- 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.

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

9. 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.

10. 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.

Appendix

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

Industry	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	144	11723	63,95578	54,31815	75,30339
Mining	204	9606	110,5716	96,39322	126,8355
Manufacturing	167	8089	107,4924	92,36523	125,097
Construction	171	11302	78,77653	67,81139	91,51474
Wholesale, retail, motor repair, accommodation	160	8671	96,07421	82,2834	112,1764
Transport	233	9096	133,371	117,2996	151,6445
Human health	22	884	129,5766	85,31912	196,7916
Educational services	92	2692	177,938	145,0519	218,2802
Waste & recycling	0	52	0		
Total	1193	62115			

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

Industry	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	49	3404	67,97433	51,3739	89,93887
Mining	9	571	74,42945	38,72628	143,0487
Manufacturing	52	2074	118,3949	90,21743	155,373
Construction	17	767	104,6627	65,06411	168,3614
Wholesale, retail, motor repair, accommodation	79	4968	75,09032	60,23023	93,61671
Transport	12	615	92,13923	52,32622	162,2444
Human health	66	2340	133,1884	104,6379	169,529
Educational services	99	3347	139,6748	114,701	170,086
Waste & recycling	1	47	100,471	14,15218	713,2763
Total	384	18133			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	7184	380007	99,4185	97,15	101,74
Managers	68	2915	122,6769	96,72	155,59
Professionals	167	6681	131,4521	112,95	152,98
Technicians	71	3203	116,5719	92,38	147,10
Clerks	51	1794	149,4997	113,62	196,71
Service & sales workers	250	11551	113,8185	100,55	128,84
Skilled agricultural & fishery workers	66	5325	65,18037	51,21	82,96
Craft & related trade workers	220	12108	95,55265	83,72	109,05
Plant & machine operators	424	17587	126,7846	115,27	139,45
Elementary occupations	371	25396	76,82474	69,39	85,05
Total	8872	466567			

Table 4 Renal disease-related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	6541	301539	100,3234	97,92135	102,7844
Managers	20	1030	89,80374	57,93706	139,1978
Professionals	167	6104	126,5329	108,7263	147,2559
Technicians	28	1557	83,17083	57,42568	120,4581
Clerks	71	2828	116,1129	92,01522	146,5215
Service & sales workers	104	5428	88,61253	73,11836	107,39
Skilled agricultural & fishery workers	20	1139	81,2097	52,3926	125,8768
Craft & related trade workers	34	1144	137,4531	98,21368	192,3699
Plant & machine operators	16	656	112,8023	69,10564	184,1289
Elementary occupations	431	22297	89,39896	81,34498	98,25036
Total	7432	343722			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	6531	350451	97,95797	95,61077	100,3628
Not economically active persons	653	29556	116,1328	107,5584	125,3908
Chief executives & senior officials	18	490	193,0918	121,655	306,4768
Administrative & commercial managers	5	282	93,19837	38,79113	223,9155
Production & specialised services managers	6	427	73,86025	33,18202	164,4064
Hospitality & retail services	39	1716	119,4634	87,28325	163,5078
Science & engineering professionals	25	1132	116,0863	78,44	171,8005
Health professionals	17	635	140,7222	87,48067	226,367
Teaching professionals	77	2253	179,6458	143,6851	224,6064
Business & administration professionals	33	1917	90,48555	64,32819	127,2791
Information & Communication Technologist	4	83		0	0
Legal, social & cultural professionals	15	661	119,2826	76,95543	184,8907
Science & engineering associate professionals	20	1278	82,25959	39,2154	172,5506
Health associate professionals	7	254	144,8611	101,8752	205,9847
Business & administration associate professionals	31	1057	154,1609	80,21121	296,2874
Legal, social, cultural associate professionals	9	458	103,2915	38,76643	275,2156
Information & communications technician	4	156		0	0
General & keyboard clerks	38	1284	155,5629	113,1932	213,7921
Customer services clerks	7	248	148,3658	70,73004	311,2172
Numerical & material recording clerks	5	184	142,8366	59,45162	343,1749
Other clerical support workers	1	78	67,38959	9,492391	478,4207
Personal services workers	22	977	118,3629	77,93552	179,7611
Sales workers	39	1964	104,3784	76,26174	142,8612
Personal care workers	1	103	51,03289	7,188413	362,2992
Protective service workers & armed forces	188	8507	116,1633	100,6903	134,014
Market-orientated skilled agricultural workers	12	981	64,29832	36,51526	113,2205
Market-orientated skilled forestry workers	35	3457	53,2177	38,20974	74,12045
Subsistence farmers	19	887	112,5946	71,81824	176,5225
Building & related trades workers	89	5700	82,07343	66,67664	101,0256
Metal, machinery & related trades workers	81	3985	106,8425	85,93388	132,8384
Handicraft & printing workers	7	251	146,5925	69,88466	307,4975
Electrical & electronic trades worker	34	1676	106,6332	76,19207	149,2364
Food processing, wood working workers	9	496	95,37801	49,62599	183,3105
Stationary plant & machine operators	155	6767	120,399	102,8612	140,927
Assemblers	0	27		0	0
Drivers & mobile plant operators	269	10793	131,0079	116,2513	147,6377
Cleaners & helpers	28	1867	78,83174	54,42973	114,1737
Agricultural, forestry & fishery labours	23	2696	44,84307	29,79918	67,48176
Labourers in mining, construction & manufacturing	33	2137	81,17024	57,70573	114,176
Food preparation assistants	0	12		0	0
Street & related sales workers	2	133	79,04343	19,76807	316,0583
Refuse workers & other elementary workers	285	18541	80,79772	71,94115	90,74462
Total	8876	466557	100	97,94109	102,1022

* PMRs cannot be calculated when n<5

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	5737	273668	96,9529878	94,4763195	99,4945812
Not economically active persons	804	27871	133,414755	124,504127	142,963107
Chief executives & senior officials	7	173	187,133828	89,21183	392,538408
Administrative & commercial managers	4	159	116,349155	43,6671291	310,007232
Production & specialised services managers	1	96	48,1758219	6,7859702	342,015916
Hospitality & retail services	8	602	61,4601847	30,7357022	122,897934
Science & engineering professionals	4	134	138,056087	51,8139816	367,844402
Health professionals	49	1739	130,315737	98,4905151	172,424636
Teaching professionals	97	3068	146,223355	119,836395	178,420501
Business & administration professionals	14	839	77,1731879	45,7055647	130,305817
Information & Communication Technologist	0	15		0	0
Legal, social & cultural professionals	3	309	44,9017369	14,4814707	139,223841
Science & engineering associate professionals	2	156	59,2933193	14,8287424	237,086708
Health associate professionals	8	361	102,490391	51,2545505	204,94337
Business & administration associate professionals	8	682	54,2507789	27,1303412	108,481754
Legal, social, cultural associate professionals	10	340	136,02585	73,1885158	252,813323
Information & communications technician	0	18		0	0
General & keyboard clerks	55	2065	123,180794	94,572506	160,443121
Customer services clerks	15	637	108,906097	65,6551594	180,648984
Numerical & material recording clerks	1	60	77,081315	10,8575523	547,225466
Other clerical support workers	0	66	0	0	0
Personal services workers	31	1495	95,900499	67,4431346	136,365336
Sales workers	35	1845	87,7348301	62,9926784	122,19516
Personal care workers	10	497	93,0559135	50,0686023	172,950764
Protective service workers & armed forces	28	1591	81,3932176	56,1983145	117,883533
Market-orientated skilled agricultural workers	0	56	0	0	0
Market-orientated skilled forestry workers	18	971	85,7341094	54,0156773	136,077855
Subsistence farmers	2	112	82,5871233	20,6543197	330,227915
Building & related trades workers	6	128	216,791199	97,3943326	482,558097
Metal, machinery & related trades workers	14	411	157,538454	93,3016271	266,001412
Handicraft & printing workers	1	46		0	0
Electrical & electronic trades workers	2	44		0	0
Food processing, wood working workers	11	515	98,7838212	54,7059021	178,376427
Stationary plant & machine operators	13	532	113,013958	65,6216152	194,633349
Assemblers	0	8		0	0
Drivers & mobile plant operators	3	116	119,608937	38,5756418	370,863508
Cleaners & helpers	308	14486	98,33375	87,9427416	109,952524
Agricultural, forestry & fishery labours	5	588	39,3272015	16,3688115	94,4863215
Labourers in mining, construction & manufacturing	11	543	93,6899962	51,8849716	169,178379
Food preparation assistants	0	35	0	0	0
Street & related sales workers	4	171	108,184302	40,6027692	288,252338
Refuse workers & other elementary workers	103	6473	73,5922334	60,6679139	89,2698705
Total	7432	343721			

* PMRs cannot be calculated when n<5