



OCCUPATION AND MORTALITY

Chronic Kidney Disease Mortality in South Africa, 2011-2015

National Institute for Occupational Health

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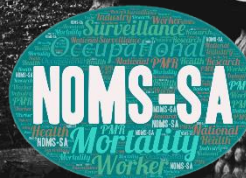
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**NATIONAL INSTITUTE FOR
OCCUPATIONAL HEALTH**

Division of the National Health Laboratory Service



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Main points

- There were reported deaths in due to chronic kidney failure from 2011-2015 in 15 to 69 year olds.
- Main industries with significantly elevated PMRs for these deaths are
- Major occupation groups with significantly elevated PMRs for chronic kidney disease in men was and in women deaths are



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 in order 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.

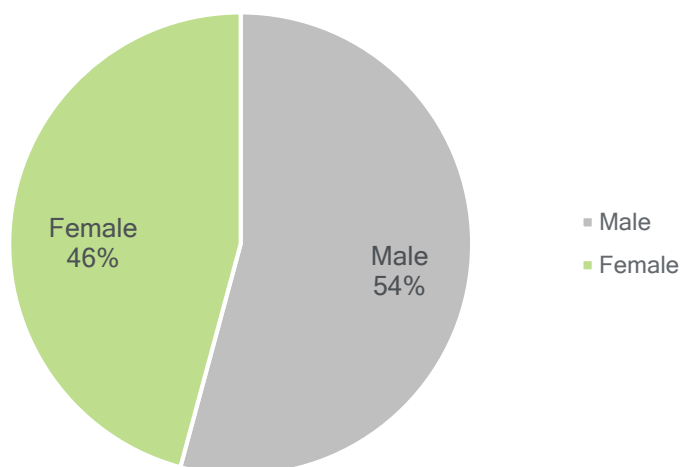
This report presents the analysis of deaths involving chronic kidney disease in different occupation groups and industries among those aged 15 to 69 years in South Africa. This analysis includes deaths that were registered from 2011 to 2015 by the Statistics South Africa.

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

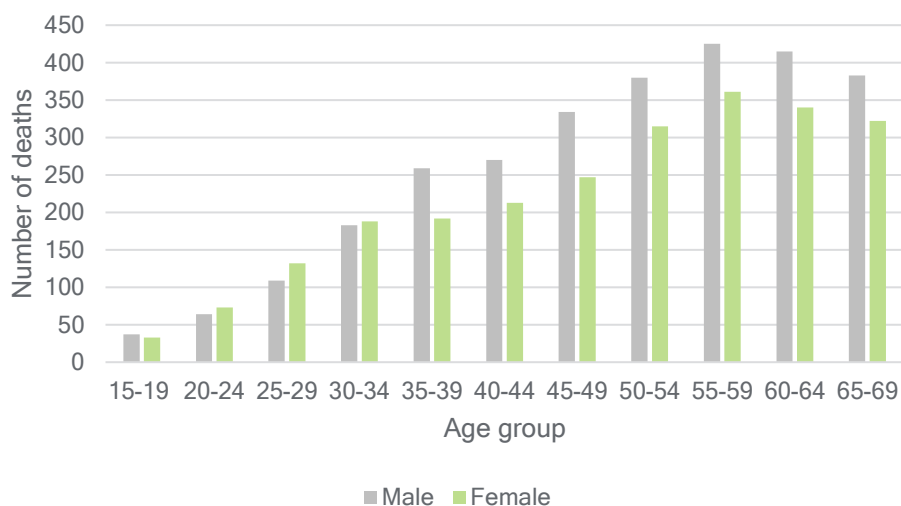
We calculated proportional mortality ratios for the population at risk of dying from chronic kidney disease. The results of the analysis do not prove that the observed proportions of deaths involving renal failure are caused by occupational exposure. The findings presented here should be interpreted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

Chronic kidney disease mortality by sex and age

- There were 5 287 reported deaths due to chronic kidney disease from 2011-2015 in 15- 69 year olds and 13 972 deaths due to unspecified kidney failure these unspecified deaths were not included in this analysis.
- Number of reported deaths due to chronic kidney disease by sex:
 - Men (2 859), Women (2 416), and Unspecified (12).



- Mean age of death due to chronic kidney disease: men (50.0 years), women (49.3 years).



Chronic kidney disease mortality by sex and main industry

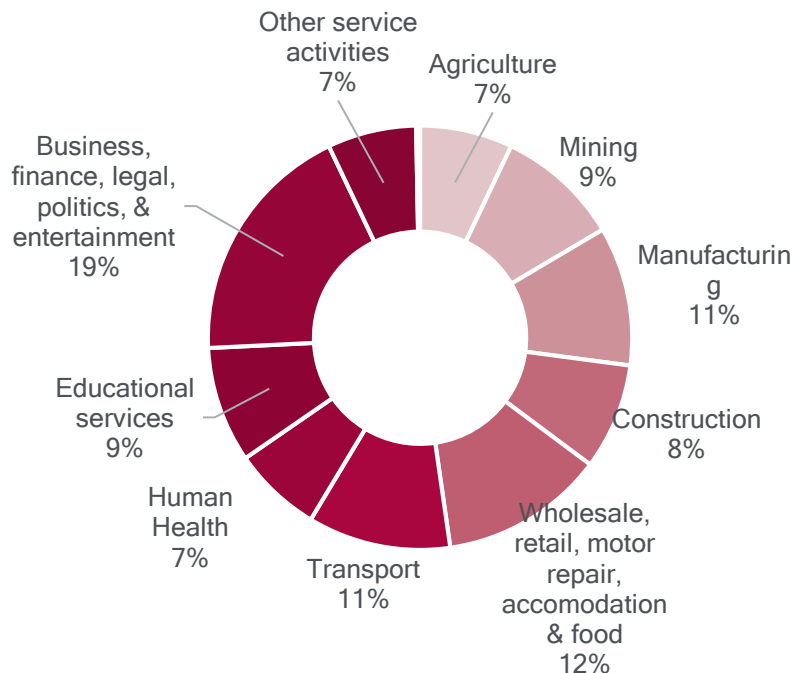


Figure 1. Percentage of chronic kidney disease-related deaths by main industry.

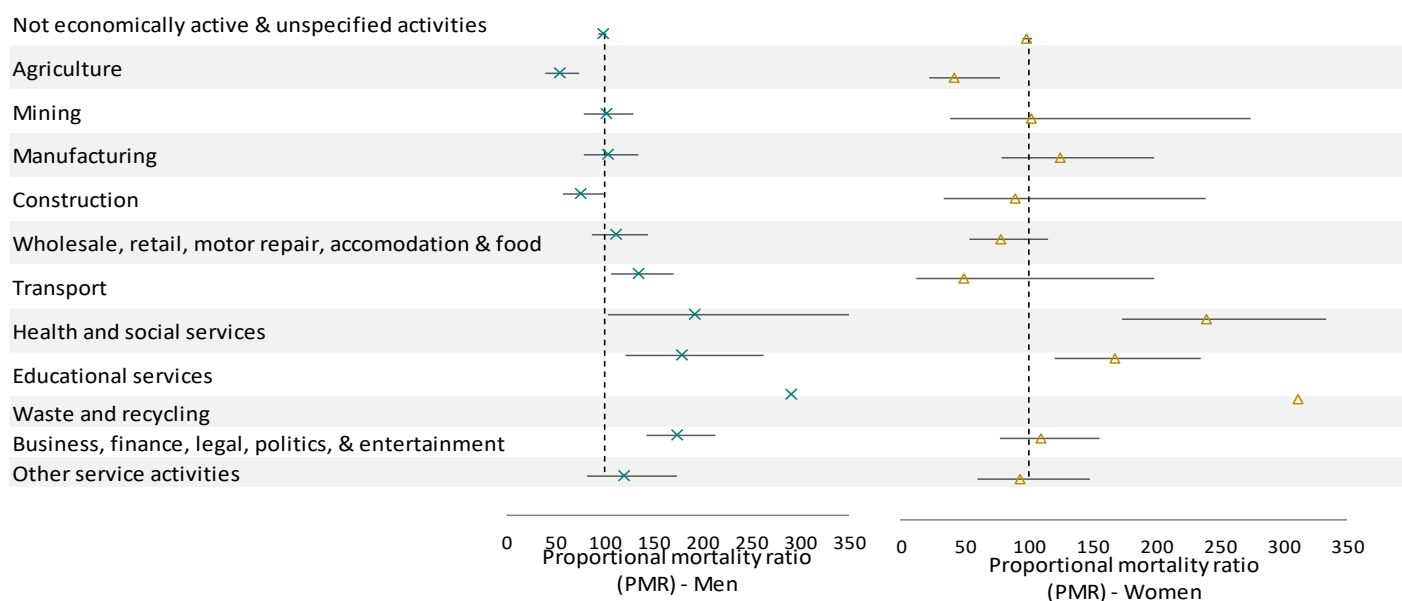


Figure 2 Chronic kidney disease -related mortality by sex and main industry. Source: Statistics South Africa (See Appendix Table 1)

- Main industries with significantly elevated PMRs for chronic kidney disease -related deaths are transport, health and education in men; and health, and education in women compared to the general population. Agriculture appears protective in both men and women.

Chronic kidney disease -related mortality by sex and major occupation

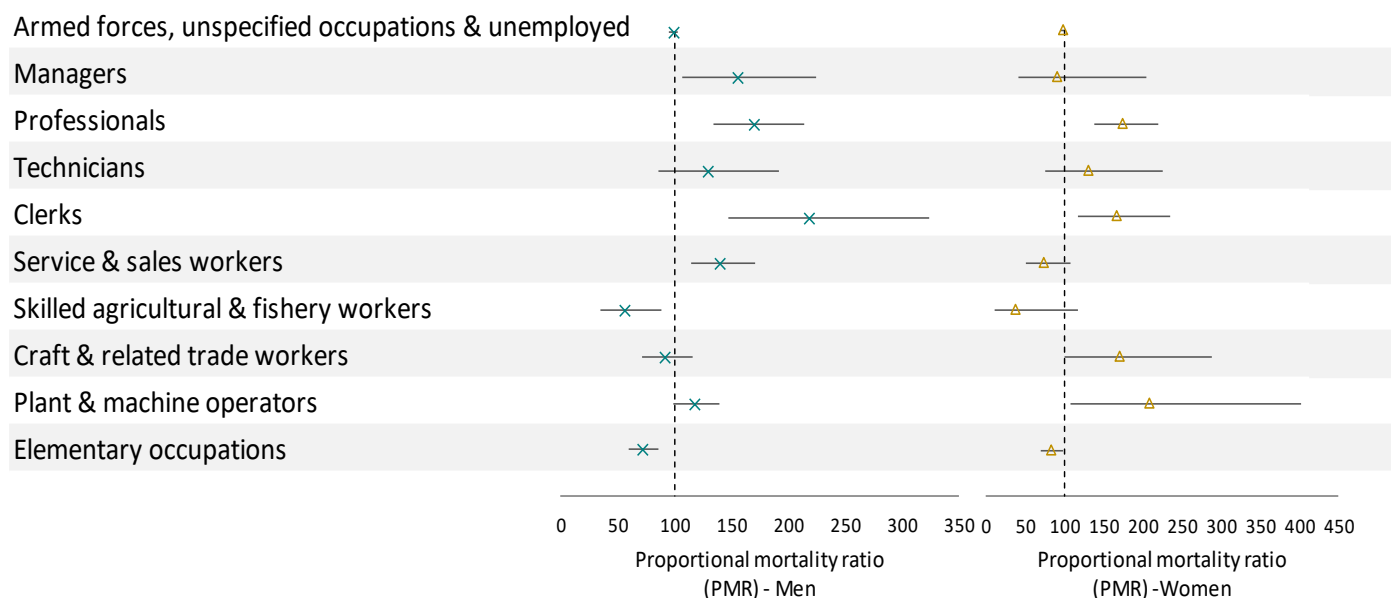


Figure 3. Chronic kidney disease -related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix Table 2 and 3)

- Men working as managers, professionals, clerks and service and sales had significant excess mortality due to chronic kidney disease compared to the general population. Plant and machine operators were increased. Agricultural and elementary workers were protected.
- Women working as professionals, clerks and plant and machine operators had significant excess mortality due to chronic kidney disease compared to the general population.

Chronic kidney disease-related mortality by sex and sub-major occupation



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

- Men who were not economically active had similar PMRs to the general population. While women had an increased PMR.
- Men employed in the following sub-major occupation groups had excess mortality due to chronic kidney disease compared to the general population.
 - Chief executives and legislators
 - Teaching and business and admin professionals
 - General and keyboard clerks
 - Protective services and armed forces
- Women employed in the following sub-major occupation groups had excess mortality due to chronic kidney disease compared to the general population.
 - Health and teaching professionals
 - Health associate professionals
 - General and keyboard clerks

The graphs show wide confidence intervals due to the small numbers of people reported dying from chronic kidney disease with a listed occupation.

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 - 69).
- Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths due to chronic kidney disease include the following underlying cause of death codes: E10 to E14.
- 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.

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

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. SASCO.
2. Statistics South Africa.

Appendix

Table 1 Chronic kidney disease-related deaths by industry (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	483	12750	158,8665	145,31	173,69
Mining	147	10288	59,92136	50,98	70,44
Manufacturing	167	8923	78,48756	67,44	91,34
Construction	375	12137	129,5732	117,10	143,37
Wholesale, retail, motor repair, accomodation	222	9295	100,161	87,82	114,24
Transport	145	9742	62,41876	53,04	73,45
Human health	13	945	57,69083	33,50	99,36
Educational services	46	2881	66,95913	50,15	89,40
Waste & recycling	0	54	0	-	-
Total	1598	67015			

Table 2 Chronic kidney disease-related deaths by industry (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	41	3663	164,9612	121,463	224,037
Mining	1	594	24,81124	3,494873	176,1431
Manufacturing	9	2293	57,84601	30,09777	111,1764
Construction	7	785	131,4206	62,65179	275,6724
Wholesale, retail, motor repair, accomodation	34	5247	95,49988	68,23706	133,6551
Transport	6	668	132,3762	59,47053	294,6577
Human health	17	2576	97,26085	60,4627	156,4547
Educational services	17	3576	70,06262	43,55479	112,7034
Waste & recycling	0	52	0	0	0
Total	132	19454			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	12 551	414682	101,9647	100,20	103,76
Managers	24	3257	24,82448	16,64	37,04
Professionals	75	7441	33,95602	27,08	42,58
Technicians	54	3452	52,69989	40,36	68,81
Clerks	22	1938	38,24333	25,18	58,08
Service & sales workers	323	12013	90,58115	81,22	101,02
Skilled agricultural & fishery workers	195	5801	113,2449	98,42	130,31
Craft & related trade workers	271	13160	69,37455	61,59	78,15
Plant & machine operators	312	18578	56,57732	50,64	63,22
Elementary occupations	1199	26898	150,171	141,91	158,92
Total	15056	507220			

Table 4 Chronic kidney disease related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	1496	332216	88,49611	84,12334	93,09619
Managers	2	1103	35,63425	8,911816	142,485
Professionals	34	6644	100,5686	71,85879	140,7489
Technicians	5	1709	57,49646	23,93124	138,1392
Clerks	10	3143	62,52717	33,64265	116,211
Service & sales workers	32	5686	110,6003	78,21335	156,3982
Skilled agricultural & fishery workers	16	1212	259,4362	158,9374	423,4819
Craft & related trade workers	5	1266	77,61568	32,30528	186,477
Plant & machine operators	4	682	115,2627	43,25937	307,1124
Elementary occupations	143	24056	116,8223	99,16157	137,6284
Total	1922	377717			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	11786	374613	106,1936	104,2936	108,1282
Not economically active persons	765	40069	64,44179	60,03324	69,17408
Chief executives & senior officials	2	555	12,16331	3,041937	48,63547
Administrative & commercial managers	1	330	10,22824	1,440733	72,61359
Production & specialised services managers	5	478	35,30667	14,69538	84,82672
Hospitality & retail services	19	1894	33,8601	21,59761	53,08489
Science & engineering professionals	11	1268	29,28115	16,21573	52,8737
Health professionals	6	695	29,13943	13,09101	64,86181
Teaching professionals	32	2431	44,43034	31,41987	62,82826
Business & administration professionals	16	2202	24,52547	15,02495	40,03332
Information & Communication Technologist	1	91	37,0914	5,224637	263,324
Legal, social & cultural professionals	9	754	40,28894	25,04582	64,80915
Science & engineering associate professionals	17	1384	41,45983	18,626	92,28592
Health associate professionals	6	263	77,00345	49,11652	120,7238
Business & administration associate professionals	19	1150	45,93914	22,97376	91,86151
Legal, social, cultural associate professionals	8	493	104,2569	39,12878	277,788
Information & communications technician	4	162	69,23729	25,98552	184,4797
General & keyboard clerks	13	1396	498,6265	289,5277	858,7377
Customer services clerks	6	259	19,43561	8,731528	43,26196
Numerical & material recording clerks	3	195	4,771891	1,539005	14,79589
Other clerical support workers	0	88	0	-	-
Personal services workers	29	1042	93,93879	65,27966	135,1799
Sales workers	64	2122	101,8003	79,67959	130,0623
Personal care workers	1	108	31,25294	4,40224	221,8749
Protective service workers & armed forces	229	8741	88,42784	77,68533	100,6559
Market-orientated skilled agricultural workers	22	1027	72,30476	47,60875	109,8113
Market-orientated skilled forestry workers	151	3716	137,1563	116,9351	160,8744
Subsistence farmers	22	1058	70,18619	46,21379	106,5938
Building & related trades workers	143	6187	78,01365	66,21986	91,90792
Metal, machinery & related trades workers	73	4325	56,97068	45,29226	71,66034
Handicraft & printing workers	7	294	80,36471	38,31206	168,5758
Electrical & electronic trades worker	28	1815	52,07102	35,95267	75,41557
Food processing, wood working workers	20	539	125,2437	80,80123	194,1305
Stationary plant & machine operators	108	7245	50,3153	41,66694	60,7587
Assemblers	0	29	0	-	-
Drivers & mobile plant operators	204	11304	60,91338	53,10257	69,87307
Cleaners & helpers	66	1963	113,485	89,15808	144,4495
Agricultural, forestry & fishery labours	147	2885	171,9833	146,3117	202,1591
Labourers in mining, construction & manufacturing	94	2280	139,1578	113,6871	170,335
Food preparation assistants	1	14	241,0941	33,96014	1711,606
Street & related sales workers	1	145	23,27805	3,27891	165,2585
Refuse workers & other elementary workers	888	19600	152,9226	143,188	163,3189
Total	15027	507209	100	98,41382	101,6117

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	1388	294129	102,02911	96,8001946	107,540478
Not economically active persons	108	38087	61,3083272	50,7704549	74,0334313
Chief executives & senior officials	1	186	116,241052	16,3735311	825,233248
Administrative & commercial managers	0	172	0	-	-
Production & specialised services managers	0	106	0	-	-
Hospitality & retail services	1	639	33,8354237	4,76600435	240,208739
Science & engineering professionals	1	141	153,33926	21,5991261	1088,60556
Health professionals	11	1935	122,909144	68,0663645	221,940127
Teaching professionals	15	3285	98,7252773	59,5175479	163,761457
Business & administration professionals	5	933	115,867287	48,2264106	278,37917
Information & Communication Technologist	0	17	0	-	-
Legal, social & cultural professionals	2	333	129,854869	32,475571	519,229887
Science & engineering associate professionals	0	161	0	-	-
Health associate professionals	2	396	109,19614	27,3090029	436,625132
Business & administration associate professionals	2	779	55,509206	13,8823686	221,95578
Legal, social, cultural associate professionals	1	355	60,9037626	8,57880783	432,37573
Information & communications technician	0	18	0	-	-
General & keyboard clerks	6	2309	56,1823362	25,2401443	125,056928
Customer services clerks	3	698	92,926228	29,9700756	288,130199
Numerical & material recording clerks	1	65	332,628242	46,8534889	2361,43668
Other clerical support workers	0	71	0	-	-
Personal services workers	10	1638	131,995334	71,0199023	245,322334
Sales workers	11	1930	123,227561	68,2427022	222,515102
Personal care workers	3	509	127,431252	41,0984534	395,117641
Protective service workers & armed forces	8	1609	107,499494	53,7595591	214,959747
Market-orientated skilled agricultural workers	0	61	0	-	-
Market-orientated skilled forestry workers	14	1023	295,886315	175,237689	499,599783
Subsistence farmers	2	128	337,825558	84,4872276	1350,809
Building & related trades workers	1	133	162,562675	22,8983216	1154,0856
Metal, machinery & related trades workers	1	479	45,1374441	6,3579891	320,445478
Handicraft & printing workers	1	55	393,106104	55,3723051	2790,7888
Electrical & electronic trades workers	0	47	0	-	-
Food processing, wood working workers	2	552	78,3363613	19,5912412	313,231073
Stationary plant & machine operators	2	551	78,4785326	19,626797	313,79955
Assemblers	0	10	0	-	-
Drivers & mobile plant operators	2	121	357,369185	89,3749185	1428,95498
Cleaners & helpers	63	15786	86,2861175	67,4058583	110,454703
Agricultural, forestry & fishery labours	11	630	377,506655	209,060977	681,673248
Labourers in mining, construction & manufacturing	4	578	149,625161	56,1559835	398,669693
Food preparation assistants	0	43	0	-	-
Street & related sales workers	0	184	0	-	-
Refuse workers & other elementary workers	65	6834	205,641545	161,261376	262,235423
Total	1747	377716			

