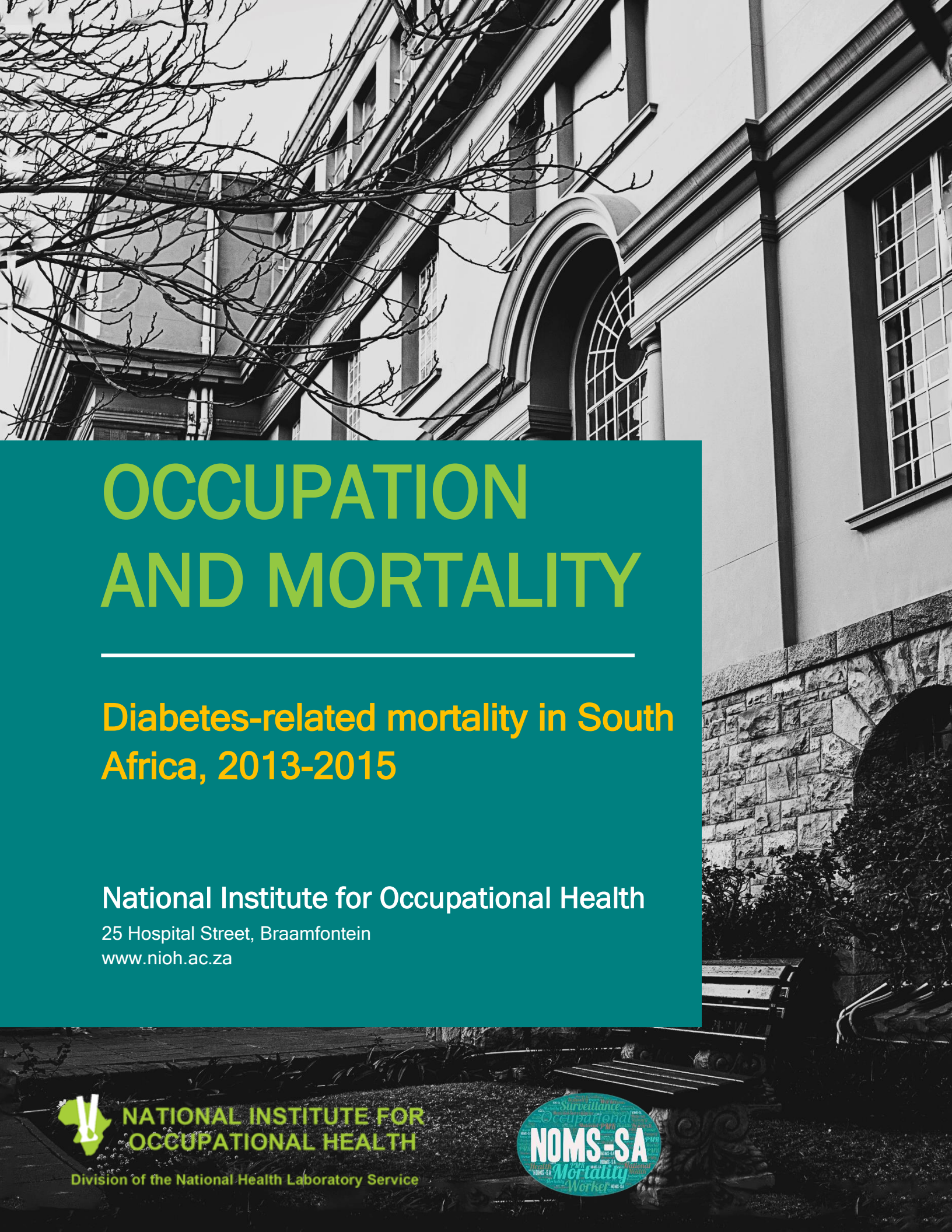

OCCUPATION AND MORTALITY

Diabetes-related mortality in South Africa, 2013-2015

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Division of the National Health Laboratory Service

NOMS-SA

Contents

Main points

- There were 32,229 reported deaths due to diabetes from 2013-2015.
- Main industries with significantly elevated PMRs for diabetes-related deaths are manufacturing, transport, educational services and waste and recycling.
- Major occupation groups with significantly elevated PMRs for diabetes-related deaths are male managers, professionals, male clerks, metal machinery and related trades workers, female subsistence farmers, food processing and wood working workers.
- Occupations at risk were different for men and women this requires further investigation.

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.

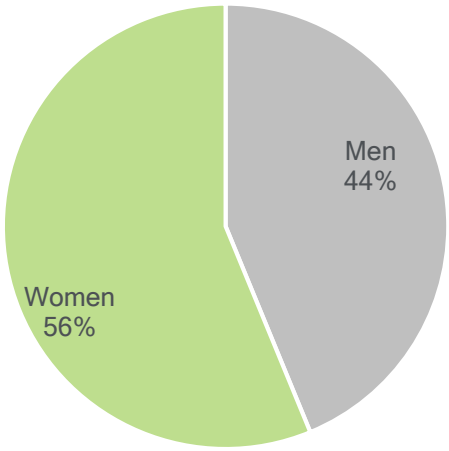
This report presents the analysis of deaths involving diabetes in different occupation groups and industries among those aged 15 to 64 years in South Africa. This analysis includes deaths that were registered from 2013 to 2015 by Statistics South Africa.

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.

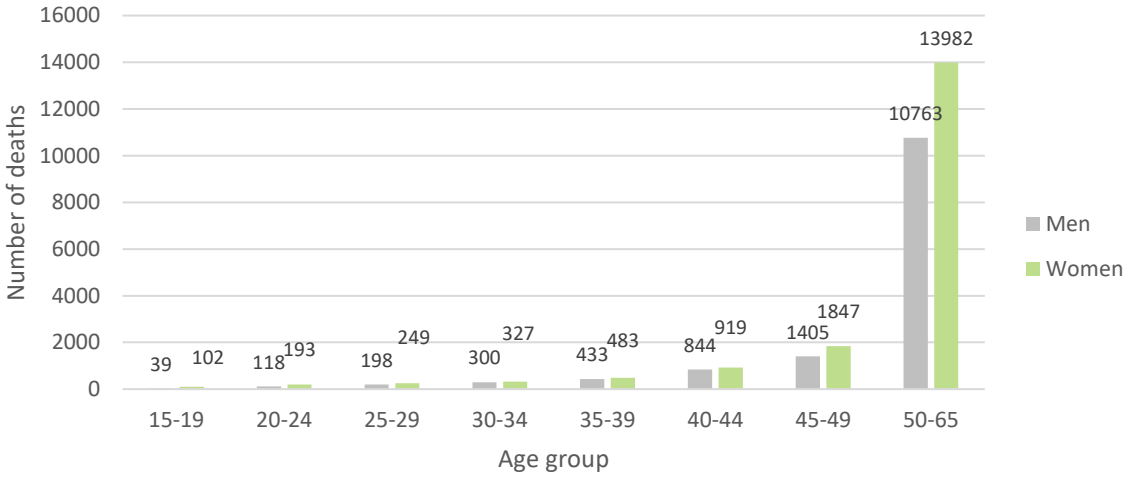
We calculated proportional mortality ratios for the population at risk of dying from diabetes. The results of the analysis do not prove that the observed risk of death involving diabetes is caused by occupational exposure. The findings presented here should be interpreted bearing in mind the warnings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

Diabetes-related mortality by sex and age

- There were 32,229 reported deaths due to diabetes from 2013-2015.
- Number of reported deaths due to Diabetes by sex:
    - Men (14,100), Women (18,102), Unknown (2) and Unspecified (25).



- Mean age of death due to Diabetes: men (50.1 years), women (43.9 years).



Diabetes-related mortality by sex and main industry

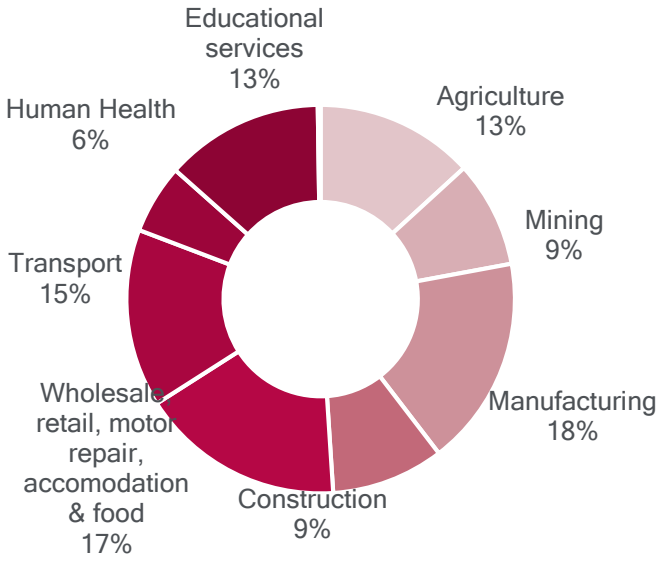


Figure 1. Percentage of diabetes-related deaths by main industry.

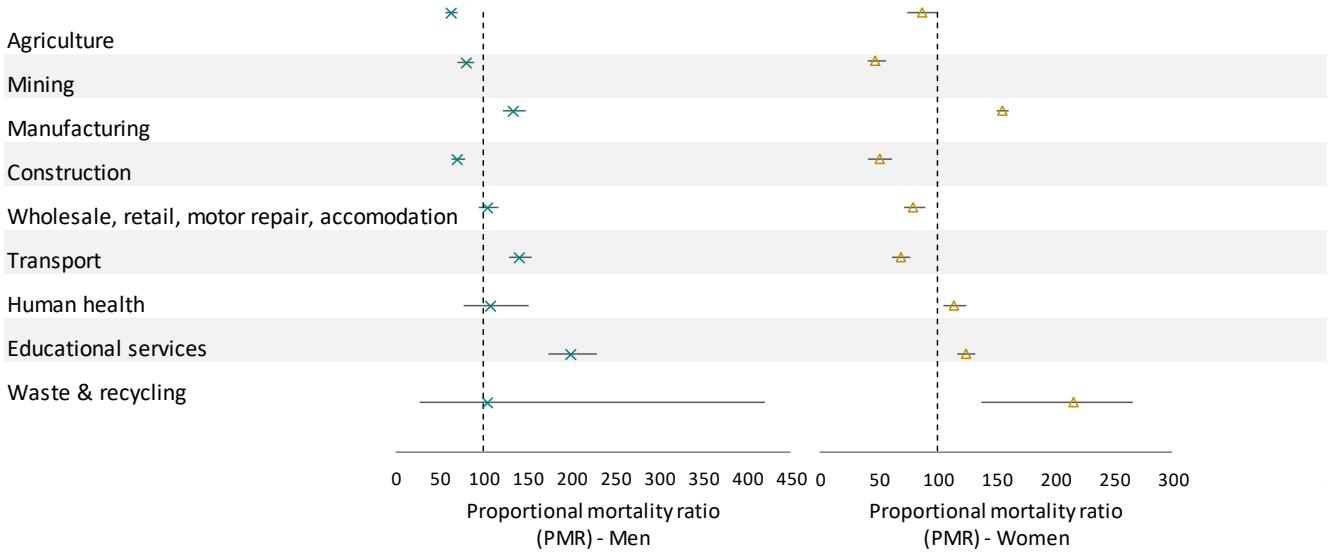


Figure 2 Diabetes-related mortality by sex and main industry. Source: Statistics South Africa (See Appendix.Table 1 and 2)

- Main industries with significantly elevated PMRs for diabetes-related deaths in men are manufacturing, transport and educational services; and manufacturing, educational services and waste and recycling in women compared to the general population.

Diabetes-related mortality by sex and major occupation

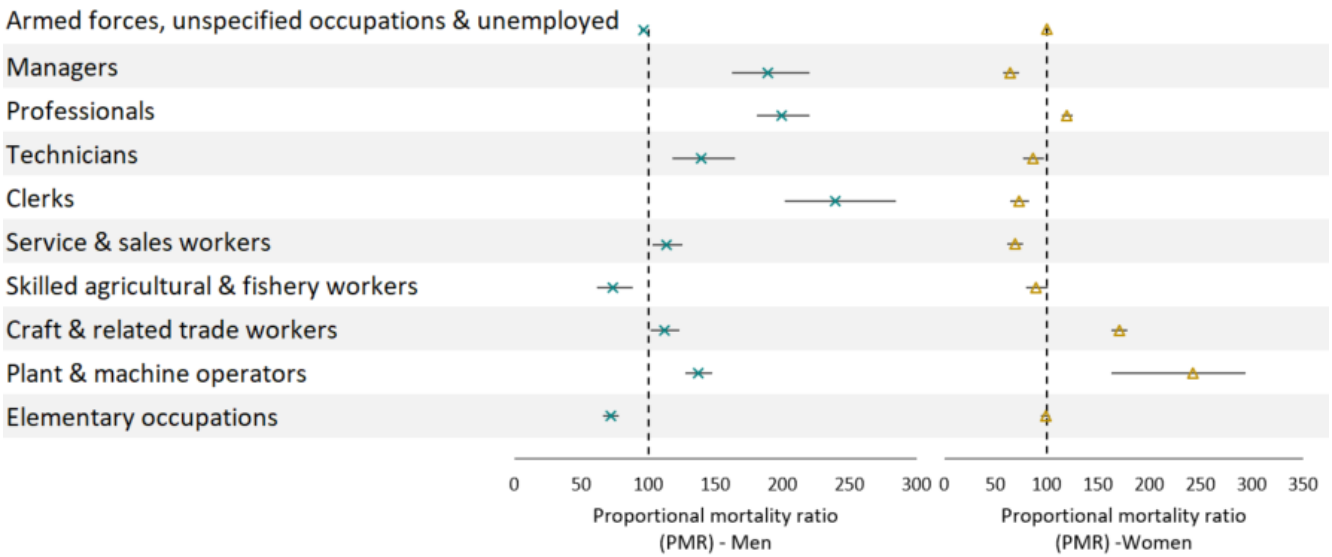


Figure 3. Diabetes-related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix.Table 3 and 4)

- Men working as managers, professionals, technicians and clerks along with service and sales, craft and related trades and plant and machine operators had excess mortality due to diabetes compared to the general population.
- Women working as professionals, craft and related trades as well as plant and machine operators, had excess mortality due to diabetes compared to the general population.

Diabetes-related mortality by sex and sub-major occupation

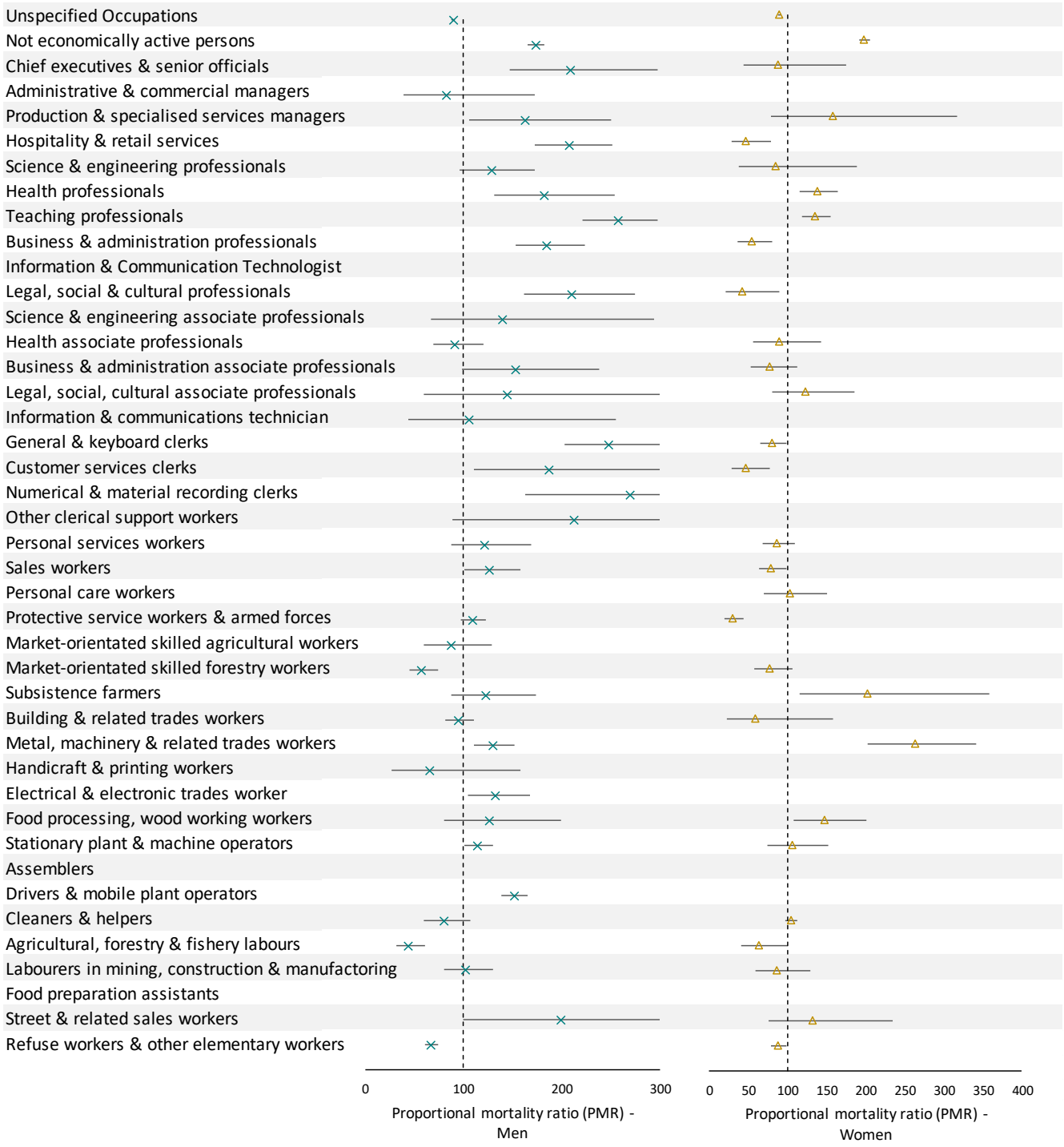


Figure 4. Diabetes-related mortality by sex and sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 5 and 6)

- Men and women with who were not economically active had significantly higher PMRs than the general population.
- Men employed in the following sub-major occupation groups had excess mortality due to diabetes compared to the general population.
    - CEOs and Officials
    - Production and specialised services managers
    - Hospitality and Retail Services Managers
    - Health, Teaching, Business and Admin, Legal Social and Cultural, Science and Engineering Professionals
    - Business and Admin Associate Professionals
    - General and Keyboard, Customer Services, Numerical and Recording Clerks
    - Electrical and Electronic Trades Workers
    - Metal Machinery and Trades Workers Stationary plant and machine operators and drivers and mobile plant operators.
    - Building and related trade workers
- Women employed in the following sub-major occupation groups had excess mortality due to diabetes compared to the general population.
    - Professionals: Health and Teaching
    - Subsistence Farmers
    - Metal Machinery and Related Trade Workers
    - Food Processing, woodworking workers

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 (15-65).
- Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths due to diabetes 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.

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

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

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 Diabetes-related deaths by industry (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	268	11723	62,4731	55,42	70,42
Mining	280	9606	79,6549	70,85	89,55
Manufacturing	396	8089	133,7819	121,23	147,63
Construction	291	11302	70,36144	62,72	78,93
Wholesale, retail, motor repair, accomodation	334	8671	105,2627	94,56	117,18
Transport	471	9096	141,5036	129,28	154,88
Human health	35	884	108,1964	77,68	150,69
Educational services	196	2692	198,9656	172,97	228,86
Waste & recycling	2	52	105,1051	26,29	420,27
Total	**2273**	**62115**			

Table 2 Diabetes-related deaths by industry (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	174	3404	86,46385	74,52534	100,3148
Mining	16	571	47,39786	29,03718	77,3683
Manufacturing	190	2074	154,96	134,4206	178,6379
Construction	23	767	50,72328	33,7067	76,33055
Wholesale, retail, motor repair, accomodation	234	4968	79,67263	70,09117	90,56387
Transport	25	615	68,76062	46,46183	101,7614
Human health	158	2340	114,2131	97,72303	133,4859
Educational services	246	3347	124,3238	109,7192	140,8724
Waste & recycling	6	47	215,9376	97,01085	480,6581
Total	**1072**	**18133**			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	11074	380007	96,31291	94,54	98,12
Managers	167	2915	189,3431	162,70	220,35
Professionals	403	6681	199,3587	180,81	219,80
Technicians	135	3203	139,2991	117,68	164,90
Clerks	130	1794	239,4928	201,67	284,41
Service & sales workers	397	11551	113,5906	102,95	125,33
Skilled agricultural & fishery workers	119	5325	73,85824	61,71	88,40
Craft & related trade workers	410	12108	111,9136	101,59	123,29
Plant & machine operators	729	17587	136,9958	127,40	147,31
Elementary occupations	553	25396	71,96667	66,21	78,22
Total	**14117**	**466567**			

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	15951	301539	100,1731	98,63054	101,7398
Managers	35	1030	64,34838	46,20145	89,62302
Professionals	385	6104	119,4409	108,0864	131,9882
Technicians	71	1557	86,35282	68,43143	108,9676
Clerks	109	2828	72,9884	60,49536	88,06142
Service & sales workers	197	5428	68,72791	59,77044	79,0278
Skilled agricultural & fishery workers	54	1139	89,77942	68,76078	117,223
Craft & related trade workers	103	1144	170,4975	140,5546	206,8192
Plant & machine operators	84	656	242,4835	195,7974	300,3016
Elementary occupations	1162	22297	98,68848	93,17414	104,5292
Total	**18151**	**343722**			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	9525	350451	89,74612	87,96175	91,56669
Not economically active persons	1553	29556	173,5017	165,0835	182,3492
Chief executives & senior officials	31	490	208,9025	146,9131	297,0481
Administrative & commercial managers	7	282	81,96472	39,07483	171,932
Production & specialised services managers	21	427	162,3938	105,8811	249,0693
Hospitality & retail services	108	1716	207,8186	172,0981	250,9533
Science & engineering professionals	44	1132	128,3466	95,51211	172,4686
Health professionals	35	635	182,0004	130,6744	253,4862
Teaching professionals	175	2253	256,4808	221,1612	297,441
Business & administration professionals	107	1917	184,3061	152,4928	222,7563
Information & Communication Technologist	0	83	0	0	0
Legal, social & cultural professionals	42	83	1670,895	1279,715	2181,651
Science & engineering associate professionals	54	661	269,7555	128,5998	565,8485
Health associate professionals	7	1278	18,08611	13,66919	23,93027
Business & administration associate professionals	49	254	637,0014	410,9627	987,3663
Legal, social, cultural associate professionals	20	458	144,1924	60,01594	346,4323
Information & communications technician	5	156	105,8336	44,05016	254,2724
General & keyboard clerks	96	1284	246,879	202,119	301,5513
Customer services clerks	14	248	186,4036	110,3969	314,7398
Numerical & material recording clerks	15	184	269,1854	162,2812	446,5137
Other clerical support workers	5	78	211,6671	88,10032	508,5449
Personal services workers	36	977	121,6707	87,764	168,6768
Sales workers	75	1964	126,095	100,5559	158,1204
Personal care workers	4	103		0	0
Protective service workers & armed forces	282	8507	109,4588	97,40056	123,0099
Market-orientated skilled agricultural workers	26	981	87,51497	59,58609	128,5345
Market-orientated skilled forestry workers	60	3457	57,30993	44,49777	73,81108
Subsistence farmers	33	887	122,8481	87,33542	172,801
Building & related trades workers	163	5700	94,42582	80,98755	110,0939
Metal, machinery & related trades workers	156	3985	129,263	110,4898	151,2259
Handicraft & printing workers	5	251	65,77703	27,37779	158,0339
Electrical & electronic trades worker	67	1676	132,0015	103,8929	167,7149
Food processing, wood working workers	19	496	126,4882	80,68026	198,3045
Stationary plant & machine operators	234	6767	114,182	100,4504	129,7907
Assemblers	0	27	0	0	0
Drivers & mobile plant operators	495	10793	151,4401	138,6697	165,3866
Cleaners & helpers	45	1867	79,58774	59,42295	106,5953
Agricultural, forestry & fishery labours	36	2696	44,09208	31,80468	61,12659
Labourers in mining, construction & manufactoring	66	2137	101,9806	80,11979	129,8061
Food preparation assistants	1	12		0	0
Street & related sales workers	8	133	198,617	99,32661	397,1614
Refuse workers & other elementary workers	376	18541	66,96266	60,52496	74,0851
Total	**14100**	**465583**	**100**	**98,36293**	**101,6643**

* PMRs cannot be calculated when n<5

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	13039	273668	90.47399451	88.93429569	92.04034978
Not economically active persons	2912	27871	198.4002968	191.3234544	205.7389038
Chief executives & senior officials	8	173	87.81068845	43.91335922	175.5893228
Administrative & commercial managers	4	159		0	0
Production & specialised services managers	8	96	158.2421781	79.13553276	316.4265921
Hospitality & retail services	15	602	47.31493699	28.52429597	78.48408474
Science & engineering professionals	6	134	85.02564796	38.1981201	189.2595969
Health professionals	127	1739	138.6780216	116.5398155	165.0216587
Teaching professionals	220	3068	136.1666722	119.3113536	155.4031704
Business & administration professionals	24	839	54.31912671	36.40816569	81.04136724
Information & Communication Technologist	1	15		0	0
Legal, social & cultural professionals	7	309	43.01729115	20.50752286	90.23456175
Science & engineering associate professionals	4	156		0	0
Health associate professionals	17	361	89.42217269	55.58975063	143.845311
Business & administration associate professionals	28	682	77.9609558	53.82849378	112.9125153
Legal, social, cultural associate professionals	22	340	122.8703972	80.90346988	186.6067613
Information & communications technician	0	18		0	0
General & keyboard clerks	87	2065	80.00234091	64.83994437	98.71036464
Customer services clerks	16	637	47.69622952	29.21996911	77.85532908
Numerical & material recording clerks	3	60		0	0
Other clerical support workers	3	66		0	0
Personal services workers	68	1495	86.37165041	68.09982131	109.5459849
Sales workers	77	1845	79.24974125	63.38589865	99.08389125
Personal care workers	27	497	103.1598908	70.74472295	150.4276591
Protective service workers & armed forces	25	1591	29.83824855	20.1618273	44.15874927
Market-orientated skilled agricultural workers	2	56		0	0
Market-orientated skilled forestry workers	40	971	78.22476366	57.37926824	106.6432849
Subsistence farmers	12	112	203.454229	115.5424271	358.2547497
Building & related trades workers	4	128	59.34081681	22.27126716	158.1110097
Metal, machinery & related trades workers	57	411	263.3519461	203.1374805	341.4153181
Handicraft & printing workers	2	46		0	0
Electrical & electronic trades workers	0	44		0	0
Food processing, wood working workers	40	515	147.4878554	108.1849892	201.0691837
Stationary plant & machine operators	30	532	107.0811732	74.86913857	153.1522583
Assemblers	0	8		0	0
Drivers & mobile plant operators	4	116		0	0
Cleaners & helpers	802	14486	105.1306587	98.1006448	112.6644522
Agricultural, forestry & fishery labours	20	588	64.58864414	41.66949326	100.1138393
Labourers in mining, construction & manufactoring	25	543	87.42661776	59.07452529	129.3859486
Food preparation assistants	3	35		0	0
Street & related sales workers	12	171	133.2565711	75.67691135	234.6463858
Refuse workers & other elementary workers	300	6473	88.00739091	78.59123237	98.55171653
Total	**18101**	**343721**			

* PMRs cannot be calculated when n<5