

OCCUPATION AND MORTALITY

Liver diseases mortality in South
Africa, 2013-2015

National Institute for Occupational Health

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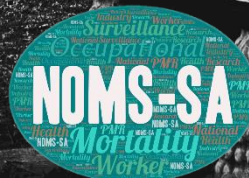
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Division of the National Health Laboratory Service



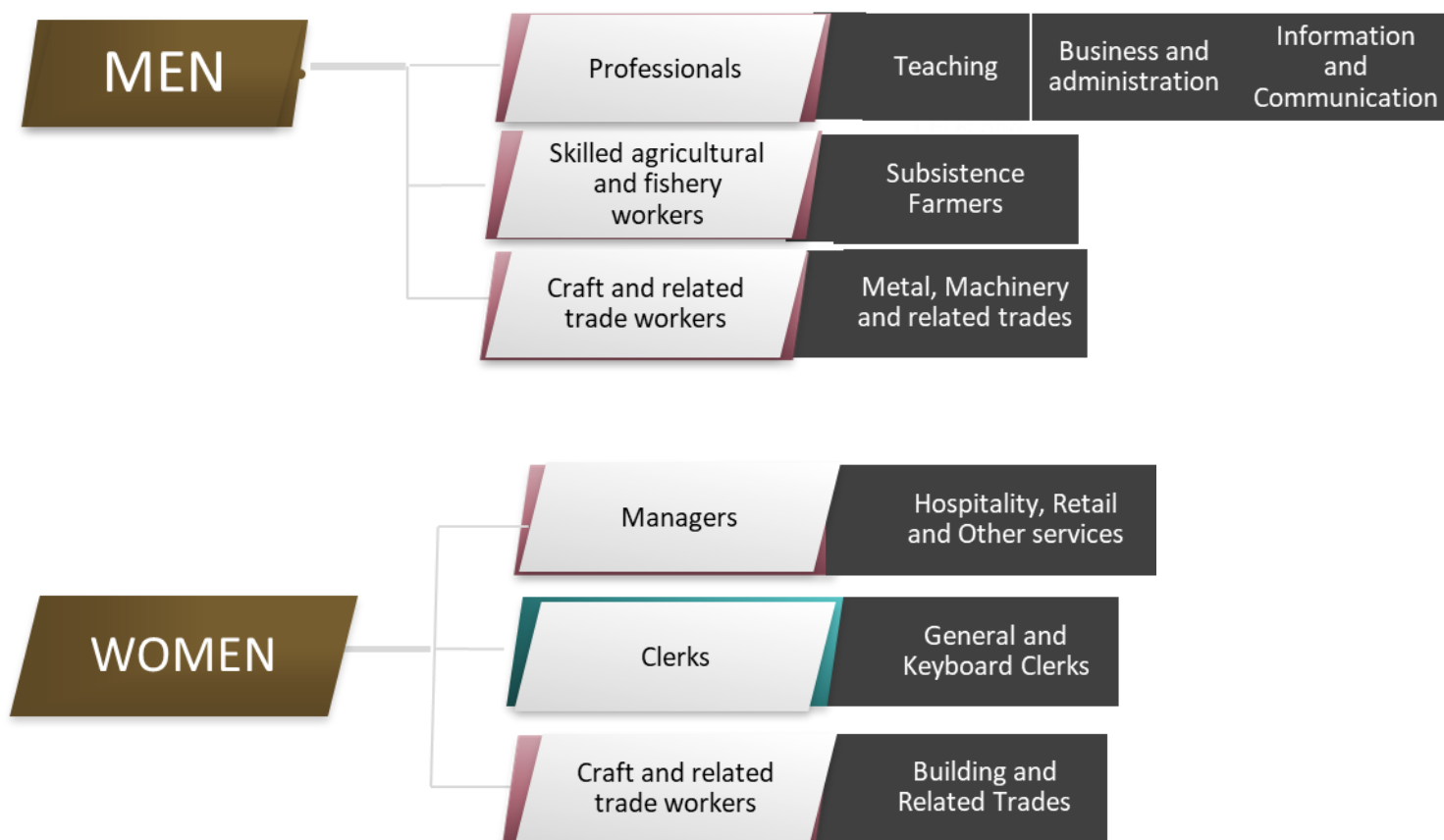
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Main points

- There were 9 607 reported deaths due to Liver diseases from 2013-2015 in ages 15-69.
- Main industries with significantly elevated PMRs for liver diseases deaths are human health and manufacturing.
- Major occupation groups with significantly elevated PMRs liver diseases deaths are managers, technicians, services and sales workers as well as craft and related trade.

Significantly elevated PMRs for major and sub-major occupations in men and women



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.

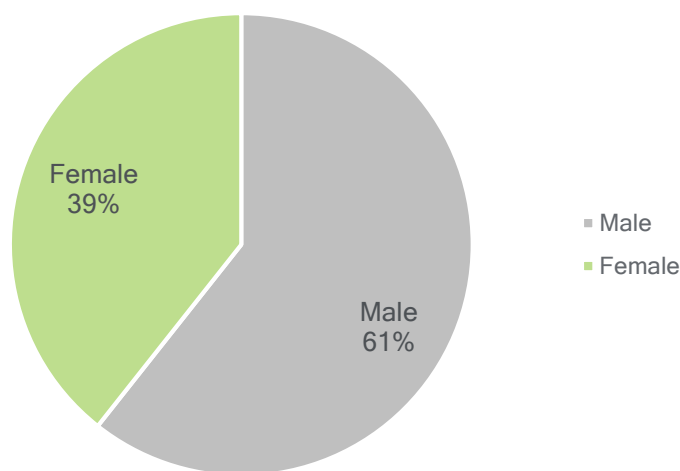
This report presents the analysis of deaths involving liver diseases in different occupation groups and industries among those aged 15 to 69 years in South Africa. This analysis includes deaths that were registered from 2013 to 2015 by the Statistics South Africa.

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.

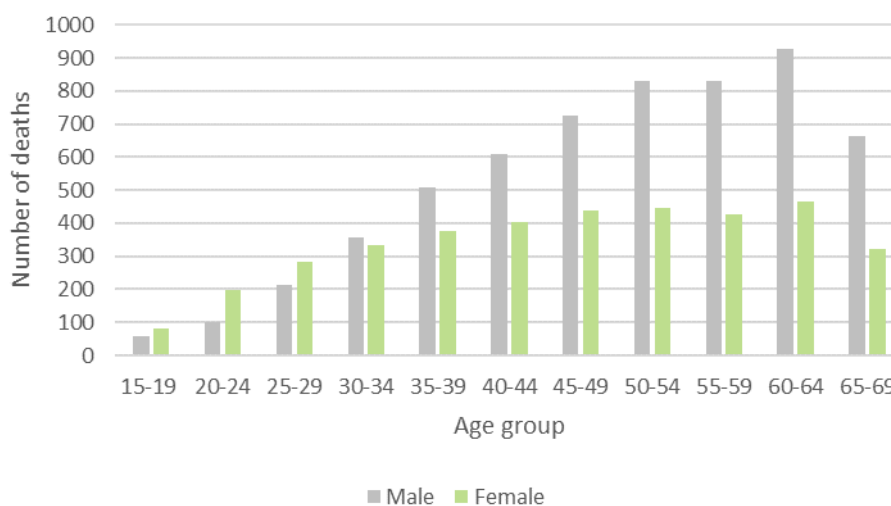
We calculated proportional mortality ratios for the population at risk of dying from liver diseases. The results of the analysis do not prove conclusively that the observed risk of death involving liver diseases are caused by occupational exposure. The findings presented here should be interpreted bearing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

Liver diseases mortality by sex and age

- There were 9 607 reported deaths due to liver diseases from 2013-2015 in 15 - 69 year olds.
- Number of reported deaths due to liver diseases by sex:
 - Men (5 827), Women (3 780), Unspecified (0).



- Mean age of death due to liver diseases: men (48.2 years), women (43.6 years).
Women died significantly younger than men.



Liver diseases mortality by sex and main industry

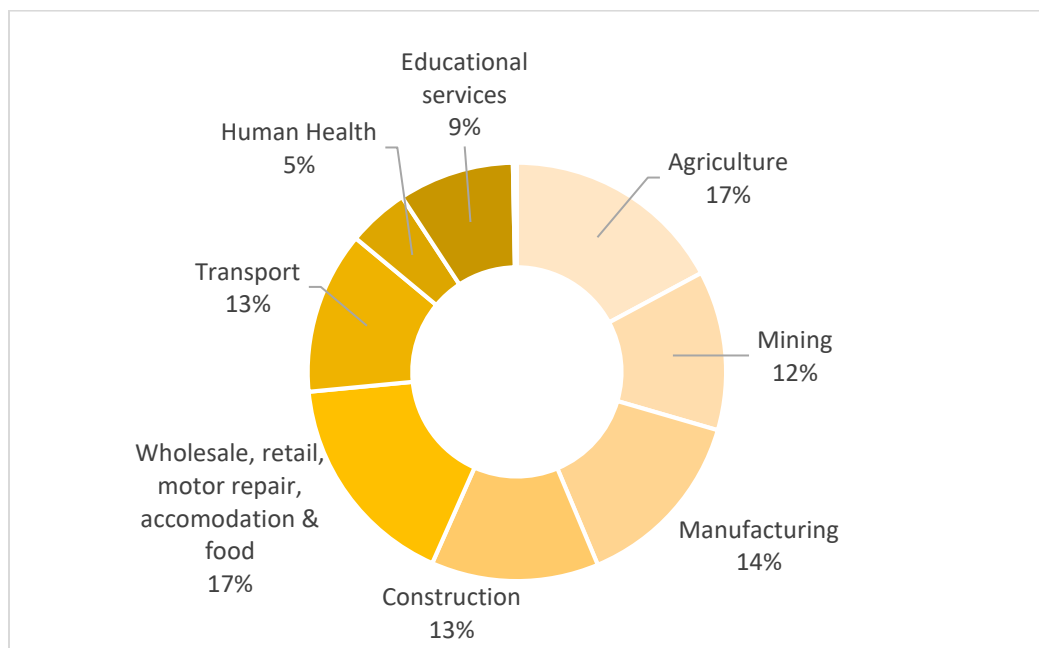


Figure 1. Percentage of liver diseases -related deaths by main industry.

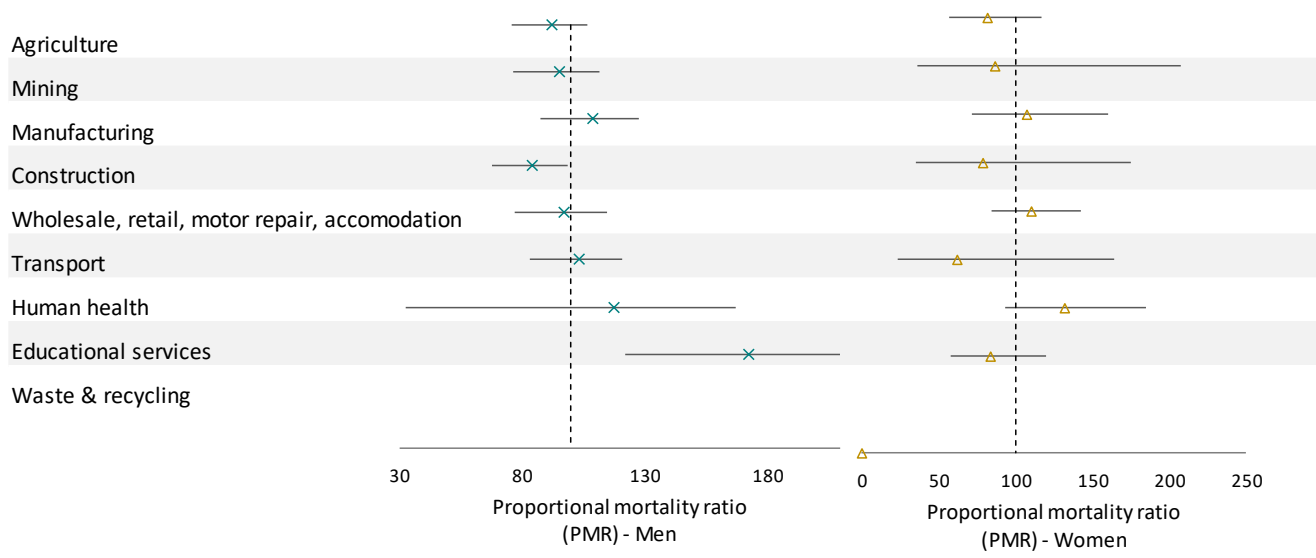


Figure 2 Liver diseases -related mortality by sex and main industry. Source: Statistics South Africa (See Appendix Table 1 and 2)

- Main industries with significantly elevated PMRs for liver diseases -related deaths are educational services, in men; and human health was raised but not significant in women compared to the general population.

Liver diseases-related mortality by sex and major occupation

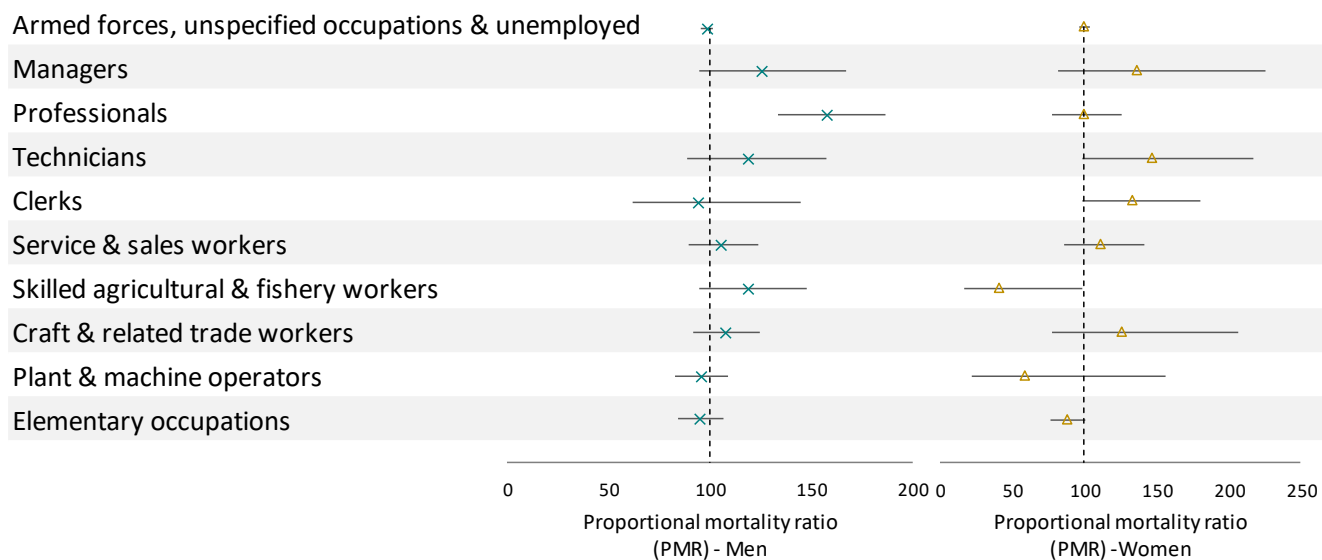


Figure 3. Liver diseases -related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix Table 3 and 4)

- Men working as professionals had significant excess mortality due to liver diseases while managers, technicians and agricultural and fishery workers were non-significantly raised compared to the general population.
- Women working as managers, technicians and clerks had non-significant excess mortality due to liver disease compared to the general population.

Liver diseases-related mortality by sex and sub-major occupation

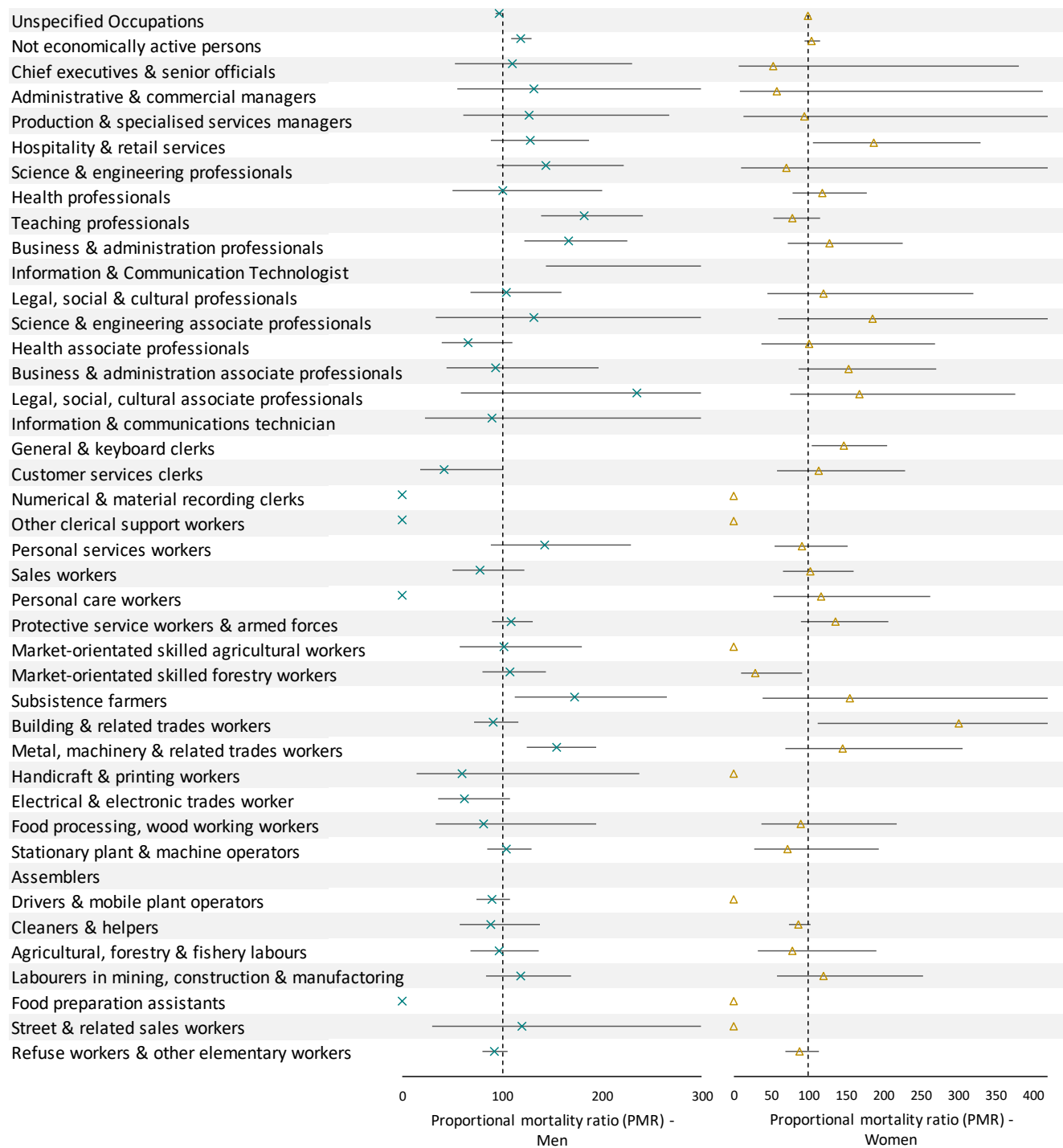


Figure 4. Liver diseases-related mortality by sex and sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 5 and 6)

- Men employed in the following sub-major occupation groups had excess mortality due to liver diseases compared to the general population.
 - Teaching professionals
 - Information and communication professionals
 - Business and administration professionals
 - Subsistence farmers
 - Metal, machinery and related trades workers

Non-significantly raised liver disease mortality in men were Hospitality and retail services and science and engineering professionals.

- Women employed in the following sub-major occupation groups had excess mortality due to liver diseases compared to the general population.
 - Hospitality and retail services
 - General and Keyboard clerks
 - Building and related trades

In women Metal, machinery and related trade workers, health professionals, business and administration professionals and associate professionals, protective services and armed forces showed non-significantly raised excess liver disease mortality.

The graph of the women in particular shows wide confidence intervals due to the small numbers of women reported dying from liver diseases. Further analysis of a larger dataset is required to confirm.

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 liver diseases include the following underlying cause of death codes: K70 K72-77 and I 85.
- 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 Liver diseases-related deaths by industry (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	138	12750	92.75433	78.50	109.60
Mining	115	10288	95.79264	79.79	115.00
Manufacturing	114	8923	109.4862	91.12	131.55
Construction	120	12137	84.7296	70.85	101.33
Wholesale, retail, motor repair, accommodation	106	9295	97.72861	80.79	118.22
Transport	118	9742	103.8004	86.66	124.33
Human health	13	945	117.89	68.45	203.03
Educational services	58	2881	172.5242	133.38	223.16
Waste & recycling	0	54	0	-	-
Total	782	67015			

Table 2 Liver diseases-related deaths by industry (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	29	3663	81.49073	56.62929	117.2668
Mining	5	594	86.64244	36.06241	208.1645
Manufacturing	24	2293	107.7344	72.21049	160.7342
Construction	6	785	78.67354	35.34441	175.1204
Wholesale, retail, motor repair, accommodation	56	5247	109.8561	84.54256	142.7489
Transport	4	668	61.63546	23.13247	164.225
Human health	33	2576	131.8606	93.74267	185.4783
Educational services	29	3576	83.4733	58.00702	120.1198
Waste & recycling	3	52	0	-	-
Total	189	19454			

Table 3 Liver diseases-related deaths by major occupation (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	4 694	414682	98,54936	95,77	101,41
Managers	47	3257	125,6337	94,39	167,21
Professionals	135	7441	157,9532	133,43	186,98
Technicians	47	3452	118,5367	89,06	157,77
Clerks	21	1938	94,33903	61,51	144,69
Service & sales workers	145	12013	105,0854	89,30	123,66
Skilled agricultural & fishery workers	79	5801	118,5633	95,10	147,82
Craft & related trade workers	162	13160	107,1729	91,88	125,02
Plant & machine operators	203	18578	95,1312	82,90	109,16
Elementary occupations	293	26898	94,83606	84,58	106,34
Total	5 826	507220			

Table 4 Liver diseases related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	3330	332216	100,2394	96,89196	103,7026
Managers	15	1101	136,2445	82,13638	225,9968
Professionals	66	6644	99,34117	78,04618	126,4465
Technicians	25	1707	146,4608	98,96417	216,7529
Clerks	42	3143	133,6349	98,75843	180,8279
Service & sales workers	63	5686	110,8023	86,55763	141,8378
Skilled agricultural & fishery workers	5	1212	41,25555	17,17143	99,1193
Craft & related trade workers	16	1266	126,3867	77,4278	206,303
Plant & machine operators	4	682	58,65305	22,01314	156,2785
Elementary occupations	211	24056	87,71502	76,64323	100,3862
Total	3777	377713			

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

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	4146	374613	96,35249	93,46373	99,33053
Not economically active persons	548	40069	119,0662	109,5031	129,4645
Chief executives & senior officials	7	555	109,8049	52,34699	230,3305
Administrative & commercial managers	5	330	131,9084	54,90307	316,9191
Production & specialised services managers	7	478	127,4931	60,77945	267,4339
Hospitality & retail services	28	1894	128,7047	88,86477	186,4058
Science & engineering professionals	21	1268	144,1838	94,00819	221,14
Health professionals	8	695	100,2124	50,11537	200,3883
Teaching professionals	51	2431	182,6424	138,8057	240,3233
Business & administration professionals	42	2202	166,0537	122,7165	224,6954
Information & Communication Technologist	4	91	382,6794	143,6238	1019,632
Legal, social & cultural professionals	9	754	103,9172	67,75429	159,3817
Science & engineering associate professionals	21	1384	132,099	33,03682	528,2033
Health associate professionals	2	263	66,20499	39,91236	109,8181
Business & administration associate professionals	15	1150	113,5559	54,13524	238,1989
Legal, social, cultural associate professionals	7	493	123,614	30,91478	494,2754
Information & communications technician	2	162	107,4809	26,88005	429,7668
General & keyboard clerks	16	1396	99,78173	61,12892	162,8753
Customer services clerks	5	259	168,0686	69,95372	403,7966
Numerical & material recording clerks	0	195	0	-	-!
Other clerical support workers	0	88	0	-	-
Personal services workers	17	1042	142,0358	88,29725	228,48
Sales workers	19	2122	77,95154	49,72125	122,2102
Personal care workers	0	108	0	-	-
Protective service workers & armed forces	109	8741	108,563	89,98084	130,9826
Market-orientated skilled agricultural workers	12	1027	101,7249	57,76996	179,1235
Market-orientated skilled forestry workers	46	3716	107,7702	80,72229	143,8811
Subsistence farmers	21	1058	172,8025	112,6677	265,0336
Building & related trades workers	65	6187	91,4639	71,72478	116,6354
Metal, machinery & related trades workers	77	4325	154,9962	123,9698	193,7877
Handicraft & printing workers	2	294	59,22419	14,81145	236,8103
Electrical & electronic trades worker	13	1815	62,35671	36,20746	107,3911
Food processing, wood working workers	5	539	80,76026	33,61413	194,0321
Stationary plant & machine operators	87	7245	104,5436	84,73001	128,9904
Assemblers	0	29	0	-	-
Drivers & mobile plant operators	116	11304	89,33925	74,4747	107,1706
Cleaners & helpers	20	1963	88,70052	57,22532	137,4878
Agricultural, forestry & fishery labours	32	2885	96,5652	68,28814	136,5513
Labourers in mining, construction & manufacturing	31	2280	118,3705	83,24539	168,3164
Food preparation assistants	0	14	0	-	-
Street & related sales workers	2	145	120,0822	30,0315	480,1533
Refuse workers & other elementary workers	208	19600	92,38974	80,64964	105,8388
Total	5826	507209			

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	2930	294129	99,6203747	96,0776993	103,293679
Not economically active persons	400	38087	105,02716	95,2227596	115,841049
Chief executives & senior officials	1	186	53,7657184	7,57335419	381,70042
Administrative & commercial managers	1	172	58,1419978	8,18979	412,769058
Production & specialised services managers	1	106	94,343619	13,2890932	669,776208
Hospitality & retail services	12	639	187,801382	106,653116	330,692252
Science & engineering professionals	1	141	70,9249902	9,99038212	503,519702
Health professionals	23	1935	118,868084	78,9903815	178,877747
Teaching professionals	26	3285	79,1509936	53,8913356	116,250223
Business & administration professionals	12	933	128,622812	73,0453819	226,486977
Information & Communication Technologist	0	17	0	-	-
Legal, social & cultural professionals	4	333	120,125209	45,084324	320,068362
Science & engineering associate professionals	3	161	186,343297	60,0984547	577,782317
Health associate professionals	4	396	101,01438	37,9118179	269,148395
Business & administration associate professionals	12	779	154,050171	87,4856756	271,261039
Legal, social, cultural associate professionals	6	355	169,021244	75,9334853	376,226389
Information & communications technician	0	18	0	-	-
General & keyboard clerks	34	2309	147,256129	105,218193	206,089528
Customer services clerks	8	698	114,618036	57,3194797	229,194232
Numerical & material recording clerks	0	65	0	-	-
Other clerical support workers	0	71	0	-	-
Personal services workers	15	1638	91,5789708	55,2093236	151,907456
Sales workers	20	1930	103,631333	66,8579621	160,630878
Personal care workers	6	509	117,883186	52,9595035	262,39758
Protective service workers & armed forces	22	1609	136,736681	90,0336631	207,66588
Market-orientated skilled agricultural workers	0	61	0	-	-
Market-orientated skilled forestry workers	3	1023	29,3267555	9,45831007	90,9315279
Subsistence farmers	2	128	156,256619	39,0784185	624,798339
Building & related trades workers	4	133	300,76462	112,8803	801,374169
Metal, machinery & related trades workers	7	479	146,143978	69,6708436	306,556676
Handicraft & printing workers	0	55	0	-	-
Electrical & electronic trades workers	0	47	0	-	-
Food processing, wood working workers	5	552	90,5835473	37,7027845	217,633237
Stationary plant & machine operators	4	551	72,5983566	27,246969	193,435144
Assemblers	0	10	0	-	-
Drivers & mobile plant operators	0	121	0	-	-
Cleaners & helpers	138	15786	87,4229355	73,9886267	103,296547
Agricultural, forestry & fishery labours	5	630	79,3684414	33,0348207	190,688169
Labourers in mining, construction & manufacturing	7	578	121,112397	57,7376022	254,049564
Food preparation assistants	0	43	0	-	-
Street & related sales workers	0	184	0	-	-
Refuse workers & other elementary workers	61	6834	89,2633656	69,4522093	114,72563
Total	3777	377716			