

OCCUPATION AND MORTALITY

Hematological Disorders in South Africa, 2013-2015

National Institute for Occupational Health

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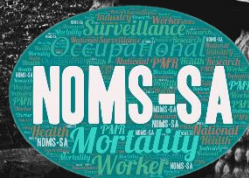
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Division of the National Health Laboratory Service



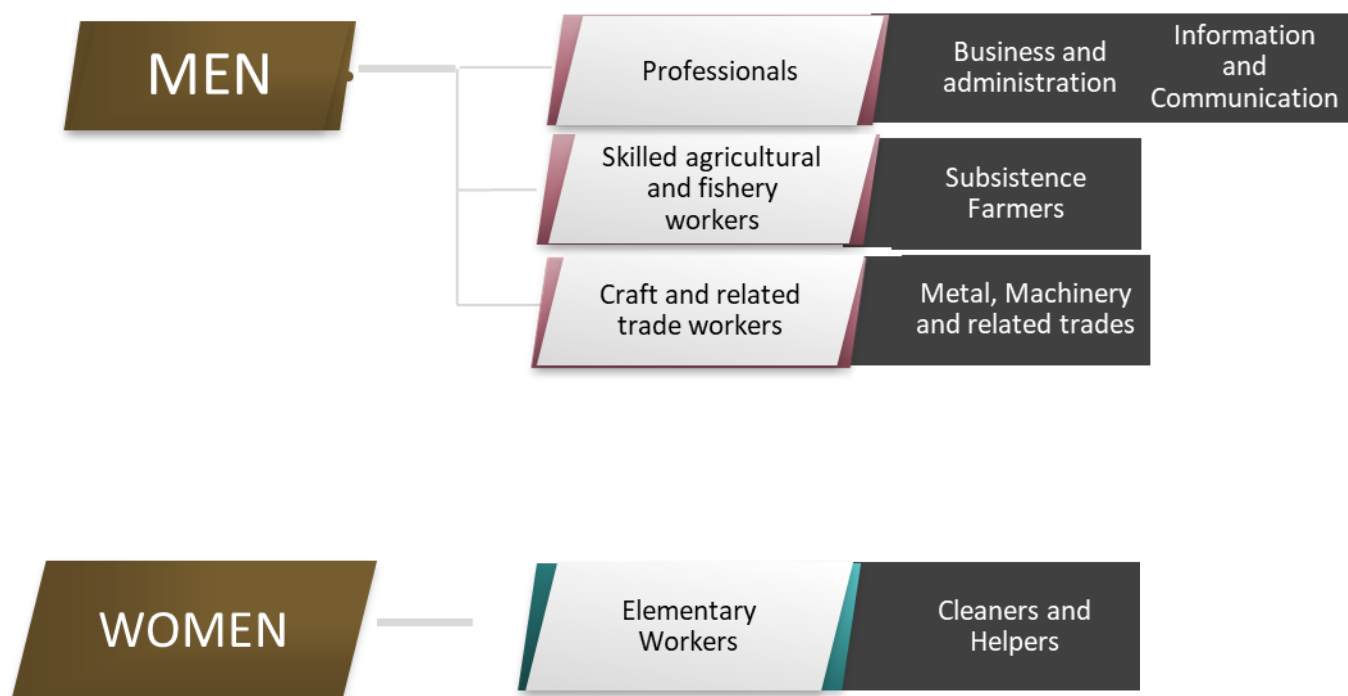
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Main points

- There were 5 425 reported deaths due to hematological disorders from 2013-2015 in 15-69 year olds.
- Main industries with significantly elevated PMRs for hematological disorders deaths are agriculture, construction and transport.
- Major occupation groups with significantly elevated PMRs for hematological disorders deaths are craft and related trade workers, service and sales workers, elementary workers and clerks.

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.

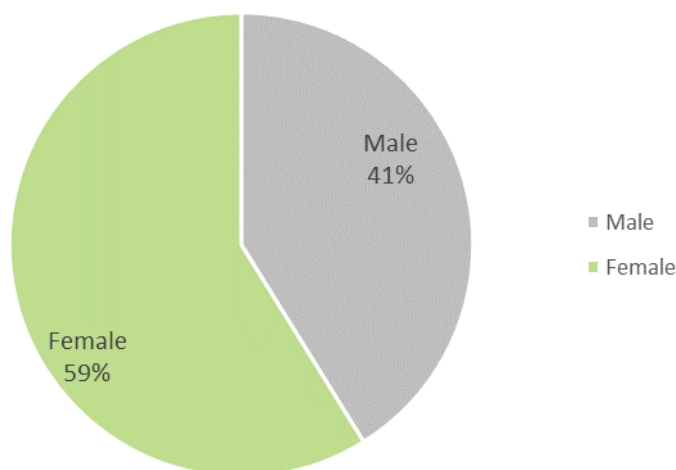
This report presents the analysis of deaths involving hematological disorders in different occupation groups and industries among those aged 15 to 69 years in South Africa. This analysis includes deaths that were registered from 2013 to 2015 by the Statistics South Africa.

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.

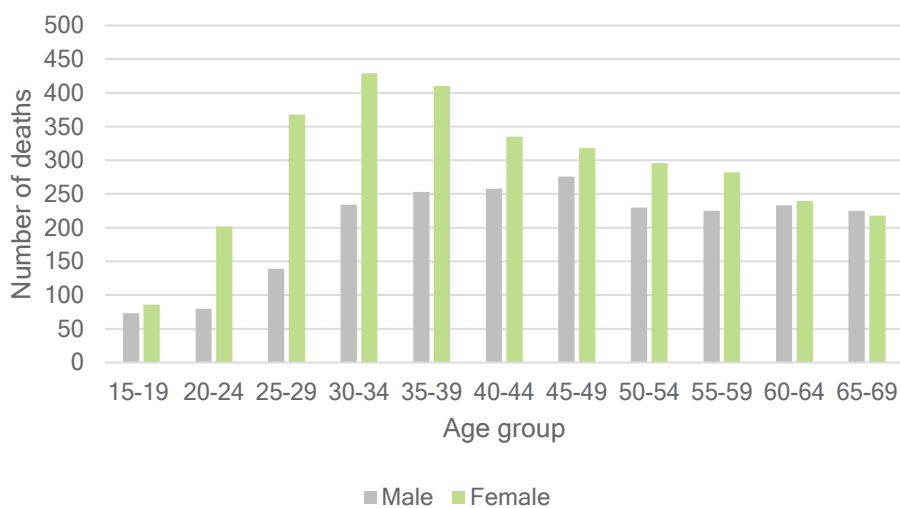
We calculated proportional mortality ratios for the population at risk of dying from hematological disorders. The results of the analysis do not prove conclusively that the observed risk of death involving hematological disorders are caused by occupational exposure. The findings presented here should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

Hematological disorders mortality by sex and age

- There were 5 425 reported deaths due to hematological disorders from 2013-2015.
- Number of reported deaths due to hematological disorders by sex:
 - Men (2 226), Women (3184), and Unspecified (15).



- Mean age of death due to hematological disorders: men (45.7 years), women (42.3 years). Women died significantly younger than men.



Hematological disorders mortality by sex and main industry

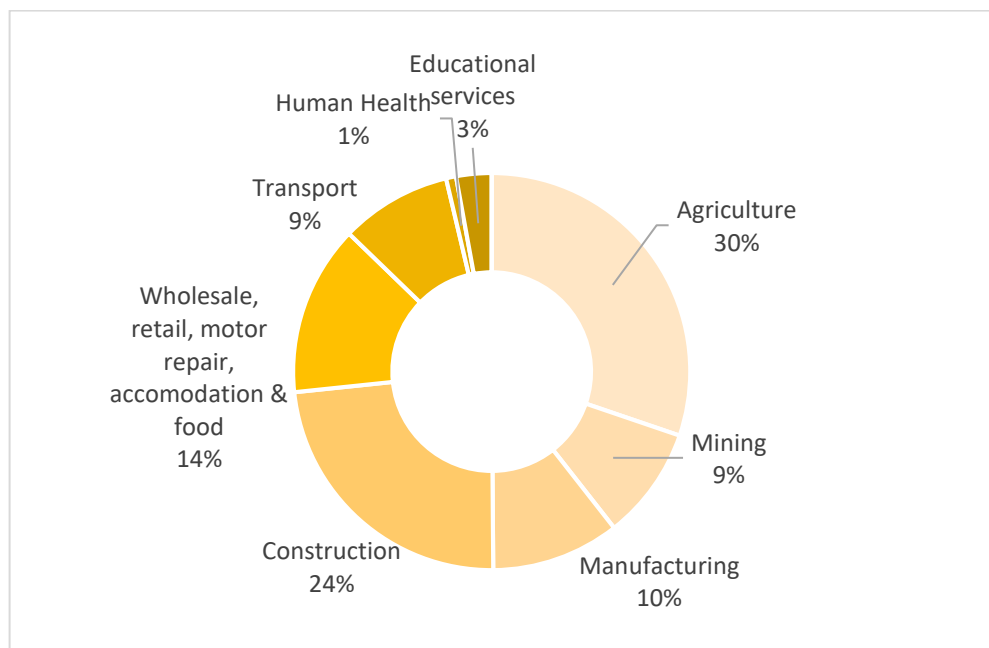


Figure 1. Percentage of hematological disorders-related deaths by main industry.

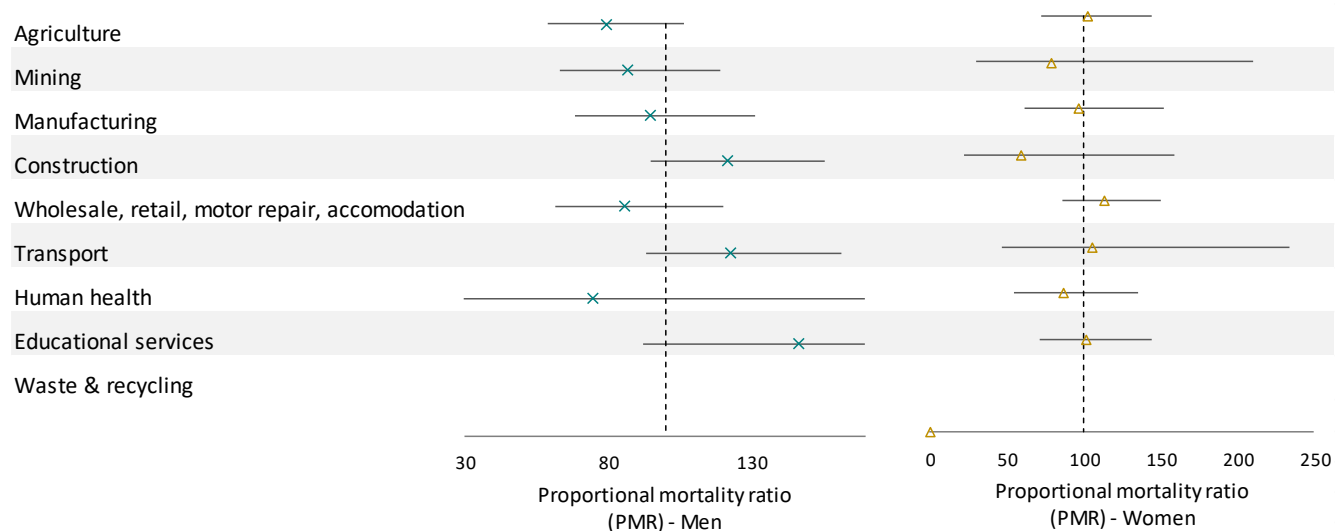


Figure 2 Hematological disorders-related mortality by sex and main industry. Source: Statistics South Africa (See Appendix Table 1 and 2)

- Main industries with non-significantly elevated PMRs for hematological disorder-related deaths are construction, transport and educational services in men; and wholesale, retail, motor repair and accommodation in women.

Hematological disorders-related mortality by sex and major occupation

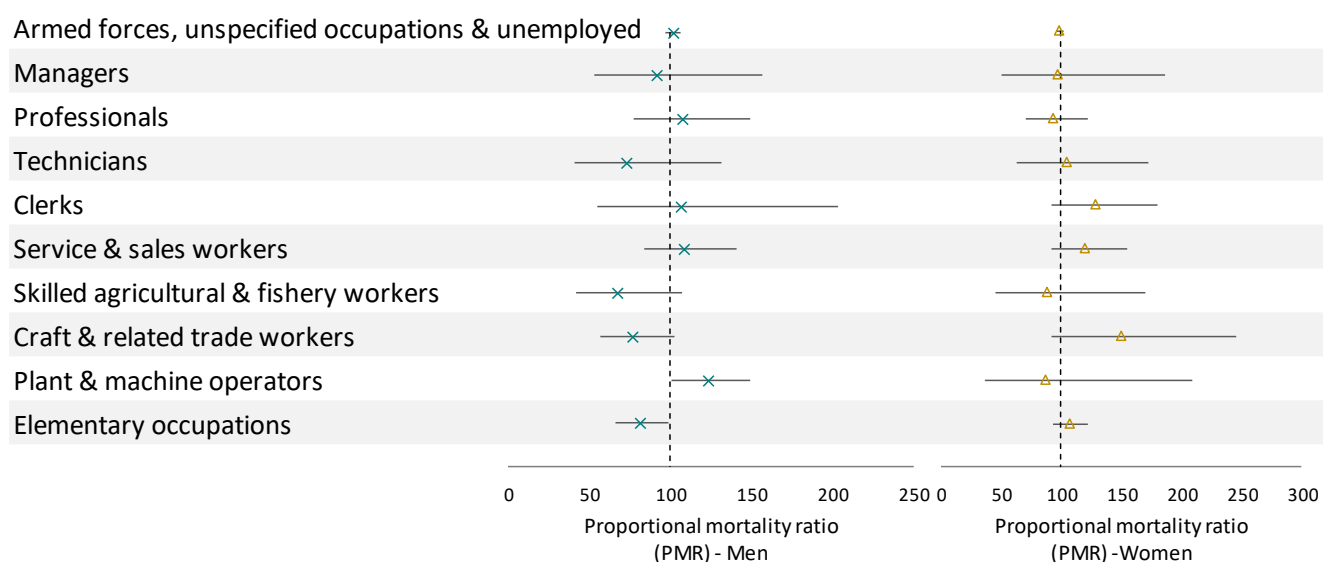


Figure 3. Hematological disorders-related mortality by sex and major occupation. Source: Statistics South Africa. (See Appendix Table 3 and 4)

- Men working as plant and machine operators had excess mortality due to hematological disorders.
- Women working as craft and related trade workers, clerks, had non-significant excess mortality due to hematological disorders.

Hematological disorders-related mortality by sex and sub-major occupation



Figure 4. Hematological disorders -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 significant excess mortality due to hematological disorders.
 - Teaching Professionals
 - Business and administration professionals
 - Information and communication professionals
 - Subsistence farmers
 - Metal, machinery and related trades workers

Among men administrative, commercial, Production, specialized services, hospitality and retail managers, science and engineering professionals, customer services clerks and personal services workers had non-significantly raised excess mortality.

- Women employed as Cleaners and Helpers had significant excess mortality due to hematological disorders.

In women administrative and commercial managers, general and keyboard clerks, metal, machinery and related trades workers, food processing and wood working workers and labourers in mining construction and manufacturing.

The graph of the women in particular shows wide confidence intervals due to the small numbers of women reported dying from hematological disorders.

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 interpersonal violence 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 Hematological disorders-related deaths by industry (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	43	12750	79,02496	58,61	106,55
Mining	38	10288	86,54832	62,98	118,94
Manufacturing	36	8923	94,53608	68,19	131,06
Construction	63	12137	121,6285	95,01	155,70
Wholesale, retail, motor repair, accomodation	34	9295	85,71079	61,24	119,95
Transport	51	9742	122,6671	93,23	161,41
Human health	3	945	74,38672	23,99	230,65
Educational services	18	2881	146,398	92,24	232,36
Waste & recycling	0	54	0	-	-
Total	286	67015			

Table 2 Hematological disorders -related deaths by industry (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Agriculture	32	3663	102,3797	72,39999	144,7736
Mining	4	594	78,91769	29,61869	210,2727
Manufacturing	19	2293	97,10696	61,93951	152,2415
Construction	4	785	59,71606	22,4121	159,1108
Wholesale, retail, motor repair, accommodation	51	5247	113,9095	86,56966	149,8836
Transport	6	668	105,263	47,28982	234,3061
Human health	19	2576	86,43877	55,13482	135,5162
Educational services	31	3576	101,5933	71,44665	144,4602
Waste & recycling	0	52	0	0	0
Total	166	19454			

Table 3 Hematological disorders-related deaths by major occupation (men)

Men					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	1 841	414682	101,3423	96,82	106,08
Managers	13	3257	91,11249	52,90	156,91
Professionals	35	7441	107,3715	77,09	149,54
Technicians	11	3452	72,74015	40,28	131,35
Clerks	9	1938	106,0086	55,16	203,74
Service & sales workers	57	12013	108,3118	83,55	140,42
Skilled agricultural & fishery workers	17	5801	66,89573	41,59	107,61
Craft & related trade workers	44	13160	76,32189	56,80	102,56
Plant & machine operators	100	18578	122,8721	101,00	149,48
Elementary occupations	95	26898	80,62244	65,94	98,58
Total	2 222	507220			

Table 4 Hematological disorders-related deaths by major occupation (women)

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Armed forces, unspecified occupations & unemployed	2765	332216	98,88959	95,27141	102,6452
Managers	9	1103	96,94893	50,44335	186,3297
Professionals	52	6644	92,99289	70,86098	122,0372
Technicians	15	1709	104,2858	62,86977	172,985
Clerks	34	3143	128,5318	91,83918	179,8842
Service & sales workers	57	5686	119,1088	91,87504	154,4154
Skilled agricultural & fishery workers	9	1212	88,22992	45,90678	169,5723
Craft & related trade workers	16	1266	150,1628	91,99368	245,1131
Plant & machine operators	5	682	87,10872	36,25649	209,2847
Elementary occupations	217	24056	107,1796	93,82702	122,4325
Total	3179	377717			

Table 5 Hematological disorders-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 Professionals	4	91	382,6794	143,6238	1019,632
Legal, social & cultural professionals	9	754	103,9172	54,06903	199,7224
Science & engineering associate professionals	21	1384	132,099	86,12889	202,6052
Health associate professionals	2	263	66,20499	16,55729	264,7233
Business & administration associate professionals	15	1150	113,5559	68,45837	188,362
Legal, social, cultural associate professionals	7	493	123,614	58,93018	259,297
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	100	97,46483	102,6011

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

Women					
Occupation	n	Total deaths	PMR	95% CI LL	95% CI UL
Occupations unspecified	2522	294129	101,878394	97,9788104	105,933182
Not economically active persons	243	38087	75,8061362	66,8495909	85,9626845
Chief executives & senior officials	1	186	63,8795591	8,99797382	453,501883
Administrative & commercial managers	2	172	138,158116	34,5521407	552,430752
Production & specialised services managers	0	106	0	-	-
Hospitality & retail services	6	639	111,5643	50,1207182	248,332298
Science & engineering professionals	1	141	84,2666524	11,8696676	598,236526
Health professionals	12	1935	73,6843286	41,8456092	129,747909
Teaching professionals	29	3285	104,890819	72,8904137	150,940068
Business & administration professionals	5	933	63,6741586	26,5025289	152,981569
Information & Communication Technologist	0	17		-	-
Legal, social & cultural professionals	5	333	178,402372	74,2548332	428,624037
Science & engineering associate professionals	2	161	147,597491	36,9128459	590,174468
Health associate professionals	3	396	90,012106	29,0302284	279,094574
Business & administration associate professionals	7	779	106,766606	50,8985701	223,957335
Legal, social, cultural associate professionals	2	355	66,9385802	16,7407555	267,65659
Information & communications technician	1	18	0	-	-
General & keyboard clerks	27	2309	138,935966	95,2791473	202,5963
Customer services clerks	7	698	119,156427	56,8051377	249,946653
Numerical & material recording clerks	0	65	0	-	-
Other clerical support workers	0	71	0	-	-
Personal services workers	12	1638	87,0446739	49,4329999	153,273628
Sales workers	23	1930	141,594173	94,0923528	213,076931
Personal care workers	5	509	116,715108	48,5792917	280,416119
Protective service workers & armed forces	17	1609	125,53584	78,0399962	201,93808
Market-orientated skilled agricultural workers	0	61	0	-	-
Market-orientated skilled forestry workers	9	1023	104,530188	54,3879473	200,900395
Subsistence farmers	0	128	0	-	-
Building & related trades workers	1	133	89,3353232	12,5836326	634,220678
Metal, machinery & related trades workers	6	479	148,830037	66,862503	331,282543
Handicraft & printing workers	1	55	216,029054	30,4295115	1533,66091
Electrical & electronic trades workers	1	47	0	-	-
Food processing, wood working workers	7	552	150,672438	71,829685	316,055732
Stationary plant & machine operators	4	551	86,2547948	32,3723818	229,822126
Assemblers	0	10	0	-	-
Drivers & mobile plant operators	1	121	98,1950247	13,8315961	697,118596
Cleaners & helpers	165	15786	124,190021	106,6153	144,661801
Agricultural, forestry & fishery labours	3	630	56,579038	18,2475721	175,430875
Labourers in mining, construction & manufacturing	7	578	143,894785	68,5985919	301,838692
Food preparation assistants	0	43	0	-	-
Street & related sales workers	2	184	129,147804	32,2987402	516,402659
Refuse workers & other elementary workers	40	6834	69,5440327	51,0117963	94,8089038
Total	3179	377716			

