OCCUPATION AND MORTALITY

Prostate Cancer Mortality in South Africa, 2011-2015

National Institute for Occupational Health

25 Hospital Street, Braamfontein
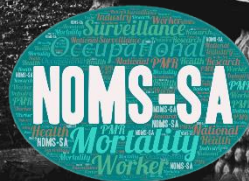www.nioh.ac.za

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Main points

- There were 4,537 reported deaths related to prostate cancer disease from 2011 - 2015 among men aged 15 to 69 years old.
- The main industries with significantly elevated PMRs for these deaths are men who work in education services, manufacturing and, business, finance, legal, politics, and entertainment.
- Major occupation groups with significantly elevated PMRs related to prostate cancer were legislators, senior officials and managers, professionals, technicians and associate professionals, and craft and related trade workers.

MEN

Education services

Manufacturing

Business, finance, legal, politics, and entertainment
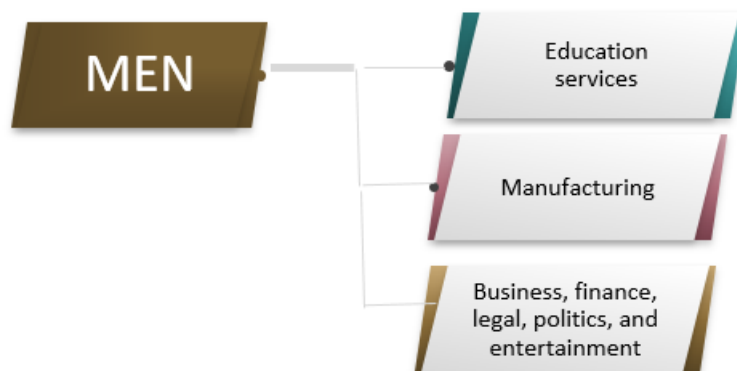
Introduction

The National Occupational Mortality Surveillance South Africa (NOMS-SA) is a nationwide, 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 well-being 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 related to prostate cancer disease in different occupation groups and industries among men 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 ten 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 prostate cancer disease. The results of the analysis do not prove that the observed proportions of deaths involving prostate cancer disease are caused by occupational exposure. The findings presented here should be interpreted considering the warnings in the strengths and limitations section.

Prostate cancer mortality by age

- There were 4,537 reported deaths due to prostate cancer disease from 2011 to 2015 among men 15 to 69 years old.
- Mean age of death due to prostate cancer disease: (62.2 years).
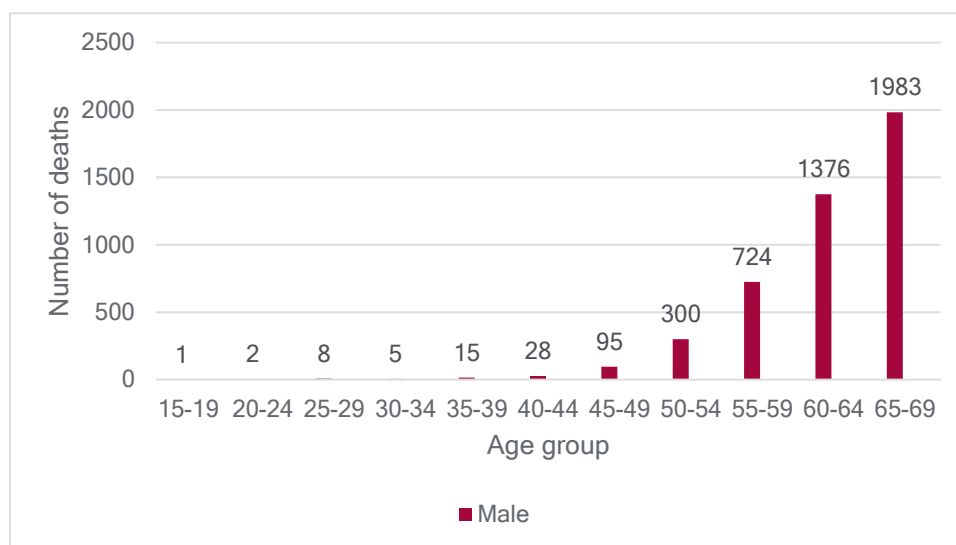
Prostate cancer mortality by main industry
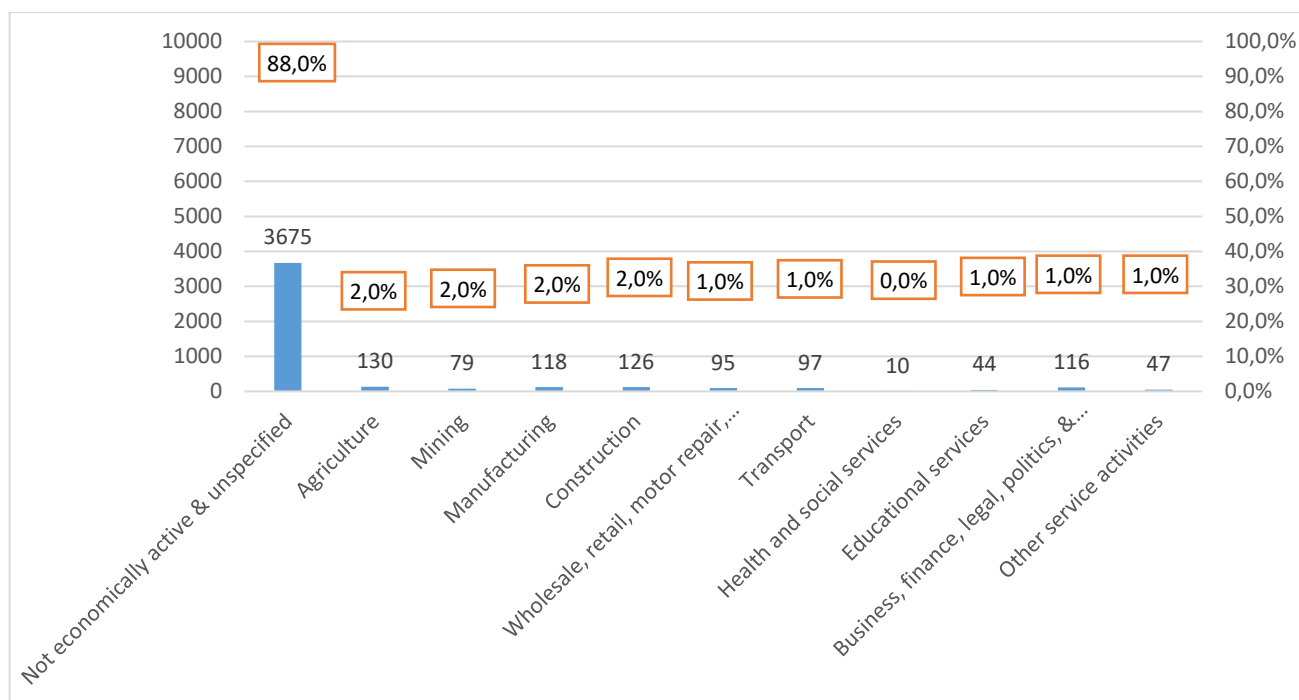
Figure 1. Percentage of prostate cancer-related deaths by main industry.
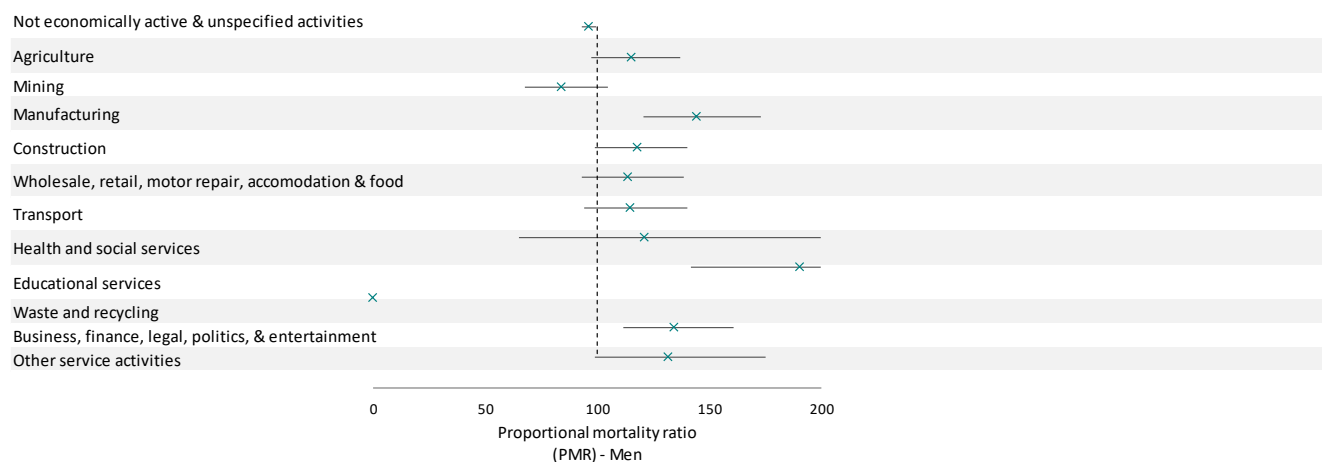
Figure 2 Prostate cancer-related mortality by main industry. Source: Statistics South Africa (See Appendix Table 1)

- The main industries with significantly elevated PMRs for prostate cancer disease-related deaths are education services, manufacturing and, business, finance, legal, politics, and entertainment, compared to the general population. Being not economically active seems to be protective.

Prostate cancer mortality by major occupation

Figure 3. Prostate cancer disease-related mortality by major occupation. Source: Statistics South Africa. (See Appendix Tables 2)

- Men working as legislators, senior officials and managers, professionals, technicians and associate professionals, and craft and related trade had significant excess mortality due to prostate cancer disease compared to the general population. Working in service and sales, and elementary occupations seem to be protective.

Prostate cancer mortality by sub-major occupation

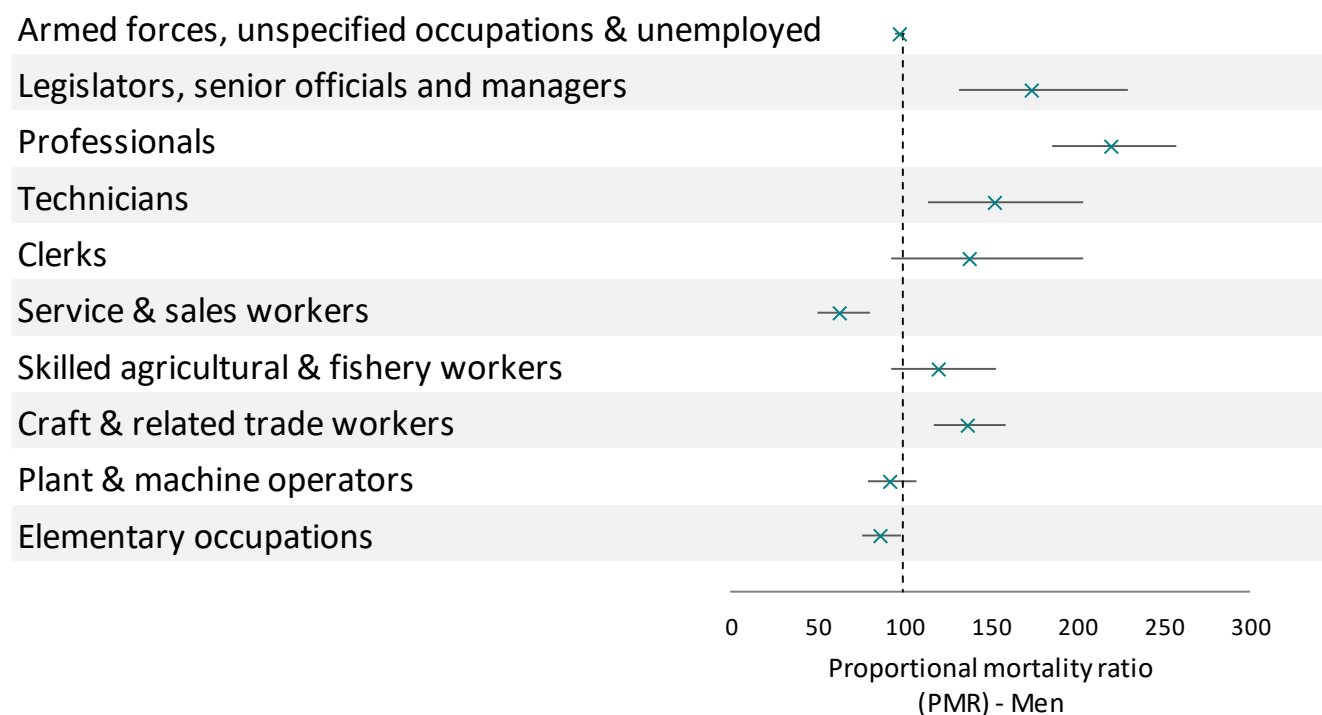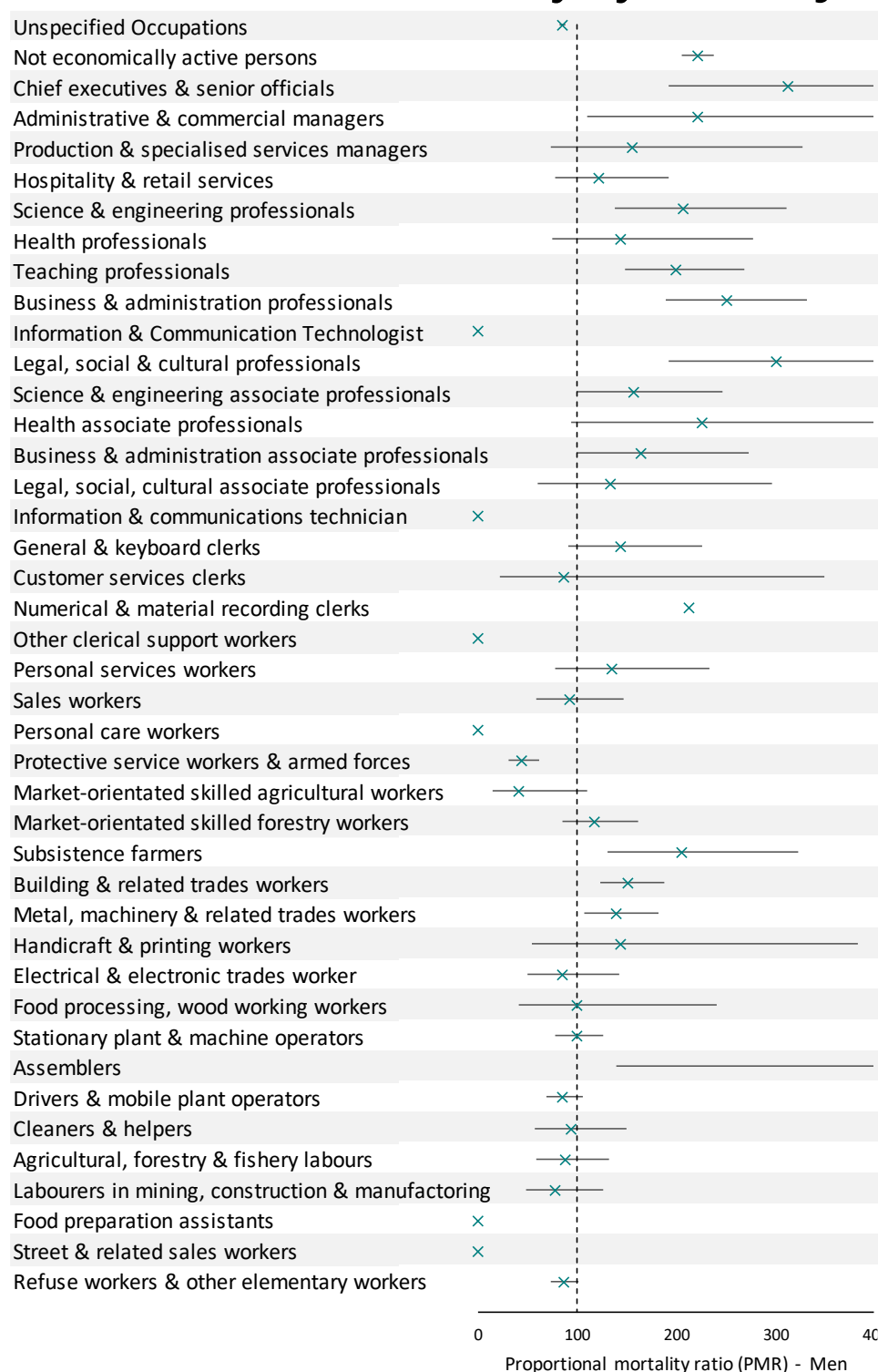**Figure 4.** Prostate cancer disease-related mortality by sub-major occupation. Source: Statistics South Africa (See Appendix, Tables 3)

- Men employed in the following sub-major occupation groups had excess mortality due to prostate cancer disease compared to the general population:
    - Men not economically active
    - Chief executives and senior officials
    - Administrative and commercial managers
    - Science and engineering professionals
    - Teaching and business and admin professionals
    - Legal, social and cultural professionals
    - Science and engineering associate professionals
    - Subsistence farmers
    - Building and related trades workers
    - Metal, machinery and related trades workers

The graphs show wide confidence intervals due to the small number of deaths related to prostate cancer disease.

Measuring the data

- o 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 – 69 years).
- o Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths due to prostate cancer disease include the underlying cause of death code: C61.
- o 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 provide 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

- o PMRs can only be calculated where data on occupation or industry are available; it is not a reflection of the length of employment.
- o A statistically significantly elevated PMR cannot be interpreted directly as a causal relationship between the occupation and the cause of death.
- o 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 Prostate cancer deaths by industry

Men					
Occupation	**n**	**Total deaths**	**PMR**	**95% CI LL**	**95% CI UL**
Not economically active & unspecified activities	3675	733993	96,21238	93,15	99,37
Agriculture	130	21634	115,4708	97,23	137,13
Mining	79	18064	84,03858	67,41	104,77
Manufacturing	118	15710	144,3349	120,51	172,88
Construction	126	20531	117,9305	99,04	140,43
Wholesale, retail, motor repair, accomodation & food	95	16078	113,5421	92,86	138,83
Transport	97	16215	114,953	94,21	140,26
Health and social services	10	1588	121,0083	65,11	224,90
Educational services	44	4439	190,4728	141,74	255,95
Waste and recycling	0	105	0	-	-
Business, finance, legal, politics, & entertainment	116	16612	134,1843	111,86	160,97
Other service activities	47	6866	131,5405	98,83	175,07
Total	**4537**	**871835**			

Table 2 Prostate cancer deaths by major occupation

Men					
Occupation	**n**	**Total deaths**	**PMR**	**95% CI LL**	**95% CI UL**
Armed forces, unspecified occupations & unemploy	3 610	710203	97,61413	94,48	100,85
Legislators, senior officials and managers	50	5520	173,9478	131,84	229,51
Professionals	144	12601	219,455	186,38	258,39
Technicians and Associate professionals	45	5678	152,1967	113,64	203,84
Clerks	25	3488	137,6422	93,01	203,70
Service & sales workers	67	20458	62,89261	49,50	79,91
Skilled agricultural & fishery workers	61	9812	119,3879	92,89	153,44
Craft & related trade workers	164	23116	136,2445	116,91	158,78
Plant & machine operators	157	32749	92,06394	78,73	107,65
Elementary occupations	214	47653	86,24055	75,43	98,61
Total	**4 537**	**871278**			

Table 3 Prostate cancer deaths by major occupation

Men					
Occupation	**n**	**Total deaths**	**PMR**	**95% CI LL**	**95% CI UL**
Occupations unspecified	2881	647593	85,48584	82,42054	88,66514
Not economically active persons	729	63166	221,7672	206,2389	238,4645
Chief executives & senior officials	16	981	313,4036	191,9993	511,5739
Administrative & commercial managers	8	693	221,8247	110,9326	443,5683
Production & specialised services managers	7	863	155,862	74,3037	326,9416
Hospitality & retail services	19	2983	122,3921	78,06759	191,8828
Science & engineering professionals	23	2132	207,2973	137,7535	311,9498
Health professionals	9	1198	144,3573	75,11033	277,4456
Teaching professionals	43	4136	199,7749	148,1602	269,3707
Business & administration professionals	49	3753	250,8826	189,613	331,9503
Information & Communication Professionals	1	169	0	-	-
Legal, social & cultural professionals	19	1213	300,9857	191,9832	471,8766
Science & engineering associate professionals	19	2325	157,0304	100,1616	246,1877
Health associate professionals	5	426	225,5348	93,87233	541,8628
Business & administration associate professiona	15	1748	164,8933	99,40759	273,5182
Legal, social, cultural associate professionals	6	865	133,2871	59,87979	296,6854
Information & communications technician	0	314	0	#NUM!	#NUM!
General & keyboard clerks	19	2530	144,3066	92,04571	226,2397
Customer services clerks	2	440	87,34346	21,84384	349,2463
Numerical & material recording clerks	4	360	213,5062	-	-
Other clerical support workers	0	158	0	#NUM!	#NUM!
Personal services workers	13	1845	135,3942	78,61671	233,1767
Sales workers	18	3715	93,10366	58,65877	147,7749
Personal care workers	2	180	0	-	-
Protective service workers & armed forces	34	14718	44,3898	31,71762	62,1249
Market-orientated skilled agricultural workers	4	1846	41,63719	15,6269	110,9405
Market-orientated skilled forestry workers	38	6196	117,8488	85,75108	161,9612
Subsistence farmers	19	1770	206,2687	131,5682	323,3821
Building & related trades workers	87	11006	151,8948	123,107	187,4144
Metal, machinery & related trades workers	54	7441	139,449	106,802	182,0755
Handicraft & printing workers	4	534	143,9368	54,02107	383,5133
Electrical & electronic trades worker	14	3175	84,73003	50,18108	143,0654
Food processing, wood working workers	5	960	100,081	41,65584	240,4516
Stationary plant & machine operators	66	12707	99,80538	78,41089	127,0374
Assemblers	2	69	556,9728	139,294	2227,078
Drivers & mobile plant operators	89	19973	85,62484	69,56182	105,3971
Cleaners & helpers	17	3492	93,54655	58,15369	150,4798
Agricultural, forestry & fishery labours	24	5176	89,09843	59,71949	132,9303
Labourers in mining, construction & manufacturi	17	4177	78,20554	48,61687	125,8021
Food preparation assistants	1	29	0	-	-
Street & related sales workers	0	275	0	#NUM!	#NUM!
Refuse workers & other elementary workers	155	34480	86,38086	73,79826	101,1088
Total	**4537**	**871810**			