Cause of death and premature mortality in Cape Town, 2001 - 2006

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Copies of the report

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Foreword

Estimation of the burden of disease and its disaggregation by demographic and spatial variables is essential in order to be able to carry out effective planning and implementation of targeted interventions, and to address inequities. As is evident from this report, this has relevance not just for the health sector but for all sectors concerned about development and the well-being of the community.

In our district it is HIV, TB, homicide and road traffic injuries that account for almost half of all the premature deaths. Only by advocating for an integrated, multi-sectoral approach will these components of the burden be successfully prevented. The health sector plays a critical role in the prevention of diseases through its preventative, promotive and curative interventions; however, often it can only intervene when disease is already evident. Global evidence shows that preventative efforts which take place in schools, workplaces and communities are just as important in addressing the burden of disease through the health services.

Partnerships are therefore very important in reducing the burden of disease. It gives us great pleasure to present this report, which is the result of a partnership between the City of Cape Town, Western Cape Department of Health, Medical Research Council and University of Cape Town within the Western Cape Burden of Disease Reduction project, where other partners are also involved.

This report highlights the geographical areas and demographic groups that should be prioritized and targeted in the district. We are committed to ensuring that the results and recommendations of this report feed into the integrated planning and decision-making cycle of City Health and Metro District Health Services in the Provincial Government. We are also committed to advocating for appropriate action within the broader provincial government and the City of Cape Town to effectively address this burden.

We would like to thank all our staff, the Medical Research Council Burden of Disease Research Unit and the School of Public Health of the University of Cape Town, without whom this report would not have been possible. We would also like to thank the Department of Home Affairs, which graciously allowed us to access the death notification forms from their offices.

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Abstract

Mortality surveillance is a central aspect of the information required to identify the health needs of a community, monitor progress in the implementation of programmes and track changes over time. Although cause of death data have been collected in the Cape Town Metropole for more than 100 years, the system has been revamped in recent years to provide the City with more relevant information. The first report covered data for the year 2001 and provided insight into the mortality differentials between sub-districts as well as identifying the major causes of premature mortality, which were characterized as a quadruple burden of disease (infectious diseases; injuries, especially among young adults; non-communicable diseases later in life; and the growing HIV/AIDS epidemic). The second report covered a detailed analysis of the cause of death data for the Cape Town Metropole for the period 2001 to 2004. This is the third report and covers the period 2001 to 2006 (data for 2005 omitted since they were incomplete).

The information in this report has been collected directly from the local offices of the Department of Home Affairs and supplemented by information collected from the local mortuaries. The cause of death coding was done by trained clerks at the City of Cape Town. Deaths were analysed by age, cause and gender for 8 new sub-districts from 2003 until 2006. Premature mortality and age-standardised rates were calculated and compared across sub-districts. Temporal trends are given for major cause groupings. Up-to-date population estimates for each sub-district and estimates of the completeness of death registration were calculated.

Key findings and recommendations:

- HIV/AIDS mortality has increased dramatically since 2001; however, it appears to have stabilised since 2004, possibly demonstrating the impact of the prevention of mother-to-child transmission (PMTCT) and antiretroviral (ARV) programmes. It remains a leading cause of premature mortality across sub-districts, highlighting the need to strengthen intersectoral prevention

strategies and to continue to strengthen the health service response. HIV/AIDS is particularly high in the sub-district of Khayelitsha and is accompanied by very high TB mortality.

- Injury-related mortality remains extremely high. Although there was evidence of a declining trend until 2004, there was an increase until 2006. Furthermore, injury mortality rates - particularly homicide and road traffic injuries - are still among the highest in the world, particularly for men. Of particular concern are the high homicide and road traffic injury fatality rates among the male youth. Urgent attention needs to be given to identifying and implementing strategies to prevent injuries. Interventions to address the high burden of violence and homicide must be planned, implemented, monitored and evaluated multi-sectorally. National Injury Mortality Surveillance System (NIMSS) data for Cape Town confirm a strong association between alcohol and fatal injuries. Other substances of abuse are also likely to be important contributors, but routine data were not collected.

- Mortality rates due to non-communicable diseases are high, with variations along the lines of the epidemiological transition. Non-communicable diseases account for a high proportion of premature mortality, particularly among adult women. Smoking rates are particularly high in the coloured population, especially among females. The emerging epidemic of non-communicable diseases must be tackled through strengthening primary care management, promoting healthy lifestyles and addressing upstream risk factors, the “cause of causes”.

- Child mortality appears to have remained constant over this period, but there was a noticeable increase in mortality from low birthweight until 2004 that needs further investigation. There is a suggestion that child mortality due to HIV/AIDS has started decreasing (however, this study period covers only the beginning of the full-scale PMTCT roll-out).

- During this period the mortality differentials between sub-districts remained fairly static. Given the current sub-district boundaries, Khayelitsha stands out as having the highest rates of premature mortality. Trends indicate that although child mortality has improved and HIV/AIDS mortality may have decreased, mortality from interpersonal violence has increased. However, it is likely that some other suburbs, such as Nyanga and Gugulethu, experience similarly high mortality. Equity must be prioritised in resource allocation between the sub-districts to address the greatest needs.

- The continued success and improvement of this mortality surveillance system depends on departments from the various spheres of government collaborating to ensure the availability of quality information that can influence decision making.

Introduction

Cause of death data form an essential component of the health information system. Such data are required to identify the health needs of a community, monitor progress in the implementation of programmes and track changes over time. They need to be timeous, reliable and relevant. In the context of limited resources and disparities, sub-population data become critical to identify and monitor inequalities in health status and to inform the process of prioritisation of interventions, services and research at a local level.

The City of Cape Town has collected cause of death statistics for more than 100 years as part of its public health programme. An evaluation of the statistical system identified the need for standardization of the coding and a more public health-oriented analysis of the statistics. The first report on the cause of death and premature mortality study done in the Cape Town Metropole in 2001[1] highlighted the fact that HIV/AIDS had created a quadruple burden of disease together with injuries, the degenerative, chronic diseases and childhood illnesses and other infectious diseases, particularly tuberculosis (TB). There were marked variations in the levels of mortality across the city, with some sub-districts having rates that were twice as high as others. These disparities reflected socio-economic differences embedded in the city.

The collection of cause of death statistics developed in the City of Cape Town has been extended to the Boland/Overberg region and has played an important role in monitoring and planning for that health region.[2] This region has since been sub-divided into Overberg district and the eastern part of Cape Winelands. As part of the collaborative Burden of Disease Reduction Project initiated by the Western Cape Provincial Government, the surveillance system is currently being implemented in the other health districts of the province in a process to cover mortality in all the health districts of the Western Cape, using a common methodology of data collection and analysis.

A second mortality report for the City of Cape Town covered a detailed analysis of the cause of death data for the period 2001 to 2004[3] and incorporated an assessment of the priority programmes. This third report presents the key findings from the trend analysis of the cause of death statistics for Cape Town Metropole for 2001 until 2006 and the 8 new sub-districts for 2003-2006. Analysis of the trend in causes of death and premature mortality focuses on the five programme priorities that have been identified by the City of Cape Town and the Provincial Department of Health[4] in line with National Policy.[5] These include:

HIV/AIDS
TB
Chronic Diseases
Child Health
Woman's Health.

Methods and data quality

Cause of death data

Cape Town has a well established system of routinely compiling cause of death statistics. The City of Cape Town Health Department regularly collects copies of death certificates from the regional offices of the Department of Home Affairs that fall in the City. These include the offices of Bellville, Cape Town, Wynberg, Khayelitsha, Mitchell's Plain and Nyanga. The underlying cause of death is identified and coded using a shortlist based on ICD-10[6] (Table 2 –web version only, http://www.who.int/bulletin) including the most prevalent conditions in Cape Town, as well as diseases of public health importance. The list also allows for the capture of selected combinations of diseases such as diabetes and ischaemic heart disease (IHD), which are difficult to attribute to a single cause. Deaths attributed to HIV on the death certificates or obvious euphemisms for AIDS were coded to HIV as the underlying cause. The combination of HIV and TB on the death certificate was captured as a combination but analysed with HIV as underlying cause for general comparison. Similarly, when diabetes was recorded in association with a cardiovascular co-morbidity, diabetes was identified as the underlying cause in the general analysis.

The data were captured into a customized data base. The mortality data for 2001 - 2006 were extracted, cleaned and analysed using Microsoft Excel and Stata software. Stillbirths and duplicate records were excluded prior to any analysis. The completeness of death registration for adults in the City of Cape Town during the period 2001 until 2006 was estimated to be 96%, with the exception of 2005 where the completeness was 84%, about 55% for children 0 – 4 years, and about 70% for infants (see Appendix 1).[7] The total number of injury deaths registered by the City of Cape Town comprised more than 90% of the injury fatalities reported by the National Injury Mortality Surveillance System (NIMSS)[8] for the City of Cape Town for all the years under study except 2003, where only 84% of the injury deaths reported by NIMSS were registered by the City of Cape Town (see Appendix 2). One would expect the NIMSS to have slightly more

deaths registered than the City of Cape Town, since the City only registers deaths for residents whereas NIMSS registers all injury deaths occurring in the Cape Town Metro District. However, there were variations in the profile of the manner of death. Homicide deaths registered on the City system accounted for more than 90% of the homicide deaths registered on NIMSS, and are therefore likely to be fairly complete. However, the number of deaths due to road traffic injuries and suicide were lower (approximately 80% of NIMSS deaths), while deaths due to unintentional injuries in the City system were higher than the number reported by NIMSS.

After cleaning, the shortlist cause of death codes were aggregated according to the South African National Burden of Disease Study,[9] based on an adapted version of the 1990 Global Burden of Disease Study.[10] The Groups are:

> **Group I:** the pre-transitional causes - communicable diseases, maternal causes, perinatal conditions, and nutritional deficiencies. (HIV/AIDS is part of Group I but is kept separate in the South African National Burden of Disease analysis due to the size of the burden that it contributes in South Africa.)
>
> **Group II:** the non-communicable causes.
>
> **Group III:** the injuries.

Missing and ill-defined information

The deaths at unknown ages were redistributed proportionally by age and sex for each cause of death. The ill-defined cardiovascular deaths (e.g. heart failure) were redistributed by age and sex across rheumatic heart disease, IHD, hypertensive heart diseases, pulmonary heart diseases and other cardiovascular diseases. The ill-defined respiratory deaths (respiratory failure) were redistributed proportionally by age and sex across COPD, asthma and other respiratory diseases. The deaths coded to ill-defined natural causes were redistributed proportionally by age and sex across all pre-transitional and non-

communicable causes. The ill-defined injury deaths were redistributed proportionally by age and sex across all intentional and unintentional causes.

Old, interim and new sub-districts

The data were analysed for each of the 8 current health sub-districts within the Cape Town Metro District as shown in the map in Figure 1. The boundaries of the sub-districts have been changed twice since 2001 and will be referred to as “old”, “interim” and “new”. The old health boundaries are shown in Figure 2. Preliminary analysis of the death data by the 11 old and the 8 new sub-districts suggested that the new sub-district configuration masks some of the inequities in mortality rates that were evident using the old boundaries. This is illustrated in Figure 3, which shows the premature mortality rates in 2004 across old sub-districts and the new sub-districts. In the old sub-districts, Nyanga and Khayelitsha had the highest premature mortality rates. Based on the new boundaries, the former Nyanga sub-district is divided between the new sub-districts of Klipfontein and Mitchell’s Plain, making the rates for these sub-districts higher. Table 1 shows the socio-economic conditions across sub-districts using old and new boundaries.

Deaths were allocated to health sub-districts on the basis of the residential address of the decedent. For this reason, amongst others, these data are not suitable for analysis at facility level.

Population estimates for the health sub-districts

Population Censuses were conducted by Statistics South Africa in 1996 and 2001, making it necessary to use projected population estimates for the years 2001 - 2006. It was decided against using the population estimates and projections from the provincial Department of Health, since although based on the official statistics from StatsSA, these had not adjusted for undercount in specific age groups, and those currently available have not adjusted for the 2007 community survey which showed that the previous estimates were far too low. Alternative estimates were used that are consistent with the annual estimates of the total population for the Cape Town Metropole from the demographic projections

undertaken by the University of Cape Town Centre for Actuarial Research for the City of Cape Town.[11] These yearly estimates were projected using the ASSA (Actuarial Society of South Africa) model from 1985 to 2010, having made adjustment to the 1996 and 2001 Census data and allowing for the impact of AIDS.

Sub-district population estimates for new boundaries were estimated from the estimates derived for the interim sub-districts. The populations by age and sex for each of the interim health sub-districts were obtained from the community profile data sets for the 1996 and 2001 Census and adjusted proportionately to match the total population estimates derived by Dorrington[11] for these years. It should be noted that the 1996 Census had unspecified ages by sex which were reapportioned to all the ages above 20, based on the assumption that age reporting below 20 is more accurately and completely reported. The populations in the interim health sub-districts were then interpolated and projected by age and sex to 2010 using the ratio method, assuming an exponential rate of change in the percentage distributions between the two Censuses and the percentage distributions to approach a stable condition after 60 years from 2001 (i.e. equilibrium is reached and that there is no further inter-district migration). The distribution of the population by age was projected by interpolating between 1996 and 2001, and extrapolating after 2001. The population was effectively adjusted, on a pro rata basis, so that the sum of the projected population by age and sex in the 8 interim health sub-districts equalled the projected total population for the Cape Town Metropole in the ASSA model.

The populations for the new health sub-districts were estimated from those of the interim health sub-districts, based on an extrapolation of the proportional composition of the new health districts when compared to the interim sub-districts (by age and sex group). The common Census sub-place names were identified for each of the new health sub-districts compared to the interim health sub-districts to calculate the proportions in 1996 and 2001 for each age and sex group. These proportions were extrapolated beyond 2001 and used to estimate

the new health sub-districts from the estimates of the interim health sub-districts.

Figure 1: New health sub-districts of Cape Town

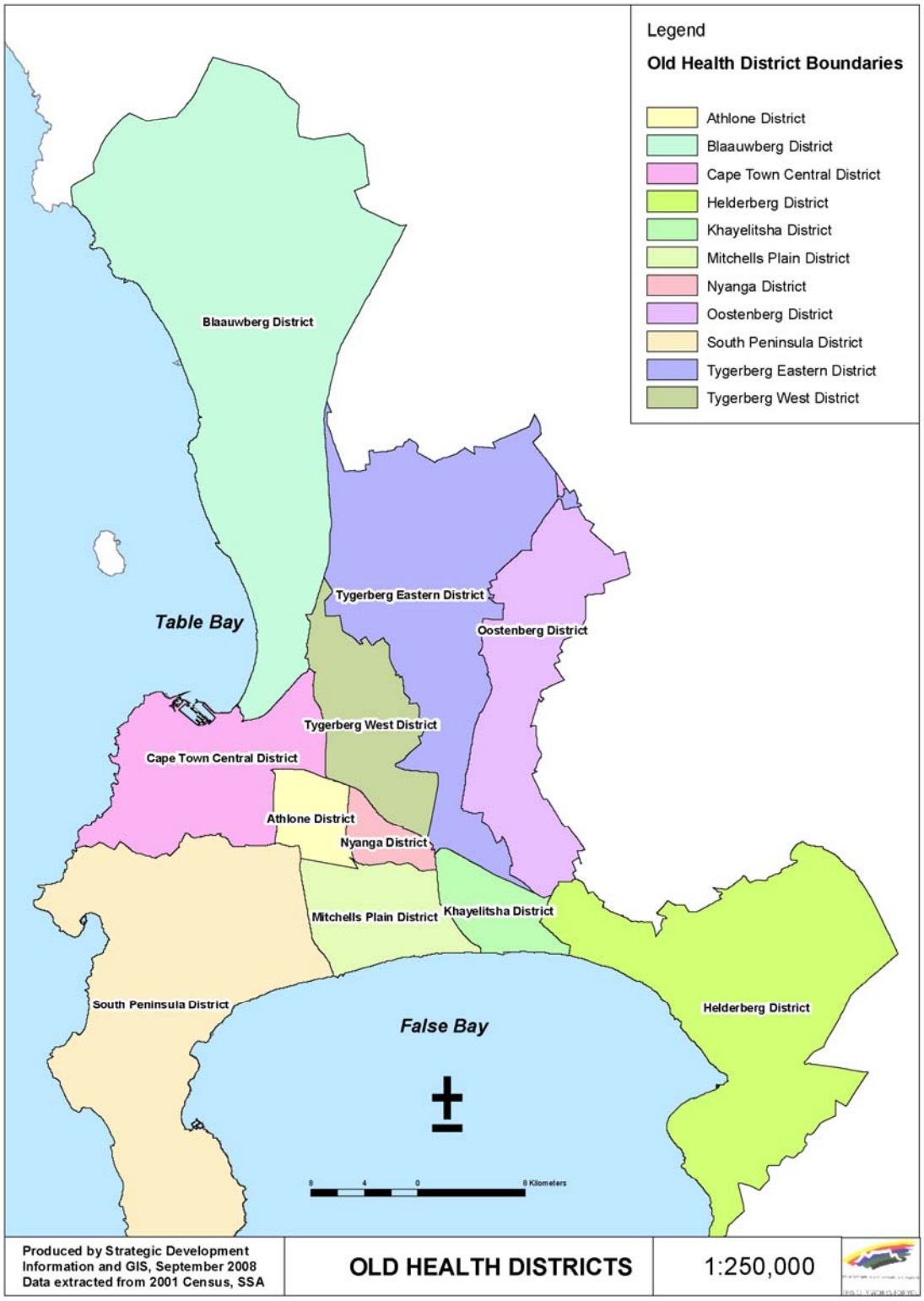
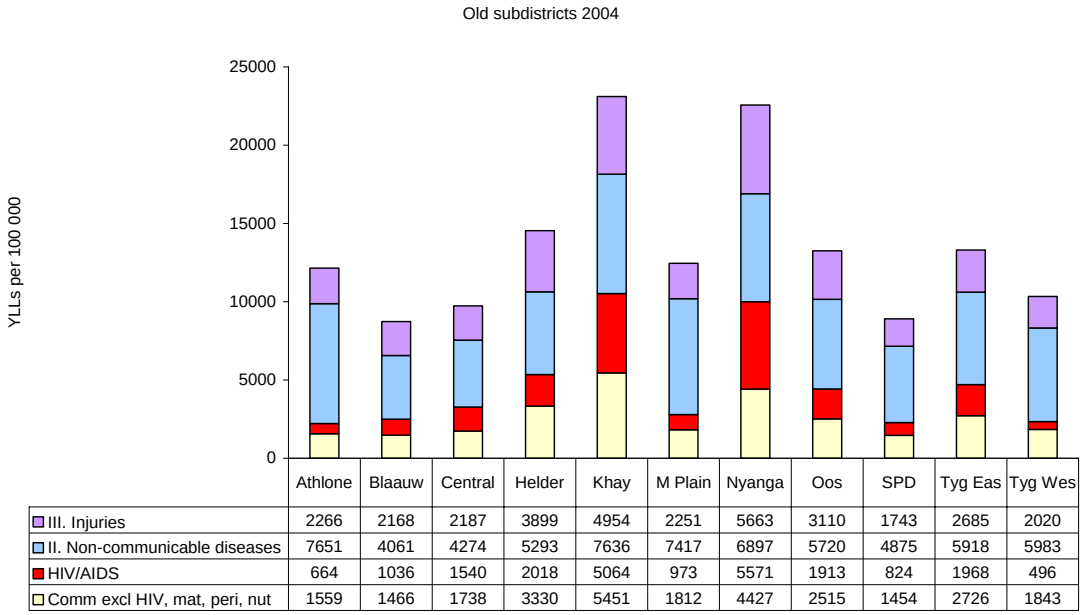
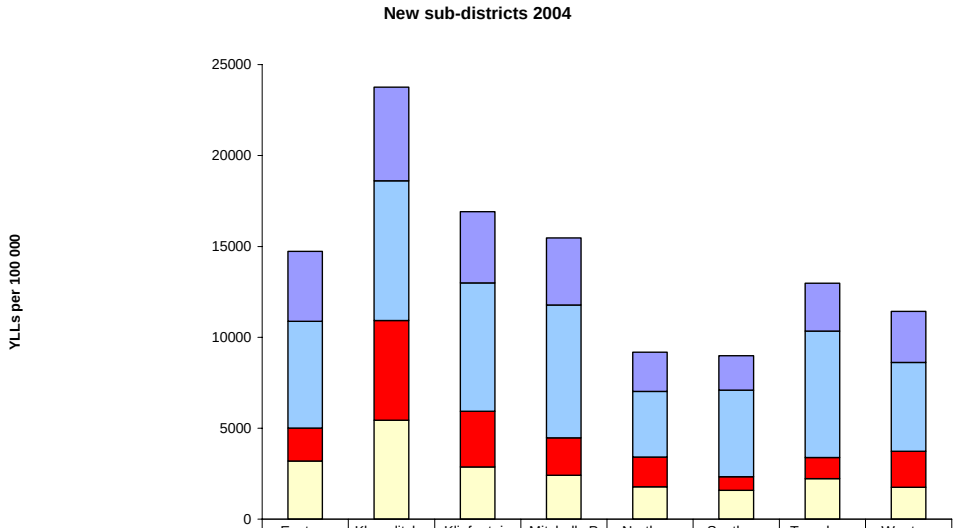


Figure 2: Old health sub-districts of Cape Town



	Athlone	Blaauw	Central	Helder	Khay	M Plain	Nyanga	Oos	SPD	Tyg Eas	Tyg Wes
III. Injuries	2266	2168	2187	3899	4954	2251	5663	3110	1743	2685	2020
II. Non-communicable diseases	7651	4061	4274	5293	7636	7417	6897	5720	4875	5918	5983
HIV/AIDS	664	1036	1540	2018	5064	973	5571	1913	824	1968	496
Comm excl HIV, mat, peri, nut	1559	1466	1738	3330	5451	1812	4427	2515	1454	2726	1843



	Eastern	Khayelitsha	Klipfontein	Mitchells P	Northern	Southern	Tygerberg	Western
I. Other comm, mat, peri and nut	3848	5145	3917	3687	2165	1891	2630	2806
II. Non-communicable diseases	5869	7689	7064	7308	3602	4762	6955	4877
HIV/AIDS	1813	5487	3060	2063	1636	751	1159	1991
I. Other comm, mat, peri and nut	3202.4	5439.8	2873.4	2411.6	1783.9	1582.9	2228.8	1751.8

Figure 3: Comparison of premature mortality rates by cause group across old and new sub-districts, Cape Town 2004

Table 1: Socio-economic indicators for Cape Town by old and interim sub-districts (%)[12,13]

SUB-DISTRICT	Not on Medical Aid	Informal dwelling	No electricity	No piped water in dwelling or on site	Not completed Matric	Unemployed or the employable	Households below poverty line
Old sub-districts							
Athlone	75	4	1	1	75	25	24
Blaauwberg	57	8	9	6	64	20	24
Central	52	7	9	5	44	17	21
Helderberg	66	14	8	8	57	18	18
Khayelitsha	97	80	32	26	86	47	55
Mitchell's Plain	81	6	4	5	80	24	18
Nyanga	97	64	54	29	85	50	57
Oostenberg	57	18	13	11	67	20	18
South	52	8	5	4	60	17	16
Tygerberg	55	7	6	5	54	18	16
Tygerberg	68	4	2	1	69	22	17
Interim sub-districts							
Central	45	6	7	4	8	16	19
Eastern	70	14	9	8	16	20	18
Khayelitsha	99	80	32	26	26	47	55
Klipfontein	84	23	20	15	20	36	37
Mitchell's Plain	88	41	23	21	20	33	30
N. Panorama	41	12	10	9	16	18	20
Southern	58	10	7	5	15	19	17
Tygerberg	49	4	2	0	15	22	17
Total	69	20	13	10	17	26	25

Results

Overview of mortality in Cape Town

The age pattern of deaths in Cape Town in 2006 is shown for males and females in Figure 4. This pattern is very similar to that observed in 2001,[1] and is typical of the quadruple burden of disease experienced by societies undergoing a transition in their mortality patterns[9]: infectious disease mortality, primarily among young children; high levels of mortality due to violence and injuries among young adults; non-communicable diseases later in life; and the growing HIV/AIDS epidemic impacting on young adults and young children. There are considerable gender differences, with young adult males experiencing much larger numbers of deaths than females, mainly due to violence and injuries. HIV/AIDS accounts for a large proportion of deaths in young women.

Age-standardised rates

Figure 5 shows the trend in the age-standardised mortality rates. Please note that data were incomplete during 2005, so these data were excluded. The overall age-standardised mortality rate for females decreased slightly between 2001 and 2006. However, among women there was an increase in HIV/AIDS and other group I cause mortality and a decrease in the non-communicable disease death rate. The overall age-standardised mortality rate for males is much higher than that for females and declined slightly during this period. The death rates from injuries for men decreased markedly between 2002 and 2004 but increased again in 2006. Mortality from non-communicable disease decreased, while there was an increase in HIV/AIDS mortality rates.

Age standardisation. A technique which eliminates differences in observed mortality rates caused by differences in the age structure of the population in different areas.

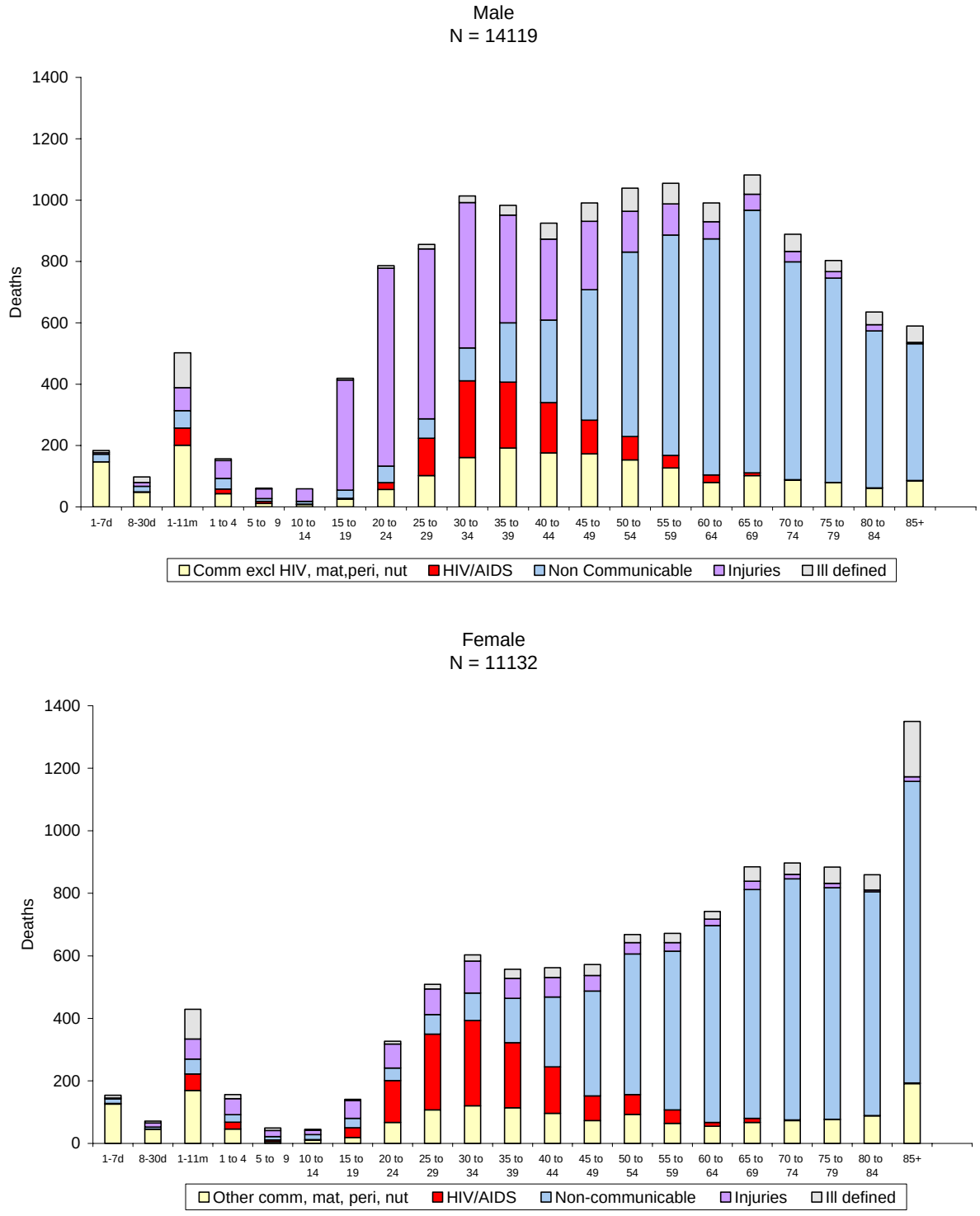
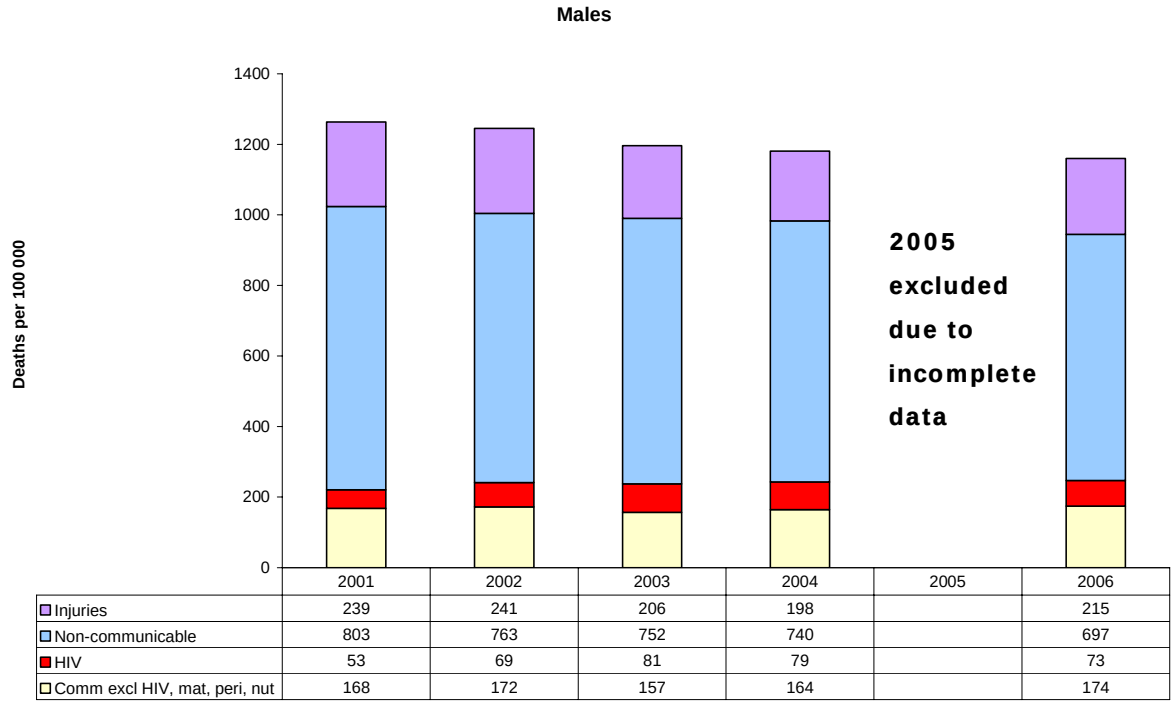
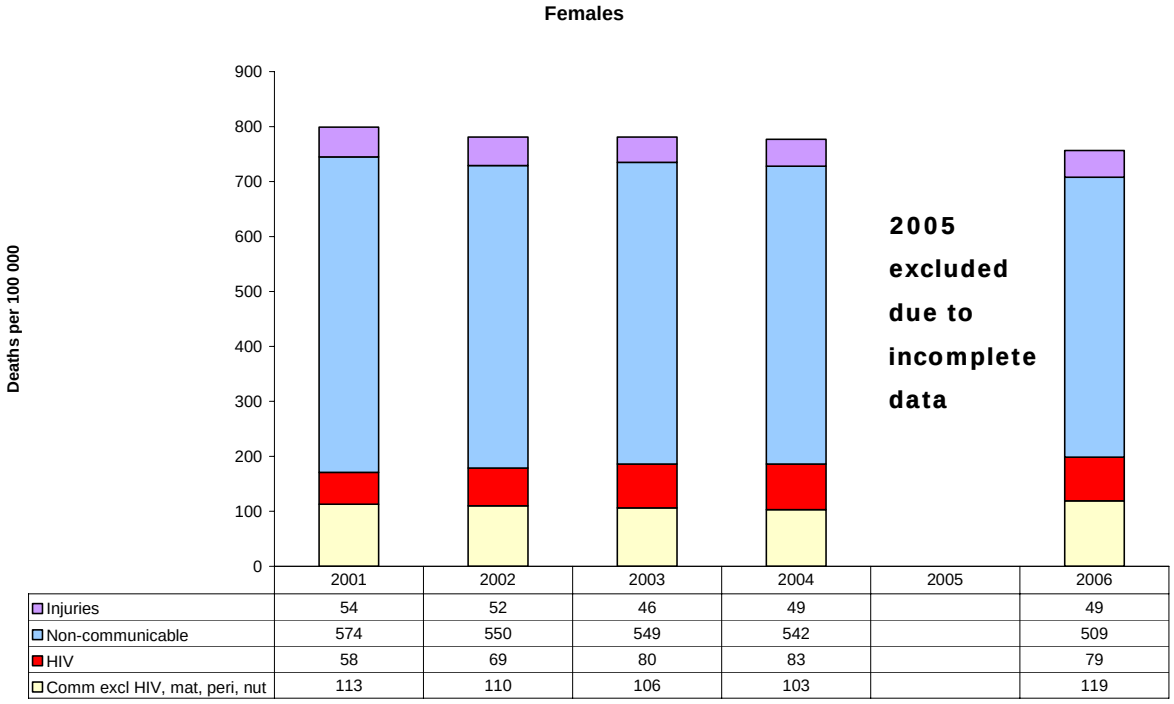


Figure 4: Age distribution of deaths by cause group and gender, Cape Town, 2006



	2001	2002	2003	2004	2005	2006
Injuries	239	241	206	198		215
Non-communicable	803	763	752	740		697
HIV	53	69	81	79		73
Comm excl HIV, mat, peri, nut	168	172	157	164		174



	2001	2002	2003	2004	2005	2006
Injuries	54	52	46	49		49
Non-communicable	574	550	549	542		509
HIV	58	69	80	83		79
Comm excl HIV, mat, peri, nut	113	110	106	103		119

Figure 5: Age-standardised mortality rate by broad cause group by sex for Cape Town, 2001- 2006 (2005 excluded due to incomplete data)

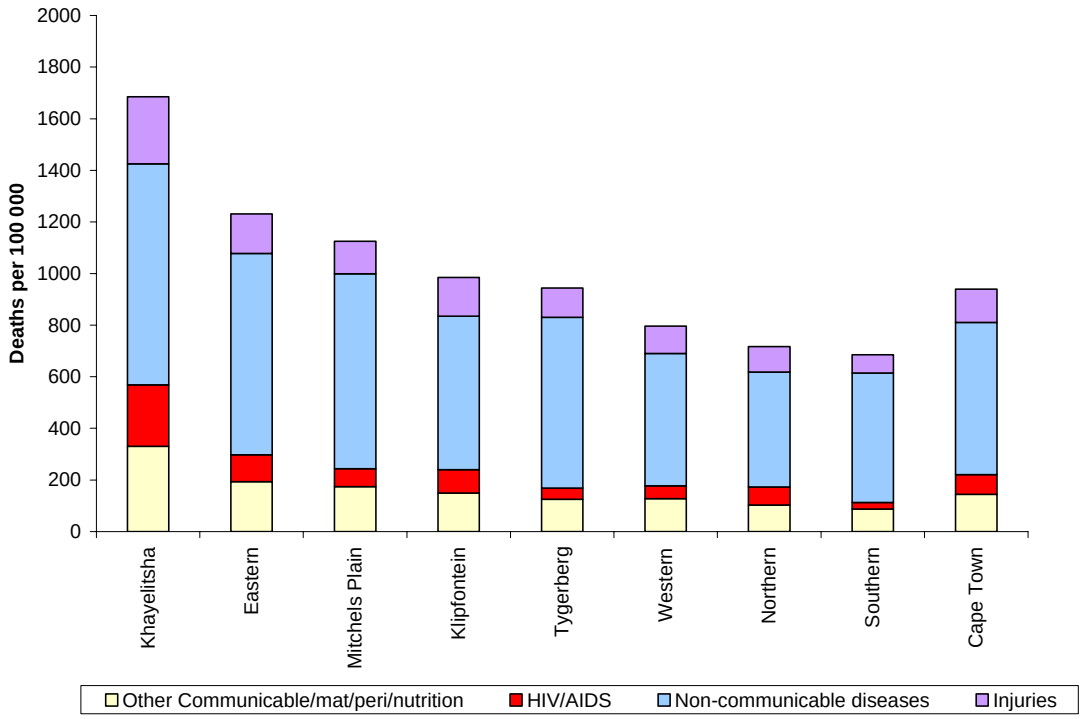


Figure 6: Age-standardised mortality rate for broad cause groups by sub-district, 2006

Figure 6 shows that mortality rates differed by health sub-district. The age-standardised mortality rate was lowest in Southern and highest in Khayelitsha by a factor of nearly 2.5. The rates for Khayelitsha were highest for all broad cause groups.

Trends in premature mortality

A comparison of the leading causes of premature deaths (for men and women) over the period 2001-2006 shows that since 2001 violent deaths have declined, but deaths due to HIV/AIDS have increased, with HIV/AIDS now replacing violence as the leading cause of death (see Figure 7). The four leading causes of death in Cape Town, namely homicide, HIV/AIDS, TB and road traffic injuries, accounted for 44.2% of all premature mortality in 2006.

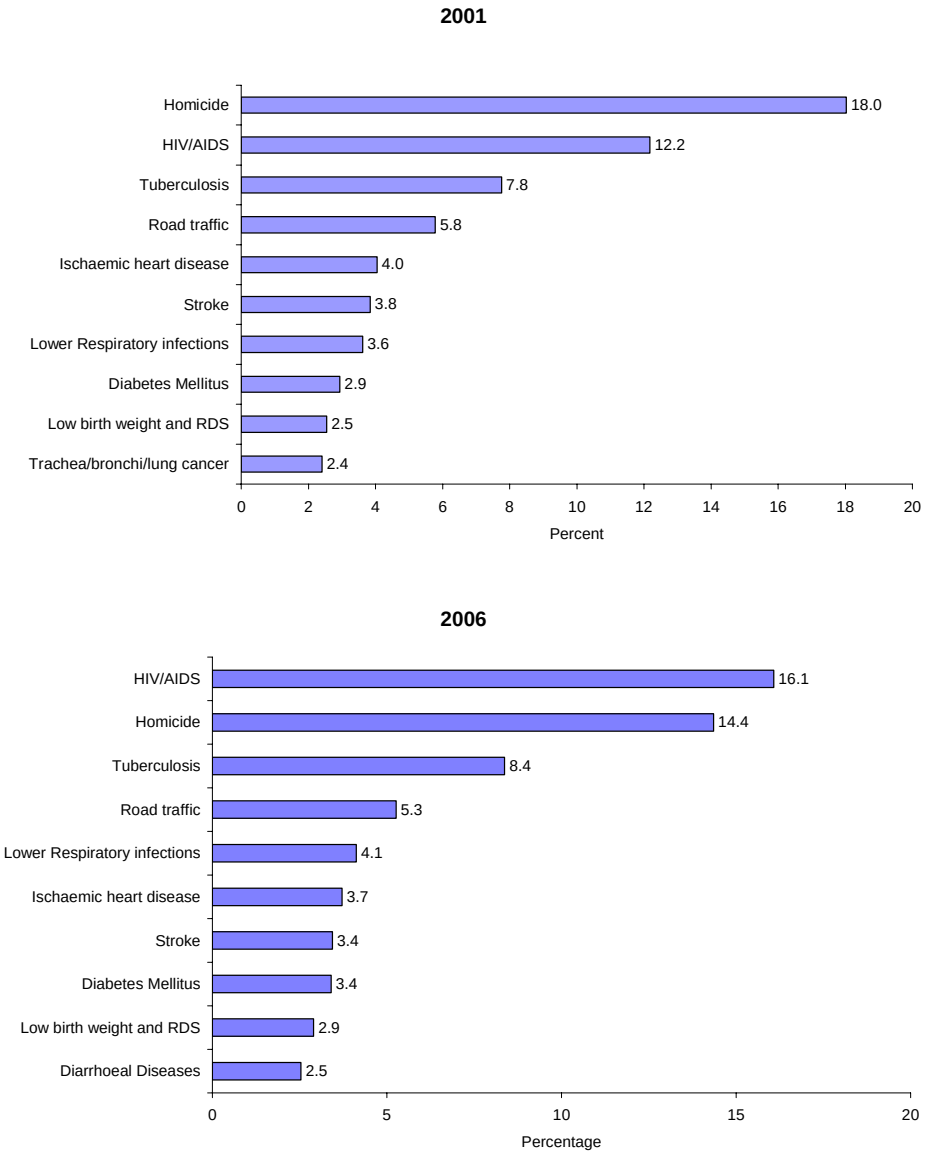


Figure 7: Top 10 causes of premature mortality (YLLs) for persons in Cape Town, 2001 and 2006

Figure 8 shows the leading causes of premature mortality for males and females in 2001 and 2006. Although homicide continued to be the leading cause of premature mortality for males, it accounted for a lower proportion in 2006 compared with 2001. HIV/AIDS remained the leading cause for females and accounted for an increasing proportion of the YLLs, with lower respiratory infections rising in the ranking of the causes of death.

YLL Years of life lost

Premature mortality has been estimated using the standard Global Burden of Disease (GBD) approach to calculate years of life lost (YLLs)[10]. Age weighting, time discounting of 3% per annum and standard life expectancies based on the West model levels 25 and 26 (considered to a maximum life expectancy) have been used. The younger the age of death the greater the years of life lost.

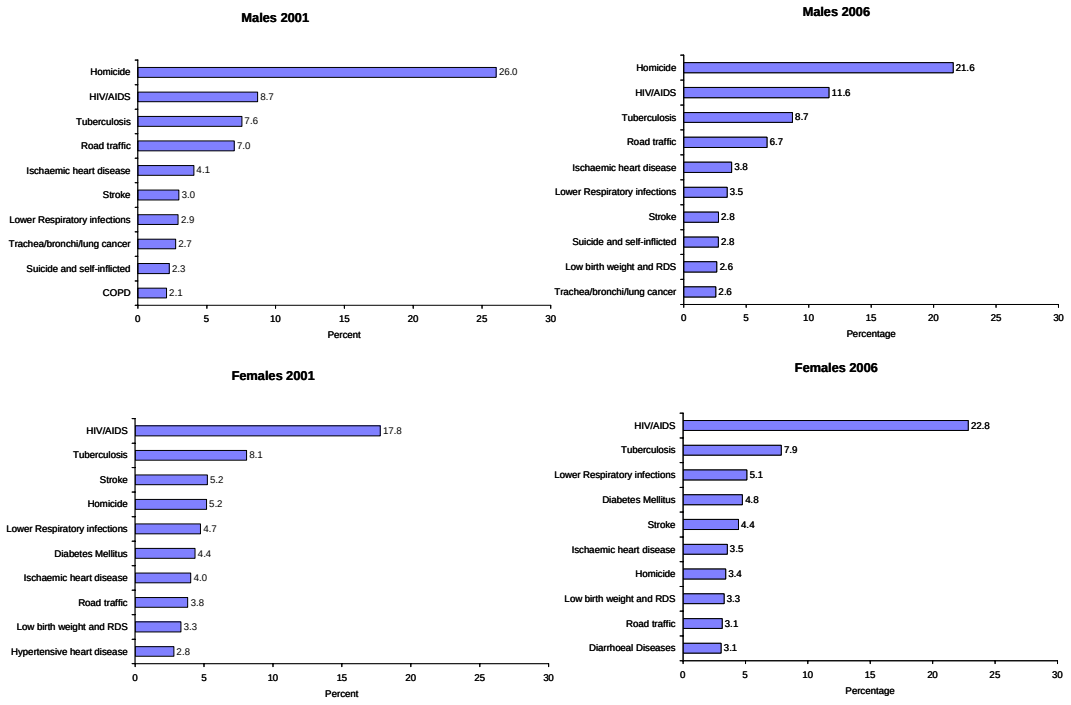


Figure 8: Top 10 causes of premature mortality (YLLs) by sex for Cape Town, for the years 2001 and 2006

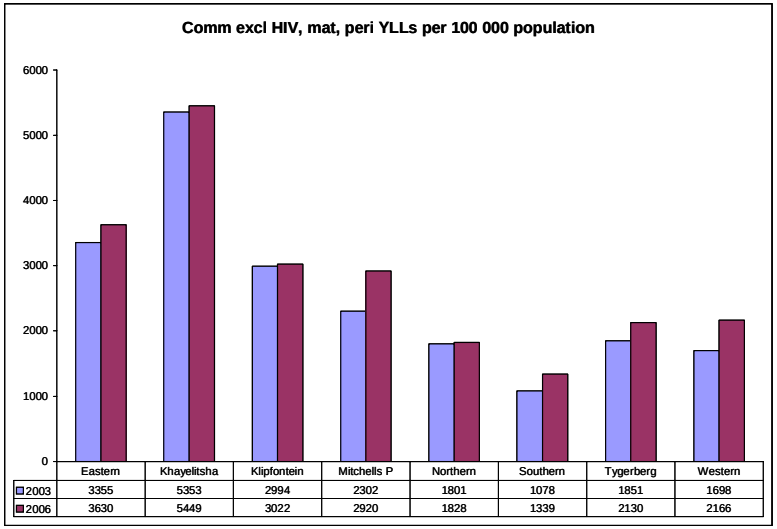
Sub-district variations

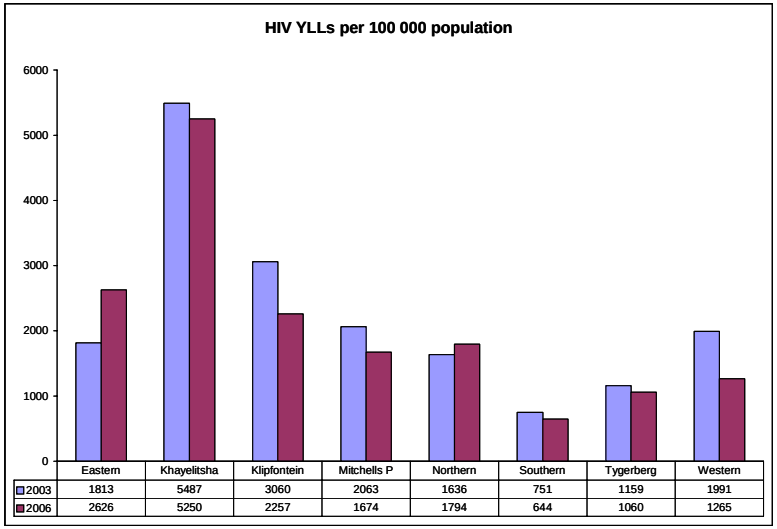
Table 2 shows the ranking of conditions based on YLLs for each health sub-district in 2006. HIV/AIDS ranked as the top cause of death in the Eastern, Khayelitsha, Southern and Western sub-districts. Homicide ranked second in all of these sub-districts, except in Southern where IHD ranked second and

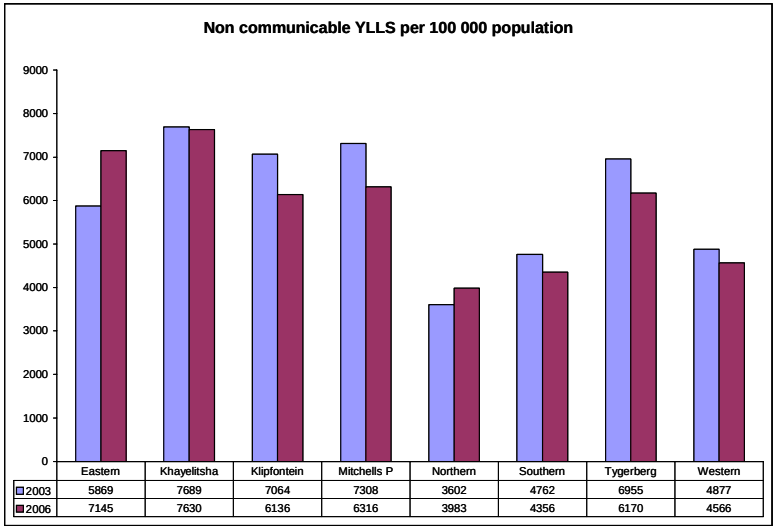
homicide third. Homicide ranked top in Klipfontein, Mitchell's Plain, Northern and Tygerberg with HIV/AIDS ranking second. In the majority of sub-districts TB ranked third and road traffic injuries fourth. Khayelitsha had the highest premature mortality rates for all three main cause groups compared to the other sub-districts (see Figure 9). This was particularly marked for poverty-related conditions, HIV and injuries. Figure 10 shows the change from 2003 to 2006 by health sub-district. It is difficult to interpret the increase or decrease in premature mortality due to poverty-related conditions and HIV since some of this may be due to misclassification of AIDS deaths. What is striking, however, is the marked increase in premature mortality due to injury in Khayelitsha between 2003 and 2006.

Table 2: Leading 10 causes of premature mortality (YLLs) for Cape Town and current sub-districts, 2006

Rank	Eastern	Khayelitsha	Klipfpntein	Mitchells Plain	Southern	Western	Tygerberg	Northern	Cape Town
1	HIV/AIDS (17.5%)	HIV/AIDS (25.7%)	Homicide (17.4%)	Homicide (17.7%)	HIV/AIDS (8.5%)	HIV/AIDS (13.1%)	Homicide (11.1%)	Homicide (17.0%)	HIV/AIDS (16.1%)
2	Homicide (11.8%)	Homicide (20.1%)	HIV/AIDS (15.7%)	HIV/AIDS (14.5%)	Ischaemic heart disease (7.6%)	Homicide (12.5%)	HIV/AIDS (9.7%)	HIV/AIDS (14.59%)	Homicide (14.4%)
3	Tuberculosis (9.73%)	Tuberculosis (.8%)	Tuberculosis (8.0%)	Tuberculosis (8.7%)	Homicide (7.2%)	Tuberculosis (8.3%)	Tuberculosis (7.6%)	Tuberculosis (8.6%)	Tuberculosis (8.4%)
4	Road traffic (5.1%)	Road traffic (6.3%)	Lower respiratory infection (5.0%)	Road traffic (5.9%)	Tuberculosis (6.2%)	Road traffic (5.4%)	Road traffic (6.1%)	Road traffic (6.0%)	Road traffic (5.3%)
5	Ischaemic heart disease (3.9%)	Lower respiratory infection (4.7%)	Road traffic (4.2%)	Lower respiratory infections (4.6%)	Stroke (5.3%)	Ischaemic heart disease (4.8%)	Diabetes mellitus (5.4%)	Ischaemic heart disease (5.5%)	Lower respiratory infections (4.1%)
6	Diarrhoeal diseases (3.6%)	Diarrhoeal diseases (3.5%)	Diabetes mellitus (3.8%)	Diabetes mellitus (3.9%)	Diabetes mellitus (4.2%)	Stroke (4.1%)	Ischaemic heart disease (4.9%)	Suicide (5.5%)	Ischaemic heart diseases (3.7%)
7	Lower respiratory infections (3.6%)	Low birth weight and RDS (2.5%)	Ischaemic heart disease (3.8%)	Low birth weight and RDS (3.6%)	Lower respiratory infection (4.2%)	Lower Respiratory infections (3.7%)	Stroke (4.8%)	Lung cancer (2.7%)	Stroke (3.4%)
8	Low birth weight and RDS (3.4%)	Fires (2.4%)	Stroke (3.4%)	Diarrhoeal diseases (3.4%)	Lung cancer (3.9%)	Low birth weight and RDS (3.7%)	Lung cancer (3.9%)	Stroke (2.6%)	Diabetes mellitus (3.4%)
9	Stroke (3.4%)	Stroke (1.8%)	Low birth weight and RDS (2.8%)	Ischaemic heart disease (2.8%)	Road traffic (3.6 %)	Diabetes mellitus (3.2%)	Lower respiratory infection (3.5%)	Diabetes mellitus (2.6%)	Low birth weight and RDS (2.9%)
10	Diabetes mellitus (2.9%)	Diabetes mellitus (.5%)	Lung cancer (.2%)	Stroke (2.5%)	Suicide (2.9%)	Lung cancer (2.6%)	COPD (3.4%)	Diarrhoeal diseases (2.4%)	Diarrhoeal diseases (2.5)







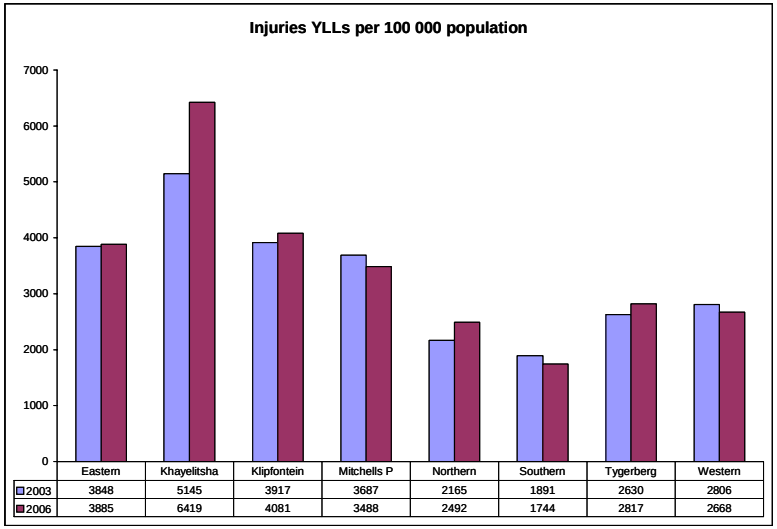
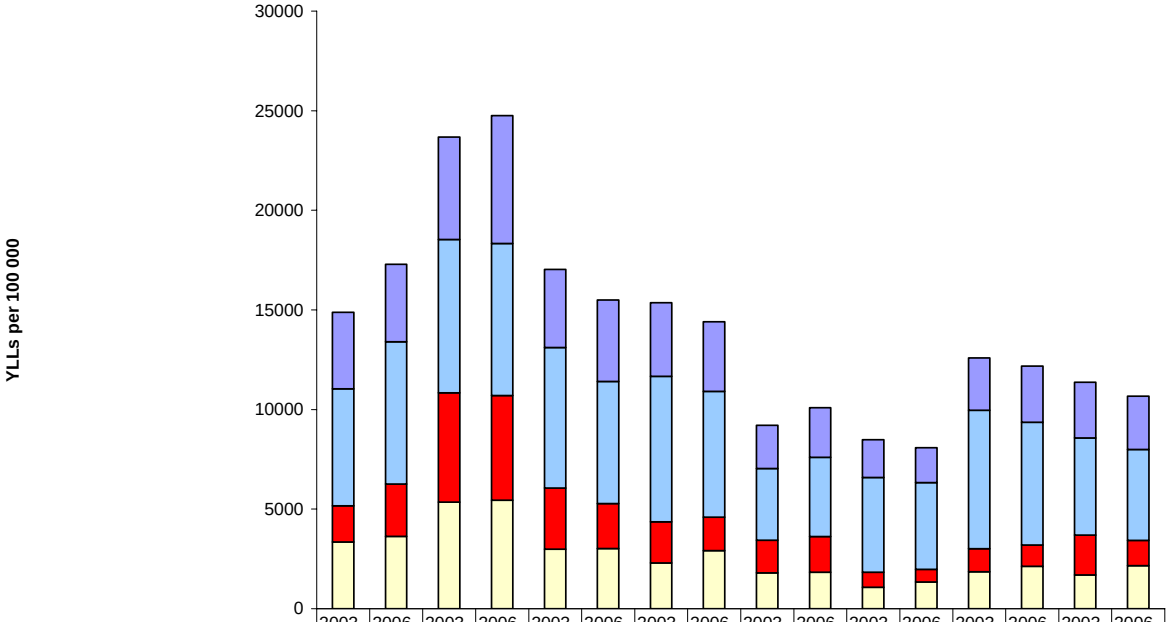


Figure 9: Age-standardised premature mortality rates per 100 000 by broad cause group for Cape Town sub-districts, 2003 and 2006



	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006
	Eastern		Khayelitsha		Klipfontein		Mitchels P		Northern		Southern		Tygerberg		Western	
III. Injuries	3848	3885	5145	6419	3917	4081	3687	3488	2165	2492	1891	1744	2630	2817	2806	2668
II. Non-communicable diseases	5869	7145	7689	7630	7064	6136	7308	6316	3602	3983	4762	4356	6955	6170	4877	4566
HIV/AIDS	1813	2626	5487	5250	3060	2257	2063	1674	1636	1794	751	644	1159	1060	1991	1265
I. Other comm, mat, peri and nut	3355	3630	5353	5449	2994	3022	2302	2920	1801	1828	1078	1339	1851	2130	1698	2166

Figure 10: YLLs per 100 000 by cause group and HIV/AIDS for Cape Town current sub-districts, 2003 and 2006

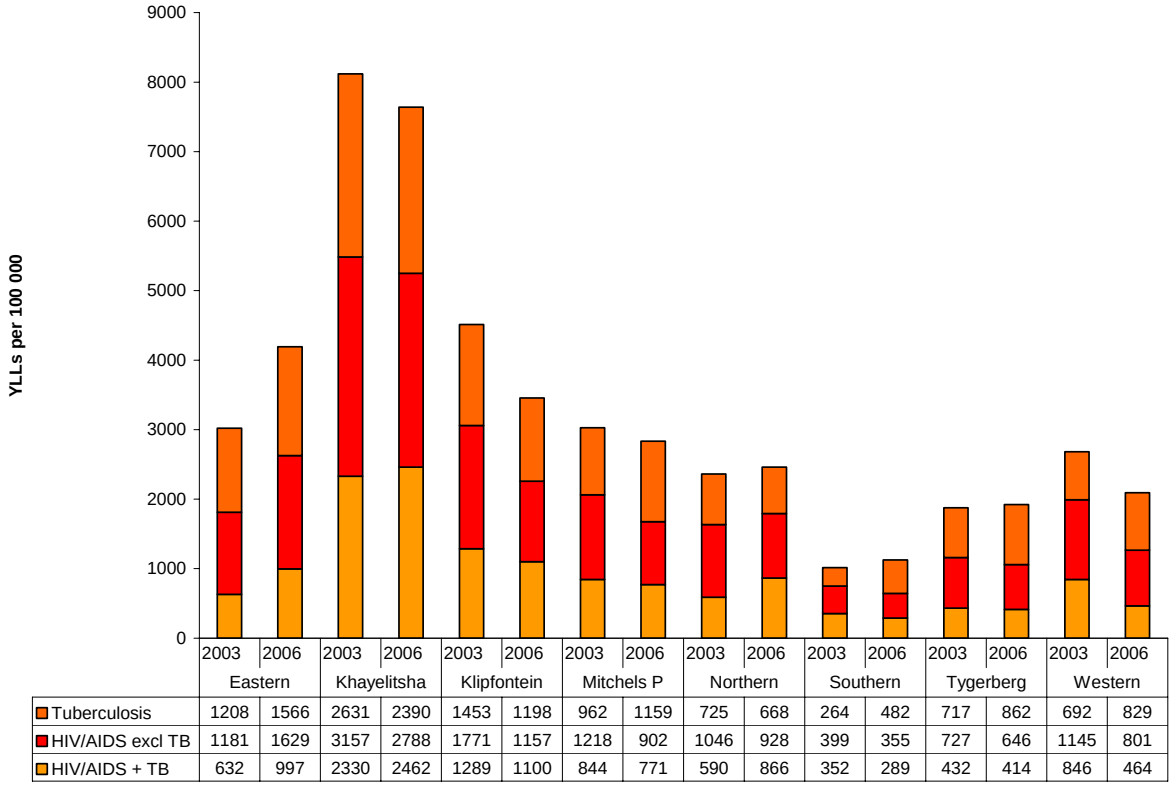
Important conditions

HIV and TB

The data for 2001 - 2006 show that HIV-related mortality has become the leading cause of premature mortality in the city, and that TB remains the third. HIV/AIDS and TB are closely linked. Aside from TB being one of the indicator conditions for AIDS, there is clear evidence that the TB epidemic is being fuelled by the HIV epidemic. These data therefore reflect the impact of the dual HIV/AIDS and TB epidemics in this province. Where HIV/AIDS and TB were reported on the death certificate, the underlying cause was assumed to be HIV/AIDS, in accordance with ICD 10 guidelines.[14] However, for TB programme purposes this co-morbidity was recorded, and has been reported in Figure 10 as "HIV/AIDS excluding TB" and "HIV/AIDS + TB". In the rest of the document figures reported for HIV/AIDS include both of the above. TB refers to deaths certified with TB as the underlying cause with no mention of HIV/AIDS.

Variation between sub-districts

As with HIV prevalence patterns, there is evidence of wide differentials in the HIV-related mortality rates by age, gender and geographical area.[15] The HIV-related premature mortality rates at the health sub-district level in the City of Cape Town vary in terms of both magnitude and trends (Figure 11). Premature mortality due to TB, HIV excluding TB and HIV/AIDS + TB were highest in Khayelitsha and lowest in Southern in 2006. The rates in Khayelitsha were almost 8x those in Southern. Eastern had the second highest premature mortality rates in 2006 followed by Klipfontein. In the majority of sub-districts the premature mortality rates for TB, HIV excluding TB and HIV + TB decreased between 2003 and 2006. In contrast, there was a marked increase in premature mortality rates for all three categories in Eastern. A slight increase in premature mortality rates for HIV/AIDS and TB was noted in Eastern and Northern between 2003 and 2006.



	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006	2003	2006
	Eastern		Khayelitsha		Klipfontein		Mitchels P		Northern		Southern		Tygerberg		Western	
Tuberculosis	1208	1566	2631	2390	1453	1198	962	1159	725	668	264	482	717	862	692	829
HIV/AIDS excl TB	1181	1629	3157	2788	1771	1157	1218	902	1046	928	399	355	727	646	1145	801
HIV/AIDS + TB	632	997	2330	2462	1289	1100	844	771	590	866	352	289	432	414	846	464

Figure 11: Age-standardised premature mortality rates for TB, HIV + TB and HIV for persons by sub-district, Cape Town, 2003 and 2006

Underlying cause of death. In accordance with ICD 10 guidelines[14], HIV/AIDS was selected as the underlying causes when both tuberculosis and HIV/AIDS appeared on the death certificate.

An examination of the top 10 causes of premature mortality across the health sub-districts revealed that 4 out of 8 health sub-districts in the Cape Metropole reported HIV/AIDS as the leading cause of premature mortality, with HIV/AIDS ranked second in the remaining 4 in 2006 (see Table 2).

Age and gender differences

Trends of age-specific deaths due to HIV/AIDS revealed a notable increase in mortality for both males and females for the period 2001 to 2004, with a slight decrease in 2006 (Figure 12). The decrease was particularly marked for children

but was absent in the case of older females over 55 years, for whom there was a slight increase. The highest rates were observed in women aged 25-34 years of age and in men, a decade older, at 35-44 years of age.

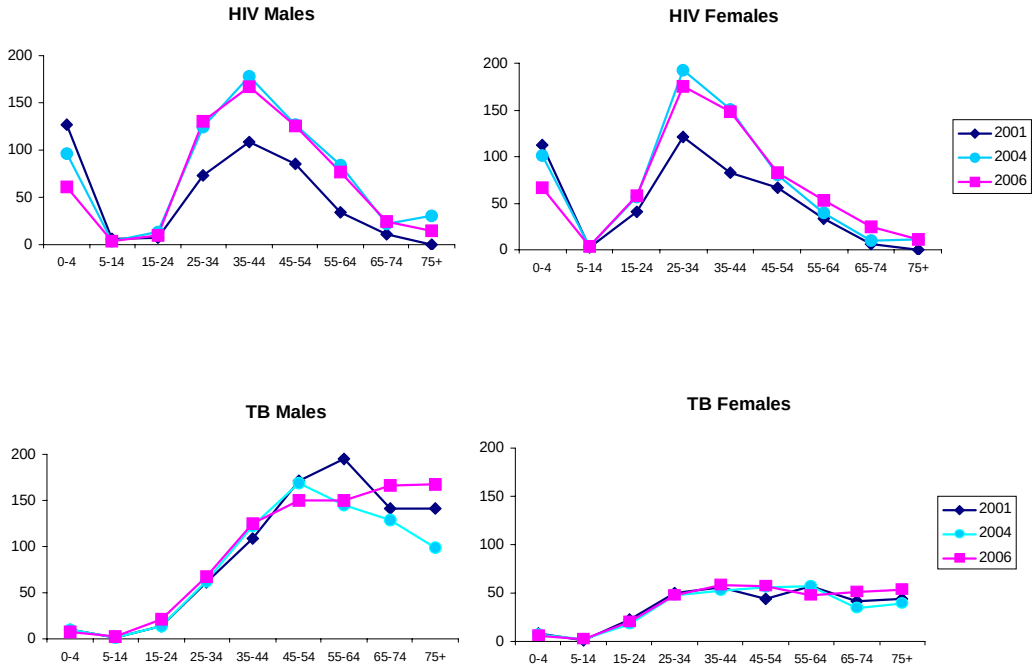


Figure 12: Age-specific death rates for HIV and TB by gender, Cape Town, 2001 and 2006

Figure 12 also shows the age-specific death rates due to TB. There are stark differences by gender. Adult TB mortality rates were higher for males than females. While there has been little change in the TB mortality rates for females, there was a decline in the older ages for men to a low in 2004, which has appeared to have reversed by 2006.

Injuries

Despite the dramatic increase in deaths due to HIV/AIDS between 2001 and 2004, deaths due to non-natural causes (i.e. violence and injuries) remain among the greatest contributors to premature mortality among Capetonians.

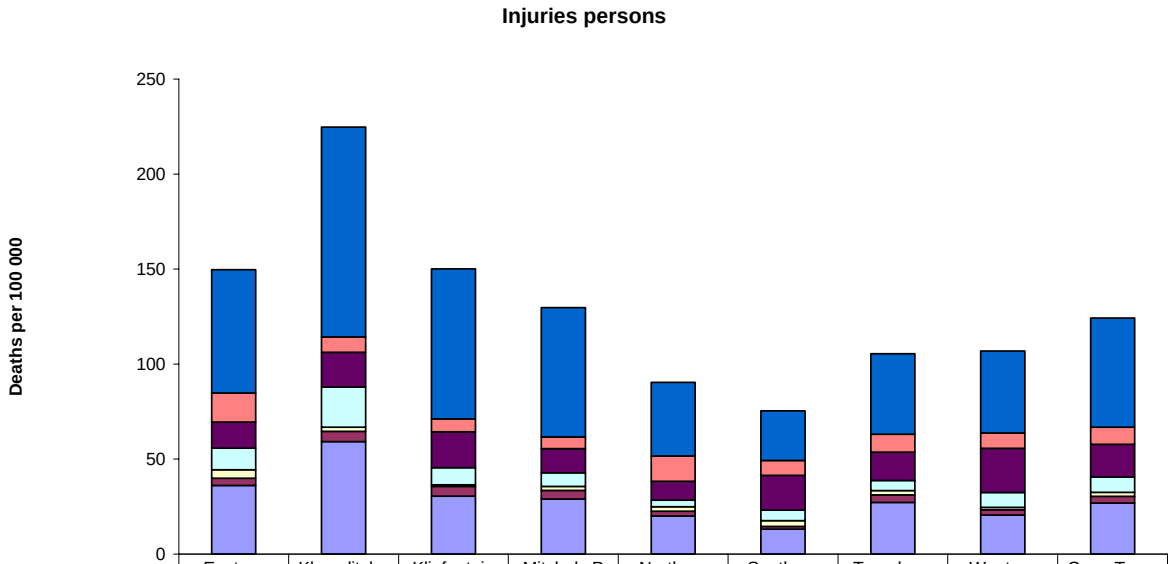
Although there is not a specific health programme to address injuries, it is clear that a co-ordinated effort is required across different sectors including health. The most common causes of injury in 2006 were homicide, accounting for 14.4% of YLLs in the city, road traffic injuries (5.3%), other unintentional injuries (3.2%), suicide (2.1%), fires (1.7%), and other transport (0.7%). Combined, these injury deaths accounted for 37.9% of YLLs among males and 12.8% among females.

The injury mortality rates in South Africa are approximately six times higher than the global average.[16] Homicide is eight times the global rate and road traffic injuries are double. Within South Africa, city-level comparisons from the NIMSS indicate that the proportions of non-natural deaths due to homicide in Cape Town and Durban are significantly higher than those in Johannesburg and Pretoria.[17]

Analysis of the data by sub-district indicates considerable disparities in the rates of fatal injuries across all categories (Figure 13). Most striking is the comparison of homicide rates - from the relatively low levels of under 26.1/100 000 population in Southern to 110.5/100 000 in Khayelitsha. These areas also correspond in terms of the lowest and highest rates of road traffic fatalities.

Deaths in the “other transport” category are also concentrated in three key sub-districts: Khayelitsha, Klipfontein and Mitchell’s Plain. The higher incidence of deaths from fires in Khayelitsha, Eastern and Klipfontein is probably a function of the housing stock and fuel usage patterns in these areas, which are characterised by large informal settlements.

There was little variation in suicide rates between six of the sub-districts, at between 6 and 10 per 100 000. However, the suicide rates in two sub-districts, Eastern and Northern, were much higher, at 15.4 and 13.3 per 100 000 respectively.



	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Homicide	64.9	110.5	79.0	68.0	38.7	26.1	42.3	43.1	57.5
Suicide	15.4	8.0	6.9	6.2	13.3	7.8	9.5	8.2	9.0
Other unint	13.6	18.4	18.8	12.7	10.0	18.3	14.9	23.2	17.2
Fires	11.4	21.1	9.1	7.1	3.5	5.6	5.3	7.8	8.0
Drowning	4.5	2.2	0.9	2.0	2.3	3.1	2.3	1.3	2.2
Other transport	3.9	5.4	5.1	4.6	2.6	1.4	3.9	2.7	3.5
Road Traffic	36.0	59.2	30.5	29.0	20.0	13.0	27.2	20.6	26.8

Figure 13: Age-standardised death rates (pooled estimates) due to injuries by sub-district, Cape Town 2003, 2004, 2006

Homicide remains the leading cause of premature mortality among males in Cape Town, but its contribution to total YLLs in the city has dropped from 26% in 2001 to 21.6% in 2006. Similarly, the contribution of homicide to premature mortality among females has dropped from 5.2% to 3.4%, and its rank dropped from fourth to seventh position between 2001 and 2006.

Data from the NIMSS for the Tygerberg, Salt River and Stellenbosch mortuaries combined are assessed, since this data source has almost complete coverage of injury fatalities in the Metropole, and can be used to assess the completeness of the data collected by the local authority. The numbers of injuries corresponded well, but NIMSS data has additional information such as scene of death, blood alcohol levels and use of firearms, which is useful for policy making. The NIMSS data indicate that the decrease in homicide between 2001 and 2004 is largely

due to the significant decrease in firearm-related homicides from 2002 to 2004, whereas non-firearm homicide rates have remained fairly stable (Figure 14).[8] Reasons for the decrease are uncertain, but heightened public awareness prior to the introduction of stricter gun control legislation and the effectiveness of targeted policing initiatives have been offered as possible contributing factors.

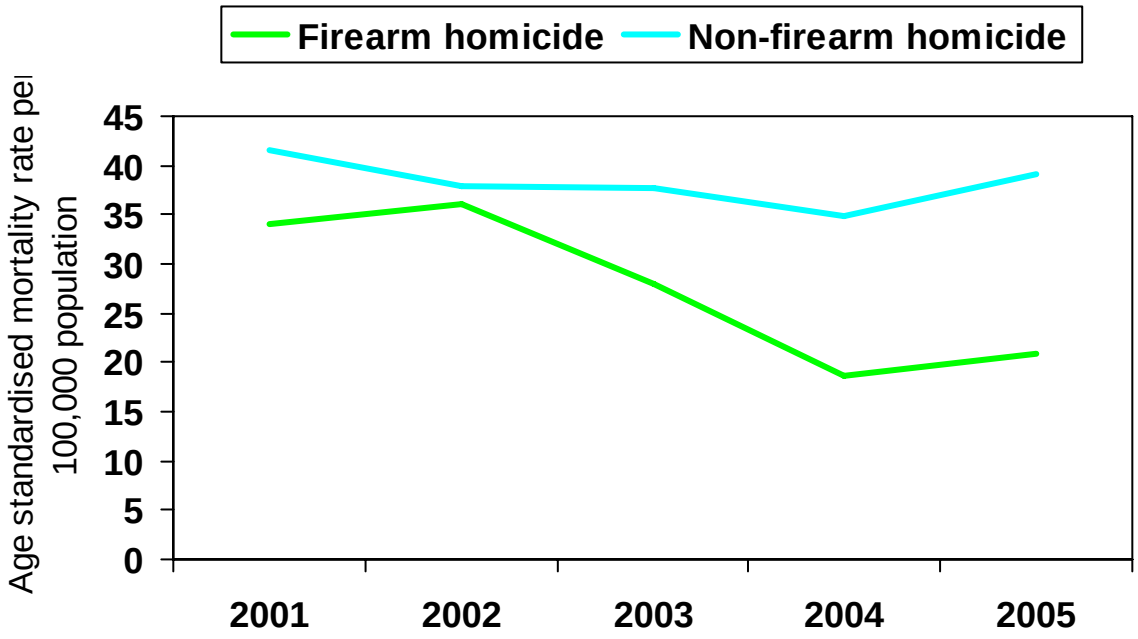
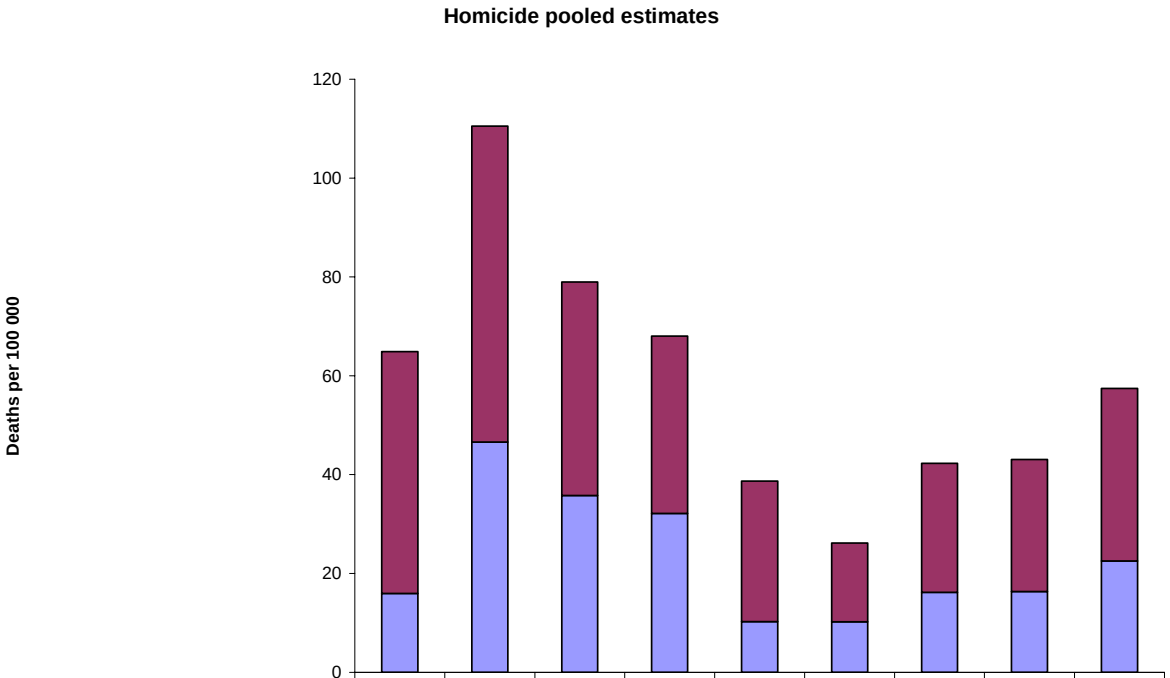


Figure 14: Firearm and non-firearm homicide rates in Cape Town, 2001 - 2005[8]

The analysis of homicide rates by sub-district has further implications for firearm control interventions. As well as the high rates of gun violence in the sub-districts already noted for high homicide rates (i.e. Khayelitsha and Klipfontein), a disproportionately large percentage of firearm homicides were recorded in Mitchell's Plain and Klipfontein (Figure 15).

The gender ratio of homicide in Cape Town is 9 male deaths for every female death, but homicide rates among females do not follow the same pattern as in males across sub-districts. In males the pattern is similar to that in Figure 14, where rates are highest in Khayelitsha followed by Klipfontein, Mitchell's Plain and then Eastern. The male homicide rates in Khayelitsha (204.8/100 000) are

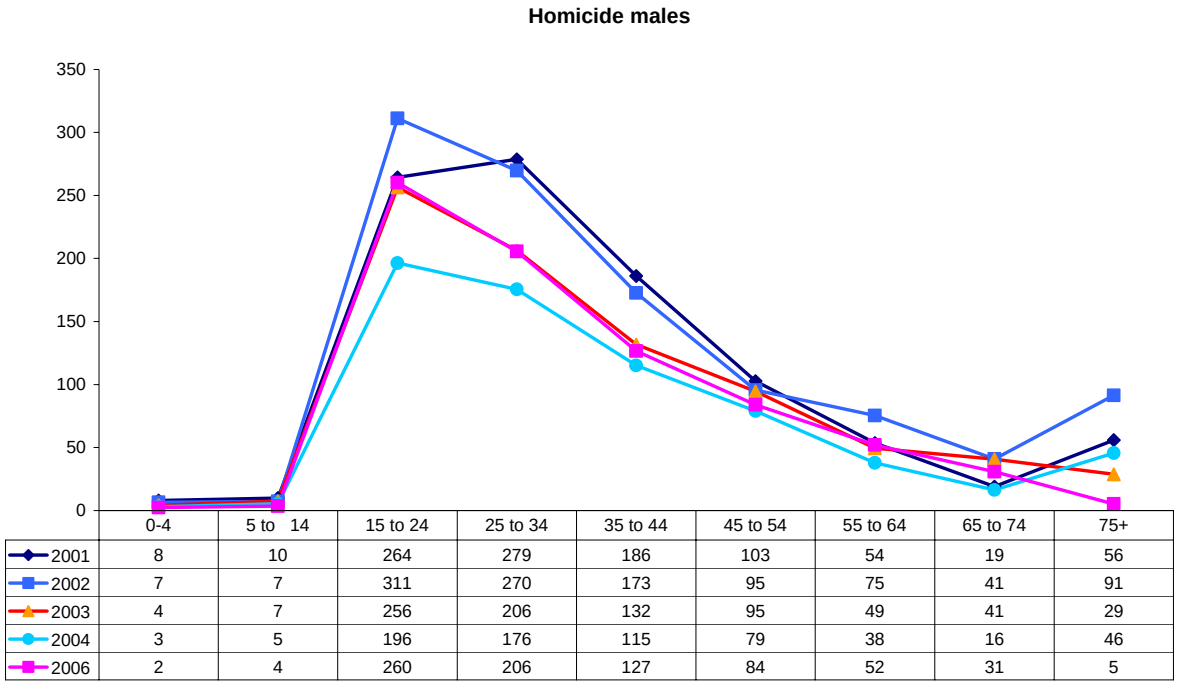
double those in Eastern (103.9/100 000), while among females the homicide death rates are the same in both sub-districts (24/100 000).



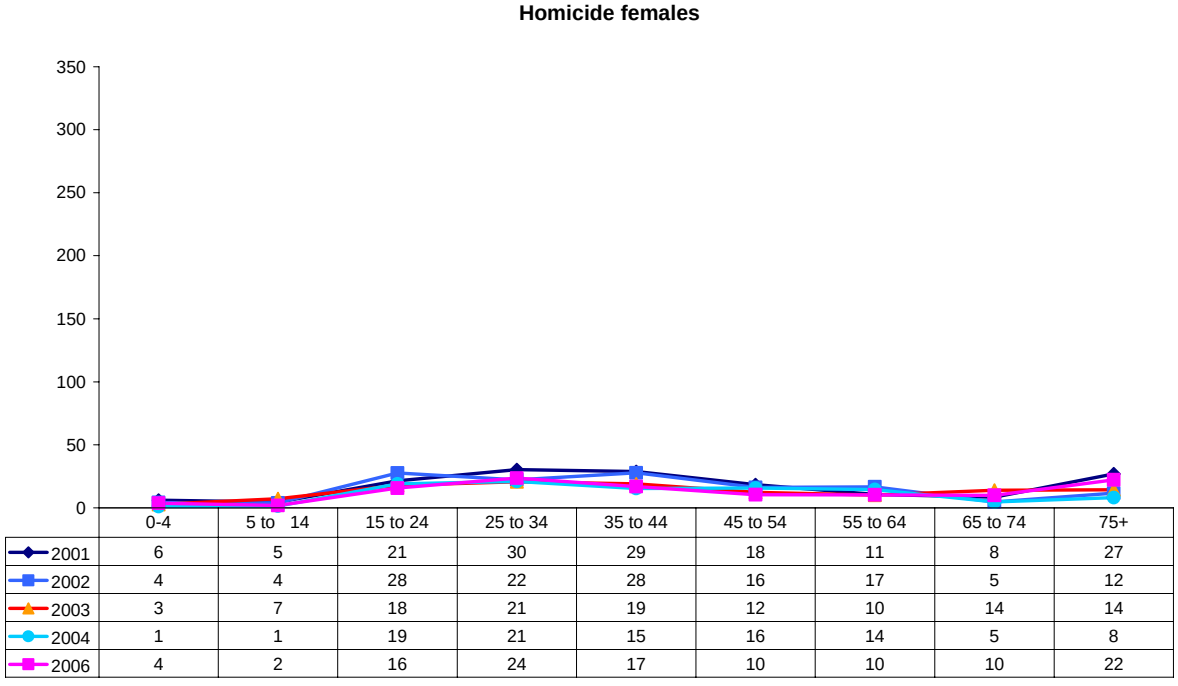
	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Homicide and violence without firearm	48.9	63.9	43.2	35.9	28.4	15.9	26.1	26.7	34.9
Homicide and violence with firearm	16.0	46.6	35.8	32.1	10.2	10.2	16.2	16.4	22.5

Figure 15: Age-standardised death rates (pooled) due to homicide by sub-district, for persons, Cape Town 2003, 2004, 2006

Among males there was a distinct peak in the 15-24-year age group between 2001 and 2004 (see Figure 16) that tapered off with increasing age and rose again after the age of 65 years (except in 2003 and 2006, where the rate was lower in the older age categories). The high rates in the 75+ age group may be a result of age misreporting, but should be investigated further. Comparison of the age profile from 2001 to 2004 also revealed a decrease in mortality across all age groups, but particularly among young adults, which is consistent with a decrease in firearm homicide and community violence. However, between 2004 and 2006 a marked increase was noted back to levels in 2003.



	0-4	5 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74	75+
2001	8	10	264	279	186	103	54	19	56
2002	7	7	311	270	173	95	75	41	91
2003	4	7	256	206	132	95	49	41	29
2004	3	5	196	176	115	79	38	16	46
2006	2	4	260	206	127	84	52	31	5



	0-4	5 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74	75+
2001	6	5	21	30	29	18	11	8	27
2002	4	4	28	22	28	16	17	5	12
2003	3	7	18	21	19	12	10	14	14
2004	1	1	19	21	15	16	14	5	8
2006	4	2	16	24	17	10	10	10	22

Figure 16: Age-specific homicide death rates by gender, Cape Town, 2001 - 2006

Of the four major cities with full NIMSS coverage, Cape Town recorded the highest percentage of alcohol-positive deaths, with 61% of all homicides in 2005 testing positive for blood alcohol concentration. Levels of intoxication were significantly higher than in Johannesburg and Durban.[18]

The second major cause of non-natural mortality, road traffic injuries (including pedestrians), has not experienced the same level of decrease as homicide over the 4-year period. Road traffic injuries are still ranked as the 4th leading cause of premature mortality among males and dropped from 8th to 9th among females. Among females the contribution has dropped from 3.8% to 3.1% of YLLs in the city, and among males it has dropped from 7.0% to 6.7%.

Although the NIMSS data for 2001 to 2005 show a slight decrease in age-standardised mortality rates, from 34.2 to 30.8/100 000 population, the findings point to the relative ineffectiveness of current road traffic injury prevention efforts compared to violence prevention. The NIMSS data reveal two major problem areas, viz.: (1) the high percentage of pedestrian deaths, which accounted for approximately 60% of all road traffic fatalities in the city in 2004; and (2) the alcohol-relatedness of road deaths. The latest NIMSS report for Cape Town reveals that in 2005 more than half of drivers (52%) and a staggering 63% of pedestrians killed on Cape Town roads tested positive for alcohol. The fatality rates by sub-district (Figure 17) indicate that those with the lowest number of fatalities are more developed in terms of road infrastructure, are more affluent, and have smaller pedestrian populations. Road traffic mortality is almost 5 times higher in Khayelitsha than in Southern and almost double that of Eastern, Klipfontein and Mitchell's Plain.

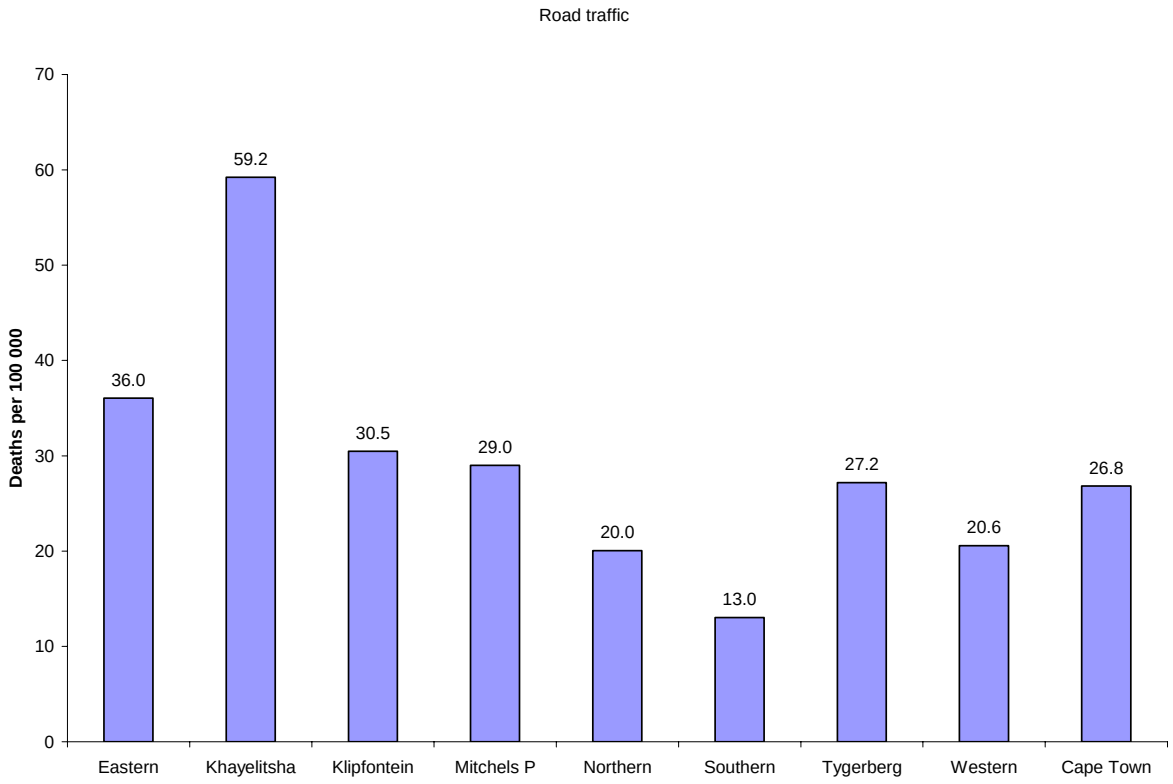


Figure 17: Age-standardised death rates (pooled estimates)
due to road traffic injuries by sub-district, for persons, Cape Town (2003, 2004, 2006)

Suicide rates (10.3/100 000) are low in comparison with homicide (59.8) and road traffic injuries (27.4), and have remained fairly stable between 2001 and 2006. It is likely that some suicide deaths are reported as 'undetermined', since it may take months or years for the final manner of death to be determined through an inquest. Therefore it is probable that suicide deaths are under-reported in these data. As observed in earlier years, the sex ratio for suicide is 4 male deaths for every 1 in females.

Although suicide rates in Cape Town are similar to the global average, this should not be construed as an indicator of good mental health, since it should be recognised that only a small fraction of those with mental health problems commit suicide. Other injury mortality data also provide proxy measures for the extent of mental health problems. Homicide rates may also be a good indicator of mental illness in the community, as well as information on substance abuse,

which falls within the spectrum of mental illness. As indicated earlier in this chapter, homicide rates in Cape Town are abnormally high, and the majority of deaths due to violence and traffic were alcohol-positive. The importance of recognising the weighty contribution of mental health problems to YLLs in the province relates to the necessity to plan for mental health and substance abuse services in the context of the Western Cape having the highest proportions of premature deaths due to injuries in the country.

Non-communicable diseases

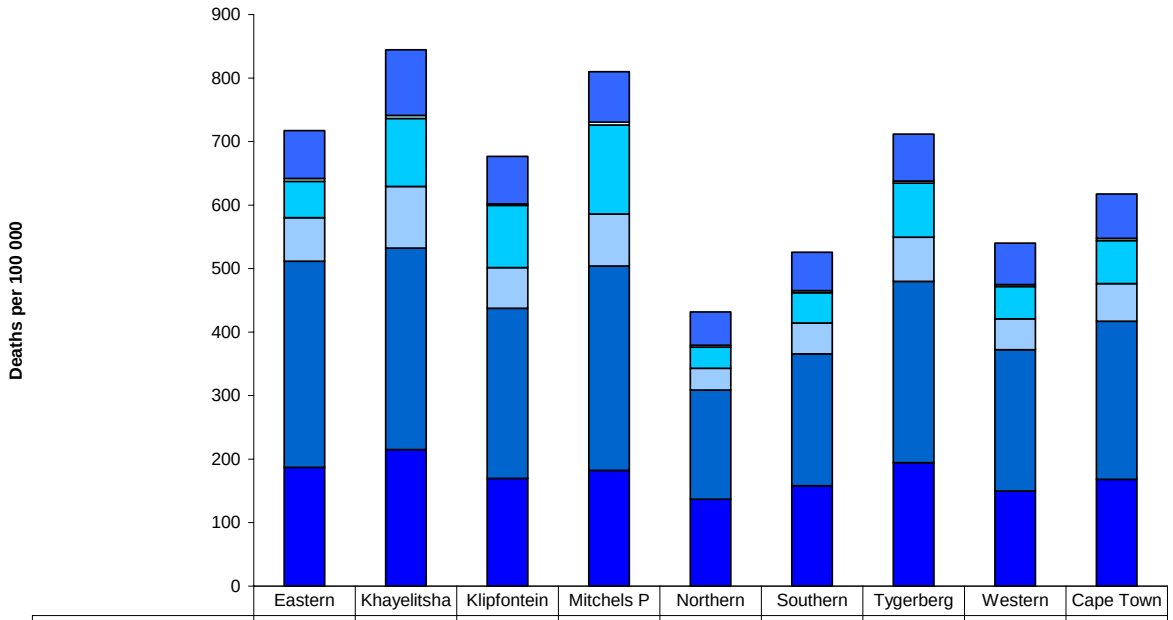
Overall, non-communicable disease mortality in Cape Town was lower than the provincial and national averages estimated for 2000 and based on national vital registration data (Table 3). Mortality rates for IHD and stroke were lower, while those for diabetes and lung cancer were higher than national rates. In the case of diabetes, IHD and stroke, the differences may be a result of differences in coding practice between the Cape Town system and the national vital registration system. However, smoking prevalence is very high among the coloured population (39%),[19] which is concentrated in the Western Cape.[1] This may contribute to the higher mortality rates from cancer of the lung.

[1] The population group classification is used in this article to demonstrate differences in the risk factor profile. Data are based on self-reported categories according to the population group categories used by Statistics South Africa. Such mentioning of differences may assist in higher effectiveness of future interventions. The authors do not subscribe to this classification for any other purpose.

Table 3: Comparison of National, Western Cape, and Cape Town age-standardised mortality rates for non-communicable diseases

Condition	Age-standardised mortality rates per 100 000			
	SA 2000[20]	WC 2000[20]	CT 2001	CT 2006
IHD	123	169	101	86
Hypertension	68	28	42	28
Stroke	124	122	86	77
Diabetes	53	52	63	65
Chronic Obstructive Pulmonary disease (COPD)	49	52	42	35
Lung cancer	24	56	41	40
Oesophageal cancer	17	15	12	11
Colon cancer	9	15	15	14
All non-communicable	756	768	674	590

From Figure 4 it can be seen that non-communicable diseases were the leading cause of death among both genders over the age of 40 years. These mainly comprise cardiovascular diseases, cancers (neoplasms), respiratory diseases and diabetes, as shown in the age-standardised rates across the sub-districts in Figure 18. Conspicuous among these causes are the consequences of the community syndrome of hypertension, atherosclerosis and diabetes on the one hand and tobacco use on the other. This confirms earlier work suggesting that non-communicable disease occurs among poor communities as well as the richer communities.[21] However, the causes of non-communicable disease mortality differ across the sub-districts, suggesting that they are in different stages of the health transition.



	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Other	75.2	103.2	74.7	79.4	52.5	60.2	73.8	65.4	69.9
Congenital abnormalities	4.5	4.4	2.6	4.5	3.0	3.6	3.5	2.9	3.7
Diabetes mellitus	57.3	107.3	97.6	140.2	33.4	47.4	85.1	51.3	67.8
Respiratory disease	68.3	97.1	64.3	82.0	34.0	48.7	69.6	48.2	59.1
Cardiovascular disease	324.9	317.3	268.2	321.8	172.2	207.5	285.8	222.8	249.2
Neoplasms	186.9	215.0	169.3	182.2	136.7	158.1	194.1	149.6	168.0

Figure 18: Age-standardised cause of death rates for non-communicable diseases by sub-district, for persons, Cape Town, (pooled estimates 2003, 2004, 2006)

The cardiovascular transition is described by Yusuf *et al*.[22] as having 5 stages, as shown in Table 4. As populations move from conditions of under-development towards industrialised societies, the cardiovascular disease profile changes from one related to infections and undernutrition. In the second stage, hypertensive heart disease and haemorrhagic stroke predominate. This is followed by the stage of increasing obesity, diabetes, all forms of stroke and IHD affecting young ages. The fourth stage is indicated by a shift in the IHD and stroke mortality to older ages, and is the current experience of many Western countries. Yusuf *et al.* have added the final stage based on the experience in parts of Eastern Europe, with the re-emergence of conditions related to infections and alcohol.

Table 4: Epidemiological transition of cardiovascular diseases (Yusuf *et al.*[22])

Stages/ages	CVD deaths % of total	Predominant CVD and risk factors
1. Pestilence and famine	5 – 10	Rheumatic heart, infectious and nutritional cardiomyopathies
2. Receding pandemics	10 – 35	Hypertensive heart disease and haemorrhagic stroke
3. Degenerative diseases	35 – 50	All forms of stroke, IHD at young ages, increasing obesity and diabetes
4. Delayed degenerative disease	< 50	Stroke and IHD at old age
5. Regression and social upheaval	35 – 50	Re-emergence of rheumatic heart disease, infections, increased alcoholism and violence, increased CVD in young

Figure 19 shows the variations in mortality resulting from IHD, stroke, hypertensive disease and diabetes. IHD mortality is very high in Eastern and Tygerberg but low in Khayelitsha. These rates would suggest that while Khayelitsha is in the 3rd stage of the cardiovascular transition, some of the other sub-districts are in a later stage. The rates are consistently higher for men. Hypertension is very high in Khayelitsha and Mitchell's Plain. Stroke is particularly high in Mitchell's Plain and Khayelitsha. Mitchell's Plain and Khayelitsha have high diabetes mellitus death rates. There is a marked excess of female mortality from diabetes in Khayelitsha and Mitchell's Plain.

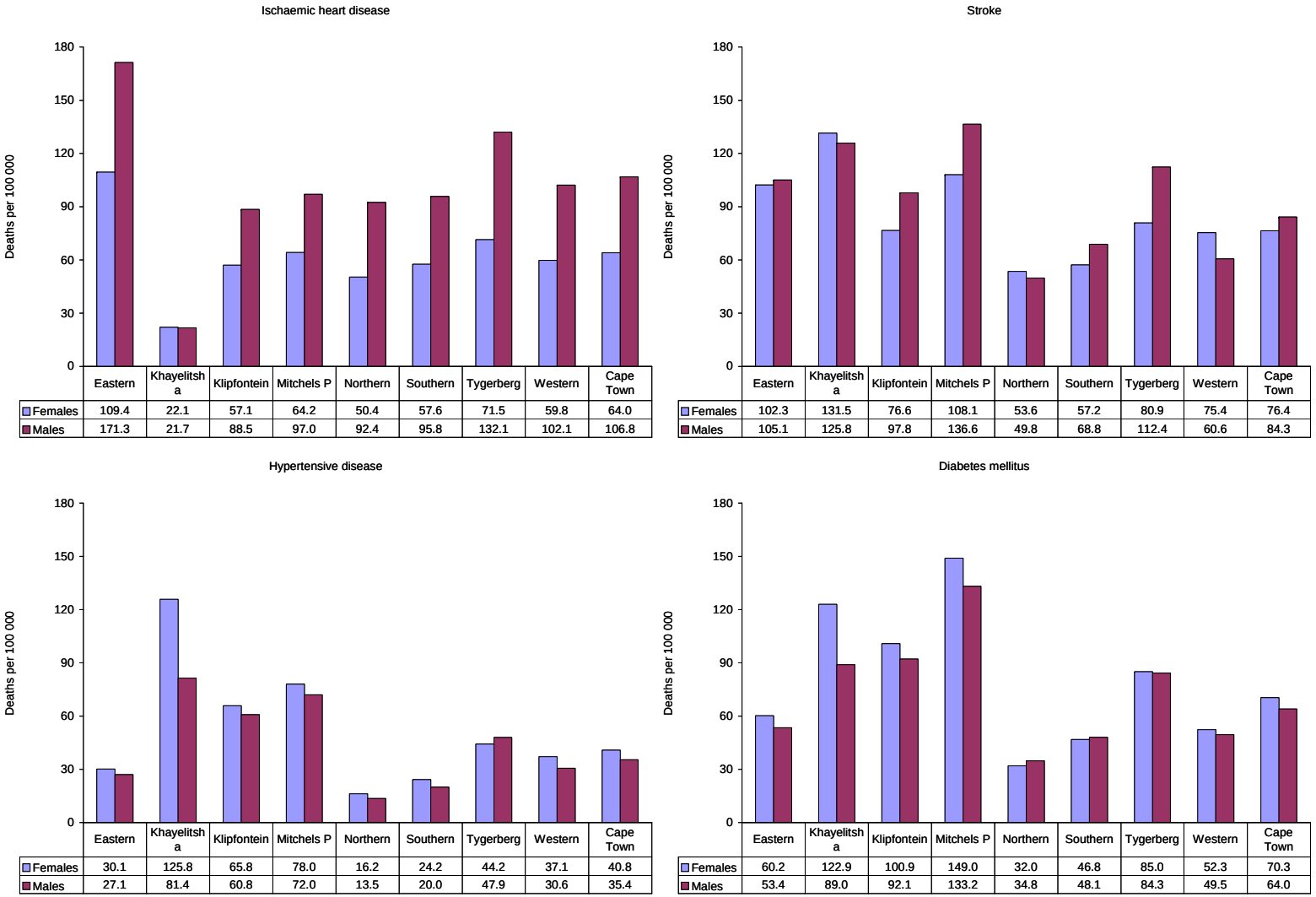
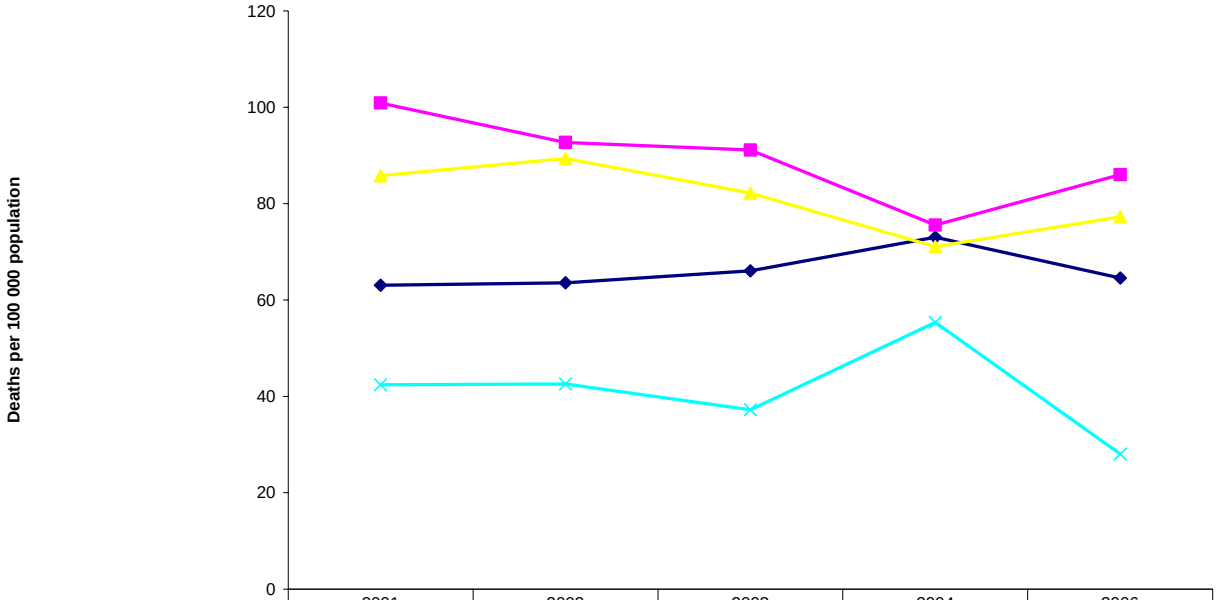


Figure 19: Age-standardised death rates for IHD, stroke, hypertension and diabetes by gender and sub-district, Cape Town (pooled estimates 2003, 2004, 2006)

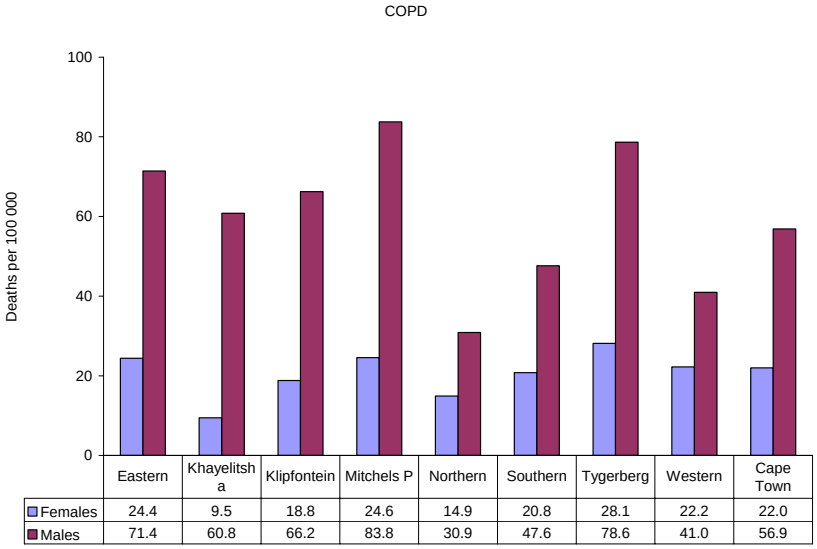


	2001	2002	2003	2004	2006
Diabetes mellitus	63	64	66	73	65
Ischaemic heart disease	101	93	91	76	86
Stroke	86	89	82	71	77
Hypertensive heart disease	42	43	37	55	28

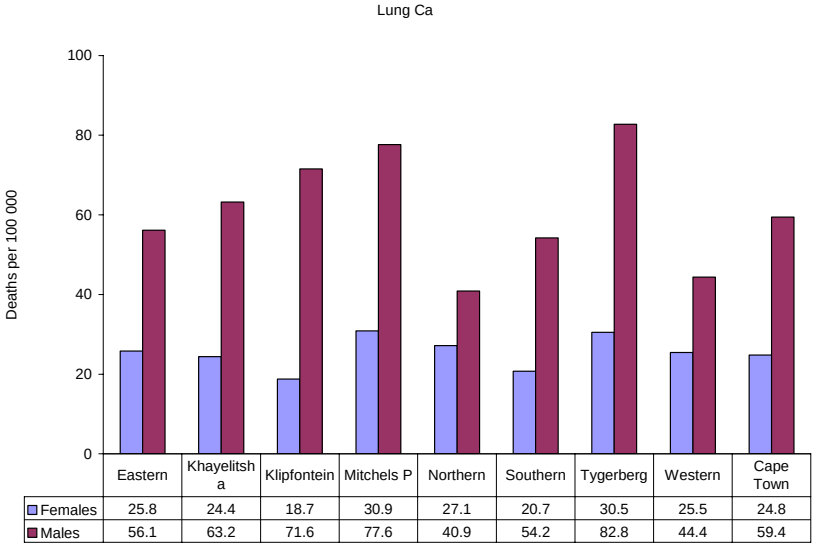
Figure 20. Trends in age-standardised death rates per 100 000 population for selected non-communicable diseases, Cape Town, 2001 - 2006 (2005 excluded)

Death rates due to IHD and stroke declined between 2001 and 2004, while death rates due to diabetes and hypertensive disease increased (Figure 20). However, these trends reversed between 2004 and 2006. It is difficult to interpret these trends. While they could reflect the transition of a stratified population, with part of the population in the more advanced stages of the cardiovascular transition and part in the early stages, they could also reflect specific trends in the major risk factors - a possible reduction in smoking but worsening diet and physical inactivity. Alternatively there might be health interventions (such as the development of stroke units) that play a role, or perhaps the change in the coding shortlist introduced during 2004 has contributed to the trend. The data require more careful analysis to investigate this.

Figure 21 shows the mortality rates due to chronic obstructive pulmonary disease (COPD). These are high in Mitchell's Plain, Tygerberg and Eastern. The gender differential consistently shows higher rates for men, which is probably related to smoking. Mitchell's Plain, Tygerberg and Klipfontein also display high rates for lung cancer (Figure 19), and show the same gender differential.



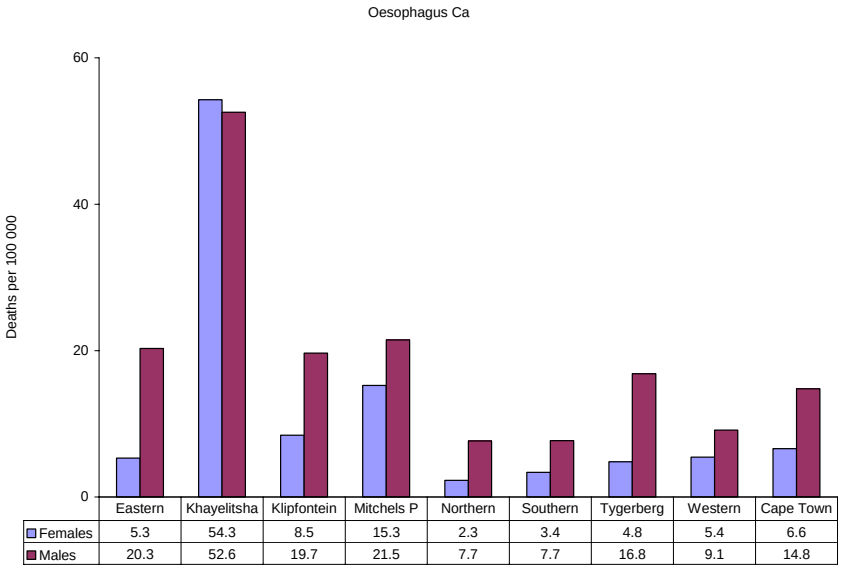
	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Females	24.4	9.5	18.8	24.6	14.9	20.8	28.1	22.2	22.0
Males	71.4	60.8	66.2	83.8	30.9	47.6	78.6	41.0	56.9



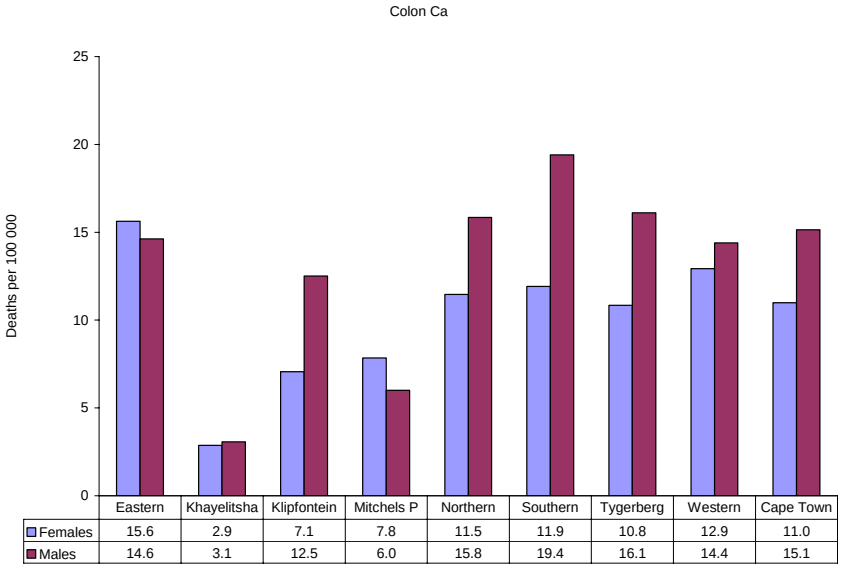
	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Females	25.8	24.4	18.7	30.9	27.1	20.7	30.5	25.5	24.8
Males	56.1	63.2	71.6	77.6	40.9	54.2	82.8	44.4	59.4

Figure 21: Age-standardised death rates for COPD and lung cancer by gender and sub-district, Cape Town, (pooled estimates 2003, 2004, 2006)

Cancer of the oesophagus (Figure 22) is very high in Khayelitsha. These high rates may possibly be a result of migration from the Transkei, which has very high rates. On the other hand, colon cancer (Figure 21) is very low in Khayelitsha.



	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Females	5.3	54.3	8.5	15.3	2.3	3.4	4.8	5.4	6.6
Males	20.3	52.6	19.7	21.5	7.7	7.7	16.8	9.1	14.8



	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Females	15.6	2.9	7.1	7.8	11.5	11.9	10.8	12.9	11.0
Males	14.6	3.1	12.5	6.0	15.8	19.4	16.1	14.4	15.1

Figure 22: Age-standardised death rates for oesophageal cancer and colon cancer by gender and sub-district, Cape Town, (pooled estimates 2003, 2004, 2006)

Child and adolescent health

Trends in the mortality of children and adolescents can contribute to assessing the impact of child health programmes and assist in identifying priorities. In 2003, 2004 and 2006 there was a total of 7409 deaths in children and adolescents up to 19 years of age. Table 5 shows the age distribution of these deaths.

Table 5: Age distribution of deaths in those aged 19 years and under (2003, 2004, 2006)

Age group	Number of deaths	% of child deaths
Early neonatal (0 - 7 days)	1085	14.6
Late neonatal (8 - 30 days)	575	7.8
Post-neonatal infant (1 - 11 months)	2458	33.2
1 - 4 years	946	12.8
5 - 9 years	369	5.0
10 - 14 years	342	4.6
15 - 19 years	1634	22.1

Mortality rates by age group are shown in Table 6. The sex ratio for infants' deaths increased with age from 1.1 in the 1 - 4-year age group to 1.3 in the 5 - 14-year age group and 2.9 in the 15 - 19-year age group, showing that male children are at a substantially higher risk of dying than female children, particularly in the 15 - 19- year age group, as a result of higher injury death rates.

Table 6: Childhood mortality rates, Cape Town, pooled estimates (2003, 2004, 2006)

Mortality rates per 1000 live births		
Neonatal	9	
Infant	23	
Mortality rates per 100 000 population		
	Male	Female
1 - 4 years	144	126
5 - 14 years	51	38
15 - 19 years	293	100

We report trends in rates for infant deaths (<12 months) and children aged 1 - 4 years since these are important public health indicators and the leading causes of death in the distinct age groups set out in Table 5, based upon pooled data from 2003, 2004 and 2006 (2005 data were excluded since these were incomplete).

Infant mortality

There has been a steady increase in the number of births reported in the city, with a relatively large increase in the births reported from facilities between 2003 and 2004 (from 53 000 to 58 000). Model estimates of the number of births (ASSA) suggest that the may be some under-reporting of births. The range of uncertainty indicated in Figure 22 has therefore been based on the variability that would arise from statistical variation (assuming that rate follows a Poisson distribution) as well as a low and high estimate of the births using the births in facilities (low) and an estimate using the ASSA model (high). Figure 23 indicates that the infant mortality rates in Cape Town remained fairly constant, at about 24 deaths per 1000 live births over the period 2001 until 2004, with a decline in 2006 to about 21 per 1 000 live births.

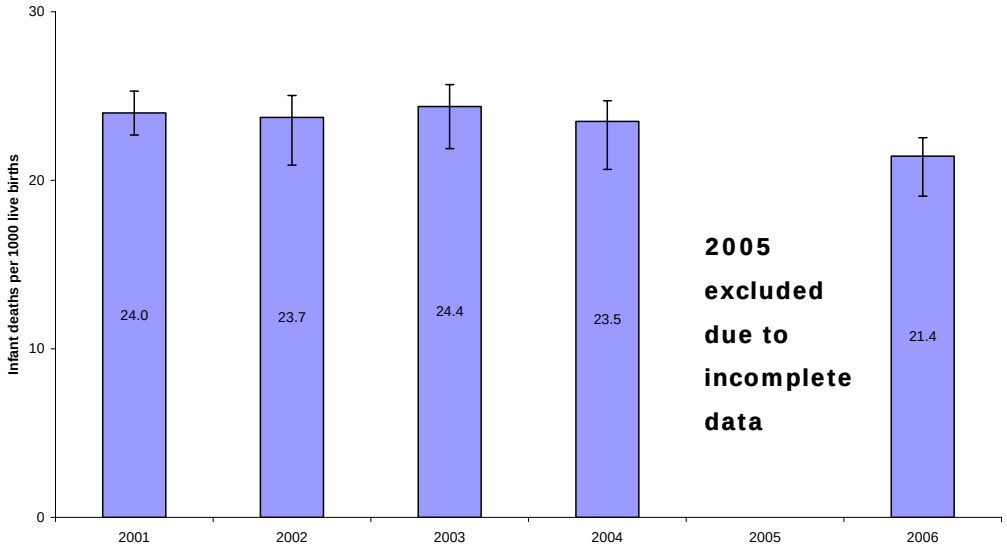
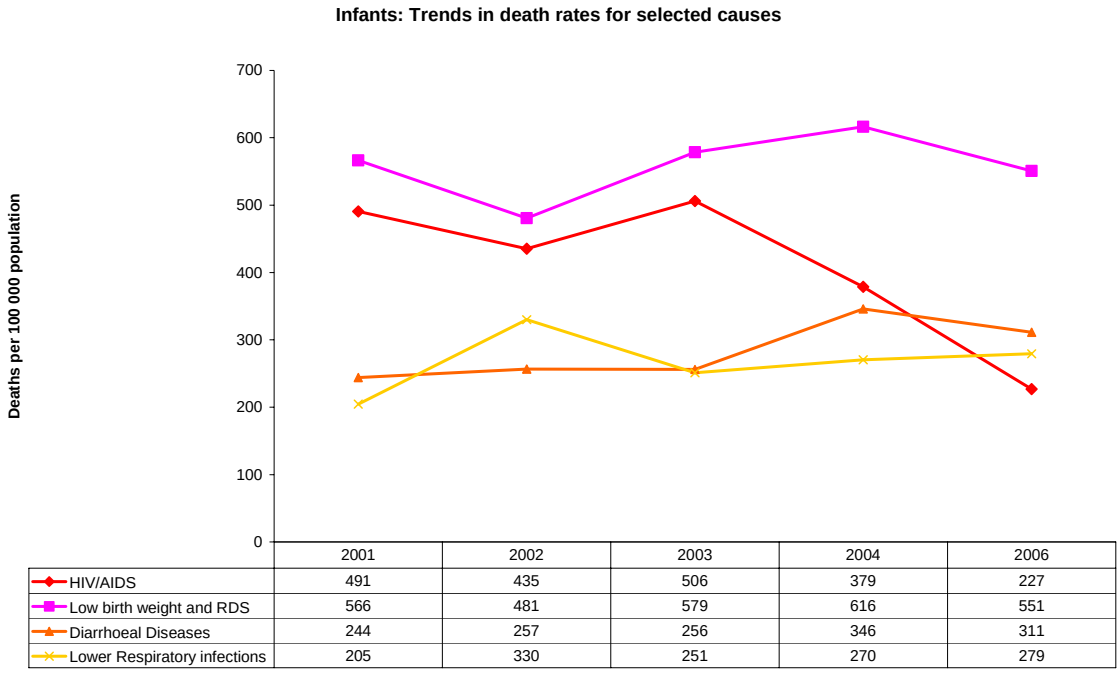


Figure 23: Trends in infant mortality rate per 1000 live births, Cape Town, 2001 - 2006 (please note that data for 2005 were incomplete)

The trends in cause-specific rates for infants per 100 000 population are shown in Figure 24, but are difficult to interpret. The death rate due to low birthweight and respiratory distress syndrome increased markedly between 2002 and 2004, but decreased between 2004 and 2006. This is accompanied by a decrease in the mortality rate from HIV/AIDS. Mortality from diarrhoea and lower respiratory infections, however, increased in 2004, raising questions about misclassification of HIV/AIDS to diarrhoea. The increase in diarrhoea deaths coincides with an increase in diarrhoea cases noted at public health facilities in 2004 (Tony Westwood - personal communication), suggesting that this increase is probably not a misclassification of HIV-related deaths but due to an outbreak of diarrhoeal disease. HIV/AIDS ranked as the second highest cause of deaths in 2001 and 2004, following short gestation and low birthweight. However, HIV/AIDS dropped to 5th in the ranking in 2006 and accounted for 7.9% of deaths, down from 15.1% in 2003 (data not shown) relative to other causes of death.



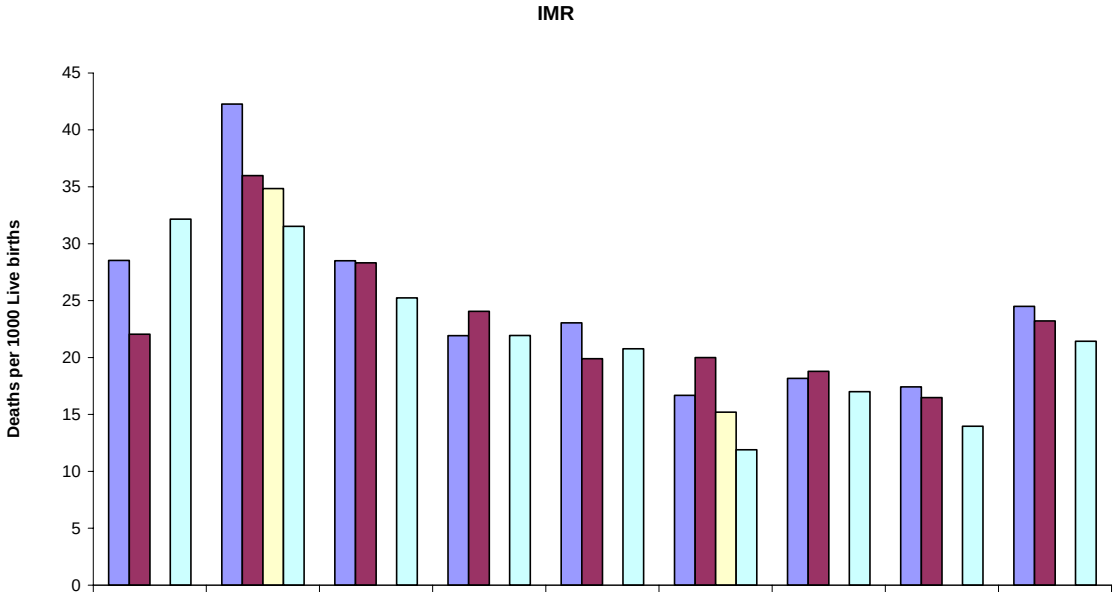
	2001	2002	2003	2004	2006
HIV/AIDS	491	435	506	379	227
Low birth weight and RDS	566	481	579	616	551
Diarrhoeal Diseases	244	257	256	346	311
Lower Respiratory infections	205	330	251	270	279

Figure 24: Trends in <1 year mortality rates per 100 000 population for selected conditions, Cape Town, 2001 - 2006

A marked increase in injury mortality for infants was noted between 2004 and 2006 (data not shown). However, upon further investigation into this increase it was discovered that, while there had been an increase in the number of infant death cases that presented to the mortuaries, it was not possible to assess from our data whether these deaths were definitely due to injuries or whether they were natural causes. However, these deaths had all been coded as ill-defined injury deaths. The new system of data collection directly from the mortuary electronic records implemented in 2007 will overcome this problem in future.

Figure 25 shows that there was substantial variation in levels and trends in infant mortality between sub-districts. It should be noted that the data for 2005 have been presented for Khayelitsha and Southern in Figure 24, since they are considered fairly complete for these two sub-districts. The infant mortality rates in Eastern and Khayelitsha were almost a third higher than the average for the Metropole, and almost three times higher than Southern in 2006. There was a surprising increase in infant mortality

in Eastern in 2006, resulting in the rate being higher than in Khayelitsha, in contrast with previous years. In Khayelitsha infant mortality appears to have declined over the same period. This requires further investigation to ensure that infant deaths from Khayelitsha have not been mistakenly allocated to Eastern sub-district. Some areas have shown little change over the period, while others have increased and yet others decreased.



	Eastern	Khayelitsha	Klipfontein	Mitchell's Plain	Northern	Southern	Tygerberg	Western	Cape Town
2003	28.5	42.3	28.5	21.9	23.0	16.7	18.2	17.4	24.5
2004	22.0	36.0	28.3	24.1	19.9	20.0	18.8	16.5	23.2
2005		34.8				15.2			
2006	32.2	31.5	25.2	21.9	20.8	11.9	17.0	14.0	21.4

Figure 25: Infant mortality rates per 1000 live births by sub-district, Cape Town, 2003 - 2006 (data for 2005 are only considered complete for Khayelitsha and Southern)

Infants in the neonatal period

The cause of death profile for all neonatal deaths (early and late) is shown in Figure 26, and the leading causes for the early neonatal period (0 - 7 days) and the late neonatal period (8 - 30 days) are shown in Figure 27. Unfortunately the shortlist codes available for causes of death during the perinatal period are too abbreviated to allow for really meaningful analysis of the cause profile for deaths of young babies, and the data should be

interpreted with caution. From Figure 26 it can be seen that prematurity, indicated by low-birthweight and respiratory distress syndrome, accounted for the majority of deaths, followed by other perinatal and infections. Thirteen per cent of deaths in this group were ill-defined. The high proportion of deaths resulting from prematurity and respiratory distress syndrome indicates that the shortlist for coding should allow for better differentiation of these causes. A code must be included for asphyxia and separate codes for the small-for-dates low-birthweight neonate, as distinct from prematurity.

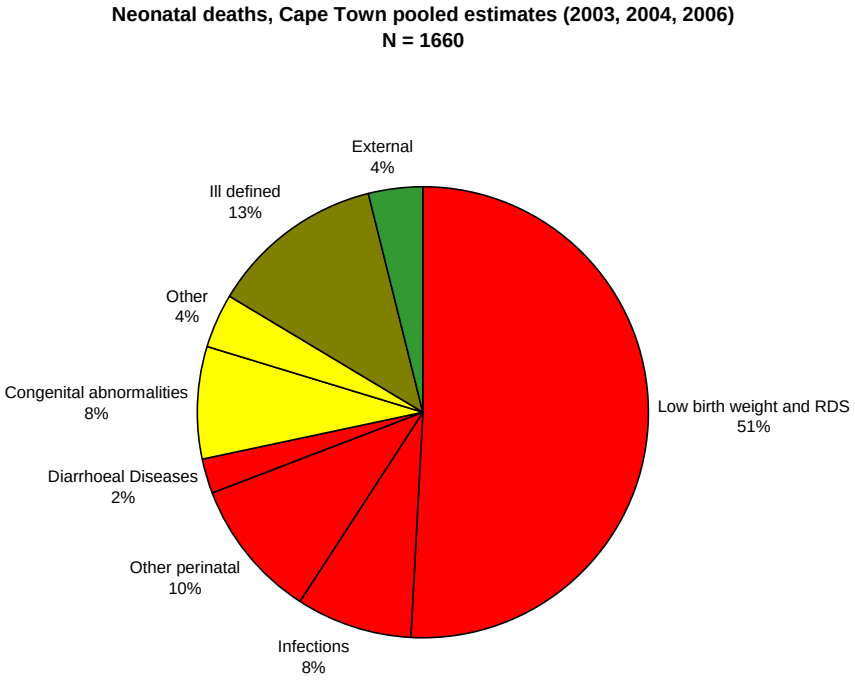
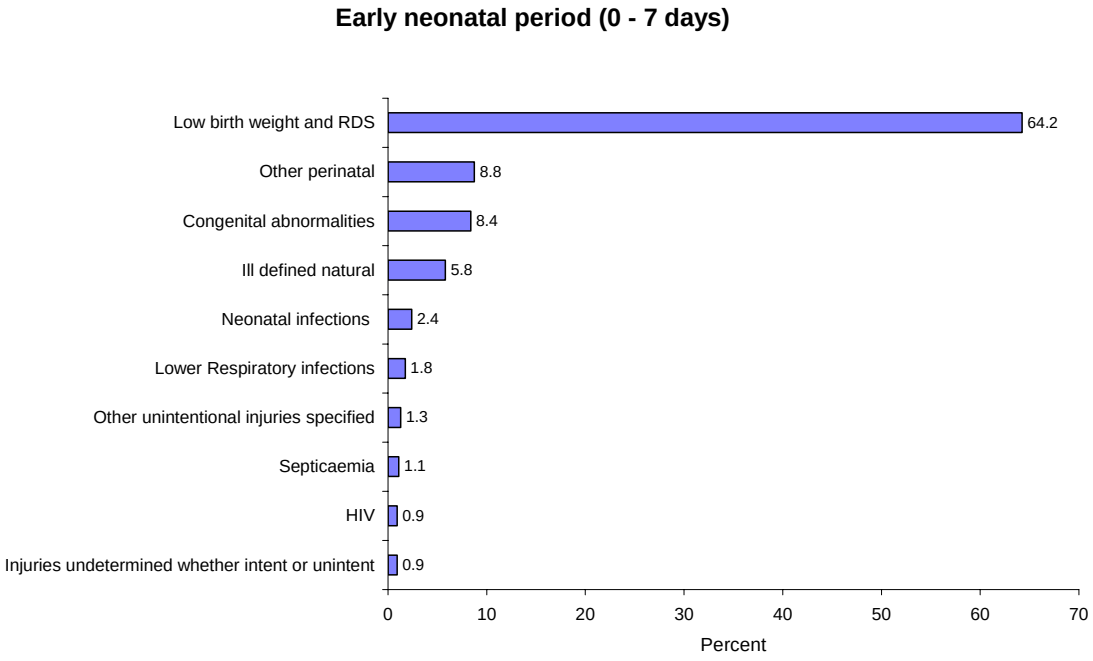


Figure 26: Neonatal cause of death profile, Cape Town, 2003, 2004, 2006

Not unexpectedly, the leading cause of early neonatal deaths in the pooled data (2003, 2004 and 2006) was low birthweight and respiratory distress syndrome (64.2%), followed by other perinatal (8.8%) - see Figure 27. Ill-defined deaths accounted for 5.8% of the perinatal deaths. About a quarter of the deaths in the late neonatal period were due to ill-defined causes (24.5%). Prematurity and respiratory distress syndrome was the leading defined cause of death in this age group, accounting for 25.4% of

these deaths. This was followed by ill-defined (24.5%) and congenital abnormalities (7.8%). HIV/AIDS accounted for 2.8% of these deaths.



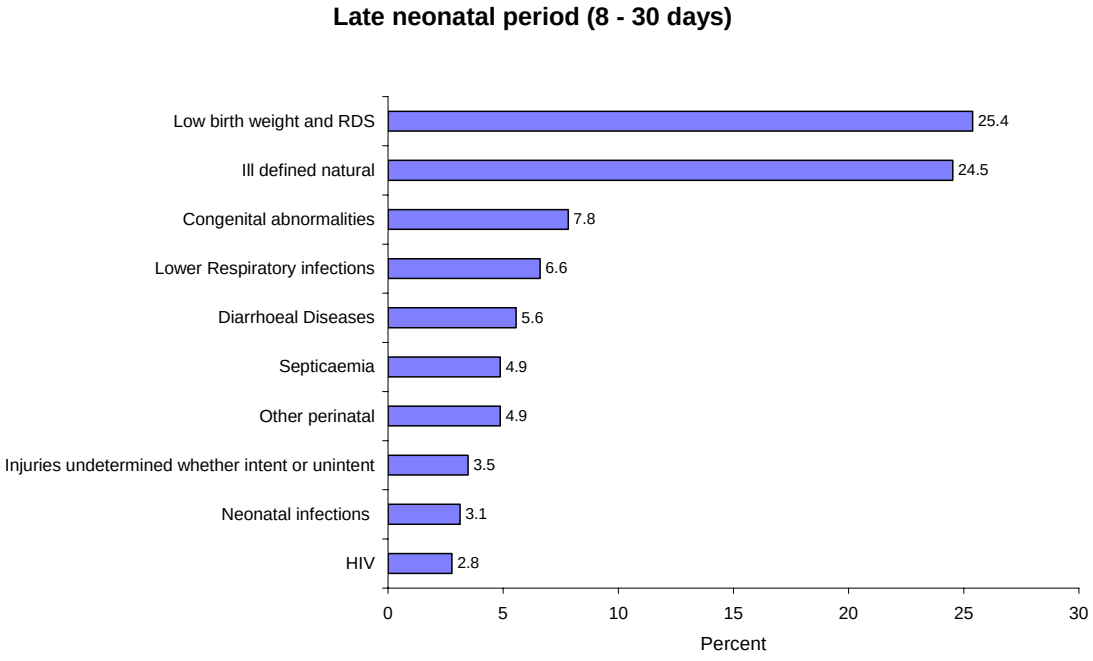


Figure 27: Leading causes of deaths in early neonatal infants (0 - 7 days) and late neonatal infants (8 - 30 days), Cape Town, pooled estimate (2003, 2004 and 2006)

Ill-defined deaths accounted for a quarter of deaths in the post-neonatal infants (1 – 11 months), as shown in Figure 28. HIV/AIDS (18%) was the leading defined cause of death for this age group, followed by diarrhoea and lower respiratory infection (Figure 28). Compared with the younger age groups, HIV/AIDS was attributed to much higher proportions (<1% in early neonates and <3% in late neonates).

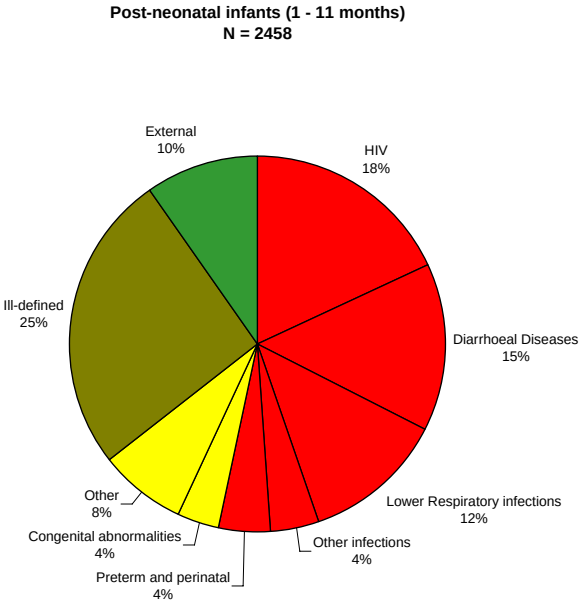


Figure 28: Cause of death profile, post-neonatal infants (1-11 months), Cape Town, 2003, 2004 and 2006

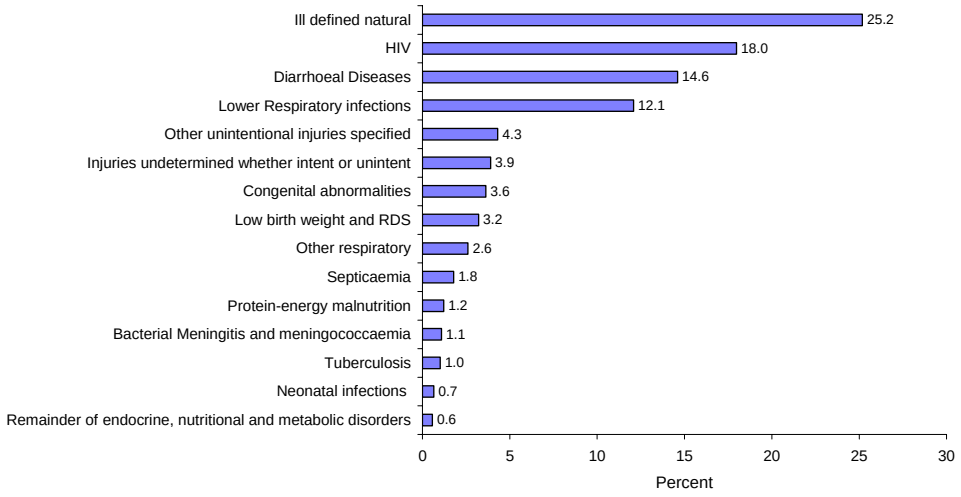


Figure 29: Leading causes of deaths in post- neonatal infants (1 – 11 months), Cape Town pooled estimates (2003, 2004 and 2006)

Child mortality (1 - 4 years)

In contrast to the relatively steady trend in infant mortality, there was a slight increase in the 1 - 4-year mortality rates between 2001 and 2002, followed by a decrease to 2004 and again in 2006. The decrease was mainly due to a drop in infectious diseases, including HIV/AIDS and nutritional conditions (Figure 30). A decrease in the HIV/AIDS death rate would be expected due to the roll-out of the PMTCT programme which commenced in 2001, and the availability of ARVs in public hospitals since 2003, but it is encouraging to note the decrease in the other infections and nutritional conditions as well. It should be noted that the marked decline in the HIV/AIDS mortality rate in 2006 in this age group was accompanied by an increase in the other infections and nutritional conditions. It is not clear whether this is a result of changes in the classification of HIV as the underlying cause of death or whether it is the result of a real change in the causes of deaths. However, the combined rate for these conditions declined overall.

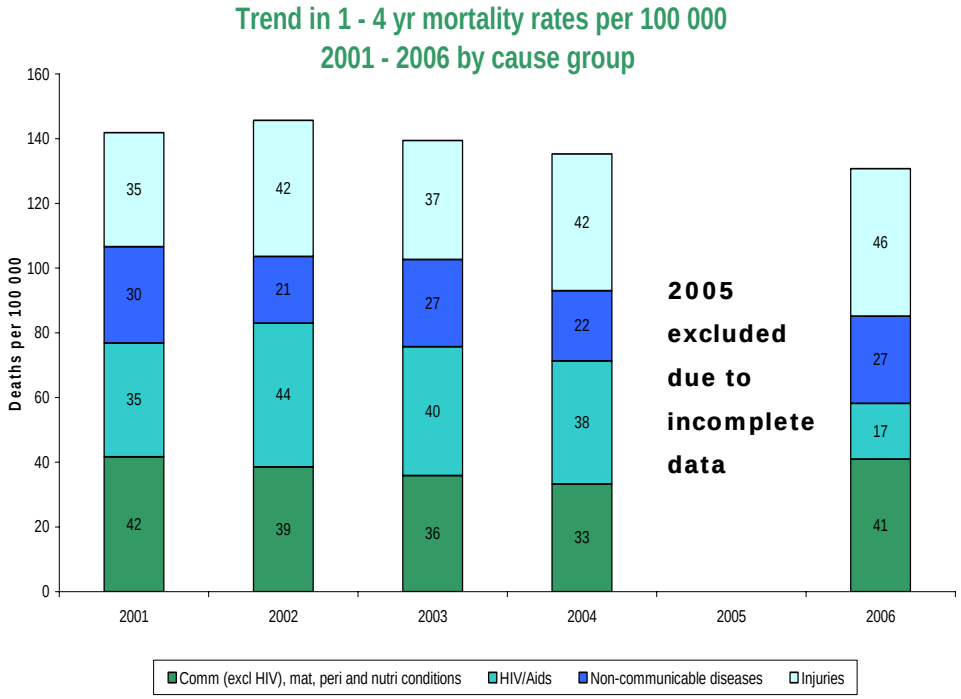


Figure 30: Trend in 1 - 4-year mortality rates per 100 000, Cape Town, 2001 - 2006 (2005 data excluded since incomplete)

The trends in the 1 - 4-year mortality rates per 100 000 population for selected conditions are shown in Figure 31. This shows very clearly that the death rates due to HIV/AIDS peaked in 2002 and declined thereafter. Diarrhoea and lower respiratory infection mortality rates, while remaining fairly stable between 2002 and 2004 increased slightly between 2004 and 2006. As discussed earlier, this may reflect a change in the reporting of

the cause of death rather than a real change in the profile.

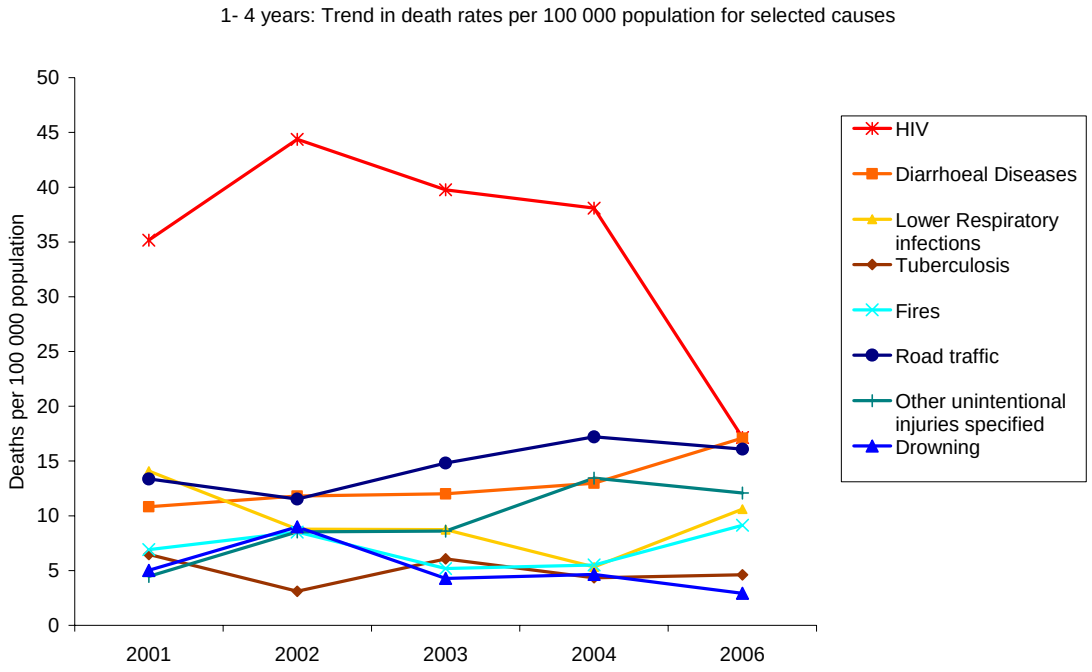
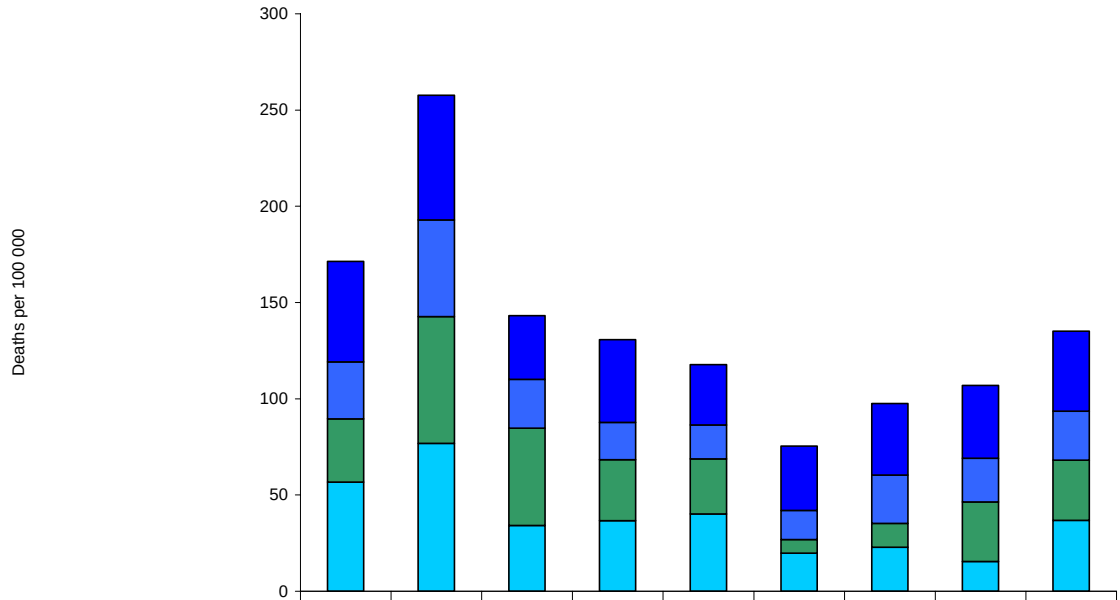


Figure 31: Trend in 1 - 4-year mortality rates per 100 000 population for selected conditions, Cape Town 2001 - 2006 (excluding 2005)

From Figure 31 it can be seen that there was a slight increase in death rates due to road traffic injuries and other unintentional injuries between 2002 and 2006.

Pooled estimates of the child (1 - 4 years) mortality rates per 100 000 population, for the period 2003 – 2006, show large variations by sub-district (Figure 32). Similar to the geographic differentials in child mortality, Khayelitsha had the highest rates and Southern the lowest. In 2003 the highest HIV/AIDS-related death rate in children under 5 years was observed in Khayelitsha (278/100 000). The lowest rates were observed in Southern (47.8/100 000) and Tygerberg (66.4/100 000). In 2006 these rates had declined, but the inequities remain, with stark differences in paediatric HIV/AIDS-related mortality across the sub-districts. Despite the fact that it has the most established PMTCT programme in the province, the highest rate was in Khayelitsha (139/100

000) and the lowest in Southern (17.5/100 000) (data not shown). It is clear that the paediatric AIDS epidemic remains a public health challenge, and these findings underscore the importance of improving the coverage and assessing the impact of the PMTCT interventions at sub-district level.



	Eastern	Khayelitsh	Klipfontein	Mitchells P	Northern	Southern	Tygerberg	Western	Cape Town
III. Injuries	52.2	64.7	33.1	42.9	31.4	33.4	37.3	37.8	41.5
II. Non-communicable diseases	29.5	50.3	25.3	19.4	17.6	15.1	25.1	22.8	25.4
HIV/AIDS	32.9	65.8	50.6	31.6	28.6	7.1	12.5	30.9	31.3
I Comm (excl HIV) mat, peri, nut	56.6	76.8	34.1	36.7	40.2	19.7	22.8	15.4	36.8

Figure 32: 1 - 4-year mortality rates per 100 000 by sub-district, Cape Town (pooled rates 2003, 2004, 2006)

For the period 2003 - 2006 HIV/AIDS was the leading cause of death among children aged 1-4 years, accounting for 20.6% of the deaths. This was followed by road traffic injuries, diarrhea, ill-defined natural and other unintentional injuries (Figures 33 and 34). Ill-defined deaths accounted for 7.8% of deaths in this age group. Males had a larger proportion of road traffic and drowning deaths, while females had a slightly higher proportion of HIV, diarrhoea and fire deaths.

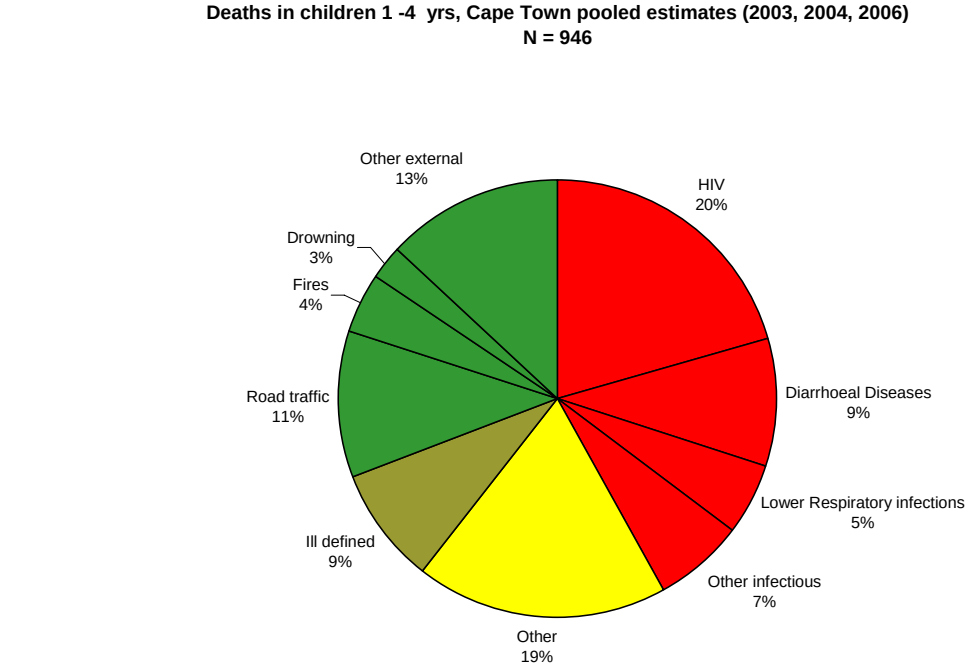


Figure 33: Cause of death profile, children 1 - 4 years, Cape Town pooled estimates (2003, 2004, 2006)

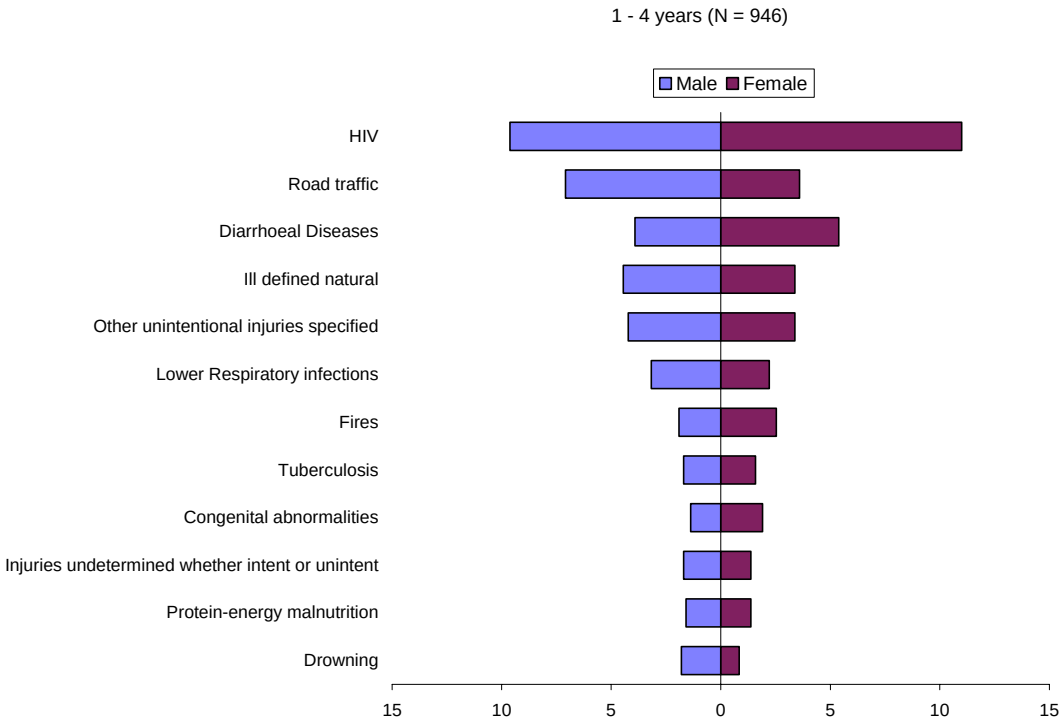


Figure 34: Leading causes of death in the 1 - 4-year age group, Cape Town pooled estimates (2003, 2004, 2006)

Children of 5-9 years

In age group 5 - 9 years, road traffic injuries (26.4%) move up in the ranking to the leading cause of death, followed by HIV/AIDS (10.9%) and lower respiratory infections (6.0%). Homicide ranked fourth and accounted for 4.9% of deaths in this age group. It is interesting to note the gender differential, with males having a much higher proportion of deaths due to road traffic injuries than females (Figure 35). It can also be seen that the proportion of deaths that was ill-defined was lower for males, but the proportions due to HIV/AIDS and lower respiratory infections were somewhat higher.

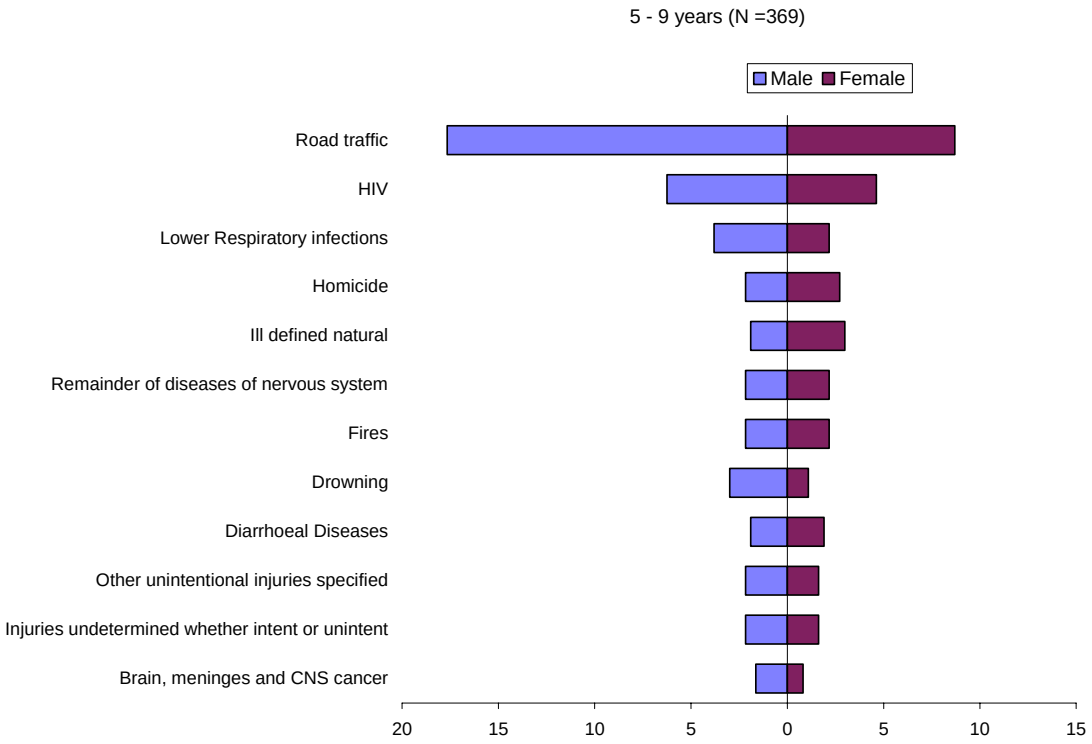


Figure 35: Leading causes of death in 5 – 9-year age group, Cape Town pooled estimate, (2003, 2004, 2006)

Children of 10 - 14 years

Injuries dominate the cause of death profile for children aged 10-14 years (Figure 36). Road traffic accidents were the leading cause of death and homicide ranked second, accounting for 14.3% of deaths in this age group. Suicide ranked sixth, accounting for 4.4% of deaths. Again the males had higher proportions of injury deaths than females, particularly for homicide. TB ranked 5th in this age group and accounted for a higher proportion of deaths among the females than males, while HIV ranked 10th with the reverse gender pattern.

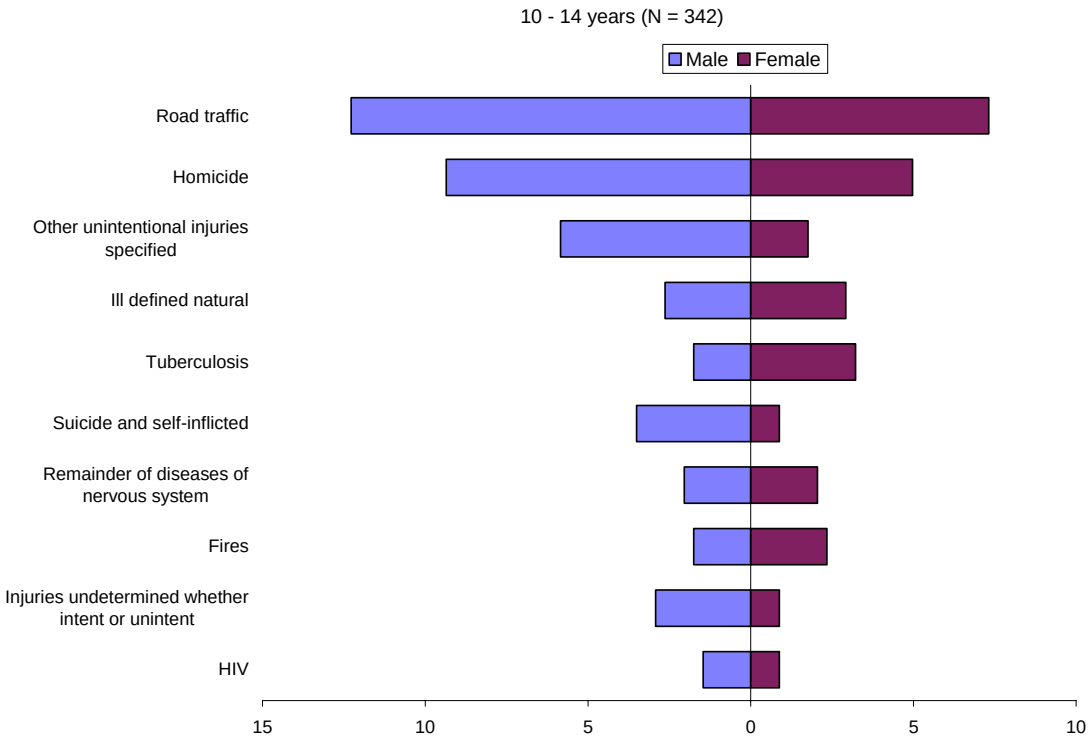


Figure 36: Leading causes of death in the 10 - 14-year age group, Cape Town pooled estimate (2003, 2004, 2006)

Children of 15 - 19 years

In the 15 - 19-year age group it is shocking to note that homicide ranks first and accounts for almost half of the deaths (48.6%). Road traffic ranks second, followed by HIV/AIDS and TB. The ranking by gender is shown in Figure 37. Males in this age group are at much higher risk of dying than females, with 2.9 male deaths for every female death from all causes, and 6.4 male deaths for each female death from injury.

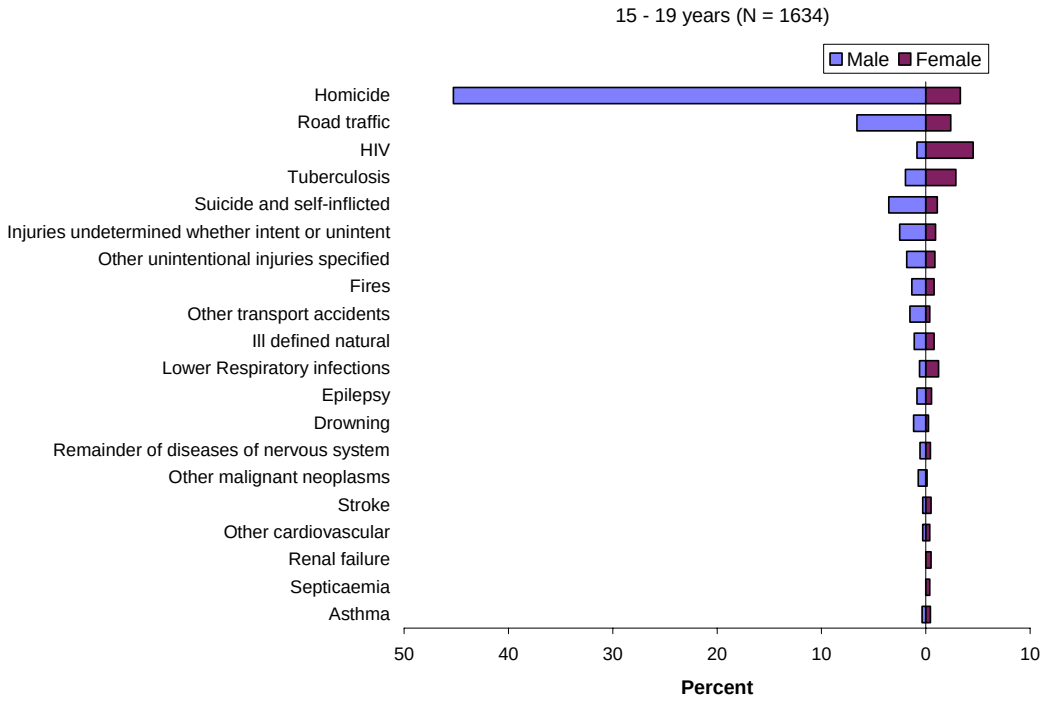


Figure 37: Leading causes of death in the 15 - 19-year age group, Cape Town pooled estimates (2003, 2004, 2006)

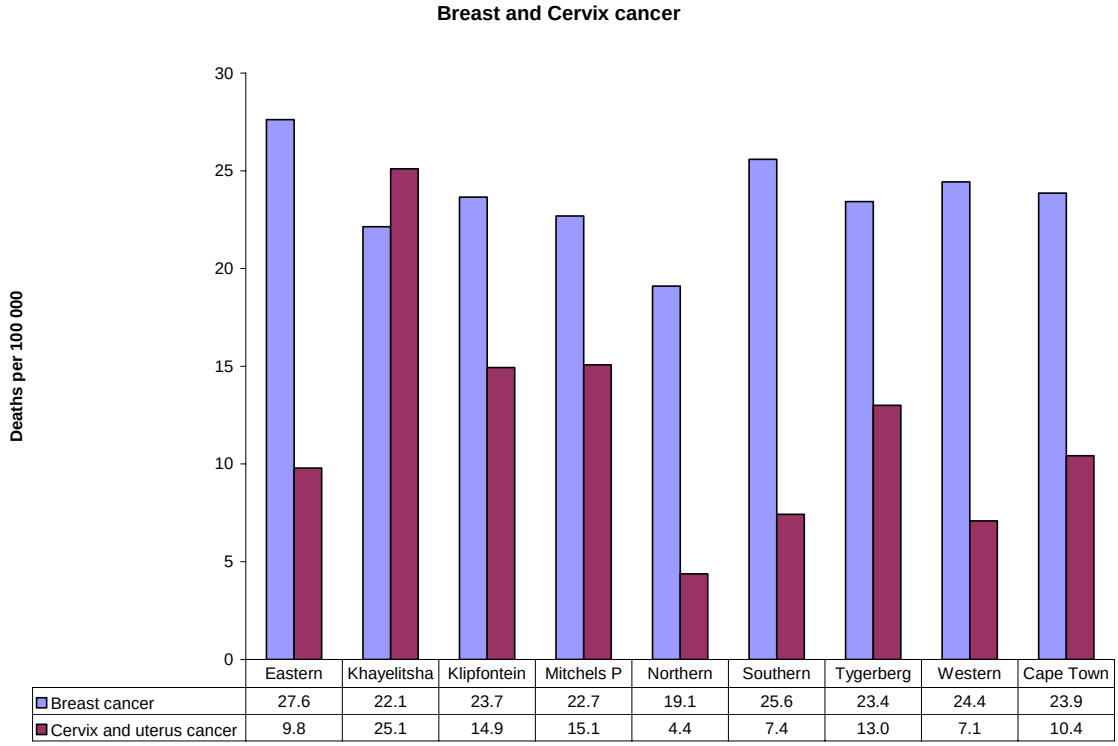
Women's health

The City of Cape Town has introduced a women's health programme that aims to improve reproductive health services and provide cervical cancer screening. Maternal mortality and cervical cancer mortality rates are therefore important indicators. However, in the context of women's health it is useful to review breast cancer mortality as well as the overall mortality pattern among adult women.

From 2001 to 2004 there were 33 deaths reported as being due to maternal conditions on death notifications for Cape Town. This gives a maternal mortality ratio of 15 deaths per 100 000 births, somewhat lower than the maternal mortality ratio of 112 per 100 000 for deliveries in health facilities in 2002 that was reported by Fawcus *et al*.[23] based on a review of the Peninsula Maternal and Neonatal Service data. The most recent report from the Confidential Enquiry into Maternal Deaths based on the notifications of maternal deaths indicates that there were 207 maternal deaths in the whole of the Western Cape Province between 2002 and 2004. Since approximately half the deaths in the Western Cape occur in the Cape Town Metropole, one might expect about 100 maternal deaths during this period, suggesting that maternal deaths are under-reported on the death notification. While it would be useful for the programme to obtain the data collected by the province through the confidential enquiry, the quality of the cause of death data regarding maternal deaths also needs to be improved. Training is needed to sensitise the coders on the one hand and improve quality of certification on the other.

Death from cancer of the cervix is eminently preventable through early detection. The screening programme aims to identify cases of cancer in the early stage of the disease when appropriate treatment can prevent the fatal consequence. In contrast, there is no public programme for breast cancer screening since such a programme is much more costly. Age-standardised rates for cervical cancer and breast cancer mortality are shown for the sub-districts of Cape Town in Figure 38. Overall, the age-

standardized mortality rate for cervical cancer was 10.3/100 000 but there was considerable variation in cervical cancer mortality rates, partly reflecting differential access to health services. Cervical cancer mortality rates were highest in Khayelitsha (25.1/100 000 females), where they were higher than breast cancer mortality rates. In all the other sub-districts breast cancer death rates were higher than cervical cancer rates and much more consistent across sub-districts. The overall breast cancer mortality rate for the Metropole was 23.9/100 000 and it was highest in the Eastern sub-district (27.6). The women's health programme needs to assess how it can promote the early detection of breast cancer so as to reduce mortality and also how to reduce the risk factors for breast cancer so as to prevent the disease.



	Eastern	Khayelitsha	Klipfontein	Mitchels P	Northern	Southern	Tygerberg	Western	Cape Town
Breast cancer	27.6	22.1	23.7	22.7	19.1	25.6	23.4	24.4	23.9
Cervix and uterus cancer	9.8	25.1	14.9	15.1	4.4	7.4	13.0	7.1	10.4

Figure 38: Age-standardised mortality rates for cervix and breast cancer by sub-district, Cape Town (pooled estimates 2003, 2004, 2006)

The premature mortality experienced in 2006 by women aged 15 years and older is presented in Figure 39. This shows that breast cancer

accounts for 3%, cervical cancer for 1% and maternal deaths for less than 1%, and that the major causes of death are conditions that affect both men and women. HIV/AIDS and TB together account for a third of the premature mortality. Among young women HIV/AIDS is the leading cause of death, while at later ages non-communicable diseases dominate (see Figure 4). Non-communicable diseases account for almost half of the premature mortality among adult women. The cardiovascular causes together with diabetes account for almost a quarter of the premature mortality among women. While the focus of a women's health programme needs to continue to address the concerns of women's specific conditions, it is clear that reducing the premature mortality burden for women will require interventions targeting HIV/AIDS and TB on the one hand and cardiovascular diseases and diabetes on the other.

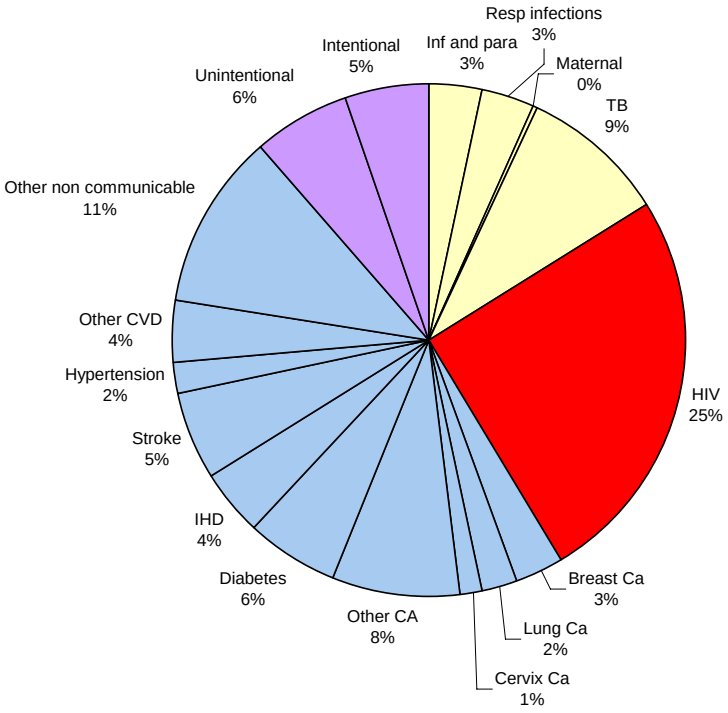


Figure 39: Premature mortality (YLLs) cause profile for women of 15+ years, Cape Town, 2006

Men's health

There is currently no men's health programme in the Metropole. In 2006 injuries accounted for 40% of premature mortality among men (Figure 40). Injuries predominate in early adulthood, and the majority were the result of interpersonal violence. HIV/AIDS and TB also accounted for a large burden - almost a quarter of the premature mortality among men. A variety of chronic conditions that occur later in life accounted for about a third of premature mortality. These feature not only the cardiovascular and diabetes combination, as reflected in the profile for women, but also the respiratory conditions, including COPD and lung cancer. The data on premature mortality among men indicate a need to focus on violence and injuries, HIV/AIDS and TB, smoking and other risk factors for chronic diseases.

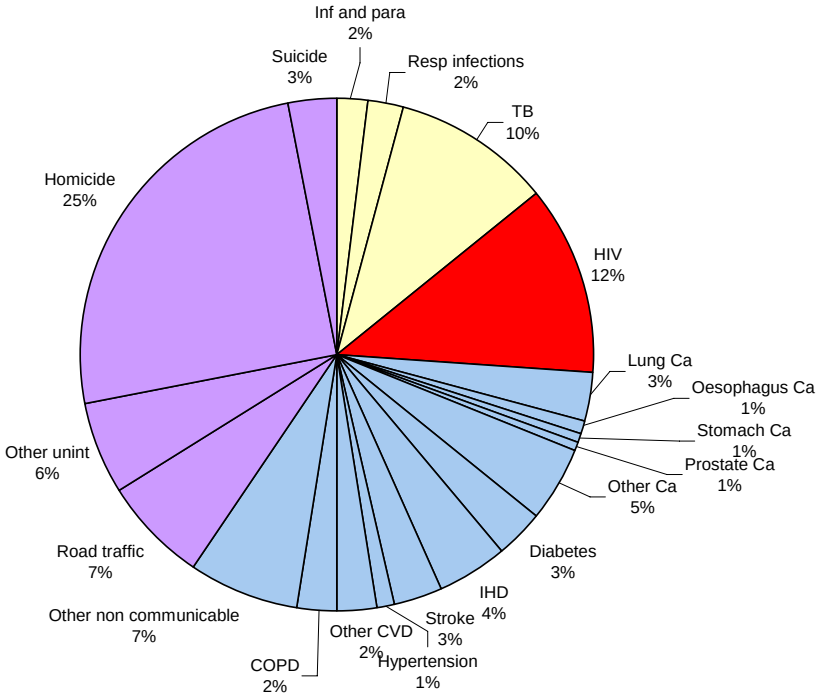


Figure 40: Premature mortality (YLLs) cause profile for men 15+ years, Cape Town, 2006

Prostate cancer is the only condition that is specific to men. It accounted for 1% of the overall premature mortality among men. The age-standardised rates for the sub-districts are shown in Figure 41. These compare to the estimate of 32/100 000 for the Western Cape Province and a national estimate of 27/100 000 in 2000.[20] The rates were lowest in Khayelitsha (21/100 000 males), Western and Northern, while Tygerberg and Eastern had rates over 33/100 000 males. It is not clear whether these geographical variations reflect real differences in the incidence of the condition or variations in access to diagnosis and treatment.

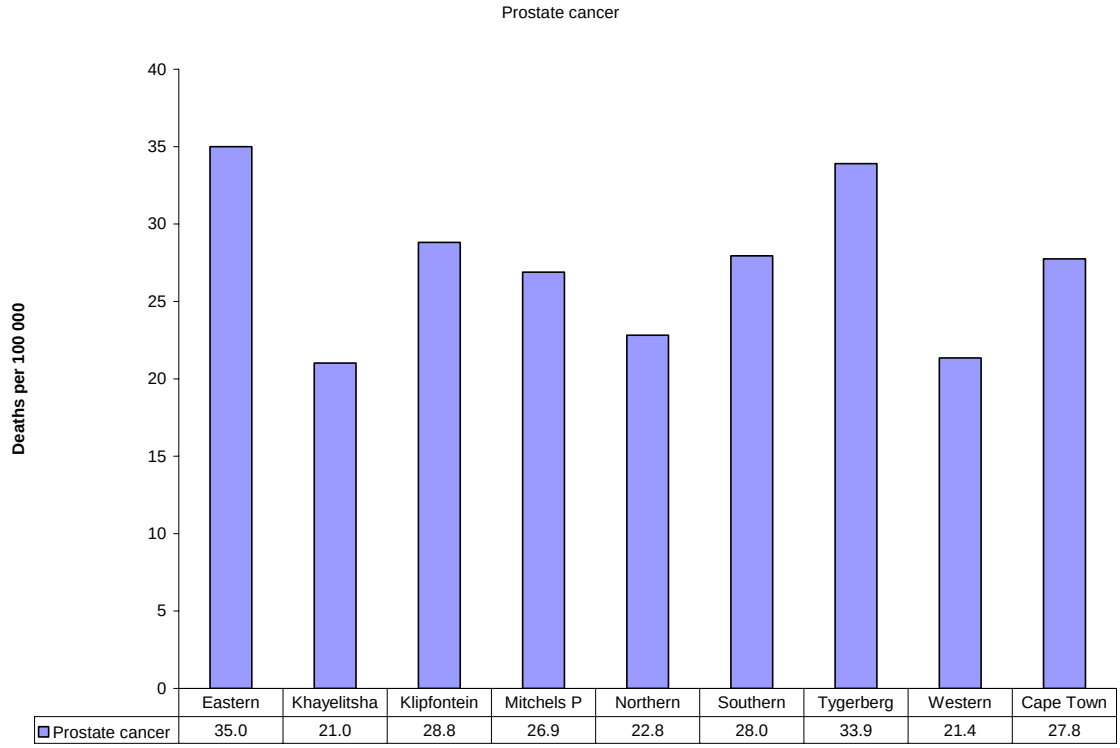


Figure 41: Age-standardised mortality rates for prostate cancer by sub-district, Cape Town (pooled estimates 2003, 2004, 2006)

Discussion

The Cape Town routine local mortality surveillance system provides a wealth of data on the health of the population in Cape Town. This second report in the Burden of Disease Reduction project has provided an opportunity to assess priority programmes in terms of mortality. The analysis also points to emerging health issues and vulnerable groups who can be identified and targeted for interventions. Unfortunately, during 2005 data collection became a problem, and the data for this year are not complete enough to assess trends.

It is clear that HIV/AIDS mortality for young adults increased dramatically since 2001, but it appears to have stabilised in 2004, possibly demonstrating the impact of the ARV programmes. HIV/AIDS mortality in children appears to have declined since 2001, which may reflect successful introduction of the PMTCT programme. However, ongoing monitoring is required in order to confirm these trends. The coding practice with regard to HIV/AIDS used in the Metropole is different from that used by StatsSA, where euphemisms and abbreviations for HIV such as 'RVD' and 'immune suppression' are not coded to HIV. It is considered that the interpretive coding practice used in the Metropole provides more meaningful statistics regarding HIV/AIDS. Nonetheless, the tendency of doctors to certify the indicator conditions and not disclose HIV would result in an under-estimate of the HIV/AIDS mortality rates.

Despite the potential under-estimation, in 2006 HIV/AIDS was the either the most common or the second most common cause of premature mortality in each sub-district, and accounted for 16% of the burden in the Metropole. Continued efforts to reduce the spread of HIV and provide appropriate treatment and care for people with AIDS is therefore a priority.

Mortality due to injuries, particularly homicide, is extremely high in the City of Cape Town. There is evidence of a declining trend until 2004, but mortality due to injuries has increased since then, with homicide mortality rates reaching 2003 levels in 2006. Injury mortality rates, particularly homicide and road traffic injuries, remain among the highest in the world. The homicide rates are exceedingly high for men. Of particular concern are the high homicide and road traffic injury fatality rates among the male youth and children aged 10-14. This is likely to be linked to alcohol and other substance abuse, but limited routine data are collected regarding substances used. Urgent attention needs to be given to identifying the risk factors involved and developing strategies to prevent injuries (inevitably be multi-sectoral and multilevel).

Mortality rates due to non-communicable diseases are relatively high, with geographic variations suggesting different staging of the epidemiological transition. Diabetes mortality rates are very high when compared to developed countries, suggesting that there is scope for better management of the condition, particularly at primary care level. While the mortality rates for other cardiovascular conditions are lower than the national average, they nonetheless can be reduced further through health promotion, improved risk factor management at primary care, and secondary prevention after a cardiovascular event. Tobacco control efforts should be strengthened - smoking rates are high among men of all groups and coloured and white women.[19]

Child mortality (<5 years) appears to have remained constant over this period (2001 - 2006), with the indication of a slight drop in 2006. The cause of death is unknown in a large proportion of the under 1-year olds, particularly those aged 1 - 11 months. This needs further investigation. While the data suggest that child mortality due to HIV/AIDS has started decreasing, HIV/AIDS remains a leading cause of death in children under 5 years of age, and highlights the need to strengthen the link of the PMTCT interventions to other child health programmes beyond the first few months of life. Attention must be given to promoting safe infant

feeding. Cape Town experienced an increase in the diarrhoea death rate in 2004 that was accompanied by an increase in the number of cases attending hospital; this appears to be related to an outbreak rather than being related to HIV/AIDS.

Khayelitsha has a considerably higher burden of premature mortality than other sub-districts, with a rate of 250 YLLs per 1000 population. Overall, premature mortality in Khayelitsha decreased until 2004 and then increased. However, not all causes of death displayed the same secular trend. The infant mortality rate declined consistently between 2003 and 2006, but Khayelitsha remains one of areas with the highest rates.

The initial decrease in the overall premature mortality rate was mainly due to a reduction in injuries. This may be partly due to an intervention by the Department of Safety and Security which prioritised certain police stations (including Khayelitsha) for additional resources and attention. In Khayelitsha, for example, an operational centre and two new police stations were built and resourced, sector policing was introduced, community partnerships were forged and shebeen trading hours were restricted. However, since 2005 the injury mortality rate has increased and reached 2003 levels in 2006. HIV/AIDS mortality increased until 2004 and declined by 2006. However, compared with other sub-districts, premature mortality rates from HIV/AIDS or TB remain highest in this sub-district. Non-communicable diseases are also a major cause of mortality in this area. Stroke, hypertensive heart disease and diabetes mortality rates are also high, particularly for women.

We consider the Cape Town surveillance system to consist of fairly robust statistics for between 2001 and 2004 and for 2006. Assessment of the completeness of adult death data indicates that there is little under-registration in these years; however, there was significant under-registration in 2005 due to problems with data collection. Estimates of the population at sub-district level are from the projections done for the City using the ASSA model. The number of births is taken from the City of

Cape Town's birth data. It should be recognised that there is a level of uncertainty in these numbers. In addition, the higher caseload recorded by the NIMSS for injuries underscores the importance of developing a sustainable mortuary-based data collection system. The province has gone some way in developing such a system, with the implementation of an electronic data collection system at all the mortuaries. They have also expanded the mortality surveillance to cover the whole of the Western Cape, and it will now possible to link the electronic mortuary data with the death surveillance data, which should improve the completeness and quality of the data in future.

Recommendations

Analysis of the 2001 mortality data for the City of Cape Town highlighted the differentials in levels of mortality across the city as well as the quadruple burden that is experienced across all the sub-districts. An analysis of the emerging trends in mortality has been undertaken covering the period 2001 - 2006. This shows that HIV/AIDS has taken over from homicide as the leading cause of premature mortality, partly as a result of a decline in homicides in this period as well as an increase in HIV/AIDS. TB, road traffic injuries, diabetes, stroke and IHD have all remained among the leading causes of premature mortality.

The broad recommendations made on the basis of the 2001 data are still highly pertinent. While there are indications that there were some gains in reducing the high levels of deaths due to violence and homicide, these appear to have been lost after 2004. The extremely high mortality rates (particularly in some areas, such as Khayelitsha) highlight the urgency of addressing the underlying determinants of the high levels of violence. Efforts to curb the HIV/AIDS epidemic as well as TB need to continue to be strengthened. The emerging epidemic of non-communicable diseases must also be tackled through strengthening primary care management on the one hand and promoting healthy lifestyles on the other. Finally, equity must be prioritised in resource allocation between the sub-districts.

Focusing on child health shows that the effective implementation of the PMTCT programme will impact on mortality in the age group 1 - 4 years (still high beyond neonatal phase - and this needs more serious policy and programme input), and that there is a need to investigate the large proportion of ill-defined causes of death, particularly among infants. Road traffic injuries and other unintentional injuries among young children and homicide among older children are also issues of concern, particularly for boys aged 10 - 14 years. The inequities in health status are marked in the

child mortality indicators, making these mortality rates a sensitive indicator to monitor progress in reducing these inequities in the future.

The high disease burden experienced by Khayelitsha points to the need for equity to be prioritised in resource allocation between the sub-districts. It must also be noted that the change to new health sub-districts has masked some of the inequalities in health status that were previously observed. In 2001 - 2004 the former sub-district of Nyanga had high mortality, but it is no longer possible to assess the trend for these areas.

The local mortality surveillance system is providing mortality information for the region. Integration with Home Affairs, the mortuaries and NIMSS has been achieved and will help in ensuring the sustainability of the system, improving the quality of the data collected and improving utilization of the results. However, integration with other systems such as StatsSA, South African Police Services and the Departments of Transport and Education must be improved.

Interventions must be planned, implemented, monitored and evaluated multi-sectorally. Vulnerable groups/areas identified through the system must be targeted for interventions. Men's health has traditionally been overlooked, which is of concern given the high death rates among young adult men. Injuries are the predominant cause of death among men, for which structural and social interventions are urgently needed - particularly given the increasing trend in injury mortality noted in recent years.

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Appendix 1: Completeness of vital registration in Cape Town

Assessing the completeness of death registration is difficult. Although there are techniques available, they either require that migration be negligible in comparison with the deaths (which is unlikely for small populations), or - if adapted to allow for migration - that one has a reasonably accurate measure of net migration. Since we do not have such an accurate measure of migration for Cape Town, an alternative approach was necessary: the numbers of deaths registered by the City of Cape Town were compared to those reported by households in the 2001 census. However, before this could be done, it was necessary to adjust the numbers of deaths reported by households in the census for any incompleteness of reporting. This was done at a national level by Dorrington, Moultrie and Timaeus (2004), and we used their correction factors by population group on the assumption that the quality of reporting by households was independent of geographical area.[1]

Unfortunately, since this method relies on the assumption that completeness of reporting of deaths by households is constant with respect to age, it is only reliable for estimating the completeness of reporting of adult deaths (e.g. those 15 and older). For children, in the absence of any recent independent estimates of child mortality, we were forced to assess completeness by comparing the number of recorded deaths against those estimated by the ASSA2003 model for the City (Dorrington, 2005).[2]

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Completeness of adult deaths

The number of adult deaths from the Cape Town vital registration in 2001 is compared with the number of deaths reported by households based on the 2001 census, once the household deaths had been adjusted for under-reporting.[3] Table 2.1 shows a summary of the comparison that was done by age and sex. This indicates that the 2001 vital registration of deaths among adults in Cape Town can be considered to be around 95% complete. Although completeness was pretty constant with respect to age for females, there was a steady downward trend in completeness with age for males which is difficult to interpret and needs further analysis.

Table 2.1: Completeness ratios of vital registration in Cape Town (2001) (%)

Age	Male	Female	Total
Median (15-85+)	96.8	94.5	96.2
Average (15-85+)	95.8	96.5	96.8
Median (20-85+)	95.7	93.9	95.9
Average (20-85+)	94.9	95.2	95.9

As the census data are only available for a single year, it is necessary to assess whether the levels of completeness of death registration in Cape Town have changed over time. In order to do this we examined the ratio of the rates of mortality in each year to that in 2001 for non-lung and non-oesophageal cancers combined, as well as the overall mortality rates in the 10-14 and 60+ age groups (which are not expected to be influenced by AIDS). Trends in these ratios (Figure 2.1) suggest that it is reasonable to assume that the levels of completeness have not changed much during this period 2001 to 2006, excluding 2005.[3]

[3] Zinyakatira N; 2007. Completeness of death registration in Cape Town and its health districts, 1996-2004. Thesis. Centre for Actuarial Research, University of Cape Town, Cape Town.

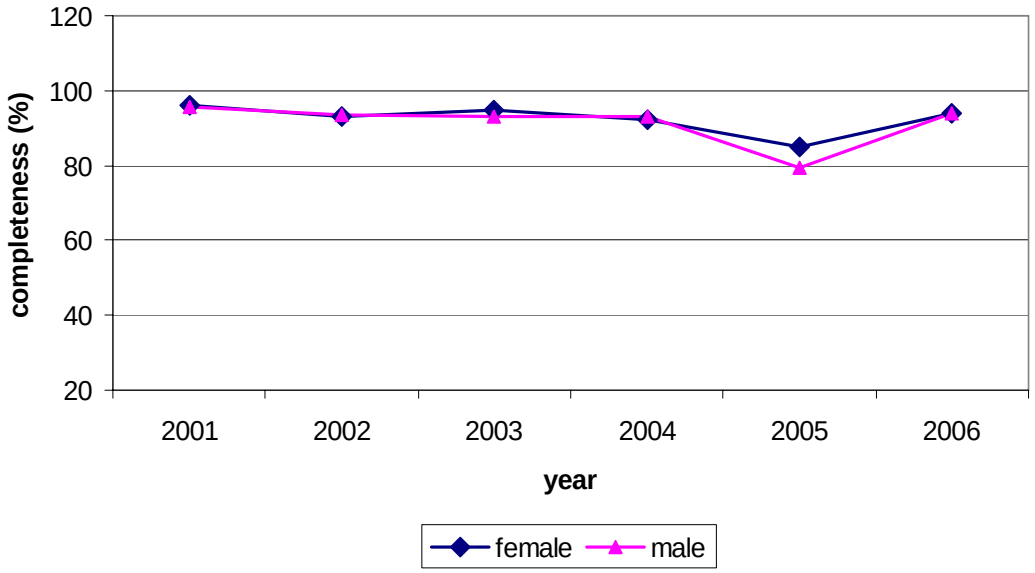

Figure 2.1: Completeness of death registration, Cape Town, 2001-2006

Table 2.2 shows the number of deaths on the population register registered in the regional offices of Home Affairs based in Cape Town. The population register of the Department of Home Affairs, however, only records the deaths of those with a national ID number (ie citizens and permanent residents). The number of deaths in the population of 15 years and older compares well with those registered on the population register. However, in 2005 the proportion drops to 84%, suggesting that there was a problem in the system of collecting the death certificates in that year. For this reason, 2005 has been excluded from the analysis.

Table 2.2: Numbers of deaths in those aged 15+ years reported by Cape Town Metropole and on the population register

Year	Cape Town deaths	Population register (Cape Town offices of Home Affairs)	% of population register deaths
2001	21810	20 921	104.2
2002	22222	22 318	99.6
2003	22162	22 616	98.0
2004	22498	22 663	99.3
2005	19996	23 804	84.0
2006	23286		

Completeness in children and infant death data

The ratio of the number of deaths of children aged 0 - 4 to the number of women aged 15 -49[4] was obtained from the ASSA model in each year from 1996 to 2004 for Africans, whites and coloureds (Indians are included with coloureds due to their small numbers in the city). Using the proportion of women aged 15 to 49 in each population group (with coloured and Indian proportions combined) as weights; a weighted average of the mortality ratio of the children to women of child-bearing age was calculated from the model. From this the expected numbers of deaths in each year were then estimated by multiplying the weighted average ratios of the children (0 - 4) with the total female population aged between 15 and 49.

The expected deaths are calculated for both sexes combined as there is no reason to suppose that the completeness between the male and female children is different. This was also done for infants alone. Table 2.3 compares the number of deaths from the Cape Town death surveillance system with these estimates. While this could suggest considerable under-registration of child deaths, it is more likely to suggest the need to

[4] Women aged 15-49 are the population giving birth to children at risk of dying. This ratio was used in preference to a mortality rate since there is significant under registration of births, and under count of children in the census.

reconsider the assumptions that are made in the ASSA model regarding child mortality. While it is known that there is considerable under-registration of child deaths in rural areas,[5] the problem has not previously been identified in the in the urban areas.

Table 2.3: Completeness in infants and children

	Infants	Children (0 - 4)
2001	66.9	53.3
2002	65.4	51.6
2003	70.1	53.6
2004	78.1	58.6

[5] Kahn K. Dying for change reports that in the rural area of Agincourt, registration of child deaths increased from 20% in the early 1990' to 30% by the year 2000.

Appendix 2: Completeness of injury deaths

Table 2.4 shows a comparison of the total number of injury deaths in the Cape Town mortality surveillance with data from the National Injury Mortality Surveillance System (NIMSS), which has maintained coverage of the two Cape Town mortuaries at Salt River and Tygerberg over the four–year period from 2001 to 2004.[6] Deaths that occur in Helderberg present to Stellenbosch mortuary, so these data are removed from the Cape Town mortality surveillance data for the comparison. It was not possible to compare the data for 2005 and 2006 as the Cape Town surveillance data was incomplete in 2005 and the 2006 NIMSS data was not yet available for comparison at the time this analysis was done. However, the NIMSS data for 2005 confirms the increasing trend in injuries seen in the surveillance data in 2006 and the death rates are comparable.

As may be expected, there are more deaths recorded in the NIMSS for all years, since the Cape Town mortality surveillance system includes deaths based on place of residence while the NIMSS records the place of death for the deceased. Thus deaths among recent migrants into the city, many of whom are young adults most at risk of injuries, will not be reflected in the Cape Town mortality surveillance system but will be reflected in NIMMS. The comparison suggests that suicides might be under-reported in the Cape Town mortality surveillance. However, more detailed investigation is needed to understand the differences between the two data sets.

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Table 2.4: City of Cape Town* injury deaths as % of NIMSS deaths

	2001	2002	2003	2004
Homicide	93.3	95.1	86.3	88.2
with firearm	102.9	98.8	91.8	95.4
Suicide	77.2	73.7	61.4	82.8
Road traffic	79.4	77.9	77.8	86.2
Unintentional	122.8	136.8	116.9	150.0
Undetermined	71.0	130.7	50.4	83.8
Total	91.6	97.7	84.3	95.4

* Deaths in the sub-district of Helderberg have been removed

Appendix 3: CARe * population estimates for the Cape Town metro district, 2001 - 2006

Age group	Male						Female					
	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
0	30066	30681	31112	31386	31511	31506	29583	30197	30626	30899	31024	31019
1 - 4	112996	113885	115215	116867	118703	120547	111317	112243	113593	115251	117082	118910
5 - 9	130287	131944	133710	135527	137265	139191	127690	129549	131385	133271	135255	137475
10 - 14	132580	132323	132040	131655	131471	131472	131380	130682	130203	129746	129427	129109
15 - 19	145290	143571	140965	138282	135773	135728	147002	145465	142750	139494	136377	135863
20 - 24	145224	149247	152722	155021	155855	152901	148822	153153	156653	159246	160246	157281
25 - 29	144967	147770	149485	150773	152017	153236	149332	151884	153777	155020	156123	157497
30 - 34	132660	135399	138381	141119	143470	145437	136129	139403	142371	145175	147514	149101
35 - 39	116724	120001	122665	125079	127259	129431	124740	126971	128868	130388	131996	133653
40 - 44	97187	100791	104097	106985	109819	112399	105839	110167	113898	117171	119755	121936
45 - 49	73130	76803	80765	84986	89016	92637	82397	86334	90638	94938	99130	103013
50 - 54	57956	60068	62021	63867	65900	68464	65210	68171	70806	73457	76397	79613
55 - 59	42139	44140	46313	48704	51061	53063	48226	50392	53256	56361	59401	62348
60 - 64	34026	34766	35349	35717	36370	37511	40903	41750	42285	43011	43988	45347
65 - 69	23386	24272	25385	26779	27885	28749	31483	32700	34033	35136	36247	37132
70 - 74	16780	17094	17336	17461	17814	18286	24259	24674	25077	25670	26267	27071
75 - 79	10640	10849	11069	11317	11526	11717	16749	17270	17832	18364	18874	19314
80 - 84	5873	6042	6218	6361	6469	6594	10455	10853	11128	11403	11723	12051
85 +	3235	3379	3512	3661	3825	3966	8113	8229	8457	8698	8936	9196
Total	**1455149**	**1483025**	**1508359**	**1531549**	**1553009**	**1572837**	**1539630**	**1570085**	**1597636**	**1622700**	**1645762**	**1666931**

* CARe – Centre for Actuarial Research, University of Cape Town

Appendix 4: Population estimates for males for sub-districts of Cape Town Metropole, 2001 – 2004

2001 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3506	3945	3581	4741	2492	3831	4709	3261
1 - 4	13076	13660	13733	17156	10054	15127	18389	11801
5 - 9	15290	14848	16211	19167	11328	17905	22609	12931
10 - 14	15140	14517	16759	19601	11274	18714	23489	13086
15 - 19	15043	16114	17999	21545	12348	22069	25258	14914
20 - 24	13975	18285	16942	21172	12557	22111	22030	18153
25 - 29	14419	19086	16786	20852	13617	20517	20459	19232
30 - 34	14619	15217	14876	16780	14158	20165	19825	17019
35 - 39	13568	12570	12870	14438	12329	17944	18956	14049
40 - 44	11134	9253	10369	11999	11201	15437	16141	11653
45 - 49	7841	6437	8119	9661	8651	11794	11863	8764
50 - 54	5685	4156	6673	7137	6822	10517	9493	7475
55 - 59	4117	2317	5238	4416	5089	8198	7022	5743
60 - 64	3462	1622	4350	2952	3952	6969	5896	4824
65 - 69	2433	714	3140	1572	2754	5087	4317	3370
70 - 74	1702	442	2112	922	1851	3957	2893	2901
75 - 79	1207	230	1405	345	1241	2691	1679	1842
80 - 84	693	148	592	152	531	1464	810	1483
85 +	409	52	297	80	291	944	435	727
Total	157318	153614	172050	194687	142537	225441	236273	173228

2002 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3622	3962	3643	4878	2570	3870	4793	3344
1 - 4	13217	13561	13772	17290	10303	15281	18380	12080
5 - 9	15526	15032	16381	19223	11583	18123	22879	13196
10 - 14	15155	14716	16769	19329	11267	18709	23302	13077
15 - 19	15045	16165	17721	21106	12291	21643	24965	14636
20 - 24	14599	18778	17125	21867	13195	22487	22473	18723
25 - 29	14673	19489	16862	21707	14180	20614	20536	19709
30 - 34	14744	15258	15139	17141	14822	20437	20235	17623
35 - 39	13963	12849	13273	14728	12765	18397	19642	14384
40 - 44	11725	9449	10714	12187	11720	15975	16983	12037
45 - 49	8369	6783	8535	10150	9150	12189	12582	9045
50 - 54	5848	4359	6881	7517	7106	10765	9899	7694
55 - 59	4289	2381	5452	4660	5402	8554	7392	6012
60 - 64	3513	1695	4376	3055	4117	7126	5980	4905
65 - 69	2505	711	3242	1648	2921	5247	4532	3465
70 - 74	1681	444	2119	960	1937	4027	2967	2959
75 - 79	1190	226	1444	326	1321	2731	1737	1875
80 - 84	680	162	619	151	554	1497	837	1542
85 +	420	52	311	78	317	980	454	767
Total	160762	156072	174376	198003	147519	228653	240568	177072

2003 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3716	3957	3683	4987	2631	3886	4846	3406
1 - 4	13407	13524	13865	17491	10589	15495	18439	12405
5 - 9	15774	15237	16567	19295	11842	18359	23164	13472
10 - 14	15163	14918	16777	19061	11249	18701	23109	13062
15 - 19	14944	16115	17337	20545	12147	21095	24510	14272
20 - 24	15176	19208	17240	22484	13789	22775	22824	19227
25 - 29	14813	19756	16813	22414	14636	20559	20454	20040
30 - 34	14890	15330	15428	17530	15518	20743	20675	18265
35 - 39	14285	13067	13610	14939	13132	18759	20229	14643
40 - 44	12289	9616	11026	12331	12200	16466	17785	12383
45 - 49	8939	7159	8983	10676	9681	12620	13356	9351
50 - 54	5993	4557	7070	7885	7368	10981	10278	7890
55 - 59	4475	2451	5685	4926	5739	8942	7792	6304
60 - 64	3546	1762	4381	3146	4263	7253	6034	4964
65 - 69	2598	713	3373	1741	3119	5456	4792	3592
70 - 74	1653	445	2116	995	2015	4080	3028	3005
75 - 79	1174	223	1484	308	1404	2772	1795	1909
80 - 84	668	176	647	151	578	1531	865	1602
85 +	428	51	324	76	343	1013	472	804
Total	163930	158265	176410	200982	152242	231486	244448	180597

2004 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3791	3934	3704	5071	2678	3883	4874	3450
1 - 4	13632	13532	13997	17740	10901	15754	18544	12767
5 - 9	16027	15455	16760	19375	12101	18604	23452	13753
10 - 14	15156	15114	16772	18785	11216	18681	22897	13035
15 - 19	14824	16054	16948	19983	11984	20547	24035	13907
20 - 24	15640	19498	17219	22926	14278	22885	22990	19585
25 - 29	14907	19972	16716	23062	15045	20448	20310	20314
30 - 34	15003	15379	15688	17887	16195	21012	21072	18882
35 - 39	14577	13264	13922	15119	13466	19084	20776	14871
40 - 44	12812	9744	11292	12418	12628	16892	18524	12676
45 - 49	9549	7564	9460	11235	10241	13080	14178	9679
50 - 54	6125	4751	7246	8246	7614	11175	10640	8070
55 - 59	4680	2532	5943	5218	6106	9371	8230	6626
60 - 64	3557	1821	4359	3218	4383	7336	6048	4994
65 - 69	2718	723	3540	1854	3355	5724	5108	3758
70 - 74	1614	442	2099	1024	2080	4105	3067	3031
75 - 79	1160	220	1527	292	1493	2820	1857	1948
80 - 84	652	190	672	150	598	1558	888	1654
85 +	438	50	339	75	372	1049	491	847
Total	166861	160237	178202	203678	156735	234008	247981	183846

2005 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3849	3895	3708	5131	2711	3863	4878	3478
1 - 4	13877	13566	14150	18016	11228	16039	18675	13152
5 - 9	16270	15671	16944	19444	12349	18839	23722	14025
10 - 14	15170	15338	16791	18546	11194	18689	22718	13026
15 - 19	14714	16009	16583	19456	11827	20035	23586	13564
20 - 24	15957	19609	17038	23150	14631	22779	22933	19759
25 - 29	14992	20186	16615	23707	15445	20333	20159	20580
30 - 34	15072	15390	15903	18193	16833	21221	21404	19454
35 - 39	14840	13441	14210	15269	13771	19375	21283	15071
40 - 44	13335	9867	11551	12495	13046	17308	19259	12960
45 - 49	10149	7956	9915	11768	10777	13500	14974	9978
50 - 54	6272	4965	7442	8639	7880	11398	11033	8272
55 - 59	4879	2609	6194	5509	6472	9792	8662	6944
60 - 64	3595	1895	4372	3316	4537	7480	6109	5065
65 - 69	2806	723	3667	1948	3558	5930	5370	3882
70 - 74	1597	446	2109	1066	2172	4183	3144	3097
75 - 79	1141	216	1564	276	1579	2856	1912	1981
80 - 84	633	203	694	148	615	1575	906	1696
85 +	449	50	354	74	404	1089	512	893
Total	169595	162034	179803	206149	161029	236284	251240	186874

2006 males	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3889	3842	3696	5169	2731	3827	4860	3491
1 - 4	14120	13606	14301	18294	11557	16326	18799	13545
5 - 9	16532	15916	17149	19543	12613	19101	24016	14322
10 - 14	15201	15588	16831	18340	11185	18722	22568	13037
15 - 19	14863	16255	16517	19290	11879	19893	23555	13476
20 - 24	15877	19248	16450	22807	14618	22128	22316	19457
25 - 29	15069	20402	16509	24355	15840	20216	19999	20848
30 - 34	15095	15364	16071	18450	17432	21371	21669	19984
35 - 39	15100	13622	14495	15419	14073	19665	21785	15273
40 - 44	13831	9968	11778	12539	13432	17683	19951	13215
45 - 49	10711	8316	10323	12246	11262	13849	15703	10227
50 - 54	6466	5224	7694	9110	8208	11709	11513	8540
55 - 59	5041	2667	6398	5766	6796	10144	9034	7216
60 - 64	3680	1998	4442	3460	4754	7725	6247	5205
65 - 69	2868	718	3760	2026	3734	6083	5587	3973
70 - 74	1590	452	2132	1116	2280	4290	3242	3185
75 - 79	1121	212	1597	261	1664	2887	1963	2012
80 - 84	615	218	717	146	633	1596	925	1744
85 +	457	49	367	72	434	1123	530	934
Total	172127	163666	181227	208408	165125	238338	254261	189684

Appendix 5: Population Estimates for females for sub-districts of Cape Town Metropole, 2001–2006

2001 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3314	3958	3424	4682	2520	3821	4628	3237
1 - 4	12925	13480	13632	17215	9473	14509	18423	11661
5 - 9	14841	15034	15754	19372	10938	17260	21717	12774
10 - 14	14408	15367	16794	19798	10948	17939	23115	13011
15 - 19	14851	18476	18557	22740	12281	19808	25001	15289
20 - 24	14014	20107	18325	22357	11925	20208	23619	18266
25 - 29	14960	20747	17877	20839	13860	20094	21541	19413
30 - 34	14833	15673	15635	16599	14410	20139	21941	16899
35 - 39	14075	13060	14481	15139	12681	19292	21408	14605
40 - 44	11241	9782	11960	13798	11551	17144	17868	12496
45 - 49	8178	6567	10004	10850	8887	13754	13995	10162
50 - 54	5966	3836	8256	7700	7120	12153	11625	8554
55 - 59	4437	2332	6305	4780	5404	9719	8569	6681
60 - 64	3777	1787	5845	3523	4342	8278	7753	5598
65 - 69	2786	929	4841	2116	3134	6832	6315	4530
70 - 74	2521	505	3474	1228	2368	5846	4562	3755
75 - 79	1879	260	2140	667	1682	4229	2906	2986
80 - 84	1254	158	1213	357	960	2872	1725	1916
85 +	887	101	749	232	660	2420	1348	1715
Total	161146	162160	189263	203991	145145	236318	258061	183547

2002 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3442	3975	3472	4785	2589	3898	4713	3323
1 - 4	13109	13339	13721	17347	9660	14634	18519	11914
5 - 9	15085	15255	15916	19580	11208	17464	21978	13062
10 - 14	14386	15479	16729	19418	10934	17920	22865	12950
15 - 19	14793	18508	18234	22347	12274	19497	24634	15178
20 - 24	14657	20530	18620	23272	12426	20674	24118	18857
25 - 29	15129	21344	17983	21632	14237	20234	21449	19875
30 - 34	15009	15962	15901	16930	15044	20549	22494	17515
35 - 39	14412	13367	14755	15085	12957	19591	22014	14789
40 - 44	11851	10264	12348	14165	12142	17817	18658	12922
45 - 49	8637	7089	10461	11459	9363	14200	14602	10522
50 - 54	6174	4028	8599	8217	7502	12561	12202	8887
55 - 59	4574	2394	6484	5049	5779	10157	8907	7047
60 - 64	3801	1855	5861	3671	4575	8393	7851	5743
65 - 69	2796	955	5053	2213	3308	7065	6640	4671
70 - 74	2491	509	3587	1241	2442	5933	4692	3779
75 - 79	1863	251	2250	669	1775	4332	3057	3073
80 - 84	1286	170	1285	374	1013	2950	1812	1962
85 +	860	104	755	233	694	2448	1393	1742
Total	164355	165378	192015	207687	149922	240317	262601	187811

2003 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3550	3968	3500	4860	2641	3951	4767	3388
1 - 4	13342	13258	13863	17544	9880	14814	18681	12211
5 - 9	15326	15482	16078	19784	11472	17664	22233	13347
10 - 14	14386	15621	16694	19080	10931	17929	22653	12908
15 - 19	14610	18390	17771	21780	12157	19032	24070	14940
20 - 24	15230	20845	18809	24069	12857	21022	24476	19344
25 - 29	15228	21861	18011	22340	14546	20282	21262	20246
30 - 34	15148	16220	16131	17220	15650	20910	22995	18096
35 - 39	14713	13648	14991	14992	13193	19837	22564	14931
40 - 44	12406	10699	12665	14446	12667	18393	19347	13275
45 - 49	9139	7667	10961	12123	9876	14691	15263	10918
50 - 54	6349	4204	8900	8710	7848	12900	12721	9173
55 - 59	4770	2488	6746	5393	6244	10735	9363	7516
60 - 64	3795	1911	5832	3794	4778	8442	7888	5846
65 - 69	2812	983	5283	2318	3496	7321	6992	4828
70 - 74	2460	512	3700	1253	2515	6017	4821	3800
75 - 79	1850	244	2367	672	1873	4442	3218	3166
80 - 84	1302	180	1345	386	1055	2994	1880	1985
85 +	846	109	770	237	737	2509	1457	1792
Total	167264	168291	194418	211002	154414	243885	266653	191709

2004 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3642	3944	3509	4909	2679	3984	4797	3435
1 - 4	13612	13221	14043	17788	10122	15033	18891	12541
5 - 9	15574	15721	16246	19995	11736	17869	22493	13636
10 - 14	14388	15770	16662	18755	10923	17938	22445	12865
15 - 19	14367	18199	17250	21139	11982	18500	23418	14640
20 - 24	15722	21045	18887	24733	13212	21243	24686	19718
25 - 29	15261	22295	17961	22960	14785	20244	20988	20527
30 - 34	15267	16465	16341	17489	16241	21244	23467	18661
35 - 39	14972	13895	15184	14858	13383	20023	23048	15026
40 - 44	12920	11100	12927	14662	13139	18895	19957	13570
45 - 49	9645	8271	11458	12791	10387	15168	15915	11304
50 - 54	6522	4384	9202	9216	8195	13235	13244	9459
55 - 59	4982	2591	7031	5767	6750	11361	9854	8025
60 - 64	3805	1976	5830	3936	5004	8527	7956	5977
65 - 69	2807	1005	5479	2408	3661	7525	7300	4950
70 - 74	2447	519	3843	1273	2605	6147	4985	3850
75 - 79	1834	236	2482	673	1968	4543	3375	3253
80 - 84	1318	190	1406	399	1096	3038	1948	2007
85 +	833	114	787	241	783	2572	1523	1845
Total	169918	170942	196528	213991	158652	247088	270291	195290

2005 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3717	3903	3502	4934	2702	3997	4804	3465
1 - 4	13904	13208	14243	18057	10377	15274	19125	12892
5 - 9	15834	15978	16426	20220	12007	18087	22766	13936
10 - 14	14403	15939	16647	18458	10922	17964	22262	12834
15 - 19	14133	18020	16754	20528	11807	17992	22792	14351
20 - 24	16061	21039	18775	25151	13429	21251	24646	19893
25 - 29	15279	22714	17895	23561	15002	20187	20699	20785
30 - 34	15336	16661	16497	17699	16782	21508	23859	19171
35 - 39	15241	14156	15387	14737	13576	20223	23546	15130
40 - 44	13364	11443	13111	14787	13532	19287	20448	13784
45 - 49	10144	8892	11939	13451	10883	15613	16538	11670
50 - 54	6718	4583	9537	9773	8574	13615	13818	9779
55 - 59	5183	2689	7298	6139	7261	11973	10327	8532
60 - 64	3837	2054	5859	4103	5264	8659	8067	6145
65 - 69	2802	1027	5676	2499	3828	7731	7612	5073
70 - 74	2434	526	3988	1294	2696	6278	5150	3900
75 - 79	1814	228	2596	673	2063	4635	3530	3335
80 - 84	1338	202	1474	413	1142	3093	2024	2037
85 +	819	118	803	245	830	2633	1590	1897
Total	172362	173382	198408	216721	162678	250001	273603	198609

2006 females	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Western
0	3776	3847	3480	4938	2713	3994	4790	3480
1 - 4	14197	13198	14442	18326	10630	15515	19355	13247
5 - 9	16123	16266	16633	20482	12295	18337	23075	14263
10 - 14	14417	16107	16630	18171	10915	17987	22078	12803
15 - 19	14165	18180	16582	20317	11850	17833	22602	14336
20 - 24	15997	20519	18206	24941	13306	20737	23999	19576
25 - 29	15322	23174	17859	24209	15238	20167	20450	21078
30 - 34	15327	16774	16567	17820	17239	21663	24125	19588
35 - 39	15516	14426	15594	14626	13769	20430	24052	15241
40 - 44	13767	11751	13247	14860	13877	19616	20866	13953
45 - 49	10615	9510	12379	14075	11341	15998	17101	11994
50 - 54	6934	4802	9904	10380	8983	14036	14442	10132
55 - 59	5371	2779	7545	6507	7771	12565	10776	9034
60 - 64	3900	2152	5936	4308	5576	8863	8243	6369
65 - 69	2777	1042	5838	2574	3971	7887	7877	5165
70 - 74	2439	537	4166	1324	2808	6460	5356	3981
75 - 79	1787	220	2701	670	2149	4709	3673	3405
80 - 84	1358	214	1544	428	1189	3149	2101	2069
85 +	807	124	820	250	880	2700	1660	1955
Total	174597	175622	200072	219207	166501	252644	276621	201667