

# SOUTH AFRICAN NATIONAL BURDEN OF DISEASE STUDY ESTIMATES OF PROVINCIAL MORTALITY 2000 MPUMALANGA PROVINCE

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Burden of Disease  
Research Unit



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Mortality Estimates

for

**MPUMALANGA PROVINCE, 2000**

South African National Burden of Disease Study

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# **SOUTH AFRICAN NATIONAL BURDEN OF DISEASE STUDY 2000**

Timeous and accurate cause of death statistics are an essential component of the information needed for planning and monitoring health services and responding to the health needs of the population. Such information is required for the process of prioritisation of not only health services, programmes and research, but also for guiding the priorities in other sectors. In particular, sub-population data are needed to identify and monitor inequalities in health status. While policy is directed from a national perspective, provincial and local government need to respond to the specific needs of their communities.

Efforts to improve cause of death statistics in South Africa have been under way since 1994, and have resulted in better coverage of death registration. However, the system does not yet routinely provide cause of death statistics that can be used by provinces. The Initial Burden of Disease Study that applied the burden of disease approach developed by the WHO and used available information and presenting it in a format that is relevant for planning health and other services (Bradshaw et al., 2003).

This study makes use of more recent data, namely the 12% sample of deaths for 1997-2001. However, due to under-registration of deaths, it was necessary to estimate the total number of deaths and number of AIDS deaths using a demographic and epidemiological model. It was also necessary to make adjustments for mis-classification of underlying causes due to inadequacies in the medical certification of the cause of death as a result of both poor certification by medical doctors and certification by traditional headmen in some rural areas. Full details of the methods used to estimate the number of deaths, the death rates and the years of life lost (YLLs) for each province according to the South African Burden of Disease list are given in the report Estimates of Provincial Mortality by Bradshaw et al. (2004).

# Mpumalanga provincial profile

## Background

Mpumalanga is in the north-east of South Africa, having international borders with Mozambique and Swaziland in the east, and local borders with KwaZulu-Natal and Free State in the south, Gauteng in the west, and Limpopo in the north. The province encloses 79 490 km<sup>2</sup>, constituting 6.5% of the total land area of the country (SSA, 2003). In 2000 the average population density was estimated at 38 persons per square kilometre. During the 1996 Census 61% of the population lived in non-urban areas (SSA, 1998). Prior to 1994 the province territorially consisted of three patches of the self-governing area of Kangwane in the east, two patches of KwaNdebele in the north west, and one patch of the 'national state' of Bophuthatswana. These areas formed part of the so-called homelands, while the rest of the province was under the separate provincial administration of the then Transvaal. These territorial divisions are no longer valid. However, given the consolidation of the various administrations and differing levels of development, they are important when examining data distribution patterns (Tait, 1996).

The best performing sectors include mining, manufacturing and services. Mpumalanga is rich in coal reserves, explaining on the one hand very high levels of air pollution, and on the other the presence of huge power stations and the country's second petroleum-from-coal installation. Besides coal, the province also produces steel and vanadium. Extensive forestry plantations, timber processing and large paper mills further enrich the province's economy. In addition, agriculture plays an important role in the economy through sugar production, an abundance of tropical and sub-tropical fruits, maize, wheat, sunflowers, potatoes and other vegetables, nuts, cotton, wool and dairy products. The province's Gross Geographic Product at 2001 prices was R70 621 million, contributing 7.2% to the national Gross Domestic Product (GCIS, 2004).

## Population structure

According to ASSA estimates for 2000, 3 054 973 people lived in Mpumalanga, constituting 6.8% of South Africa's total population. The province accommodated slightly more women than men, with men constituting 49.5% and women 50.5% of the population. Just over 35% of the population were younger than 15 years, while 62% were in their 'economically active' years (15-64), and 5% were 60 years or older. [Comparison with 2001 Census: total population 3 122 990 (ASSA had 68 017 less); 7% of total population of South Africa; 52.1% female; 92.4% Black African, 0.7% Coloured, 0.4% Indian, 6.5% White.]

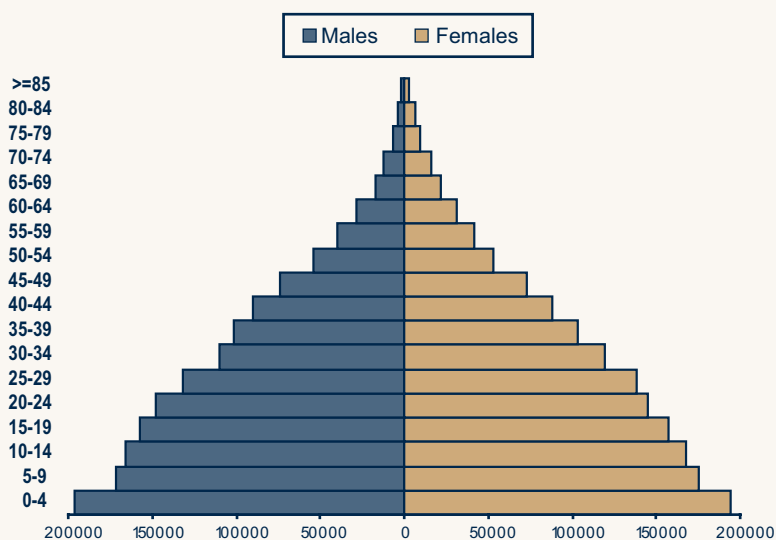


Figure MP1: Age structure of the Mpumalanga population, 2000

## Living conditions

According to the 2001 Census, 27.5% of the population aged 20 years or older had no formal school education, and 41% of those in the age group 15-64 were unemployed. Almost one-third of those who were employed were in elementary occupations (SSA, 2003). Almost 55% of the province's population lived below the national poverty line in 2002 (UNDP, 2004). About 67% of all households lived in formal dwellings, and 16% and 13% in informal and traditional structures respectively. On average, 4 persons shared a household. Piped water, either in the dwelling, on site, or from a communal tap, was available in 87% of households. About 10% of households did not have access to a toilet facility, and 39% had a refuse removal service once a week or more often. In 40% of households electricity was used as the main source of energy for cooking, while wood was used in 23% and paraffin in 17%. Of the households, 74% had a radio, 50% a television, 51% a refrigerator, 15% a telephone in the dwelling, and 32% a cell phone (SSA, 2003).

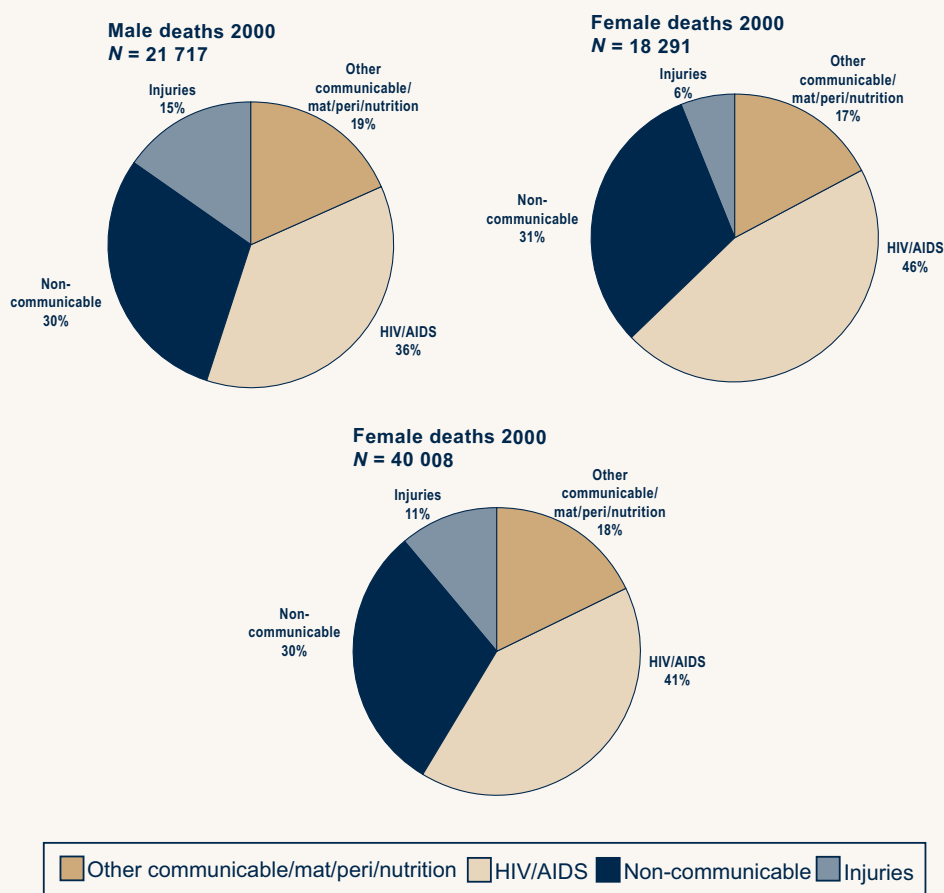


Figure MP2: Estimated deaths by Groups, Mpumalanga 2000

## Mortality profile

For the year 2000 there were an estimated 40 008 deaths in Mpumalanga, in the broad Groups I, II, III and AIDS. HIV/AIDS accounted for 46% of the female deaths and 36% of the male deaths. A considerable sex difference was also visible in the proportions of deaths due to injuries, with two and a half times more injury deaths among men. The proportions of deaths in Groups I and II were very similar for men and women.

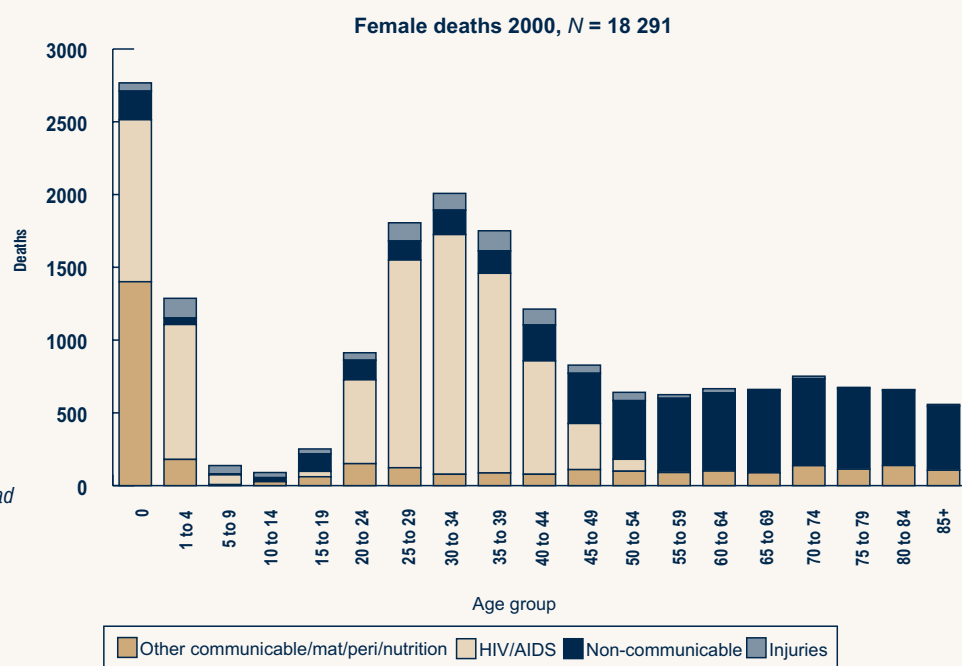
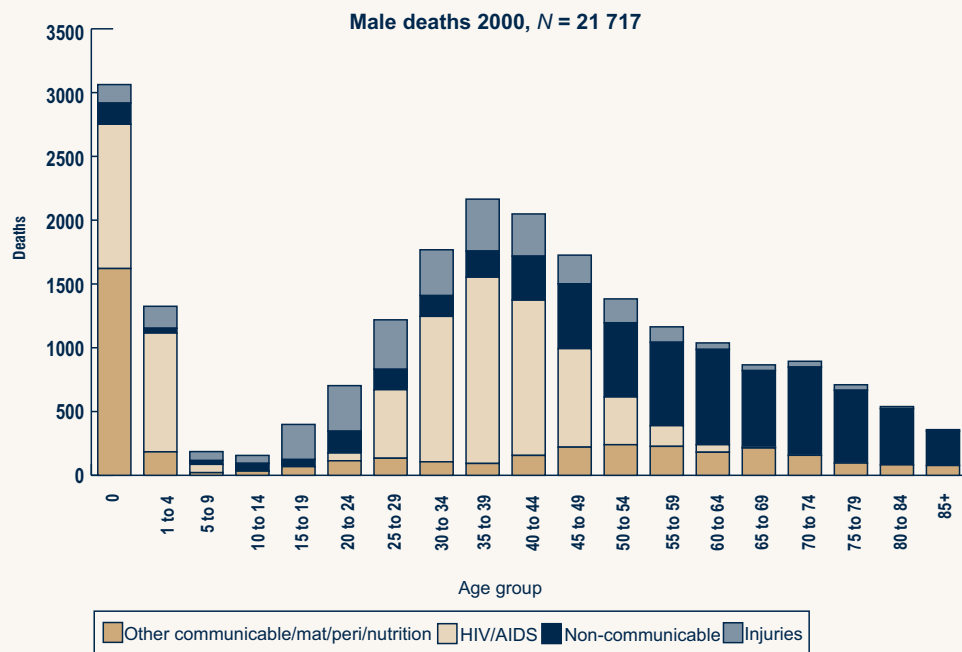
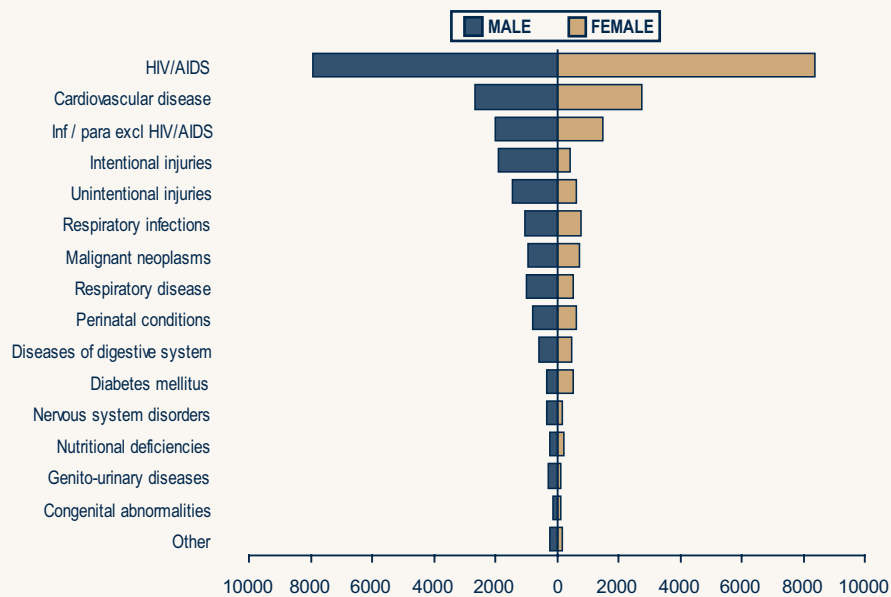


Figure MP3: Age distribution of deaths by broad Groups, Mpumalanga 2000

The age-specific cause of death profiles are presented in Figure MP3. The numbers of deaths are presented by five-year age intervals for the three broad Groups and HIV/AIDS. Due to particular disease and mortality profiles in children during the first year of life, the under 5 year age group was divided into infants less than 1 year old and children aged 1-4 years. For the infants, deaths from both HIV/AIDS and the communicable, maternal, perinatal and nutrition Group (Group I) predominated. There were more male infant deaths than female infant deaths and Group I accounted for a higher proportion of infant deaths than HIV/AIDS. For children of 1-4 years old HIV/AIDS was the main cause of death.

HIV/AIDS deaths were also exceptionally high in young adults and early middle-aged men and women (from about 20 to 54 years). Besides there being more HIV/AIDS deaths among women than men overall, there were more HIV/AIDS deaths in younger adult women than men. The number of HIV/AIDS deaths peaked for females in the 30-34-year age group, and for males in the 35-39-year age group. While injury deaths were high for young men, non-communicable deaths come to the fore as men and women age.

Each cause of death group is divided into several major categories of causes of death. Figure MP4 shows the broad cause of death categories ranked in descending order by the total number of deaths. The leading cause of death in both men and women was HIV/AIDS, followed by cardiovascular disease and infectious and parasitic disease excluding HIV/AIDS. Intentional and unintentional injuries ranked fourth and fifth respectively. Both had a larger proportion of deaths in men than in women, particularly unintentional injuries. Respiratory infections and respiratory disease ranked sixth and eighth respectively, with respiratory disease causing more deaths in males. Other disease categories ranked in the top ten (excluding HIV/AIDS) included malignant neoplasms, perinatal conditions, diseases of the digestive system and diabetes mellitus. Diabetes caused more deaths in women than in men, while the other categories accounted for more or less the same proportion of male and female deaths.



"Other" causes include endocrine and metabolic, benign neoplasms, mental disorders, maternal conditions, musculo-skeletal diseases, skin diseases, sense organ and oral conditions.

Figure MP4: Causes of death according to categories for males and females, Mpumalanga 2000

## Persons 2000, N = 40 008

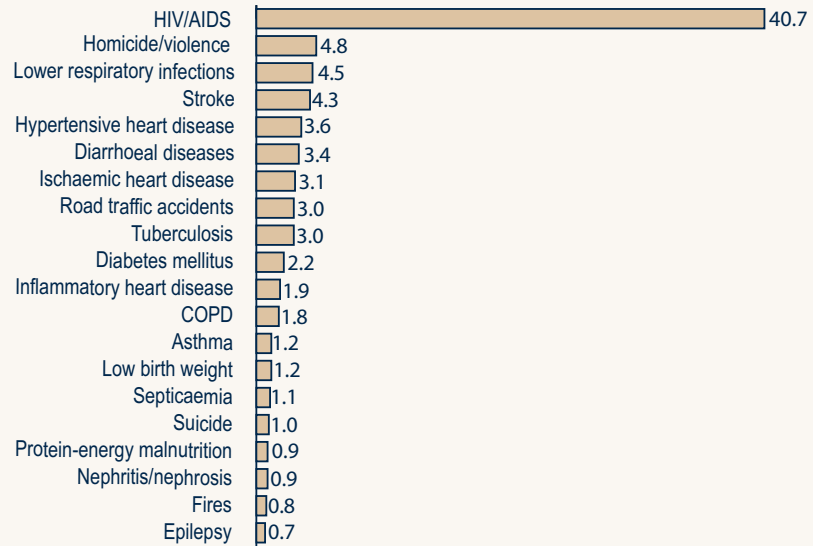


Figure MP5(a): Twenty leading single causes of death (%), Mpumalanga 2000

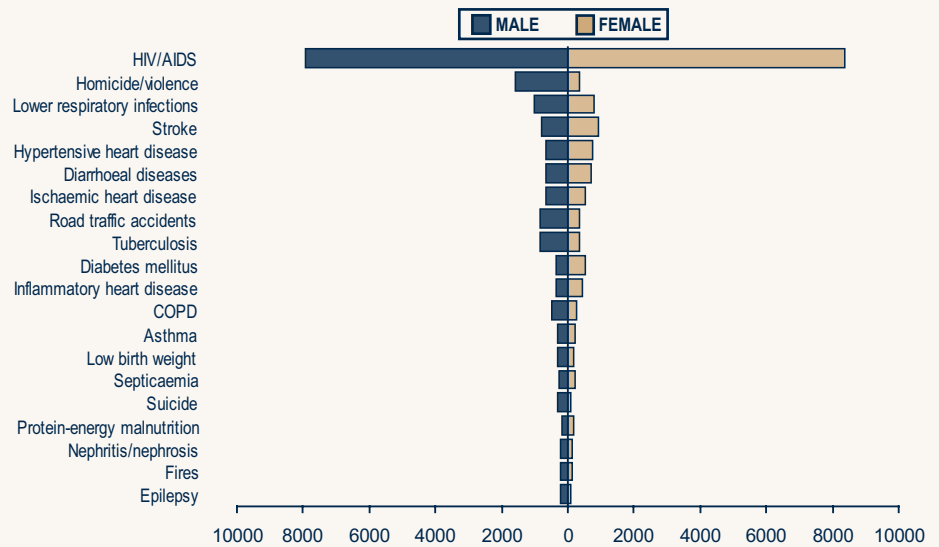


Figure MP5(b): Twenty leading single causes of death by sex, Mpumalanga 2000

The cause of death categories are further disaggregated into more specific causes of death. The twenty leading single causes of death are depicted in Figure MP5(a). HIV/AIDS accounted for 41% of all deaths in 2000, about eight times more deaths than homicide/violence, which was the next largest single cause of deaths in the province. Lower respiratory infections and stroke each accounted for less than 5% of the deaths. Hypertensive heart disease, diarrhoeal diseases, ischaemic heart disease, road traffic accidents and tuberculosis each accounted for between 3.6% and 3% of deaths.

Figure MP5(b) shows that in the top ten ranking, men had a higher number of deaths from homicide/violence, road traffic accidents and tuberculosis, as well as a slightly higher number of deaths from ischaemic heart disease than women. In addition to HIV/AIDS, women had a higher number of deaths due to stroke and diabetes mellitus than did men. For the remaining rankings, apart from inflammatory heart disease, men had higher numbers of deaths due to the various causes than women.

## Premature mortality

The years of life lost (YLLs) measure does not merely consider the number of deaths, but also takes into account the age at which the death occurred. YLLs were calculated using the age weighting parameter, discounting and standard life expectancy that were used in the Global Burden of Disease Study. Table MP1 shows that HIV/AIDS plays a major role in premature mortality, accounting for the largest proportion of female (56.8%) and male (43.5%) YLLs. This can partly be explained by the large numbers of deaths due to AIDS, and partly by the large proportion of AIDS deaths that occurred in young adults and children under the age of 5 years.

Homicide/violence and road traffic accidents ranked second and third in terms of YLLs for men, while these two single causes ranked fifth and fourth respectively for women. YLLs for diarrhoeal diseases and lower respiratory infections ranked second and third respectively for women and fifth and fourth respectively for men.



Table MP1: Leading 20 single causes of the premature mortality burden (YLLs) by sex, Mpumalanga 2000

Males				Females				Persons			
Rank	Cause of death	YLLs	%	Rank	Cause of death	YLLs	%	Rank	Cause of death	YLLs	%
1	HIV/AIDS	209243	43.5	1	HIV/AIDS	244296	56.9	1	HIV/AIDS	453540	49.8
2	Homicide/violence	43131	9.0	2	Diarrhoeal diseases	18718	4.4	2	Homicide/violence	51949	5.7
3	Road traffic accidents	21591	4.5	3	Lower respiratory infections	15783	3.7	3	Diarrhoeal diseases	37630	4.1
4	Lower respiratory infections	20425	4.3	4	Road traffic accidents	9909	2.3	4	Lower respiratory infections	36208	4.0
5	Diarrhoeal diseases	18911	3.9	5	Stroke	8861	2.1	5	Road traffic accidents	31500	3.5
6	Tuberculosis	13532	2.8	6	Homicide/violence	8818	2.1	6	Tuberculosis	21305	2.3
7	Low birth weight	10042	2.1	7	Tuberculosis	7774	1.8	7	Stroke	17516	1.9
8	Stroke	8655	1.8	8	Hypertensive heart disease	6852	1.6	8	Low birth weight	15840	1.7
9	Ischaemic heart disease	7555	1.6	9	Inflammatory heart disease	6113	1.4	9	Ischaemic heart disease	12381	1.4
10	Suicide	7116	1.5	10	Low birth weight	5798	1.4	10	Hypertensive heart disease	12376	1.4
11	Septicaemia	6250	1.3	11	Protein-energy malnutrition	5677	1.3	11	Protein-energy malnutrition	11433	1.3
12	Protein-energy malnutrition	5756	1.2	12	Diabetes mellitus	5672	1.3	12	Septicaemia	11124	1.2
13	Fires	5660	1.2	13	Septicaemia	4874	1.1	13	Diabetes mellitus	10499	1.2
14	Hypertensive heart disease	5524	1.2	14	Ischaemic heart disease	4826	1.1	14	Inflammatory heart disease	10265	1.1
15	COPD	5461	1.1	15	Fires	3802	0.9	15	Fires	9461	1.0
16	Epilepsy	5203	1.1	16	Cervix ca	3706	0.9	16	Suicide	9339	1.0
17	Diabetes mellitus	4827	1.0	17	COPD	3205	0.7	17	COPD	8665	1.0
18	Inflammatory heart disease	4152	0.9	18	Asthma	2995	0.7	18	Asthma	6965	0.8
19	Asthma	3970	0.8	19	Nephritis/nephrosis	2407	0.6	19	Epilepsy	6910	0.8
20	Nephritis/nephrosis	3625	0.8	20	Suicide	2223	0.5	20	Nephritis/nephrosis	6032	0.7
	<b>All causes</b>	<b>480 947</b>		<b>All causes</b>	<b>429 538</b>			<b>All causes</b>	<b>910 485</b>		

## Leading causes of death among children (<15 years)

The leading ten causes of death among children under 5 years of age and children aged 5-14 years are shown in Figure MP6. Almost half the deaths in the under 5 year olds were attributed to HIV/AIDS with diarrhoeal diseases, low birth weight, lower respiratory infections and protein-energy malnutrition all among the leading causes of deaths for boys and girls.

The cause of death profiles for boys and girls aged 5-14 years differed. Road traffic accidents were the leading cause of death among boys this age while HIV/AIDS was the leading cause for girls. Injuries and other infectious diseases were among the leading causes in this age group for girls. Inflammatory heart disease was responsible for 6% of girl deaths in this age group.

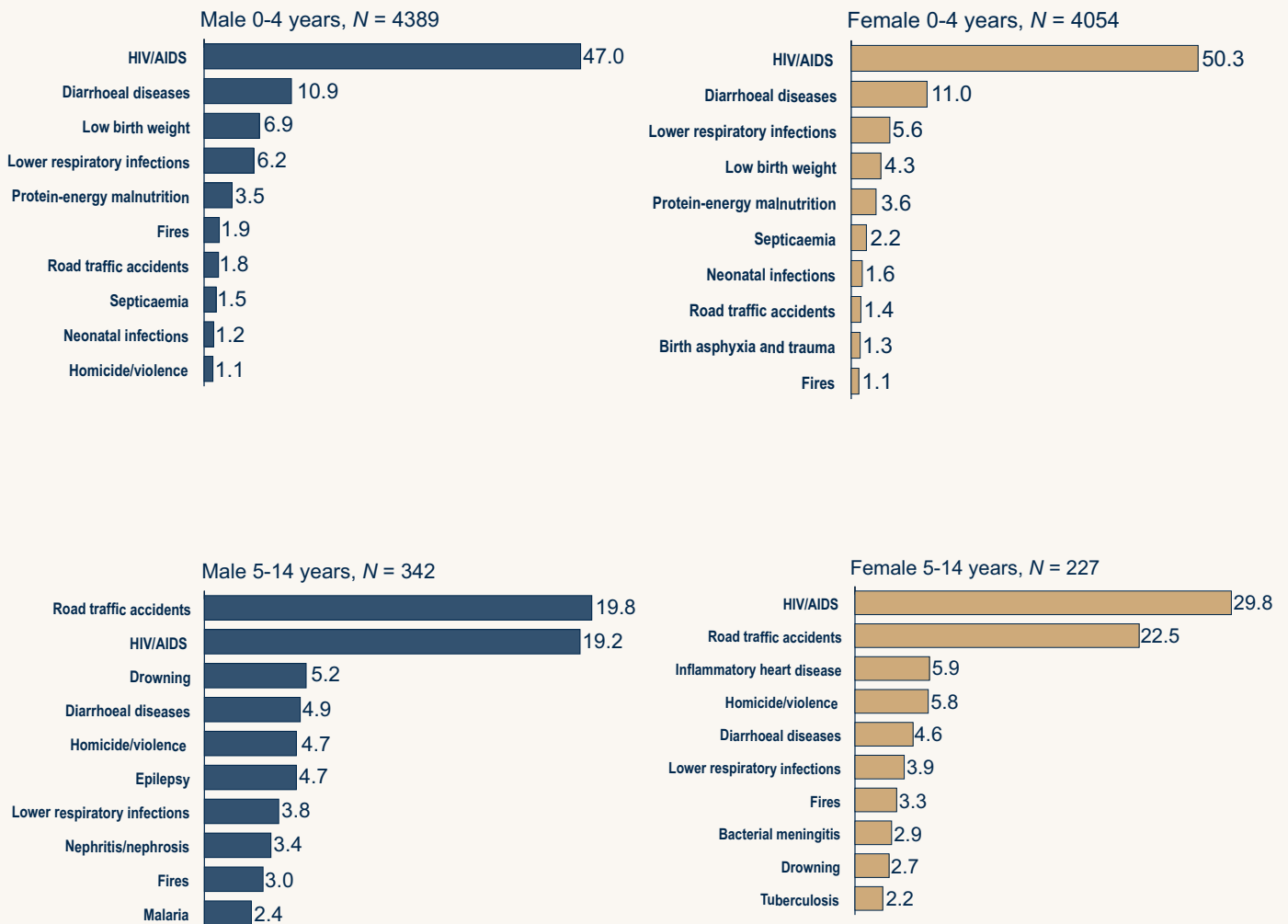


Figure MP6: Ten leading single causes of death (%) among children (<15 years) by sex, Mpumalanga 2000

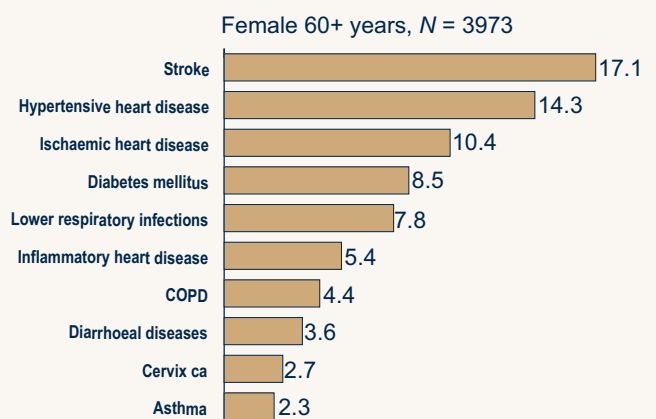
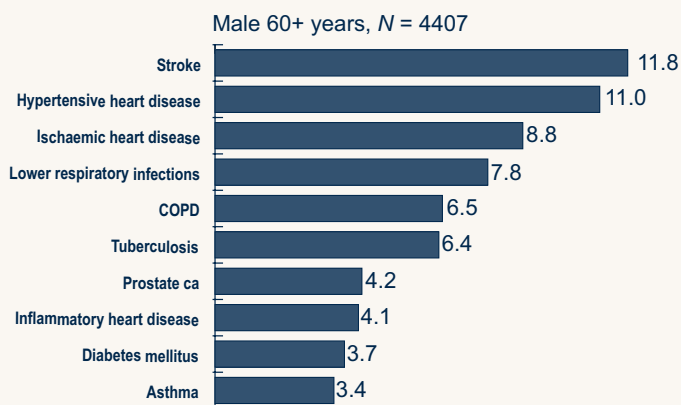
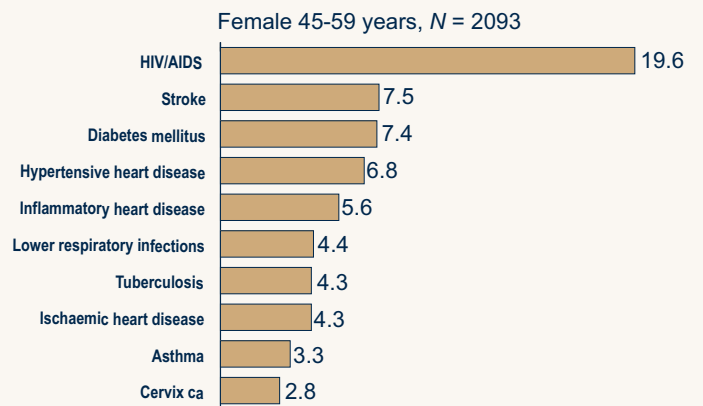
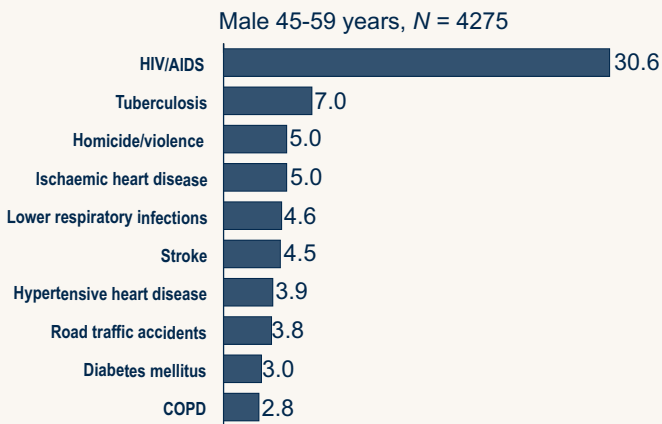
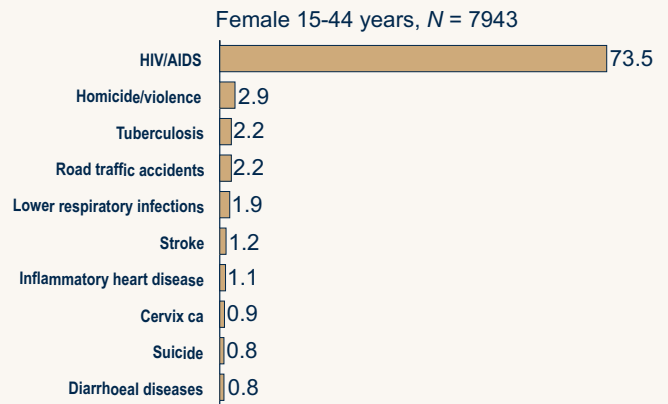
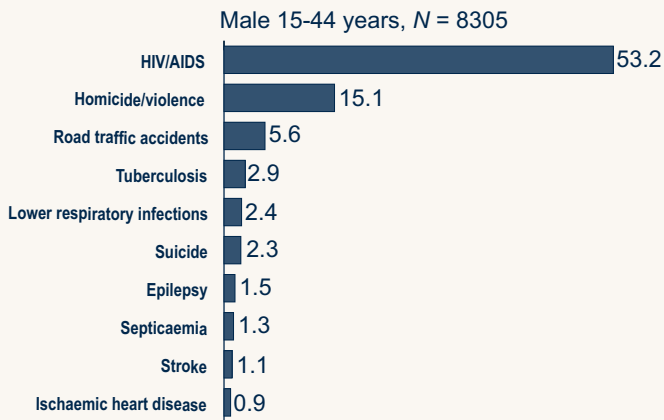
## Leading causes of death among adults

The leading causes of death for adults are shown in Figure MP7. HIV/AIDS was the leading cause of death for men and women, and accounted for 53% and 30% of the deaths respectively in the 15-44 year old age group. Deaths due to road traffic accidents and homicide and violence were also high in this age group and accounted for 21% and 28% in men and women respectively. Infectious diseases such as diarrhoeal and lower respiratory infections and tuberculosis, as well as other injuries including fires, drowning and suicide featured among the leading causes in adults.

The profile for the older adults aged 45-59 years differed from the young adult age group with an increasing number of deaths due to non-communicable diseases and fewer deaths due to infectious diseases or injuries. Although HIV/AIDS was the leading cause of death in this age group, stroke, diabetes, hypertensive and ischaemic heart disease featured in both men and women. Infectious diseases such as tuberculosis and lower respiratory infections also featured in both. Injury deaths such as homicide, violence and road traffic accidents showed up in men, while cervical cancer showed up in women.

In older persons the majority of the leading ten single causes of death were non-communicable diseases, with stroke and cardiovascular disease ranked in the top three, accounting for over 30% of the deaths in the elderly (Figure MP7). Cardiovascular disease was the primary cause of death in older persons in Mpumalanga. The fourth, fifth and sixth rankings in men were deaths attributed to respiratory conditions, accounting for a further 21% of deaths. In women respiratory conditions were ranked fifth and seventh in the elderly in the province. Figure MP7 shows that stroke was responsible for more deaths in older women than older men.

Figure MP7: Ten leading single causes of death (%) among adults by sex, Mpumalanga 2000



## Contrast with national profile

The Initial National Burden of Disease Study highlighted the substantial impact of HIV/AIDS as a cause of death in South Africa by the year 2000, and the major health transition that is under way. As countries become more developed the disease profile changes, from one of infectious diseases, high child mortality and malnutrition, to a predominance of degenerative, chronic diseases. However, developing countries often experience a double burden, resulting from the simultaneous occurrence of these disease spectrums. During the early 1990s the health transition in South Africa was characterised by a very high injury burden on top of the double burden, resulting in a 'triple burden' (Bradshaw et al., 2002). In more recent years the impact of HIV/AIDS has created a quadruple burden of disease in South Africa. This study shows that all provinces are experiencing this quadruple burden of disease to varying degrees and signifies an important milestone in generating burden of disease information at provincial level by providing mortality estimates for the provinces. This requires a broad range of interventions, including improved access to health care, promotion of a healthy lifestyle and ensuring that basic needs such as water and sanitation are met. Social cohesion needs to be fostered to ensure safe and caring communities

Mpumalanga has a population age structure that resembles the national one. The age distribution of deaths by broad groups was also similar to the national profile.

HIV/AIDS deaths in this province were higher than nationally - 41% person deaths versus 30%. The 11% person deaths for injuries was comparable with the national figure of 12%, with the rates being higher than the national average. Similarly, deaths from Group I conditions, excluding HIV/AIDS, were 18% in Mpumalanga and 20% nationally. There were fewer deaths from non-communicable diseases in Mpumalanga than nationally.

The top ten leading single causes of death were the same for Mpumalanga as they were nationally, just the rankings differed. Noteworthy is that homicide and violence accounted for 5.8% of deaths nationally and 4.8% of the deaths in the province, and road traffic accidents accounted for about 3% of the deaths in both. Death rates due to lower respiratory infections and diarrhoea were high. For Mpumalanga the lower-ranked single causes of death were epilepsy and fire, while nationally they were lung and oesophageal cancer. Prostate and cervical cancer death rates were also higher in this province. The cardiovascular profile of this province showed high rates of death from stroke and hypertensive heart disease. Ischaemic heart disease was ranked lower and accounted for fewer deaths than it did nationally. Similarly, tuberculosis was ranked higher and accounted for a greater death burden nationally.

These estimates are extrapolations from a variety of data sources, all with limitations. There is an urgent need to further improve the cause of death data system to provide timely and reliable statistics. While the data systems are being improved, provincial and local level planners are urged to make use of the findings of this study to modify the emphasis of national policies to meet the health needs of their communities. It should be noted that the spread of the HIV epidemic during the 1990s was very rapid and that the mortality profile is changing rapidly. This should be taken into account when making use of these estimates for planning, and highlights the urgency of implementing the treatment programme approved by Cabinet in September 2003 as quickly as possible as well as strengthening efforts to reduce the spread of HIV/AIDS.

## References

Bradshaw D, Groenewald P, Laubscher R, Nannan N, Nojilana B, Norman R, Pieterse D, Schneider M, Bourne D, Timæus IM, Dorrington RE, Johnson L. 2003. Initial burden of disease estimates for South Africa, 2000. *S Afr Med J* 93(9): 682-688.

Bradshaw D, Schneider M, Dorrington R, Bourne D, Laubscher R. 2002. South African cause of death profile in transition – 1996 and future trends. *S Afr Med J* 92: 618-623.

Bradshaw D, Nannan N, Laubscher R, Groenewald P, Joubert J, Nojilana B, Norman R, Pieterse D, Schneider M. South African National Burden of Disease Study, 2000, Estimates of Provincial Mortality. 2004. ISBN: 1-920015-14-0.

Government Communication and Information System (GCIS). 2004. South Africa Yearbook 2003/04. Pretoria: GCIS and STE Publishers. ISBN 1-919855-18-1. Available: <http://www.gcis.gov.za/docs/publications/yearbook.htm> [2004, 10 September]

Statistics South Africa. 1998. The people of South Africa, Population Census, 1996: Census in Brief. Report No. 1: 03-01-11 (1996). Pretoria: Statistics South Africa.

Statistics South Africa. 2003. Census 2001: Census in Brief. Report No. 03-02-03 (2001). Pretoria: Statistics South Africa.

Tait N. 1996. Background information. In: Tait N, Whiteford A, Joubert J, Van Zyl J, Krige D & Pillay B. A socio-economic atlas of South Africa. A demographic, socio-economic and cultural profile of South Africa. Pretoria: HSRC.

United Nations Development Programme. 2004. South Africa Human Development Report 2003. Cape Town: Oxford University Press Southern Africa





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