SOUTH AFRICAN NATIONAL BURDEN OF DISEASE STUDY

ESTIMATES OF PROVINCIAL MORTALITY 2000

KWA-ZULU NATAL PROVINCE

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Burden of Disease
Research Unit

Mortality Estimates

for

KWA-ZULU NATAL PROVINCE, 2000

South African National Burden of Disease Study

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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).

KwaZulu-Natal provincial profile

Background

KwaZulu-Natal is on the east coast of South Africa, bordering Mozambique and Swaziland in the north, Mpumalanga and Free State in the west, Eastern Cape in the south and Lesotho in the south west. The province encloses 92 100 km^2, constituting 7.6% of the total land area of the country (Statistics South Africa (SSA), 2003). The average population density during 2002 was 100 persons per square kilometre. During the 1996 Census 57% of the population lived in non-urban areas (SSA, 1998). Prior to 1994 the province territorially consisted of several patches of the self-governing area of KwaZulu. Together with the 'national state' of Transkei in the southern part of the province, these areas formed part of the so-called 'homelands', while the rest of the province was under the separate provincial administration of the then Natal. These territorial divisions are no longer valid, but given the consolidation of various administrations and levels of development, they are important when examining data distribution patterns (Tait, 1996).

Durban, housing an international airport and one of the 10 largest ports in the world, and served by an extensive national road network, is one of the fastest-growing urban areas. Steel production, coal mining and export, a rich wildlife protected in several game parks, holiday resorts along the coast, forestry, tea plantations, meat processing, and mixed agriculture all contribute to the economy. The coastal belt agriculture includes yields of sugar cane, oranges, wood, bananas, mangos and other tropical and sub-tropical fruits, while farmers in the hinterland focus on vegetable, dairy and stock farming.

KwaZulu-Natal has recently undergone rapid industrialisation, and industries are found in towns such as Dundee, Hammarsdale, Ladysmith, Mandeni, Newcastle, Richards Bay, and Richmond (GCIS, 2004). During 2001 KwaZulu-Natal made the second highest Gross Geographic Product contribution of all the provinces to the national Gross Domestic Product (GDP), providing 15.5% of the total GDP at R152 703 million (GCIS, 2004). However, at the micro level it is important to realise that high levels of unemployment and poverty prevail.

Population structure

According to the 2000 ASSA estimates, 9 211 922 people lived in KwaZulu-Natal, constituting 20.4% of South Africa's total population. The province accommodated slightly more women (52%) than men (48%). Nearly 35% of the population were younger than 15 years, and 61% were in their 'economically active' years (15-64), while 6% were aged 60 years or older. [Census 2001: total population 9 426 017 (ASSA had 214 095 less); 21% of South Africa's total population; 53.2% female; 84.9% Black African, 1.5% Coloured, 8.5% Indian, 2.4% White.]

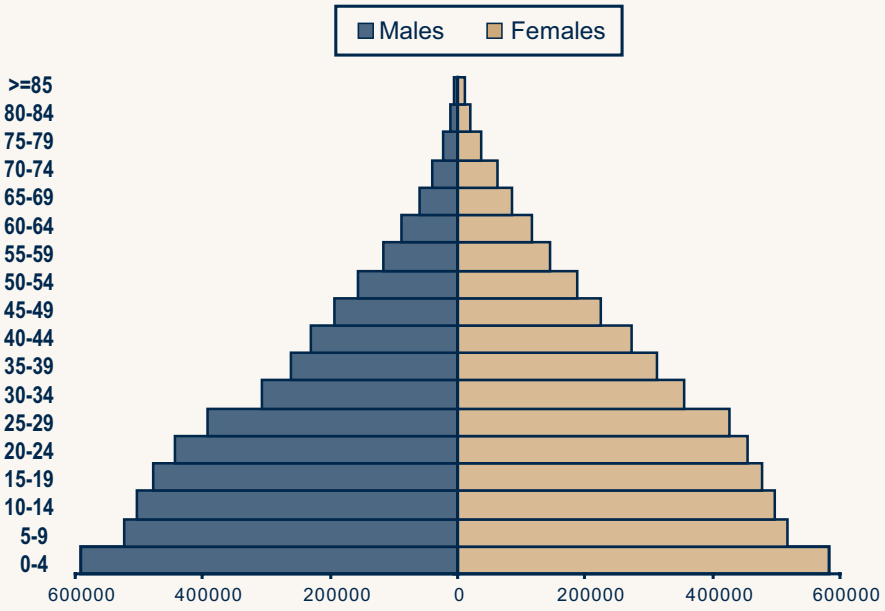


Figure KZN1: Age structure of the KwaZulu-Natal population, 2000

Living conditions

According to the 2001 Census, 21.9% of the population aged 20 years or older had no formal school education, and 48.7% of those in the age group 15-64 were unemployed (SSA, 2003). Just over half of the population (50.5%) lived below the national poverty line in 2002 (UNDP, 2004). A large proportion of the households in KwaZulu-Natal (nearly 57%) are accommodated in formal housing, and 10.8% and 27.9% respectively in informal and traditional structures. On average, 4.2 persons share a household. The majority of households (86%) have access to piped water, whether it is in the home, yard or at a public facility. In 16.2% of the households there is no toilet facility; 49.2% of the households' refuse is removed at least once a week. For cooking purposes 48.3% of the households have access to electricity, in 27% wood is used, and in 17.9% paraffin is used. Seventy three per cent of the households have a radio, 47.3% a television, 46.9% a refrigerator, 24% a telephone, and 28.5% a cell phone (SSA, 2003).

Mortality profile

KwaZulu-Natal's mortality profiles are based on 66 385 (51.1%) male and 63 473 (48.9%) female deaths estimated for the year 2000, totalling 129 858 deaths. Figure KZN2 shows the causes of death for the broad Groups. The proportions of other infectious diseases, maternal, perinatal and nutritional deficiencies and non-communicable diseases were very similar for men and women, while HIV/AIDS accounted for 46% of the female deaths and 38% of the male deaths. The greatest differences were seen in the proportions of deaths due to injuries - 13% for men and 5% for women.

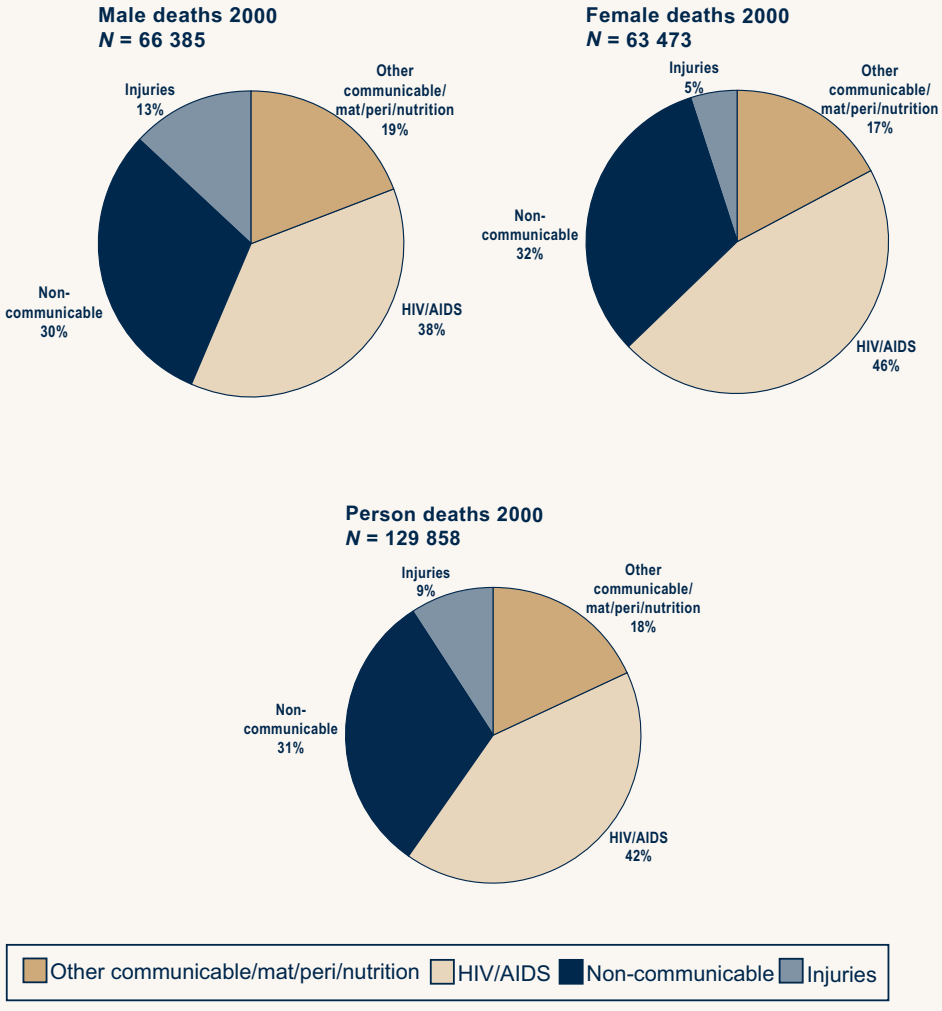


Figure KZN2: Estimated deaths by Groups, KwaZulu-Natal 2000

The age-specific cause of death profiles are presented in Figure KZN3. 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 is divided into infants less than 1 year old and children aged 1-4 years old. HIV/AIDS deaths were exceptionally high for young adult men and women. Deaths due to other infectious diseases and HIV/AIDS were extremely high for boys and girls in the perinatal period. Deaths from injury were higher in young adult men than in women. In adults of 50 years or older non-communicable disease mortality dominated.

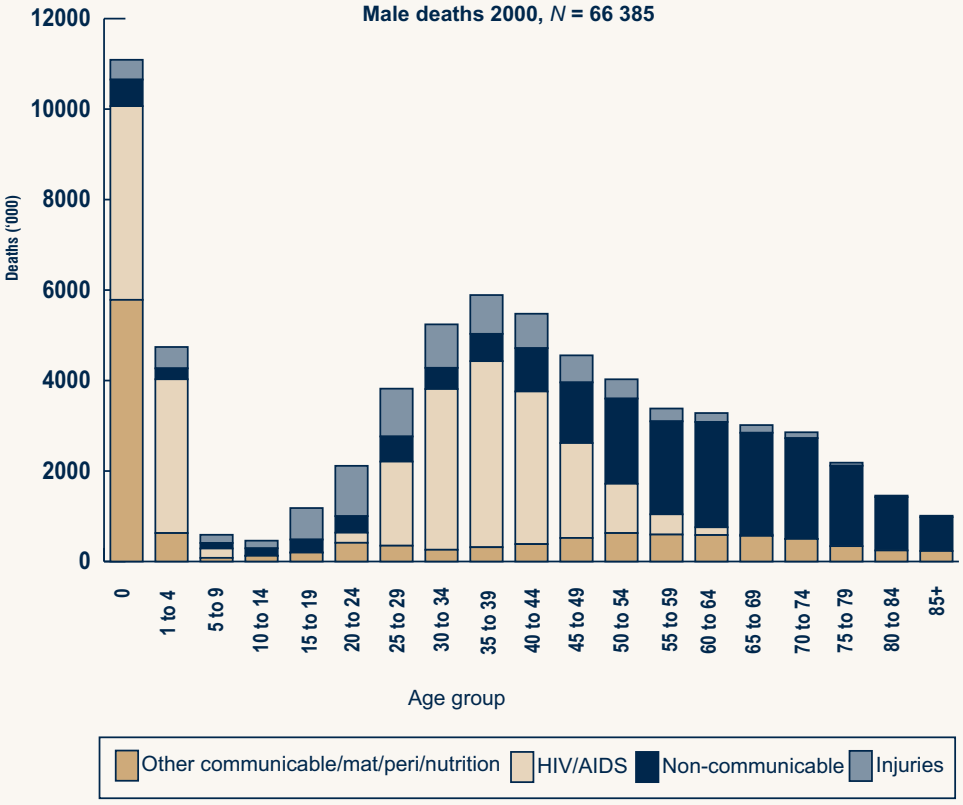


Figure KZN3: Age distribution of deaths by broad Groups, KwaZulu-Natal 2000

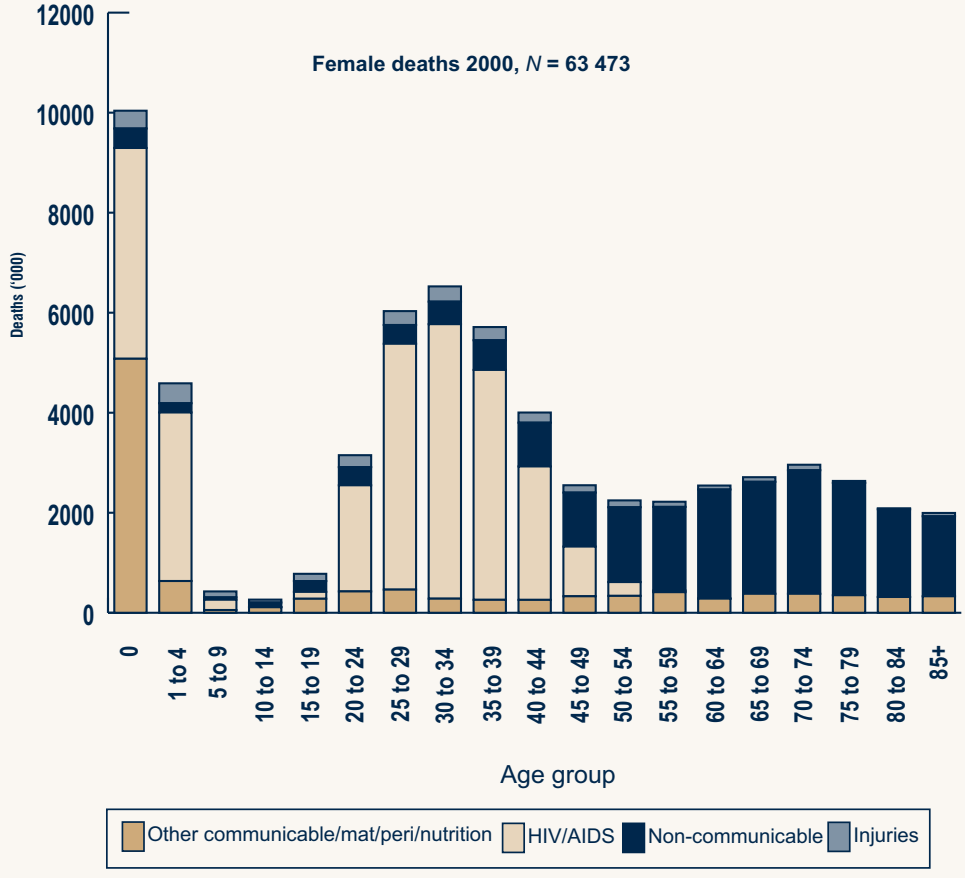


Figure KZN4 shows KwaZulu-Natal's cause of death profile for categories of causes of death, ranked in descending order according to total deaths. In both men and women HIV/AIDS was the leading cause of death (41.5%), followed by cardiovascular disease (15%), infectious and parasitic diseases excluding HIV/AIDS (9%), intentional injuries (5%) and unintentional injuries (4%), perinatal conditions (4%) and respiratory infections (4%). Differences were observed between men and women, with HIV/AIDS, cardiovascular disease and diabetes accounting for higher proportions of deaths in females than in males. In contrast, in men intentional and unintentional injuries, as well as infectious and parasitic infections excluding HIV/AIDS, predominated among the leading ten categories.

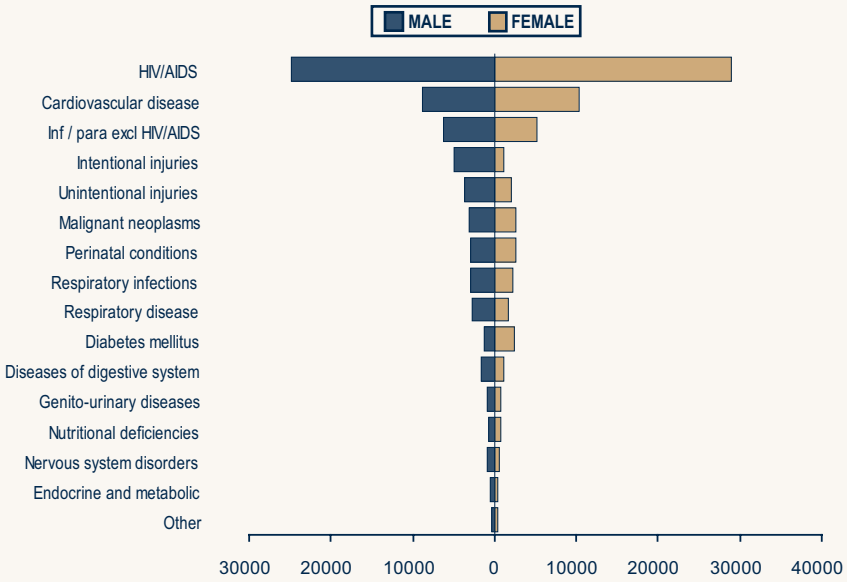


Figure KZN4: Causes of death according to categories for males and females, KwaZulu-Natal 2000

"Other" causes include congenital abnormalities, maternal conditions, benign neoplasms, musculo-skeletal diseases, skin disorders, oral conditions and conditions of the sense organs.

The twenty leading single causes of death in the total KwaZulu-Natal population are shown in Figure KZN5(a) below, illustrating that HIV/AIDS was the largest single cause of death, accounting for 41.5% of all deaths during 2000. HIV/AIDS caused about seven times more deaths than strokes, the next largest single cause (6%). Ischaemic heart disease and hypertensive heart disease, lower respiratory infection, homicide, diarrhoea and tuberculosis were next in the ranking, each accounting for between 3% and 5% of deaths. From Figure KZN5(b) it is clear that women had higher numbers of deaths due to HIV, stroke, hypertensive heart disease, and diabetes mellitus, while men had higher numbers of deaths due to the remaining leading causes of death.

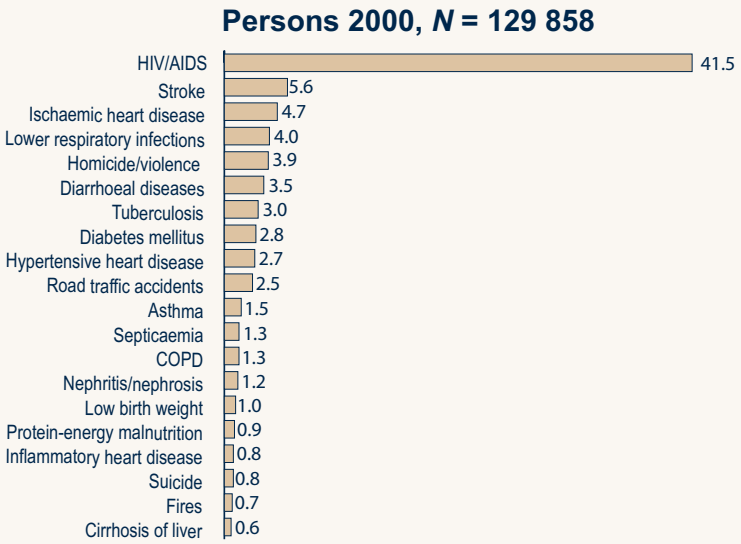


Figure KZN5(a): Twenty leading single causes of death (%), KwaZulu-Natal 2000

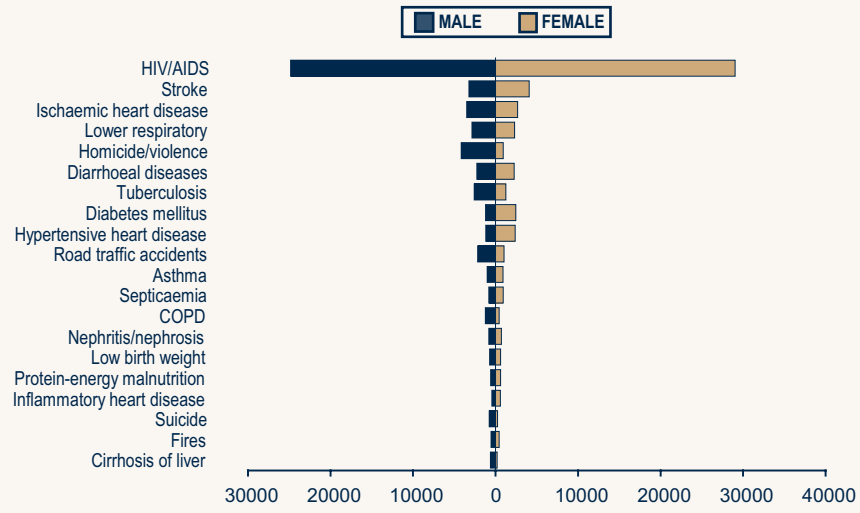


Figure KZN5(b): Twenty leading single causes of death by sex, KwaZulu-Natal 2000

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 deaths occurred. YLLs are calculated using the age weighting parameter, discounting and the standard life expectancy used in the Global Burden of Disease Study. Table KZN1 shows that HIV/AIDS played a major role in premature mortality. This can be explained by the large numbers of deaths due to AIDS, especially in young adults and children under the age of 5 years. The proportions attributable to other causes are much smaller, with homicide/violence, diarrhoeal diseases, lower respiratory infections and road traffic accidents each being responsible for 2.8 - 4.7% of premature loss of life. Premature mortality manifested differently in men and women. For example, HIV/AIDS accounted for 58% of all YLLs in women and 45% in men. Homicide/violence and road traffic accidents were ranked in the top five causes in men, but ranked lower in women. Two of the classic lifestyle causes of death, stroke and diabetes, ranked in the top five causes for women.

Table KZN1: Leading 20 single causes of the premature mortality burden (YLLs) by sex, KwaZulu-Natal 2000

Males				Females				Persons		
Rank	**Cause of death**	**YLLs**	**%**	**Rank**	**Cause of death**	**YLLs**	**%**	**Rank**	**Cause of death**	**YLLs**	**%**
1	HIV/AIDS	673918	45.0	1	HIV/AIDS	853688	58.0	1	HIV/AIDS	1527606	51.4
2	Homicide/violence	113849	7.6	2	Diarrhoeal diseases	59773	4.1	2	Homicide/violence	138231	4.7
3	Diarrhoeal diseases	63563	4.2	3	Lower respiratory infections	49024	3.3	3	Diarrhoeal diseases	123336	4.2
4	Lower respiratory infections	61841	4.1	4	Stroke	37927	2.6	4	Lower respiratory infections	110865	3.7
5	Road traffic accidents	56282	3.8	5	Diabetes mellitus	27041	1.8	5	Road traffic accidents	83225	2.8
6	Tuberculosis	42322	2.8	6	Road traffic accidents	26943	1.8	6	Stroke	73199	2.5
7	Ischaemic heart disease	36723	2.5	7	Tuberculosis	25400	1.7	7	Tuberculosis	67723	2.3
9	Stroke	35272	2.4	9	Homicide/violence	24382	1.7	9	Ischaemic heart disease	60961	2.1
10	Low birth weight	23770	1.6	10	Ischaemic heart disease	24238	1.6	10	Low birth weight	44371	1.5
11	Protein-energy malnutrition	19603	1.3	11	Septicaemia	21038	1.4	11	Diabetes mellitus	41144	1.4
12	Septicaemia	19583	1.3	12	Hypertensive heart disease	20811	1.4	12	Septicaemia	40621	1.4
13	Suicide	18620	1.2	13	Low birth weight	20602	1.4	13	Protein-energy malnutrition	39314	1.3
14	Fires	15438	1.0	14	Protein-energy malnutrition	19711	1.3	14	Hypertensive heart disease	33467	1.1
15	Asthma	14951	1.0	15	Asthma	14136	1.0	15	Asthma	29087	1.0
17	Diabetes mellitus	14103	0.9	17	Birth asphyxia and trauma	12920	0.9	17	Fires	27305	0.9
18	Nephritis/nephrosis	12850	0.9	18	Fires	11867	0.8	18	Suicide	24502	0.8
19	Hypertensive heart disease	12657	0.8	19	Nephritis/nephrosis	10831	0.7	19	Nephritis/nephrosis	23681	0.8
20	COPD	12132	0.8	20	Neonatal infections	6984	0.5	20	Birth asphyxia and trauma	23563	0.8
	All causes	**1 497 562**			**All causes**	**1 472 015**			**All causes**	**2 969 577**	

Leading causes of death among children (<15 years)

The leading ten causes of death in children under 15 years of age are shown in Figure KZN6 for boys and girls separately. In the under 5 year olds, HIV/AIDS accounted for about half the deaths. The pattern for boys and girls in the top five are the same, with two infectious diseases and two perinatal conditions after HIV/AIDS. Among children 5 to 14 years, the number of deaths for boys was nearly twice as high as for girls, with the pattern for boys and girls in the top four the same. HIV/AIDS accounted for most of the deaths, followed by road traffic accidents and two infectious diseases. Injuries, including drowning and homicide, were among the leading causes for boys, while homicide and fires were among the leading causes for girls.

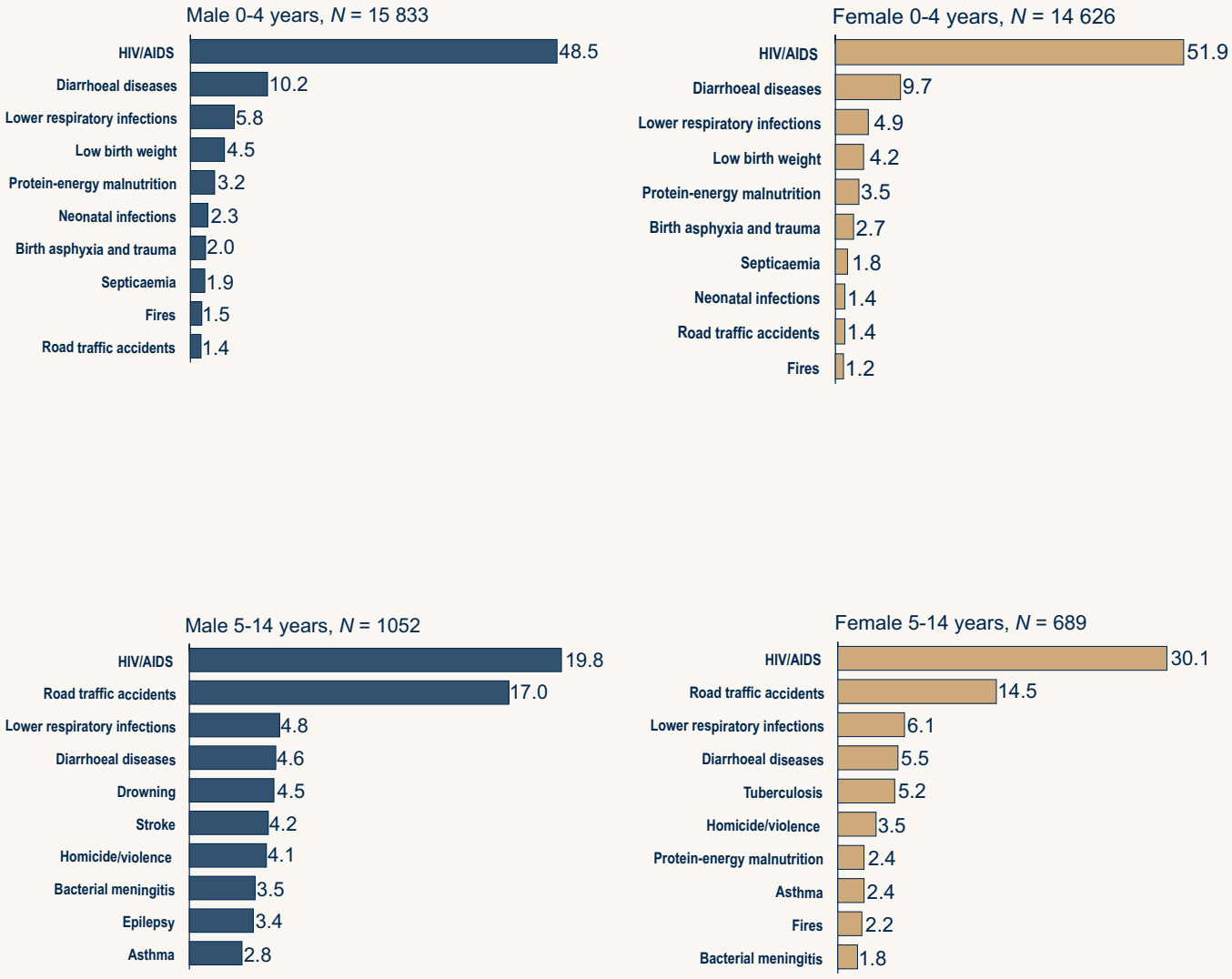


Figure KZN6: Ten leading single causes of death (%) among children (<15 years) by sex, KwaZulu-Natal 2000

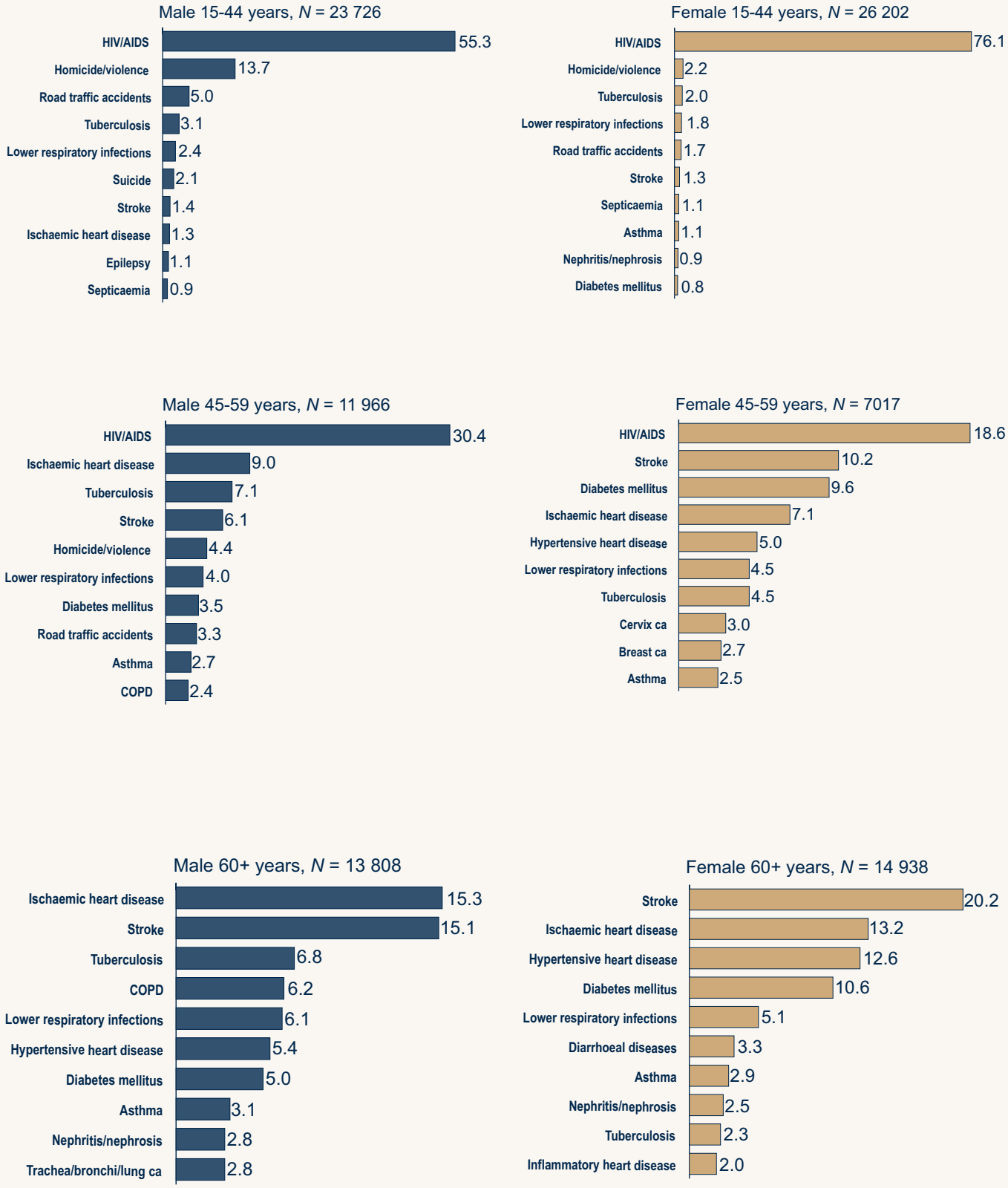
Leading causes of death among adults

The leading ten causes of death among adults are shown in Figure KZN7 by selected age groups and sex. Among young adults aged 15 to 44 years, HIV/AIDS was the leading cause for both men and women, followed by homicide. These two conditions accounted for 69% and 78.3% of the deaths in males and females respectively. The next three causes were the same for males and females, but the ranking differed.

Among the next age group, 45 to 59 years, HIV/AIDS accounted for most of the deaths. Thereafter the pattern differed slightly. Lifestyle diseases, such as stroke, diabetes, ischaemic and hypertensive heart disease, accounted for 31.9% of deaths in women. All of these lifestyle diseases, except hypertensive heart disease, appeared in males too, and accounted for 18.6% of the deaths. Injuries, such as homicide and road traffic accidents, were among the leading causes for men, but not for women. The common female cancers, cervix and breast, were among the leading causes of death for women.

In older persons (60 years and older) most of the leading causes of death were non-communicable diseases, and it is clear that cardiovascular diseases were the primary cause of death in older persons. Stroke, ischaemic heart disease and hypertensive heart disease were the leading single causes of death, accounting for 35.8% and 46% of the deaths in males and females respectively. Diabetes was the fourth largest cause, accounting for 10.6% of the deaths in women, while it was in seventh place for men, accounting for 5% of the deaths. Figure KZN7 shows that tuberculosis, chronic obstructive pulmonary disease and lung cancer caused more deaths in older men than in older women. Lower respiratory infections, asthma and nephritis accounted for deaths in both males and females at similar levels.

Figure KZN7: Ten leading single causes of death (%) among adults by sex, KwaZulu-Natal 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

In KwaZulu-Natal mortality was very high. This province had the highest HIV/AIDS mortality rates and the highest child mortality rates. Comparing KwaZulu-Natal's cause of death profile with the country's national profile, it is clear that there were similarities as well as differences. In the broad Groups, injuries in KwaZulu-Natal (9%) constituted a smaller proportion than nationally (12%), as did non-communicable diseases with 31% in KwaZulu-Natal and 37% nationally. In KwaZulu-Natal HIV/AIDS mortality was much higher (42%) than nationally (30%).

The leading top ten single causes of death were the same in KwaZulu-Natal as they were nationally, but they ranked differently. Tuberculosis not related to HIV was ranked lower in KwaZulu-Natal, while lower respiratory infections, diarrhoea and septicaemia were ranked higher. Stroke and ischaemic heart disease were ranked higher in KwaZulu-Natal. Unnatural causes of death like homicide/violence and road traffic accidents ranked lower in KwaZulu-Natal than nationally. Lung cancer ranked seventeenth nationally, but does not feature among the leading twenty causes in KwaZulu-Natal.

The KwaZulu-Natal Epidemiology Unit estimated the burden of disease based on the sample death data for the years 1997-2001 (KwaZulu-Natal Department of Health, 2003). A comparison of their results by broad cause combining AIDS and other Group I shows 50% against our estimate of 60%. This difference is due to the fact that their estimate is based on an earlier period. The injuries are 10% for the period 1997-2001 and 9% in this study. The focus of their study was on non-communicable diseases, for which very similar observations were made.

Empirical data has been collected in the Demographic Surveillance Site in the Umkhanyakude district of northern KwaZulu-Natal by the Africa Centre for Health and Population Studies (ACDIS) using verbal autopsy to obtain cause of death data in the area under surveillance. By the year 2000, the study reported adult mortality levels (45q15), of 75% for males and 58% for females (Hosegood et al., 2004). These levels of adult mortality are considerably higher than the ASSA2000 estimates of 55% for males and 43% for females for the province. This difference in level of mortality is considered plausible given the comparison of a rural population and an average of the province. The profile of the broad causes of death for the province was compared with that from the ACDIS which had defined causes for 97% of the deaths (Table KZN2). While the profiles were reasonably similar with the rural area showing a higher proportion of deaths due to AIDS and lower proportion of deaths due to non-communicable diseases, it would need more careful comparison of age specific rates to assess the distinctions.

Table KZN2. Comparison of the cause of death profile estimated for KwaZulu-Natal with the ACDIS profile for adults over 15 years

Cause Group	KwaZulu-Natal (%)	Africa Centre Demographic Information System (%)
Other Group I	11	11
AIDS	39	48
Non-communicable	40	27
Injuries	10	11

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.

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