Epidemiological profile of Umzinyathi District, KwaZulu-Natal, South Africa

Dr. Venanzio Vella, Epidemiologist Italian Cooperation, DOH, KZN 20/10/05

Introduction

This note provides a profile of Umzinyathi district in KwaZulu-Natal (KZN) to identify health priorities and suggest what the district could do to improve planning and management of health services. The profile is based on available socioeconomic, demographic, epidemiological and management indicators. The socioeconomic profile is provided according to individual and household characteristics. The demographic indicators are related to the structure of the population by age and gender, fertility, infant mortality rates and life expectancy. The epidemiological information includes the morbidity and mortality by cause in the general population and among service users. The management indicators are those related to hospital occupancy and turnover, use of outpatient services, and coverage and impact by specific programmes. The last section of this note suggests what the district health authorities could do to improve planning and management of services and programmes.

Socioeconomic characteristics

The census of 2001 has collected socioeconomic information on individuals and households. Figures 1 through 6 show that the district of Umzinyathi is worst off compared with the average profile for KZN in terms of schooling, employment, income, access to safe water and sanitation and type of energy. The more deprived socioeconomic conditions are likely to be associated with a higher burden of communicable diseases and poor nutritional status, which is combined with lower access to services.

Figure 1 Educational status population age >= 20 y. (2001 Census)

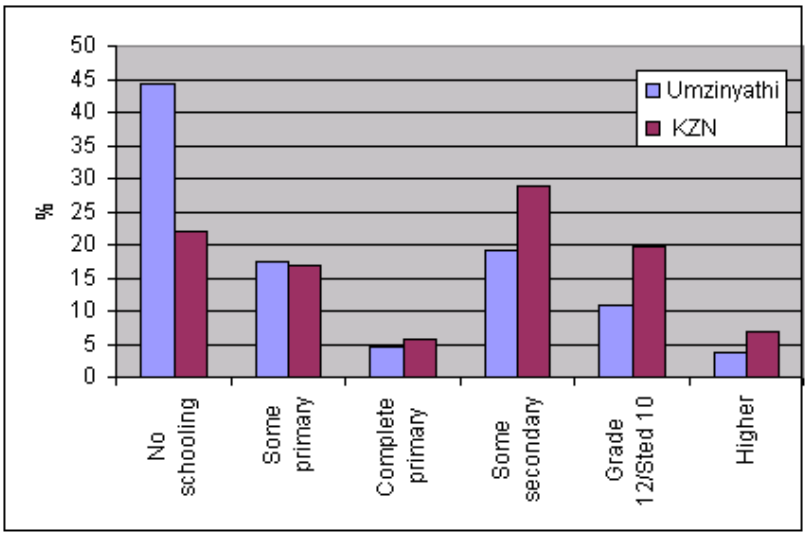


Figure 2 Employment status population age 15-65 y. (Census 2001)

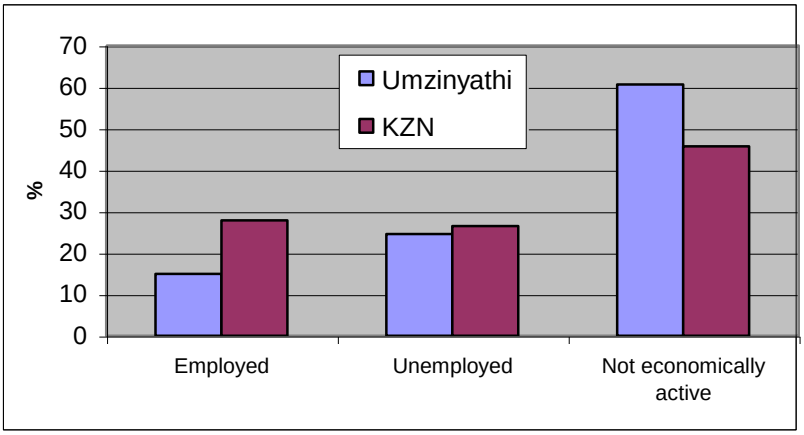


Figure 3 Income per person age 15-65 y (Census 2001)

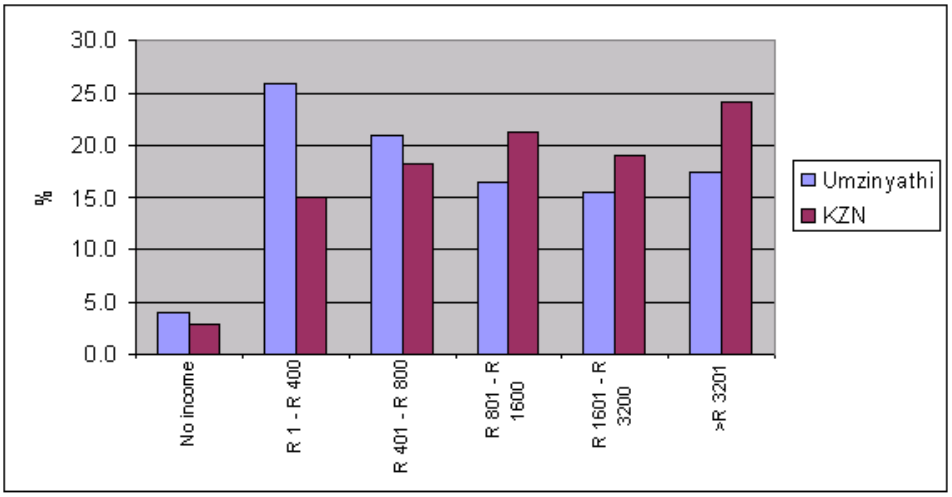


Figure 4 % Households using water source (Census 2001)

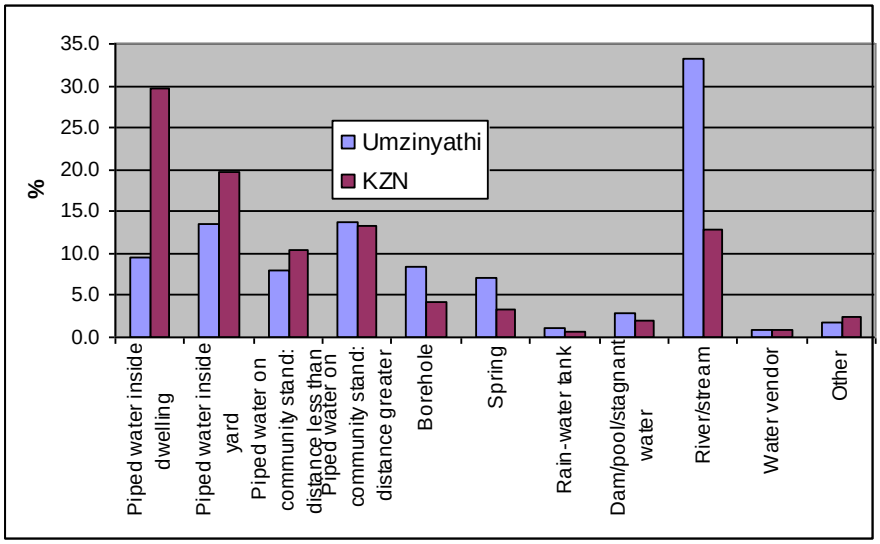


Figure 5 Access to sanitation (Census 2001)

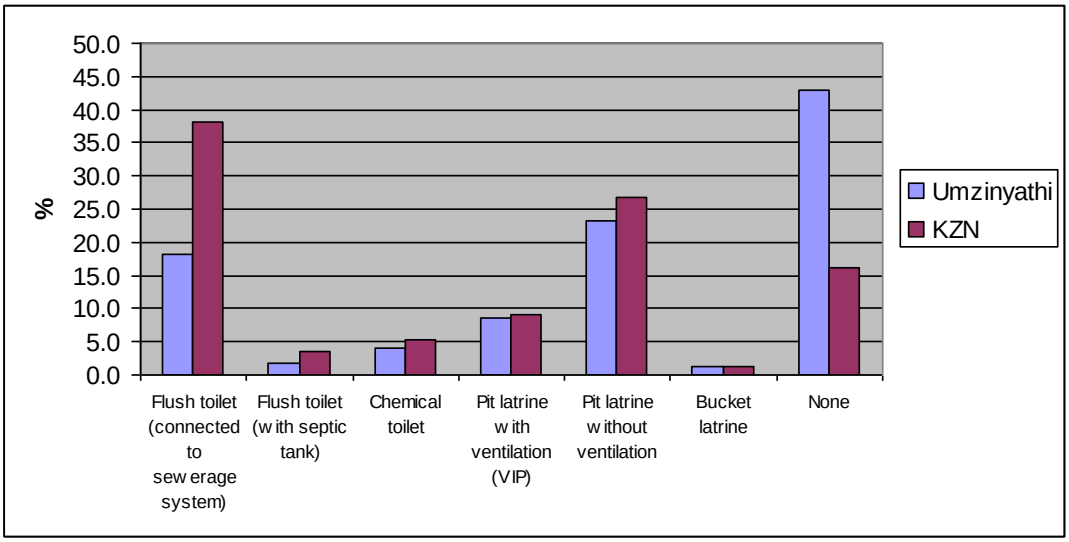
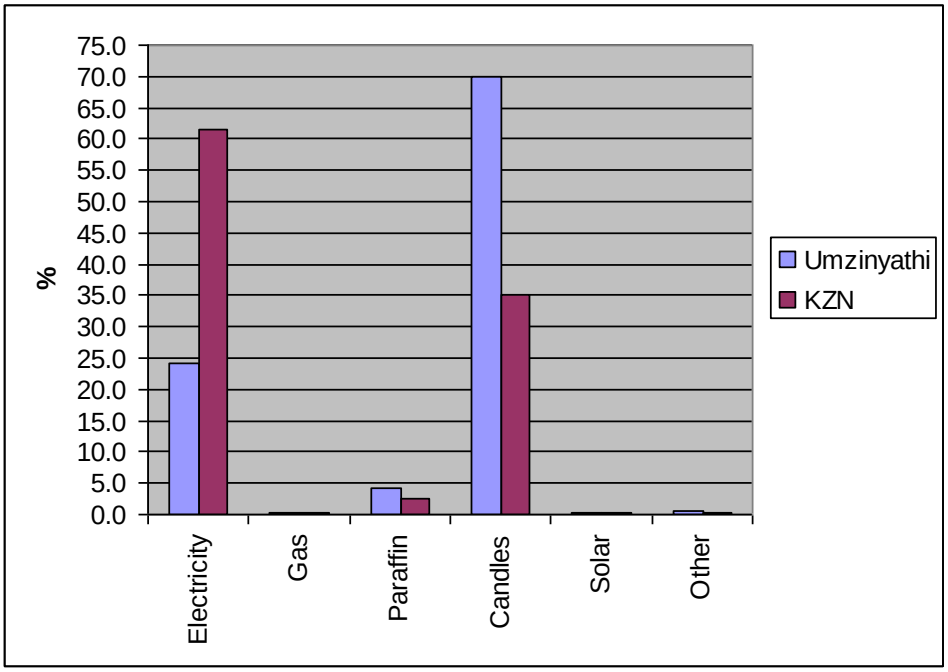


Figure 6 Access to energy sources (Census 2001)



Demographic indicators

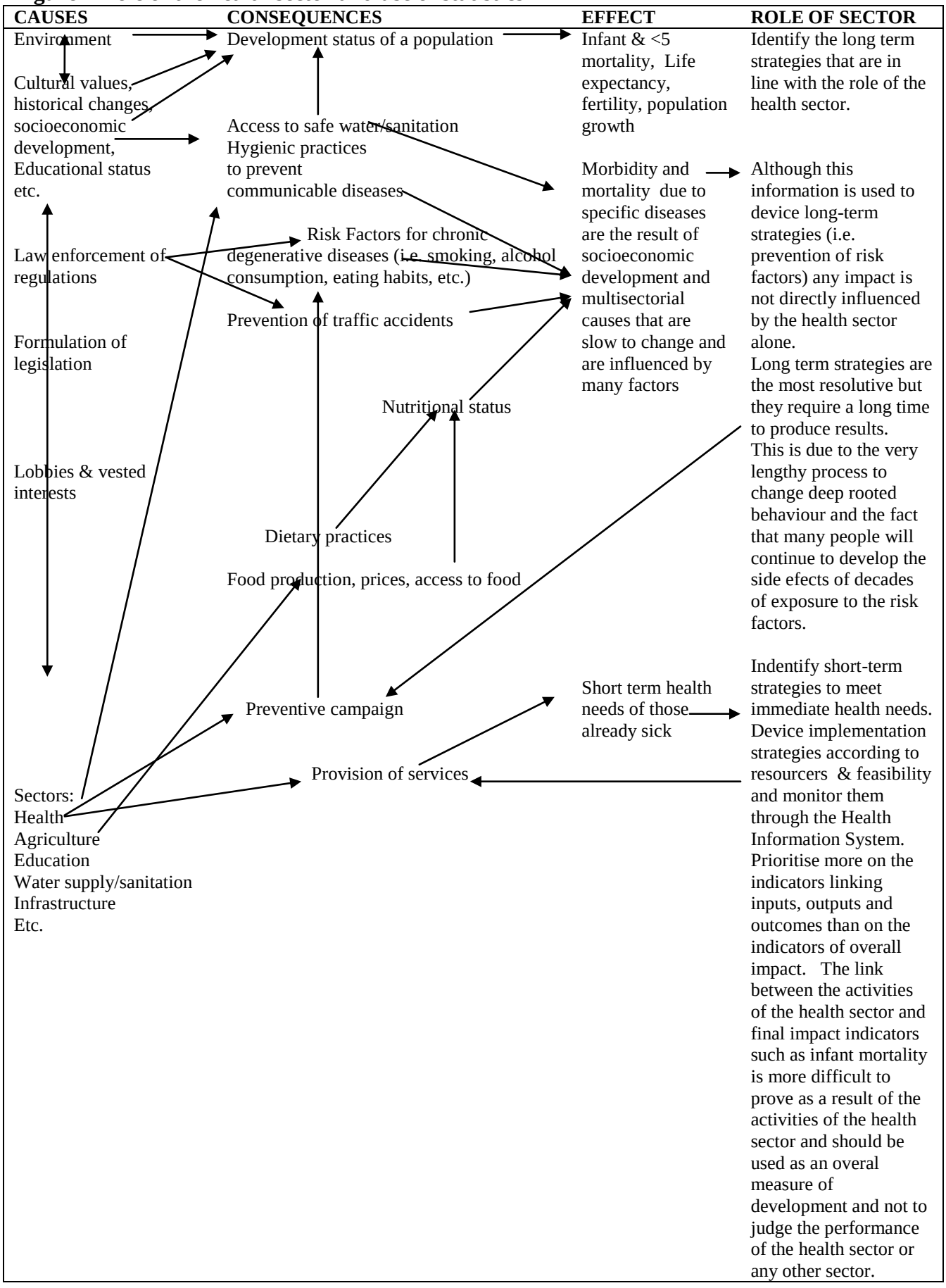
The structure of the population is based on the census of 2001 but the reliability of the population structure declines with the disaggregation to the district level. Censuses are affected by undercounting, especially for some age groups, and by the difficulty of taking into account migration across provinces and across districts within a given province, which affects differently males and females. Furthermore, the projections after the last census of 2001 depends on reliable modeling to take into account fertility and the increased mortality due to AIDS. These factors affect annual population growth differently across age groups and genders. The 2005 population structure in Table 1 is from the GIS Unit of the DOH and has been derived by applying the annual provincial population growth rate provided by Statistics SA on the 2001 Census across all the age groups. This is an over-simplification because each district should have its own age and gender specific annual growth rate, which should take into account the impact of HIV/AIDS.

Table 1 2005 population in Umzinyathi

	2001			2005		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**
0 - 4	30136	30024	**60160**	30856	30741	**61597**
5 - 9	33607	34024	**67631**	34410	34837	**69246**
10 - 14	33320	33674	**66994**	34116	34478	**68594**
15 - 19	28804	30353	**59157**	29492	31078	**60570**
20 - 24	15825	20196	**36021**	16203	20678	**36881**
25 - 29	10753	17067	**27820**	11010	17475	**28484**
30 - 34	8607	14221	**22828**	8813	14561	**23373**
35 - 39	8123	14089	**22212**	8317	14425	**22742**
40 - 44	6753	11296	**18049**	6914	11566	**18480**
45 - 49	6099	10079	**16178**	6245	10320	**16564**
50 - 54	5172	8760	**13932**	5296	8969	**14265**
55 - 59	3887	6925	**10812**	3980	7090	**11070**
60 - 64	3412	7120	**10532**	3493	7290	**10784**
65 - 69	2289	5324	**7613**	2344	5451	**7795**
70 - 74	1835	5511	**7346**	1879	5643	**7521**
75 - 79	1029	3224	**4253**	1054	3301	**4355**
80 - 84	763	2495	**3258**	781	2555	**3336**
85+	373	1290	**1663**	382	1321	**1703**
Total	**200787**	**255672**	**456459**	**205582**	**261778**	**467359**

The infant mortality rate and other demographic indicators are available for the provincial level only and they should be considered more as development indicators than health indicators. Because there is a certain misconception on the use of these indicators, Figure 7 provides the context in which these and other indicators should be considered.

Figure 7 Role of the health sector and use of statistics



The conceptual framework in Figure 7 should help to identify the proper use the different indicators. For example, infant and under five mortality and other demographic indicators listed under "effect" in Figure 7 are the result of a long process of socioeconomic development. This is contributed by many sectors and many factors influencing the primary causes of ill health. It is for this reason that infant mortality and other demographic indicators should be used to monitor the overall development status of a country and not to judge the performance of the health sector.

The direct measurements of fertility, maternal and infant mortality can only be estimated through complex demographic surveys. The most recent demographic indicators are from the 1998 Demographic Health Survey, they refer to the five years preceding the survey (1993-98) and the maximum disaggregation is provincial. The only annual estimates are from modeling such as the ASSA 2000, which takes into account the demographic impact of HIV/AIDS, but also in this case the maximum disaggregation is the province. Like any other modeling, the goodness of the ASSA predictions depends on the assumptions of the model. For example, the estimates of the ASSA 2000 models given in Table 2 for KZN for 2005 are in the process of being revised downwards because the new ASSA 2002 version, which at the moment is only available for national estimates, is using different assumptions compared with the previous ASSA 2000 model.

Table 2 KZN demographic indicators*

Indicator	Definition	Estimate	Period	Source
Crude Birth rate	Births per 1000 population	26	2005	ASSA 2000
Life Expectancy at birth	Average number of years a newborn is expected to live	41	2005	ASSA 2000
Infant mortality <1 year	Deaths per 1000 live births	66	2005	ASSA 2000
<5 mortality	Deaths per 1000 live births	129	2005	ASSA 2000
Mortality between 15 and 60 years of age	Probability of dying between 15 and 60	76%	2005	ASSA 2000

* No estimates available by district

Morbidity and mortality by cause

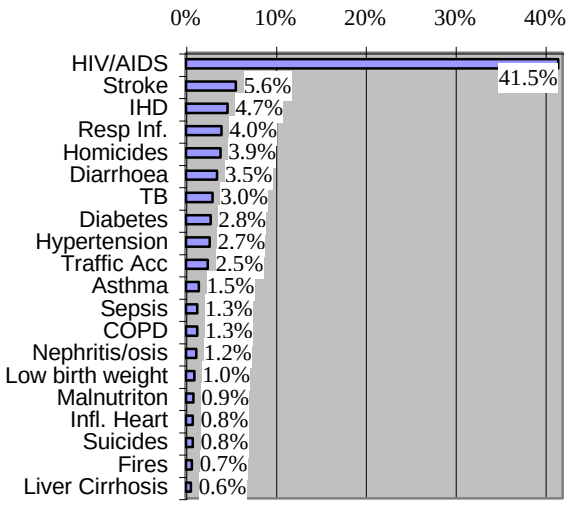
The other indicators mentioned under "effects" in Figure 7 include morbidity and mortality. These should be used to set priorities and to select specific long and short-term strategies according to the specific role of the health sector. For example morbidity and mortality indicate that HIV/AIDS is a priority and should be tackled with "long-term strategies" to reduce HIV transmission through a change in sexual behaviour. The "short –term strategies" are those related to the provision of services (i.e. antiretrovirals) to tackle the immediate health problems of those already affected.

The morbidity estimates can be related to the general population and to the users of the health services. Morbidity in the general population is measured in terms of new

cases (incidence) and of new plus already existing cases (prevalence) within a given time period (i.e. 2004). The only available morbidity for Umzinyathi is based on the users of the health services, which should not be confused with the morbidity of the general population.

Mortality by cause from the general population is derived from the death certificates and it is only available for KZN. The death certificates are processed by Statistics SA, which is the National Institute of Statistics. The data process of all the death certificates takes a long time and the maximum level of disaggregation of the mortality by cause is the province. Because there are no death statistics by district, the proportion of total death due to the first 20 causes presented in Figure 8 is related to KZN. These estimates are from the Medical Research Council (MRC) for the year 2000 and are more reliable that other sources because the MRC has taken into account the under-registration, the impact of HIV/AIDS and the problems related to the misclassification of the underline cause of death. The death profile for Umzinyathi should be similar to the KZN profile but with a lower frequency of chronic degenerative diseases.

Figure 8 % mortality, KZN, 2000



Another source of information is a longitudinal study carried out in Hlabisa, KZN. This study has covered all the deaths occurred in the study population and has applied standardized methods to assign the underline cause of death. The data from this study, analyzed by the DOH and the Italian Cooperation, were compared with the data from the MRC for the year 2000. Table 3 shows that even for a small rural population like the one covered in Hlabisa, the priority causes producing the major burden of mortality were similar to the mortality profile of the whole province. In the year 2000, according to the MRC, 41% of deaths in KZN were caused by HIV/AIDS, which is not very far from the 46% recorded in Hlabisa for the same year. Stroke and lower respiratory tract infections were respectively the second and fourth cause, while the third cause was ischaemic heart disease in KZN and homicides for Hlabisa. TB,

Traffic accidents, diabetes and respiratory infections were among the first 10 causes of deaths both in KZN and in Hlabisa in the year 2000 but with different rankings. Some causes such as other accidents and malaria were among the first 10 causes of death in Hlabisa but they were not among the first 10 causes for the whole KZN.

These statistics suggest that the mortality burden is complex and not all the burden can be easily prevented. HIV/AIDS and TB are among the primary causes of mortality and the relative programmes can make a difference if they are efficiently implemented. However, it should be also recognized that chronic degenerative disease and violence, which contribute substantially to the burden of mortality, require a multisector approach and are more difficult to control through the health sector alone. Although the above data are not specific to Umzinyathi, it is unlikely that the mortality profile will be very different from that one presented for the whole province.

Table 3 First 10 causes of death in Hlabisa and KZN in 2000

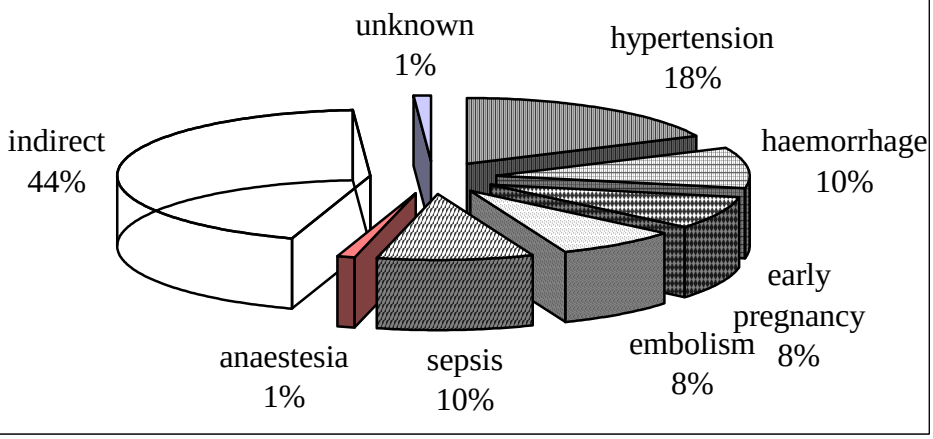
Rank	**MRC for KZN 2000**	**%**	**Hlabisa 2000**	**%**
1	HIV/AIDS	41.5%	HIV/AIDS	46.2%
2	Stroke	5.6%	Stroke	5.7%
3	Ischaemic Heart	4.7%	Homicides	4.6%
4	Lower Resp. Inf	4.0%	Lower Resp. Inf	4.6%
5	Homicides	3.9%	TB	4.4%
6	Diarrhoea	3.5%	Traffic Acc	3.4%
7	TB	3.0%	Diabetes	2.4%
8	Diabetes	2.8%	Acc. Other	2.3%
9	Hypertensive heart	2.7%	Ischaemic Heart	1.9%
10	Traffic Acc	2.5%	Malaria	1.9%

Maternal mortality

Of the indicators of mortality, maternal mortality is presented separately because of the serious consequences associated with each maternal death. There is a need to be aware that maternal mortality rates are only available for the national level and the maternal mortality by cause is only available for the provincial level. The maternal mortality rate was estimated at around 150 per 100000 live births for South Africa by the 1998 DHS. The last Report on the Confidential Enquiries into Maternal Death has suggested that maternal mortality per 100,000 live births has increased to 175-200 per 100000 live births between 1998 and 2001 because of HIV/AIDS.

In terms of causes of maternal mortality, the most frequent direct cause of obstetric mortality is hypertension. The Confidential Enquiries into Maternal Deaths, which was established as a routine system to monitor the causes of maternal mortality, estimated that in 1999 in KZN 44% of maternal deaths were due to causes not directly connected with pregnancy. The remaining 56% mortality was due to the following pregnancy related direct causes: hypertension, haemorrhage, sepsis, embolism, early pregnancy and anesthesia (Figure 9). Early pregnancy deaths occurred under 24 months of gestation and were mainly due to septic abortion and ectopic pregnancies. This profile has not substantially changed in the period 1999-2001 when the most frequent direct causes of deaths continued to be hypertension, haemorrhage and sepsis.

Figure 9 Obstetrict causes of death in KZN in 1999



From: Second Interim Report on Confidential Enquiries into Maternal Deaths in South Africa for 1999.

These causes of maternal mortality were also the most important ones reported by Bradshaw D et al. in the South Africa Burden of Disease (BOD) Study (Table 4). The highest burden in terms of death rates per 100,000 female population was contributed by hypertension, abortion, haemorrhage and sepsis. The higher contribution of abortion is probably due to the adjustment for the under-reporting expected for this cause of death.

Table 4 Maternal death rate per 100,000 female population in South Africa

CAUSES	**Age groups in years**				
	15-24	**25-34**	**35-44**	**45-54**	**Total female population**
haemorrhage	3.1	3.9	3	0.2	1.6
sepsis	1.5	1.5	0.7	0.2	0.7
hypertension	4.6	5	3.1	0.2	2.2
Obstructed labour		0.2			0
Abortion	2.9	4.2	2.6	0.7	1.7
Other maternal conditions	3.2	5.6	3.4	0.2	2

Bradshaw D. et al, 2000

Hospitalization profile

The hospital morbidity and mortality is based on the hospital survey of 2003. The health information system collects statistics on the total number of hospital deaths but no information is routinely processed on the causes of admission and mortality. Although most developing countries attempt to collect statistics on the causes of hospitalization, these are so unreliable that they are practically useless. Therefore, the DOH has made a wise decision not to waste human resources for the routine collection of the causes of admission and discharge because any reliable statistics on the causes of hospitalization should be collected through a representative sample of medical records. In 2003, the DOH and the Italian Cooperation conducted such a

survey of the medical records stored in the archives of all public hospitals of KZN for the period between 1998-02. The diagnoses, which were assigned independently by two medical doctors on the basis of the medical history, have a high degree of reliability. The technical details can be found in Issue 6 of the Epidemiological Bulletin and in the Full Technical Report of the hospital survey.

The sample was sufficient to get a detailed picture of the provincial profile of hospitalization of KZN. The hospitalization by cause presented for KZN in Figures 10-11 are related to the proportional distribution of the pathological conditions, including those ones associated with pregnancy and complicated deliveries, but excluding the normal deliveries. Figure 10 shows that the first cause of hospitalization in KZN between 1998-02 was HIV/AIDS followed by unintentional injuries, TB Lower Respiratory Tract Infections and diarrhoea. Figure 11 shows that of the first three causes of hospital mortality were AIDS, TB and cardiovascular diseases.

Figure 10 Leading specific causes, annual admissions, KZN, 1998-02

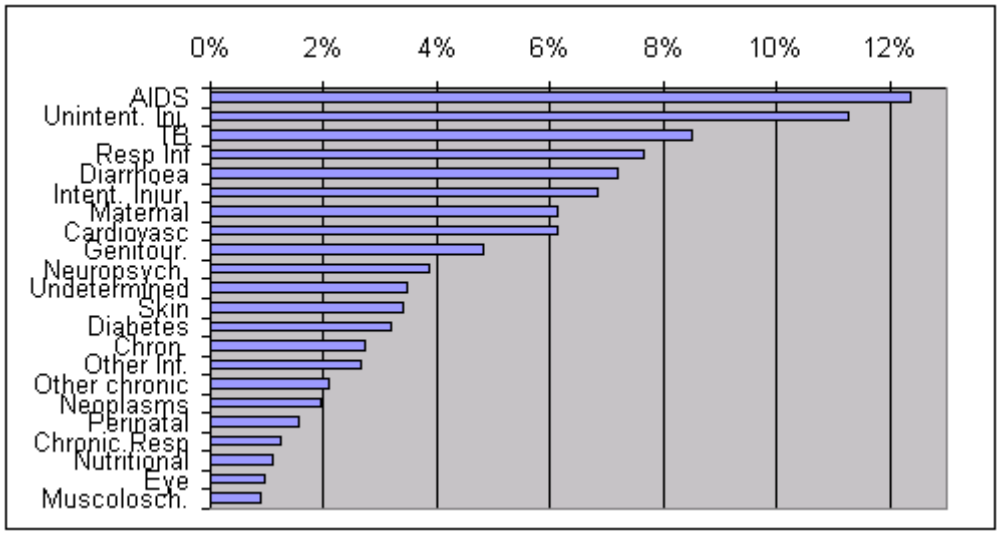
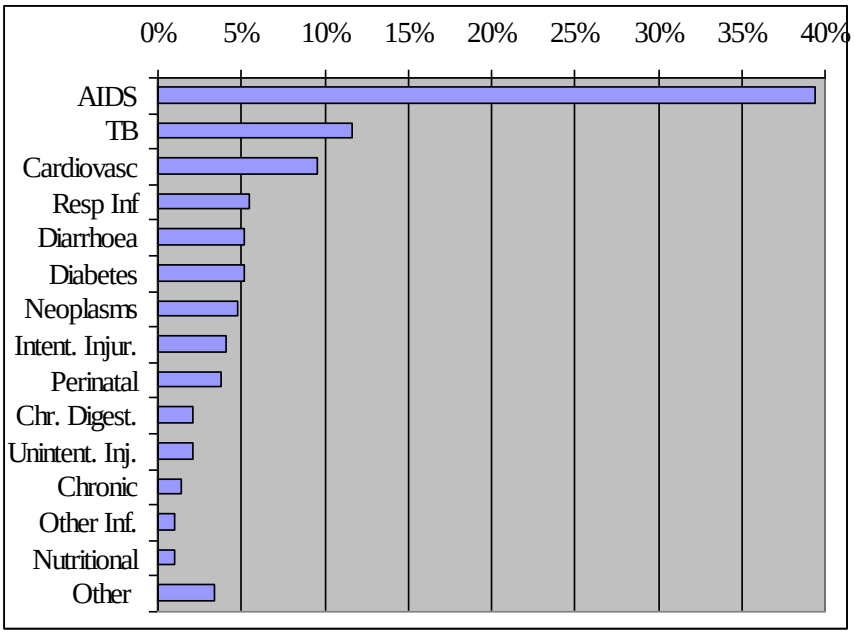
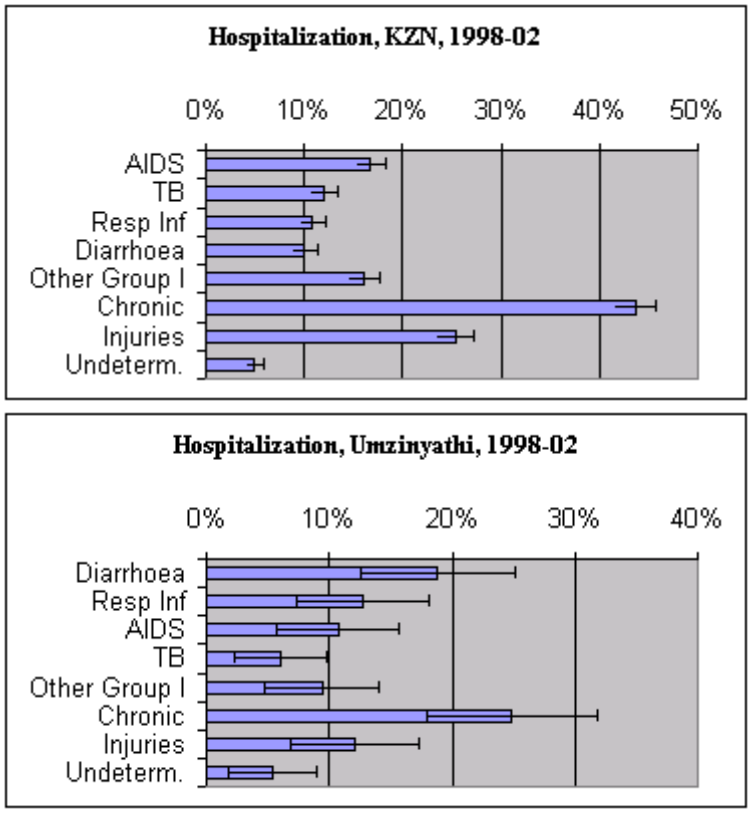


Figure 11 Proportional mortality 1998-02 KZN hospitals



Figures 12-13 provide the causes of hospitalization of Umzinyathi compared with the province. Even if the objective of the hospital survey was to give only the provincial profile of hospitalization, data were extracted for Umzinyathi and compared with the total sample for KZN. It has to be taken into account that the extraction of the data related to the four hospitals of Umzinyathi produced a small sample. Because this reduces the certainty around the estimates, the statistics is presented by broader categories of diseases and with the relative 95% confidence intervals around the estimates. It has to be considered that the sub-sample related to the hospital of Umzinyathi represents more the burden affecting these hospitals, and does not necessarily reflects the hospitalization requirements for the whole population of Umzinyathi. In fact, the more complicated cases are hospitalized in the specialized and regional hospitals of the other districts. It can be noted that the first cause of hospitalizations in the four hospitals of Umzinyathi in the period 1998-02 was diarrhea, followed by respiratory infections, AIDS, TB and other group I conditions which include other communicable diseases and maternal, perinatal and nutritional conditions. Chronic degenerative diseases and injuries accounted for respectively about one fourth and one tenth of the hospitalizations in Umzinyathi for the period 1999-02. This is slightly different from the provincial profile where AIDS was the first cause, while chronic degenerative disorders and injuries (intentional and unintentional) caused respectively more than 40% and 20% of the hospitalizations. As already mentioned, although these differences may be partially related to the different morbidity profile of a more rural population, they are also the reflection of the fact that Umzinyathi has only district hospitals.

Figure 12 and 13 Comparisons between hospitalization in Umzinyathi and KZN



Management Indicators

The district health information system (DHIS) collects data coming from hospitals, clinics and programmes. The indicators from the DHIS are related to the utilization of the health services and programmes mentioned on the lower right hand side of Figure 7. This section is divided into personnel, hospital indicators, PHC services and programmes.

Personnel

Personnel shortage is affecting the service delivery. The district of Umzinyathi, like any rural area, is hampered by lack of the incentive existing in more urbanized districts. The shortage of personnel is summarized in the tables below, where the most vacant positions are those related to doctors and enrolled nurses. The ratio per 10,000 population is less than 1 for medical doctors, 23 for nurses, 0.1 for pharmacist and 5 for CHWs.

Tables 5 Number of filled and vacant positions in FY04/05

Category	**District Hospital**		**Fixed Clinic**		**Mobile Clinic**		**Total**	
	Filled	Vacant	Filled	Vacant	Filled	Vacant	Filled	Vacant
Doctors	37	70					37	70
Prof. Nurse	342	381	109	30	32	8	483	419
E. Nurse	242	118	54	9	7	11	303	138
E. Nurse A.	295	130					295	130
FIO	2	2					2	2
OPD Clerk	38	15					38	15
Pharmacist	6	2					6	2
A. Nurse			9	0	6	9	15	9
Lay counselor	34	0	73	10	10	0	117	10
CHW							257	150

Hospital indicators

The information coming from the hospitals should be used to improve their management. The data in table 6 shows that Umzinyathi has similar number of beds, admissions and discharges per 1000 population than the provincial average; while surgery and OPD rates are lower. Mortality per 100 admissions is slightly higher than in the other districts.

Table 6 Hospital data per 1000 population FY03/04

	Ugu	Umgung	Uthukhela	Umzinyathi	Amajuba	Zululand	Umkhanyakude	Uthungulu	Ilembe	Sisonke	Ethekiwni	KZN FY03/04
usable beds	1.9	4.5	1.6	2.9	3.4	2.2	2.1	2.4	1.5	3.4	2.7	2.6
admissions	61.2	95.2	61.5	87.1	65.5	55.6	49.8	75.0	50.4	108.5	66.2	68.5
discharges	56.8	102.2	55.9	76.4	60.2	49.6	40.2	65.3	42.5	96.1	60.2	62.9
Deaths	5.8	8.7	4.9	7.2	4.9	5.1	5.4	6.1	5.0	8.6	5.3	5.9
operations	19.8	25.7	13.3	18.4	12.8	10.0	11.1	17.0	19.1	21.7	25.0	19.2
inpatient days	449.3	1183.8	319.9	546.8	541.9	428.2	441.2	497.9	311.0	683.7	669.0	600.5
OPD visits	492.6	811.8	248.7	324.4	267.8	287.9	223.8	403.9	323.4	362.2	710.8	501.3
Live Births	14.4	15.2	15.2	21.5	15.1	14.9	13.9	17.4	10.8	28.9	12.5	14.8
Stllbirths	0.4	0.5	0.6	0.7	0.6	1.0	0.4	0.5	0.3	0.8	0.5	0.5

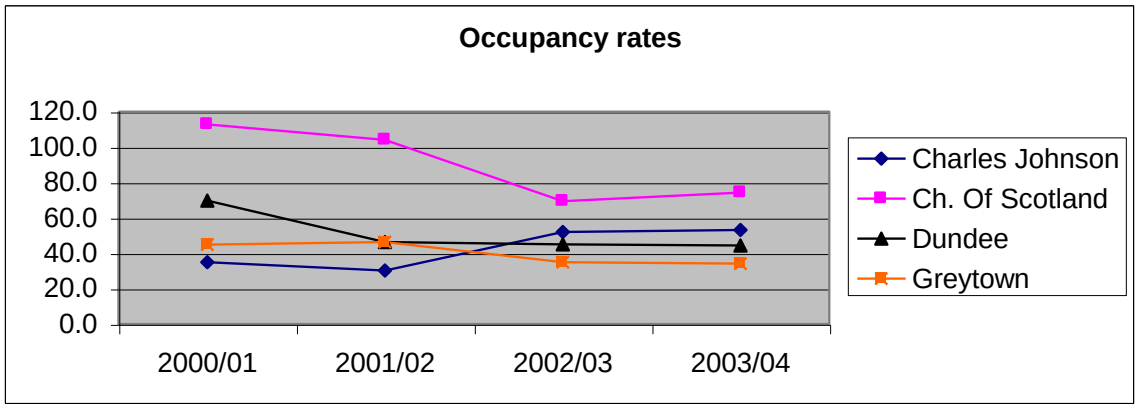
The most important indicators of utilization include the followings:

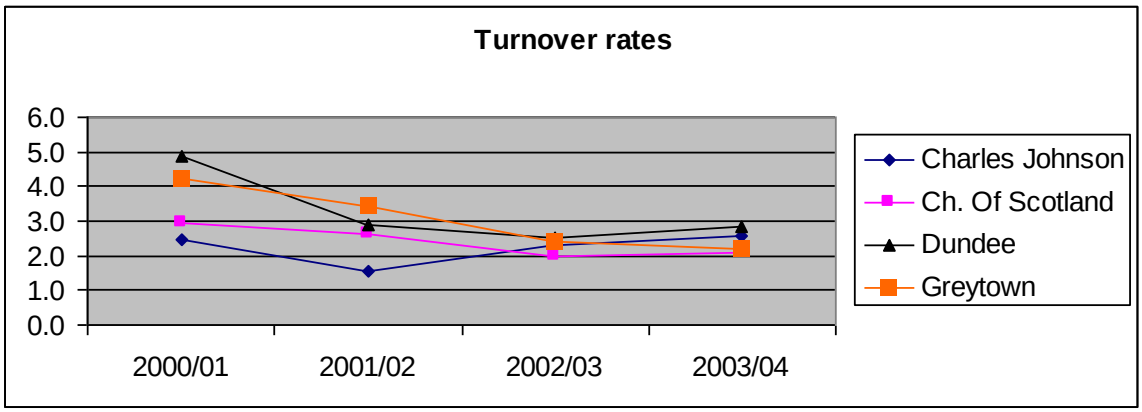
Occupancy = (Inpatient Days + 1/2 Day Patients + Transfers-in)/Beds
ALOS = (Inpatient Days + 1/2 Day Patients + Transfers-in)/(Discharges+Deaths+TrasferOut)
Turnover = (Discharges+Deaths+TrasferOut) / Beds
Cost per equivalent patient day = expenditures/(inpatient days+1/2 day patients+ 1/3 OPD)

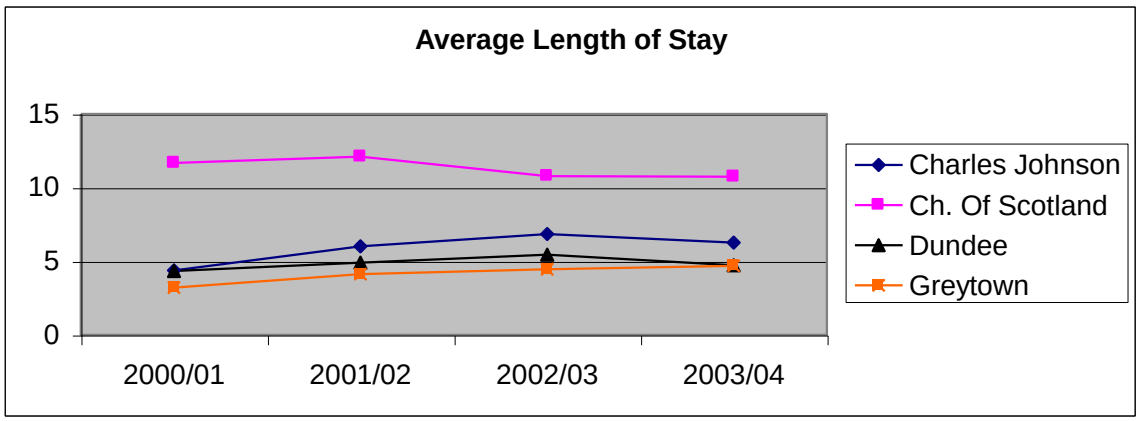
Figures 14-19 show the trends in the annual indicators of utilization for the period 2000/01 – 2004/04. The occupancy has been lower than 60%, except for Church of Scotland (COSH), which had a higher occupancy than the other hospitals. However, the over 100% occupancy reported by COSH in FY00/01 and FY01/02 should be considered due to an overestimation of inpatient days, which were inconsistent with the reported admissions and discharges (not shown). The turnover has slightly declined and the average length of stay (ALOS) has slightly increased. The high ALOS for COSH is partially due to the above mentioned problems with the reporting of inpatient days. The overall mortality and surgery rate, which are derived by dividing deaths and operations by the admissions, show high fluctuation (Figures 15-16) which are due to reliability problems of the reported data.

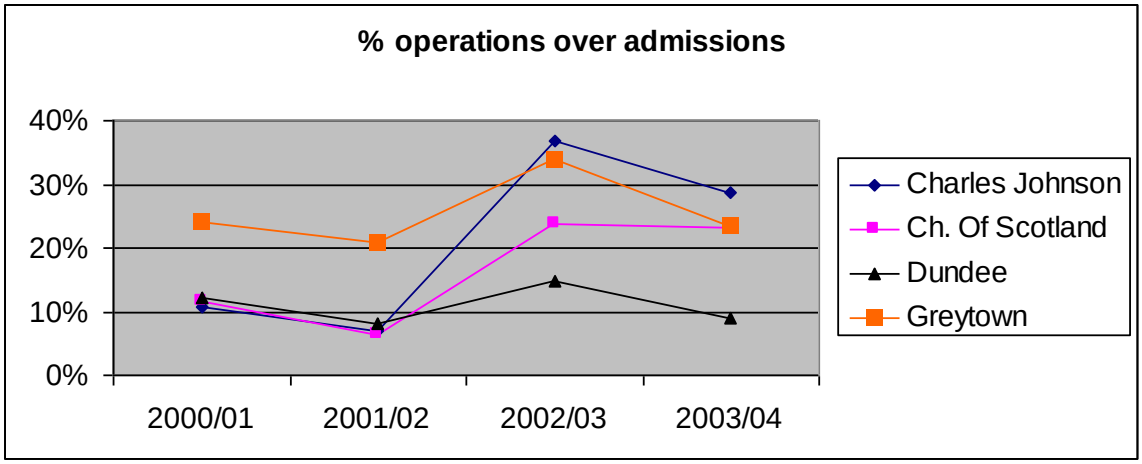
The cost per equivalent patient day has slightly increased for Greytown and Church of Scotland while the abrupt decline for Dundee in FY02/03 is the result of unreliable data. The likely average annual increase in cost per equivalent patient day between 2000/01 – 2003/04 has varied between 7%-23%. The changes reported in expenditures and equivalent patient days suggest that the slight increase in cost per equivalent patient day is the combined result of increased expenditures and declined utilization.

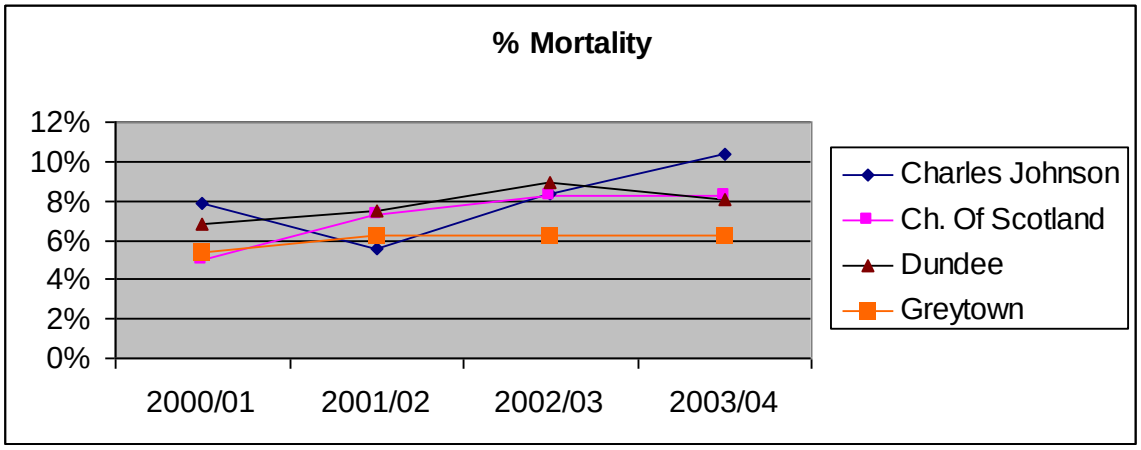
Figures 14-19 Indicators of hospital utilization for the period FY00/01-FY03/04

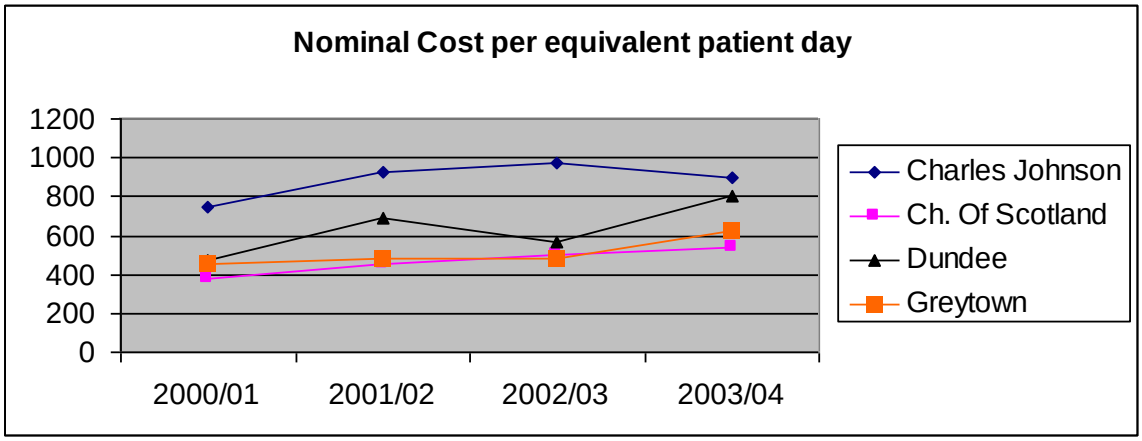












PHC services

There are about 40 clinics and 9 mobiles providing PHC services in Umzinyathi. Although the statistics collected by the DHIS from these units is affected by reliability problems, the data can be used to check the workload and the utilization profile of outpatient services. In FY03/04, the utilization rate in terms of outpatient visits per 100 population was 1.4 visits for the population 5 years and older and about 3.5 visits for the children under 5.

The number of symptomatic visits divided by the population of Umzinyathi provides a rough estimate of the frequency of the morbidity for key diseases. According to the DHIS in FY03/04 there were around 3 visits per 100 population of all age groups for epilepsy; and 3 visits for malnutrition and 17 visits for intestinal worms per 100 population under 5 years of age. It has to be considered that the number of OPD visits cannot be directly used to estimate the population prevalence for specific conditions. This is due to the fact that most diagnoses are based on symptoms that are not very specific, not everybody who is affected by these conditions uses the services and the same patient may visit the services several times in a year for the same complaints. However, for serious diseases such as epilepsy and malnutrition, the above rates may be approaching the real prevalence rates because a high proportion of these patients contact the clinics and most of these patients may have only one visit per year. More interesting are the "new visits" for hypertension,

diabetes, and sexually transmitted infections (STI) which provide an estimate of the incidence for 100 population 15 years and older of about 1.4 for hypertension and 0.3 for diabetes and 5 for STI. These rates are slightly lower than the incidence estimates provided by the 1998 DHS

The least usable statistics to estimate population rates for certain diseases are those related to the notifiable diseases. The diseases, which are on the notification list, include polio, cholera, congenital syphilis, diphtheria, food poisoning and a few other communicable diseases. The reporting is highly variable because depend on the willingness to report each case and the perceived threat associated with a certain medical condition. For example, very few doctors would report all cases of measles or food poisoning, while they would more likely report all cases of rabies. Therefore, the notification system should be used for a management objective such as the isolation of outbreaks but not to estimate incidence. It is enough to say that in FY02/03 Umzinyathi notified only 18 food poisonings, 17 measles, 1 typhoid and a few other communicable diseases.

PMTCT

The high coverage of antenatal and delivery care provides a good opportunity for the prevention of mother to child transmission (PMTCT) of HIV. The high coverage of pregnancies and deliveries by the health units provides a good opportunity for PMTCT Applying the crude birth rates predicted by the ASSA 2000, Umzinyathi should have had about 12000 births of which slightly more than 10000 occurs in health units according to the latest data of the DHIS (FY03/04). ASSA 2000 predicts a perinatal and post natal transmission rate of about 8% and 3% respectively. Therefore, of the about 10,000 newborns which were delivered in FY03/04, an estimated 845 were expected to be HIV+ because of perinatal transmission and about 255 were expected to be HIV+ due to the post natal transmission.

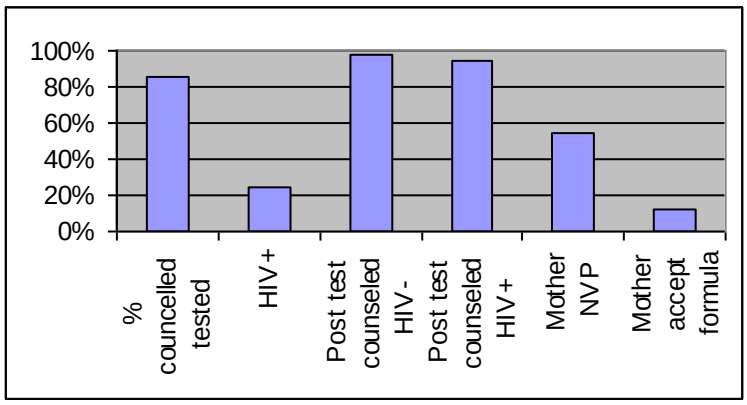
The aim of the PMTCT programme is to reduce these HIV+ newborns and therefore decrease the fraction of child morbidity and mortality due to HIV/AIDS. This is done through voluntary counselling and testing followed by ARV before birth and through the encouragement of exclusive formula feeding from birth by providing 6 month supply of formula to all mothers. Support and advice is provided to mothers who decide to breastfeed, 6 months of supply of formula from 7 to 12 months of age is provided. The PMTCT programme, which started as a pilot at Church of Scotland in 2001, was extended to the other districts hospital in 2002, and by 2005 the programme was available in all the clinics. The programme coordinator for PMTCT is coordinating the VCT service too.

Providing reliable data on the coverage of services is always difficult and PMTC is no exception. Table 7 shows the coverage in Umzinyathi according to the DHIS for FY02/03 and FY03/04, according to which about 23% of the women who were tested were HIV+, about 60% of HIV+ women and their children received nevirapine. According to data coming directly from the district, there were 118 lay counsellors in September 2005 and in FY04/05. Figure 20 shows that of the 13500 antenatal care attenders who were counselled, more than 80% were tested, 24% were HIV+, and almost all of those who were tested received post test counselling, while slightly less than 60% of HIV+ mothers received nevirapine and 12% accepted not to breasfeed.

Table 7 PMCT for FY02/03 and FY03/04 (DHIS)

Indicator	FY 02/03	FY03/04
Women tested at ANC units	2596	7947
HIV+	611	1830
Women receiving Nevirapine	347	1078
Babies receiving nevirapine	381	1049

Figure 20 PMTC in FY04/05 (Data from Umzinyathi)

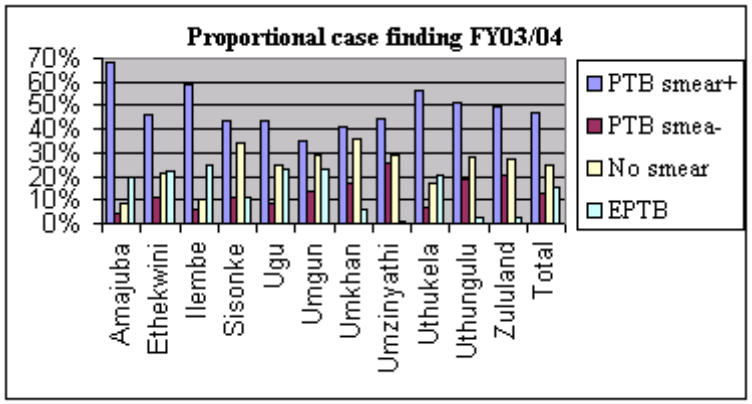


The follow up indicators need to be strengthened. The schedule of follow up visits of the babies born to HIV + women is the following: fortnightly in the first month, monthly thereafter until 12 months of age and quarterly during the 2nd year. Of the first 1433 babies who were enrolled at the beginning of the programme, only 511 (36%) were followed up. Of those children who were followed up, 346 (68%) were tested and 34 (10%) resulted HIV+ at their 15th months. The programme hopes to improve the poor rate of follow-up through a consultative process with CHW organizations, local councils and both maternal and IMCI programme committees. Other activities include the development and implementation of an electronic coding system and data management of patients' records throughout the province. The province has begun to implement an earlier diagnosis of perinatal HIV with the use of PCR testing for infants at 6 months in place of the rapid test at 12/18 month. The main motivation for these sub-projects is to help improve the follow-up of mothers and infants in the programme and facilitate a continuum of care particularly in view of availability of antiretroviral therapy for women and children who are HIV+ and eligible.

TB Programme

The total number of TB cases reported in KZN by the TB programme has steadily increased although reliability problems affect the comparability between years. The number of TB cases reported by the TB programme in KZN more than doubled between FY00/01 and FY03/04, representing an increase in incidence from 400 to 800 per 100,000 population for all types of TB. The TB programme relies on case findings and treatment rates of sputum + cases. The case finding is based on the diagnostic categorization of all new cases into Pulmonary (sputum +, sputum –, no sputum) and Extrapulmonary (EPTB). Figure 21 shows the proportional distribution of case finding by district for FY03/04, Umzinyathi appears to have almost no EPTB, which is highly unlikely because the proportion of EPTB should be between 15%-20% and because this proportion usually increases with the increasing number of AIDS cases. Another characteristic of Umzinyathi is a smaller proportion of smear + cases and a higher proportion of no smear compared with other districts, which is likely to be related to lab problems and may cause an underestimation of the proportion of all smear +.

Figure 21 TB case findings



The treatment outcomes are based on the proportion of the initial smear + who convert into sputum –, remain sputum + (failure), complete treatment but are not confirmed by sputum, die, are lost to follow up or are not evaluated. The indicators related to the patients who had an initial sputum positive test include the following rates:

Cure = (initial sputum + who become sputum – after 6 month) / total initial sputum +
Completion = number completing treatment but not confirmed sputum - / total initial sputum +
Failure = number still sputum + / total initial sputum +
Death = number of deaths / total initial sputum +
Defaulter = number lost to follow up / total initial sputum +
Not evaluated = outcome unknown.

Figures 22 and 23 show what happened to the known new smear + cases and the known retreated cases between 1/1/03 and 31/12/03 across the districts of KZN. Umzinyathi had one of the highest cure rates and one of the lowest default rates among both new cases and retreated cases. The highest death rates in Umzinyathi is probably related to the highest proportion of known outcomes in this district, which

therefore produce also a highest number of known deaths compared with the other districts which have a high number of defaulters and therefore unknown fate.

Figure 22 treatment outcomes of new smear+ cases

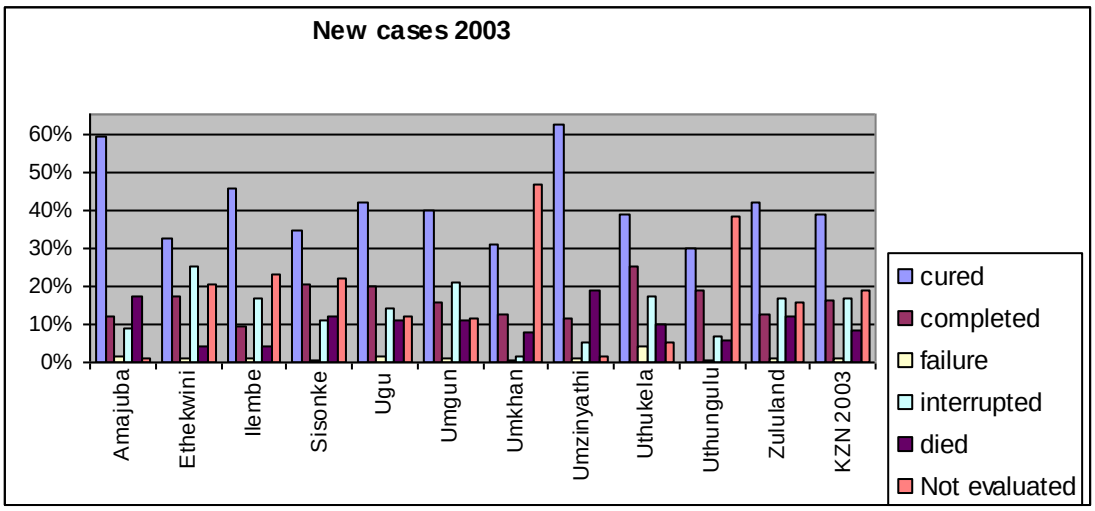
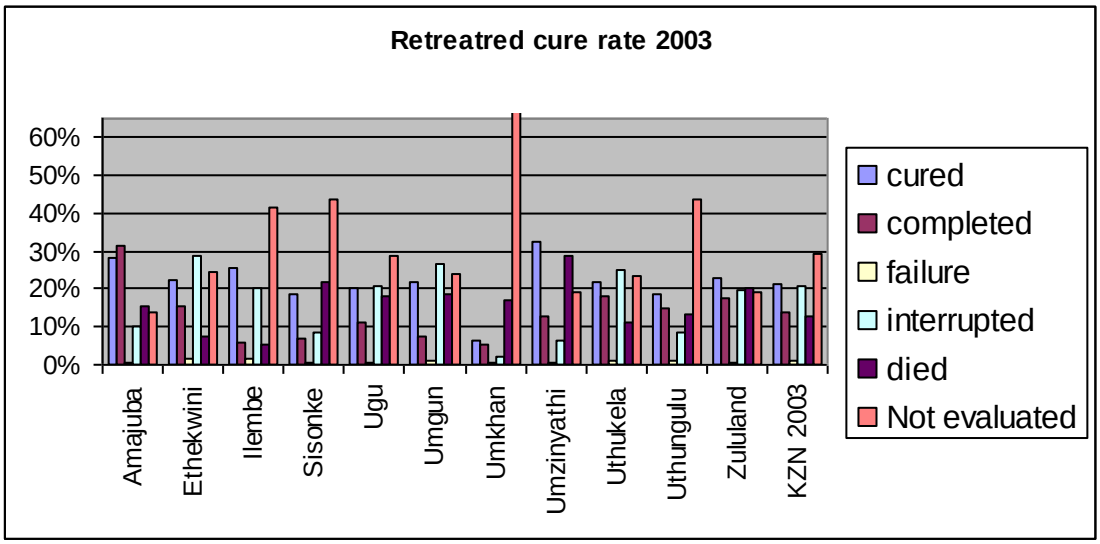


Fig 23 outcomes of the retreated TB cases in 2003



The reliability of these data is presently validated through a survey. The validation is based on the data entry of all the information present on the register for 2004 and extra information collected on the clinics and the nurses. This will allow to validate the indicators mentioned above, produce death and default rates for the other TB categories and estimate the influence that certain factors have on the above indicators. This will help to identify strategies to improve programme's activities.

Antiretrovirals (ARV)

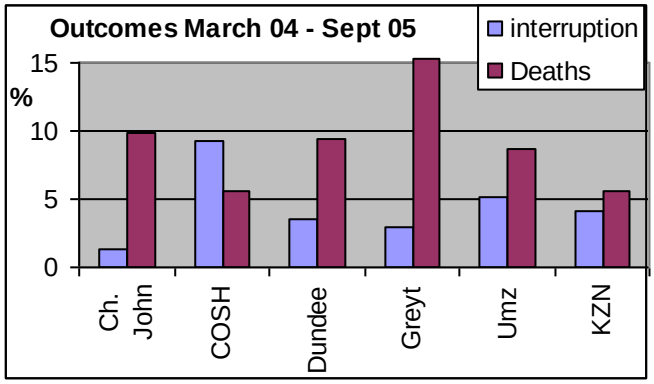
ARV are distributed in the clinics attached to the four district hospitals, the coverage is still relatively low. Table 8 shows that about 1890 patients have been enrolled between March 2004 and May 2005, which is a fraction of about 12600 AIDS patients

expected for the district when the 2005 predictions of the ASSA model for KZN are applied to the population of Umzinyathi. Because about 80% of those under 200 CD4 are under ARV, there is a waiting list. Figure 23 shows that the situation varies considerably across hospitals with Charles Johnson and Church of Scotland having the highest compliance and Dundee having the lowest one as far as session 1 and 2 are concerned. However, Dundee had the highest coverage of patients under 200 CD4 for session 3 and ARV, while Church of Scotland is doing well for coverage of session 3 but it is covering the lowest proportion of the eligible patients (<200 CD4) with ART. Figure 18 shows that the highest proportion of interruption and mortality was in Greytown and the lowest was in Charles Johnson.

Table 8 ARV coverage March 04 – September 05

	CD4 Screened	Counselling Session 1	Session 2	CD4<200	Session 3	Total ARVs
Charles Johnson Mem.	1105	1024	843	485	368	385
Church of Scotland (COSH)	2486	2321	1584	970	1108	682
Dundee	2562	1030	912	679	807	653
Greytown	523	339	253	224	184	170
TOTAL Umzinyathi	6676	4714	3592	2358	2467	1890
TOTAL KZN	**107248**	**42160**	**36133**	**48308**	**32695**	**20646**

Figure 24 ARV outcomes



Priorities for planning and management

The profile of Umzinyathi suggests that the priorities are HIV/AIDS and TB and the knowledge gaps are related to the programmes dealing with these two diseases. This section suggests how the district health authorities could focus the attention on several areas to improve planning and management. These areas include: hospital admissions by cause, evaluation of the TB, PMTC, ARV programmes, DHIS and maternal services.

Hospital admissions by cause

The sub-sample of the hospital survey carried out in 2003 suggests that the hospitalization profile of Umzinyathi is slightly different from the rest of the province. However, the small sub-sample allowed only to produce estimates for broad group of causes of admission and it was too small to estimate mortality. Therefore the district could conduct a hospital survey on the discharges and death of 2004 with the same methodology used for the 2003 survey but with a larger sample. The quantification of the more recent causes of hospitalization and hospital mortality, the pattern of surgical interventions and other indicators will provide information that at the moment is not available and which is critical for planning and management of hospital resources. For example, the pattern of hospitalization and surgical interventions will shed light on the efficient utilization of the hospitals and what interventions could decrease the hospitalization of certain diseases. This will provide a baseline against which to compare changes in the pattern of admissions as a consequence of the expansion of the ARV coverage and other interventions. In a similar manner, a survey on a representative sample of the OPD registers in the clinics of Umzinyathi could provide a profile of the diagnosis recorded for outpatients for 2004.

Evaluation of the TB programme

The ongoing validation survey could be followed up by a second survey to monitor the implementation bottlenecks. There is an ongoing survey to validate the outcome indicators and to collect data on clinic and nurses to identify the critical factors influencing the performance of the programme. The analysis from the first validation will help to identify hypotheses to be tested to improve the management of the TB programme through specific actions to be implemented. The implementation of these recommendations will then have to be evaluated by a second survey to be conducted in the same clinics visited during the validation. This second survey could include a task analysis to capture critical information on the interaction between patients and nurses, the workload, the use of the staff time and the consumption of supplies during the diagnosis and follow up visits, and during the tracing of the defaulters. The different strategies to trace the defaulters could be evaluated during the second survey by interviewing a representative sample of CHWs, volunteers, family members and other relevant actors who may be involved in the tracing. Another aspect to be investigated will be the possible increase of Multiple Drug Resistance.

Evaluation of PMTC and ARV programmes

Another programme to be evaluated is the PMCT and the ARV for HIV/AIDS. The indicators from PMTC suggest high coverage but poor follow up which need to be validated. The ARV programme is collecting data on individual patients through forms that need to be entered into a database to be analyzed. This will provide information of many aspects affecting the coverage, compliance and outcomes and the relevant actions to improve ARV. In the meantime, similar to what has been suggested for the second survey on the TB programme, a task analysis could cover the four clinic distributing ARV to identify critical factors affecting the diagnosis,

treatment and follow up of the patients under ARV. This could be done concurrently with the second survey of the TB programme in 2006.

Use of the DHIS

Another area to be strengthened is the reliability and interpretation of the information from the DHIS. The information collected by the DHIS from hospitals, clinics and programmes is frequently unreliable and under-utilized. Reliability could be improved by comparing the monthly number of beds, discharges, admissions, deaths and other variables reported by each hospital for a given month with the reporting for the same months in the previous years. This will allow to identify outliers and to check with the FIO what could be the reason for such outliers. Once the numbers have been checked for reliability, they should be interpreted in terms of monthly variation in occupancy, turnover, ALOS, surgery, mortality and still birth rate. Also these monthly indicators should be compared with the monthly fluctuations reported in the previous years to exclude outliers. Finally the hospitals should be plotted on a Pabon Lasso graph where occupancy and turnover are respectively the X and Y axes. This technique, which has been described in Issues 7 and 8 of the Epidemiological Bulletin will help hospital managers to interpret changes in utilization of their hospitals to identify reasons for low efficiency, propose specific actions and evaluate the results on the changes of the indicators. Similarly, the hospital managers should interpret the changes in cost per equivalent patient day to identify changes in economic efficiency.

Maternal services

Although there is a high coverage of pregnancies by the health services, there is room for improvement. The high coverage in antenatal care visits and delivery case is still associated with high levels of maternal mortality. The reports on the Confidential Enquiries on Maternal Deaths have identified "avoidable factors" and have recommended specific actions. For example, the most important recommendations included increasing the access to Termination of Pregnancy (TOP) services and reducing the delay in transport from home to institutions and between institutions. There is a need to assess the feasibility of implementing these recommendations to tackle the avoidable factors of maternal mortality. Feasibility is not always assessed in its overall complexity as demonstrated by the difficulty encountered in implementing the Termination of Pregnancy (TOP) Act. Although one of the avoidable factors of maternal mortality is to increase access to the TOP services, this is not easy to implement. Several studies carried out in KZN have found that it is difficult to provide TOP because of cultural reasons, including staff attitude and stigma associated with abortion. Evaluating the status of implementation of TOP and other recommendations and identifying the reasons behind the difficulty of implementing them should be a priority.

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