

Windows of Opportunity Project:

Review and Analysis of Maternal and Child Health
Development Data for Four Project Districts
in South Africa

**Ms Candy Day, Ms Fiorenza Monticelli, Dr Catherine Ogunmefun,
Dr Annette Gerritsen, Dr René English, Dr Peter Bock**



**A report compiled by the
Health Systems Research Unit
Health Systems Trust
South Africa**



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Published by Health Systems Trust

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December 2011

This study was funded by PATH USA



Suggested citation:

Day C, Monticelli F, Ogunmefun C, Gerritsen A, English R, Bock P. Windows of Opportunity Project: Review and Analysis of Maternal and Child Health and Development Data for Four Project Districts in South Africa. Compiled for PATH by Health Systems Trust; December 2011.

Cover page pictures were downloaded from <http://office.microsoft.com/>

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome	NC	Northern Cape
ANC	Antenatal Care	NCCEMD	National Committee on Confidential Enquiries into Maternal Deaths
ART	Antiretroviral Therapy	NDoH	National Department of Health
ASSA	Actuarial Society of South Africa	NGO	Non-government Organisation
BAS	Basic Accounting System	NHI	National Health Insurance
CBO	Community-based Organisation	NHLS	National Health Laboratory Service
CHC	Community Health Centre	NCD	Non-communicable Disease
CI	Confidence Interval	NFCS	National Food Consumption Survey
CS	Community Survey (StatsSA)	NiDS	National income Dynamics Study
DHB	District Health Barometer	NSDA	Negotiated Service Delivery Agreement
DHIS	District Health Information System	NVP	Nevirapine
DI	Deprivation Index	NYRBS	National Youth Risk Behaviour Survey
DM	District Municipality	PCA	Principal Component Analysis
DWQM	Drinking Water Quality Management	PCE	Per Capita Expenditure
EID	Early Infant Diagnosis	PCR	Polymerase Chain Reaction
EMS	Emergency Medical Supply	PDE	Patient Day Equivalent
FTE	Full Time Equivalent	PHC	Primary Health Care
GHS	General Household Survey (StatsSA)	PMTCT	Prevention of Mother-to-Child Transmission (of HIV)
GNI	Gross National Income	PNMR	Perinatal Mortality Rate
GP	Gauteng Province	QLFS	Quarterly Labour Force Survey
HIV	Human Immunodeficiency Virus	SADHS	South Africa Demographic and Health Survey
HSRC	Human Sciences Research Council	SAHR	South African Health Review
HST	Health Systems Trust	SAIMD	South African Index of Multiple Deprivation
IDP	Integrated Development Plan	SAIMDC	South African Index of Multiple Deprivation in Children
IEC	Independent Electoral Commission	SBR	Stillbirth rate
IEC	Information, Education and Communication	SEQ	Socio-economic Quintile
IMSA	Innovative Medicines South Africa	SDBIP	Service Delivery and Budget Implementation Plan
KZN	KwaZulu-Natal	StatsSA	Statistics South Africa
LG	Local Government	TB	Tuberculosis
MCH	Maternal and Child Health	UNDP	United Nations Development Programme
MDB	Municipal Demarcation Board	WSDP	Water Services Development Plan
MDG	Millennium Development Goal	WHO	World Health Organization
MOU	Midwife Obstetric Unit	YYLs	Years of Life Lost

Acknowledgements

Thank you to Catherine Pagett for final layout of the report.

1 Executive Summary

Introduction

Up to half a million African babies die on the day they are born, and every year 1.16 million babies die in the first month of life, while another one million babies are stillborn. In addition, about 250 000 women die of pregnancy-related causes every year in Africa. The majority of these deaths are preventable. However due to factors such as critical shortage of health professionals and essential materials and infrastructure, ineffective intervention programmes as well as the impact of the HIV and AIDS epidemic, the African continent continues to lose millions of babies and mothers every year. Hence, there is a need to strengthen the health systems in many African countries through effective maternal and child health (MCH) intervention programmes.

PATH is one of the international non-profit organisations that are involved in the development and provision of interventions to improve maternal and child health and well-being in South Africa. By collaborating with local organisations in South Africa, PATH is able to provide effective intervention programmes that address maternal and child health problems.

PATH, through the Window of Opportunity Project, is currently in the process of developing a model package of evidence-based interventions to address early childhood development. This report aims to present baseline data covering a broad range of health related indicators that can be used as part of a situational analysis to help guide the development of this package and ensure maximum impact of interventions.

Report methodology

The analysis covers the Sedibeng, Uthungulu, Nkangala and John Taolo Gaetsewe districts in Gauteng, KwaZulu-Natal, Mpumalanga and the Northern Cape respectively. Data have been extracted from a number of routine data sources listed within the document. The methodology used varied between data sources and indicators, however, standard procedures with respect to data extraction, integration into a unified database and coding were followed. Data were reviewed and adjusted for quality issues according to the general guidelines of the Health Metrics Network and WHO guidance for Country Health Surveillance Systems. Various visual outputs including linear and loess regression curves were generated to inspect the data. Validation of the indicators against expected norms and alternative data sources was undertaken where possible.

Table 1: Summary of Data Sources

Indicator group	Indicators	Source	Period Covered	Adjustments	General Comments/Comments on Completeness	Report methodology section
Cause of Death Data and Burden of Disease	Leading causes of death (age 0), Leading causes of death (age 1-4). Percentage of Years of Life Lost (YLL) due to Communicable, maternal, perinatal, nutrition causes, Percentage of Years of Life Lost (YLL) due to HIV or TB. Percentage of Years of Life Lost (YLL) due to non-communicable diseases, Percentage of Years of Life Lost (YLL) due to injuries. Leading causes of YLLs (all ages)	StatsSA causes of death and 2008 MRC (Causes of Death), District Health Barometer 2010/11	2008	Cleaning, coding, redistribution and adjustments of StatsSA data using Stata11 by MRC . No change to data by HST.	- Incomplete, ill-defined and garbage codes in vital registration data, variable across districts. - No. of deaths by age group is small and may not be representative. - Underreporting of deaths in vital registration system is worst in children and affects resulting data.	Sect 5.1
ASSA2008	Number of children HIV+ (under 5 years). HIV prevalence (under 5 years).	Actuarial Society of South Africa	2005 to 2012	None made by HST.	This is a model using the most recent antenatal and mortality data.	Sect 5.2

Indicator group	Indicators	Source	Period Covered	Adjustments	General Comments/Comments on Completeness	Report methodology section
General Household Survey (GHS) and Community Survey (CS) 2007	Maternal/double orphans. Orphanhood, Pre-school attendance 0-4, Pre-school age 5. Piped water.	Statistics South Africa	2007	None made by HST.	- Small size of survey sample especially with GHS data causes substantial fluctuations at district level. - Systematic problems exist with 2007 GHS data.	Sect 5.3
HIV prevalence	No. of HIV+ pregnant women . HIV prev of ANC (survey).	National Antenatal Sentinel HIV and Syphilis Prevalence Surveys 2008 to 2011	Financial Year 2008 to Financial Year 2011	No. of HIV+ve women was estimated by HST from district level. HIV prevalence of HIV ANC survey X population <1yr X adjustment factor 1.07.	Antenatal survey prevalence figures in older age groups no longer a good proxy for incidence as result of introduction of ART.	Sect 5.4
Orphan Data	Number of maternal/double orphans due to AIDS (ASSA). No. of Maternal/double orphans (ASSA, CS, GHS,). Orphanhood (%) maternal/double (CS, GHS).	ASSA 2008 2010 Community Survey 2007	2005 - 2012 (ASSA) 2007 (Community Survey) 2010 (GHS)	No adjustments made by HST.	CS data available at district level & sub-district level, GHS and ASSA only at province level.	Sect 5.5
District Health Information System (DHIS) data	Low birth weight in fac. Severe malnut <5. Fixed PHC supervis rate, Util rate PHC, Util rate PHC <5. ANC coverage. Delivery rate in facility. Caesarean sect rate. Imm coverage, Measles 1st dose cov, RV 1st dose coverage. Diarrhoea incidence <5 Stillbirth rate. Perinatal Mort rate. Maternal deaths. Maternal Mort rate.	National Department of Health DHIS	Financial Year (FY) 2007 to 2011, FY 2009-2011 for Antenatal coverage rate , FY 2011 - 2012 for RV 1st dose coverage, FY 2009 - 2011 for Maternal Deaths , FY 2012 for Maternal Mortality Rate	Adjustments made by HST to DHIS data included reviewing data and adjusting for quality issues according to general guidelines of the Health Metrics Network. Linear and loess regression curves were generated to inspect data.	- Immunisation - problems with denominator (population) estimates - thus uncertainty of coverage. - Clinic supervision rate errors in numerator found. - Caesarean section rate reflects only District. Hospitals and excludes higher levels of care. Incomplete data for private sector hospitals. - Delivery rate in facility denominator is estimate and must be treated with caution at lower levels of aggregation.	Sect 5.6
Other data sources on Nutrition	Stunting	National Food Consumption Survey 2005, The South African Youth Risk Behaviour Survey 2008, NIDS Health Wave 1	2005 (NFCS) 2008 (NYRBS) 2009 (NIDS Health Wave)	No adjustments made by HST.	Data at province level only and measured by individual surveys with different age groups - data are thus not directly comparable.	Sect 5.7
Education: pre-school enrollment	Percentage of 0-4 year olds attending educational institutions. Percentage of 5 year olds attending educational institutions.	Community Survey 2007, General Household Survey 2010	2007(CS) 2010 & 2011(GHS)	No adjustments made by HST.	GHS data only at province level, CS data at sub-district, district and province level. Separate surveys and different years;- data thus not directly comparable.	Sect 5.8

Indicator group	Indicators	Source	Period Covered	Adjustments	General Comments/Comments on Completeness	Report methodology section
Population	Total population. Population (by age categories in population pyramids) Population <1. Denominator for severe malnutrition <5 yrs. PHC utilisation rate. PHC utilisation rate <5yrs. Immunisation coverage rate. Measles 1st dose coverage. Diarrhoea incidence under 5 years.	National Department of Health population estimates based on Census 2001 and StatsSA mid-year estimates (DHIS)	2005 - 2012	No adjustments made by HST.	DHIS population estimates differ from the StatsSA mid-year estimates. Estimates are plagued by documented under-count of children, especially at disaggregated levels. Estimates for urban areas may be inaccurate due influx of people from elsewhere and underestimation of immigration flow.	Sect 5.9
Deprivation	Deprivation Index Rank and SEQ (DHB). South African Index of Multiple Deprivation Rank and SEQ (SAIMD). South African Index of Multiple Deprivation Child Index Rank and SEQ (SAIMDC).	HST's District Health Barometer Deprivation Index (DI) South African Index of Multiple Deprivation (SAIMD) South African Index of Multiple Deprivation Child (SAIMDC)	2007	No adjustments made by HST.	A different set of variables was used to calculate the DI and the SAIMD and different methodologies were used. Thus there are some differences between the ranks of the two at municipality level. Greatest difference is in Emalahleni District.	Sect 5.10
Access to water and water quality	Percentage of households with access to piped water. Drinking water quality. Waste water management.	General Household Survey 2010 2011 Community Survey 2007 Blue Drop Report 2011 Green Drop Report 2011	2007, 2010, 2011	No adjustments made by HST.	GHS data only at province level, CS data at sub-district, district and province level. Separate surveys and different years; data thus not directly comparable.	Sect 5.11
Early infant diagnosis coverage for HIV and PCR positivity	Baby PCR testing coverage. Baby PCR positivity.	National Health Laboratory Service (N HLS) data Antenatal Surveys DHIS data on live births	Financial Year 2008 to 2011	Calculation by HST uses N HLS data on number of PCR tests on children <2 yrs as numerator & calculated estimate of HIV exposed infants (using live births reported in DHIS x antenatal HIV prevalence from the survey).	Data for proportion of PCR tests that are +ve (N HLS) for 2011 are only for April - June 2011 & therefore may be unstable due to small numbers. Information on KZN only available for 2011 as previously they used a different laboratory information system.	Sect 5.12

Indicator group	Indicators	Source	Period Covered	Adjustments	General Comments/Comments on Completeness	Report methodology section
Primary health care (non hospital) expenditure per capita	Non-hospital PHC expenditure per capita.	District Health Barometer 2010/11	Financial Year 2006 to 2011	Calculation by HST uses data obtained from National Treasury Basic Accounting System, Local Government expenditure on PHC, factors for inflation adjustment based on CPIX, medical Scheme coverage figures from StatsSA GHS, data on health facilities and population from DHIS.	- Data are complete for all districts and provinces. - Public sector expenditure is divided by uninsured population. Uncertainty exists with respect to total uninsured population due to differences reported by Medical Schemes Council and the GHS.	Sect 5.13
Maternal Mortality	No. of maternal deaths. Maternal Mortality Rate.	National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD) DHIS	Financial year 2009 - 2011 (DHIS), 2006 to 2008 (NCCEMD at ZA level)	No adjustments made by HST.	DHIS data are incomplete, especially prior to 2011. NCCEMD and DHIS report only deaths in facility.	Sect 5.14
District Hospital Performance overviews	Overall performance score for District hospitals based on 7 indicators.	DHIS	Financial year 2011	Calculation of composite performance score by HST based on indicator ranking and values.	Assignment of scores is somewhat subjective.	Sect 5.15

Data analysis by district

Sedibeng

The deprivation index (DI) ranking for Sedibeng sub-districts ranged from 173 to 210, placing the sub-districts in the best off two socio-economic quintiles. The proportion of households with access to piped water was 97.5% compared to the Gauteng average of 97.9%. Drinking water quality management ratings varied from 'good' to 'exceptional' across sub-districts and the waste water management rating was 'average'. Causes of death under 1 year were aligned to national norms; although there was a higher incidence of lower respiratory tract infections (LRTIs) than nationally (27.4% vs. 19.6%). In the 1 to 4 year group there was a higher rate of death following motor vehicle accidents (17.3% vs. 11.5%). The determinants of 'Years of Life Lost' (YLLs) were also closely aligned to national trends.

The rate of orphanhood (7.25%) is similar to the rest of the province (7.15%) but higher than the national figure of 5.0%. The rate of low birth weight (14.3%) was lower than the Gauteng average (14.8%), but higher than the national average (13.1%). The occurrence of severe malnutrition in the under 5 age group, however, was 1.3%; markedly less than both the provincial (3.6%) and national (4.8) averages. Pre-school attendance in the 0 to 4 year age group (37.2%) was higher than the Gauteng (29.5%) and national averages (22.6%); as expected the attendance in children five years old was greater.

Clinic supervision rates (92.1%), PHC utilisation rates (2.2%) and caesarean section rates (22.3%) were higher than the provincial and national averages. Antenatal attendance (91.5%) and in facility delivery rates (88.8%) were lower than the respective averages.

PCR uptake in Sedibeng was only 47%. The national average for 6 week PCR uptake is also low, approximately 50%. PCR positivity in Sedibeng is 2.5% which is slightly lower than the recorded averages for Gauteng and South Africa. The SBR and PNMR are similar to Gauteng and national averages; however, the MMR (182) is significantly higher compared to both Gauteng (99.7) and South Africa (135.4).

Uthungulu

The DI ranking shows high levels of deprivation of the district with 4 of the 6 sub-districts amongst the 40 most deprived in the country. Only 75% of households have access to piped water, which is below the national and provincial averages. The quality of drinking water was rated 'good' and waste water management 'average with need for improvement'.

Causes of death under 1 year group for the district are similar to the rest of the country, apart from a higher reported number of deaths associated with pre-term delivery (9.7%) compared to a national average of 8.9%. In the 1 to 4 years group there is a notably higher proportion of TB related deaths (20.0%) compared to nationally (13.1%). Determinants of YLLs were similar to national trends.

The rate of orphanhood is similar to rest of KwaZulu-Natal (9.5% vs. 9.7%); but higher than the national average (7.0%). Low birth weight rates were similar to national averages; however there is a lower rate of severe malnutrition under 5 years (4.3%), when compared to KwaZulu-Natal (7.0%) and South Africa (4.8%).

The non-hospital PHC expenditure per capita is lower than the rest of the province and South Africa (R374 vs. 430 and 531 respectively). Values for indicators describing health system coverage and utilisation are similar to other parts of KwaZulu-Natal and South Africa. The Caesarean section rate was higher (29.9% vs. 26% and 18.8%) compared to the rest of the province and nationally.

The antenatal HIV prevalence in the district is well above the national average (36.9% vs. 30.1%). Infant PCR uptake was 52.1%, of whom 3.5% tested HIV positive. Although the SBR and PNMR were similar to provincial and country averages, the MMR was once again very high (237 vs. 172 and 135 respectively).

Nkangala district

The DI ranking for sub-districts ranged from 70 to 196. A total of 91.6% of households had piped water. The rating for drinking water quality management ranged from 'significant improvement required' to 'excellent' and the rating for waste water management ranged from 'critical state' to 'average'.

Causes of death under 1 year were similar to national trends, except for a higher proportion of deaths attributable to diarrhoeal disease and LRTI's. In the 1 to 4 year olds an astonishing 19.9% of deaths were attributed to road traffic accidents. The determinants for YLLs were similar to national trends; with the exception of a more common occurrence of LRTIs (15.7% vs. 11.9%).

The rate of orphanhood in the district was 6.7% compared to 7.6% and 7.1% in the rest of Mpumalanga and South Africa respectively. The rate of pre-school attendance in the 0 to 4 year group was similar to national trends; however in those five years old attendance rate was marginally higher (62.3%).

The clinic supervision rate was 70% and the PHC utilisation rate ranged from 1.2% to 2.3 % across sub-districts. The rate of antenatal attendance, facility based delivery and caesarean section rates were all lower than the national and provincial averages. The PHC non-hospital expenditure was R412 per capita, slightly lower than the rest of the province (R445).

The 2010 antenatal HIV prevalence in the district was 27.2%, infant PCR uptake 50.2% and PCR positivity 3.7%. The SBR (27.6) and PNMR (36.2) were slightly higher and the MMR (160) was very similar to the provincial averages.

John Taolo Gaetsewe

There are only three sub-districts in John Taolo Gaetsewe district, with DI ranking of 35, 107 and 215, placing Joe Morolong in the most deprived socio-economic quintile, and Gamagara in SEQ 5 (best off). A total of 91.8% of households had piped water (NC average is 94.4%) Water quality management ratings in 2 sub-districts were 'improvement required' and 1 sub-district 'good'. Waste water management was deemed 'critical' and 'in need of improvement'.

The cause of death data for children under 1 year showed a higher rate of diarrhoeal disease (35.5% vs. 26.7%) and birth asphyxia and trauma (12.9% vs. 5.7%) when compared to the national values. In the 1 to 4 year group, road injuries contributed a massive 31.3% compared to 11.8% nationally and LRTIs 22.9% compared to 11.2% nationally. Due to the very small population, the number of deaths in children is very small, and these results may be inaccurate. Determinants of YLLs showed high LRTI rates (26.2% vs. 11.9%) and lower TB rates (11.0% vs. 16.9% nationally)

The rate of orphanhood was 6.1% compared to a provincial average of 6.4%. There were low rates of low birth weight and malnutrition, although the numbers were small and the indicator values therefore fluctuated over time. Missing data for one of the two district hospitals for a substantial period has also impacted on data validity for this district substantially. In general, survey-based data sources suggest that nutritional status (for example, stunting) is worse in the Northern Cape than the rest of the country.

Health service indicators showed a clinic supervision rate of 27.9%, higher than the provincial average of 19.6%; but much lower than the national average of 68.8%. Non-hospital PHC utilisation rates, immunisation coverage, the antenatal attendance rate (104%) and proportion of mothers delivering in facilities (90.1%) were higher than the provincial and national averages. The Caesarean section rate (10.9%) was lower than these averages.

The 2010 antenatal HIV prevalence was 27.5%, lower than the national average, but substantially increased from 2009. Infant PCR uptake was 49.4% (provincial average was 63.1%) and the PCR positivity rate was 4.9%; which was higher than the Northern Cape average of 3.4%. The SBR (32.2) and PNMR (41.9) were both higher than the Northern Cape average; although the numbers were small and the rates vary substantially from year to year. The MMR rate recorded in DHIS is implausibly low (87.1) and there is a strong suggestion of incomplete data.

Conclusions

The data reported here confirm the wide variability in both baseline determinants of maternal and child health and health outcomes, not only between but within districts. The analyses presented here can be used for developing a model for prioritising health care interventions to assist early childhood development.

Recommendations

Should PATH wish to continue monitoring the status of health of women and children in these districts, the following indicators are most useful;

The two impact indicators Perinatal mortality rate (PNMR) and Stillbirth rate, which are available from the DHIS – as these are relatively stable and clean when measured on an annual basis at district level and have provided relatively stable trends over the past few years.

Maternal mortality as reported by the NCCEMD. Although these are only at province level and only available every 2 years these reports give a fair and comprehensive overview of maternal health delivery in facilities.

Qualitative research on quality of care should be conducted on a regular basis by PATH if at all possible. The recent Human Rights Watch report on maternal deaths argues that many preventable deaths of mothers and children occur due to abysmal quality of care of pregnant women in hospitals and CHCs of which they had ample examples in the Eastern Cape. The report is available at <http://www.hrw.org/reports/2011/08/08/stop-making-excuses-0>

Incidence of Diarrhoea and Pneumonia linked to quality of water and waste water management (Blue and Green Drop reports)

2 Introduction

Up to half a million African babies die on the day they are born, and every year 1.16 million babies die in the first month of life while another one million babies are stillborn. In addition, about 250 000 women die of pregnancy-related causes every year in Africa.¹ The majority of these deaths are preventable. However due to factors such as critical shortage of health professionals and essential materials and infrastructure, ineffective intervention programmes as well as the impact of the HIV and AIDS epidemic, the Africa continent continues to lose millions of babies and mothers every year. Hence, there is a need to strengthen the health systems in many African countries through effective maternal and child health (MCH) intervention programmes.

South Africa, one of the few countries in Africa with a relatively high Gross National Income (GNI) per capita, has reproductive health policies that could be regarded as among the most progressive and comprehensive in the world.^{1,2} Despite government commitment however, maternal and child mortality rates have continued to increase over the past few years. Each year, an estimated 1 400 mothers die, 20 000 babies are stillborn and another 22 000 die before the reach the first month of age, and an additional 60 000 children die before the reach their 5th birthday (Chopra and Lawn, 2009; Department of Health, 2009).^{3,4}

According to Chopra and Lawn, South Africa is one of only 12 countries where the under-5 mortality rate is higher than the baseline of 1990. This means, that the country is not only off track for the Millennium Development Goal (MDG) 4, but it is actually going in the wrong direction. Even though the high maternal and child mortality rates in South Africa are closely linked to the high HIV prevalence in the country, most of the deaths could have been prevented with effective MCH services. Thus, it is imperative for health systems strengthening in South Africa to be geared towards the implementation of effective MCH services, particularly at the district level.

PATH is one of the international non-profit organisations that are involved in the development and provision of interventions to improve maternal and child health and well-being in South Africa. By collaborating with local organisations in South Africa, PATH is able to provide effective intervention programmes that address maternal and child health problems. PATH, through the Window of Opportunity Project, is currently in the process of developing a model package of evidence-based interventions to address early childhood development, such as optimal care practices and appropriate use of technologies in the home or clinic, immunisation, and child development assessments. Thus, there is a need to conduct an initial assessment of the maternal and child health problems and needs in four selected provinces and districts – Sedibeng (Gauteng); uThungulu (KwaZulu-Natal); Nkangala (Mpumalanga); and John Taolo Gaetsewe (Northern Cape Province).

In order to collect relevant information on MCH, Health Systems Trust (HST) was commissioned by PATH to conduct a desktop review and analysis of MCH data for the four selected districts and provinces. The objective of the study is to analyse district and sub-district level data to identify the problems, needs, challenges, services and priority solutions for each of the four project districts.

3 Background

In the *Countdown to 2015 Initiative*, South Africa was identified as one of 68 priority countries with a high burden of maternal and child health mortality. In addition to a lack of progress towards achieving MDG 4, the MCH rates of the country are higher than those in other middle-income countries such as Brazil, Argentina and Thailand.^{3,5,6} The estimated maternal mortality ratio in South Africa is 400 deaths per 100 000 live births and the perinatal mortality stands at 31.1 deaths 100 births, and both are higher than that of countries of similar socio-economic development.⁷

According to the South African mortality audit reports, *Saving Mothers, Saving Babies and Saving Children*, there is a toll of over 260 (maternal and child) deaths every day, which is due to five major health challenges:⁸

- Pregnancy and childbirth complications
- Newborn illness
- Childhood illness
- HIV and AIDS
- Malnutrition.

Furthermore, the findings from the reports of three Ministerial Committees appointed by the Minister of Health, Dr Aaron Motsoaledi, at the Maternal Child and Women's Health Summit 2009, show that the rates for maternal and child deaths are very high in the country. The estimated numbers of MCH deaths, leading causes and avoidable factors from the reports, are as summarised in Table 2.⁴

Table 2: Maternal and child deaths, causes and avoidable factors in South Africa

	Maternal	Perinatal	Children under five
Annual number of deaths (estimated)	1 400	22 000	60 000
Direct causes of death	Hypertension 15.7%; Haemorrhage 12.4%; Ectopic pregnancy 1.4%; Abortion 3.4%; Pregnancy-related sepsis 5.6%; Anaesthetic-related 2.7%; Embolism 1.4%; Acute collapse 3.2%	Immaturity-related 46%; Asphyxia-hypoxia 29%; Infection 10%; Congenital abnormalities 8%	Gastroenteritis; Acute respiratory infection; Tuberculosis; HIV; Neonatal conditions
Indirect or underlying causes	AIDS 23.1%; Other non-pregnancy-related infections 20.6%; Pre-existing maternal disease 6%		Malnutrition and HIV were underlying causes in 60% and 50% (respectively) of all under five deaths
Avoidable deaths-modifiable factors, missed opportunities and sub-standard care	38.4% of all deaths clearly avoidable	43% of neonatal deaths probably avoidable	Location of modifiable factors: Home-36.8%; PHC clinics-13.4%; Admission & Emergency-17.5%; Wards- 27.7%

Even though Table 2 shows unacceptably high infant, child and maternal mortality rates, the full extent of problem is likely to be underestimated. The underestimation of MCH rates is mostly due to the fact that the routine mortality data collected in the country has tended to be incomplete, missing a large proportion of maternal and child deaths outside health facilities and lacking detail to provide a comprehensive profile of direct and indirect causes of death.⁹ A recent review of the health information

system by Statistics South Africa and National Department of Health (NDoH) also identified major weaknesses such as uncertainty about the exact level of child mortality and maternal mortality as well as missing , incomplete or poor quality data for evaluating maternal, newborn and child health programmes.⁶

South Africa has high coverage of routine indicators, such as antenatal care coverage and having a skilled attendant at delivery. However, the country cannot be complacent about its performance on these indicators given the fact that the maternal mortality ratio and other MCH-related indicators continue to rise.¹⁰ There is therefore the need for additional indicators to identify differentials in access to quality maternal care, access to emergency obstetric services and access to antiretroviral treatment, as these factors are more directly associated with maternal and child mortality in South Africa.¹⁰ This current study would therefore not only highlight gaps in the provision of MCH services but also in the data available for MCH indicators. The findings from the study would also guide the development of indicators and metrics that would be used in the monitoring of the success of the intervention programmes for addressing MCH problems and challenges in the selected districts (Sedibeng, Uthungulu, John Taolo Gaetsewe and Nkangala) of South Africa.

Profiles of the districts of Sedibeng, Uthungulu, Johan Taolo Gatetsewe and Nkangala follow, detailing information relevant to the social determinants of health and maternal and child health issues available from the Integrated Development Plans, Annual Reports and District Health Plans.

4 Literature Review

4.1 Sedibeng District Municipality

Sedibeng District Municipality is situated in the south-western part of Gauteng Province. It is a mostly urban and metropolitan district and is made up of three local municipalities, Emfuleni, Midvaal and Lesedi, and has a population density of 203 people/km² (2008). The Community Survey 2007, found that 14.1% of people lived in informal housing and 0.9% of households had no toilet facilities at all, with 4.3% having no refuse removal. The population of 876 584 (2011) people of which 15 102 (1.7%) are children under one year old, are serviced by eight public sector PHC clinics, two health posts, one satellite clinic, five community health centres (CHCs), eight mobile clinics, two district hospitals and one regional hospital. (The population pyramids are available in chapter '6 Discussion of Indicators'). There are a total of 1 052 public sector hospital beds and 650 private health sector hospital beds available in the district. There were 16 247 recorded births^a in Sedibeng in 2010, but there are no standalone Midwife Obstetric Units (MOUs) although one CHC is reported to have a 24 hour MOU service.

The Integrated Development Plan (IDP) and budget for 2011/12^b reports that the district plans to focus on the following key health and social services areas during the financial year:

Improving access to HIV and AIDS treatment, programmes, education and social awareness throughout the district by engaging and liaising with all relevant stakeholders (NGO's, CBO's and hospitals) to ensure access to treatment and have visible campaign programmes.

Improving Emergency Medical Supply (EMS) services, especially in areas of Lesedi, where provision was made for dedicated Emergency Medical Vehicles to be operational in rural and outlying areas at identified satellite venues.

Addressing the provision of sufficient medication in all townships of Sedibeng, was planned to be dealt with through liaison with the Department of Health provincially.

Provision of birth certificates and Identity documents for orphaned people.

Plans and budgets which indirectly or directly affect the health of women and children and which are included in Service Delivery and Budget Implementation Plan (SDBIP) 2010/2011^c covered the following:

For the envisaged outcome Improved health status of the community R20 000 was budgeted for supporting the development of the District Health System and the establishment of District Health Councils, District Health Committees and supporting the implementation of health programmes.

R30 000 was budgeted for improving the community participation in PHC service via the functioning and establishment of clinic committees and hospital boards.

R65 000 was allocated to facilitate implementation of women empowerment programmes which includes supporting an implementation plan against gender based violence.

R30 000 was allocated to support and facilitate birth certificate campaigns and to increase the number of children with birth certificates. Other activities specific to children included the implementation of programmes on child trafficking and improving the quality of services for children in the health and social development areas.

^a Statistics South Africa. Recorded Live Births 2010. Release P0305. Pretoria: Statistics South Africa; August 2011.

^b Sedibeng District Municipality. IDP (Integrated Development Plan) and Budget

http://www.sedibeng.gov.za/a_keydocs/idp_2011_12/chapter_1.pdf

^c Sedibeng District Municipality. Service Delivery and Budget Implementation Plan (SDBIP) 2010/2011.

http://www.sedibeng.gov.za/a_keydocs/sdbip_2010_11/2010_11_sdbip.pdf

Improving the response times of EMS, the quality of care by EMS personnel and services in rural and outlying areas.

A mere R5000 was allocated to inform communities on women and child abuse, including reduction on incidents involving violence against women and children.

R150 000 was allocated to improved access to ART for adults and children.

Most of these full time equivalents (FTEs), except for medical officers, were reported to be below the required target for the financial year. Many nurses were tied up with administrative work and did not have adequate time to see patients.

4.2 Uthungulu District Municipality

Uthungulu is one of the 11 district municipalities of KwaZulu-Natal and is located in the north eastern region of the province. The district comprises six local municipalities namely: Mbonambi, uMhlathuze, Ntambanana, uMlalazi, Mthonjaneni and Nkandla. uMlalazi is the largest municipality covering 2 214 km² and uMhlathuze the smallest with an area of 795 km². Nkandla covers an area of 1 827 km², Mbonambi 1 208 km², Mthonjaneni 1 086 km² and Ntambanana 1 083 km². The district is characterised by low levels of urbanisation with approximately 80% of the people living in the rural areas. There are two urban and significant economic centres, Richards Bay and Empangeni. Richards Bay, as a harbour and industrial town attracts people from surrounding towns, rural settlements and from beyond the district. The 2011 population estimate is 972 860 with 19 893 (2.0%) of the population under one year old. The female population is significantly higher than the male population – a phenomenon that can be attributed to migration patterns associated with the province and rural areas in general. The population pyramids by sub-districts and district illustrating this fact can be viewed in chapter ‘6 Discussion of Indicators’ chapter.

Even though the economic performance of the district is good, it must be noted that unemployment remains high and according to the Community Survey 2007, is 21.6%.

There are 14 mobile clinics, 52 PHC clinics and one CHC with a 24 hour MOU facility in the district. There are no standalone MOU facilities available. There are six district hospitals and two regional hospitals with a total of 1 891 public sector beds and 339 private sector beds available.

The Integrated Development Plan (IDP) and budget for 2007/08 - 2011/12^d reports that there are large infrastructure backlogs, particularly in respect of water and sanitation mainly in the rural areas, however the implementation of the district Water Services Development Plan (WSDP) has reduced the rural backlogs for water supply to RDP standard from 81.7% in 2001/02 to 43.9% in 2006/07. The backlog in rural sanitation to RDP standards has been reduced from 89.1% to 72.2% over the same period.

According to the IDP report, a Community Facilities Plan entailed an audit of 626 community facilities in the district. Of the 626 facilities visited, only 59 had no infrastructure or services problems.

The majority of problems at facilities related to the following:

- No infrastructure (particularly at the majority of ‘kick-around’ sport fields)
- No shelter or ablution facilities at Pension Payout Points
- No electricity
- No water
- Problems with sanitation connections
- Problems with water connections
- Problems with electricity connections
- Infrastructure that has been vandalised (broken windows)
- Damaged / stolen fencing
- Damage to roofs
- Poor workmanship (cracked walls)

The IDP also reports that funding required for child care facilities was R1 040 000 in 2007/08. Some of the key milestones achieved with regard to social and community development relative to maternal

^d Uthungulu District Municipality Integrated Development Plan: 2007/2008 – 2011/2012.
http://devplan.kzntl.gov.za/idp_reviewed_2007_8/IDPS/DC28/Adopted/IDP%20Final%20May%2007.pdf

and child health included funding secured for a three year HIV and AIDS project in partnership with the UNDP and Japanese Government and building of an HIV and AIDS centre at KwaMpungose in uMlalazi.

The 3 Year Implementation Plan (2007/08 to 2009/10) report showed that budgeted amounts for health related activities for 2009/10 were:

- Children's Desk Programme R25 000
- Community Awareness and Education on diseases R120 000
- Gender Equality Plan and Women's Day R25 000
- Model Communities HIV/AIDS Programme (UDM/UN) R125 000.

The District Council had been successful in accessing funds to the value of R9 million from the United Nations Development Programme (UNDP) for developing the district's Integrated HIV and AIDS Programme. The funds of the UNDP were to be utilised for the implementation of services that will be of assistance to those infected and affected by the disease over three years as per by the agreement with the UNDP. This included work under the following objectives: (1) Strengthening and expanding existing prevention and awareness programmes taking into account the cultural context and prevailing gaps in knowledge and myths that still surround HIV and AIDS (2) Reducing stigma and discrimination and improving care and support for people living with and affected by HIV and AIDS (3) Reducing vulnerability of households and to strengthen their livelihood capacity to respond to the epidemic (4) Strengthening working relations between provincial departments and Regional councils with clear definition of roles and responsibilities.

There are no obstetricians and gynaecologists, nor paediatric specialists in the district hospitals and for these services patients have to be referred to the regional hospitals. It is also of concern is that there is only one advanced midwife available among the six hospitals.

4.3 Nkangala Municipality

Nkangala District is composed of six local municipalities: namely; Victor Khanye, Emalahleni , Steve Tshwete, Emakhazeni, Thembisile Hani and Dr JS Moroka. The area of the district covers a total area of approximately 16,892 square kilometres, with an estimated population of 1 138 858 in 2011 of which 22 710 (2%) are under the age of one year old. The population pyramids by district and sub-district (local municipality) are available in the 'Discussion of Indicators' chapter). According to the Community Survey of 2007, Emalahleni had the highest population growth of 36.4% between 2001 and 2007. The population in Emakhazeni was reduced by 11.4% in the same period.

The district has 70 clinics, 17 CHCs, 20 mobile clinics, six district hospitals, one provincial tertiary hospital and one specialised hospital. There are a reported 969 usable beds in the public sector and 503 private sector beds.

The Nkangala District Municipality Integrated Development Plan 2011 – 2016^e (IDP) reports that Emalahleni has the highest backlog in terms of water and sanitation. Informal settlements are also on the increase due to the existing housing backlog in the District. Nkangala's urbanisation rate has increased from 44.1% in 1996 to 53.2% in 2008. Emalahleni exhibited the highest urbanisation rate among the six local municipalities with a rate of 86.2%, followed by Steve Tshwete with 72.1%. The lowest urbanisation rate in 2008 was recorded in Dr JS Moroka at 15.5%.

According to Statistics South Africa, the unemployment rate for South Africa and Mpumalanga at the end of the third quarter of 2010, was 25.3% and 28.4%, respectively. The Quarterly Labour Force Survey (QLFS) conducted by Statistics South Africa is unfortunately not disaggregated to district level. The IDP reports that the unemployment rate in Nkangala at 26.2% was higher than the provincial figure. Dr JS Moroka recorded the highest unemployment rate of 58.2% and Steve Tshwete the lowest at 13.1% in 2009. Table 3 represents the unemployment rate for Nkangala and its local municipalities from 1996 to 2009.

Table 3: Unemployment rate estimates of the six Local Municipalities of Nkangala District

REGION	1996	2001	2009
Nkangala	18.9%	31.2%	31.2%
Victor Khanye	20.2%	34.9%	34.9%
Emalahleni	15.3%	25.1%	25.1%
Steve Tshwete	9.6%	16.5%	16.5%
Emakhazeni	13.4%	18.4%	18.4%
Thembisile	24.1%	36.1%	36.1%
Dr JS Moroka	30.3%	55.2%	55.2%

The majority of people living in Nkangala are extremely poor and do not have access to mainstream economic activities. The spatial distribution of people reflects that there are three distinguishable groups of people affected by poverty, namely:

The main poverty concentration exists in the Dr JS Moroka and Thembisile municipalities.

The second poverty concentration is found in communities residing in informal settlements on the periphery of towns (e.g. west of Emalahleni and Middelburg, north of Victor Khanye Local Municipality). High population densities, poor access to basic infrastructure and community facilities, absence of local economies are the main characteristics.

The third category of poor people resides in the rural areas, particularly in the former black townships of small villages and on farms.

Based on information from Global Insight regarding the highest level of education, The Nkangala Annual Report 2009/10 states that 13.1% of the people 15 years and older, have not received any

^e Nkangala District Municipality Integrated Development Plan 2011 – 2016.
http://www.nkangaladm.org.za/index.php/documents-a-reports/cat_view/37-annual-report

schooling, 33.3% have an education level of grades 0-9, 23.5% grade 10-11 and 22.5% only a matric qualification. Only 6.7% of the people in Nkangala have a post-matric qualification.

The Multi Purpose Community Centres (MPCC) were introduced in the Nkangala in 2001. The MPCC is a one-stop, integrated community development centre, with its key purpose to enhance community participation through access to information, services and resources from government and non-government agencies. These services are aimed particularly to the poor and the previously disadvantaged as a catalyst to local economic development. Nevertheless, equitable distribution of basic foods at affordable prices to poor households and communities remains a challenge.

The Nkangala District Municipality Annual Report 2009/10^f states that Nkangala has made significant investments in water and sanitation infrastructure in the district during the past few years. Since 2004, R264 611 986 has been spent on water infrastructure, and about R138 902 148 on sanitation. Despite this, there is still a backlog in reaching the MDG targets for basic water and sanitation services, with 22 037 households needing basic water services and 122 307 households requiring sanitation.

Despite much detail on the Expanded Public Works Programme, water, electricity, waste management, roads and infrastructure provision, no detailed information is available in the Annual Plan or IDP of Nkangala on health provision, health promotion or health related services or any plans relating to social support services to women, children or disadvantaged communities.

In clinics, the number of doctors and enrolled staff nurses are below target, whereas the number of professional nurses and enrolled nursing assistants are above target. Clinics in Dr JS Moroka sub-district are reported to have a surplus of professional nurses whereas other facilities have a shortage, which causes an unbalanced workload.

Emalahleni sub-district, due to its urban nature, has a surplus of staff in all categories: nurses, administrative and data capturers and general workers, which also raises equity issues. There is good representation of midwives in Nkangala with a reported 168 full time equivalent (FTE) staff in clinics, 178 FTEs in CHCs and 10 advanced midwives in the six district hospitals.

^f Nkangala District Municipality Annual Report 2009/10.
http://www.nkangaladm.org.za/index.php/documents-a-reports/cat_view/37-annual-report

4.4 John Taolo Gaetsewe District

John Taolo Gaetsewe District borders on Botswana and is one of the five district municipalities of the Northern Cape Province in South Africa.⁹ The district covers 23 612 square kilometers and consists of 186 smaller towns and settlements of which 80% are villages. The area is 98% rural with a total population of 217 661 in 2011. The district is one of the districts declared a Presidential Rural Poverty Node in 2000. It comprises of three sub-districts namely: Gamagara, Ga-Segonyana and Joe Morolong. Mining and agriculture form the economic base of the district, however, the unemployment rate is estimated at 42% with Joe Morolong being the most affected in as far as poverty levels are concerned.

John Taolo Gaetsewe has made significant strides towards the provision of power in terms of electricity to the rural areas, which will improve the quality of services. However, a high number of households do not have access to clean and potable water as well as toilet facilities, which impacts negatively on health. The district is known for its asbestos mines and although these mines ceased to function in the 1980's, proper rehabilitation of the mining areas was not done thus exposing communities to asbestos related infections which are significantly high in the area. Lung related diseases like TB, asbestosis and asthma are some of the major causes of death in the district. Chronic diseases such as hypertension, diabetes and cardiovascular conditions are also common. Deaths as a result of HIV and AIDS and TB co-infections are also increasing gradually.

There are two hospitals, Tshwaragano and Kuruman, with 214 and 69 usable beds respectively, both rendering level 1 package of services, and which both serve as referral points for all PHC facilities. Kuruman Hospital also renders oncology services to some extent, which is a level 2 competency. Specialists also render outreach services periodically in the district. Both hospitals in turn refer to Kimberley Hospital as their level 2 care. There are 33 PHC facilities all rendering a core package of care on an eight hours, five days a week basis. Services include among others health promotion and comprehensive education to decrease infant mortality and maternal deaths, immunisation and family planning, treatment of acute conditions, screening of chronic diseases, and screening and testing for TB (including the management of patients). Deliveries are also performed by 86% of these facilities. There are also 5 CHCs with only two of them rendering 24 hour comprehensive care, while the rest are operating for 12 hours, 7 days a week, as a result of shortage of professional nurses.

The Integrated Development Plan (IDP) 2010/11 reports that the district plans to focus on the following key health and social services areas:

Completing the eradication of all bucket latrines in the area.

Increasing access to high quality sanitation facilities in the area, with specific reference to ensuring, at least, toilet facilities with adequate ventilation.

Addressing the 11% backlog where members of the community still do not have access to any acceptable standard of sanitation.

Addressing the current backlog in terms of access to water; and

Ensuring piped water inside dwellings to all of its households.

In clinics there is understaffing in all core areas except nursing assistants in the district, which has an effect of compromising quality of care. The areas most affected are pharmacy assistants-post basic and staff nurses. In CHCs there is a large shortage of doctors and pharmacy assistants-post basic. In general, facilities are understaffed to the extent that three facilities that should be open 24 hours a day are only open 12 hours, while other clinics are manned by one professional nurse only.

⁹ John Taolo Gaetsewe District Municipality: Synopsis of the Reviewed Integrated Development Plan 2010-2011 Financial Year.

In district hospitals, management needs to revisit the skill mix and produce strategies to achieve equity within the district as a whole.

5 Methodology and data sources

The methodology will vary by specific indicator and source, but the following general principles apply.

The most recent, disaggregated data for each indicator was extracted from the source data and combined into one integrated data store, where all data were linked to a common facility and district coding list.

Data was reviewed and adjusted for quality issues according to the general guidelines of the Health Metrics Network and WHO guidance for Country Health Surveillance Systems.

Various visual outputs including linear and loess regression curves were generated to inspect the data.

Validation of the indicators against expected norms and alternative data sources was undertaken.

The spreadsheet provides the annualised data for the list of indicators for the past 5 years (where available) for the four identified districts and their sub-districts, along with the provincial and national averages. However in some cases more detailed data were available, and were available for a longer time period, and therefore some graphs or tables may display a longer time series or present the data in greater detail, where this is useful for interpretation of the data and trends.

The following sections highlight particular methodology issues, either by data source, or by indicator.

5.1 Cause of death data

5.1.1.1 **Leading causes of death (age 0) and (age 1-4), percentage of YLLs by broad cause group and leading causes of YLLs**

Currently, Statistics South Africa (StatsSA) compiles cause of death statistics based on death notifications, but reports only limited information at district level. District level mortality information is useful for health managers and programme planners to monitor health status, assess effectiveness of priority programmes and identify emerging health issues and vulnerable groups. It can also be used to gauge the inequities in health among districts. Therefore, in a resource constrained setting such as South Africa, where reliable morbidity data are scarce, epidemiological mortality profiles can be used as part of a measure of need for equitable resource allocation and priority setting.

The 2008 mortality data were provided by StatsSA¹¹ in MS Excel tabular format with variables by age category, sex, district and the underlying cause of death, coded according to a revised South African National Burden of Disease (NBD) list based on ICD-10.¹² The ICD coding structure contains a detailed list of causes of mortality which is too extensive for public health use.¹³ The NBD list is a condensed version of the ICD list, containing the most prevalent diseases across South Africa, including those of public health importance.

STATA 11 was used to adjust the data, firstly by redistributing deaths of unknown ages proportionally by age and sex across each of the known causes of death. Deaths misclassified to ill-defined signs and symptoms (ICD chapter XVII) and other ‘garbage codes’ (intermediate causes of death e.g. septicaemia; mechanisms of death (e.g. cardiac arrest); partially specified causes (e.g. cancer with unknown site of the disease); or risk factors (e.g. hypertension))¹⁴ were proportionally redistributed to specified causes within each age and sex category. Cause of death information for injuries was particularly problematic with a very high proportion of ‘undetermined cause’.

The list was aggregated into three broad cause groups, namely communicable, non-communicable and injuries, as indicated in the 2000 NBD study (see Table 4). Given the large burden caused by HIV-related deaths, which form part of the communicable disease group, these deaths were separated into a fourth group. Since many HIV deaths are misclassified to tuberculosis (TB), the TB deaths were reported with the HIV deaths.

Table 4: Examples of causes of death in each broad cause group

Broad Cause Group	Examples
Communicable diseases (excluding HIV and TB) maternal, perinatal and nutritional disorders (Comm/Mat/Peri/Nut)	<ul style="list-style-type: none"> • Diarrhoeal diseases • Meningitis & encephalitis • Maternal conditions • Perinatal conditions • Nutritional disorders
HIV related and TB (HIV and TB)	<ul style="list-style-type: none"> • HIV related • Tuberculosis
Non-communicable diseases (NCDs)	<ul style="list-style-type: none"> • Cerebrovascular disease • Diabetes Mellitus • Ischaemic heart disease • Cancers
Injuries	<ul style="list-style-type: none"> • Transport injuries • Interpersonal violence

The proportion of deaths and Years of Life Lost (YLLs) due to the four broad cause groups was calculated for each of the districts. YLLs are an estimate of premature mortality based on the age at death, and thus highlight the causes of death that should be targeted for prevention. In line with the initial South African NBD study, the highest observed national life expectancy was selected as the standard against which YLLs are calculated.^h

Completeness of death registration for 2008 was reported to be 81% nationally, but Dorrington and Bradshaw estimate that it is higher at 90%.¹⁵ However, estimates of completeness of registration are not available at district level and since variation in completeness of death registration at district level could distort death rates, these were not calculated.

The number and proportion of leading single causes of death were then calculated for children under one (age 0) and children age 1-4. There are several challenges with these data in addition to the general issues already noted, including:

The number of deaths by age group at district level is small and may not be representative of the true mortality profile.

Under-reporting of deaths in the vital registration (VR) system is suspected to be lowest in children, however there are no published estimates of completeness except for the total population at national level.

The ratio of deaths in age 1-4 to age 0 varies substantially and is very low in some districts, in line with the perception that under-reporting is a major problem in this age group.

Errors in the underlying data are apparent – for example deaths due to ‘adult’ diseases reported in these age categories may be due to errors in recording of age or underlying cause.

Very high proportions of ill-defined and garbage codes at district level for these age groups in some districts make the results very uncertain.

The proportion of ill-defined causes varies by district but indicates that all districts need to improve the quality of death certification. In addition, not being able to assess the completeness of death

^h This standard is represented by a model life table, Coale and Demeny West level 26, with a life expectancy at birth of 82.5 years for Japanese females and 80 for males. YLLs are estimated for each age, sex and cause category by multiplying the observed number of deaths in each category by the expected life expectancy in each age category, implying that YLLs are greater when age at death is younger. Since people value years of life gained in the future less than years gained in the present, a 3% discount rate is applied. In contrast to the first NBD study, an age weighting function that assigns greater value to a year of life lived in the economically active age groups higher than years lived in childhood or old age was not applied, in line with the latest Global Burden of Disease protocol (<http://www.dcp2.org/pubs/GBD>).

registration by district and the extensive misclassification of the causes severely limits the scope to analyse the district data and the consequent utility of these data for healthcare planning.

5.2 ASSA2008

ASSA has been used for some indicators since it provides useful smoothed, time-series estimates, which are often poorly available from empirical sources. The projections may be useful for planning services. It is however noted that although the model is fitted to empirical and research-based data, and tends to be well correlated with other data sources, it cannot be used to monitor performance since it is modelled rather than measured.

The National Health Insurance (NHI) Policy Briefs published by Innovative Medicines South Africa (IMSA) provide a useful analysis of outputs from ASSA2008. Policy Brief 18, 'Projected Population and HIV/AIDS Update',¹⁶ compares the current model with the previous version (ASSA2003), and with NDoH/HISP and StatsSA population estimates.

Modelling of the AIDS epidemic in South Africa by actuaries began with the so-called Doyle or Metropolitan Life model, which was developed in 1989. The model was based on a population hypothetically divided into four groups that differed in terms of the relative ease with which individuals belonging to each group were expected to contract and transmit the HIV.

The code for the Metropolitan model is proprietary. The Actuarial Society of South Africa (ASSA) felt that it was desirable for people to have access to a non-proprietary programme which users could alter to suit their needs. In 1996, ASSA therefore released the ASSA500 model. In 1998, the AIDS Committee of ASSA decided to develop the model further. The result was an Excel 95 workbook called ASSA600, released to the public in early 1999. The model was designed to be appropriate for use as a national population model for the Pattern II (heterosexual) HIV epidemic found in South Africa. The base model contained a scenario that reflected its builders' best estimates of values for the model parameters and was calibrated to fit the antenatal data up to 1997.

In 2000, the AIDS Committee felt that a further revision of the model was necessary. The update was needed because of increased knowledge about the epidemic, the availability of new data against which to calibrate the model, and greater awareness of the uses to which the model was being put. It was also decided to change the naming convention to reflect the year of the latest antenatal data used to calibrate the model.

The date in the model name refers to the most recent antenatal and mortality data used in the calibration of the model. Since the Department of Health embargo the detailed data needed to calibrate the model for six months after they release their report, and the report on the surveys have been released as late as October, the model is released invariably some time after the year to which the data refer.

The ASSA2008 version of the model is the most recent version to be released and is described in the ASSA2008 User Guide.¹⁷ The structure of this model is similar to that of ASSA2003. The following are the most significant changes that have been made and are presented below.

Interventions

PMTCT takes into account slower pace of rollout, and lower uptake of single-dose nevirapine. Roll-out is now in terms of percentage of pregnant women tested and percentage of women on NVP who also receive ART. Changes to modelling of the impact of interventions on vertical transmission were made.

Separate ART roll-out rates for men, women and children, and in terms of percentage of new AIDS sick who start treatment. Also allowing for greater reduction in viral load on ART (from 1.76 to 2.8 unit reduction in log of viral load and higher rates of retention on ART).

Changed the way condom usage is modelled (and information, education and communication (IEC) rates of rollout and the factor by which the odds of condom usage increases with 100% rollout)

Allows for separate HIV survival for adult males and adult females. The survival of untreated adults is now assumed to follow an Exponential distribution rather than a Weibull distribution which leads to a longer mean survival time but with greater variance. Survival of untreated children is assumed to be longer, especially for children infected at or before birth. Because of this the model now allows for the survival of some infected children to adulthood.

Like the ASSA2000 model the ASSA2008 model has been produced as a suite of several versions. The *lite* version, like previous *lite* versions and the ASSA600 model before them, treats the population of the country as one population group. The *full* version models present each of the four population groups (Asian/Indian, black African, Coloured and White) separately at a national level, and aggregates these to produce results for the population as a whole. The *provincial* version is the result of the aggregation of the application of the *full* version of the model separately to each of the provinces, although this aggregation is left to the user to do if desired. It would thus allow for geographic differences in the spread of the epidemic.

The data for this project have been extracted from the provincial version of ASSA2008, with the standard assumptions.¹⁸

5.3 Statistics South Africa survey data

The Community Survey (CS) in 2007 sampled 284 000 households and provided indicators down to municipal (sub-district) level.¹⁹

The General Household Surveys²⁰ (GHS), conducted since 2002, have a smaller sample size and only provide indicators to provincial level. The surveys in 2005-2007 were somewhat larger and provided district-level estimates as well. However due to relatively small numbers there are substantial fluctuations for some indicators at this level. In addition there seemed to be some systematic problems in the 2007 survey data and results for this year were often not consistent with long term trends or comparative data sources.

5.4 HIV prevalence

The proportion of pregnant women whose first antenatal HIV tests were positive was 22% in 2010/11 (DHIS). This is considerably lower than the prevalence found in the 2009 antenatal sero-prevalence survey of 29.4%.²¹ The survey prevalence has remained stable at 29% since 2006, slightly higher at 30.2 in 2010²² but not statistically different. The HIV positivity rate reported in the DHIS has changed slightly from 24% in 2006/07 to 22% in 2010/11, probably due to more women knowing that they are already HIV positive when booking at antenatal clinics.²³

It is hard to interpret the antenatal survey in recent years because prevalence in older age groups is no longer a good proxy for incidence as a result of the introduction of ART. A decline of prevalence at higher ages might indicate that people are dying who should have been on ART. However it would be desirable to see a decline in prevalence in young women, as this gives some indication of whether efforts to reduce new infections are reducing incidence.

The prevalence from DHIS data is consistently lower than the antenatal survey across all provinces. This is probably due to the fact that the DHIS data only includes women tested for the first time in their pregnancy and women who agree to HIV testing and excludes women who already know that they are HIV positive. The survey, on the other hand, includes all antenatal clients and since it is anonymous and unlinked, some of the women may already know their status.

The number of pregnant women who are HIV positive has been estimated from the district-level HIV prevalence derived from the annual antenatal sero-prevalence surveys, multiplied by the population under one year and an adjustment factor of 1.07 (for mortality in the under one population). This factor is the same as is used by DHIS for estimates of the number of pregnant women derived from the under one population estimates.

5.5 *Orphan data*

The SA Child Gauge 2010/2011²⁴ highlighted available data on the extent of orphanhood, and contrasted the data from StatsSA GHS and the ASSA2008 model. They demonstrated that the ASSA2008 projections are very similar to the results of the StatsSA GHS, except in 2007 when the GHS estimates were lower. However several indicators deviated in this particular GHS, suggesting that there were some problems with the sampling or data quality in that year, possibly due to the additional workload of the Community Survey conducted in the same year.

The 2009 GHS data indicated there were approximately 4.3 million orphans living in South Africa, comprising of 622 000 maternal orphans, 2 655 000 paternal orphans and 966 000 double orphans, equivalent to 23% of all children. According to ASSA projections, "maternal orphaning rates are expected to start declining from 2010, and should level out by 2015. However, it is not until 2025 that they will fall to 2009 levels". A substantial growth in the total orphan population has been demonstrated, with over one million more orphaned children in 2009 than in 2002. It should be noted however, that 24% of children do not live with either of their biological parents.

The HSRC Household Survey in 2008²⁵ also reported data on orphans, although they were only reported at the national level and differed quite substantially from GHS and ASSA and so were not included in this analysis. See the Health Indicators site for more information:

<http://indicators.hst.org.za/healthstats/265/data>.

The definition of orphans chosen here is 'maternal/double' orphans, namely, a child (0-17 years) whose mother has died, or whose living status is unknown, whether or not the father is alive.

Only ASSA covers orphans due to HIV and AIDS, however total numbers of orphans were included for comparison. As noted in the section on ASSA, these are modelled, not empirical data.

Since the population size and structure may vary quite dramatically across areas, the Orphanhood indicator was also calculated, to show the percentage of children 0-17 years who are orphaned.

5.6 *District Health Information System (DHIS)*

Indicators from DHIS were taken from the DHIS data files at facility level (NDoH5) for the financial years ending March, for 2008/09 up to 2010/11, received in June 2011. Similarly, data for prior years were extracted from earlier data files. Data for the indicators of interest were exported into a single MySQL database to facilitate uniform coding of districts and trend analysis across the entire period.

More detailed graphs of the monthly data by indicator are available electronically, since sometimes information on monthly variation in the values provides insight into the range of variation and also seasonal variations or specific public service problems like strikes.

5.6.1 Immunisation indicator issues

The average immunisation coverage in the country for 2010/11 was 86.7%, which is a drop from the above 90% coverage achieved in the past two years. There is some speculation as to the reliability of the population estimates of children under one year used to calculate the denominators, and thus uncertainty about the actual level of coverage. The decline in coverage may however be due to data inconsistencies over the past few years as well as reduced immunisations due to vaccine supply problems and general PHC service disruptions during the public sector strikes. Immunisation coverage in the metro districts was 99.5%, 12.8 percentage points higher than the national average. This may

reflect better service delivery in urban areas, or underestimation of the denominator due to inaccurate projections of population growth in urban areas, partly influenced by influx of people from elsewhere.

As discussed in the SAHR 2010²⁶ and the DHB 2010/11, the discrepancy between routine immunisation data (DHIS) and survey estimates (SADHS, HIV Children 2008) of immunisation coverage may be due to methodological differences and denominator issues rather than deliberately inflated data. An extract from the SAHR is included:

The HSRC Household survey conducted in 2008 also included questions about the vaccination status of children. Of particular interest was the low level of measles immunisation reported (64.8%), substantially lower than the DHIS value of 93.7% for 2008/09. It is widely recognised that in many countries there is substantial deviation in the data on immunisation coverage from routine data sources compared to survey and other data sources, and South Africa is no exception [Bull World Health Organ 87(535- 41), Lancet 372(2031-46)]. Earlier data from the SADHS and recent data from the HSRC Household Survey indicate that survey estimates of immunisation coverage across several antigens are substantially lower than DHIS data. Although survey data are often considered to be the 'gold standard', both the SADHS and HSRC surveys are based on small sample sizes for the target age group, and since other studies have shown substantial heterogeneity in coverage it is possible that the samples are not sufficiently representative. The HSRC survey also presents anomalous results. It reports different coverage rates for DTP3 and Hib3, which are administered as part of a combination vaccine. It also reports lower coverage for DTP3 than measles, which is unlikely since coverage tends to drop with vaccines administered at older ages. Survey data assess coverage through inspection of immunisation cards and/or recall of the parent/guardian among children 12-23 months old, whereas DHIS is based on administered doses of vaccine at the relevant age of administration; different age groups and methodologies. Routine data (DHIS) is plagued by the documented under-count of children in official population estimates. In addition, the delivery of immunisation to an unknown number of immigrants, who are not included in the population denominator, further inflates the coverage in some provinces. Despite the uncertainty over the true coverage suggested by DHIS, there is remarkable stability in the 10-year trends in the numerator (vaccine doses administered across antigens), although there appears to be some over counting, and some campaign data erroneously included in routine immunisation data. Comparison of doses administered to vaccine doses procured show a difference of about 10%, which is quite a plausible wastage factor. Further research (including routine data verification) is clearly needed to describe all these issues and improve the utility of immunisation data for both planning and monitoring of health service delivery, since immunisation is often used as a proxy for general health systems performance.

5.6.1.1 Clinic supervision rate:

There has been a general improvement in the supervision rate since 2006/07, although this has reached a plateau in 2010/11 and some districts continue to have very low levels of supervision. Overall, data for the past three years appears to be relatively stable and plausible, although some definite errors were found. For example, in 2010/11, 115 facilities had numerator values greater than one, which should be rejected by validation rules in terms of the indicator definition (The monthly data element value for the numerator, 'Supervisor visits this month' should always be a zero (no visit this month) or a one (one or more visits this month)). However, it is difficult to further validate the quality of this indicator without data verification checks since the data element doesn't correlate directly with any others. The graphs detailing supervision rates at facility level for the four districts show monthly visits per facility, and are helpful for determining the frequency of visits and the range across facilities.

5.6.1.2 Caesarean section rate

This indicator has been filtered for district hospitals only. It may however be relevant to understand the proportion of deliveries and Caesarean sections by OrgUnitType (i.e. level of facility), per province (Figure 1) and per district. For example, in JT Gaetsewe all deliveries in the district take place in district hospitals, whereas in Uthungulu over half of deliveries occur in regional hospitals (Figure 2). The presence of other levels of care may impact the rates observed in district hospitals.

It must be noted that private sector data reported to DHIS are very incomplete. Although there are no private sector data on deliveries or Caesarean sections for the four districts of interest, the following number of private hospitals and beds are located in each district in 2010:²⁷

- Sedibeng, 6 private hospitals, 650 beds
- Uthungulu, 2 private hospitals, 339 beds
- Nkangala, 3 private hospitals, 503 beds
- JT Gaetsewe, 1 private hospital, 25 beds.

Figure 1: Caesarean section rates and proportion of deliveries (denominator), by level of care, by province, 2010/11

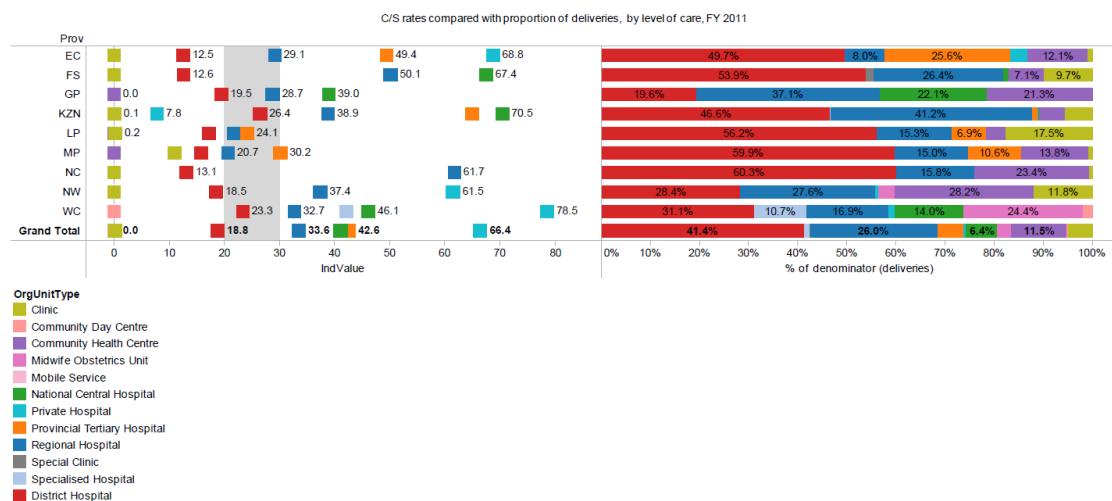
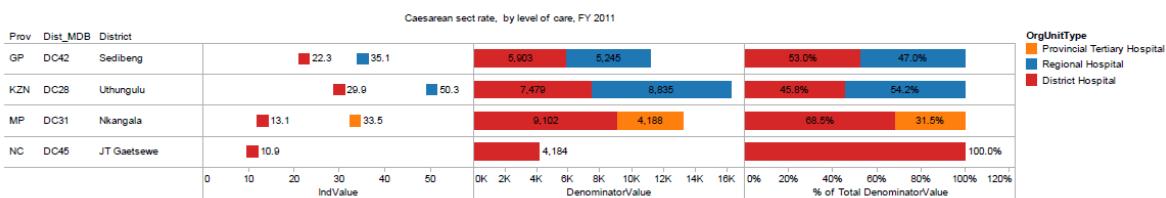


Figure 2: Caesarean section rates and proportion of deliveries (denominator), by level of care, by district, 2010/11



5.6.1.3 Delivery rate in facility

The numerator for this indicator is the number of deliveries in all facilities while the denominator is the expected number of deliveries in the target population. The denominator uses the number of children under one year from the country's population estimates multiplied by a factor of 1.07 to allow for infant mortality. The denominator is estimate-based which can impact negatively on the accuracy of the indicator values. Consequently, these indicator results should be treated with some caution, especially at lower levels of disaggregation.

During 2010/11, the South African delivery rate in facilities was 84.0% which declined from the 2008/09 estimates of 86.6%. The ideal situation would be to have all women delivering in a health facility under the supervision of trained personnel. The current system does not include comprehensive data on deliveries performed in private health institutions; as such, the indicator value is unlikely to reach 100%.

5.7 Other data sources on Nutrition

5.7.1.1 Stunting

Stunting is defined as the Proportion of children with height for age under 2 standard deviations from the norm (reference population median). It has been measured in a number of surveys, as listed, however each measured nutritional status in different age groups, and the results are therefore not directly comparable.

Food Consumption Survey 2005: Labadarios D, editor. The National Food Consumption Survey-Fortification Baseline (NFCS-FB): South Africa, 2005. Stellenbosch: National Department of Health; 2007.²⁸
Children aged 1-9 years.

NYRBS 2008: Reddy SP, James S, Sewpaul R, Koopman F, Funani NI, Sifunda S, Josie J, Masuka P, Kambaran NS, Omardien RG. Umthente Uhlaba Usamila - The South African Youth Risk Behaviour Survey 2008. Cape Town: South African Medical Research Council; 2010.²⁹ <http://www.mrc.ac.za/healthpromotion/healthpromotion.htm>
Learners in grades 8-11.

NIDS Health Wave 1: Ardington C, Case A. National Income Dynamics Study Health: Analysis of the NIDS Wave 1 Dataset. Discussion Paper No. 2. Cape Town: Southern African Labour and Development Research Unit, University of Cape Town; 2009.³⁰ <http://www.nids.uct.ac.za/home/index.php?/Nids-Documentation/discussion-papers.html>
Children aged six months to 14 years.

5.8 Education: pre-school enrolment

A variety of documents from the Department of Educationⁱ were reviewed for information on pre-school education.

Enrolment data, as reported by schools to the Department of Education, is incomplete for the pre-school level, since only 'ordinary' schools routinely report in this way. Pre-schools that are not connected to primary schools, or are part of playschools, do not submit data. Therefore data from household surveys on *attendance* rather than *enrolment* have been used. The following two indicators have been calculated to cover the age group of interest:

Percentage of 0-4 year olds attending educational institutions

Percentage of 5 year olds attending educational institutions.

Since there is an explicit government policy to increase enrolment in Grade R, there has been greater analysis done for the 5-year-old category.

5.8.1 GHS 2010 questions relevant to pre-school attendance

The variables from the general household surveys, which have been used to calculate the pre-school attendance indicators are given in Table 5.

Table 5: GHS variables for pre-school attendance

Percentage of 0-4 year olds attending educational institutions				
Variable Q17atecd : Currently attending ECD facility				
Literal Question: Does attend a day care centre, crèche, Early Childhood Development Centre (ECD), play group, nursery school or pre-primary school?				
Values	Categories	N	NW	
1	Yes	3132	1597634	3.2%
2	No	6984	3341400	6.7%

ⁱ <http://www.education.gov.za>

8	Not applicable	85649	44847231	89.9%
9	Unspecified	153	82365	0.2%

Universe

Every person who has stayed in the households in selected dwelling units at least four nights per week in the four weeks prior the interview and are aged between 0-4 years.

Percentage of 5 year olds attending educational institutions

Variable Q114edui : Educational institution

Literal Question: Which of the following educational institutions does... attend?

Values	Categories	N	NW	
1	Pre-school (including day care; crèche; pre-primary; ECD centre; nursery school)	979	525630	1.1%
2	School (including Grade R/Grade 0 learners who attended a formal school)	27273	14034481	28.1%
3	Adult Basic Education and Training Learning Centre (ABET Centre)	245	113381	0.2%
4	Literacy classes (e.g. Kha Ri Gude)	29	10982	0.0%
5	Higher Education Institution (University/University of Technology)	1116	678543	1.4%
6	Further Education and Training College (FET)	411	202078	0.4%
7	Other College	309	168798	0.3%
8	Home based education/home schooling	17	17080	0.0%
9	Other than any of the above	85	47716	0.1%
88	Not applicable	64368	33433549	67.0%
99	Unspecified			

N = number, NW = number weighted (to total population)

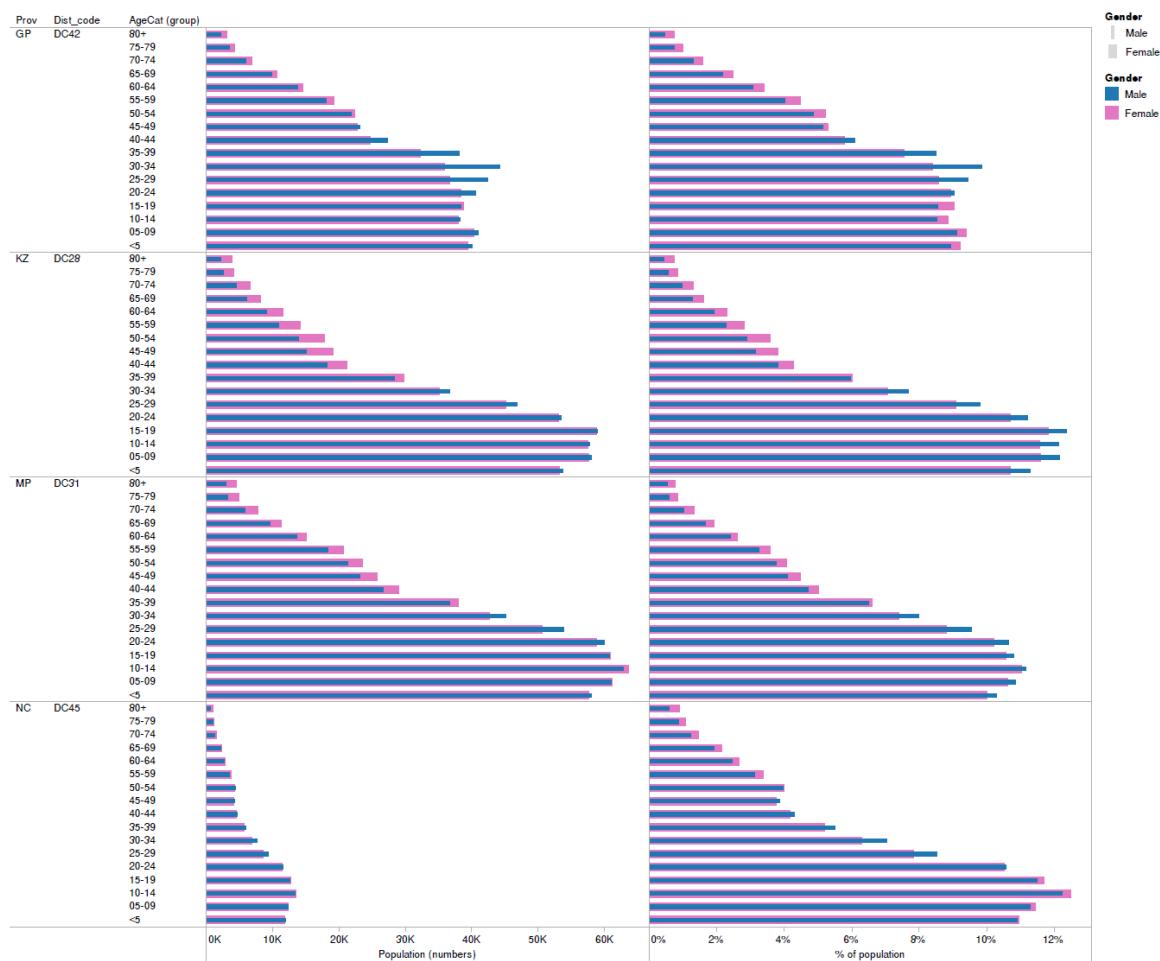
5.9 Population

Indicators that require population denominators use the mid-year population estimates for the relevant year that were available at the time of calculation. The district population estimates that were developed by the NDoH for 2001–2016 (based on the best available information from the Census 2001 and mid-year estimates) were used in this report. These are the only source available at district level and below.

NHI Policy Brief 18 includes analysis of the differences between the main sources of population estimates.

The population pyramids have been created using an alternative format where the male and female bars are overlaid so that the relative size between genders, as well as between age groups, can easily be judged (with a conventional pyramid graph it is difficult to determine which bar is longer). The first column of the graph gives the number of people by each age and gender. The second column gives the percentage of the population for each geographic area by age group for males and for females, i.e. adding up to 100% each for males and females.

Figure 3: Population pyramid (number and % of population by age group and gender), Sedibeng, Uthungulu, Nkangala and JT Gaetsewe, 2011



5.10 Deprivation

5.10.1.1 Deprivation Index

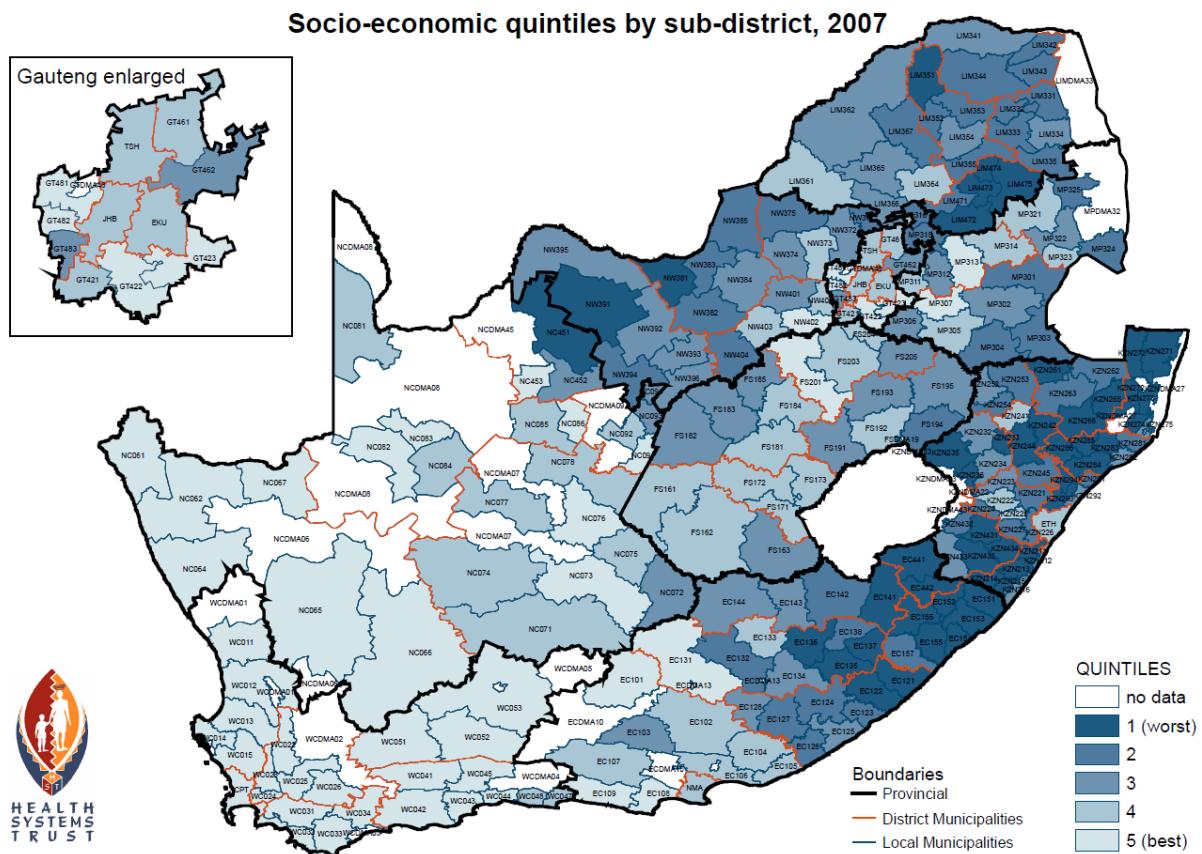
The deprivation index is a measure of relative deprivation across districts within South Africa.³¹ Just as any index, the deprivation index is a composite measure derived from a set of variables. It is generated using principal component analysis (PCA) which identifies the underlying process that has the most influence in determining the outcome of each variable included in the analysis. Each variable is weighted based on its linear association with the underlying process. The weighted variables are then used to construct the deprivation index. Variables included in the analysis are considered to be indicators of material and social deprivation. The deprivation indices for this report were generated using StatsSA's 2006 GHS data and the 2007 Community Survey (CS) data and have been calculated in such a way that the indices are directly comparable to the deprivation indices generated from the 2005 GHS data. This therefore provides three years of deprivation trend data.

To simplify interpretation, the deprivation index was normalised such that the district that is least deprived has a deprivation index of 1. Districts with higher values are relatively more deprived than districts with lower values. The score itself does not have any intrinsic meaning, but the relative scores show which districts are more deprived than others and can be used to rank districts. Each district was thus ranked according to levels of deprivation and categorised into socio-economic quintiles (SEQ). Districts that fall into quintile 1 (worst off) are the most deprived districts. Those that fall into quintile 5 are the least deprived (best off).

Variables included in the PCA for calculating the deprivation index were:

- The proportion of the district's population that are children below the age of five.
- The proportion of the district's population that are black Africans.
- The proportion of household heads in the district that are female.
- The proportion of household heads in the district that has no formal education.
- The proportion of working-age population within the district that is unemployed (not working, whether looking for work or not – the official definition of unemployment in South Africa).
- The proportion of the district's population that lives in a traditional dwelling, informal shack or tent.
- The proportion of the district's population that has no piped water in their house or on site.
- The proportion of the district's population that has a pit or bucket toilet or no form of toilet.
- The proportion of the district's population that does not have access to electricity, gas or solar power for lighting, heating or cooking.

Figure 4: Socio-economic quintiles by sub-district (based on deprivation index), 2007



5.10.1.2 The South African Index of Multiple Deprivation 2007

The South African Index of Multiple Deprivation 2007³² (SAIMD 2007) was constructed at municipality level using data from the 2007 Community Survey. The SAIMD 2007 comprises a series of uni-dimensional domains of deprivation, where each contains one or more indicators relating to that

domain of deprivation. Four domains were produced for the SAIMD 2007: income and material deprivation; employment deprivation; education deprivation; and living environment deprivation. The domains were each constructed as a separate domain index and then combined into a single measure of multiple deprivation.

The income and material deprivation domain contained the following indicators: number of people living in a household with a household income that is below 40% of the mean equivalent household income; or number of people living in a household without a refrigerator; or number of people living in a household with neither a television nor a radio. A simple proportion of people living in households experiencing one or more of the deprivations was calculated.

The employment deprivation domain contained the following indicators: number of people who are unemployed; plus number of people who are not working because of illness or disability. A simple proportion was calculated of adults aged 15- 65 who were unemployed plus those who said they were too sick/disabled to work, divided by the total economically active population aged 15-65 plus those not able to work due to sickness/disability.

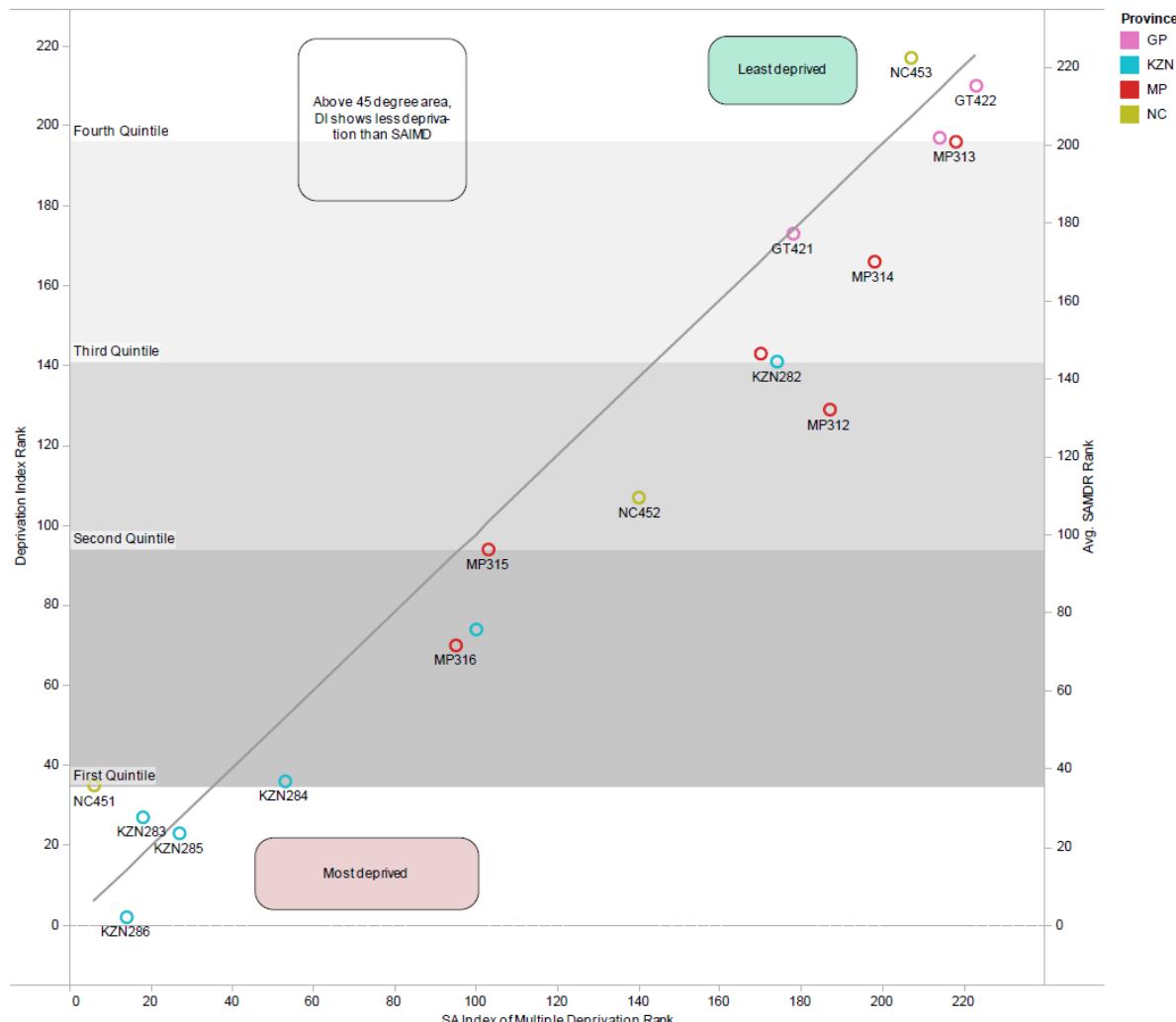
The education deprivation domain consisted of the indicator number of adults (18-65 years) with no secondary schooling, and was calculated as a simple rate for 18-65 year-olds. The living environment deprivation domain consisted of the following indicators: number of people living in a household without piped water inside their dwelling yard; or number of people living in a household without a pit latrine with ventilation or flush toilet; or number of people living in a household without use of electricity for lighting; or number of people living in a shack; or number of people living in a household that is crowded. A simple proportion of people living in households experiencing one or more of these deprivations was calculated.

Once the domain scores were created as described above, district management areas and municipalities containing less than a 1 000 people were deleted. The domain indices were then standardised by ranking and were transformed to an exponential distribution. Equal weights were assigned to the exponentially transformed domains and the SAIMD 2007 is the (equally) weighted sum of the exponentially transformed domain rank of the domain scores. The larger the SAIMD score, the more deprived the municipality.

Both the deprivation index and the SAIMD 2007 seek to measure deprivation, and the ranks produced from the two methods have a rank order correlation of 0.87. However, there are some differences in ranking between the SAIMD 2007 and the DI at municipality level. If one compares the two indices, the SAIMD 2007 does have a different set of variables from the DI. The DI does not include indicators for income and material deprivation, or the indicators on unemployment related to illness/disability, and overcrowding of households. The SAIMD 2007 does not include indicators related to population structure (i.e. the proportion of children below the age of five, the proportion that is black African and the proportion that is female). The main difference between the two indices, however, is not so much the choice of variables, but the method for calculating the indices; whereas the DI uses principal components analysis to assign weights, the SAIMD 2007 applies equal weights to all domains. The SAIMD 2007 thus ignores the possibility that each of the domains might have a different pattern of variation, hence a different relationship (association and strength) with deprivation.³³

Scatter plots (Figure 5) and league graphs (available on CD) compare the results of the two methods. The greatest difference between the two indices is found in Emalahleni (MP312) where the DI shows greater deprivation than the SAIMD. On the other extreme, in Joe Morolong (NC451) the DI reflects much lower deprivation than the SAIMD.

Figure 5: Scatter plot of DI rank compared to SAIMD rank, 2007



5.10.1.3 The South African Index of Multiple Deprivation for Children 2007 (SAIMDC 2007)

The South African Index of Multiple Deprivation for Children 2007³⁴ (SAIMDC 2007) at municipality level is a composite index reflecting five dimensions of deprivation experienced by children aged 0-17. The SAIMDC 2007 that is used in this report has been constructed using data from the 2007 Community Survey (Statistics South Africa, 2007).

The SAIMDC 2007 was constructed on the basis of a model of child deprivation comprising a series of uni-dimensional domains of deprivation which each contain one or more indicators relating to that domain of deprivation. The domains were each constructed as a separate domain index and then combined into a single measure of multiple deprivation – the SAIMDC 2007.

The SAIMDC 2007 was constructed by combining the five transformed domain scores with equal weights. The five domain indices are:

- Income and Material Deprivation
- Employment Deprivation
- Education Deprivation
- Biological Parent Deprivation
- Living Environment Deprivation

A total of 12 indicators were used in the SAIMDC 2007 and unless specified otherwise they relate to children aged 0-17 inclusive. The domains and their constituent indicators are detailed below.

Income and Material Deprivation Domain

The purpose of this domain is to capture the proportion of children experiencing income and/or material deprivation in an area.

Number of children living in a household that has a household income (needs-adjusted using the modified OECD equivalence scale) that is below 40% of the mean equivalent household income (approximately R1 003 per month in February 2007 Rand); or

Number of children living in a household without a refrigerator; or

Number of children living in a household with neither a television nor a radio.

A simple proportion of children living in households experiencing one or more of the deprivations was calculated (i.e. the number of children living in a household with low income and/or without a refrigerator and/or without a television and radio divided by the total child population).

Employment Deprivation Domain

The purpose of this domain is to measure the proportion of children living in workless households in an area.

Number of children living in households where no adults (aged 18 or over) are in employment.

A simple proportion of children living in households experiencing this type of deprivation was calculated (i.e. the number of children living in a household with no employed adults divided by the total child population). This indicator is used in the analysis of child income deprivation in South Africa undertaken by Barnes (2009), where it is set alongside a range of other income poverty lines and types of equivalence scales. Children over the age of 15 are legally allowed to be in certain forms of income generating employment. This means that there might be a very small overestimation of workless households (if any children in the household aged 16 or 17 are in paid employment). However, as a child is defined as aged 0-17 inclusive, the domain does capture children in households where there are no working adults.

Education Deprivation Domain

The purpose of this domain is to capture the extent of children's educational deprivation in an area.

Number of children (7-15 years inclusive) who are not in school.

This domain was calculated as a simple rate for 7-15 year olds.

Living Environment Deprivation Domain

The purpose of this domain is to identify children in an area living in poor quality environments.

Number of children living in a household without piped water inside their dwelling or yard; or

Number of children living in a household without a pit latrine with ventilation or flush toilet; or

Number of children living in a household without use of electricity for lighting; or

Number of children living in a shack; or

Number of children living in a household that is crowded.

A simple proportion of children living in households experiencing one or more of the deprivations was calculated (i.e. the number of children living in a household without piped water and/or without adequate toilet and/or without electricity for lighting and/or that is a shack and/or that is crowded divided by the total child population).

Biological Parent Deprivation Domain

The purpose of this domain is to capture children in an area whose biological parents have both died, or who live in a child-headed household.

Number of children whose mother and father are no longer alive; or

Number of children living in a child-headed household.

A simple proportion of children experiencing either of the deprivations was calculated (i.e. the number of children whose mother and father are no longer alive or who are living in a child-headed household divided by the total number of children).

Constructing the SAIMDC 2007

Once the domain scores had been created as described above, district management areas and municipalities containing less than a thousand children were deleted. The domain indices were then standardised by ranking, and were transformed to an exponential distribution. The exponential distribution was selected for the following reasons. First, it transforms each domain so that they each have a common distribution, the same range and identical maximum/minimum value, so that when the domains are combined into a single index of multiple deprivation the (equal) weighting is explicit. Second, it is not affected by the size of the municipality's population. Third, it effectively spreads out the part of the distribution in which there is most interest, i.e. the most deprived municipalities in each domain. Each transformed domain has a range of 0 to 100, with a score of 100 for the most deprived municipality. The exponential transformation that was selected stretches out the most deprived 25% of municipalities in the country.

For the SAIMDC 2007, equal weights were assigned to the exponentially transformed domains in the absence of evidence suggesting differential weights should be used. The SAIMDC score is therefore the (equally) weighted sum of the exponentially transformed domain rank of the domain scores. The larger the SAIMDC score, the more deprived the municipality. However, because of the transformations applied, it is not possible to say, for example, that a municipality with a score of 44 is twice as deprived as a municipality with a score of 22. In order to make comparisons between municipalities using the SAIMDC the municipality ranks should be used.

The municipality with the highest score is the most deprived and the municipality with the lowest score is the least deprived. The municipality with a rank of 1 is the most deprived and the municipality with a rank of 237 is the least deprived.

There is no comparator for the child-focused index.

5.11 Access to water and water quality

The proportion of households with access to piped water in their yard or nearby was obtained from a range of StatsSA surveys.

The variable answers included from the GHS were: piped (tap) in building or yard, neighbour's tap or public/communal tap.

The variable answers included from the CS were: piped water inside the dwelling, piped water inside the yard, piped water from access point outside the yard.

5.11.1 Blue Drop and Green Drop reports

Data from the Department of Water Affairs reports in 2011 for drinking water quality management (DWQM) and waste water management are presented in the Blue Drop 2011³⁵ and Green Drop 2011³⁶ reports. Blue Drop Certification is an indication that a water supply authority has complied with stringent procedural, chemical, biological and other requirements. The number of water authorities receiving certification increased from 38 in 2010 to 66 in 2011. The scores given to each municipality are based on a performance rating from less than 33% (inadequate DWQM, urgent intervention required) to 100% (exceptional DWQM). The national average Blue Drop score has improved from

51.4% in 2009 to 67.2% in 2010 and 72.9% in 2011.^j The reported results were given for a mixture of municipal and district areas, which were overlaid to create one map (Figure 6).

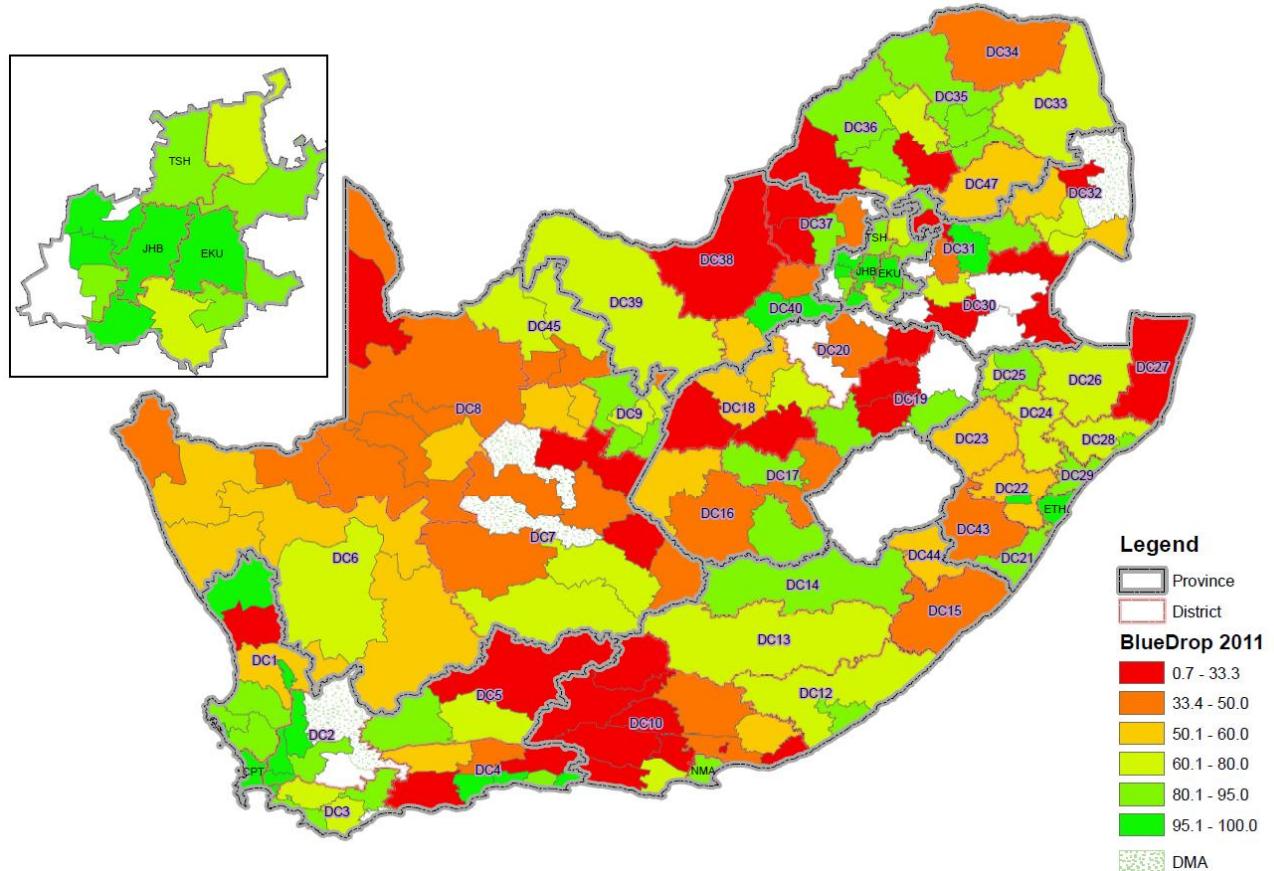
Table 6: Drinking Water System Blue Drop Performance Rating

Rating	Explanation
100%	Exceptional Drinking Water Quality Management (DWQM) This score implies that the water services institutions complies 100% with all Blue Drop Certification Criteria. DWA has full confidence in the management ability of water services institutions involved in treating, monitoring and managing drinking water in the specific water supply system. This institution/municipality fully comprehends its responsibility to continuously act in a proactive/preventative manner to ensure safe water supply.
95-<100%	Managing Drinking Water Quality with Excellence DWA has confidence that the water services institutions (municipality) is capable of sustaining safe quality of water supply and will act responsibly when deviation in tap water quality is detected (which might pose a health risk) through continuous efficient operational and compliance monitoring.
80-<95%	Very Good Drinking Water Quality Management The municipality/institution have very good systems in place to effectively manage the quality of drinking water in this specific supply zone. However there are shortcomings which prevent it from becoming a Blue Drop certified system.
60-<80%	Good DWQM There is sufficient proof that the municipality/institution has adequate processes in place to ensure safe water supply. However portions of the requirements are not complied with as yet.
50-<60%	Reasonable (Satisfactory) DWQM The municipality/institution has an average level of ability and understanding to manage DWQ according to most of the regulatory criteria.
33.3-<50%	Improvement Required in DWQM While the municipality/institution might still be in the position to provide safe drinking water most of the time, DWA has a lower level of confidence in the institution's ability to sustain the provision of safe water.
<33.3%	Significant Improvement Required in DWQM This score is an indication of inadequate DWQ Management efficiency levels. Urgent intervention is required to ensure drastic improvement towards the point where the public and DWA could have confidence in the manner DWQ is being managed.

Source: Adapted from Blue Drop 2010.

^j The report states that “[p]rovincial performance profiles are the summation of the respective municipal performances”, although it is not clear whether these averages are weighted by the output of the different systems or the size of the population served. The national average score is a simple average of the provincial scores, although the report notes that Gauteng manages the bulk of the national supply (38%) followed by the Western Cape (18%) and KwaZulu-Natal (13%).

Figure 6: Blue Drop scores by district and municipality, 2011



Waste water management is more challenging and the Green Drop 2011 report shows that more than half of the country's sewerage works are performing poorly or are in a 'critical state'. Poor effluent quality poses a significant risk to public health and the environment.

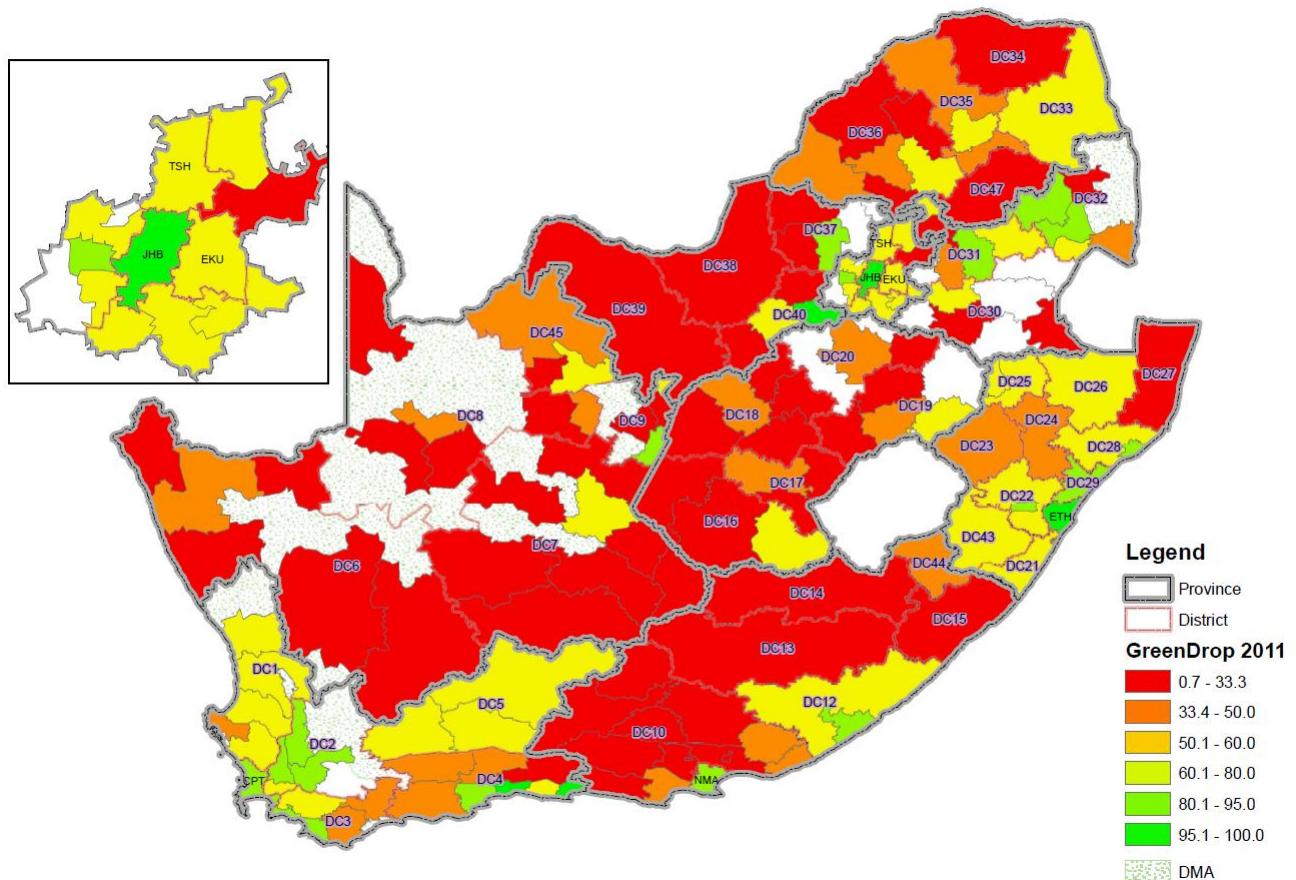
The maps were created by overlaying the mixture of district and sub-district (municipality) level data provided in the reports, which together covered most of the country (Figure 7).

Table 7: Waste Water System Green Drop Performance Rating

Rating	Explanation
90-100%	Excellent situation, need to maintain via continued improvement
80-<90%	Good status, improve where gaps identified to shift to 'excellent'
50-<80%	Average performance, ample room for improvement
31-<50%	Very poor performance, need targeted intervention towards gradual sustainable improvement
<31%	Critical state, need urgent intervention for all aspects of the wastewater services business

Source: Adapted from Green Drop 2011.

Figure 7: Green Drop scores by district and municipality, 2011



5.12 Early infant diagnosis coverage for HIV and PCR positivity

Gaps in the completeness of the DHIS data affect national averages, interpretation, analysis and trends for some of the National Indicator Data Set (NIDS) indicators such as 'Baby PCR test around 6 weeks uptake rate' and 'Baby PCR test positive around 6 weeks rate'. These two indicators have been replaced by two other indicators, namely 'early infant HIV diagnosis coverage' and 'proportion of PCR tests HIV positive for infants under two months of age'.

Early infant diagnosis (EID) coverage measures the proportion of HIV-exposed infants who receive a PCR test under two months of age. It has been very difficult to obtain accurate estimations of EID coverage through the DHIS since the denominator that was used to calculate this indicator (live births to women with HIV) has been substantially under-recorded, resulting in overestimated EID coverage rates. The National Health Laboratory Service (N HLS) data on PCR tests performed is likely to be more reliable.

Several sources of data have been assessed for the number of PCR tests:^k DHIS data, the National PMTCT Evaluation³⁷ and data from N HLS, which performs infant PCR testing for the public health service. Three methods have also been assessed to estimate the number of HIV-exposed infants in need of PCR testing (for the denominator) including live births recorded in the DHIS multiplied by antenatal HIV prevalence, as well as live births reported by StatsSA multiplied by antenatal HIV prevalence as compared to the DHIS data element for live births to HIV-positive women.

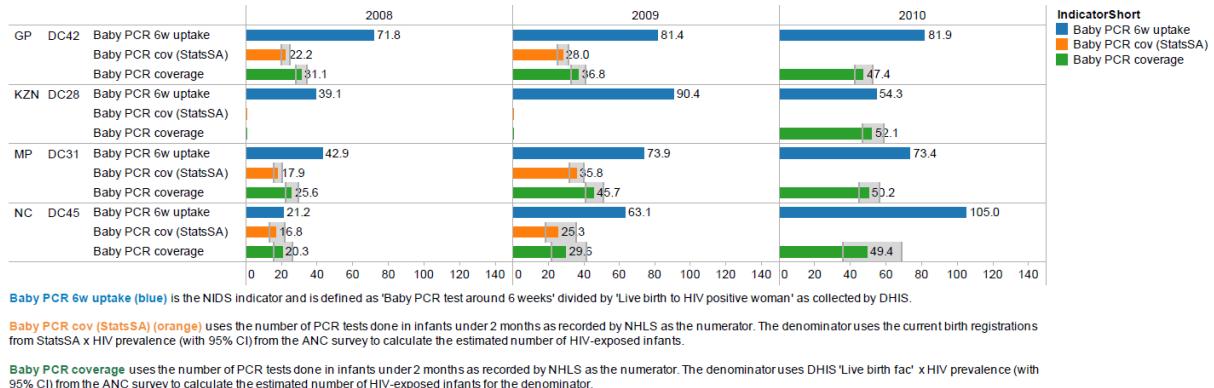
^k Described in more detail in chapter on PMTCT in DHB 2010/11 (forthcoming).

This report uses the NHLS data on the number of PCR tests for HIV on children under 2 months as the numerator, and the calculated estimate of HIV-exposed infants as the denominator (using live births reported in the DHIS multiplied by antenatal HIV prevalence from the survey). DHIS live births were used in preference to StatsSA live birth data since they are available monthly, thus allowing aggregation by financial years, and are more current than vital statistics which are reported more than a year later. Vital statistics are also affected by incomplete reporting since many births are reported late, whereas routine data recorded in health facilities does not have this problem. The overall number of births from both sources are comparable, although there are some differences at the district level which affect districts with substantial cross-border use of delivery services.

This report also uses NHLS data on the proportion of PCR tests that are positive, since the laboratory data are considered to be more reliable. Note that data for 2011/12 are only for April-June 2011 and therefore may be unstable due to small numbers.

A limitation of the NHLS source is that information on KZN was only available from 2010/11, since the province previously used a different laboratory information system. The PMTCT Evaluation was not available at lower levels of disaggregation due to the sample size, and was thus used as a benchmark to compare the sources at national level.

Figure 8: Comparison of three methods to calculate early infant diagnosis coverage, 2008-2010



Notes on PMTCT Evaluation:

The first South African national PMTCT evaluation survey took place between June and December 2010. This has provided a baseline from which to monitor the effectiveness of the antenatal and intrapartum aspects of the National PMTCT programme. The survey provides much-needed data on coverage of key PMTCT interventions and services as well as early mother-to-child transmission (MTCT) rates by province. It is envisaged that this will become a routine annual survey similar to the annual antenatal sero-prevalence survey.

5.13 Primary health care (non-hospital) expenditure per capita

Data on provincial health expenditure for 2010/11 were extracted from the National Treasury Basic Accounting System (BAS) database and added to the database containing similar data since 2005/06. This was the first year that data from North West was included in BAS.

Provincial expenditure was coded according to the programmes and sub-programmes published by National Treasury. Expenditure from sub-programmes 2.1–2.5 (district management, community health clinics, community health centres, community-based services and other community services) constitute the non-hospital PHC expenditure under District Health Services.

Additional data sources used include:

Data on local government expenditure on primary health care from National Treasury. Net expenditure was used, i.e. expenditure less income which includes transfers from provinces to local government.

Factors for inflation adjustments based on CPIX were obtained from National Treasury to convert expenditure for all years to real 2010/11 prices.

Medical scheme coverage from the StatsSA General Household Surveys (GHS) was used to calculate the uninsured population. The three-year average medical scheme coverage from 2005–2007 was used to calculate the uninsured population denominator for the 2005/06 to 2007/08 period to reduce variability due to sampling error at district level. Thereafter GHS has not been available at district level and thus the district medical scheme coverage for later years was extrapolated based on the provincial growth rates in medical scheme coverage from GHS applied to the proportion of medical scheme beneficiaries by district in 2005–2007.

Geographic information determining district boundaries from the Municipal Demarcation Board.

Data on health facilities and population.

For the purposes of these calculations of per capita expenditure (PCE), we have divided public sector expenditure by the uninsured population. It is noted that there are substantial differences between medical scheme coverage reported by the Medical Schemes Council and the GHS for some provinces in some years. The values for Gauteng and Western Cape also deviate from the likely trend during 2005–2007. It is however noted that the GHS and other sources indicate that there is significant use of the private sector by the uninsured population and also some use of the public sector by the insured population. Thus it is acknowledged that there is a wide range of uncertainty surrounding the true size of the population which is dependent on the public sector, and this will affect the accuracy of the per capita expenditure indicators.

All expenditure was allocated to districts using information from various fields in the financial database. The DHIS facilities file was used to code all entries linked to individual health facilities. Expenditure which could not be allocated to a specific district was subsequently allocated to all of the districts within the relevant province in proportion to the total population share of each district. Expenditure that was allocated to a region including two districts was similarly allocated to each district within that region according to population share. Finally, expenditure for cross-boundary districts was combined and included as one item in the province that the district is located in according to the new demarcation boundaries. This means that for the purposes of analysis of per capita expenditure at district level, some expenditure which is originally recorded in one province may be shown under a different province. By 2010/11 there was not much cross-boundary expenditure, however, with the extensive changes to boundaries from May 2011, it is likely that this will be an issue complicating expenditure allocation in the future.

Net local government expenditure on health services was added to provincial expenditure on district health services.

The figures have all been adjusted to take the effect of inflation into account and are presented in real 2010/11 prices. This means that increases in expenditure over time reflect greater availability of resources rather than just increases to cover the increasing cost of health care due to inflation.

5.14 Maternal mortality

Data on maternal deaths have only recently been added to the routine information system, DHIS, and are still incomplete and not reported by all provinces. These data will also only capture facility-based deaths and therefore not be comparable with population-based estimates for the whole country. However, by 2010/11 the number of maternal deaths is approaching the number expected to be reported from the National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD) for most provinces. Up to now NCCEMD data have only been reported at provincial level, and therefore it will be very useful if routine reporting becomes more reliable, since this is available much more rapidly and to facility level.

The data currently presented should however be treated with extreme caution. In addition to concerns about data quality and completeness, maternal deaths are relatively rare events, and the numbers may be very small and thus unstable at disaggregated levels.

It is also noted that at a national level there is no consensus on the level of maternal mortality, and widely differing estimates have been reported previously. There are also a number of methodological issues around the definitions of maternal or pregnancy-related mortality, and the various methods of estimating the true maternal mortality ratio. This topic was covered extensively in the chapters on Maternal Mortality and Health and Related Indicators in the SAHR 2010.

5.15 District Hospital Performance overviews

This is not a PATH indicator, but includes several indicators in the PATH list, and has a crude scoring method, which gives a quick overview of performance at a facility level (for district hospitals).¹

There is general consensus that measurement is central to the concept of quality improvement. It provides a means to define what hospitals actually do, and to compare that with the original targets or comparators in order to identify opportunities for improvement. Generally indicators for performance measurement include input measures (such as expenditure, human resources), activity measures (such as patient numbers, length of stay), quality measures (availability of drugs, waiting times) and outcomes (mortality rates). In order to obtain meaningful data on quality measures needs more detailed data than is collected routinely. It requires looking at compliance with established processes and guidelines across a wide range of processes. However until such information is routinely available for all health facilities, use of routine data focusing on process indicators can give a crude sense of areas requiring improvement.

Table 8: DHIS indicators chosen for inclusion in the district hospital performance overview

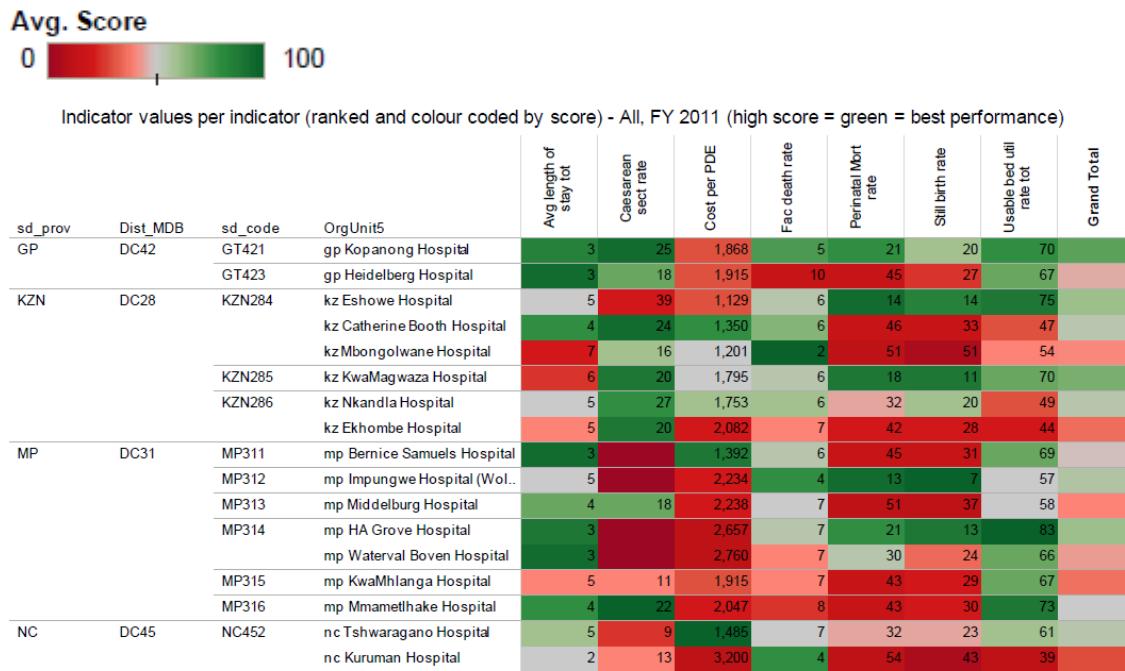
Indicator	Numerator Description	Denominator Description	Type
Average length of stay - total	Inpatients days + 1/2 Day patients	Separations (Day patients + Inpatients discharges + Inpatients deaths + Inpatients transfers out)	Days
Caesarean section rate	Caesarean section in facility	Deliveries in facility	%
Expenditure per patients day equivalent (PDE)	Expenditure - Total	Patients day equivalent - Total	Rand

¹ Unpublished document on preliminary work to develop a district hospital performance scoring methodology (Dec 2010).

Facility crude death rate	Total deaths	Total separations	%
Perinatal mortality rate in facility	Still births in facility + Inpatients death (early neonatal)	Total births in facility	per1K
Still birth rate in facility	Still births in facility	Total births in facility	%
Usable bed utilisation rate - total	Inpatients days + 1/2 Day patients	Usable bed days	%

Since most of the chosen indicators cannot be directly ranked from top to bottom or vice versa, and are on different measurement scales (e.g. days, percentages, deaths per 1 000 births) it was necessary to convert the indicator value for each facility to some scale that was approximately comparable, to enable calculation of a composite overall performance score. The ranked data values for each indicator were divided into 20 equally-sized groups/centiles. A score between zero and 100 was assigned to each group of values. The optimal scores were set after discussion based on the given target values and perceived optimal ranges of indicator values. Thus the assignment of scores is somewhat subjective and could be debated. The average score for all six indicators was then calculated (equal weighting) to give an overall indication of performance.

Figure 9: District hospital performance results, 2010/11



Values are Indicator values by OrgUnit5. Color shows average of Score.

6 Discussion of Indicators

6.1 Sedibeng District Municipality

6.1.1 Socio-demographic status

6.1.1.1 Population

Sedibeng District Municipality (DC42) is part of Gauteng Province. It consists of three local municipalities: Emfuleni (GT421), Midvaal (GT422) and Lesedi (GT423).

The total population (NDoH/HISP 2001-2016) of each of these three local municipalities has been increasing over the years. The 2012 estimated population of Emfuleni is 725 102, of Midvaal is 72 273 and of Lesedi is 79 209. Emfuleni makes up 83% of the population of Sedibeng (876 584), and therefore the values for this sub-district will drive the district values for most indicators.

The population under one year showed an increase from 2005 to 2007 and then showed a decreasing trend towards 2012; Emfuleni from 13 479 in 2005 to 12 554 in 2012, Midvaal from 1 240 in 2005 to 1 155 in 2012, Lesedi from 1 495 in 2005 to 1 393 in 2012 and Sedibeng from 16 214 in 2005 to 16 636 in 2007 to 15 102 in 2012.

Figure 10: Population pyramid (number and % of population by age group and gender), Sedibeng, 2011

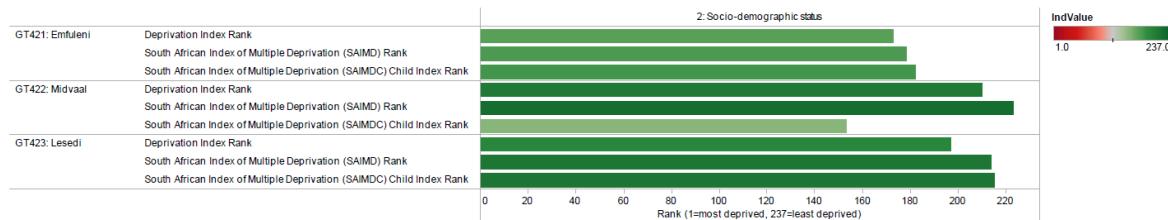


6.1.1.2 Deprivation index and socio-economic quintile

The District Health Barometer (DHB) provides data on the Deprivation Index (DI) rank for the municipalities for 2007: Emfuleni (173) is the most deprived, followed by Lesedi (197), and then by Midvaal (210). The same order is found using the South African Index of Multiple Deprivation (SAIMD) rank for the same year: 178 for Emfuleni, 214 for Lesedi and 223 for Midvaal. However, the SAIMD Child (SAIMDC) rank gives a different result with Midvaal (153) being the most deprived, then Emfuleni (182) and then Lesedi (215).

The same sources also provide information on the Socio-economic Quintile (SEQ) (1=poor, 5=best). According to the DHB, Emfuleni falls into SEQ 4, whereas Midvaal and Lesedi are in the least deprived quintile (SEQ 5). Exactly the same result is seen with the SAIMD, while the SAIMDC places both Emfuleni and Midvaal in SEQ 4, and Lesedi in SEQ 5.

Figure 11: DI, SAIMD and SAIMDC rank, Sedibeng, 2007



6.1.1.3 Access to piped water

Data on the percentage of households with access to piped water are available from the Community Survey (CS) 2007: Midvaal scores lowest with 94%, followed by Lesedi with 95.9% and Emfuleni with 98.2%, Sedibeng scores 97.5% and this is similar to Gauteng (97.9%) and higher compared to the national figure (88.7%). The General Household Survey (GHS) provides figures for the province and country for 2009 and 2010 which are 98.0% and 96.9% for Gauteng and 89.3% for both years for South Africa.

6.1.1.4 Drinking water quality

Based on the Blue Drop 2011 data, Midvaal received the lowest Blue Drop score of the Sedibeng municipalities for drinking water quality management of 67.9%. This places it in the category of 'Good Drinking Water Quality Management (DWQM)'. Lesedi scored 87.4% ('Very Good DWQM') and Emfuleni achieved 95.8% ('Exceptional DWQM'). See Figure 6: Blue Drop scores by district and municipality, 2011.

6.1.1.5 Waste water management

Based on the Green Drop 2011 data, all three sub-districts fall into the category 'Average performance', indicating that there is ample room for improvement. See Figure 7: Green Drop scores by district and municipality, 2011.

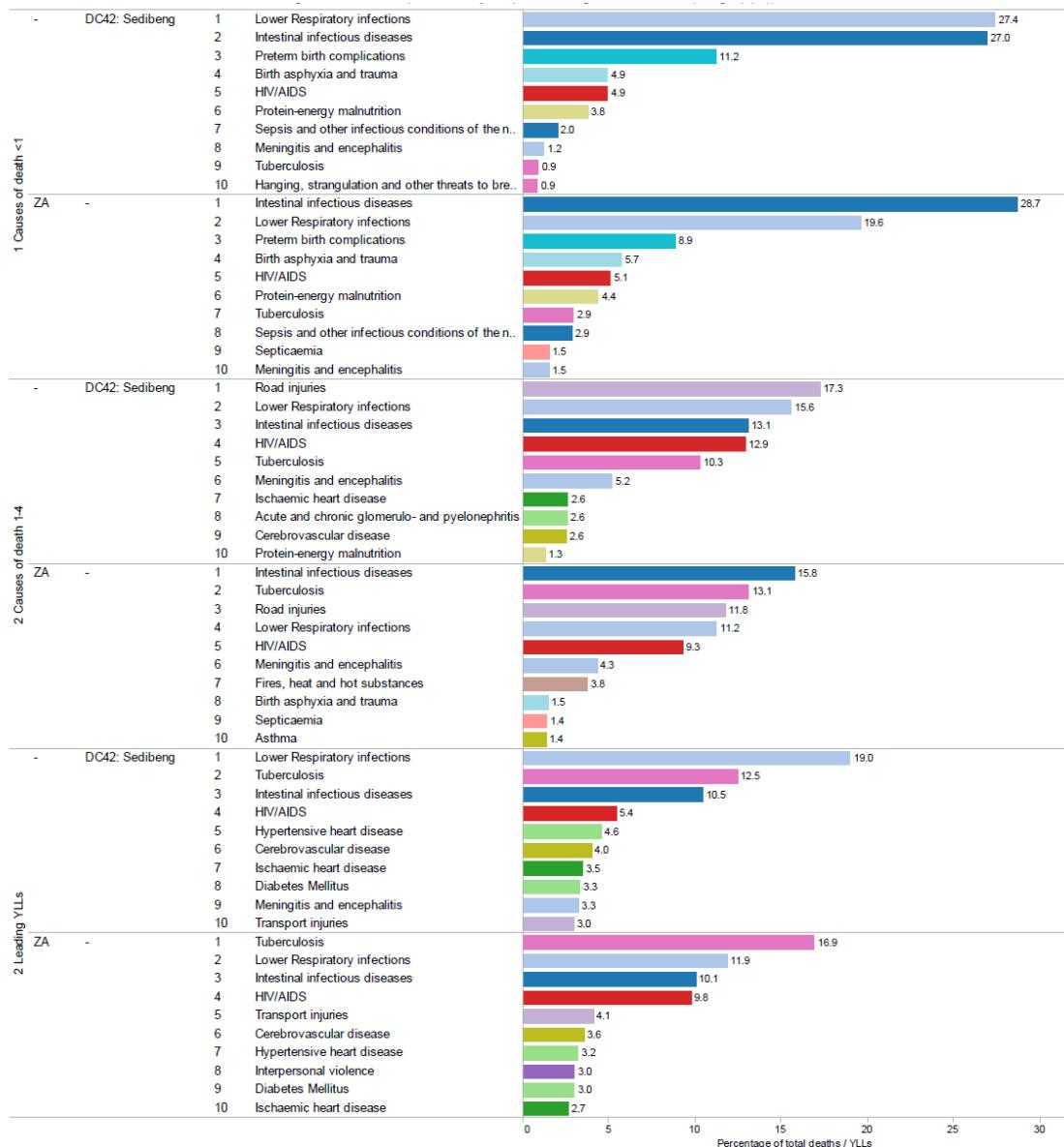
6.1.2 Child development indicators

6.1.2.1 Leading causes of death of young children

The leading causes of death of young children are given at district level for 2008 (MRC analysis of Statistics SA data). These figures need to be interpreted with some caution, due to incompleteness of vital registration data (especially in children and particularly in the 1-4 years age category) and incorrectness of the data (ill-defined and inappropriate causes of death). The top 10 causes for children under one year is given in Figure 12, with lower respiratory infections (27.4%) being the most frequent, followed by intestinal infectious diseases (27.0%) and preterm birth complications (11.2%). The top three diseases in the district are similar to that of the country, although in the country, intestinal infectious diseases are most frequent (28.7%), followed by lower respiratory infections (19.6%) and preterm birth complications (8.9%).

For children aged 1-4 years, road injuries (17.3%) are most frequent in the district, followed by lower respiratory infections (15.6%) and intestinal infectious diseases (13.1%). However, the top 3 diseases in the country are: intestinal infectious diseases (15.8%), tuberculosis (13.1%) and road injuries (11.8%).

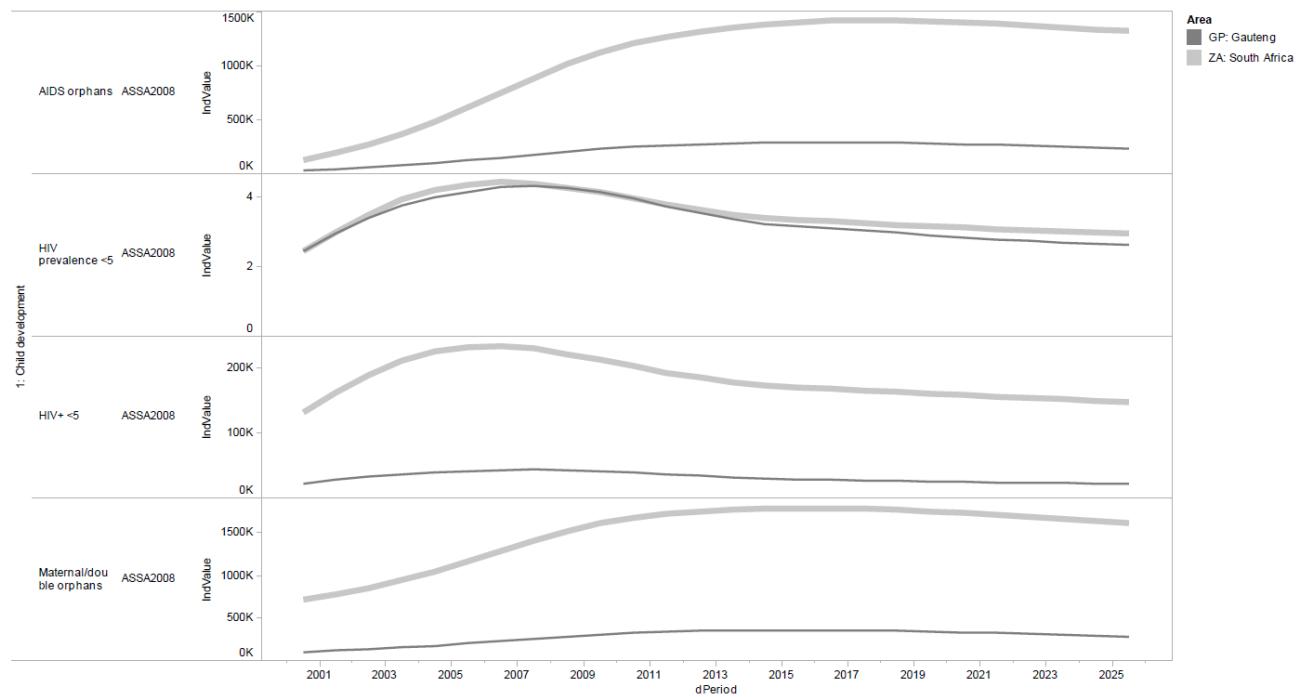
Figure 12: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008



6.1.2.2 Young children infected with HIV

The number of HIV positive children under five years as well as the prevalence (%) of HIV in this age group is available from the ASSA2008 model for Gauteng and South Africa. In Gauteng the prevalence (number) was 4.0% (38 882) in 2005, then peaked in 2008 with 4.3% (44 081) and from then is estimated to slowly decrease to 3.7% (35 804) in 2012. The national data follow a similar pattern, with a slightly higher prevalence (3.8%) in 2012.

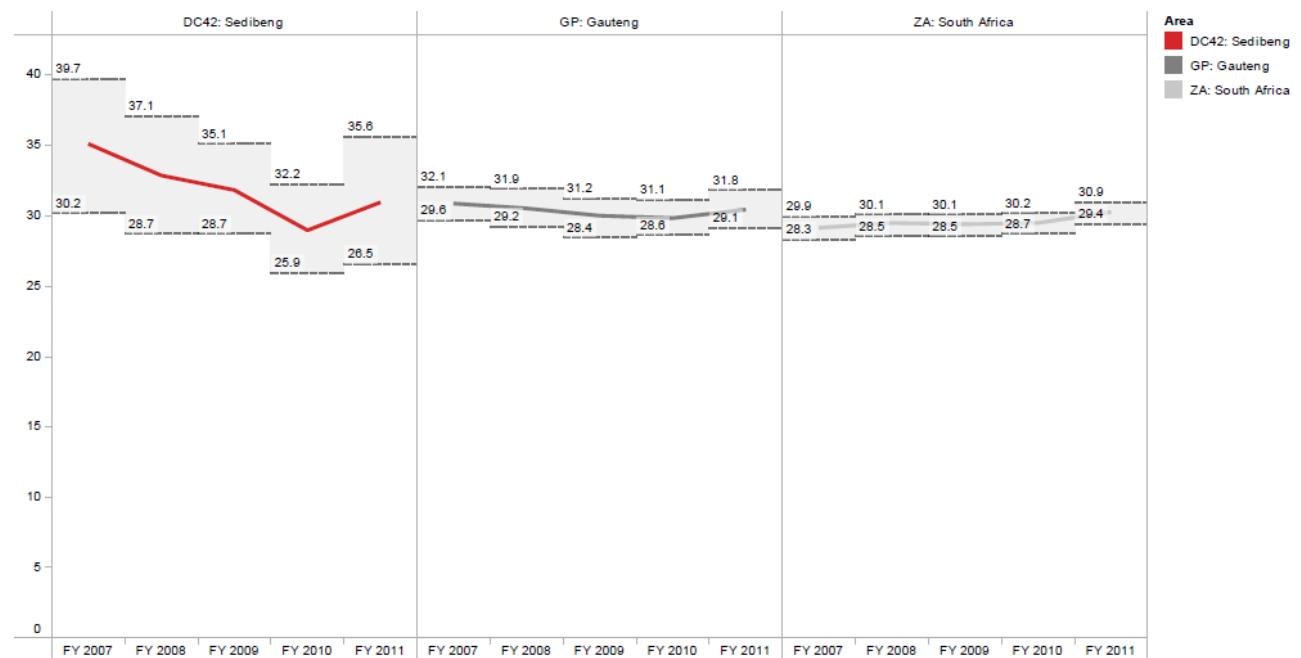
Figure 13: Indicators based on ASSA2008 model for Gauteng and South Africa, 2000-2025



6.1.2.3 Pregnant women infected with HIV

The prevalence (%) of HIV among ANC clients tested is available from the antenatal surveys^m (and the numbers have been calculated based on that). In Sedibeng prevalence has been steadily decreasing from 35.0% (6 230) in 2006 to 28.9% (4 931) in 2009 with a small increase to 30.9% (5 109) in 2010. The provincial HIV prevalence only decreased slightly over this time period and is fractionally lower than the district in 2010 (30.4%). The national HIV prevalence shows a slightly increasing trend over this time period (not statistically significant) and is similar to the district in 2010 (30.2%).

Figure 14: HIV prevalence among antenatal clients tested (survey) with 95% CI, FY 2007 - FY 2011



^m The antenatal surveys are usually conducted in October, therefore the 2006 survey falls into FY 2007 in the data tables and graphs.

6.1.2.4 *Orphans*

The number of maternal/double orphans (children 0-17 years whose mother has died, whether or not father is alive) as well as the prevalence of orphanhood is available from different sources and at different levels. The CS 2007 gives the following prevalences and numbers: with 7.5% (15 610), Emfuleni has the highest prevalence, followed by Lesedi 6.9% (1 529) and then Midvaal 4.9% (1 337). The prevalence in Sedibeng (7.2%; 18 475) is higher compared to that of Gauteng (5.0%), but similar to that of South Africa (7.1%). The GHS also gives similar data for 2010, but only for Gauteng (5.2%) and South Africa (8.5%), which is in line with the increasing trend in the number of orphans as can be seen from the ASSA2008 projection model (Figure 13).

The ASSA2008 model estimates the number of maternal/double orphans as well as specifically those due to AIDS at provincial and national level. The numbers show a large increase over time for Gauteng; from 168 699 in 2005 to 330 393 in 2012 (factor 2.0) for the maternal/double orphans; and from 91 024 in 2005 to 257 667 in 2012 (factor 2.8) for the AIDS orphans. For South Africa these figures are: 1 040 962 to 1 712 677 (factor 1.6) and from 478 855 in 2005 to 1 264 771 in 2012 (factor 2.6).

6.1.2.5 *Low birth weight*

Data on the prevalence of low birth weight (under 2 500 gram) in facilities are available from the DHIS.ⁿ The low birth weight rate has fluctuated over time (due to unstable numerators), although in general there seems to be an increasing trend (Figure 17). In Emfuleni the prevalence was 12.8% in 2006/07 and 14.3% in 2010/11, in Lesedi 7.4% in 2007/08 and 14.2% in 2010/11 and Sedibeng 10.1% in 2006/07 and 14.3% in 2010/11. In 2010/11 the prevalence in Sedibeng is somewhat lower compared to Gauteng (14.8%), but somewhat higher compared to the national level (13.1%).

6.1.2.6 *Malnutrition*

Data on the prevalence of stunting (low height for age) are only available at provincial and national level from different sources, which cover different age categories of children (see Methodology section for more detail). Gauteng: 16.8% in 2005 (National Food Consumption Survey – NFCS, age 1-9 years), 13.2% in 2008 (National Youth Risk Behaviour Survey – NYRBS, Grade 8-11). South Africa: 18.0% in 2005 (NFCS), 17.1% (National income Dynamics Study - NiDS Health Wave 1, age 6 months to 14 years) in 2008 and a much lower estimate for the older children of 13.1% (NYRBS), also in 2008.

Data on the prevalence of severe malnutrition (weight below 60% of expected) among under fives are available from the DHIS. It is fluctuating over time, although over the whole time period there is a decreasing trend: Emfuleni 2.7% in 2006/07 and 1.4% in 2010/11, Midvaal 5.1% in 2006/07 and 1.3% in 2010/11, Lesedi 5.5% in 2006/07 and 0.8% in 2010/11, Sedibeng 3.1% in 2006/07 and 1.3% in 2010/11. The latter is lower compared to the prevalence in Gauteng (3.6%) in 2010/11 as well as the national level (4.8%).

6.1.2.7 *Pre-school enrolment*

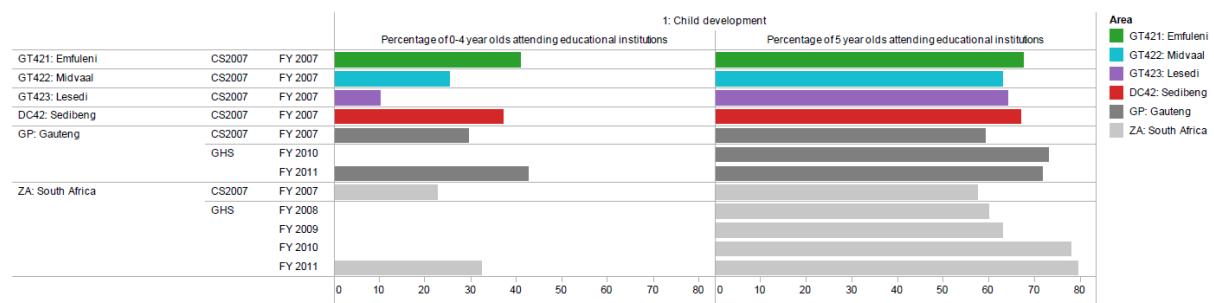
Pre-school attendance for 0-4 year olds as well as for 5 year olds is available from the CS 2007. For the 0-4 year olds Lesedi has the lowest attendance (10.2%), followed by Midvaal (25.3%) and Emfuleni (40.9%). The level for Sedibeng (37.2%) is higher compared to the provincial (29.5%) and national (22.6%) level. The GHS reports a provincial attendance for 0-4 year olds of 42.6% for Gauteng, and 32.3% for South Africa, in 2010.

As expected, pre-school attendance for 5 year olds is higher. According to the CS 2007, Midvaal has the lowest attendance with 63.0%, followed by Lesedi with 64.1% and Emfuleni with 67.7%. The level for Sedibeng (66.9%) is higher compared to the provincial (59.4%) and national level (57.4%). The

ⁿ Note that for this indicator, and other related indicators, no value for Midvaal sub-district is available due to the absence of delivery services.

GHS reports a provincial attendance for 5 year olds of 71.8% for Gauteng and 79.6% for South Africa in 2010.

Figure 15: Pre-school attendance in children age 0-4 years and 5 years old, FY 2007 - FY 2011



6.1.3 Burden of disease

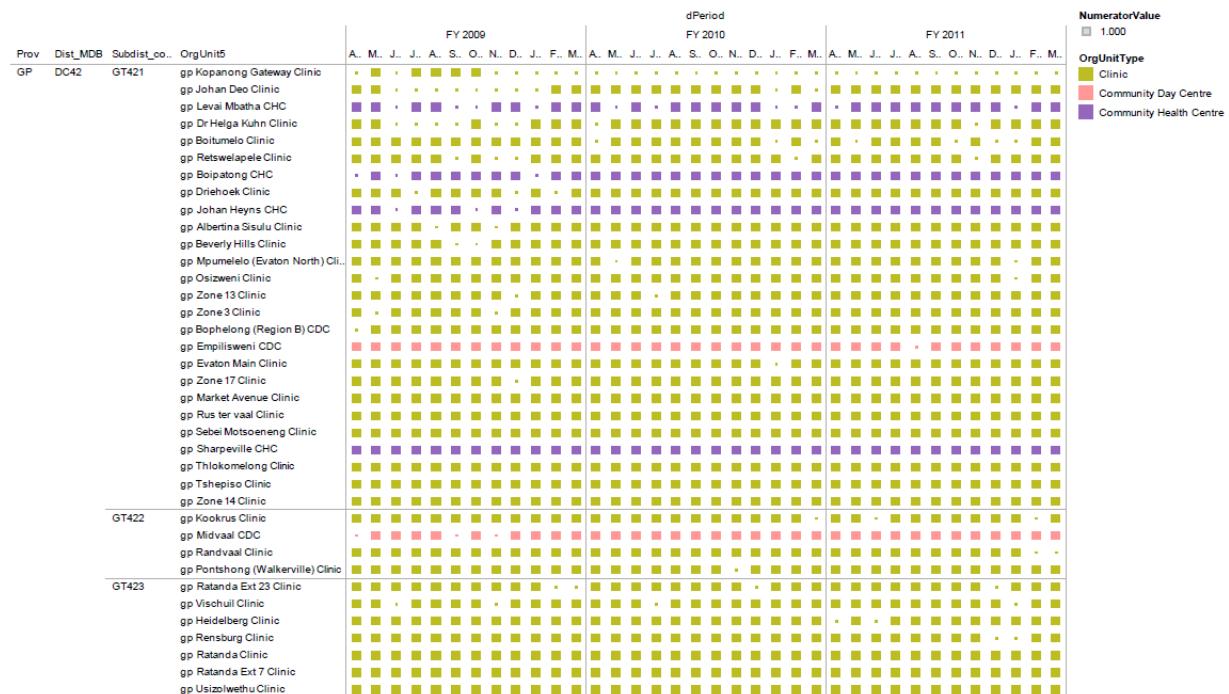
The leading years of life lost (YLLs) for the total population are given at district level for 2008 (MRC). The top 10 causes are shown in Figure 12, with lower respiratory infections accounting for 19.0%, tuberculosis for 12.5% and intestinal infectious diseases for 10.5% of YLLs. The top three diseases in the district are similar to that of the country, although in the country tuberculosis accounts for 16.9%, lower respiratory infections for 11.9 % and intestinal infectious diseases for 10.1 of YLLs. For Sedibeng, the proportion of YLLs due to communicable diseases/maternal/perinatal/nutritional disorders was 39.9%, non-communicable diseases (NCDs) 32.5%, HIV related and TB 17.9%, and injuries 9.6%.

6.1.4 PHC management and process indicators

6.1.4.1 Clinic supervision rate

The fixed PHC facilities with a monthly supervisory visit rate is available from the DHIS. In general, numbers were low for 2005/06 and 2006/07, then showed a large increase in 2007/08. In 2010/11 the levels were 92.6% in Emfuleni, 91.7% in Midvaal, 92.9% in Lesedi and 92.6% in Sedibeng. These levels are higher than the provincial level (81.3%) and especially the national level (68.8%).

Figure 16: Clinic supervision rate per facility (monthly), Sedibeng, 2008/09 - 2010/11



Note: The monthly value should always be a zero (no visit this month) or a one (one or more visits this month), represented as a dot or a square block, respectively.

6.1.4.2 PHC utilisation rate

The PHC utilisation rate (rate at which PHC services are utilised by the catchment population) is available from the DHIS. With some fluctuations the numbers somewhat increased between 2004/05 and 2010/11 in the three municipalities and Sedibeng: from 1.4% in 2004/05 to 2.2% in 2010/11 for Emfuleni, from 1.5% in 2004/05 to 2.4% in 2010/11 for Midvaal, from 1.5% in 2004/05 to 1.8% in 2010/11 Lesedi and from 1.4% in 2004/05 to 2.2% in 2010/11 for Sedibeng. For the province and national level the numbers were more stable over the period. In 2010/11 the province scored lower (1.8%) than the district, while the national figure is just above (2.3%).

6.1.4.3 Under 5 PHC utilisation rate

The under 5 PHC utilisation rate (rate at which PHC services are used by children under five years) is relatively stable over the period 2006/07-2010/11. In 2010/11 the rate of Emfuleni is 3.9%, Midvaal 4.6%, Lesedi 3.2% and Sedibeng 3.9%. The latter is similar to the provincial level (3.9%) and a bit lower than the national one (4.4%).

6.1.5 Service coverage

Note that the service coverage indicators use denominators based on population estimates and therefore could be incorrect, which could lead to percentages above 100.

6.1.5.1 Antenatal care coverage rates

The percentage of pregnant women coming for at least one antenatal visit is available from the DHIS. It seems to fluctuate over time; Midvaal (118.3%) and Lesedi (94.2%) have a higher coverage in 2010/11 compared to 2008/09, but Emfuleni had lower coverage (88.9%) in 2010/11 compared to 2008/09. The coverage in Sedibeng (91.5%) in 2010/11 is lower compared to the provincial (109.3%) and country (97.5%) level.

6.1.5.2 Delivery rate in facility

The percentage of deliveries taking place in health facilities is available from the DHIS. The rate fluctuates over time, but is higher in 2010/11 compared to 2004/05. In 2010/11 the rate for Emfuleni is 89.2% and for Lesedi 158.3%. The rate in Sedibeng (88.8%) is lower than the provincial rate (95.0%), but higher than the national one (84.0%).

6.1.5.3 Caesarean section rate

The percentage of deliveries for which a Caesarean section is performed (only district hospitals) is available from the DHIS. The coverage fluctuates over time, but is higher in 2010/11 compared to 2004/05, except for Emfuleni (which had the highest rate in 2004/05). In 2010/11, the rate for Emfuleni is 25.1% and for Lesedi 18.2%. The rate in Sedibeng (22.3%) is higher than the provincial rate (19.5%) as well as the national one (18.8%).

6.1.5.4 Immunisation coverage under 1 year

The percentage of children under one year in the target area who are fully immunised is available from the DHIS. In general there is a steady increase over this period. In 2010/11 the coverage for Emfuleni is 106.9%, for Midvaal 111.0% and for Lesedi 95.7%. The coverage in Sedibeng (106.3%) is a bit lower than the provincial coverage (107.7%), but substantially higher than the national one (86.7%).

6.1.5.5 Measles coverage

The percentage of children under one year in the target area who received their first dose of measles vaccine is available from the DHIS. The coverage is fluctuating, but in general the coverage is higher in 2010/11 compared to 2006/07 (except for Lesedi and the country). In 2010/11 the coverage for Emfuleni is 100.6%, for Midvaal 112.1% and for Lesedi 96.9%. The coverage in Sedibeng (101.1%) is a bit lower than the provincial coverage (107.3%), but higher than the national one (91.9%).

6.1.5.6 Rotavirus coverage

The percentage of children under one year in the target area who received their first dose of rotavirus vaccine is available from the DHIS. The coverage has increased between these years (due to the fact that the vaccine was first introduced into the programme in 2009/10). In 2010/11 the coverage for Emfuleni is 99.5%, for Midvaal 109.6% and for Lesedi 88.5%. The coverage in Sedibeng (99.2%) is a bit lower than the provincial coverage (100.9%), but substantially higher than the national one (81.6%).

6.1.5.7 Baby PCR testing coverage

Data on the proportion of infants under 2 months born to HIV positive mothers who received a PCR test were calculated for the DHB using data from the National Health Laboratory Service (NHLs), antenatal surveys and DHIS data on live births. This was available at district, provincial and national level from 2008/09 to and 2010/11. There is an upwards trend, but in 2010/11 the level in Sedibeng (47.4%) is lower than Gauteng (68.0%) and South Africa (52.6%)

6.1.6 Input indicators

6.1.6.1 Non-hospital PHC expenditure per capita

Data on the expenditure per capita on PHC (non-hospital), i.e. the total amount spent on non-hospital PHC health services per uninsured person, are available from the DHB 2010/11 for 2005/06 to 2010/11 and show an increase at district, provincial and national level over this period in real (inflation-

adjusted) 2010/11 prices. In 2010/11 the expenditure per capita in Sedibeng (R528.9) is lower than the provincial level (R549.4) but higher compared to the national level (R513.9).

6.1.7 Outcome indicators

6.1.7.1 *Diarrhoea incidence*

The diarrhoea incidence among children under five years is available from the DHIS. Incidence is fluctuating over time, but for all levels except Midvaal, the incidence is lower in 2010/11 compared to 2004/05. In 2010/11 the incidence is highest in Midvaal (88.1 per 1 000), followed by Lesedi (62.4) and Emfuleni (43.0). In the same year the incidence in Sedibeng (45.7) is lower compared to the provincial level (62.4) and especially the national level (109.3).

6.1.7.2 *PCR positivity*

Data on the proportion of PCR tests that conclude that a baby is HIV positive are available from the NHLS at district, provincial and national level from 2008/09 to 2010/11. In general there is a downwards trend, and in 2010/11 the level in Sedibeng (2.5%) is lower than the Gauteng (3.3%) and country level (3.5%).

6.1.8 Impact indicators

6.1.8.1 *Stillbirth rate*

Data on the stillbirth rate (SBR; number of babies born dead/1 000 births in facility) are available from the DHIS and are quite stable over time. The SBR in 2010/11 was generally lower than in 2004/05 (except for the province). In 2010/11 the rate in Emfuleni is 22.8 and Lesedi 26.6. In Sedibeng (24.4) the rate is slightly higher than in the province (22.2) and the country (23.0).

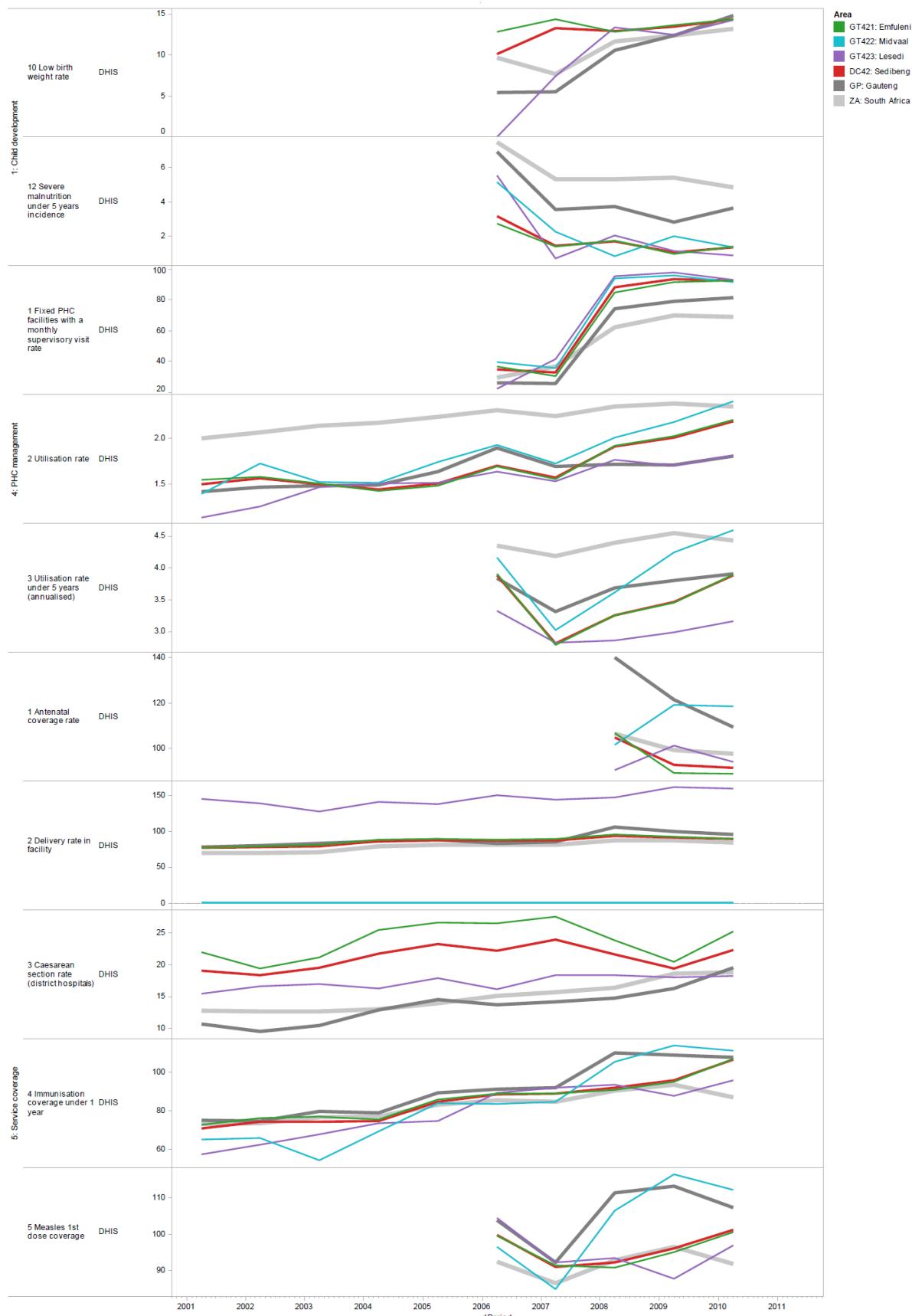
6.1.8.2 *Perinatal mortality rate*

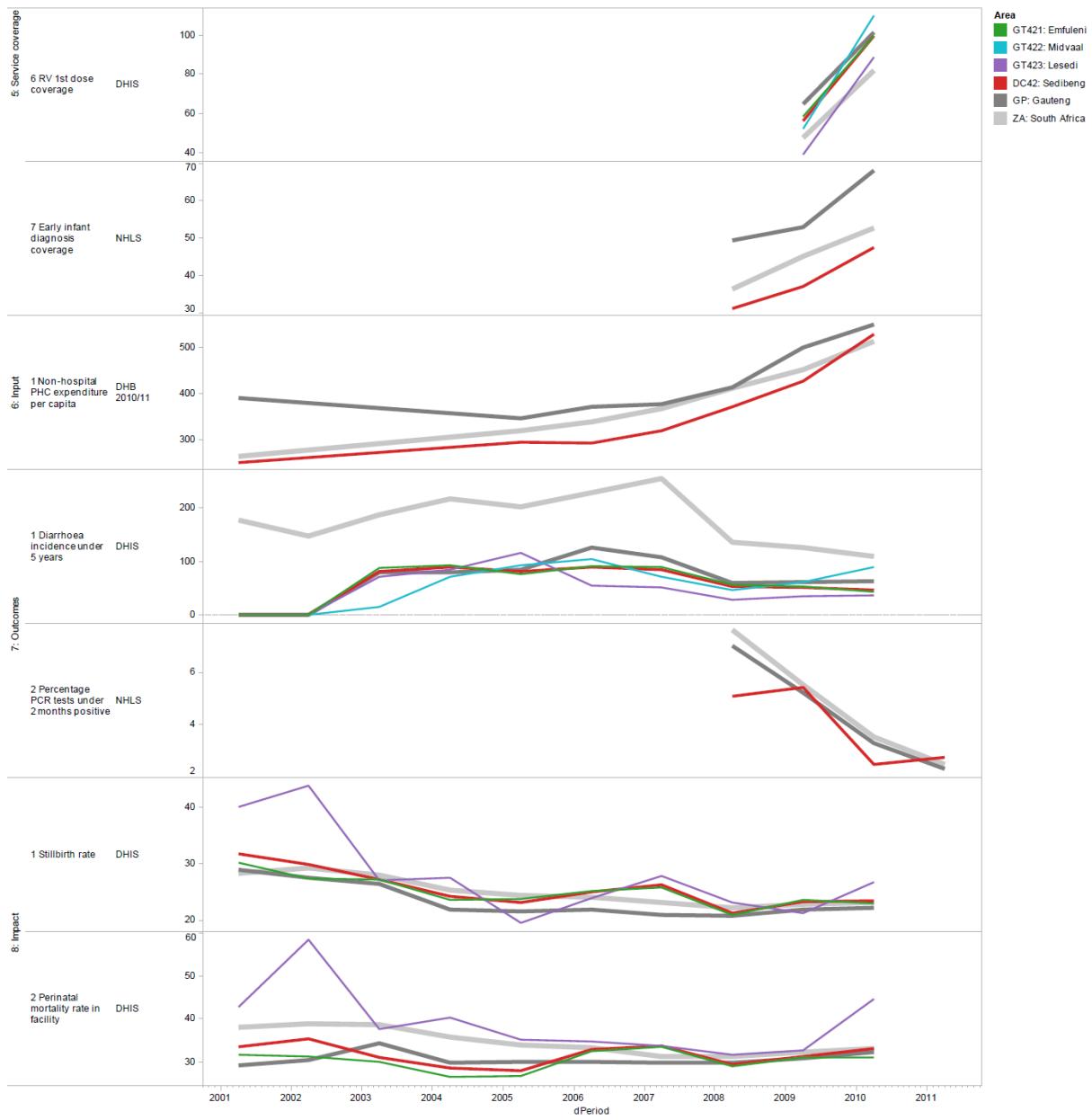
Data on the perinatal mortality rate (PNMR; the sum of stillbirths plus those babies dying within 7 days of life/1 000 births in facility) are available from the DHIS and are quite stable over time, but in 2010/11 generally higher than in 2004/05 (except for the country). In 2010/11 the rate in Emfuleni is 30.9 and in Lesedi 44.6 (probably due to missing denominator data from Heidelberg Hospital in that period). In Sedibeng (33.0) the rate is slightly higher than in the province (32.1) and the country (32.8).

6.1.8.3 *Maternal mortality*

The maternal mortality rate (maternal deaths e.g. due to pregnancy, delivery, per 100 000 live births in facility) is available from the DHIS for 2010/11. In Emfuleni it is 182.4 and in Lesedi 185.1. In Sedibeng (182.8) the rate is considerably higher than the provincial level (99.7) as well as the country level (135.4). However, the DHIS data must be interpreted with some caution as they are incomplete and only include deaths in facilities. The maternal mortality rate recorded by DHIS for Sedibeng is in line with the level of maternal mortality recorded by the National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD).

Figure 17: Selected indicator trends for Sedibeng and South Africa





6.2 Uthungulu District Municipality

6.2.1 Socio-demographic status

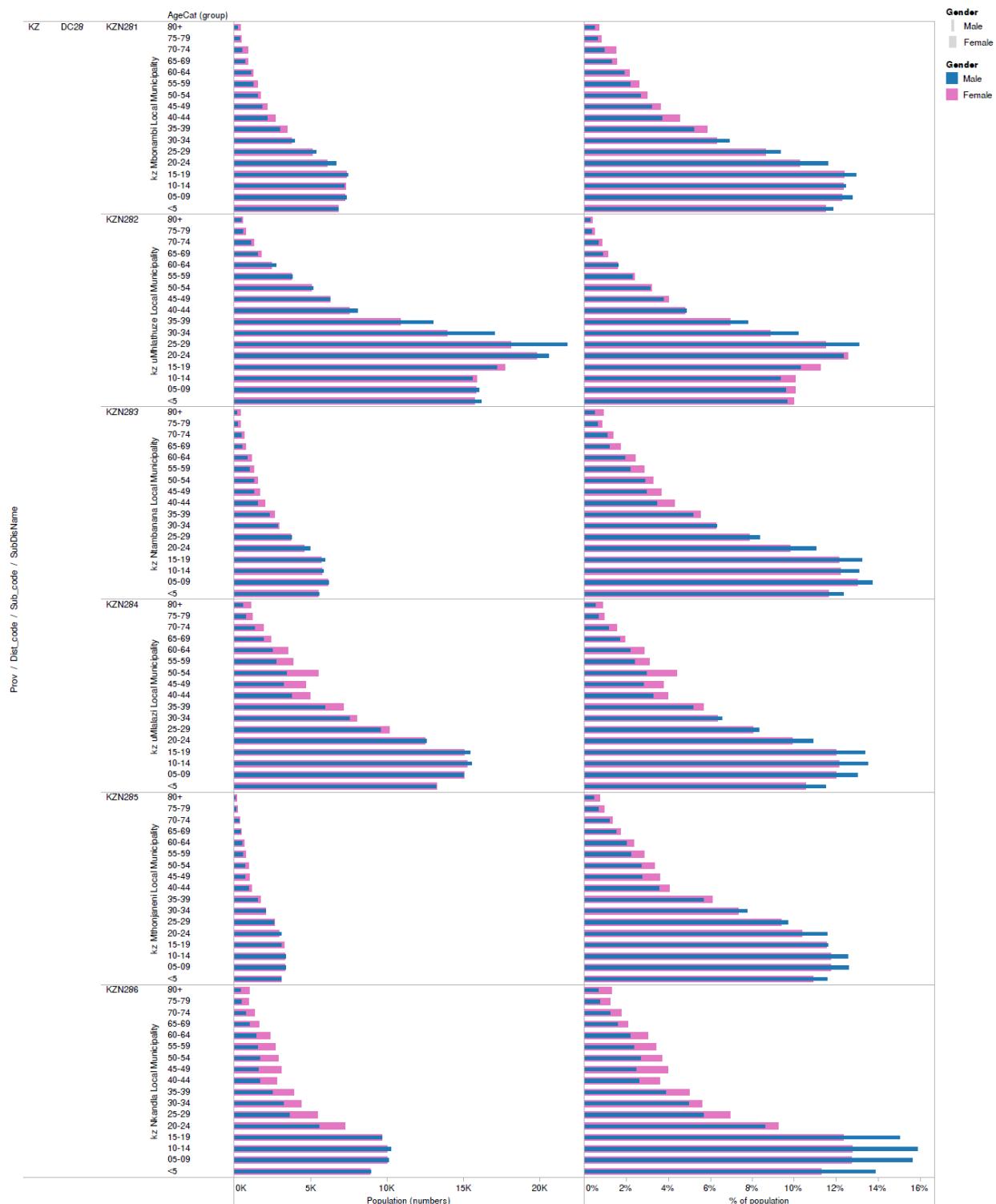
6.2.1.1 Population

Uthungulu District Municipality (DC28) is part of KwaZulu-Natal Province. It consists of 6 local municipalities: Mbonambi (Mfolozi) (KZN281), uMhlathuze (KZN282), Ntambanana (KZN283), uMlalazi (KZN284), Mthonjaneni (KZN285) and Nkandla (KZN286).

The total population (NDoH/HISP 2001-2016) of each of these 6 local municipalities has been increasing over the years. The 2012 estimated population of Mbonambi (Mfolozi) is 116 882, of uMhlathuze 324 026, of Ntambanana 92 251, of uMlalazi 241 086, of Mthonjaneni 55 341 and of Nkandla 143 310. UMhlathuze and uMlalazi make up 58% of the population of Uthungulu (972 860) (and therefore the values for these sub-districts will have a large influence on the district-values for most indicators).

The population under one year showed an increase from 2005 to 2007 and then showed a decreasing trend towards 2012. The 2012 estimated population under one year of Mbonambi (Mfolozi) is 2 534, of uMhlathuze 5 924, of Ntambanana 2 053, of uMlalazi 4 922, of Mthonjaneni 1 152 and of Nkandla 3 308. The estimated population under one year in Uthungulu in 2012 is 19 893.

Figure 18: Population pyramid (number and % of population by age group and gender), Uthungulu, 2011



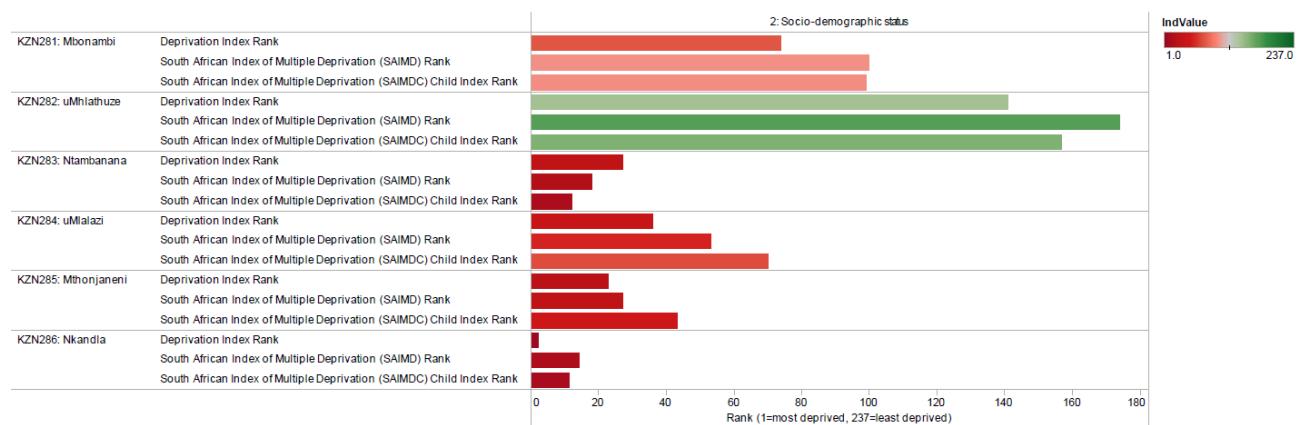
6.2.1.2 Deprivation index and socio-economic quintile

The District Health Barometer (DHB) provides data on the Deprivation Index (DI) rank for the municipalities for 2007: Nkandla is the most deprived (2), followed by Mthonjaneni (23), Ntambanana (27), uMlalazi (36), Mbonambi (Mfolozi) (74) and uMhlathuze (141). The South African Index of Multiple Deprivation (SAIMD) rank for the same year gives a different order for Ntambanana and Mthonjaneni; the rest stayed the same: Nkandla (14), Ntambanana (18), Mthonjaneni (27), uMlalazi

(53), Mbonambi (Mfolozi) (100) and uMhlathuze (174). The same ordering is found on the SAIMD Child (SAIMDC) rank: Nkandla (11), Ntambanana (12), Mthonjaneni (43), uMlalazi (70), Mbonambi (Mfolozi) (99) and uMhlathuze (157).

The same sources also provide information on the Socio-economic Quintile (SEQ) (1=poor, 5=best). According to the DHB, Ntambanana, uMlalazi, Mthonjaneni and Nkandla fall into the most deprived quintile (SEQ 1), Mbonambi (Mfolozi) into SEQ 2, and uMhlathuze into SEQ 3. Based on the SAIMD Ntambanana, Mthonjaneni and Nkandla fall into SEQ 1, uMlalazi into SEQ 2, Mbonambi (Mfolozi) into SEQ 3 and uMhlathuze into SEQ 4. The same is found from the SAIMDC. Thus the differences between the district municipalities – Mbonambi (Mfolozi) and uMhlathuze on the one side and the rest on the other - are large.

Figure 19: DI, SAIMD and SAIMDC rank, Uthungulu, 2007



6.2.1.3 Access to piped water

Data on the percentage of households with access to piped water are available from the Community Survey (CS) 2007: Ntambanana scores lowest with 47.6%, followed by uMlalazi 50.7%, Mbonambi (Mfolozi) with 62.7%, Mthonjaneni with 66.1%, Nkandla with 71.9% and uMhlathuze with 95.6%. Uthungulu scores 75.0% and this is below the level of KwaZulu-Natal (79.3%) and the national figure (88.7%). The General Household Survey (GHS) provides figures for the province and country for 2009 and 2010 which are 84.3% and 84.4% for KwaZulu-Natal and 89.3% for both years for South Africa.

6.2.1.4 Drinking water quality

The Blue Drop 2011 data only provides information on uMhlathuze at sub-district level, scoring 89.3%. This places it in the category of ‘Very Good Drinking Water Quality Management (DWQM)’. Overall, the Blue Drop score for Uthungulu was 71.3%, categorised as ‘Good DWQM’. See Figure 6: Blue Drop scores by district and municipality, 2011.

6.2.1.5 Waste water management

The Green Drop 2011 data also only provides information on uMhlathuze at sub-district level, scoring 83.3%. This places it in the category of ‘Good status, improve on gaps identified to shift to Excellent’. The overall Green Drop score for the municipality was however lower at 68.4% - ‘Average performance, ample room for improvement’. See Figure 7: Green Drop scores by district and municipality, 2011.

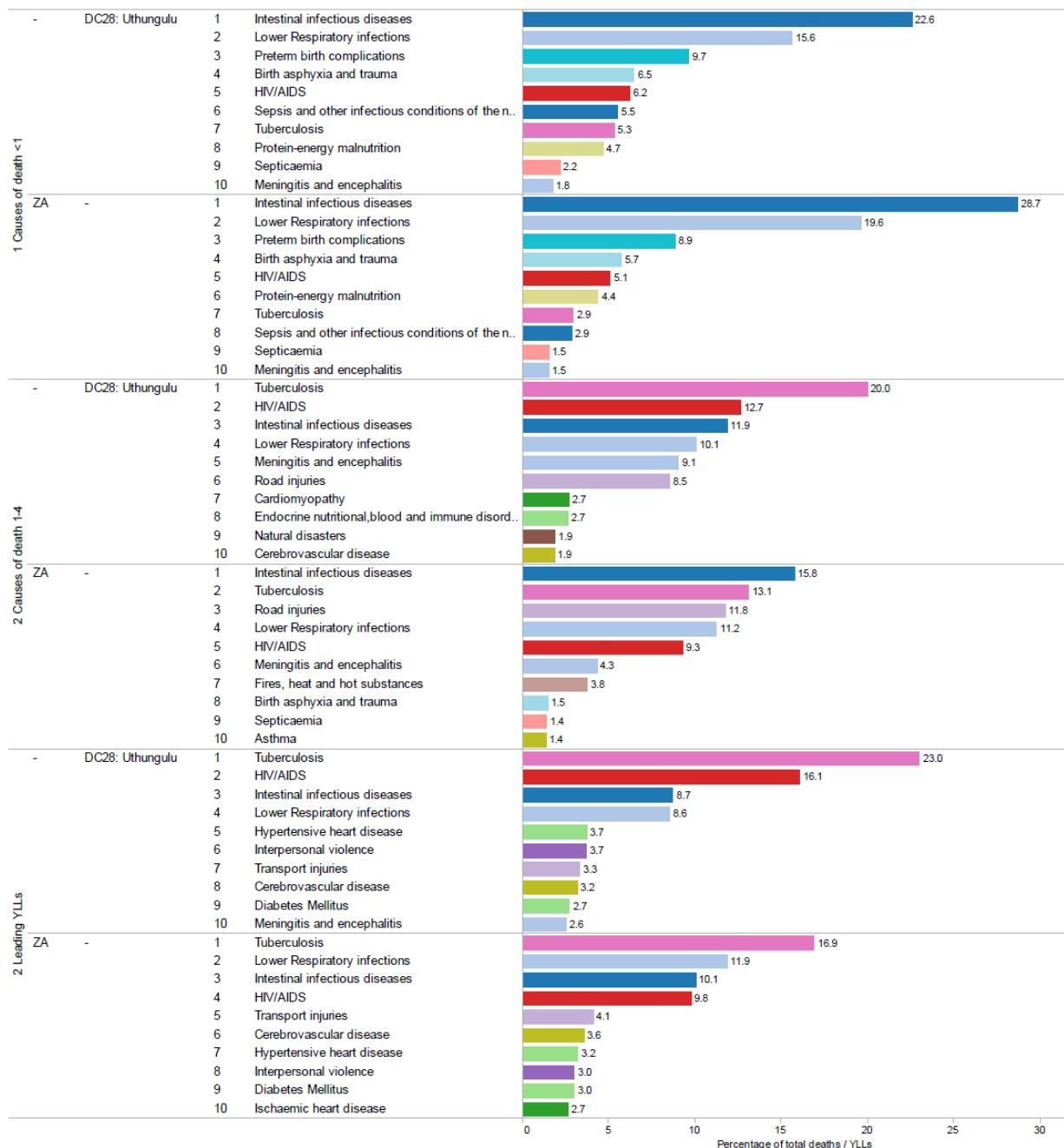
6.2.2 Child Development Indicators

6.2.2.1 Leading causes of death of young children

The leading causes of death of young children are given at district level for 2008 (MRC analysis of Statistics SA data). These figures need to be interpreted with some caution, due to incompleteness of vital registration data (especially in children and particularly in the 1-4 age category) and incorrectness of the data (ill-defined and inappropriate causes of death). The top 10 for children under one year is given in Figure 20, with intestinal infectious diseases (22.6%) being the most frequent, followed by lower respiratory infections (15.6%) and preterm birth complications (9.7%). The top three in the district is similar to that of the country: intestinal infectious diseases (28.7%), lower respiratory infections (19.6%) and preterm birth complications (8.9%).

For children aged 1-4 tuberculosis (20.0%) is most frequent in the district, followed by HIV/AIDS (12.7%) and intestinal infectious diseases (11.9%). However, the top three diseases in the country are: intestinal infectious diseases (15.8%), tuberculosis (13.1%) and road injuries (11.8%).

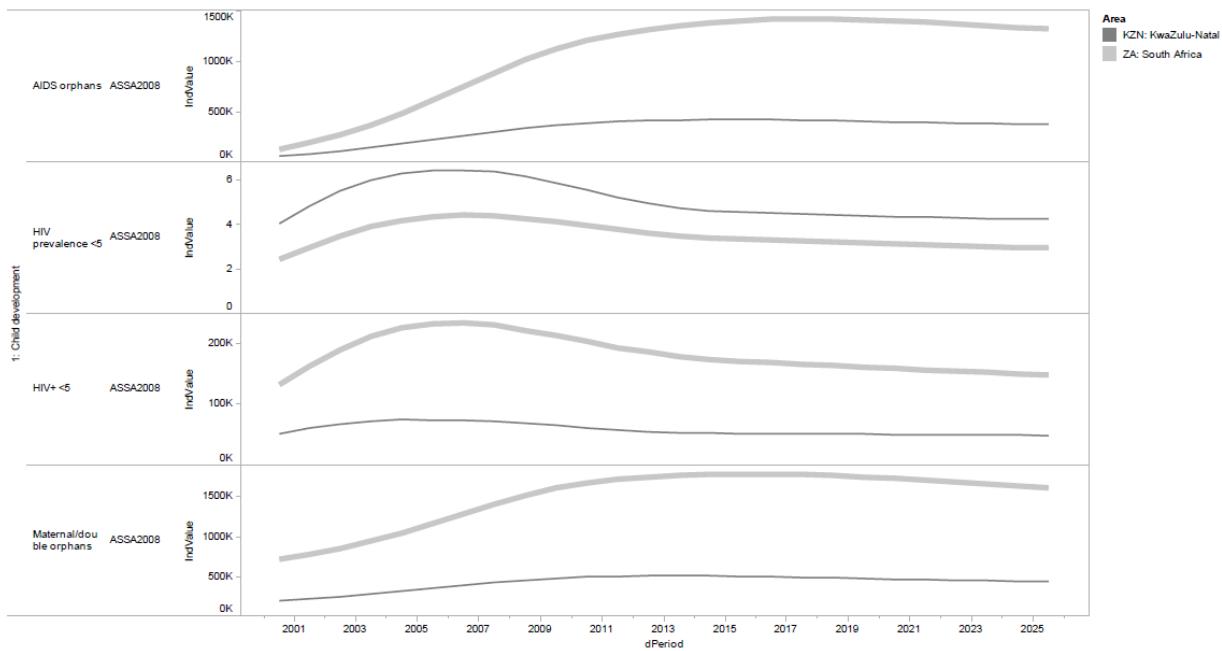
Figure 20: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008



6.2.2.2 Young children infected with HIV

The number of HIV positive children under five years as well as the prevalence (%) of HIV in this age group is available from the ASSA2008 model for KwaZulu-Natal and South Africa. In KwaZulu-Natal the prevalence (number) was 6.3% (72 906) in 2005. After an initial increase it starts to slowly decrease from 2009 to 5.2% (56 329) in 2012. The national data follow a similar pattern, but with a lower prevalence (3.8%) in 2012.

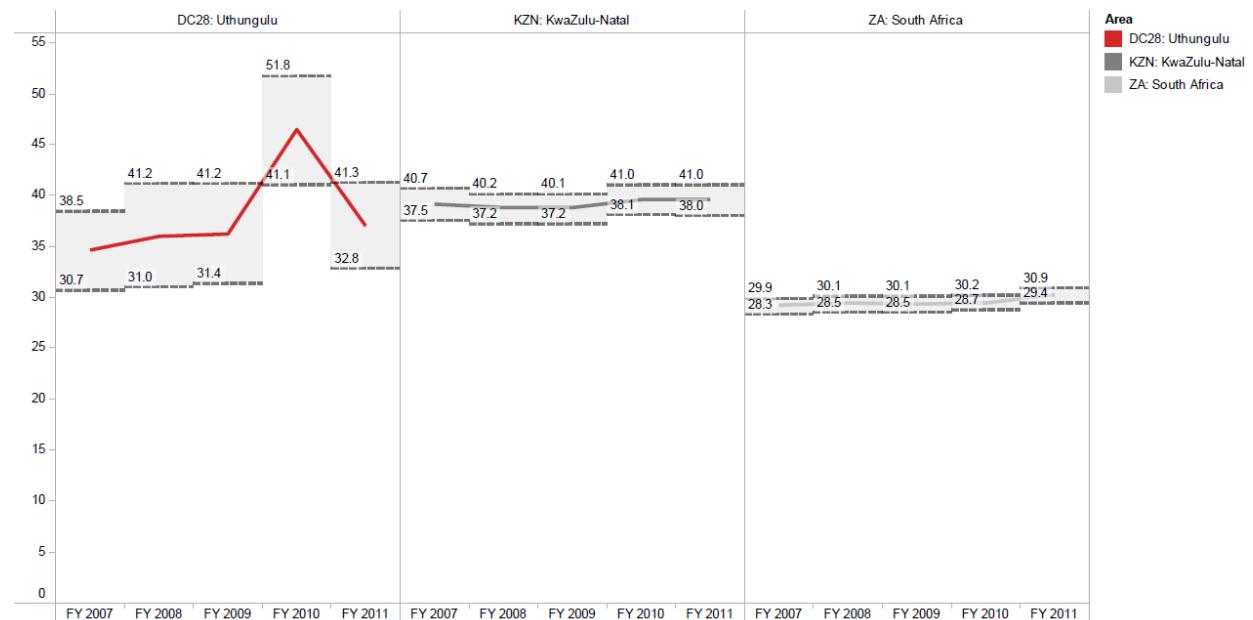
Figure 21: Indicators based on ASSA2008 model for KwaZulu-Natal and South Africa, 2000-2025



6.2.2.3 Pregnant women infected with HIV

The prevalence (%) of HIV among ANC clients tested is available from the antenatal surveys (and the numbers have been calculated based on that) for Uthungulu, KwaZulu-Natal and South Africa. In Uthungulu it has been increasing from 34.6% (9 191) in 2006 to 36.9% (8 355) in 2010. The very high value of 46.4% (11 269) in 2009 is probably anomalous. The provincial HIV prevalence was stable over this period (between 38.7% and 39.5%) and is a bit higher compared to the district in 2010 (39.5%). The national HIV prevalence shows a slightly increasing trend over this time period (not statistically significant) and is lower compared to the district in 2010 (30.2%).

Figure 22: HIV prevalence among antenatal clients tested (survey) with 95% CI, FY 2007 - FY 2011



6.2.2.4 *Orphans*

The number of maternal/double orphans (children 0-17 years whose mother has died, whether or not father is alive) as well as the prevalence of orphanhood is available from different sources and at different levels. The CS 2007 gives the following prevalences and numbers: with 10.7% (4 762) Ntambanana has the highest prevalence, followed by Mbonambi (Mfolozi) 10.3% (5 254), uMhlathuze 10.0% (12 968), Mthonjaneni 9.7% (2 008), uMlalazi 8.7% (6 950) and then Nkandla 7.9% (5 315). The prevalence in Uthungulu (9.5%; 37 257) is similar compared to that of KwaZulu-Natal (9.7%), but higher compared to that of South Africa (7.1%). The GHS also gives similar data for 2010, but only for KwaZulu-Natal (12.0%) and South Africa (8.5%), which is in line with the increasing trend in the number of orphans as can be seen from the ASSA2008 data presented in Figure 21.

The ASSA2008 model estimates the number of maternal/double orphans, as well as specifically those due to AIDS, for KwaZulu-Natal and South Africa. The numbers show a large increase over time. For KwaZulu-Natal these increased from 305 527 in 2005 to 495 545 in 2012 (factor 1.6) for the maternal/double orphans and from 173 525 in 2005 to 397 715 in 2012 (factor 2.3) for the AIDS orphans. For South Africa these figures are: 1 040 962 to 1 712 677 (factor 1.6) and from 478 855 in 2005 to 1 264 771 in 2012 (factor 2.6).

6.2.2.5 *Low birth weight*

Data on the prevalence of low birth weight (under 2 500 gram) in facilities are available from the DHIS. It is fluctuating over time (due to unstable numerators), although in general there seems to be an increasing trend. In Mbonambi (Mfolozi) the prevalence is 8.9% in 2007/08 and 6.1% (so lower) in 2010/11, in uMhlathuze 5.2% in 2006/07 and 16.6% in 2010/11, in Ntambanana 46.0% in 2007/08 and 14.7% in 2010/11 (due to small number of hospital deliveries this is unstable), in uMlalazi 1.2% in 2006/07 and 9.3% in 2010/11, in Mthonjaneni 8.0% in 2006/07 and 9.1% in 2010/11, and in Nkandla 4.4% in 2006/07 and 8.6% in 2010/11. In 2010/11 the prevalence in Uthungulu (13.7%) is somewhat higher compared to KwaZulu-Natal (12.0%) and the national level (13.1%).

6.2.2.6 *Malnutrition*

Data on the prevalence of stunting (low height for age) are only available at provincial and national level from different sources, which cover different age categories of children (see Methodology section for more detail). KwaZulu-Natal: 15.1% in 2005 (National Food Consumption Survey – NFCS, age 1-9 years), 17.1% in 2008 (National Youth Risk Behaviour Survey – NYRBS, Grade 8-11). South Africa: 18.0% in 2005 (NFCS), 17.1% (National income Dynamics Study - NiDS Health Wave 1, age 6 months to 14 years) in 2008 and a much lower estimate of 13.1% (NYRBS) also in 2008.

Data on the prevalence of severe malnutrition (weight below 60% of expected) among under fives are available from the DHIS. It is fluctuating over time, although over the whole time period there is a decreasing trend: Mbonambi (Mfolozi) 2.3% in 2006/07 and 3.7% in 2010/11, uMhlathuze 6.9% in 2006/07 and 6.3% in 2010/11, Ntambanana 4.4% in 2006/07 and 3.4% in 2010/11, uMlalazi 5.7% in 2006/07 and 4.9% in 2010/11, Mthonjaneni 13.2% in 2006/07 and 0.3% in 2010/11 and Nkandla 12.4% in 2006/07 and 2.0% in 2010/11. In Uthungulu it was 7.1% in 2006/07 and 4.3% in 2010/11. The latter is lower compared to the prevalence in KwaZulu-Natal (7.0%) in 2010/11 as well as the national level (4.8%).

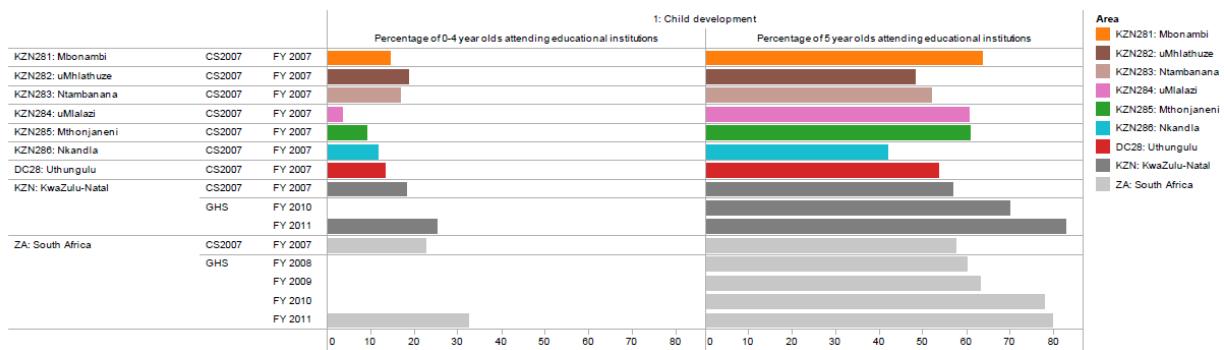
6.2.2.7 *Pre-school enrolment*

Pre-school attendance for 0-4 year olds as well as for 5 year olds is available from the CS 2007. For the 0-4 year olds uMlalazi has the lowest attendance (3.5%), followed by Mthonjaneni (9.1%), Nkandla (11.3%), Mbonambi (Mfolozi) (14.5%), Ntambanana (16.9%) and uMhlathuze (18.5%). The level for Uthungulu (13.2%) is lower compared to the provincial (18.1%) and national (22.6%) level. The GHS reports a provincial attendance for 0-4 years olds of 25.1% and a national one of 32.3% in 2010.

As expected, pre-school attendance for 5 year olds is higher. According to the CS 2007 Nkandla has the lowest attendance with 42.0%, followed by uMhlathuze with 48.3%, Ntambanana 51.8%, uMlalazi

60.5%, Mthonjaneni 60.9% and Mbonambi (Mfolozi) 63.4%. The level for Uthungulu (53.5%) is lower compared to the provincial (56.9%) and national level (57.4%). The GHS reports a provincial attendance for 5 year olds of 82.6% and a national one of 79.6% in 2010.

Figure 23: Pre-school attendance in children age 0-4 years and 5 years old, FY 2007 - FY 2011



6.2.3 Burden of disease

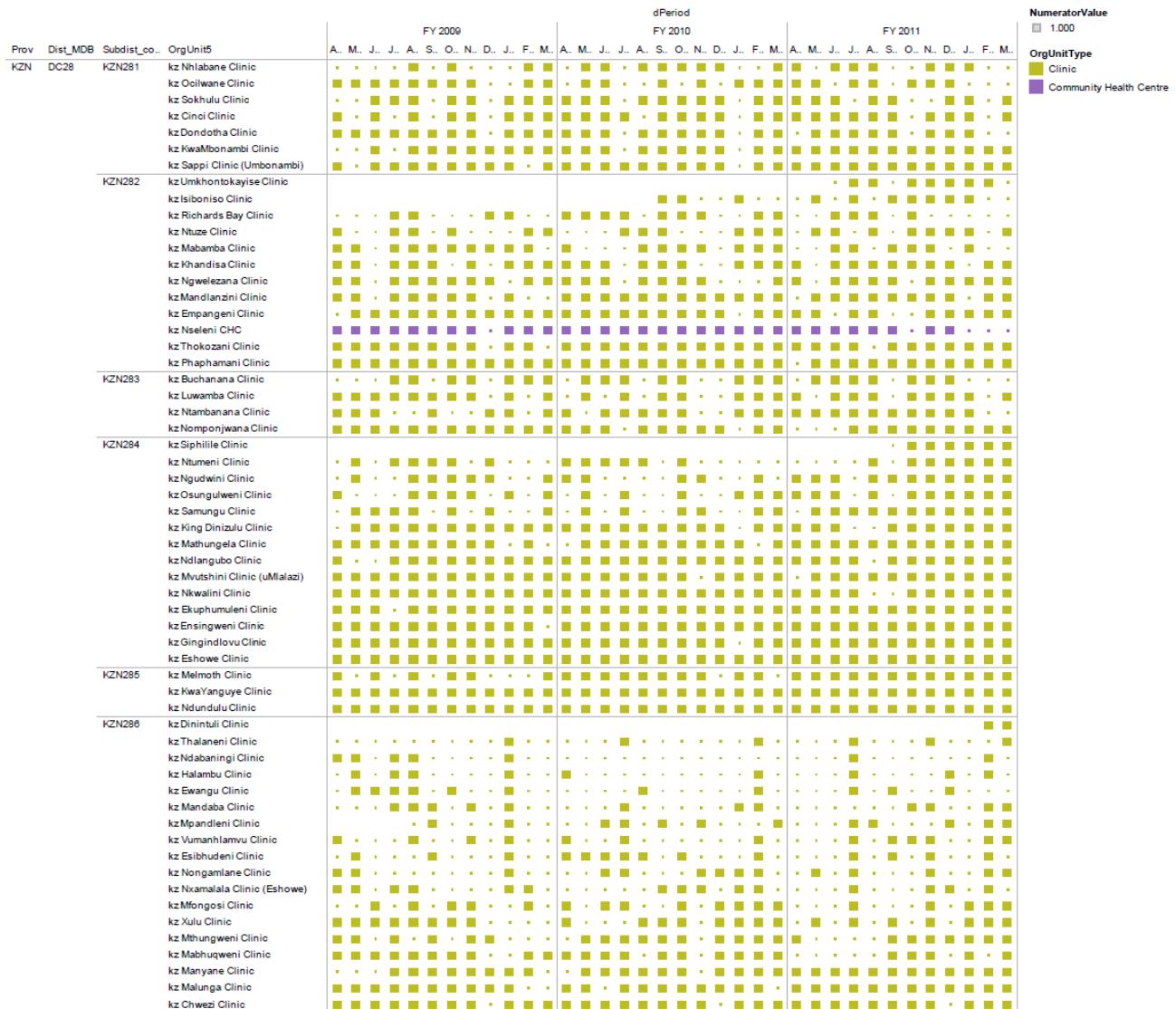
The leading years of life lost (YLLs) for the total population are given at district level for 2008 (MRC). The top 10 causes are shown in Figure 20, with tuberculosis accounting for 23.0%, HIV/AIDS for 16.1% and intestinal infectious diseases for 8.7% of YLLs. The top three is different from that of the country where lower respiratory infections are in second place and HIV/AIDS in fourth place: tuberculosis 16.9%, lower respiratory infections 11.9 % and intestinal infectious diseases 10.1% of YLLs. For the district, the proportion of YLLs for non-communicable diseases (NCDs) is 39.1%, for communicable diseases/maternal/perinatal/nutritional disorders 28.7%, for HIV related and TB 22.1%, and for injuries 10.1%.

6.2.4 PHC management and process indicators

6.2.4.1 Clinic supervision rate

The fixed PHC facilities with a monthly supervisory visit rate is available from the DHIS. In general there is an increasing trend from 2005/06 to 2010/11. In 2010/11 the levels were 76.2% in Mbonambi (Mfolozi), 71.1% in uMhlathuze, 72.9% in Ntambanana, 90.2% in uMlalazi, 100.0% in Mthonjaneni and 49.3% in Nkandla. The level in Uthungulu (71.4%) is higher than the provincial level (61.7%) and the national level (68.8%).

Figure 24: Clinic supervision rate per facility (monthly), Uthungulu, 2008/09 - 2010/11



Note: The monthly value should always be a zero (no visit this month) or a one (one or more visits this month), represented as a dot or a square block, respectively.

6.2.4.2 PHC utilisation rate

The PHC utilisation rate (rate at which PHC services are utilised by the catchment population) is available from the DHIS. With some fluctuations the numbers in general stayed similar between 2004/05 and 2010/11 in the 6 municipalities and Uthungulu. In 2010/11 the values were: 2.2% in Mbonambi (Mfolozi), 3.2% in uMhlathuze, 1.3% in Ntambanana, 1.8% in uMlalazi, 1.3% in Mthonjaneni, 2.1% in Nkandla and 2.3% in Uthungulu. For the province and national level the numbers also stayed the same over the period. In 2010/11 the province scored lower (1.8%) than the district, as well as the country (2.3%).

6.2.4.3 Under 5 PHC utilisation rate

In general, the under 5 PHC utilisation rate (rate at which PHC services are used by children under five years) is also relatively stable over the period 2006/07-2010/11. In 2010/11 the rate of Mbonambi (Mfolozi) is 3.1%, uMhlathuze 7.9%, Ntambanana 2.7%, uMlalazi 3.7%, Mthonjaneni 2.6%, Nkandla 4.3%. The level of Uthungulu is 4.9% which is somewhat higher compared to the provincial level (4.3%) and the national one (4.4%).

6.2.5 Service coverage

Note that the service coverage indicators use denominators based on population estimates and therefore could be incorrect, which could lead to percentages above 100.

6.2.5.1 Antenatal care coverage rates

The percentage of pregnant women coming for at least one antenatal visit is available from the DHIS. It seems to fluctuate over time, with Ntambanana (51.9%), uMlalazi (90.5%), Mthonjaneni (115.8%) and Nkandla (81.7%) having higher coverage in 2010/11 compared to 2008/09, but Mbonambi (Mfolozi) (62.8%) and uMhlathuze (125.7%) having lower coverage in 2010/11 compared to 2008/09. There is clearly substantial use of antenatal and delivery services across municipal borders. The coverage in Uthungulu (94.5%) in 2010/11 is a bit lower compared to the provincial (96.8%) and country (97.5%) level.

6.2.5.2 Delivery rate in facility

The percentage of deliveries taking place in health facilities is available from the DHIS. The rate fluctuates over time, but is lower in 2010/11 compared to 2004/05. In 2010/11, the rate for Mbonambi (Mfolozi) is 5.5%, uMhlathuze 138.5%, Ntambanana 2.1%, uMlalazi 73.6%, Mthonjaneni 55.1%, Nkandla 58.6%. The rate in Uthungulu (75.4%) is similar compared to the provincial rate (74.1%), but lower than the national one (84.0%).

6.2.5.3 Caesarean section rate

The percentage of deliveries for which a Caesarean section is performed (only district hospitals) is available from the DHIS. The coverage fluctuates over time, but is higher in 2010/11 compared to 2004/05. In 2010/11 the rate for uMlalazi is 34.9% (due to the fact that Eshowe and KwaMagwaza hospitals have missing denominators for 2010/11 the given rate is higher than the actual one), Mthonjaneni 20.2% and Nkandla 25.3% (note that the other local municipalities do not have district hospitals). The rate in Uthungulu (29.9%) is higher than the provincial rate (26.4%) and especially the national one (18.8%).

6.2.5.4 Immunisation coverage under 1 year

The percentage of children under one year in the target area who are fully immunised is available from the DHIS. It is fluctuating over time, but three out of the six local municipalities show a higher rate in 2010/11 compared to 2004/05. In 2010/11 the coverage for Mbonambi (Mfolozi) is 62.4%, for uMhlathuze 107.6%, for Ntambanana 38.9%, for uMlalazi 93.3%, for Mthonjaneni 100.9% and for Nkandla 81.6%. The coverage in Uthungulu (87.2%) is a bit higher than the provincial coverage (83.0%), and similar to the national one (86.7%).

6.2.5.5 Measles coverage

The percentage of children under one year in the target area who received their first dose of measles vaccine is available from the DHIS. The coverage is fluctuating, but in general the coverage is lower in 2010/11 compared to 2006/07 (except for Ntambanana). In 2010/11 the coverage for Mbonambi (Mfolozi) is 62.7%, uMhlathuze 124.7%, Ntambanana 40.2%, uMlalazi 80.1%, Mthonjaneni 96.3% and Nkandla 83.9%. The coverage in Uthungulu (89.8%) is higher compared to the province (85.8%) and similar to the national one (91.9%).

6.2.5.6 Rotavirus coverage

The percentage of children under one year in the target area who received their first dose of rotavirus vaccine is available from the DHIS. The coverage has increased between these years (due to the fact that in 2009/10 the vaccine was first introduced into the program). In 2010/11 the coverage for Mbonambi (Mfolozi) is 68.0%, uMhlathuze 120.2%, Ntambanana 46.0%, uMlalazi 91.3%, Mthonjaneni 68.4%, Nkandla 74.4%. The coverage in Uthungulu (89.1%) is exactly the same as the provincial coverage and higher than the national one (81.6%).

6.2.5.7 Baby PCR testing coverage

Data on the proportion of infants under 2 months born to HIV positive mothers who received a PCR test were calculated for the DHB using data from the National Health Laboratory Service (NHLs), antenatal surveys and DHIS data on live births. This was available at district and provincial level in 2010/11 and national level from 2008/09 to 2010/11. In 2010/11 the level in Uthungulu (52.1%) is higher than the KwaZulu-Natal level (42.1%) and similar to the country level (52.6%). At national level, there was a steady increase over the three years.

6.2.6 Input indicators

6.2.6.1 Non-hospital PHC expenditure per capita

Data on the expenditure per capita on PHC (non-hospital), i.e. the total amount spent on non-hospital PHC health services per uninsured person, are available from the DHB 2010/11 for 2005/06 to 2010/11 and show an increase at district, provincial and national level over this period in real (inflation-adjusted) 2010/11 prices. In 2010/11 the level in Uthungulu (R374.0) is lower than the provincial level (R430.4) as well as the national level (R513.9).

6.2.7 Outcome indicators

6.2.7.1 Diarrhoea incidence

The diarrhoea incidence among children under five years is available from the DHIS. Incidence is fluctuating over time, but for all levels the incidence is lower in 2010/11 compared to 2004/05. In 2010/11 the incidence is 114.0 per 1 000 in Mbonambi (Mfolozi), 185.9 in uMhlathuze, 109.5 in Ntambanana, 228.6 in uMlalazi, 141.7 in Mthonjaneni, 191.2 in Nkandla. In the same year, the incidence in Uthungulu (178.1) is higher compared to the provincial level (156.0) and especially the national level (109.3).

6.2.7.2 PCR positivity

Data on the proportion of PCR tests that conclude that a baby is HIV positive are available from the NHLs at district and provincial level in 2010/11 and national level from 2008/09 to 2010/11. In 2010/11, the level in Uthungulu (3.5%) is similar to the provincial (3.2%) and country level (3.5%). At the national level there has been a steady decrease over the 3 years.

6.2.8 Impact indicators

6.2.8.1 Stillbirth rate

Data on the stillbirth rate (SBR; number of babies born dead/1 000 births in facility) are available from the DHIS and the rate is quite stable over time for those local municipalities with a considerable number of hospital births (uMhlathuze, uMlalazi, Mthonjaneni, Nkandla), but in 2010/11 generally lower than in 2004/05. In 2010/11, the rate in Mbonambi (Mfolozi) is 32.9, uMhlathuze 27.7, Ntambanana 55.6, uMlalazi 21.4, Mthonjaneni 11.1 and Nkandla 20.2. In Uthungulu (24.7) the rate is slightly higher than in the province (22.9) and the country (23.0).

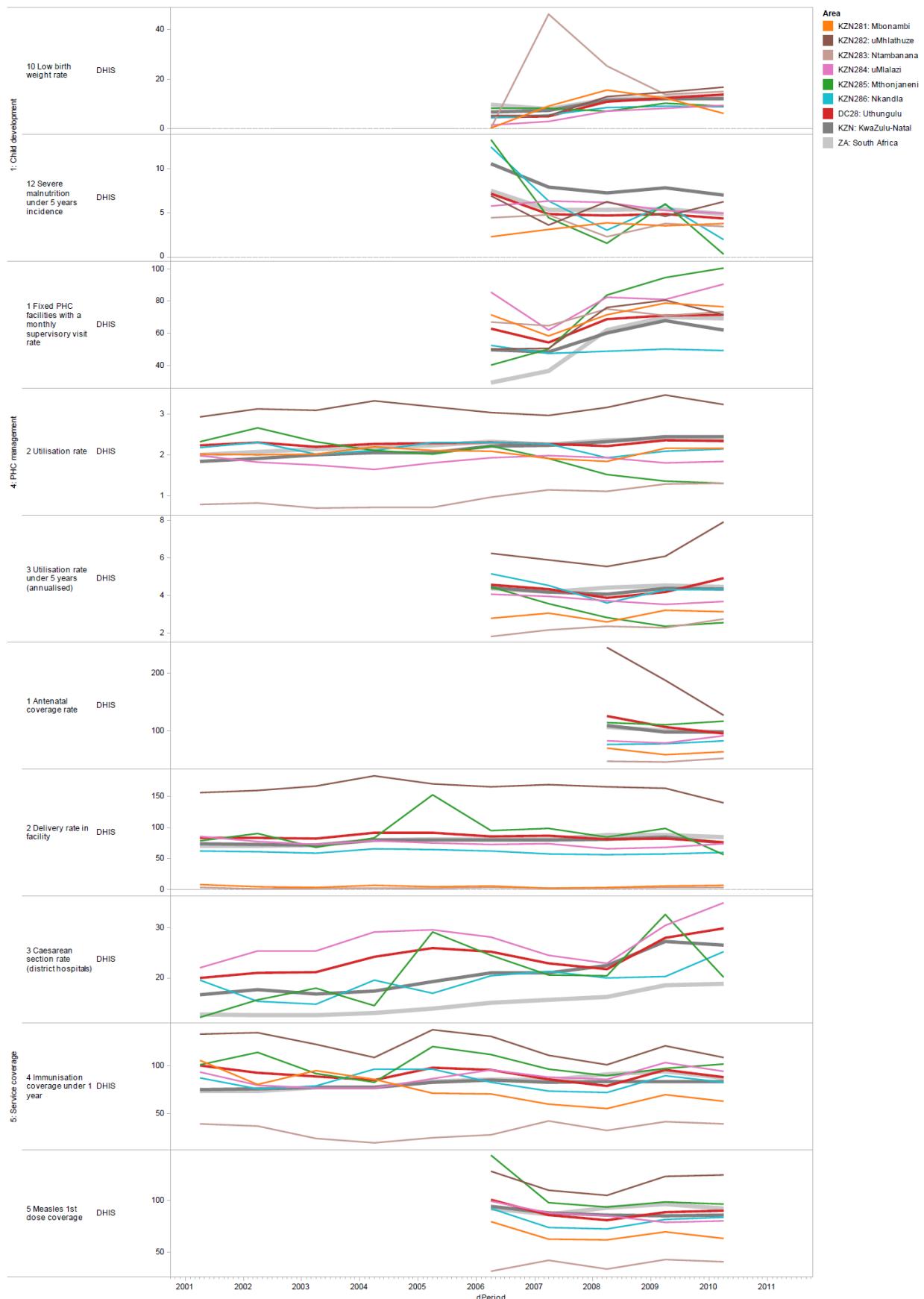
6.2.8.2 Perinatal mortality rate

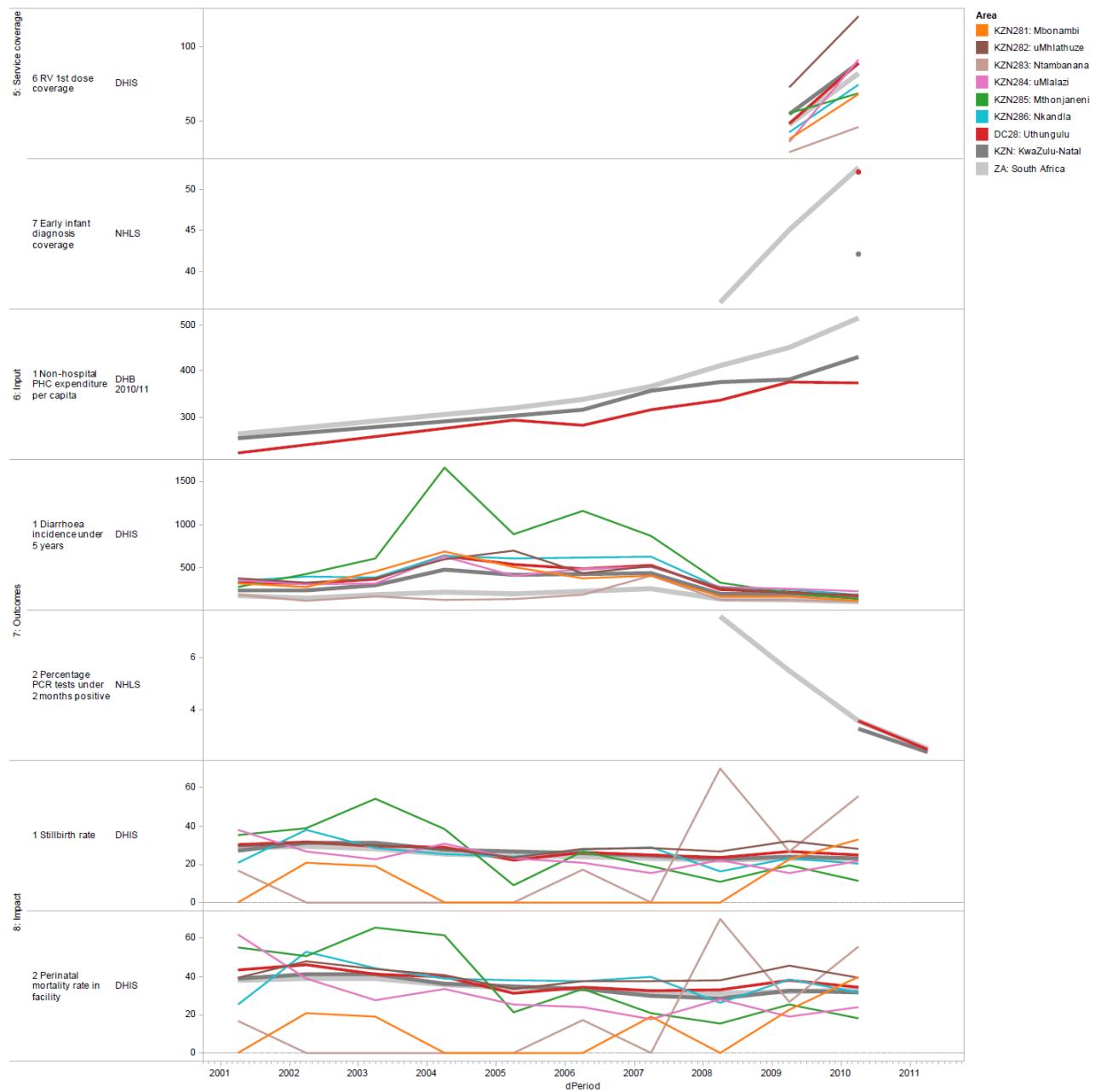
Data on the perinatal mortality rate (PNMR; the sum of stillbirths plus those babies dying within 7 days of life/1 000 births in facility) are available from the DHIS and the rate is quite stable over time for those local municipalities with a considerable number of hospital births (uMhlathuze, uMlalazi, Mthonjaneni, Nkandla), but in 2010/11 generally lower than in 2004/05 (except for the province which stayed the same). In 2010/11 the rate in Mbonambi (Mfolozi) is 39.5, uMhlathuze 39.2, Ntambanana 55.6, uMlalazi 23.8, Mthonjaneni 18.0, Nkandla 31.5. In Uthungulu (34.1) the rate is slightly higher than in the province (31.6) and the country (32.8).

6.2.8.3 Maternal mortality

The maternal mortality rate (maternal deaths e.g. due to pregnancy, delivery, per 100 000 live births in facility) is available from the DHIS for 2010/11. In uMhlathuze it is 300.0, uMlalazi 218.8 and Mthonjaneni 172.9. In Uthungulu (237.0) the rate is considerably higher than the provincial level (172.3) as well as the country level (135.4). However, the DHIS data must be interpreted with some caution as they are incomplete and only include deaths in facilities. The maternal mortality rate recorded by DHIS for Uthungulu is in line with the level of maternal mortality recorded by the National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD).

Figure 25: Selected indicator trends for Uthungulu and South Africa





6.3 Nkangala District Municipality

6.3.1 Socio-demographic status

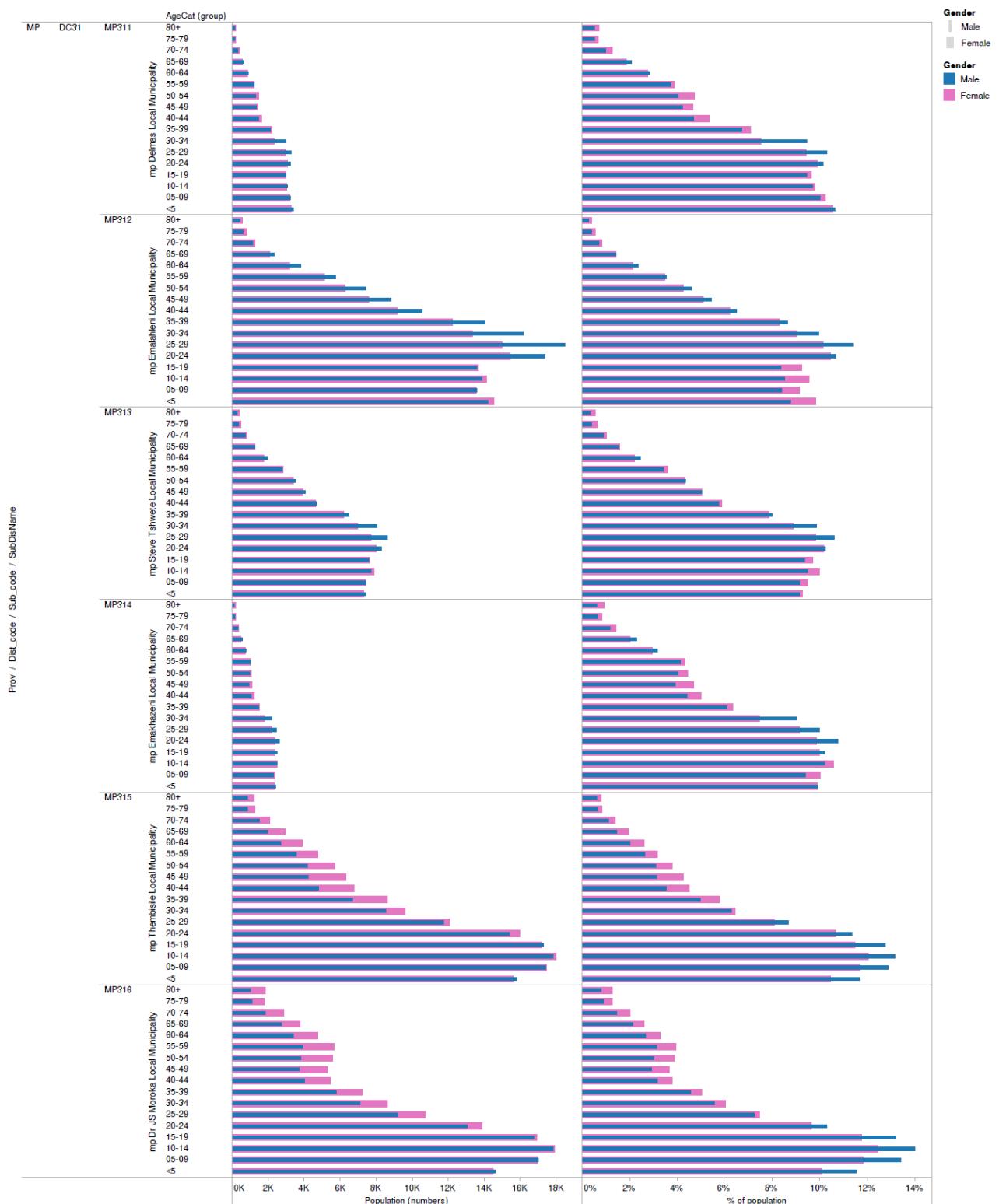
6.3.1.1 Population

Nkangala District Municipality (DC31) is part of Mpumalanga Province. It consists of 6 local municipalities: Victor Khanye (Delmas) (MP311), Emalahleni (MP312), Steve Tshwete (Middelburg) (MP313), Emakhazeni (Highlands) (MP314), Thembisile (MP315) and Dr JS Moroka (MOP316).

The total population (NDoH/HISP 2001-2016) of each of these 6 local municipalities has been increasing over the years. The 2012 estimated population of Victor Khanye (Delmas) is 63 308, of Emalahleni 310 879, of Steve Tshwete 160 351, of Emakhazeni 48 500, of Thembisile 284 874 and of Dr JS Moroka 270 964. Emalahleni, Thembisile and Dr JS Moroka make up 76% of the population of Nkangala District (1 138 858) (and therefore the values for these sub-districts will have a large influence on the district-values for most indicators).

The population under one year showed a decrease from 2005 to 2010 and then stabilised towards 2012. The 2012 estimated population under one year of Victor Khanye (Delmas) is 1 316, of Emalahleni 5 656, of Steve Tshwete 2 899, of Emakhazeni 943, of Thembisile 6 172 and of Dr JS Moroka 5 724. The estimated population under one year in Nkangala District in 2012 is 22 710.

Figure 26: Population pyramid (number and % of population by age group and gender), Nkangala, 2011



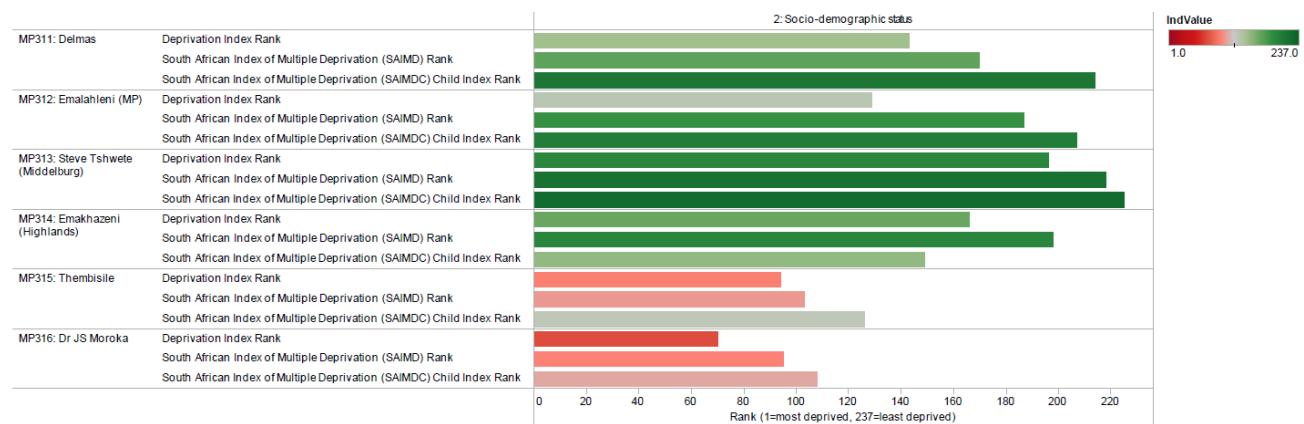
6.3.1.2 Deprivation index and socio-economic quintile

The District Health Barometer (DHB) provides data on the Deprivation Index (DI) rank for the municipalities for 2007: Dr JS Moroka is the most deprived (70), followed by Thembisile (94), Emalahleni (129), Victor Khanye (Delmas) (143), Emakhazeni (166) and Steve Tshwete (196). According to the South African Index of Multiple Deprivation (SAIMD) rank for the same year Victor Khanye (Delmas) and Emalahleni (MP) changed positions, the rest stayed the same: Dr JS Moroka

(95), Thembisile (103), Victor Khanye (Delmas) (170), Emalahleni (187), Emakhazeni (198) and Steve Tshwete (218). Based on the SAIMD Child (SAIMDC) rank, Emakhazeni and Victor Khanye (Delmas) changed positions compared to the SAIMD rank: Dr JS Moroka (108), Thembisile (126), Emakhazeni (149), Emalahleni (207), Victor Khanye (Delmas) (214), Emalahleni and Steve Tshwete (214).

The same sources also provide information on the Socio-economic Quintile (SEQ) (1=poor, 5=best). According to the DHB Thembisile and Dr JS Moroko fall into SEQ 3, Emalahleni and Victor Khanye (Delmas) in SEQ 4, and Emakhazeni and Steve Tshwete in the highest quintile (SEQ 5). According to the SAIMDC, Thembisile and Dr JS Moroka fall into SEQ 3, Victor Khanye (Delmas) and Emalahleni into SEQ 4, and Steve Tshwete and Emakhazeni into SEQ 5. Finally, according to the SAIMDC Thembisile and Dr JS Moroka fall into SEQ 3, Emakhazeni in SEQ 4, and Victor Khanye (Delmas), Emalahleni and Steve Tshwete in SEQ 5.

Figure 27: DI, SAIMD and SAIMDC rank, Nkangala, 2007



6.3.1.3 Access to piped water

Data on the percentage of households with access to piped water are available from the Community Survey (CS) 2007: Dr JS Moroka scores lowest with 70.9%, the other local municipalities are all above 90%: Victor Khanye (Delmas) 90.8%, Emalahleni 98.2%, Steve Tshwete 95.1%, Emakhazeni 93.2% and Thembisile 96.4%. Nkangala scores 91.6% and this is slightly above the level of Mpumalanga (91.1%) and the national figure (88.7%). The General Household Survey (GHS) provides figures for the province and country for 2009 and 2010 which are 87.3% and 87.4% for Mpumalanga and 89.3%, for both years, for South Africa.

6.3.1.4 Drinking water quality

The Blue Drop 2011 score classifies Thembisile (27.8%) as 'Significant Improvement Required in Drinking Water Quality Management (DWQM)'; Emalahleni as 'Improvement Required in DWQM', scoring 46.9%. Dr JS Moroka (84.4%) and Emakhazeni (83.7%) scores represents 'Very Good DWQM'. Steve Tshwete (96.5%) is classified as 'Managing Drinking Water Quality with Excellence'. No data are available for Victor Khanye (Delmas). See Figure 6: Blue Drop scores by district and municipality, 2011.

6.3.1.5 Waste water management

The Green Drop 2011 score classified Victor Khanye (Delmas) (28.5%) and Thembisile (29.6%) as 'Critical state, need urgent intervention for all aspects of the wastewater'; Emalahleni as 'Very poor performance, need targeted intervention towards gradual sustainable improvement', scoring 45.6%; Dr JS Moroka (58.6%), Emakhazeni (70.2%) and Steve Tshwete (76.1%) scored 'Average performance, ample room for improvement'. See Figure 7: Green Drop scores by district and municipality, 2011.

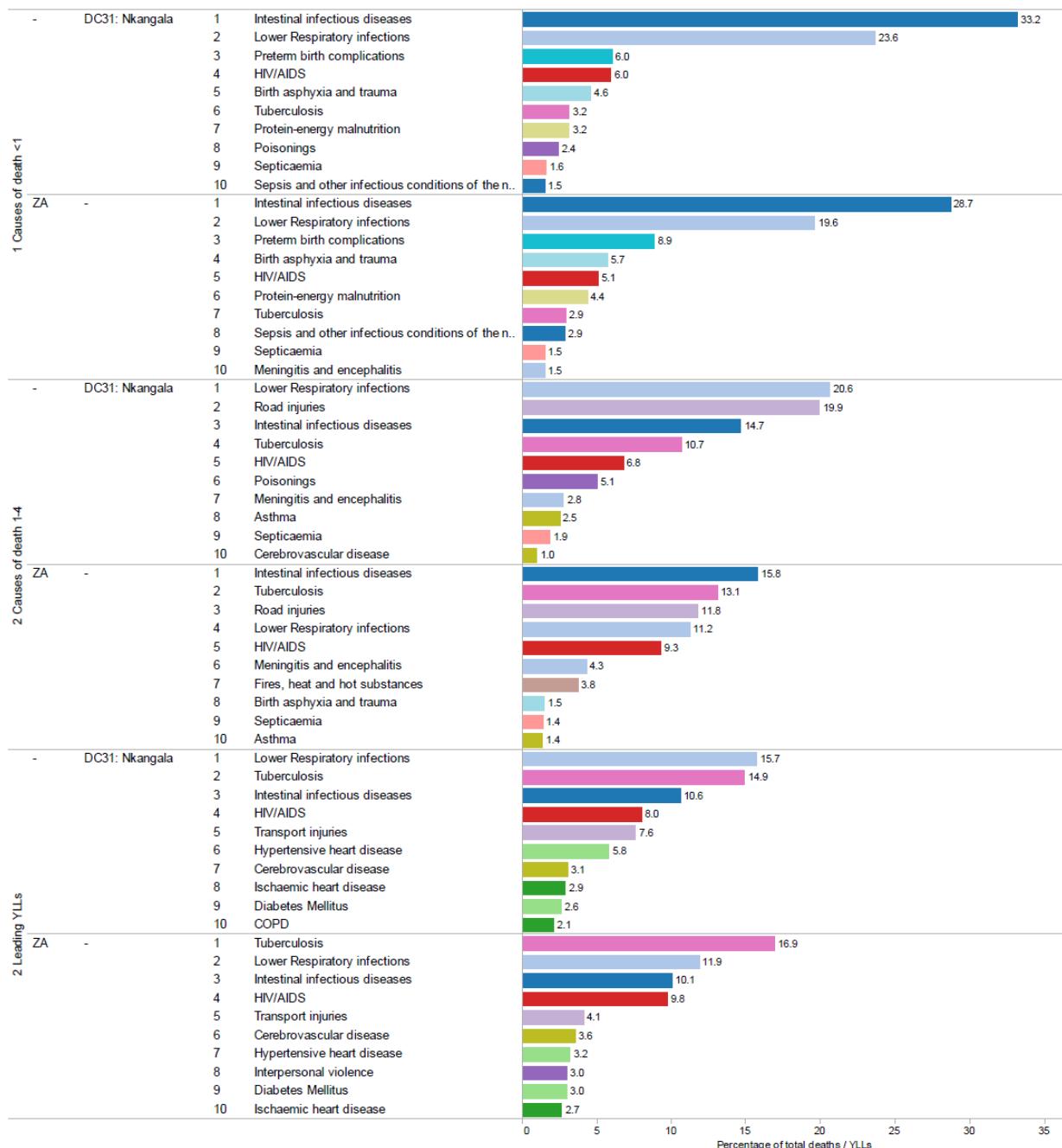
6.3.2 Child Development Indicators

6.3.2.1 Leading causes of death of young children

The leading causes of death of young children are given at district level for 2008 (MRC analysis of Statistics SA data). These figures need to be interpreted with some caution, due to incompleteness of vital registration data (especially in children and particularly in the 1-4 age category) and incorrectness of the data (ill-defined and inappropriate causes of death). The top 10 for children under one year is given in Figure 28, with intestinal infectious diseases (33.2%) being the most frequent, followed by lower respiratory infections (23.7%) and preterm birth complications (6.0%). The top three in the district is similar to that of the country: intestinal infectious diseases (28.7%), lower respiratory infections (19.6%) and preterm birth complications (8.9%).

For children aged 1-4 lower respiratory infections are the most frequent in the district (20.6%), followed by road injuries (19.9%) and intestinal infectious diseases (14.7%). However, the top three diseases in the country are: intestinal infectious diseases (15.8%), tuberculosis (13.1%) and road injuries (11.8%).

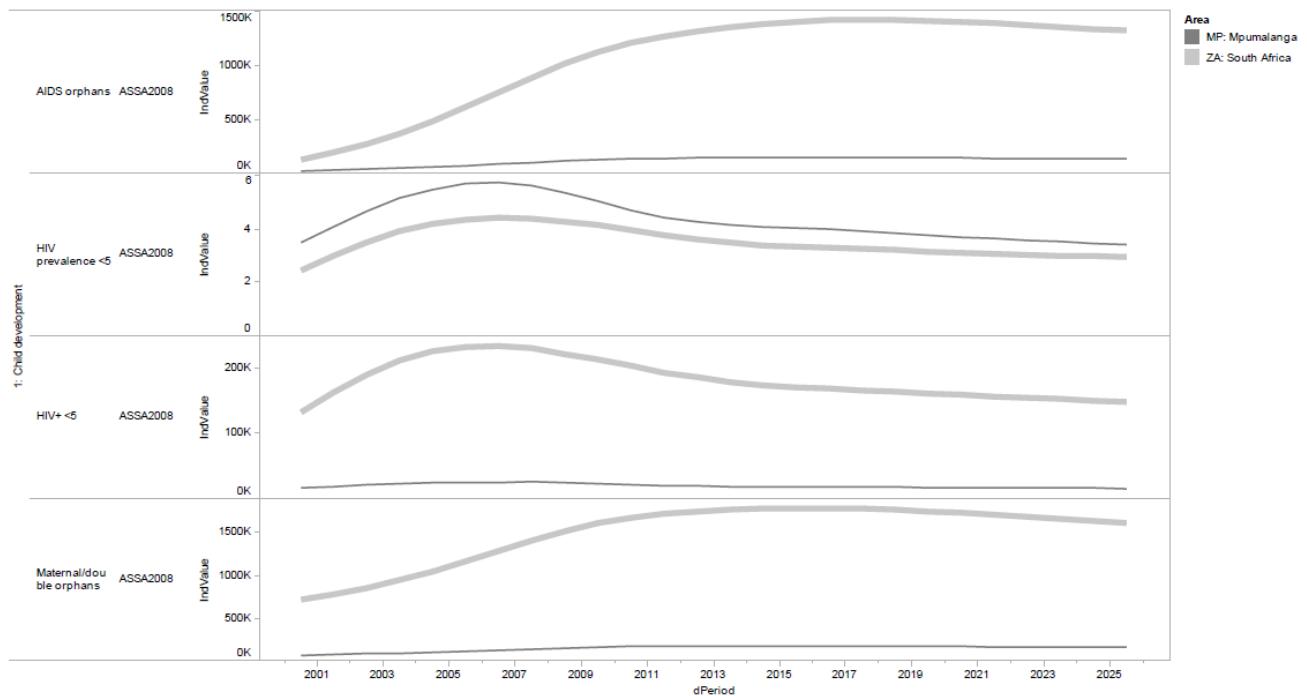
Figure 28: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008



6.3.2.2 Young children infected with HIV

The number of HIV positive children under five years as well as the prevalence (%) of HIV in this age group is available from the ASSA2008 model for Mpumalanga and South Africa. In Mpumalanga the prevalence (number) was 5.5% (22 163) in 2005 and started decreasing from 2009 to an estimated 4.4% (18 161) in 2012. The national data follow a similar pattern, but with a lower prevalence (3.8%) in 2012.

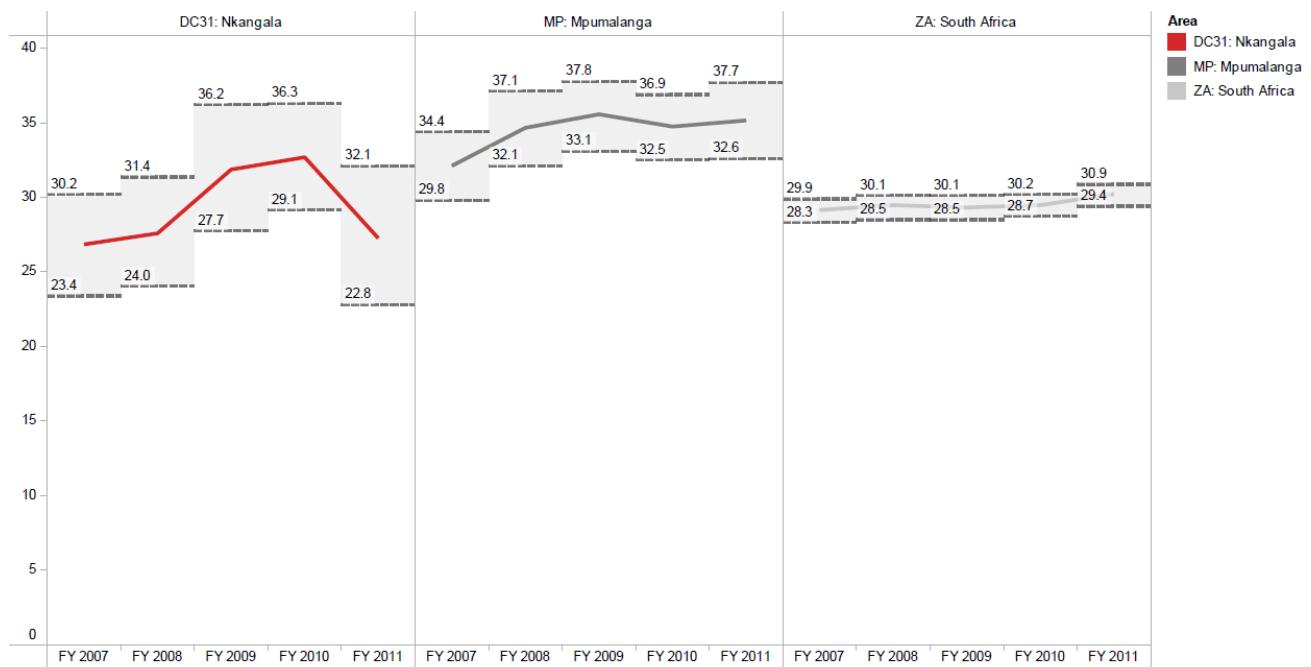
Figure 29: Indicators based on ASSA2008 model for Mpumalanga and South Africa, 2000-2025



6.3.2.3 Pregnant women infected with HIV

The prevalence (%) of HIV among ANC clients tested is available from the antenatal surveys (and the numbers have been calculated based on that) for Nkangala, Mpumalanga and South Africa. In Nkangala prevalence has been increasing from 26.8% (6 888) in 2006 to 32.6% (7 843) in 2009, but showed a decrease in 2010 to 27.2% (6 553). The provincial HIV prevalence increased from 2006 to 2009 and then stabilised. In 2010 it is a bit higher compared to the district (35.1%). The national HIV prevalence shows a slightly increasing trend over this time period (not statistically significant) and is slightly higher compared to the district in 2010 (30.2%).

Figure 30: HIV prevalence among antenatal clients tested (survey) with 95% CI, FY 2007 - FY 2011



6.3.2.4 Orphans

The number of maternal/double orphans (children 0-17 years whose mother has died, whether or not father is alive) as well as the prevalence of orphanhood is available from different sources and at different levels. The CS 2007 gives the following prevalences and numbers: with 9.0% (1 054) Emakhazeni has the highest prevalence, followed by Dr JS Moroka 8.2% (8 967), Victor Khanye (Delmas) 7.4% (1 456), Thembisile 6.3% (7 658), Emalahleni 6.2% (69 074) and then Steve Tshwete 4.8% (2 683). The prevalence in Nkangala (6.7%; 30 892) is a bit lower compared to that of Mpumalanga (7.6%) and South Africa (7.1%). The GHS also gives similar data for 2010, but only for Mpumalanga (9.7%) and South Africa (8.5%), which is in line with the increasing trend in the number of orphans as can be seen from the ASSA2008 data presented below.

The ASSA2008 model estimates the number of maternal/double orphans as well as specifically those due to AIDS for Mpumalanga and South Africa. The numbers show a large increase over time. For Mpumalanga from 94 441 in 2005 to 163 174 in 2012 (factor 1.7) for the maternal/double orphans and from 53 851 in 2005 to 131 613 in 2012 (factor 2.4) for the AIDS orphans. For South Africa these figures are: 1 040 962 to 1 712 677 (factor 1.6) and from 478 855 in 2005 to 1 264 771 in 2012 (factor 2.6).

6.3.2.5 Low birth weight

Data on the prevalence of low birth weight (under 2 500 gram) in facilities are available from the DHIS. It is fluctuating over time, although in general the prevalence is higher in 2010/11 compared to 2007/8. In Victor Khanye (Delmas) the prevalence is 10.5% in 2010/11, in Emalahleni 14.3%, in Steve Tshwete 11.1%, in Emakhazeni 9.3%, in Thembisile 11.1% and in Dr JS Moroka 9.9%. In 2010/11 the prevalence in Nkangala (11.8%) is somewhat higher compared to Mpumalanga (9.8%), but lower compared to the national level (13.1%).

6.3.2.6 Malnutrition

Data on the prevalence of stunting (low height for age) are only available on provincial and national level from different sources which cover different age categories of children (see Methodology section for more detail). Mpumalanga: 17.8% in 2005 (National Food Consumption Survey – NFCS, age 1-9 years), 11.3% in 2008 (National Youth Risk Behaviour Survey – NYRBS, Grade 8-11). South Africa:

18.0% in 2005 (NFCS), 17.1% (National income Dynamics Study - NiDS Health Wave 1, age 6 months to 14 years) in 2008 and a much lower estimate of 13.1% (NYRBS) also in 2008.

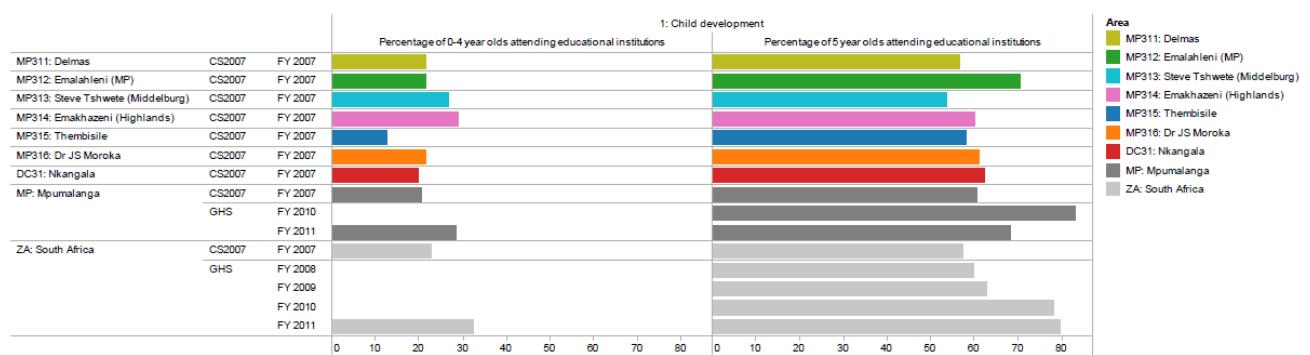
Data on the prevalence of severe malnutrition (weight below 60% of expected) among under fives are available from the DHIS. It is fluctuating over time, with four local municipalities having a higher value in 2010/11 compared to 2006/07 (Victor Khanye (Delmas), Steve Tshwete, Emakhazeni, Thembisile) while two have a lower value (Emalahleni and Dr JS Moroka). In 2010/11 Victor Khanye (Delmas) has a prevalence of 3.1%, Emalahleni 7.6%, Steve Tshwete 4.0%, Emakhazeni 3.9%, Thembisile 2.6% and Dr JS Moroka 2.4%. In Nkangala District it was 4.1% in 2010/11 and the latter is slightly higher compared to the prevalence in Mpumalanga (3.6%), but lower compared to the national level (4.8%).

6.3.2.7 Pre-school enrolment

Pre-school attendance for 0-4 year olds as well as for 5 year olds is available from the CS 2007. For the 0-4 year olds Thembisile (12.6%) has the lowest attendance, followed by Emalahleni and Dr JS Moroka (both 21.3%), Victor Khanye (Delmas) (21.6%), Steve Tshwete (26.7%) and Emakhazeni (29.0%). The level for Nkangala District (19.9%) is similar compared to the provincial (20.6%) and national (22.6%) level. The GHS reports a provincial attendance for 0-4 years olds of 28.5% and a national one of 32.3% in 2010.

As expected, pre-school attendance for 5 year olds is higher. According to the CS 2007 Steve Tshwete has the lowest attendance with 53.7%, followed by Victor Khanye (Delmas) with 56.6%, Thembisile (58.1%), Emakhazeni with 60.1%, Dr JS Moroka with 60.9% and Emalahleni with 70.5%. The level for Nkangala District (62.3%) is slightly higher compared to the provincial (60.6%) and national level (57.4%). The GHS reports a provincial attendance for 5 year olds of 68.4% and a national one of 79.6% in 2010.

Figure 31: Pre-school attendance in children age 0-4 years and 5 years old, FY 2007 - FY 2011



6.3.3 Burden of disease

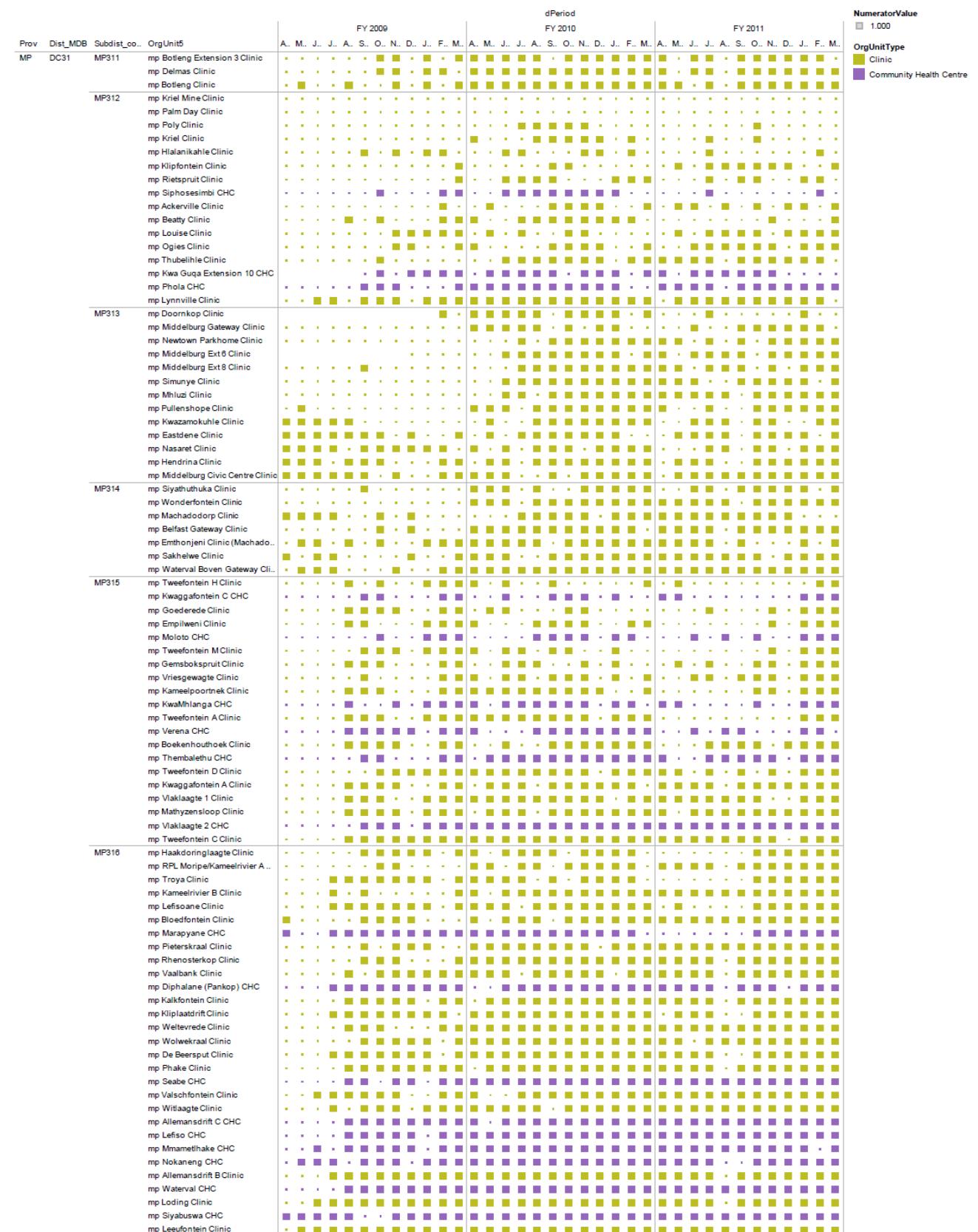
The leading years of life lost (YLLs) for the total population are given at district level for 2008 (MRC). The top 10 is given in the graph in the section on leading causes of death, with lower respiratory infections accounting for 15.8%, tuberculosis for 14.9% and intestinal infectious diseases for 10.6% of YLLs. The top three diseases is the same compared to the country, although the order of the first two diseases is different: tuberculosis 16.9%, lower respiratory infections 11.9 % and intestinal infectious diseases 10.1% of YLLs. For the district, the proportion of YLLs due to communicable diseases/maternal/perinatal/nutritional disorders is 35.4%, for non-communicable diseases (NCDs) 30.7%, for HIV related and TB 23.0%, and for injuries 10.9%. See Figure 28: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008.

6.3.4 PHC management and process indicators

6.3.4.1 Clinic supervision rate

The fixed PHC facilities with a monthly supervisory visit rate is available from the DHIS. In general there is an increasing trend from 2005/06 to 2009/10 and then a decrease in 2010/11. In 2010/11 the levels were 80.6% in Victor Khanye (Delmas), 44.3% in Emalahleni, 69.2% in Steve Tshwete, 82.1% in Emakhazeni, 58.8% in Thembisile and 88.2% in Dr JS Moroka. The level in Nkangala (70.0%) is lower than the provincial level (76.2%), but similar to the national level (68.8%).

Figure 32: Clinic supervision rate per facility (monthly), Nkangala, 2008/09 - 2010/11



Note: The monthly value should always be a zero (no visit this month) or a one (one or more visits this month), represented as a dot or a square block, respectively.

6.3.4.2 PHC utilisation rate

The PHC utilisation rate (rate at which PHC services are utilised by the catchment population) is available from the DHIS. In general the numbers stayed the same between 2004/05 and 2010/11, but with the level being somewhat higher in 2010/11, except for Dr JS Moroka (same) and Steve Tshwete (lower). In 2010/11, the values were: 1.2% in Victor Khanye (Delmas), 1.9% in Emalahleni, 1.9% in Steve Tshwete, 2.3% in Emakhazeni, 1.8% in Thembisile, 2.2% in Dr JS Moroka and 1.9% in Nkangala. In 2010/11 the province scored somewhat higher (2.2%) than the district and the country (2.3%) as well.

6.3.4.3 Under 5 PHC utilisation rate

In general, the under 5 PHC utilisation rate (rate at which PHC services are used by children under five years) is also relatively stable over the period 2006/07-2010/11, but with the level being somewhat higher in 2010/11 except for Dr JS Moroka. In 2010/11 the rate of Victor Khanye (Delmas) is 2.3%, Emalahleni 4.7%, Steve Tshwete 4.9%, Emakhazeni 4.5%, Thembisile 3.9%, Dr JS Moroka 4.6%. The level of Nkangala is 4.4%, which is similar to the provincial level (4.7%) and the national one (4.4%).

6.3.5 Service coverage

Note that the service coverage indicators use denominators based on population estimates and therefore could be incorrect, which could lead to percentages above 100.

6.3.5.1 Antenatal care coverage rates

The percentage of pregnant women coming for at least one antenatal visit is available from the DHIS. In general there is a decreasing trend between 2008/09 and 2010/11. In 2010/11 the coverage is 101.2% in Victor Khanye (Delmas), 95.1% in Emalahleni, 115.6% in Steve Tshwete, 97.4% in Emakhazeni, 81.5% in Thembisile and 87.4% in Dr JS Moroka. The coverage in Nkangala (92.5%) in 2010/11 is a bit lower compared to the provincial (96.1%) and country (97.5%) level.

6.3.5.2 Delivery rate in facility

The percentage of deliveries taking place in health facilities is available from the DHIS. The rate is quite stable over time in the local municipalities (2004/05 to 2010/11). In 2010/11 the rate for Victor Khanye (Delmas) is 73.8%, Emalahleni 94.8%, Steve Tshwete 95.3%, Emakhazeni 54.8%, Thembisile 66.6%, Dr JS Moroka 56.3%. The rate in Nkangala (74.9%) is lower compared to the provincial rate (84.1%), and the national one (84.0%).

6.3.5.3 Caesarean section rate

The percentage of deliveries for which a Caesarean section is performed (only district hospitals) is available from the DHIS. In general there is an increasing trend from 2004/05 to 2010/11. In 2010/11 the rate for Steve Tshwete is 18.4%, Thembisile 11.1% and Dr JS Moroka 21.9% (note that the other local municipalities do not have district hospitals). The rate in Nkangala (13.1%) is lower than the provincial rate (15.8%) and especially the national one (18.8%).

6.3.5.4 Immunisation coverage under 1 year

The percentage of children under one year in the target area who are fully immunised is available from the DHIS. It is fluctuating over time, but there seems to be an increasing trend from 2004/05 to 2009/10 and then a large decrease in 2010/11. In general the rate in 2010/11 is lower compared to 2004/05 (except for Emakhazeni and South Africa). In 2010/11 the coverage for Victor Khanye (Delmas) is 36.2%, for Emalahleni 62.5%, for Steve Tshwete 85.0%, for Emakhazeni 74.0%, for Thembisile 45.5% and for Dr JS Moroka 67.2%. The coverage in Nkangala (60.9%) is a bit lower than the provincial coverage (67.9%), and especially compared to the national one (86.7%).

6.3.5.5 Measles coverage

The percentage of children under one year in the target area who received their first dose of measles vaccine is available from the DHIS. The coverage is fluctuating, but in general the coverage is a bit lower in 2010/11 compared to 2006/07 (except for Victor Khanye (Delmas) and Emakhazeni). In 2010/11 the coverage for Victor Khanye (Delmas) is 60.0%, Emalahleni 93.2%, Steve Tshwete 99.3%, Emakhazeni 86.2%, Thembisile 80.6% and Dr JS Moroka 84.6%. The coverage in Nkangala (86.3%) is similar compared to the province (83.6%) and a bit lower than the national one (91.9%).

6.3.5.6 Rotavirus coverage

The percentage of children under one year in the target area who received their first dose of rotavirus vaccine is available from the DHIS. The coverage has increased between these years (due to the fact that in 2009/10 the vaccine was first introduced into the program), except for Emalahleni where it stayed the same. In 2010/11 the coverage for Victor Khanye (Delmas) is 54.3%, Emalahleni 64.0%, Steve Tshwete 71.9%, Emakhazeni 90.7%, Thembisile 64.2%, Dr JS Moroka 77.1%. The coverage in Nkangala (68.8%) is similar to the provincial coverage (68.2%) and lower than the national one (81.6%).

6.3.5.7 Baby PCR testing coverage

Data on the proportion of infants under two months born to HIV positive mothers who received a PCR test were calculated for the DHB using data from the National Health Laboratory Service (N HLS), antenatal surveys and DHIS data on live births. This was available at district, provincial and national level from 2008/09 to 2010/11. At all levels there has been a steady decrease over the three years. In 2010/11 the level in Nkangala (50.2%) is similar to the level in Mpumalanga (51.1%) and to the country level (52.6%).

6.3.6 Input indicators

6.3.6.1 Non-hospital PHC expenditure per capita

Data on the expenditure per capita on PHC (non-hospital), i.e. the total amount spent on non-hospital PHC health services per uninsured person, are available from the DHB 2010/11 for 2005/06 to 2010/11 and show an increase at district, provincial and national level over this period in real (inflation-adjusted) 2010/11 prices. In 2011, the expenditure per capita in Nkangala (R412.1) is lower than the provincial level (R444.9) as well as the national level (R513.9).

6.3.7 Outcome indicators

6.3.7.1 Diarrhoea incidence

The diarrhoea incidence among children under five years is available from the DHIS. Incidence is fluctuating over time, but most levels show a decreasing trend overall, with an incidence in 2010/11 that is lower compared to 2004/05 (except for Victor Khanye (Delmas), but this local municipality still has a low incidence). In 2010/11 the incidence is 51.7 per 1 000 in Victor Khanye (Delmas), 55.6 in Emalahleni, 57.5 in Steve Tshwete, 105.8 in Emakhazeni, 41.7 in Thembisile, 95.7 in Dr JS Moroka. In the same year the incidence in Nkangala (63.9) is lower compared to the provincial level (69.4) and especially the national level (109.3).

6.3.7.2 PCR positivity

Data on the proportion of PCR tests that conclude that a baby is HIV positive are available from the N HLS at district, provincial and national level from 2008/09 – 2010/11. At all levels there has been a steady decrease over the three years. In 2011 the level in Nkangala (3.7%) is similar to the provincial (3.8%) and country level (3.5%).

6.3.8 Impact indicators

6.3.8.1 Stillbirth rate

Data on the stillbirth rate (SBR; number of babies born dead/1 000 births in facility) are available from the DHIS and is quite stable over time at most levels, but in 2010/11 generally higher than in 2004/05 (except for Thembisile, South Africa). In 2010/11 the rate in Victor Khanye (Delmas) is 30.8, Emalahleni 33.6, Steve Tshwete 36.6, Emakhazeni 16.1, Thembisile 20.5 and Dr JS Moroka 19.2. In Nkangala (27.6) the rate is slightly higher than in the province (24.3) and the country (23.0).

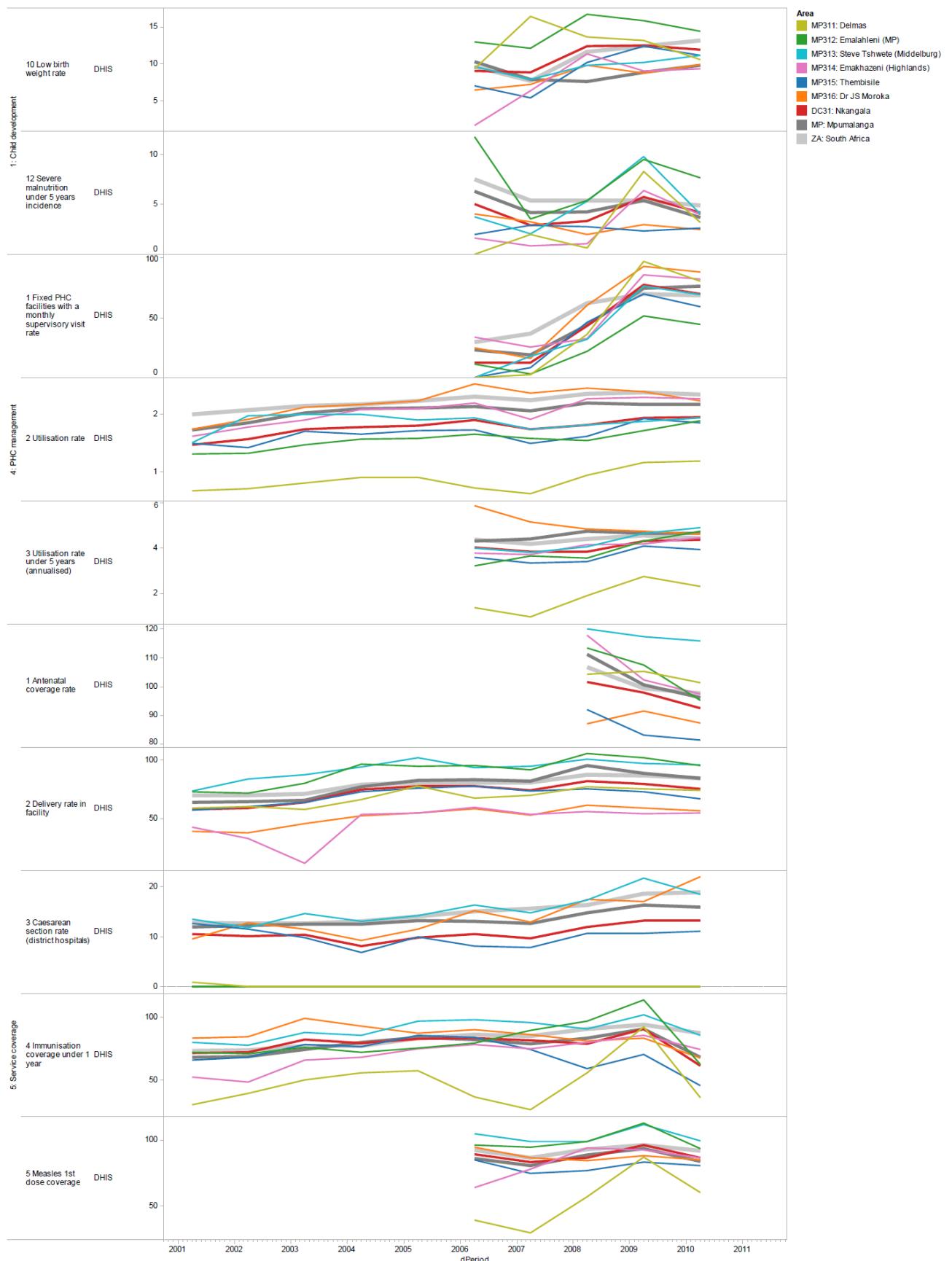
6.3.8.2 Perinatal mortality rate

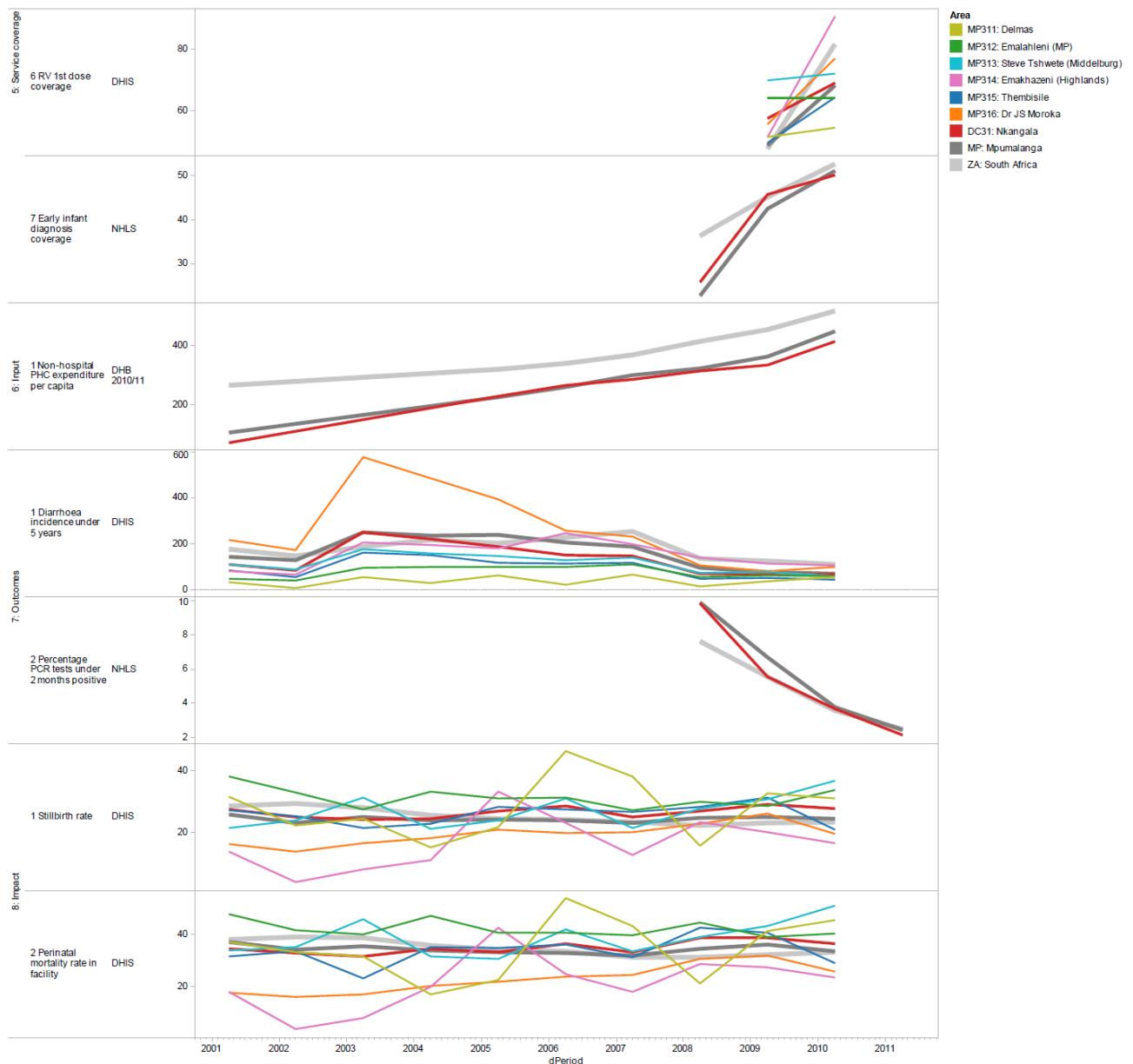
Data on the perinatal mortality rate (PNMR; the sum of stillbirths plus those babies dying within 7 days of life/1 000 births in facility) are available from the DHIS and are quite stable over time at most levels and for some levels higher in 2010/11 compared to 2004/05 (Victor Khanye (Delmas), Steve Tshwete, Nkangala) while for others lower (Emalahleni, Thembisile, Mpumalanga Province, South Africa). In 2010/11 the rate in Victor Khanye (Delmas) is 45.2, Emalahleni 40.1, Steve Tshwete 50.7, Emakhazeni 23.3, Thembisile 28.7, Dr JS Moroka 25.6. In Nkangala (36.2) the rate is slightly higher than in the province (33.2) and the country (32.8).

6.3.8.3 Maternal mortality

The maternal mortality rate (maternal deaths e.g. due to pregnancy, delivery, per 100 000 live births in facility) is available from the DHIS for 2010/11. In Victor Khanye (Delmas) it is 99.2, Emalahleni it is 186.3, Steve Tshwete 209.2, Emakhazeni 182.2, Thembisile 207.4 and Dr JS Moroka 29.6. In Nkangala (160.7) the rate is similar to the provincial one (160.3) and higher compared to the country level (135.4). However, the DHIS data must be interpreted with some caution as they are incomplete and only include deaths in facilities. The maternal mortality rate recorded by DHIS for Nkangala is in line with the level of maternal mortality recorded by the National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD).

Figure 33: Selected indicator trends for Nkangala and South Africa





6.4 John Taolo Gaetsewe District Municipality

6.4.1 Socio-demographic status

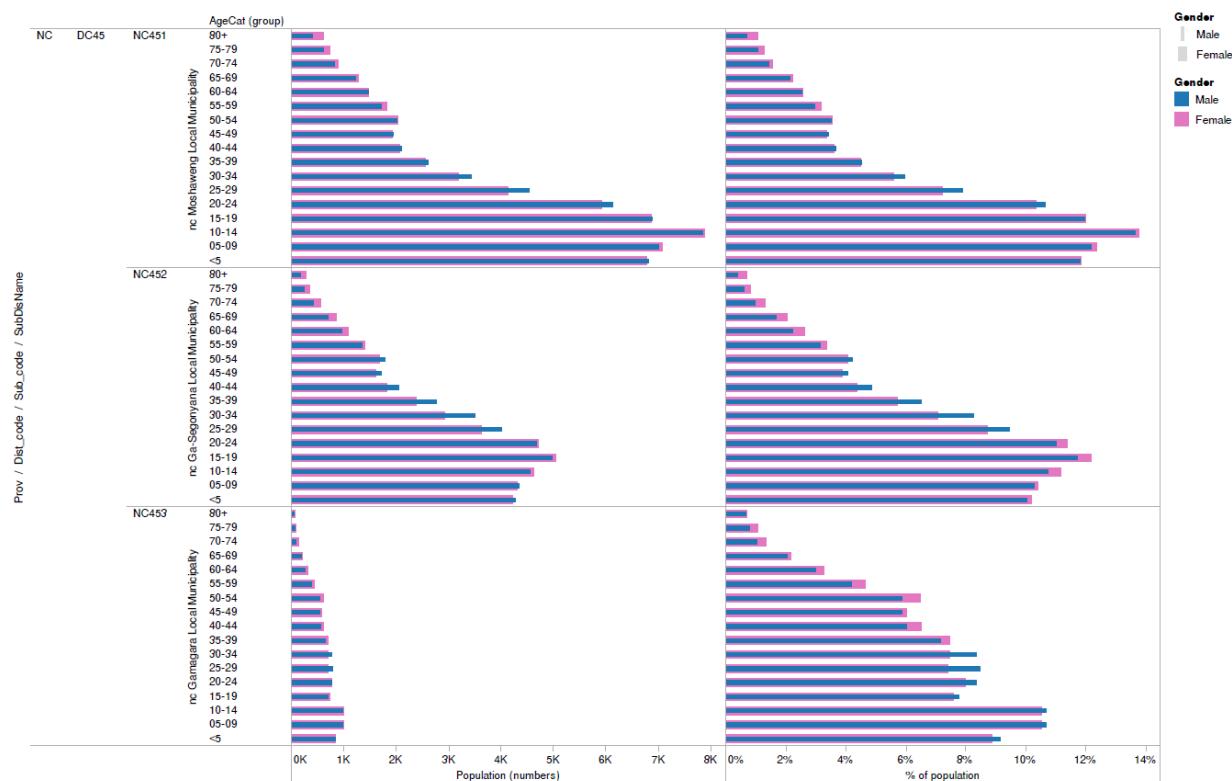
6.4.1.1 Population

John Taolo (JT) Gaetsewe District Municipality (DC45) is part of Northern Cape Province. It consists of four local municipalities: Joe Morolong (Moshaweng (Kudumane)) (NC451), Ga-Segonyana (Kudumane) (NC452), Gamagara (NC453) and Kgalagadi DMA (NCDMA45).^o

The total population (NDoH/HISP 2001-2016) of 2 of the 3 local municipalities has been increasing over the years (Joe Morolong and Ga-Segonyana), while the total population of Gamagara has been decreasing and then stabilized from 2009 onwards. The 2012 estimated population of Joe Morolong is 115 164, of Ga-Segonyana 83 814 and of Gamagara 18 683. Joe Morolong makes up 53% of the population of John Taolo Gaetsewe (217 661) (and therefore the values for this sub-district will have a large influence on the district-values for most indicators).

The population under one year showed a decrease from 2005 to 2008/2009/2010 (depending on the local municipality) and then increased again towards 2012. The 2012 estimated population under one year of Joe Morolong is 2 848, of Ga-Segonyana 1 751 and of Gamagara 306. The estimated population under one year in JT Gaetsewe in 2012 is 4 905.

Figure 34: Population pyramid (number and % of population by age group and gender), JT Gaetsewe, 2011



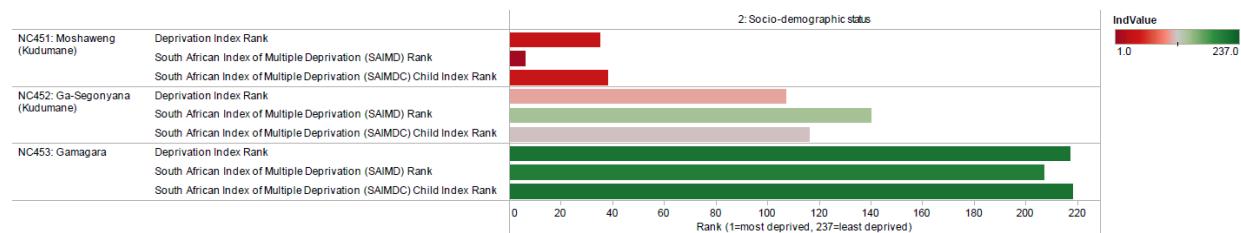
^o Note that this covers the Kalahari national park (included in NC451 from 2011) and therefore is not further reported on. This section uses the current district and sub-district names, but the graphs use the names applicable to the demarcation at the time period covered by the data.

6.4.1.2 Deprivation index and socio-economic quintile

The District Health Barometer (DHB) provides data on the Deprivation Index (DI) rank for the municipalities for 2007: Joe Morolong is the most deprived (35), followed by Ga-Segonyana (107) and Gamagara (217). According to the South African Index of Multiple Deprivation (SAIMD) rank for the same year the same ordering is found: Joe Morolong (6), Ga-Segonyana (140) and Gamagara (207). The same rank order is evident from the SAIMDC as well: Joe Morolong (38), Ga-Segonyana (116) and Gamagara (218).

The same sources also provide information on the Socio-economic Quintile (SEQ) (1=poor, 5=best). According to the DHB, SAIMD and SAIMDC Joe Morolong falls into SEQ 1, Ga-Segonyana into SEQ 3 and Gamagara into SEQ 5. So there is a clear distinction in the level of deprivation between the 3 local municipalities.

Figure 35: DI, SAIMD and SAIMDC rank, JT Gaetsewe, 2007



6.4.1.3 Access to piped water

Data on the percentage of households with access to piped water are available from the Community Survey (CS) 2007: Joe Morolong scores lowest with 80.3%, followed by Ga-Segonyana 98.4% and Gamagara 98.9%. JT Gaetsewe scores 91.8% and this is slightly below the level of Northern Cape (94.4%), but above the national figure (88.7%). The General Household Survey (GHS) provides figures for the province and country for 2009 and 2010 which are 95.9% and 92.5% for Northern Cape and 89.3% for both years for South Africa.

6.4.1.4 Drinking water quality

The Blue Drop 2011 data classifies Ga-Segonyana (37.3%) and Gamagara (49.9%) as ‘Improvement Required in Drinking Water Quality Management (DWQM)’. Joe Morolong is classified as ‘Good DWQM’, scoring 60.08%.

6.4.1.5 Waste water management

The Green Drop 2011 data classifies Gamagara as ‘Critical state, need urgent intervention for all aspects of the wastewater’, scoring 10.5%. Ga-Segonyana is classified as ‘Average performance, ample room for improvement’, scoring 65.8%. No score is available for Joe Morolong.

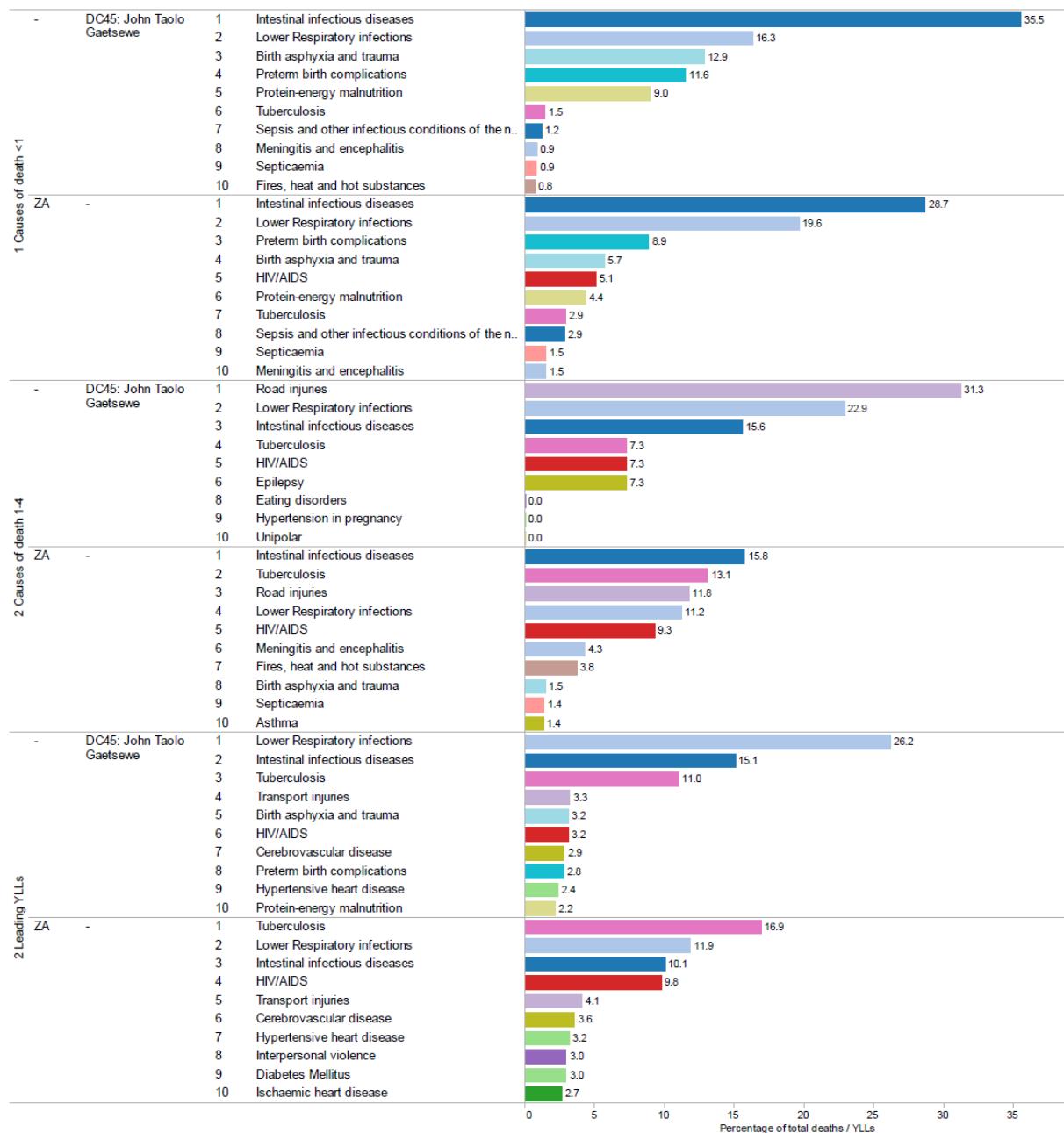
6.4.2 Child Development Indicators

6.4.2.1 Leading causes of death of young children

The leading causes of death of young children are given at district level for 2008 (MRC analysis of Statistics SA data). These figures need to be interpreted with some caution, due to incompleteness of vital registration data (especially in children and particularly in the 1-4 age category) and incorrectness of the data (ill-defined and inappropriate causes of death). The top 10 for children under one year is given in Figure 36, with intestinal infectious diseases (35.5%) being the most frequent, followed by lower respiratory infections (16.4%) and birth asphyxia and trauma (12.9%). The top two in the district is similar to that of the country, while birth asphyxia and trauma is in fourth place at national level: intestinal infectious diseases (28.7%), lower respiratory infections (19.6%) and preterm birth complications (8.9%).

For children aged 1-4, road injuries (31.1%) are the most frequent in the district, followed by lower respiratory infections (22.9%) and intestinal infectious diseases (15.6%). However, the top three diseases in the country are: intestinal infectious diseases (15.8%), tuberculosis (13.1%) and road injuries (11.8%).

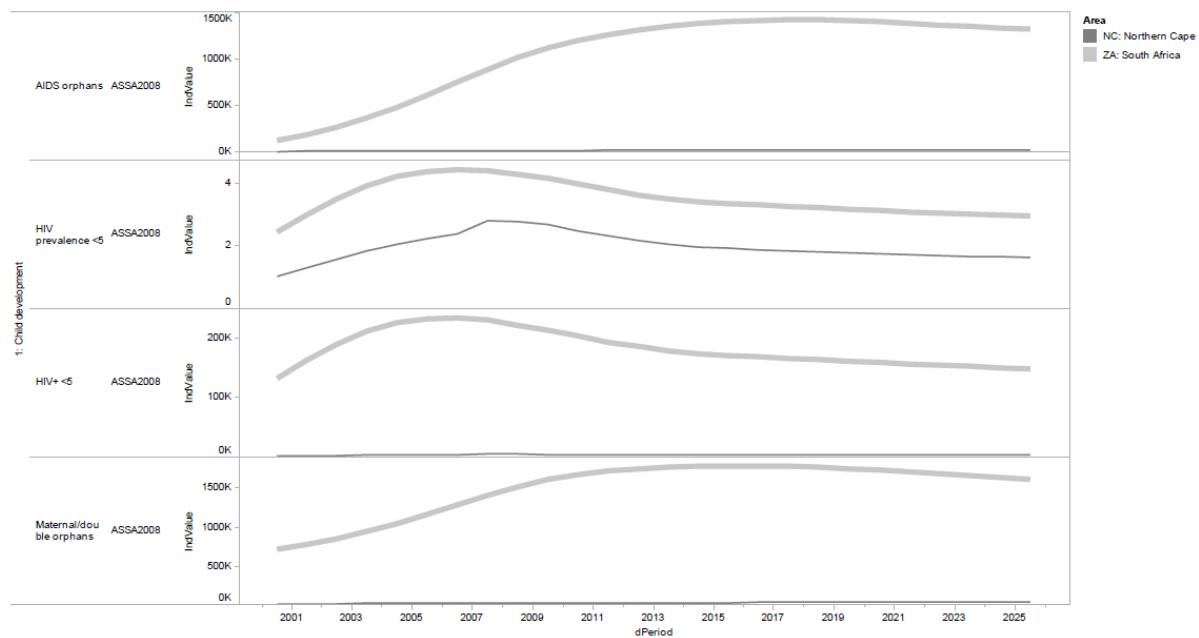
Figure 36: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008



6.4.2.2 Young children infected with HIV

The number of HIV positive children under five years as well as the prevalence (%) of HIV in this age group is available from the ASSA2008 model for Northern Cape and South Africa. In Northern Cape the prevalence (number) was 2.0% (1 818) in 2005, increased to 2.8% (3 271) in 2008, and started decreasing from 2009 to an estimated 2.3% (2 605) in 2012. The national data follow a similar pattern, but with a higher prevalence (3.8%) in 2012.

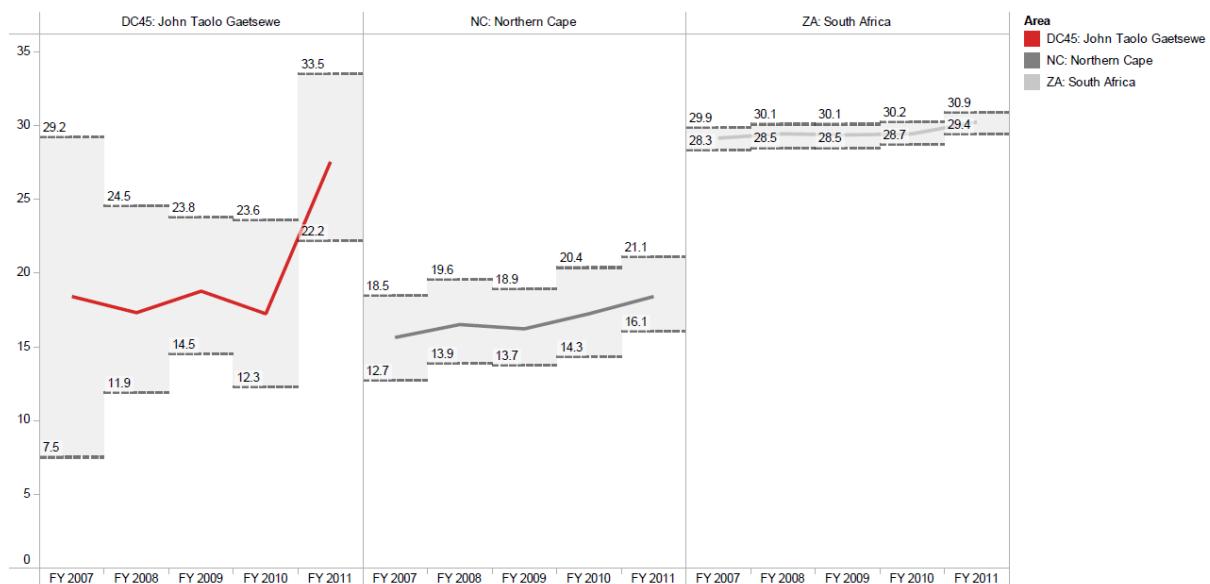
Figure 37: Indicators based on ASSA2008 model for Northern Cape and South Africa, 2000-2025



6.4.2.3 Pregnant women infected with HIV

The prevalence (%) of HIV among ANC clients tested is available from the antenatal surveys (and the numbers have been calculated based on that) for JT Gaetsewe, Northern Cape and South Africa. In JT Gaetsewe it has been stable from 2006-2009 (between 17.2% and 18.7%; 844-957), but then showed a large increase in 2010 to 27.5% (1 393). The provincial HIV prevalence showed an increase, but in 2010 it is lower compared to the district (18.4%). The national HIV prevalence shows a slightly increasing trend over this time period (not statistically significant) and is slightly higher compared to the district in 2010 (30.2%).

Figure 38: HIV prevalence among antenatal clients tested (survey) with 95% CI, FY 2007 - FY 2011



6.4.2.4 Orphans

The number of maternal/double orphans (children 0-17 years whose mother has died, whether or not father is alive) as well as the prevalence of orphanhood is available from different sources and at different levels. The CS 2007 gives the following prevalences and numbers: Joe Morolong (6.3%; 2 066) and Ga-Segonyana (6.3%; 1 735) have the highest prevalence, followed by Gamagara (6.0%; 546). The prevalence in JT Gaetsewe (6.1%; 4 351) is a bit lower compared to that of Northern Cape (6.4%) and South Africa (7.1%). The GHS also gives similar data for 2010, but only for Northern Cape (6.6%) and South Africa (8.5%), which is in line with the increasing trend in the number of orphans as can be seen from the ASSA2008 data presented below.

The ASSA2008 model estimates the number of maternal/double orphans as well as specifically those due to AIDS for Northern Cape and South Africa. The numbers show a large increase over time. For Northern Cape from 13 250 in 2005 to 20 986 in 2012 (factor 1.6) for the maternal/double orphans and from 3 602 in 2005 to 11 758 in 2012 (factor 3.3) for the AIDS orphans. For South Africa, these figures are: 1 040 962 to 1 712 677 (factor 1.6) and from 478 855 in 2005 to 1 264 771 in 2012 (factor 2.6).

6.4.2.5 Low birth weight

Data on the prevalence of low birth weight (under 2 500 gram) in facilities are available from the DHIS. In Joe Morolong it is quite stable over time. In Ga-Segonyana there was a decreasing trend, but with a large increase in 2010/11 (probably due to incorrect numerator data from Tshwaragano hospital). In Gamagara there is a deceasing trend (but with a peak in 2009/10). In Joe Morolong the prevalence is 12.2% in 2010/11, in Ga-Segonyana 15.8% and in Gamagara 13.7%. In 2010/11, the prevalence in JT Gaetsewe (15.7%) is, despite the probable overestimation, lower compared to Northern Cape (19.2%), but higher compared to the national level (13.1%).

6.4.2.6 Malnutrition

Data on the prevalence of stunting (low height for age) are only available at provincial and national level from different sources which cover different age categories of children (see Methodology section for more detail). Northern Cape: 27.7% in 2005 (National Food Consumption Survey – NFCS, age 1-9 years), 19.5% in 2008 (National Youth Risk Behaviour Survey – NYRBS, Grade 8-11). South Africa: 18.0% in 2005 (NFCS), 17.1% (National income Dynamics Study - NiDS Health Wave 1, age 6 months to 14 years) in 2008 and a much lower estimate of 13.1% (NYRBS) also in 2008.

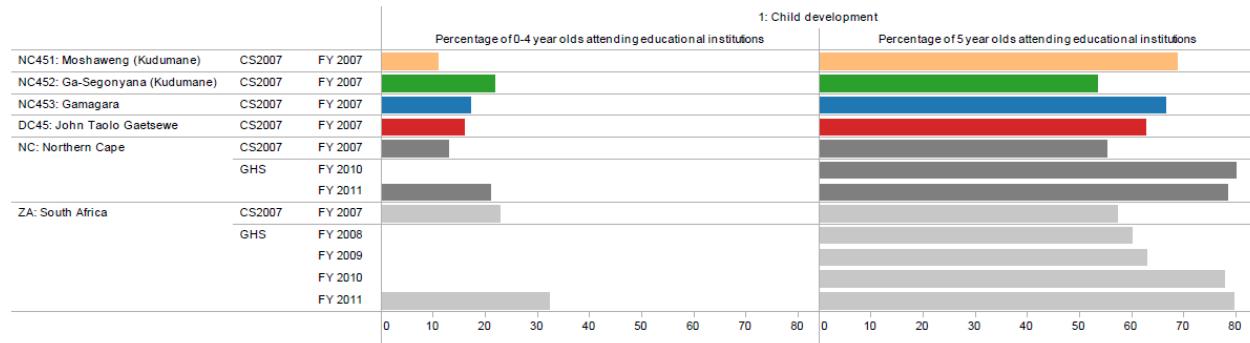
Data on the prevalence of severe malnutrition (weight below 60% of expected) among under fives are available from the DHIS. In Joe Morolong and Gamagara there seems to be an increasing trend, in Ga-Segonyana it is fluctuating over time. In 2010/11 Joe Morolong has a prevalence of 3.2%, Ga-Segonyana 3.2% and Gamagara 4.5%. In JT Gaetsewe it was 3.2% in 2010/11 and the latter is lower compared to the prevalence in Northern Cape (4.9%) and South Africa (4.8%).

6.4.2.7 Pre-school enrolment

Pre-school attendance for 0-4 year olds as well as for 5 year olds is available from the CS 2007. For the 0-4 year olds Joe Morolong (10.9%) has the lowest attendance, followed by Gamagara (17.1%) and Ga-Segonyana (22.0%). The level for JT Gaetsewe (16.0%) is slightly higher compared to the provincial level (13.0%), but lower than the national one (22.6%). The GHS reports a provincial attendance for 0-4 year olds of 21.1% and a national one of 32.3% in 2010.

As expected, pre-school attendance for 5 year olds is higher. According to the CS 2007 Ga-Segonyana has the lowest attendance with 53.6%, followed by Gamagara with 66.4% and Joe Morolong with 68.8%. The level for JT Gaetsewe (62.7%) is slightly higher compared to the provincial (55.2%) and national level (57.4%). The GHS reports a provincial attendance for 5 year olds of 78.3% and a national one of 79.6% in 2010.

Figure 39: Pre-school attendance in children age 0-4 years and 5 years old, FY 2007 - FY 2011



6.4.3 Burden of disease

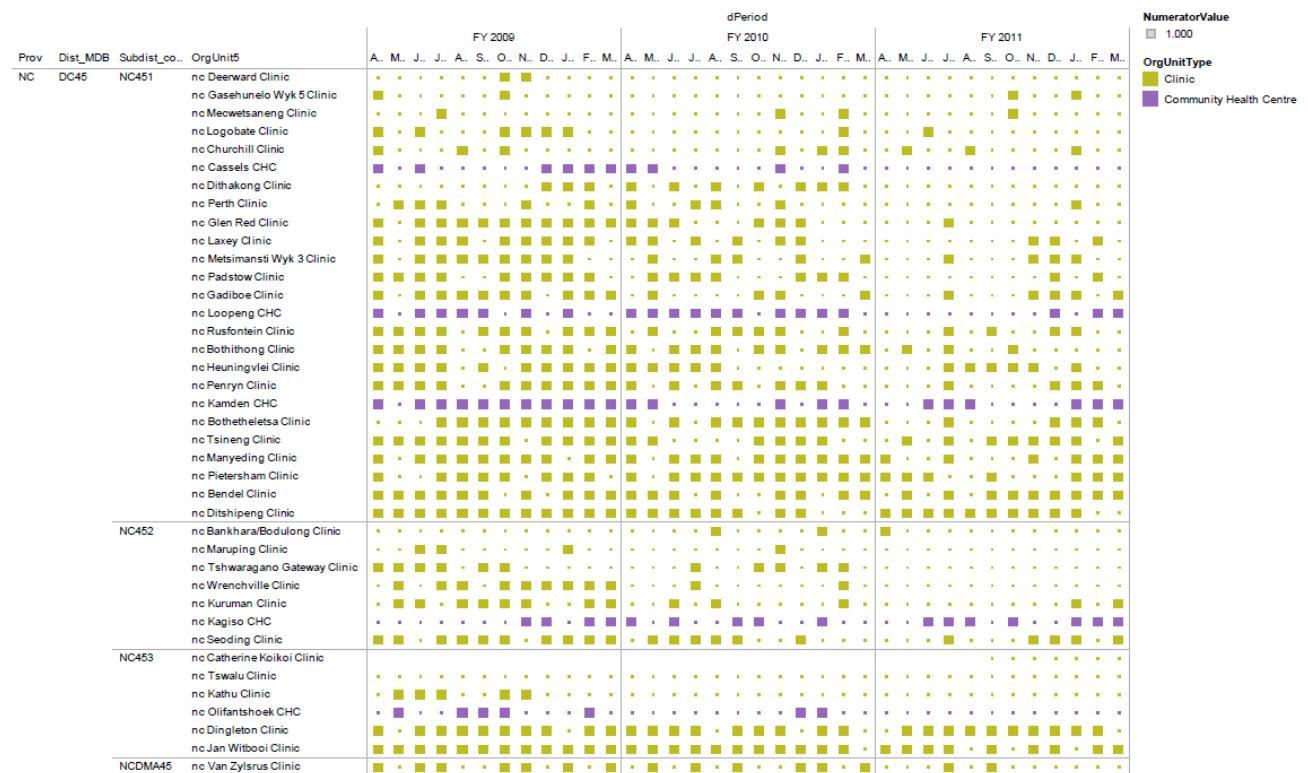
The leading years of life lost (YLLs) for the total population are given at district level for 2008 (MRC). The top 10 is given in Figure 36, with lower respiratory infections accounting for 26.2%, intestinal infectious diseases for 15.1%, and tuberculosis for 11.0% of YLLs. The top three diseases are the same compared to the country, although the order of the diseases is different: tuberculosis 16.9%, lower respiratory infections 11.9 % and intestinal infectious diseases 10.1% of YLLs. For the district, the proportion of YLLs due to communicable diseases/maternal/perinatal/nutritional disorders is 54.7%, for non-communicable diseases (NCDs) 25.2%, for HIV related and TB 14.2%, and for injuries 5.9%. See Figure 36: Leading causes of death (<1 and 0-4 years) and leading causes of YLLs (all ages), 2008.

6.4.4 PHC management and process indicators

6.4.4.1 Clinic supervision rate

The fixed PHC facilities with a monthly supervisory visit rate is available from the DHIS. In general there is an increasing trend from 2005/06 to 2008/09 and then a decrease to 2010/11. In 2010/11 the levels were 31.0% in Joe Morolong, 17.9% in Ga-Segonyana and 28.4% in Gamagara. The level in JT Gaetsewe (27.9%) is higher than the provincial level (19.6%), but much lower compared to the national level (68.8%).

Figure 40: Clinic supervision rate per facility (monthly), JT Gaetsewe, 2008/09 - 2010/11



Note: The monthly value should always be a zero (no visit this month) or a one (one or more visits this month), represented as a dot or a square block, respectively.

6.4.4.2 PHC utilisation rate

The PHC utilisation rate (rate at which PHC services are utilised by the catchment population) is available from the DHIS. Despite fluctuations, the rate in 2010/11 was similar to the rate in 2004/05. In 2010/11 the values were: 2.3% in Joe Morolong, 2.6% in Ga-Segonyana and 5.5% in Gamagara. In JT Gaetsewe it was 2.7% which is in between the provincial (2.9%) and country (2.3%) level.

6.4.4.3 Under 5 PHC utilisation rate

The under 5 PHC utilisation rate (rate at which PHC services are used by children under five years) showed a large increase from 2007/08 to 2008/09 and then decreased a bit in 2010/11 in Joe Morolong and Ga-Segonyana, but in Gamagara showed a steady increase since 2006/07. In 2010/11 the rate of Joe Morolong is 5.2%, Ga-Segonyana 6.1% and Gamagara 7.7%. The level of JT Gaetsewe is 5.7%, which is higher compared to the provincial (4.5%) and national level (4.4%).

6.4.5 Service coverage

Note that the service coverage indicators use denominators based on population estimates and therefore could be incorrect, which could lead to percentages above 100.

6.4.5.1 Antenatal care coverage rates

The percentage of pregnant women coming for at least one antenatal visit is available from the DHIS. In two local municipalities (Joe Morolong and Ga-Segonyana) there is a decreasing trend between 2008/09 and 2010/11, while in Gamagara there is an increasing trend. In 2010/11 the coverage is 74.5% in Joe Morolong, 132.7% in Ga-Segonyana and 202.3% in Gamagara. The coverage in JT Gaetsewe (104.0%) in 2010/11 is higher compared to the provincial (87.9%) and country (97.5%) level.

6.4.5.2 Delivery rate in facility

The percentage of deliveries taking place in health facilities is available from the DHIS. The rate fluctuates over time in Ga-Segonyana and Gamagara (2004/05 to 2010/11) while in Joe Morolong a decreasing trend is seen. In 2010/11 the rate for Joe Morolong is 1.4%, Ga-Segonyana 239.6% and Gamagara 60.0%. Since there are only two hospitals in JT Gaetsewe (both in Ga-Segonyana), the rates are rather meaningless at sub-district level. The rate in JT Gaetsewe (90.1%) is higher compared to the provincial (85.4%) and national rate (84.0%).

6.4.5.3 Caesarean section rate

The percentage of deliveries for which a Caesarean section is performed (only district hospitals) is available from the DHIS. In Ga-Segonyana (the only sub-district with district hospitals) it was stable from 2004/05 to 2007/08 and then steadily decreased to 2010/11. In 2010/11 the rate is 10.9%, and hence the rate for the district is the same. This is lower than the provincial rate (13.1%) and especially the national one (18.8%).

6.4.5.4 Immunisation coverage under 1 year

The percentage of children under one year in the target area who are fully immunised is available from the DHIS. It is fluctuating over time, but in Joe Morolong and Ga-Segonyana lower in 2010/11 compared to 2004/05, while in Gamagara higher. In 2010/11 the coverage for Joe Morolong is 78.9%, for Ga-Segonyana 104.6% and for Gamagara 179.6%, probably reflecting cross-boundary use of services, or possibly due to inaccurate projections of the target population at sub-district level (the population in Gamagara is so small, particularly for children under one year, that even small changes to the numerator will have a dramatic effect on indicator values). The coverage in JT Gaetsewe (94.6%) is higher than the provincial (87.8%) and the national coverage (86.7%).

6.4.5.5 Measles coverage

The percentage of children under one year in the target area who received their first dose of measles vaccine is available from the DHIS. The coverage is fluctuating, but in general the coverage is higher in 2010/11 compared to 2006/07. In 2010/11 the coverage for Joe Morolong is 75.7%, Ga-Segonyana 105.3% and Gamagara 188.2%. The coverage in JT Gaetsewe (93.5%) is slightly higher compared to the province (87.8%) and the country (91.9%).

6.4.5.6 Rotavirus coverage

The percentage of children under one year in the target area who received their first dose of rotavirus vaccine is available from the DHIS. The coverage has increased between these years (due to the fact that in 2009/10 the vaccine was first introduced into the program). In 2010/11 the coverage for Joe Morolong is 75.3%, Ga-Segonyana 89.7% and Gamagara 193.6%. The coverage in JT Gaetsewe (88.2%) is similar to the provincial coverage (87.8%) and higher than the national one (81.6%).

6.4.5.7 Baby PCR testing coverage

Data on the proportion of infants under 2 months born to HIV positive mothers who received a PCR test were calculated for the DHB using data from the National Health Laboratory Service (NHLs), antenatal surveys and DHIS data on live births. This was available at district, provincial and national level from 2008/09 to 2010/11. At all levels there has been a steady decrease over the three years. In

2010/11, the level in JT Gaetsewe (49.4%) is lower compared to the level in Northern Cape (63.1%), but similar to the country level (52.6%).

6.4.6 Input indicators

6.4.6.1 Non-hospital PHC expenditure per capita

Data on the expenditure per capita on PHC (non-hospital), i.e. the total amount spent on non-hospital PHC health services per uninsured person, are available from the DHB 2010/11 for 2006 to 2011 and show an increase at district, provincial and national level over this period in real (inflation-adjusted) 2010/11 prices. In 2010/11 the level in JT Gaetsewe (R560.8) is somewhat lower than the provincial level (R592.5) but higher than the national level (R513.9).

6.4.7 Outcome indicators

6.4.7.1 Diarrhoea incidence

The diarrhoea incidence among children under five years is available from the DHIS. Incidence is hugely fluctuating over time, which makes it difficult to see any trends. In 2010/11 the incidence is 135.1 per 1 000 in Joe Morolong, 274.3 in Ga-Segonyana and 386.9 in Gamagara. In the same year the incidence in JT Gaetsewe (205.9) is much higher compared to the provincial level (135.4) and the national level (109.3).

6.4.7.2 PCR positivity

Data on the proportion of PCR tests that conclude that a baby is HIV positive are available from the NHLS at district, provincial and national level from 2008/09 to 2010/11. At all levels there has been a steady decrease over the three years. In 2010/11, the level in JT Gaetsewe (4.9%) is higher compared to the provincial (3.4%) and country level (3.5%).

6.4.8 Impact indicators

6.4.8.1 Stillbirth rate

Data on the stillbirth rate (SBR; number of babies born dead/1 000 births in facility) are available from the DHIS. In Joe Morolong the rate shows a lot of fluctuations and reaches its highest value in 2010/11. Ga-Segonyana is more stable over the time period 2004/04 to 2010/11, while in Gamagara there is more of a decreasing trend. In 2010/11, the rate in Joe Morolong is 88.9, Ga-Segonyana 32.2 and Gamagara 19.9. In John Taolo Gaetsewe district (32.2) the rate is somewhat higher than in the province (26.8) and the country (23.0).

6.4.8.2 Perinatal mortality rate

Data on the perinatal mortality rate (PNMR; the sum of stillbirths plus those babies dying within 7 days of life/1 000 births in facility) are available from the DHIS and the patterns are similar to those for the stillbirth rate. In 2010/11 the rate in Joe Morolong is 88.9,^P Ga-Segonyana 42.5 and Gamagara 19.9. In John Taolo Gaetsewe district (41.9) the rate is slightly higher than in the province (38.3) and especially the country (32.8).

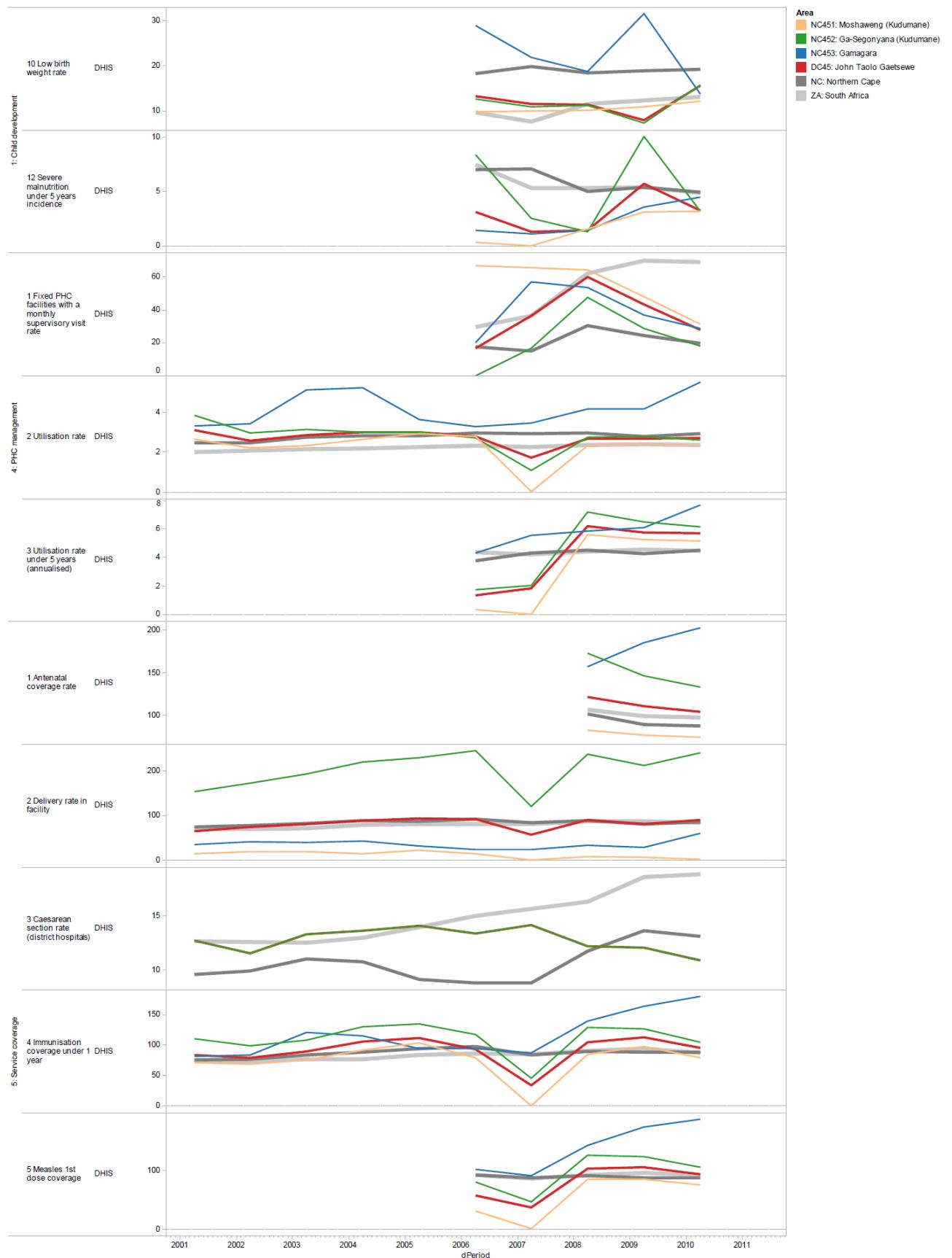
6.4.8.3 Maternal mortality

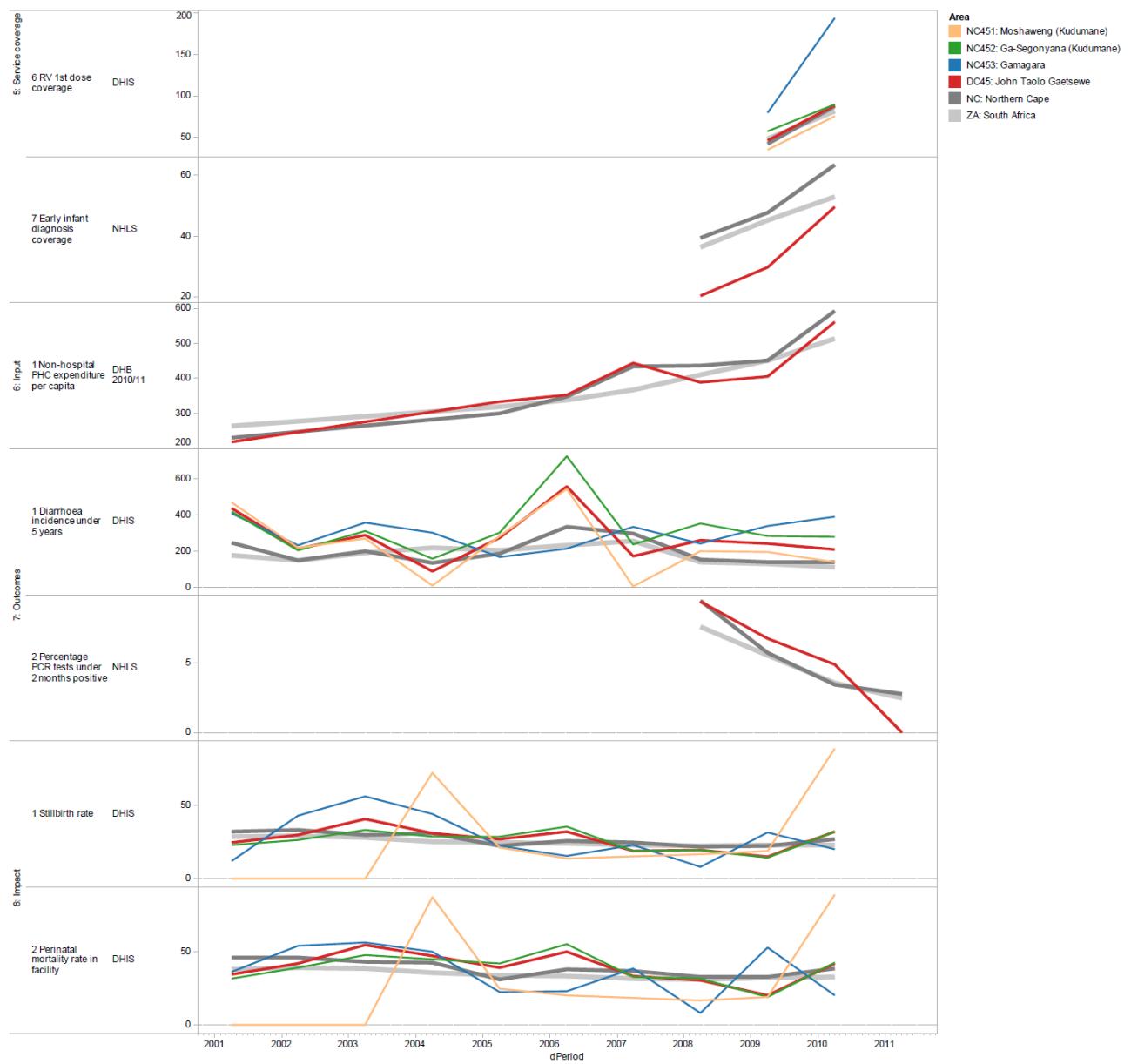
The maternal mortality rate (maternal deaths e.g. due to pregnancy, delivery, per 100 000 live births in facility) is available from the DHIS for 2010/11. The only data available is from Ga-Segonyana, and even this data is not complete, as numerators from Tshwaragano Hospital are lacking. The rate for this local municipality is 91.1, and for JT Gaetsewe 87.1, which is less than expected based on unpublished data from the National Committee on Confidential Enquiries into Maternal Deaths

^P This PNMR has been the same as the SBR for Joe Morolong from 2008/09 to 2010/11, since no early neonatal deaths were recorded in facilities, and therefore the number of perinatal deaths comprised only stillbirths. The numbers are very small in this sub-district, which has a very small population under one year.

(NCCEMD). Therefore it is not surprising that the rate in the district is considerably lower than the provincial (120.6) and higher national one (135.4). Again, the DHIS data must be interpreted with some caution as they are clearly incomplete in addition to only including facility-based deaths.

Figure 41: Selected indicator trends for JT Gaetsewe and South Africa





7 Appendix: Contextual information extracted from Gaffney's

Gaffney's publish an extensive guide on the location, size, population, facilities, services, development and other information on each of the 278 municipalities.³⁸ A brief extract of information for each municipality that may provide relevant context to the maternal and child health indicators and general development status of each municipality is provided.

In the absence of a census in the past decade, population figures are broad estimates. Those given here are calculated based on 2010 provincial level estimates by StatsSA, Municipal Demarcation Board (MDB) projections for municipal level, and numbers of registered voters at ward level per the Independent Electoral Commission (IEC), March 2011. Community statistics percentages are based on the StatsSA 2007 Community Survey; and municipality size, boundaries, and area data were supplied by the MDB, effective from the 18 May 2011 Local Government Elections.

7.1.1 Sedibeng

Sedibeng District Municipality (SDM) extends for 120 km across the south of Gauteng Province. It consists of three local municipalities – Emfuleni, Midvaal and Lesedi.

The district has an extensive road network, including the N1 toll-road and the R59 in the west, and the N3 in the east. These three routes all converge on Johannesburg, providing good linkages between important nodes in SDM and the national economic core of Johannesburg. The eastern areas of the district are mainly agricultural or rural. The main urban areas of Vereeniging and Vanderbijlpark, as well as the Evaton / Sebokeng residential complex, are concentrated in the western part of the district, in Emfuleni.

7.1.1.1 Emfuleni

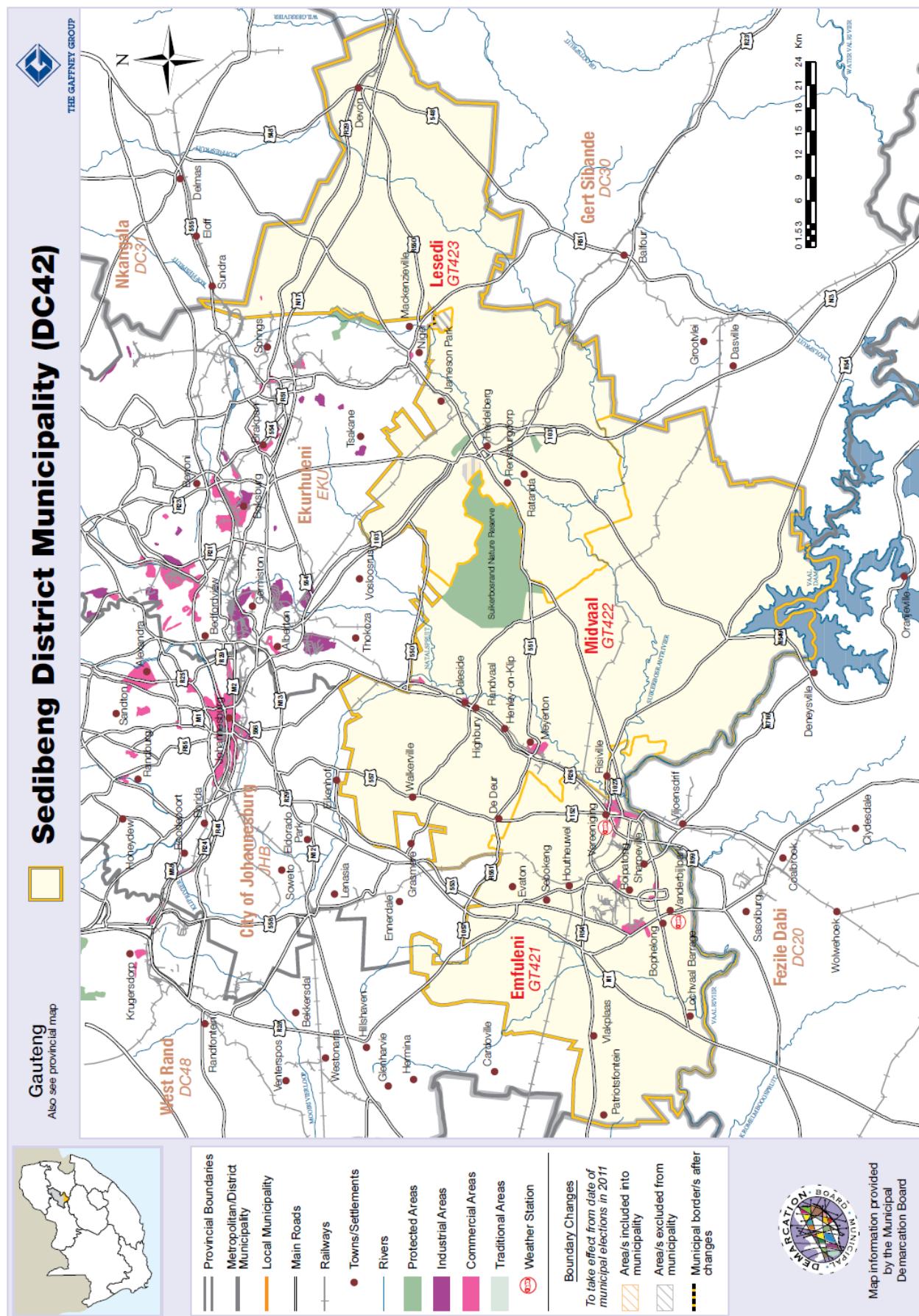
Total population	784,276
Municipality size (km ²)	965.89
Density(/km ²)	812.0
Total households:	236,752
Avg people/Household	3.3
Poor households.....	108,436
Poverty rate	45.80%
Area type - Rural	47.7%
Urban	52.3%

The impact of the global financial crisis and recession on the local economy has yet to be quantified, but at least one third of the work force is unemployed. The youth are particularly hard hit by unemployment, in spite of the skills and qualifications that exist. Some economic activity has moved from Vanderbijlpark to Vereeniging and Meyerton. Unemployment is particularly high in Evaton, Sharpeville and Sebokeng. In recent years, economic growth has been slower than population growth, resulting in a decrease in average standards of living. The socio-economic disparities are high, with pockets of severe poverty.

High levels of air pollution in the area – the result of the high levels of industrialisation, the fact that most households still burn coal for heating and cooking, and adverse (extremely stable) meteorological conditions in the winter months – have resulted in the Vaal Triangle Airshed being declared a 'priority area'. The new Air Quality Act requires that local municipalities implement air quality management plans, and a series of ambient air quality monitoring stations is being set up.

The stretch of the Vaal River within Emfuleni is severely polluted. Industrial effluent spills into the river system and untreated sewage exacerbates the problem. The degradation of the river system threatens tourism and leisure activities.

Figure 42: Map of Sedibeng (DC42)



7.1.1.2 *Lesedi*

Total population	85,667
Municipality size (km ²)	1484.39
Density (/km ²)	57.7
Total households	26,375
Avg people/Household	3.2
Poor households	11,322
Poverty rate	42.93%
Area type - Rural	91.4%
Urban	8.6%

Lesedi Local Municipality is primarily a rural area. The only significant urban concentration is Heidelberg / Ratanda in the west, situated on the N3 highway, and easily accessible to Johannesburg and O R Tambo International Airport.

Employment in Lesedi has been growing slowly, primarily because of an increase in jobs in the financial services sector. Although unemployment is relatively low, low educational and skills levels characterise the labour force. Levels of poverty and inequality are high and a large percentage of households has very low incomes.

7.1.1.3 *Midvaal*

Total population	76,612
Municipality size (km ²)	1722.48
Density (/km ²)	44.5
Total households	22,279
Avg people/Household	3.4
Poor households	8,268
Poverty rate	37.11%
Area type - Rural	96.8%
Urban	3.2%

Midvaal is largely rural, lying to the south of the Witwatersrand, at over 1 500 m above sea level, rising to 1800m at the top of the Suikerbosrand.

The Vaal Dam, on the southern boundary, is the most important source of water in Gauteng. Both the Klip River and the Vaal Dam offer opportunities for recreation and tourism. However, the Klip River and Blesbokspruit are being polluted by runoff from industrial areas, and sewage spillages from townships and waste water treatment works. Midvaal's ground and surface water is affected by activities within the municipality, but also by mining and industry in Ekurhuleni. The air quality is poor, and has a negative impact on the health of residents. Most of Sedibeng district has been declared a Priority Area in terms of the National Environmental Management: Air Quality Act in 2006. An environmental management plan has been formulated, and is being implemented. There is an extensive road network connecting Midvaal, in both a physical and a functional way, with the surrounding municipalities. Major roads run in a north-south direction, to the City of Johannesburg and Ekurhuleni where most employment opportunities are to be found.

7.1.2 uThungulu

Pockets of wealth in the urban centres are surrounded by vast rural areas where 80% of the population live in remote communities, many in abject poverty. Over half the population are children, and more than half are women, the men having migrated further afield in search of work. The challenge is to provide basic services to these people, but the mountainous terrain, coupled with long distances, makes this an expensive undertaking. While inroads have been made, significant backlogs remain.

The need to address poverty, rampant crime and the HIV/AIDS pandemic (KwaZulu-Natal has the highest incidence of all the provinces) is critical, but this must be balanced with stimulating the local economy, creating jobs, and growing SMMEs. A lack of scarce skills in the municipality has forced industries to source labour outside the region, which has contributed to high unemployment. The uThungulu District Municipality allocates the majority of its income to capital infrastructure projects in the three newly established municipalities of Mfolozi, Ntambanana, and Nkandla.

7.1.2.1 Mfolozi KZN281

Total population	118,780
Municipality size (km ²)	1209.98
Density (/km ²)	98.2
Total households	21,762
Avg people/Household	5.5
Poor households.....	12,148
Poverty rate	55.82%
Area type - Rural	100.0%
Urban.....	0.0%

The Mfolozi Municipality is adjacent to the Empangeni-Richards Bay complex and extends inland from the Indian Ocean in the east to the Mhlana Tribal Authority in the west. The N2 highway passes through the municipal area, linking it to both Richards Bay and Durban. Several primary roads traverse the municipal area which has a well-developed

road network; but the condition of the majority of the local roads is poor.

More than half the population are women, and about one fifth of all households are headed by pensioners, indicating that many of the men, and the women, move away to work in other areas. Over half the population are children, which increases the need for educational, recreational and other facilities. Levels of education are low and unemployment is high. Most employed people work in the agricultural sector, which is labour intensive, and characterised by long hours of work and low pay. As a result poverty is widespread. There are severe backlogs in the provision of basic services.

7.1.2.2 Mthonjaneni KZN285

Municipality size (km ²)	1085.97
Density (/km ²).....	51.5
Total households	12,704
Avg people/Household.....	4.4
Poor households	7,346
Poverty rate	57.83%
Area type – Rural	98.8%
Urban	1.2%

The Mthonjaneni Municipality lies inland from the KwaZulu-Natal north coast and consists of traditional settlements and commercial farms, owned by both individuals and companies. The picturesque town of Melmoth, lying 800 m above sea level at the gateway to the Zulu highlands, is the administrative centre, and the only town of economic importance. Apart from some light industry in Melmoth, the municipality is entirely dependent on timber and sugar cane production. Other agricultural products include citrus fruit, vegetables and beef and dairy products. A small cluster of farmers produce avocado pears for the export market. Most of the population lives in the rural areas where they depend on informal trading and subsistence farming (mainly the rearing of livestock) to survive. Over half of all dwellings are classified as traditional and the demand for rural housing continues to grow. There is an

urgent need to address issues of land reform. Most disputes concern land owned by commercial farmers.

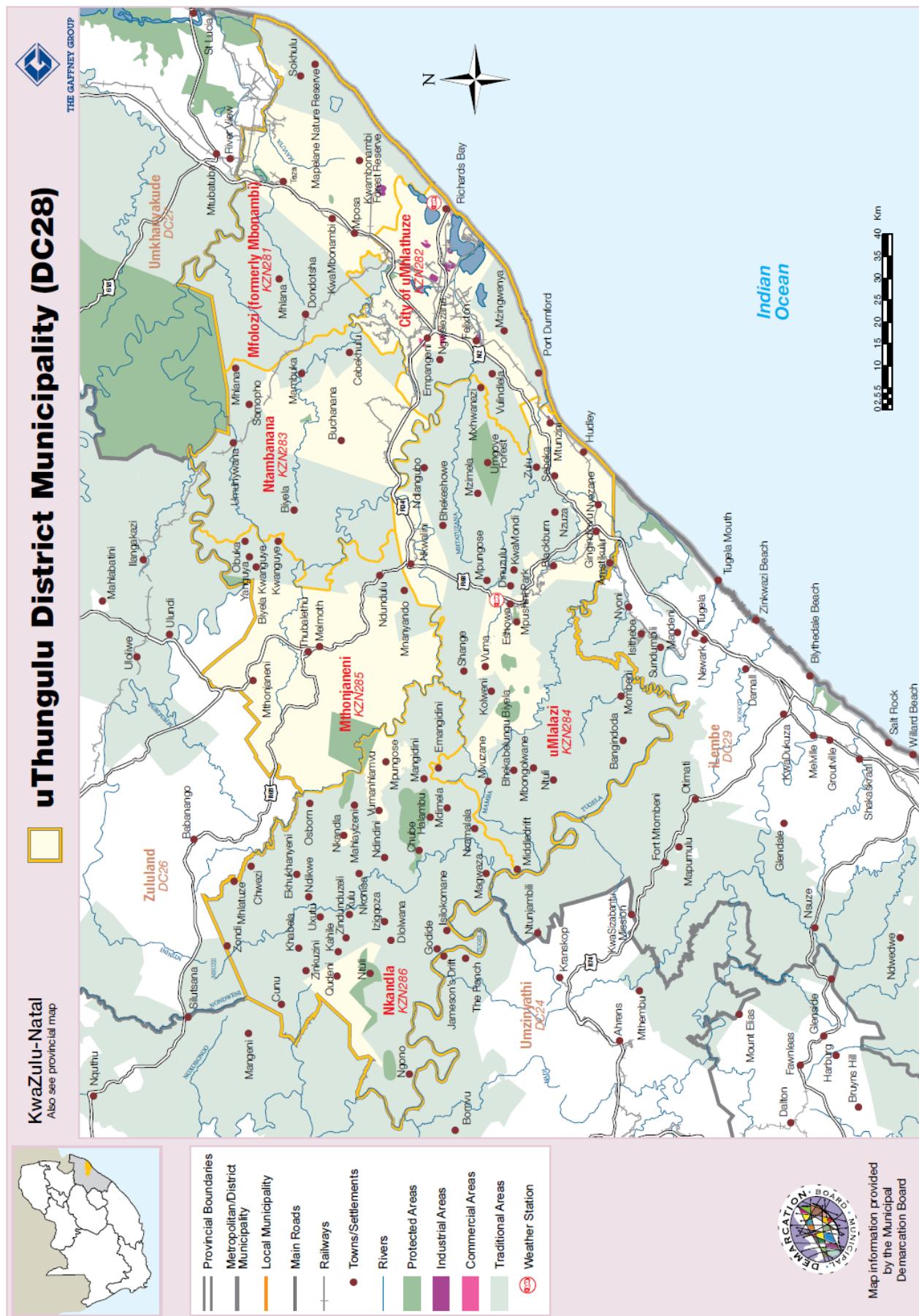
Over half the people are unemployed and those that do work are engaged in primary, unskilled activities. With a young population, dependency ratios are high and almost three quarters of households depend on social grants to survive.

Due to the unreliability of existing water schemes, particularly during the dry months, uThungulu District Municipality has identified the Goedetrouw Dam as the only sustainable source of water in this region and has embarked on the establishment of a regional water scheme which will supply water to Mthonjaneni from this source.

Sanitation facilities will continue to be provided through VIP latrines. A solid waste removal service, using two tractor-drawn units, operates in Melmoth, Thubalethu and KwaMagwaza. There are problems with the Melmoth landfill site.

While roads in the urban areas are in fairly good condition, almost half of all roads require upgrading. Although taxis, LDVs and buses operate in the area, most people still walk to their destinations

Figure 43: Map of Uthungulu (DC28)



7.1.2.3 Nkandla KZN286

Total population	148,393
Municipality size (km ²)	1827.58
Density (/km ²)	81.2
Total households	26,065
Avg people/Household	5.7
Poor households.....	18,964
Poverty rate	72.76%
Area type – Rural.....	100.0%
Urban	-0.0%

Nkandla Municipality is almost entirely rural, a hilly area through which the uThukela, Mhlathuze and Nsuze Rivers flow.

Nkandla town, approximately 280 km north of Durban, is isolated from major development corridors.

Nkandla Municipality has one of the highest unemployment rates in the country. Its economy is largely dependent on income which is generated outside the area. Almost three quarters of households depend on migrant remittances or government grants. Just over one third of those employed work in subsistence agriculture or the informal sector. The total population appears to be decreasing. Females predominate, as do children under the age of 19. This leads to large dependency ratios and widespread poverty. Levels of education remain low, in spite of considerable infrastructural investment.

Although some progress has been made in the provision of community halls and sports facilities there remain severe backlogs in water, sanitation and electricity provision and road upgrading and maintenance. The condition of the roads continues to decline.

7.1.2.4 Ntambanana KZN283

Total population	94,154
Municipality size (km ²)	1082.75
Density (/km ²).....	87.0
Total households.....	14,839
Avg people/Household.....	6.3
Poor households	8,407
Poverty rate.....	56.65%
Area type - Rural	100.0%
Urban	-0.0%

It is an area of rolling green hills rising from the coastal plain in the east to the plateau in the west. It is the poorest municipality in uThungulu District.

Most people live in traditional authority areas. The population is young, with over one third under the age of 14. Unemployment is high, levels of education are low, and extreme poverty is prevalent. The hilly terrain, coupled with the scattered nature of the settlements, makes service delivery difficult and costly.

Historically, infrastructure has been provided in a haphazard and unstructured manner. Water in the tribal areas is mainly supplied from streams and boreholes, which are being contaminated from the pit latrines many people use. The uThungulu District has identified the Goedertrouw Dam as the only potential water source for Ntambanana and a regional water supply scheme is being planned.

The condition of gravel roads is deteriorating rapidly and maintenance of these appears to be inadequate – roads often become impassable in wet conditions.

Ntambanana has a registered, fully operational waste transfer station. There are no waste treatment facilities and much of the waste is recycled. Households in the tribal areas make use of their own dumping sites.

7.1.2.5 Umhlatuze KZN282

Main Towns: Empangeni, Felixton, Mzingwenya, Ngwelezana, Port Dunford, Richards Bay, Vulindlela.

Total population	321,204
Municipality size (km ²)	793.18
Density (/km ²)	405.0
Total households	78,337
Avg people/Household	4.1
Poor households	47,107
Poverty rate	60.13%
Area type - Rural	56.7%
Urban	43.3%

The largest towns in City of uMhlathuze Municipality, Empangeni and Richards Bay, are surrounded by sugar cane fields, timber plantations, wetlands and fresh water lakes.

Four Tribal Authority Areas: Dube, KwaKhosa, Mkhwanazi North and South, and Zungu-Madlebe cover just over a third of the municipal area. Although over half the population is urbanised, the rural areas, particularly the tribal authority areas around Esikhawini, Vulindlela, Nseleni and Ngwelezane, have high population densities.

Most of the economic activity in the uThungulu District occurs in Richards Bay, Empangeni and Felixton.

The population of City of uMhlathuze is young. While the local economy is performing well, unemployment remains at over one third, due in part to the high population growth and relatively low levels of education. The prevalence of HIV/ AIDS has resulted in high dependency ratios. Many people are solely dependent on subsistence agriculture or welfare payouts.

Infrastructure and basic service provision are generally good, although there are backlogs in the urban areas. The recession has had a serious impact on the municipality, and programmes and projects have had to be re-evaluated. Projects that are not deemed urgent, and not concerned with basic services, may be postponed.

7.1.2.6 Umlalazi KZN284

Total population	245,549
Municipality size (km ²)	2213.94
Density (/km ²).....	110.9
Total households	47,558
Avg people/Household	5.2
Poor households	34,151
Poverty rate.....	71.81%
Area type – Rural	98.5%
Urban	1.5%

The uMlalazi Municipality stretches inland from the KwaZulu-Natal north coast. It is an area of undulating topography characterised by commercial farming areas and fourteen Tribal Authority Areas. The municipality is traversed by several transportation routes, including the N2 highway, the R34 and R66, linking the towns within the municipal area, and those further afield. The R34 and R66 are in need of maintenance as a result of regular use by heavy duty vehicles. Most of the local roads are in a poor condition.

Population densities are high within the urban areas and low in the commercial farming areas. The population is a youthful one. The rate of HIV/AIDS infection is high (over one third of the population). Low levels of education and high unemployment have lead to widespread poverty and many people leave the area in search of work, resulting in a declining population. While the municipality appears to have sufficient water, the topography complicates the provision of services, particularly in the rural areas.

7.1.3 Nkangala

The Emalahleni local municipality is situated on the Highveld of Mpumalanga. The town of Witbank (Emalahleni) is one of the major urban concentrations, both within the district as well as within the province as a whole. This local municipality is predominantly an industrial zone, originally known for coal mining.

Towns and settlements in the Steve Tshwete local municipality are primarily associated with agriculture, tourism and forestry. The municipality, which includes Middelburg, is also home to a large number of industries. The Victor Khanye municipality is currently characterised by an increase in mining and related activities. Other important sectors in this area are agriculture, finance and manufacturing.

The Emakhazeni municipality is situated in the eastern part and includes the towns of Dullstroom and Belfast. The municipality is known for agriculture, tourism and forestry activities.

Towns and villages in Dr JS Moroka and Thembisile Hani are mainly residential. Many future residential and economic developments in the region are planned along the Moloto Corridor route in the latter local municipality.

The level of education in Nkangala is very low. About a quarter of the adult population reported that they received no formal schooling. About one-quarter of all schoolgoing children and young adults do not attend any form of educational institution.

7.1.3.1 JS Moroka MP316

Total population	261,541
Municipality size (km ²)	1416.47
Density (/km ²)	184.6
Total households	60,233
Avg people/Household	4.3
Poor households.....	39,726
Poverty rate	65.95%
Area type - Rural	1.1%
Urban	98.9%

Dr JS Moroka Local Municipality has its origins in the former homeland of Kwa-Ndebele, which was replaced by three transitional local councils, Mdutjana, Mbibane and Mathanjana, that later amalgamated to form Dr JS Moroka Local Municipality in 2000. The municipality is located in the north-western corner of Mpumalanga, bordering Gauteng in the south-west and Limpopo to the north. It is characterised by a variety of urban, peri-urban and agricultural settlements. The municipality has two formalised townships, namely Siyabuswa and Libangeni. Most formal businesses are concentrated in Siyabuswa. It is also the major industrial area.

7.1.3.2 Emakhazeni MP314

Total population	46,227
Municipality size (km ²)	4735.58
Density (/km ²).....	9.8
Total households.....	17,072
Avg people/Household.....	2.7
Poor households	6,864
Poverty rate.....	40.20%
Area type - Rural	98.8%
Urban	1.2%

The municipality is sparsely populated and predominantly rural, with towns such as Belfast and Siyathuthuka, Dullstroom and Sakhelwe, Machadodorp and Emthonjeni, and Waterval Boven and Emgwanya as service centres. Agriculture is the dominant economic activity in the area.

7.1.3.3 *Emalahleni MP312*

Total population	297,116
Municipality size (km ²)	2677.61
Density (/km ²)	111.0
Total households	72,085
Avg people/Household	4.1
Poor households	13,374
Poverty rate	18.55%
Area type - Rural	85.5%
Urban	14.5%

Emalahleni Municipality can be described as an urban and rural area, consisting of large farms, dispersed urban settlements, coal mines and power stations. It comprises eMalahleni City (Witbank) as the main urban centre in the municipality

One of the most prominent challenges facing the Emalahleni Municipality is the housing backlog in the area. This municipality has the highest number of informal settlements in the Nkangala District.

7.1.3.4 *Steve Tshwete MP313*

Total population	153,467
Municipality size (km ²)	3976.45
Density (/km ²)	38.6
Total households	42,421
Avg people/Household	3.6
Poor households	16,676
Poverty rate	39.31%
Area type – Rural	81.6%
Urban	18.4%

Steve Tshwete Local Municipality was created in December 2000 when the areas of the Middelburg and Hendrina Transitional Councils, and the Middelburg Representative Council were amalgamated. The seat of Steve Tshwete Local Municipality is Middelburg. Middelburg is a large farming and industrial town and is known as the 'Stainless Steel Capital of Africa'.

The population of the municipal region has grown almost 30% over a 6 year period, with an average annual growth of almost 5%. Unfortunately, this substantial population growth puts severe strain on municipal services and infrastructure needs.

About two-thirds of the population is below the age of 35, indicating that there is a substantial need for youth development and proper schooling facilities.

7.1.3.5 *Thembisile MP315*

Total population	275,802
Municipality size (km ²)	2384.37
Density (/km ²)	115.7
Total households	64,757
Avg people/Household	4.3
Poor households	38,593
Poverty rate	59.60%
Area type - Rural	25.2%
Urban	74.8%

This municipality is mainly rural with a communal tenure and at most, one or two small towns in the area. Thembisile Hani Local Municipality is approximately 90 km north-east of Pretoria. The majority of properties in the municipal area are state owned with a small number of farms in the south belonging to commercial farmers. Approximately 95% of the land is subject to land claims.

Thembisile Hani has a young population with the majority being under the age of 24 years. There are numbers of child-headed households and a fairly high number of pensioners. A full range of educational facilities exists within the municipal area. There are 77 primary schools, 22 combined schools, 21 preschools and seven tertiary institutions. All communities have access to primary and secondary school facilities. Even with all of these facilities, a large portion of the adult population is illiterate.

The Thembisile Hani Municipality has high levels of unemployment and poverty and it is estimated that just over a quarter of the population between the ages of 15 and 65 are employed. The economy of Thembisile is slow

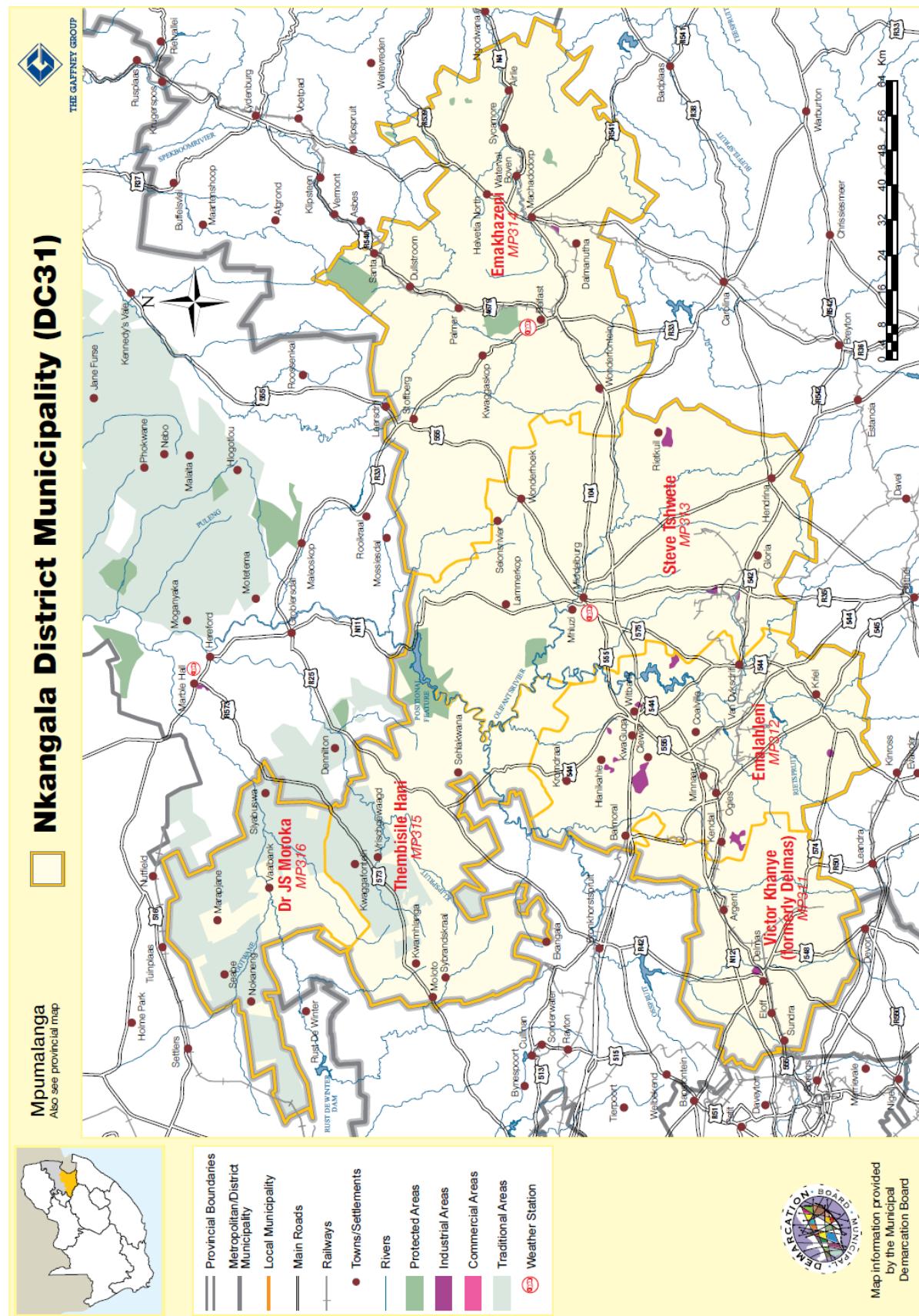
and very few employment opportunities exist in the area. Many workers commute to Tshwane on a daily basis. Most people who are employed locally are in elementary occupations, followed by craft and related trade.

7.1.3.6 Victor Khanye (Delmas) MP311

Total population	60,554
Municipality size (km ²)	1567.77
Density (/km ²)	38.6
Total households	18,158
Avg people/Household	3.3
Poor households.....	10,223
Poverty rate	56.30%
Area type – Rural.....	92.8%
Urban	7.2%

All municipal services are rendered from the town of Delmas. As well as several modern residential suburbs, the town has a dynamic business district and two industrial areas housing various commercial enterprises. Agriculture is the main source of income in Delmas. Rainfall is abundant and the municipality is a major maize producing area.

Figure 44: Map of Nkangala (DC31)



7.1.4 JT Gaetsewe

The north-eastern region of the municipality principally comprises high-density rural and peri-urban areas, while the western and southern areas are sparsely populated and consist mainly of commercial farms and mining activities. The area has a population of approximately 187 111, the majority of whom reside in the Joe Morolong municipal area. Most of these people are part of the African population group (87%). The demographics of the district are in line with those of the Northern Cape. The historically disadvantaged sections of the population represent some 94% of the total population. It is also in these groups that the main development challenges lie.

Kuruman is the main town in the Kalahari region.

7.1.4.1 Gamagara NC453

Total population	25,822
Municipality size (km ²)	2619.42
Density (/km ²)	9.9
Total households	7,031
Avg people/Household	3.7
Poor households.....	2,217
Poverty rate	31.54%
Area type - Rural	75.1%
Urban	24.9%

The single largest factor that has guided the development of the Gamagara area is the iron ore mine at Sishen. Not only does the mine provide jobs to thousands of people, but this mine was also the reason for the establishment of the town of Kathu. Kathu is the largest town within the municipality and is also the administrative centre of the Gamagara.

7.1.4.2 Ga-segonyana NC452

The Ga-Segonyana Municipality (GSM) originated as a cross-boundary municipality that straddled the boundary between the North West and Northern Cape provinces. It was established in 2000 through the amalgamation of the Kuruman and Mothibstad municipalities and includes sections of the Bophirima District Municipality.

Total population	78,341
Municipality size (km ²)	4491.63
Density (/km ²).....	17.4
Total households.....	19,202
Avg people/Household	4.1
Poor households	11,320
Poverty rate.....	58.95%
Area type - Rural	98.8%
Urban	1.2%

A total of 80% of the Ga-Segonyana Municipality (GSM) population stays in rural villages.

Owing to its location on the brink of the Kalahari, the GSM area is renowned for extreme temperatures during summer and winter.

Kuruman is the main town in the GSM area and is known as the 'Oasis of the Kalahari'; it is also the main town in the Kalahari. The town is blessed with a permanent source of water, which delivers 20 million litres of crystal-clear water daily. Kuruman is 1 340 m above sea level on the Ghaap Plateau and is situated on the Namaqualand route, forming part of the main route between Gauteng, Namibia and Cape Town via Upington.

7.1.4.3 Joe Morolong / Moshaweng NC451

Total population	109,005
Municipality size (km ²)	20172.07
Density (/km ²)	5.4
Total households	24,100
Avg people/Household	4.5
Poor households.....	17,795
Poverty rate	73.84%
Area type - Rural	92.1%
Urban	7.9%

The municipality is solely rural and comprises 11 wards and approximately 190 villages. As a result of municipal demarcation, Joe Morolong has gained the Kalahari area. Although unemployment is high, the municipality has a great deal of potential for developers, especially those interested in ecotourism and conservation.

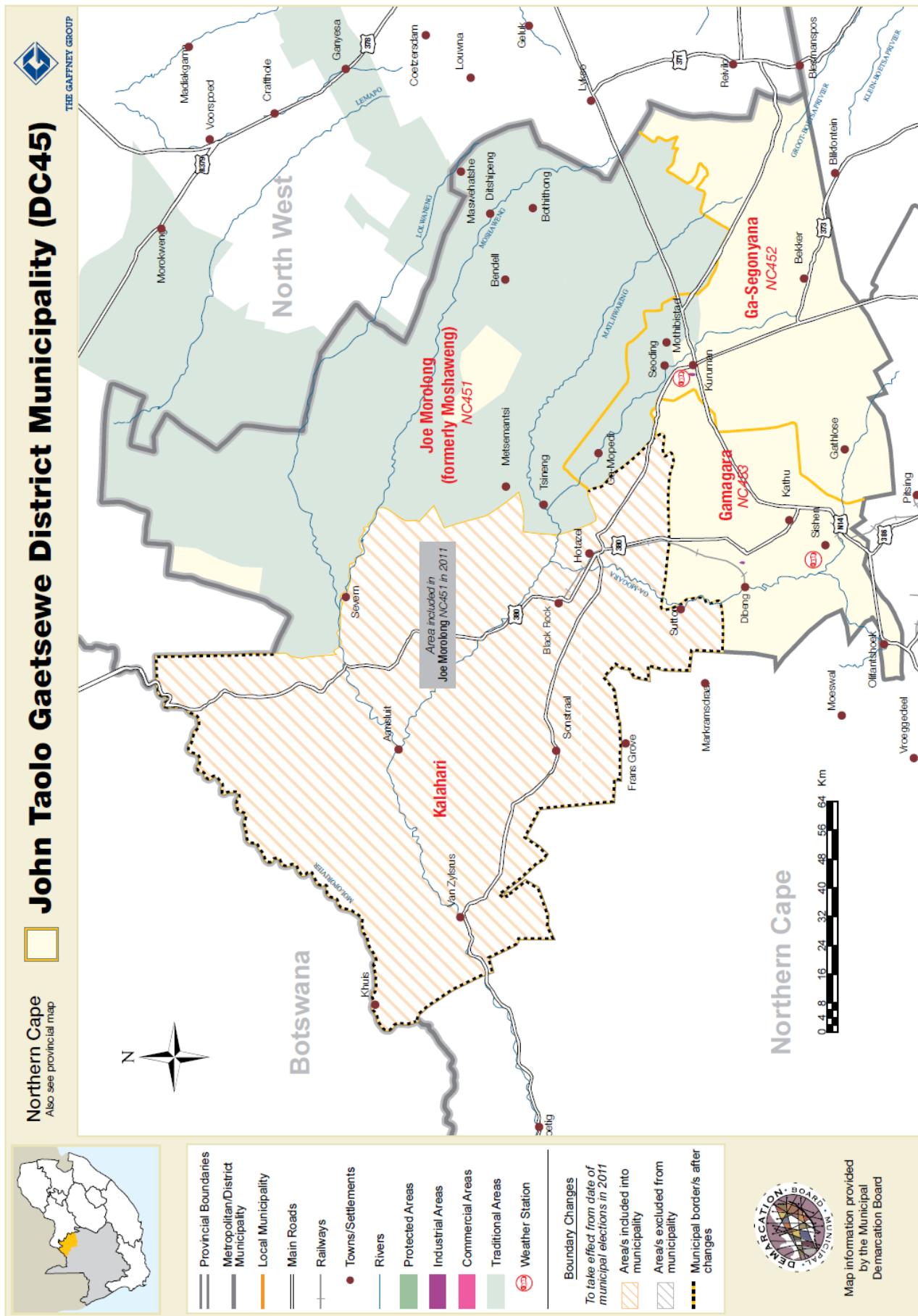
While the majority of the population enjoys safe and acceptable standards of access to water, water provision remains a challenge to the municipality and is its number one priority. Sanitation remains a serious concern and challenge as only a very small percentage of the population has access to weekly removal

services. Good progress has been made over the last couple of Integrated Development Plan (IDP) cycles to provide electricity to households in the municipal area.

In addition, the poor condition of gravel roads and total lack of proper, main, access and internal roads causes a problem and there needs to be upgrading of existing roads and construction of new roads.

The Joe Morolong area is similar to most rural areas in the country in that it faces severe challenges in educating its population and a large proportion of people have either no schooling at all or very basic schooling. There is only a small sector of the population that has any form of tertiary education. In addition, there are severe economic challenges, as the area is poverty-stricken and faces the harsh realities of chronic unemployment and a huge dependency on government grants. The high rate of unemployment in the municipal area causes long-term capacity problems, in terms of its restrictive result on access to education and skills development. The municipal area is rural and remote, which only adds to the challenge. The high percentage of people employed in elementary occupations in the area means that the Municipality is forced to 'import' people with the specialised skills and competencies needed to reach its goals and objectives. These people do not always stay long due both to the rural nature of the area and the lack of financial incentives.

Figure 45: Map of JT Gaetsewe (DC45)



8 Summary and conclusion

As referred to in the introduction, South Africa is one of the few countries in which performance against MDG 4 has regressed over the last 10 years. The data presented in this report confirms the unacceptably high levels of maternal and child mortality and morbidity in South Africa, confirming the urgent need for initiatives such as the Window of Opportunity Project.

Although priority areas for delivery of core health services in South Africa are clearly defined in the NDoH's Negotiated Service Delivery Agreement (NSDA), the type of information contained in this report is an essential adjunct for planning and implementing improvement activities; a need that is nowhere more clearly illustrated than by the wide variation in socio-economic and healthcare factors between and within the selected districts.

This marked heterogeneity between and within the districts is a reminder of the difficulties in implementing effective quality improvement interventions. The descriptive analyses contained in this report can therefore be used as part of a situational analysis to direct further maternal and child health research or interventions to ensure these activities achieve maximum impact.

Furthermore, the report draws attention to the on-going problems with poor validity of routine data. This is particularly well illustrated by the uncertainties around the cause of death data. Strengthening of routine data systems forms an essential part of health systems strengthening and is included in the NSDA priorities. The problems commonly encountered with routine data, namely missing and poor quality data are also well illustrated in this report; particularly with reference to the DHIS. Improvement on this front should also be a priority both to improve utility of existing reporting systems and to enable accurate measurement of future activities.

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