District Health Barometer
Year 2007/08

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Health Systems Trust

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<th>Description</th>
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<tr>
<td>APP</td>
<td>Annual performance plans</td>
</tr>
<tr>
<td>AZT</td>
<td>Zidovudine, Retrovir®</td>
</tr>
<tr>
<td>BAS</td>
<td>Basic Accounting System</td>
</tr>
<tr>
<td>BCG</td>
<td>Bacille Calmette-Guerin</td>
</tr>
<tr>
<td>BUR</td>
<td>Bed Utilisation Rate</td>
</tr>
<tr>
<td>DHIS</td>
<td>District Health Information System</td>
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<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DTP-Hib</td>
<td>Diphtheria, Tetanus, Pertussis, and Haemophilus influenzae B</td>
</tr>
<tr>
<td>EC</td>
<td>Eastern Cape</td>
</tr>
<tr>
<td>EOC</td>
<td>Essential obstetric care</td>
</tr>
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<td>FS</td>
<td>Free State</td>
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<td>GHS</td>
<td>General Household Survey</td>
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<td>GIS</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>GP</td>
<td>Gauteng</td>
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<tr>
<td>HAART</td>
<td>Highly active antiretroviral treatment</td>
</tr>
<tr>
<td>HAST</td>
<td>HIV, AIDS, STIs and TB</td>
</tr>
<tr>
<td>HCT</td>
<td>HIV counseling and testing</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
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<tr>
<td>ISRDN</td>
<td>Integrated, sustainable, rural development node</td>
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<tr>
<td>ISRDP</td>
<td>Integrated, sustainable, rural development programme</td>
</tr>
<tr>
<td>KZN</td>
<td>KwaZulu-Natal</td>
</tr>
<tr>
<td>LG</td>
<td>Local Government</td>
</tr>
<tr>
<td>LP</td>
<td>Limpopo</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
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<tr>
<td>MP</td>
<td>Mpumalanga</td>
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<tr>
<td>MRC</td>
<td>Medical Research Council</td>
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<tr>
<td>MTEF</td>
<td>Medium Term Expenditure Framework</td>
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<tr>
<td>NC</td>
<td>Northern Cape</td>
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<td>NP</td>
<td>Northern Province</td>
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<td>NW</td>
<td>North West</td>
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<tr>
<td>NVP</td>
<td>Nevirapine</td>
</tr>
<tr>
<td>OPV</td>
<td>Oral polio vaccine</td>
</tr>
<tr>
<td>PCE</td>
<td>Per capita expenditure</td>
</tr>
<tr>
<td>PDE</td>
<td>Patient day equivalent</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary health care</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Mother-to-Child Transmission of HIV</td>
</tr>
<tr>
<td>PNMR</td>
<td>Perinatal mortality rate</td>
</tr>
<tr>
<td>SADHS</td>
<td>South Africa Demographic and Health Survey</td>
</tr>
<tr>
<td>SAHR</td>
<td>South African Health Review</td>
</tr>
<tr>
<td>SCR</td>
<td>Smear conversion rate</td>
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<tr>
<td>SEQ</td>
<td>Socio-economic quintile</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infection</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
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</table>
Foreword

There has recently been a strong focus globally on improving health information systems, particularly in low and middle income countries. The volume and complexity of information gathered, created, manipulated and analysed has increased significantly during the last few years. Intensified monitoring of South Africa’s progress towards the MDGs, in particular those dealing with women’s and children’s health (MDG4 and MDG5), has been accompanied by a greater demand for more and better information to track performance and ensure accountability, planning and allocation of resources.

Findings from an external evaluation of the District Health Barometer highlighted its value as the only publication of its kind in South Africa currently that places comparative data of the different health services at implementation level in the public domain. Tools and publications such as the District Health Barometer thus play an important role in providing information for decision making during this crucial time.

In this edition HST has endeavoured to further refine and develop the report. Valuable additions to what has been made available in previous years include:

- graphic illustrations of trend data of various indicators over a five to eight year timeframe thus allowing for a clearer picture of disease progression and service provision,
- deprivation indices calculated to sub-district level, which provide insight into the variation of deprivation and need within a district, as well as a three year trend of the index at district level,
- TB case load and new smear positive incidence by district to augment the existing TB indicators (TB cure rate and smear positive conversion rate),
- Measles immunisation coverage and drop out rate to augment the existing DTP1-3 immunisation indicators, thus providing a wider picture of the provision of child health care services.

Although data on the health status and provision in South Africa have improved over the last few years, there are still gaps and quality concerns that leave a degree of uncertainty on the exact health status in a number of important areas such as HIV and AIDS, TB and infant mortality rates, particularly at a district and sub-district level. This report shows that whilst some progress in improving primary health care data and services has been made in certain areas, many areas still have a very long way to go. We trust that the District Health Barometer will continue to play a useful and supporting role in the developing health system in South Africa and in the ongoing pursuit of timely and accurate data to ensure accountability for resources and to meet global challenges such as the MDGs.

Dr Thobile Mbengashe
Chief Executive Officer
Health Systems Trust
Introduction and Overview

Background

The District Health Barometer (DHB), was developed by the Health Systems Trust (HST) in response to a need for accessible management information in South Africa. The DHB provides a snapshot of the overall performance of the public health sector across the provinces and health districts in South Africa by means of an annual publication. The DHB, which has been available on an annual basis since 2005 and which draws data from the District Health Information System (DHIS), StatsSA, the National Treasury (BAS data) and the national TB register, seeks to highlight inequities in health outcomes, health resource allocation and outputs as well as track the efficiency of health processes between provinces and between all districts in the country, with particular emphasis on rural and urban (metropolitan) districts.

The report also functions as a tool to monitor progress towards strategic health goals such as the Millennium Development Goals (MDGs) and to support the improvement of provision of primary health care and the improvement of the quality of routinely collected health data. The analysis and comparison of health and socio-economic indicators between districts (across provinces) in the DHB, assists in identifying successes, gaps and potential corrective measures within the health system.

The DHB is guided by an advisory committee made up of managers from the Departments of Health at national, provincial and district level, and also includes experts and stakeholders from the academic and research arenas.

The indicators chosen are all based on secondary data that are either readily available, or on available raw data that needed manipulation. Where the data are not publicly available, such as with the DHIS and Treasury data, HST has requested and received written permission to use the data.

Indicators\(^1\) used in this DHB

The DHIS indicators in the DHB, which make up about half of the indicators featured in the report, are relevant and locally appropriate. They have to a large degree been determined by the range and quality of data available. The indicators chosen generally have been the ones that are linked to measuring the MDGs, or those which measure some important aspect of health policy such as access to health services, equity in provision, or efficiency of provision of health services.

The socio-economic and demographic indicators (such as household access to water, access to private medical schemes, population figures and deprivation data) provide insight into some of the social determinants of health in the districts.

Methodology and Data Sources

Population data

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 Department of Health for 1995-2009 (based on the best available information from the Census 2001 and mid-year estimates) are still in use and were used in this DHB. The release of the Community Survey 2007 showed substantial differences in the populations of certain municipalities (districts) compared to these estimates, and these differences can have substantial effects on a range of indicators that use population-based denominators. The population figures by district and province used in the DHIS and the Community Survey and the difference between them are shown in Appendix 4.

The Community Survey also confirmed that the number of children was under-estimated in both the previous censuses. This will have resulted in an overestimation of indicators using denominators derived from these estimates such as immunisation and delivery coverage.

The Excel data summary tables provided on the CD of this publication provide the population estimates from the StatsSA Community Survey 2007 as well as those estimated by the Department of Health for 2005, 2006 and 2007.

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\(^1\) A table with definitions, references and terms for each indicator used in this report is available in the appendices.
Deprivation indices

The deprivation index is a measure of relative deprivation across districts within South Africa. Just as any index, the deprivation index is a composite measure derived from a set of variables.

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 General Household Survey (GHS) data and the 2007 Community Survey data and has 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 3 years of deprivation trend data. Although the 2001 deprivation index was generated using a similar methodology and the relative positions (ranks) and socio-economic quintiles are districts can be compared, the deprivation index scores for 2001 are not directly comparable.

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 (SEQs). Districts that fall into quintile 1 (lowest quintile) are the most deprived districts. Those that fall into quintile 5 are the least deprived (best-off).

In addition to district level deprivation indices, this report has provided deprivation indices for sub-districts. These indices calculations were based on similar variables used in generating a deprivation index at the district level. One of the spin-offs of the DHB has been that these deprivation indices were part of the data used by the National Department of Health to identify 18 sub-districts across the country with high levels of deprivation in order to provide additional support to them.

Further details on the deprivation index and its calculation can be seen in the appendices.

Other measures of socio-economic status

Since there is no official consensus on a single measure of poverty or deprivation, an additional indicator is included with the deprivation index. This is the percentage of households with access to piped water (both the General Household Survey data and the Community Survey data).

District health financing indicators

This year the district level estimates of expenditure per capita on non-hospital PHC have been updated. Updated data were extracted from the BAS for 2007/08 and the calculations for the 2005/06 and 2006/07 financial years were adjusted (due to having new district-level medical aid estimates and thus adjustments to the estimated uninsured population denominator). Therefore there are small differences between the values shown here and those published in the previous reports.

For the purposes of these calculations of per capita expenditure (PCE) we have divided public sector expenditure by the uninsured population. 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.

Data from the Basic Accounting System (BAS) financial database for all provinces except North West were obtained in June 2008 from Vulindlela. Summarised data from North West were obtained from the chief financial officer of the province. 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 included:

- Data on local government (LG) expenditure on primary health care from National Treasury. Net expenditure was used, i.e. expenditure less income (which includes transfers from provinces to LG).
- Factors for inflation adjustments based on CPIX were obtained from National Treasury to convert all values to real 2007/08 prices.

---

2 The deprivation index used in this report was generated using principal components analysis (PCA). PCA 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.

3 Note all District Municipal Areas are omitted from the analysis.
• Population data from the DHIS, based on extension of StatsSA figures to sub-district level. It is acknowledged that for recent years these estimates may not be an accurate reflection of actual population size per district, which will affect the accuracy of the per capita expenditure estimates.

• Medical scheme coverage from the StatsSA General Household Surveys was used to calculate the uninsured population. The 3-year average medical scheme coverage from 2005-2007 was used to calculate the uninsured population denominator for the 2005/06, 2006/07 and 2007/08 expenditure per capita calculations, to reduce variability due to sampling changes at district level.

• Geographic information determining district boundaries from the Municipal Demarcation Board.

• Data on health facilities from the DHIS.

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 2 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.

Net local government expenditure on health services was added to provincial expenditure on non-hospital PHC, and this total was divided by the uninsured population to obtain expenditure on non-hospital PHC per capita.

The figures have all been adjusted to take the effect of inflation into account and are presented in REAL 2007/08 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. The values for PCE are also included in NOMINAL terms (not adjusted for inflation) in the electronic version (CD).

A matter of concern is that for some provinces, expenditure is still not clearly allocated to districts and in some provinces district coding had errors. This suggests that financial management does not focus at district level. It is suggested that cost-centred accounting become standard practice. It is also difficult to get verifiable information of transfers to local government.

The indicator ‘Cost per patient day equivalent’ was calculated for all district hospitals, by dividing the total expenditure attributable to each facility (from the BAS and NW expenditure data) by the number of patient day equivalents4 for each facility (from DHIS). This indicator was then aggregated to district, provincial and national level by weighted averages.

**Health facilities and beds**

The information on private hospitals has been obtained from the Wilbury and Claymore 2008 database, and does not include state-aided private hospitals or private public partnerships.

Data on public sector health facilities were extracted from the DHIS 2007 data file. It should be noted that with the categorisation of facilities to the new definitions (e.g. from District Hospital to Level 1 Hospital) there may be some incorrect allocations of facilities. There may also be some duplication where private units or other operational units within public facilities are not coded at the correct level and are counted as facilities.

**Indicators from the District Health Information System (DHIS)**

The DHB has increased the focus and attention on DHIS data quality, analysis, feedback and use. In the past, apart from combining data for cross-boundary districts, the DHB followed the principle not to change the data from the DHIS, even if it was obviously incorrect, as that would create the additional problem of multiple ‘versions’ of the same data source.

However, this year data from the DHIS were extracted for the last eight years up to the period ending March 2007/08. Firstly, retroactive changes and corrections have been made to the data by DHIS administrators and thus the figures may differ from previous DHB publications and versions of the DHIS. In addition, for the first time, in order to portray trends in a more accurate way, outliers and data with major missing numerators or denominators have been removed. Where there were major data quality problems, we tried to highlight this in the accompanying text with the view to explaining this and improving the quality in subsequent years.

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4 Patient day equivalents (Inpatient days + 1/2 Day patients + 1/3 outpatient and ER visits).
Examples of the overall effect of these changes to the national data are shown in Figure A. In general there was little impact on the national values. However the changes may have a much greater impact at district level, where leaving data with apparent errors would have resulted in unlikely trends. Examples of this are shown in Figure B.

The dotted line represents the original data as received from the Department of Health (DoH). The solid line represents edited data that remains after removal of outliers and unlikely values as described. The trend lines are generated by loess regression (R Project for Statistical Computing).

**Figure A: Example of data editing: removal of outliers in DHIS data trends at national level**

- **Monthly Indicators for South Africa – original and edited data**

![Diagram of monthly data with loess regression line](image)

5 monthly data with loess regression line
Most of the indicators in this report have been obtained from the DHIS data files at facility level (NDoH5) for the financial years ending March, for 2000/01 up to 2007/08, received in October 2008. Data for the indicators of interest were exported into a single MS Access database to facilitate uniform coding of districts and trend analysis across the entire period. Therefore data for all DHIS indicators previously published were replaced with this recently extracted data; only manually calculated indicators such as the clinic supervision rate for 2006/07 were not revised. As in previous reports, data for selected indicators are given for district hospitals only (average length of stay, bed utilisation rate, Caesarean section rate, cost per PDE).

Gaps in the completeness of the DHIS data affect the general completeness of this report, national averages, interpretation, analysis and trends. Some indicators had major data completeness problems and data were obtained directly from provinces (e.g. WC PMTCT indicators and GP ANC 1st visits denominator).

There is inadequate monitoring of indicators throughout the system, from facility to national levels. This has resulted in some districts having indicator values that are clearly implausible.

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6 Explains why in the NC the 2006 data showed such a high PNMR and how one major outlier can so distort the annual value and affect the entire province’s value.
Averages
It is important to note that all averages (provincial, national, metro and ISRDP) are WEIGHTED AVERAGES, based on the total numerator and denominator for all the sub-areas included, and are thus not averages of the district indicator values. Therefore, these averages may appear ‘skewed’ for any indicator in any province where there are districts of very different sizes or workloads and where a bigger district has a very different value from the other smaller districts in a province.

Clinic supervision rate
The data elements for this indicator are collected by the DHIS, but the calculated indicator was not available from the system and was calculated manually:

- The number of supervisor visits per facility per month were extracted from NDoH5. Since some facilities recorded more than one visit per month the data were recoded so that all entries ≥1 were set to 1.
- These data were then summarised by district to give the total number of supervisor visits for facilities in that district for the year, from which the average number of visits per month was calculated.
- The average visits per month (x100) were then divided by the number of facilities to obtain the supervision rate.

Since there are discrepancies between the number of PHC facilities in the database and the number reporting any data on supervision (even zero visits), there may be some inaccuracies comparing trends in this indicator.

Antenatal HIV and syphilis sero-prevalence survey
This is the second year that the results of this survey have been released at district level. The DHIS routine data for the HIV prevalence indicator can be validated against the HIV prevalence survey results. Both sets of data are displayed in the district profiles, for 2006/07 and 2007/08. The correlation of the national antenatal sero-prevalence survey with the DHIS data can be seen in Appendix 1 and has improved from the previous year, with a 94% correlation for the current data. There is a systematic bias between the two data sources, with the survey values on average about 5 percentage points higher than the routine data estimates.

Data Display
As in previous District Health Barometer reports, health districts are ranked, classified and analysed by various groupings e.g. metropolitan districts, ISRDP (rural development node districts) and provinces, on the basis of these indicators.

Financial year and calendar year
The indicators from DHIS and the BAS financial system cover the 12 month period April - March, which is the financial year of the Department of Health. Only the TB data (TB cure rate and smear conversion rate) cover a calendar year. Indicators from StatsSA and the antenatal sero-prevalence data are for the period of the census, or survey.

Indicator ranking - is first always best?
The districts are ranked from 1 to 52 (for the various indicators in the league table graphs with number 1 representing the best performance and number 52 the worst performance). However, with some indicators such as nurse clinical workload and Caesarean section rate, being in the number 1 position does not mean best performance; best is usually in the middle range close to the South African average.

In the district profiles and the data file, a simple colour coding and a rank number has been added to facilitate understanding:

- green 1-17 (best)
- yellow 18-35 (middle)
- orange 36-52 (worst).

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7 An addendum to the antenatal survey results was released on 12 May 2009, revising the methodology and values of the survey results with no age weighting. These new values have been included in the Excel data file that is included in the CD that comes with this publication, but it was too late to update all the graphs and figures in this publication. The correlation coefficient using the new values remained very similar. The addendum for published 2007 HIV and Syphilis prevalence survey report can be found at URL: http://www.doh.gov.za/docs/adendum-tables-f.html

8 http://isrdp.dplg.gov.za/
Change graphs and values
The change values as shown in the DHB are absolute differences (usually expressed in percentage points), which are the arithmetic difference of two percentages. So for example if a district in 2007 had a TB smear conversion rate of 50% and in 2008 the smear conversion rate was 75% then the improvement is represented as a 25 percentage point increase i.e. the 2007 value of 50 subtracted from the 2008 value of 75.

Trend graphs
In this year’s publication, graphic illustrations of trend data allow for a clearer picture of the indicator to emerge. In many instances these graphs have replaced the year-on-year change graphs. Examples of the typical trend graphs displayed in this report are illustrated below.

1) Annual indicator trends by district within a province.
These graphs can be found in Section B: Province and District Profiles. They illustrate each indicator individually by each district within a particular province. These graphs compare districts within a province and show variation over a certain time period with respect to a particular indicator (e.g. the delivery rate in facility and the Caesarean section rate in Nelson Mandela Metro have been consistently higher than in any of the other Eastern Cape districts since 2000). The graphs also reflect if there are wide fluctuations in the data, such as in the immunisation drop out rate and nevirapine uptake in newborns.

2) Annual trends of an indicator comparing districts and provinces
These graphs help the reader explore how an indicator varies over a number of years across districts and provinces. For instance, figure D shows that the Caesarean section rate in most of the districts in the Western Cape are higher than those in the Northern Cape and North West. As the scale of the y axis is the same for all the graphs, one can easily notice differences. It also shows variation and change within the districts in a particular province over time. For example the difference in the rates between iLembe district and other districts in KwaZulu-Natal. This difference has diminished in the two most recent years.

These graphs are used in Section A: Indicator comparisons by district.

Cross-boundary districts
The existence of cross-boundary sites continues to complicate analysis at the district level, although the scale of the problem is diminishing. Currently indicators in a number of health districts that cross provincial boundaries are affected because the data on which these indicators are based are collected by two provinces with differing information systems. This is a fluid situation, which is also going to be affected by proposed changes to provincial boundaries as the Department of Provincial and Local Government has gazetted the Cross-Boundary Municipalities Laws Repeal Bill for public comment. For the current DHB data for cross boundaries have been allocated as follows:

<table>
<thead>
<tr>
<th>Cross-boundary district</th>
<th>Data from:</th>
<th>Data incorporated into:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tshwane metropolitan municipality</td>
<td>Gauteng/North West</td>
<td>Gauteng</td>
</tr>
<tr>
<td>Frances Baard district municipality</td>
<td>Northern Cape/North West</td>
<td>Northern Cape</td>
</tr>
<tr>
<td>Kgalaegadi district municipality</td>
<td>Northern Cape/North West</td>
<td>Northern Cape</td>
</tr>
<tr>
<td>West Rand district municipality</td>
<td>Gauteng/North West</td>
<td>Gauteng</td>
</tr>
</tbody>
</table>

As detailed in the government Gazette Nr. 28363 of 23 December 2005⁹, the cross-boundary municipality of Bohlabela, has been divided between Limpopo and Mpumalanga provinces and thus no longer exists¹⁰. However some sources still provide data according to the old demarcation, and where no detailed underlying data are provided it is not possible to reallocate the indicators according to the new demarcation. For example, in the case of the TB indicators, the TB cure rates are evaluated a year after the commencement of treatment, and Bohlabela district’s results are still being evaluated for the TB cure rate 2006 and the TB smear conversion rate 2007.

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¹⁰ Bushbuckridge sub-district has become part of DC32 Ehlanzeni district in MP and Maruleng has become part of DC33 Mopani district in LP.
Figure C: Annual indicator trends by district within a province

Annual Indicators for districts in Eastern Cape (EC)

Time period

Value

Districts

DC10: Cacadu  DC14: Uitenhage  NMA: Nelson Mandela Bay Metro
DC12: Amathole  DC16: O.R. Tambo
DC12: Chris Hani  DC44: Alfred Nzo
Figure D: Annual trends of an indicator comparing districts and provinces
Section A: Indicator Comparisons by District

1. Socio-economic Indicators

1.1 Deprivation Index

The deprivation index measures the relative deprivation of populations across districts within South Africa. It is a composite measure derived from a set of demographic and socio-economic variables obtained from the 2007 Community Survey and the 2005 and 2006 General Household Surveys. These variables include the proportion of the area’s population that are children below the age of 5; are from a female headed household; household heads who have no schooling, who are adults between 25 and 59 classified as unemployed; living in a traditional dwelling, informal shack or tent; no piped water in their house or on site; a pit or bucket toilet or no form of toilet; no access to electricity or solar power for lighting, heating or cooking.

Higher values of the deprivation index denote higher levels of deprivation. The deprivation index has been calculated so that it can be compared over the three years, 2005 to 2007, for each of the districts. Further information on the methodology and background to the deprivation index can be seen in the appendices.

The level of deprivation in most districts (63% of the districts) in South Africa has reduced since 2005. Reduction in levels of deprivation is as a result of a reduction in one or more of the variables used in constructing the deprivation index.

Figure 1 shows the deprivation index values for all districts in South Africa in 2007 and the ranking into socio-economic quintiles. Those districts that fall into quintile 5 are the least deprived (best off) and the districts which fall into quintile 1 are the most deprived (worst off).

In 2007, the ten most deprived districts in South Africa fell within three provinces; - KwaZulu-Natal (Uthukela, Ugu, Sisonke, Zululand, Umkhanyakude and Umzinyathi districts), Eastern Cape (Chris Hani, Alfred Nzo and O.R. Tambo districts) and Limpopo (Greater Sekhukhune). Besides Sisonke and Uthukela, all these districts are designated as rural development districts (ISRDP). The poverty rate of people living in these deprived districts is high, and ranged from 63% to 82% of households living on less than R800 per month in 2006.

All the districts within the Western Cape are ranked amongst the least deprived in the country, as are three of the six metros (City of Cape Town, City of Johannesburg and Nelson Mandela Metro). Two other metros, Ekurhuleni and City of Tshwane, and the West Rand district, dropped from the highest socio-economic quintile in 2005 to quintile 4 in 2007. Table 1 shows the deprivation index by district over three years from 2005 to 2007 and gives an indication of how districts have improved or deteriorated in terms of relative deprivation during that timeframe. Two metro districts in Gauteng, the City of Tshwane (9th to 19th place) and Ekurhuleni (11th to 17th place), have slipped the furthest amongst all the metros in terms of ranking over the last three years and their deprivation indices have also increased. Of concern is that amongst the ten districts that have deteriorated the most, two ISRDP districts, Ugu and Umzinyathi, which are already in the lowest socio-economic quintile, have slipped by four and three places respectively, to take up 45th and 52nd place. These districts are meant to receive additional resources to improve their socio-economic development.

1 Full information on the deprivation index can be seen in Appendix 2.
Figure 1: Deprivation index and socio-economic quintiles by district, 2007

Source: Calculated from StatsSA data
### Table 1: Deprivation Index² by district, 2005-2007

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² The closer to 5, the more deprived.

Figures in red highlight those districts which demonstrate an increasing level of deprivation (deprivation index increased each year) over the last 3 years.
Deprivation index by sub-district (municipality)

A new feature in this year’s report is the deprivation index calculated at sub-district level. Map 1 shows clearly where poverty in South Africa is located. The full table of deprivation indices by sub-district is available on the CD as an Excel file called ‘Deprivation Sub_District_CS2007.xls. Extracts from this file are shown below as Table 2 which illustrates the variation in the levels of deprivation within some districts. For example Chris Hani District (Eastern Cape) has sub-districts that range from being very deprived (Engcobo Local Municipality) to relatively well off (Inxuba Yethemba Local Municipality). Similarly Gert Sibande District in Mpumalanga, which falls in to socio-economic quintile 3, shows a wide variation between its sub-districts. Some districts however show little variation (e.g. Uthungulu District in KwaZulu-Natal where all the sub-districts are very deprived and Cape Winelands District in the Western Cape where all nine sub-districts are in socio-economic quintile 5).

The majority of the most deprived sub-districts (25/47) fall into KwaZulu-Natal province; 14 are in the Eastern Cape, five in Limpopo, one in the Northern Cape and two in North West Province. There are no sub-districts in the lowest socio-economic quintile in the Western Cape, Gauteng, Mpumalanga or Free State provinces. A list of these sub-districts is also included on the CD.
Table 2: Deprivation Index and socio-economic quintiles by selected sub-districts, 2007

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</tr>
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<td>MP303: Mkhondo Local Municipality</td>
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</tr>
<tr>
<td>MP304: Seme Local Municipality</td>
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<td>2</td>
</tr>
<tr>
<td>MP302: Musukaligwa Local Municipality</td>
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<td>MP306: Dipaleseng Local Municipality</td>
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<td>MP307: Govan Mbeki Local Municipality</td>
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<tr>
<td>Cape Winelands District Western Cape</td>
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<td></td>
</tr>
<tr>
<td>WC023: Drakenstein Local Municipality</td>
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</tr>
<tr>
<td>WC025: Breede Valley Local Municipality</td>
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</tr>
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<td>WC024: Stellenbosch Local Municipality</td>
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</tr>
<tr>
<td>WC022: Witzenberg Local Municipality</td>
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<td>5</td>
</tr>
<tr>
<td>WC028: Breede River/Winelands Local Municipality</td>
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</tr>
<tr>
<td>WC031: Theewaterskloof Local Municipality</td>
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<td>WC033: Cape Agulhas Local Municipality</td>
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1.2 Equity: Monitoring the gap between the most and least deprived districts

One of the main goals of the District Health System is to fulfill a number of principles embodied in the primary health care approach, including equity and accessible comprehensive services of good quality that are effective and efficient.

Although inequities in health result from the social conditions that lead to illness, health systems play a pivotal role in improving or worsening the situation, particularly through provision of PHC services.

By the monitoring of a selected set of socio-economic and health care indicators in PHC, the District Health Barometer works as a tool to monitor and support improvement of equitable provision of PHC in South Africa.

In the section that follows, a selection of some of the indicators that are in the DHB are analysed by socio-economic quintile, in order to monitor and highlight the inequities that exist between the most deprived and the least deprived districts in the country.

Social Determinants of Health

Access to water

The percentage of households in each district that have access to piped water\(^3\), as measured by the Community Survey in 2007, is illustrated in Figure 2. The districts are ranked from the highest access of 99.4% (City of Cape Town, Western Cape) to the lowest access of 35.6% (O.R. Tambo District, Eastern Cape).

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\(^3\) Defined in the survey as: Number of households with Piped water inside the dwelling, Piped water inside the yard, Piped water from access point outside the yard; as a percentage of total households.
The ten districts that have the least access to piped water in the country are the same as those identified as being the most deprived (Figure 1) with the exception that Ukhahlamba in the Eastern Cape has replaced Chris Hani from the same province. There has been an improvement in access to water in the ISDRP districts. In 2007, 62.7% of households in these districts had access to piped water up from 53.7% as shown in the Census in 2001 and up from the General Household Survey estimate of 57.7% in 2005. The district with the worst access to water is O.R. Tambo at 35.6% of households with access, up from the 28% measured during the 2001 Census. The districts with the lowest access to piped water are in KwaZulu-Natal and Eastern Cape provinces, with six (KZN) and three (EC) districts among the ten districts with the least access. The average percentage access to piped water in the highest socio-economic quintile is 97.2% vs an average of 59% for households in the lowest socio-economic quintile.

Access to medical aid
Access to medical aid refers to the percentage of the population who have access to a medical aid scheme. The national average for access to medical aid in 2007 was 14.3%. There is, however, large variation in this indicator from a low of 3.2% in Alfred Nzo to 26.7% in Nelson Mandela Bay metro. Both districts fall within the Eastern Cape illustrating the wide inequity within one province. With regard to the gap between quintiles, an average of 5.2% people had access to medical aid in those districts which were most deprived, compared to 19.5% with access to medical aid in the districts that were in the least deprived quintile.

Inputs
Per capita expenditure on primary health care
Per capita expenditure on primary health care refers to the amount spent on non-hospital PHC services per person without a medical aid. This indicator is useful in assessing the extent of equity in the distribution of PHC resources across districts.

Research on public sector financing and deprivation in 2001 indicated inequities in resource allocation across and within provinces. Differential resources were made available to different geographic areas. Poorer and underserved mostly rural districts generally received far less per capita than did the wealthier and more urban districts. The trends of the per capita expenditure (PCE) among the districts however illustrate that inequities in financial resource allocation are narrowing. Figure 3 shows that the gap between socio-economic quintile 5 and 1 has narrowed since 2001/02. However, it is paradoxical that those districts in quintile 5 (the least deprived) generally are still better funded than those in quintile 1 (the most deprived).

Processes
Average length of stay
The average length of stay (ALOS) indicator measures the average duration of patient stay in a health facility (in days). In 2007/08, the average of the ALOS in facilities in districts in the most deprived quintile, was 5.7 days. This was significantly longer than in the least deprived districts, where the average ALOS was 3.1 days. In 2005/06 the ALOS in the most deprived districts was 6.2 days, although it was much the same (3.2 days) in the least deprived districts. Although the gap is decreasing, research needs to identify the reasons for this difference (e.g. if it is related to a difference in resources, efficiency or quality of care, which causes the more deprived districts to have a longer ALOS).

Bed utilisation rate
Bed utilisation rate is a measure of the occupancy of the beds available for use. It is generally a measure of efficiency and expresses how well the hospital is using its available capacity. The indicative value set by the national DoH is 72%. The bed utilisation rate for the least deprived quintile in 2007/08 was on average 75%, up from 70% in 2005/06. On the other hand the bed utilisation rate for the most deprived quintile was on average 62% in 2007/08, similar to the 63% in 2005/06. Possible reasons for this include migration from rural to urban areas; fewer doctors working in rural areas, etc. The reasons for low utilisation requires review to ensure that there is maximum use of scarce resources.

Outputs
Immunisation coverage
Immunisation coverage measures the percentage of children under one year who have completed their primary course of immunisation. The average immunisation coverage for 2006 was 84.2%. Looking at the most deprived quintile, the average immunisation coverage in 2007/08 was 81.7%. In the least deprived quintile, however, the average immunisation coverage was 12.6 percentage points higher, at 94.3%. In addition, a number of the districts in these areas have immunisation coverage of over 100%, suggesting that mothers and their babies may be coming from neighbouring less advantaged areas to access the service. Alternatively there may be data quality problems with underestimates of the denominator.

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**Primary health care utilisation rate**

The primary health care utilisation rate is the average number of visits per person per year to a public PHC facility. In 2007/08, the average utilisation of primary health care services in South Africa (SA) was 2.2 visits per person and the national target is 3.5. Between 2005/06 and 2007/08 the utilisation rate in the most deprived quintile remained between 2.0 and 2.1 visits per person per year, whereas in the least deprived quintile, the average number of visits to public PHC facilities increased from 2.7 to 3 visits per person per year. It seems as though those with the greatest needs made less use of their PHC facilities compared to the people in the better resourced districts. This is a disturbing observation as people in poorer circumstances generally have greater health problems with greater needs for health services.

† Explanation of box-and-whisker plots: These graphs plot the values of the indicator for each district according to socio-economic quintiles. The black dot represents the median of the values for districts in the quintile. The box is drawn between the first and third quartiles of the values. The horizontal lines (the ‘whiskers’) extend to at most 1.5 times the box width (the interquartile range) from either or both ends of the box. They must end at an observed value. Any value more than 1.5 times the interquartile range is considered an outlier and is shown by a small rectangle.
Outcomes

HIV prevalence amongst antenatal clients tested

The annual data collected through the latest national antenatal sero-prevalence survey provides a picture of HIV prevalence at district level. The HIV prevalence amongst antenatal clients nationally was 28.0% in 2007. The median by socio-economic quintile and province are shown in Figures 4 and 5. In 2007 the median prevalence is 16% in the least deprived quintile, whereas the median prevalence for the most deprived quintile is more than double that 33%. In 2006, a similar difference in the median prevalence was noted; 13% for SEQ1 and 30% for SEQ5. There was no real difference in the prevalence rates between socio-economic quintiles one to four. Quintile five reflects a much lower prevalence rate largely because all the districts in the Western Cape, which have a different demographic profile, are contained in this quintile. The medians of the prevalence rates by province however, show wide variation as can be seen in Figure 5.

Figure 4. Box-and-whisker plot of the HIV prevalence among antenatal clients tested (survey) by socio-economic quintile, 2007

Figure 5. Box-and-whisker plot of the HIV prevalence among antenatal clients tested (survey) by province, 2007

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7 These values represent the median of the values of individual districts within a province and not the averages of the provinces as shown in the National HIV and Syphilis Prevalence Survey.
Section A: Socio-economic Indicators

**TB cure rate**
The TB cure rate is the proportion of new smear positive cases that are shown to be smear negative at the end of six months and/or on at least one previous occasion of TB treatment. In 2005, the average cure rate for the least deprived districts was 70.5% and for the most deprived districts 57.8%, a difference of 12.7 percentage points. This gap has widened to a 16.1 percentage point difference in 2006 (the latest available data) with the average cure rate for the least deprived districts being 71.4% and 55.3% for the most deprived districts. It is alarming that the TB cure rates have deteriorated in the most deprived districts.

**Impact**

**Stillbirth rate**
The stillbirth rate measures the number of babies born dead out of 1000 total births. The stillbirth rates are for public sector facilities only and do not give a full community picture, especially in those places where there are a significant number of home deliveries. The average stillbirth rate in South Africa in 2007/08 was 23.0. The average for the least deprived districts was 20.3 and for the most deprived quintile was 22.4 stillbirths per 1000 births. There is no clear relationship between stillbirth rates and the socio-economic quintiles of districts, and little evidence of change between the best and worst off districts.
2. Input Indicators

2.1 Per Capita Expenditure on Primary Health Care

Per capita expenditure (PCE) on Primary Health Care (PHC) measures the amount of money spent per year per person without medical aid. This indicator is useful in assessing the extent of equity in the distribution of PHC resources across districts. PCE is an input indicator and can also be compared with output indicators such as the utilisation rate.

The proportion of people on medical aid for the period 2005-2007 was 14.3%. In 2007/08, the PCE for people receiving primary health care in the public sector, was R302, up from R275 in 2006/07. Between 2001 and 2007 there was a real increase (i.e. after taking inflation into account) of R65 in the PCE. The average number of visits per person to PHC facilities per year in South Africa, has however increased only very slightly from 2.1 visits in 2001/02 to 2.2 visits in 2007/08, and is unchanged since 2004/05.

The inequity in the PCE between the provinces has steadily decreased from a ratio of 4.4 between the highest and lowest PCEs in 2001, to 2.2 in 2005/06; 1.9 in 2006/07; and 1.8 in 2007/08. In 2007/08 the Western Cape had the highest PCE of R428 and the Free State the lowest, at R233.

District View

Map 2 and Figure 6 illustrate the PCE in 2007/08 by district. This ranges from the lowest PCE of R191 per capita in Lejweleputswa (FS) to the highest, R633, in Namakwa (NC). Namakwa district has had the highest PCE for the past three years. The 3.3 fold difference between the district with the highest PCE and the district with the lowest PCE in South Africa is unchanged from 2006/07, although there has been a decrease from the 3.5 fold difference in 2005/06 and a large decrease from the nine-fold difference in 2001.

Map 2: Non-hospital PHC expenditure per capita in South Africa, 2007/08

Four of the six districts in the Western Cape were among the ten districts with the highest PCE in South Africa in 2007/08. These same districts are also ranked as the least deprived districts in the country (see section 1.1), but also had amongst the highest PHC utilisation rates in the country, with the Western Cape overall having the highest utilisation rate of all the provinces at an average of 2.7 visits per year, much higher than the South African average of 2.2.

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8 It includes expenditure on District Management, Community Health Clinics, Community Health Centres, Community based services and Other Community, but excludes expenditure on district hospitals and conditional grants such as those for HIV and nutrition.
The Northern Cape had the greatest inequity among its districts, with the PCE in Namakwa district three times higher than in Siyanda district. Most of the other provinces ranged from a 1.5 to a two-fold difference between the highest and the lowest PCE per district. Mpumalanga had the least variation between its districts, a 1.2 fold difference between Ehlanzeni and Gert Sibande districts.

Three of the five districts in the Free State province were ranked among the ten lowest PCEs in the country, and the province had overall a lower PCE in 2007/08 (R233) than it did in 2005/06 (R251). Motheo district in the Free State had the highest overall PCE decrease (R44) among all the districts since 2006/07.

**Figure 6: Non-hospital PHC expenditure per capita by district, 2007/08**

![Non-hospital PHC expenditure per capita by district, 2007/08](image)

Source: National Treasury, DHIS and StatsSA data
Metro View

The average PCE for the metro districts in 2007/08 was R356 which was R17 more than in 2006/07 and R54 more than the national average, but R23 less than the 2001 average for the metros. The City of Cape Town had the highest PCE of R454 in 2007/08. Nelson Mandela Bay Metro spent R264 per capita, which placed it among the lower third of districts in SA in 2007/08.

Figure 7: Non-hospital PHC expenditure per capita by metro district, 2007/08

Rural nodes

The PCE in the rural districts in 2007/08 was R254, well below the national average of R302. Eight of the twelve districts fell below the SA average. Central Karoo district had the second highest PCE in the country of R526 per person and is an outlier among the rural nodes. Of concern is that two districts, Thabo Mofutsanyane and Alfred Nzo have lower PCEs in 2007/08 than in 2005/06.

Figure 8: Non-hospital PHC expenditure per capita by rural district, 2007/08

Change and trends in per capita expenditure

Figure 9 shows the changes in the PCE between 2006/07 and 2007/08. These figures are based on “real prices”, which ensure that any increase due to inflation is excluded. Nationally there was an average R27 increase (close on 10%) in real 2007/08 prices since 2006/07. The “nominal price changes” which include inflation, reflect a R46 increase, (15.2%) since 2006/07. The rest of this section will reflect and discuss the “real price” changes.

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9 This means that the 2006/07 values have been multiplied by a factor based on the CPIX to convert the values to 2007/08 prices.
Nine of the 52 districts showed a decrease in PCE since 2006/07, whilst 42 increased their PCE with one district, Xhariep (FS), reflecting no change. Central Karoo (WC), Metsweding (GP) and Sisonke (KZN) each increased their PCEs by more than R100. Namakwa (NC) with the highest PCE in 2006/07 increased its PCE by R98 in 2007/08 and again is ranked as having the highest PCE among the districts. The district with the lowest PCE, Lejweleputswa (FS), decreased its PCE by R13 from 2006/07. Four of the five districts in the Free State decreased their PCEs in 2007/08 to levels below that of two years ago.

Metsweding district, which had the lowest PCE in Gauteng in 2006/07, increased its PCE by R125 in 2007/08. This resulted in a significant reduction in the inequitable distribution of PCEs in that province. Alfred Nzo was the only district in the Eastern Cape which decreased its PCE in 2007/08 which was R67 below the provincial average. Limpopo had the largest overall increase in PCE since 2006/07 of all the provinces, (R58).

Figure 9: Change in expenditure per capita by district 2006/07 - 2007/08 (real prices)
Metro view

The average change in the PCE since 2006/07 in the metro districts was an increase of R17. This is R10 less than the national average increase. With the exception of Ekurhuleni, all metros increased their PCEs since 2006/07 and eThekwini, City of Johannesburg and City of Cape Town had above average increases. The reduction of R33 per capita expenditure in Ekurhuleni to R273, brought its expenditure to below the metro and national average in 2007/08.

Rural nodes

The PCE in the rural districts increased by R21 in 2007/08. This was R6 less than the change in the national average. Six of the rural districts increased their expenditure by more than the national average. Central Karoo (WC) increased its PCE by R182, which was the largest PCE increase in South Africa. Four of the 12 rural districts had increases below the national average. Thabo Mofutsanyane (FS) and Alfred Nzo (EC) actually decreased their PCEs by R18 and R19 respectively. Given the low socio-economic status of the rural districts, it is important that they have PCE increases which are above average.

Figure 10: Annual trends in non-hospital PHC expenditure per capita

Figure 10 shows each province individually, illustrating the trend over the last few years in the PCE in each of the districts within that province.
Table 3: Non-hospital PHC expenditure per capita by province (2007/08 PCE value)

<table>
<thead>
<tr>
<th>Province</th>
<th>2001/02</th>
<th>2005/06</th>
<th>2006/07</th>
<th>2007/08</th>
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Table 3 shows the trend in PCEs per province. It shows clearly that the higher PCE values in the Western Cape and Gauteng in 2001/02 have evened out to a more equitable distribution in 2007/08. Table 3 also shows that the ISRDP districts have increased their PCE by R32 in since 2001, while during the same time the South African average as a whole has increased by R65.

**Association between per capita expenditure and PHC utilisation rate**

**Figure 11:** Per capita expenditure on PHC vs PHC utilisation rate, 2007/08

Figure 11 illustrates that plotting the PCE against the utilisation rate, shows that there was generally a correlation\(^\text{10}\) between the amount spent and the utilisation rate of PHC facilities in 2007/08. This can be seen for example by Lejweleputswa with a PCE of R191 per person and an average of 1.5 visits per person per year in 2007/08 and Central Karoo with a PCE of R536 with an average of 4.6 visits per person per year.

\(^{10}\) Correlation coefficient = 0.59.
2.2 Proportion of District Health Services Expenditure on District Management

Fiorenza Monticelli

The proportion of total district expenditure that was spent on management activities, including the management of district hospitals for the 2007/08 financial year in South Africa was 5.1%. This is up from 4.7% in 2006/07, but unchanged from the 2005/06 value.

**District View**

Figure 12 illustrates how widely the proportion that districts spend on management varies. Metsweding (GP), which does not have a district hospital spent the largest proportion (26.8%) on management. Although this is 1.3 percentage points less than 2006/07, it is still more than 5 times higher than the national average of 5.1%. At the other end of the scale, Central Karoo and Overberg (both WC), reflect zero on district management in 2007/08.

It is likely that different financial accounting and coding practices account for some of the variation. However, as all provinces, with the exception of the North West, use the BAS\(^{11}\) system, one would expect that they would all have similar coding practices (and code district management to code 2.1 which is the designated code for this).

As in 2006/07, some provinces showed wide intra-provincial variations, with one or two districts within a province spending significantly more on management than the rest. For instance in the Eastern Cape, the difference between the district spending the highest proportion (Cacadu, 16.7%) and the lowest proportion on management (Nelson Mandela Bay Metro, 2.5%) is close on seven fold. Kgalagadi spent 22.3% of its budget on management as compared to the other districts in Northern Cape, which spent between 2.5% to 8.1%.

The Western Cape (3.8%) and KwaZulu-Natal (2.3%) spent less on management in 2007/08 than the other provinces, whereas North West spent the most (9.1%), with all four of its districts spending 8% or more on management. Ten out of eleven KwaZulu-Natal districts spent less than 4% and all of the Western Cape districts spent less than 4.5% on management.

Map 3: Percentage of district health services expenditure on management in South Africa, 2007/08

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\(^{11}\) Basic Accounting System.
The average proportion of expenditure on management in 2007/08 for the metro districts was 4.5%, below the national average of 5.1%. eThekwini (0.9%), Nelson Mandela Bay (2.5%) and City of Cape Town (4.1%) all spent below average amounts on management in 2007/08. In contrast, the City of Tshwane (11.5%) spent far above the national average.
Rural nodes

The average expenditure on management in the rural districts was 5.3%, close to the national average of 5.1% and constant since 2005/06. As in 2006/07, the rural districts in KwaZulu-Natal spent the lowest proportion on management in 2007/08. The Eastern Cape rural districts remained clustered around 7%. Kgalagadi (NC) more than doubled the proportion spent on management from 9.9% to 22.3%. The Free State district Thabo Mofutsanyane (FS) reduced the proportion from 10.5% to 3.3%. Both these changes seem improbable and are probably due to some inconsistencies in the data.

Change in percentage of district health services expenditure on district management.

There was a small increase (0.4 percentage points) in the proportion of spending on district management nationally, from 4.7% in 2006/07 to 5.1% in 2007/08. The change in proportion spent on management was less than one percentage point up or down for close on two thirds of the districts. This is to be expected as this proportion of expenditure should be fairly stable.

It is of concern that a number of districts showed large increases and this implies inconsistencies in the data which should be investigated in each district to understand the reasons for the changes. Increases larger than five percentage points were seen for Kgalagadi (NC) 12.6%, Cacadu (EC) 8.5% and Sisonke (KZN) 5.5%. On the other end of the scale, the largest decreases were seen for two Free State districts, Thabo Mofutsanyane 7.2% and Fezile Dabi 2.6%, with the proportion of spending on district management in Thabo Mofutsanyane five times less in 2007/08 than it was in 2005/06. The districts at both extremes of the change scale are ISRDP districts.
2.3 Proportion of District Health Services Expenditure on District Hospitals

This indicator shows the proportion of total district expenditure that is spent on hospitals, and can be used to assess the focus of service delivery in the district. The average proportion of the total district expenditure that was spent on district hospitals in South Africa in 2007/08 was 42.7%. If this is added to the 5.1% spent on district management (see section 2.2), it means that the balance of 52.2% of the total district resources was spent on PHC services, which is marginally up from 51.7% in 2006/07.

Figure 16 shows the differences in expenditure on district hospitals in 2007/08. At the low end, excluding Metsweding which has no district hospital, the three metros, City of Johannesburg (GP), City of Cape Town (WC) and Ekurhuleni...
(GP), spent the least. This suggests a possible over-reliance and focus on teaching and tertiary hospitals in these areas. The Western Cape is remedying this situation by building district level hospitals in Khayelitsha and Mitchells Plein, sub-districts within the City of Cape Town.

At the other end, Siyanda (NC), with three district hospitals, spent 65.7% and Gert Sibande (MP), with eight district hospitals, spent 63% of their budgets on district hospitals. This high proportion of expenditure has been the case for the last 3 years. It is thus not surprising that both of these districts are ranked 50th and 48th in terms of their total per capita expenditure on non-hospital PHC. Increasing the overall district expenditure in these districts, through increasing the PHC component, would have the effect of getting their per capita expenditure closer to the average and would decrease the proportion spent on district hospitals.

Figure 16: Percentage of district health expenditure on district hospitals by district, 2007/08

Figure 16: Percentage of district health expenditure on district hospitals by district, 2007/08

Source: National Treasury, DRS and StatsSA Data
Metro View  There is a clear difference in the proportion of spending on district hospitals between metros and rural districts. The average proportion of district expenditure in the metros in 2007/08 was 32.1%, up from 27.5% in 2006/07 which is over 10 percentage points lower than the national average, largely due to the very small proportion spent by the City of Johannesburg (6.5%) and Ekurhuleni (13%). Although the City of Cape Town at 26.8%, spent less than both the metro and national average, this proportion is significantly higher than what was spent in 2006/07 (9.7%). This is probably due to the reclassification of 3 regional hospitals (GF Jooste, Helderberg & Karl Bremer) as district hospitals, thus making more district level beds available in this metro.

Figure 17: Percentage of district health expenditure on district hospitals by metro district, 2007/08

Rural View  On average the proportion of total district expenditure in the rural districts was 49.4% with all districts spending between 40% and 60% and all spending more than the national average. Ukhahlamba (EC) district spent the greatest proportion (60%) on district hospitals in 2007/08 and more than the other EC rural districts, Chris Hani, O.R. Tambo and Alfred Nzo, which were clustered around 45%.

Figure 18: Percentage of district health expenditure on district hospitals by rural district, 2007/08
Change in percentage of district health services expenditure in district hospitals

Nationally there was a decrease of one percentage point in the proportion of district expenditure on hospitals since 2006/07 and a 2.2 percentage point drop since 2005/06. In 2007/08, there were five districts with decreases of greater than 5 percentage points, with Bojanala (NW) showing a massive decrease of 19.4 percentage points. This is most probably due to underlying data corrections which have corrected the 18.8 percentage point increase in 2006/07.

Overall close on 70% (36 districts) had decreased the proportion spent on hospitals since 2006/07.

Figure 19: Change in percentage of district health expenditure on district hospitals by district, 2006/07 - 2007/08
2.4 Cost Per Patient Day Equivalent in District Hospitals

The average cost per patient per day seen in a hospital, expressed as Rands per patient day equivalent, is calculated by dividing the total expenditure of the hospital by the patient day equivalent (PDE). The PDE is calculated by the number of inpatients plus 1/2 of day patients plus 1/3 of outpatient and emergency room visits. No norm has been set for this indicator by the national DoH for 2007/08.

This indicator measures how the efficiently the resources that are available to the hospital are being spent and if a particular hospital is being optimally managed. It is a composite process indicator that links financial data with service related data taken from the hospital admissions and outpatients. It measures and compares the inputs, total financial resources available to the hospital, with the volume of patients seen and is a means of comparison with similar hospitals in other districts.

District View

Map 4 and Figure 20 show the distribution of the cost per patient day across the 52 districts in South Africa in 2007/08. Many districts have more than one district hospital and individual hospital differences are aggregated within the districts and thus the variation seen is less than that between individual hospitals.

The average cost per PDE in South Africa in 2007/8 was R1128. This conceals a wide range from a low of R744 in Chris Hani (EC) to a high of R2363 in Frances Baard (NC). Within the ten districts with the highest cost per PDE, four were in the Northern Cape (Frances Baard, Namakwa, Kgalagadi and Pixley ka Seme), two in Gauteng (Ekurhuleni, and City of Tshwane) and the others in Eastern Cape, Mpumalanga and North West. Closer inspection of the data shows that there are gaps in the monthly data for PDEs (the denominator) reported for districts in the North West, Gauteng and Northern Cape resulting in inflated cost per PDE for those districts.

There were wide intra-provincial differences among districts in some provinces. The largest range was in the Northern Cape with nearly a three-fold difference between Frances Baard R2363 and Siyanda, R820. In the Eastern Cape, the cost per PDE in Nelson Mandela Bay metro was twice as high as in Chris Hani.

As district hospitals consume over 40% of total district resources the wide ranges in this indicator are of great concern. At the high end, it may indicate lack of efficiency or leakage out of the system, while at the low end it may indicate poor quality of care. Greater monitoring of this indicator in each individual hospital is necessary.

Map 4: Cost per patient day equivalent in district hospitals in South Africa, 2007/08

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12 These figures are nominal – in other words, the cost per PDE values have not been adjusted for inflation.
Figure 20: Cost per patient day equivalent in district hospitals by district, 2007/08

The average cost per PDE in 2007/08 in the metros was R1222, R94 higher than the national average of R1128. Ekurhuleni and City of Tshwane in Gauteng had the highest costs of R1788 and R1658 per PDE respectively, twice as high as the low of R836 in eThekwini. The expenditure in these districts needs review to determine why they have deviated so far from the average.
Rural View

The rural district average cost per PDE was R1089 in 2007/08. There was a more than twofold difference between Kgalagadi (NC) with a cost per PDE of R1664 and Chris Hani (EC) at R744. There are clear provincial differences with all four Eastern Cape districts being lower than the KwaZulu-Natal districts.

Figure 22: Cost per patient day equivalent in district hospitals by rural district, 2007/08

Change and trends in cost per patient day equivalent

There was an overall increase in South Africa in the cost per PDE in district hospitals of R173 from R954 in 2006/07 to R1128 in 2007/08 and a R293 increase since 2005/06. However, taking inflation into account, the 2007/08 figure was R107 higher than in 2006/07 and R185 higher than in 2005/06, resulting in an average annual increase of 10% over the three years. As can be seen in Figure 23, there were extremely large increases and fluctuations in four of the five Northern Cape districts in the last year and since 2005/06. These are due to data quality issues since denominators are missing for the 2006 data in a number of hospitals in these districts. The poor data quality is of concern and requires review.

The next set of large increases in the patient day equivalents were in Ekurhuleni and City of Tshwane (GP) with increased costs per PDE of R901 and R699 respectively since 2005/06. Six districts had moderate decreases in costs per PDE and two districts Motheo (FS) and Amajuba (KZN) had lower costs than in 2005/06.
Figure 23: Trends in cost per patient day equivalent in district hospitals by province and district, 2005/06 - 2007/08

This trend graph shows each province individually, illustrating the trend over the last few years in the cost per PDE for district hospitals in each of the districts within that province. It shows clearly where wide fluctuations in the values occur such as in the Northern Cape and also where values have remained relatively consistent such as in the Western Cape and Limpopo.
3. Process Indicators

3.1 Nurse Clinical Workload

The nurse clinical workload is defined as the average daily number of patients attended to by a professional nurse in PHC facilities. However, the data in the DHIS shows that in some provinces the indicator (denominator) appears to include all three categories of nurse viz. Professional Nurse, Enrolled Nurse and Enrolled Nursing Assistant. In some cases, the administrative ‘paperwork’ duties, as well as the days away from the clinical situation (e.g. training, meetings) of the professional nurse are also included in the workdays used to calculate this indicator. This also gives a false impression of the actual professional nurse hours available to the clients. Given the severe shortage of human resources, particularly in some rural districts, it is not surprising that all three categories of nurse may be involved in clinical PHC work. However, this is not consistent across the provinces and districts and the data contain many irregularities. This makes analysis and interpretation of this indicator difficult and therefore difficult to conclusively determine what the true situation is.

The work done by nurses at the district level is probably the single most important factor in the delivery of primary care. Therefore the establishment of a sound monitoring system needs urgent attention. This indicator is a measure of efficiency and very low values indicate that scarce skills (i.e. professional nurse time) are not being optimally utilised. Very high values indicate that either the data are incorrect or that nurses are seeing too many patients per day resulting in a compromise in the quality of care to the patient or burn-out of the nurse, or both.

District View

The average nurse clinical workload of 23.7 patients per nurse per day in South Africa in 2007/08 has dropped by four patients per day since 2004/05. Figure 24 shows the range of values across the districts from a low of 12.5 patients per day in Waterberg (LP) to 44.2 in Fezile Dabi (FS). The data have stabilised over the last four years to reflect more realistic values.

Capricorn, Greater Sekhukhune and Waterberg districts in Limpopo remain responsible for three of the lowest workload indicators of 15 or less patients a day for four consecutive years. This being an average result for the district, requires investigation as it implies that many professional nurses are seeing less than 10 patients a day.

The range of nurse workload has reduced over the last three years with a reducing difference between the districts with the greatest and lowest workload. However, paradoxically there is a trend of increasing workload in the least deprived districts and a declining workload in the most deprived districts.

Map 5: Nurse clinical workload in South Africa, 2007/08
In 2007/08 the metros had an average clinical nurse workload of 28.9 patients per nurse, a slight decrease from 29.6 in 2006/07, and higher than the SA average of 23.7 patients per day. Workloads varied from a low of 21.7 patients per nurse in the City of Johannesburg to 40.8 patients per day in the City of Cape Town.
The ISRDP average has dropped steadily from 24.6 patients per nurse per day in 2004/05 to 21.0 patients per day in 2007/08. Four of the twelve rural node districts reported a nurse clinical workload above the South African average in 2007/08. The workload ranged from the highest in Thabo Mofutsanyane in the Free State of 40.3 patients per day to an average of 14 patients per day in Greater Sekhukhune (LP).

If one looks at the annual trend graphs, as depicted in Figure 28, it may be noted that the trend in the majority of the districts in KwaZulu-Natal, Northern Cape, North West, Gauteng, Mpumalanga and Eastern Cape provinces is downward since 2004/05. Limpopo appears to have the most stable trends, indicating the possibility that they are using a standard definition within the province. The data surrounding this indicator requires more investigation so as to ensure that the change and trend reflected is a true reflection of the circumstances in the PHC clinics. The wide intra-provincial differences among districts highlight the perspective that not enough attention is being given to reducing inequities in human resource allocation.
Figure 27: Change in nurse clinical workload by district, 2006/07 - 2007/08

Change in nurse clinical workload by district, 2006/07-2007/08

Source: DHS 2008
Figure 28: Annual trends in nurse clinical workload by province and district, 2004/05 - 2007/08
3.2 Bed Utilisation Rate

The bed utilisation (occupancy) rate is a measure of the occupancy of the beds available for use. It is calculated by dividing the number of patient days by the bed days available, over a specific time period (usually a year), and expressing this as a percentage. It is generally a measure of efficiency and expresses how well the hospital is using its available capacity. The target for district hospitals set by the national DoH for 2006/07 was 72%.

The bed days available in the numerator of the calculation need to be calculated correctly to accurately reflect the number of beds available. South African hospitals classify beds as ‘authorised’ (this number reflecting the number of beds that “should” be in use), and ‘actual’, those that are really being used. When the actual numbers of beds in use changes, this needs to be reflected in the number of bed days calculation.

District View

In map 6 and figure 29 the variation in the bed utilisation rate (BUR) for 2007/08 can be seen. The average BUR for South Africa in 2007/08 was 65.3% and the rate has been between 60 and 65 since 2000/01. The range of BURs is extensive (37.6 % in Frances Baard (NC) to 119% KgKgalagadi (NC). The figure for KgKgalagadi is of doubtful accuracy, as it is an outlier to the trend from previous years and data for one of the largest district hospitals is missing from 2007. Because many of the districts contain more than one district hospital, the district averages seen in this graph conceal greater individual hospital variations. There were no data from Metsweding (GP) as this district does not have district hospitals.

There were significant differences between provinces in 2007/08, ranging from an average BUR of 58% in North West province to a BUR of 81% in the Western Cape. Intra-provincially the BUR varied in most provinces except in North West and Limpopo provinces where the BURs were clustered more closely. The ideal management strategy is to get the districts in a particular province to have similar utilisation patterns.

There were two districts with a BUR of less than 50% and fourteen districts where the BUR was below 60% in 2007/08. This is of concern as it has increased from the ten districts which had BURs of less than 60% in the previous year. This points to large scale inefficiencies in the district hospital system and suggests that provinces should ensure that their service transformation plans include changing under-utilised hospitals into community health centres.

Map 6: Bed utilisation rate in South Africa, 2007/08

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Metro View

As one would expect, with lesser availability generally of district hospital beds in the metro areas compared to the rural districts, the metro average BUR of 71.3% was much greater than the national average. Tshwane, with a BUR of 60.1%, was the only metro below the South African average. The BUR of over 89.3% for the City of Cape Town continues to be indicative of the shortage of district beds in this metro and is a message to the management to fast track the building of additional district hospitals so as to take the pressure off the much more expensive secondary and tertiary hospital beds. Although Nelson Mandela Bay Metro has shown an encouraging increase to above the metro and national averages, it should be noted, however, that in both 2003 and 2007, the data from this district showed some discrepancies, and therefore should be investigated.
Figure 30: Usable bed utilisation rate by metro district, 2007/08

Rural nodes

The BUR for the rural districts increased slightly to 63.8% in 2007/08. There was a very wide range from a high BUR in Kgalagadi of 119%\(^{14}\) to a low of 55.8% in Zululand (KZN). It is to be noted that in 2006/07, O.R. Tambo district in the EC was the lowest of the rural nodes at 47.6% and this has improved to 56.1% in 2007/08. Only Kgalagadi district had a BUR of over 80% while four rural districts had a BUR of less than 60%.

Figure 31: Usable bed utilisation rate by rural district, 2007/08

Change and trends in bed utilisation rate

The overall BUR for South Africa has been fairly constant since 2000/01, ranging from 59.8% to 65.3%. The greatest increase in the past year was shown by Kgalagadi district (NC) which increased by 45.8 percentage points, however the accuracy of the data is in question, since data for the largest district hospital is missing from 2007. The greatest decrease of 24.9 percentage points occurred in Namakwa district (NC), however there were many missing denominators in 2006-2007, suggesting that the high value in 2006/07 was due to data errors. However, the BUR in Frances Baard has declined to very low levels over the past years, with no apparent data errors. It is of some concern that the widest variations in the data came from districts in the same province (NC). It is recommended that the provincial information units investigate further, as this indicator has budgetary implications for the district.

In total, 27 districts showed a decrease in BUR, while a further sixteen showed no change or less than 5 percentage point increase in BUR. Clearly this former statistic points to data quality issues or dysfunctional district hospitals. Managerial investigation is urgently required to establish whether this is indicative of poor data quality or institutions in need of reclassification.

\(^{14}\) Data unreliable.
Section A: Process Indicators

Six of the rural districts showed a decrease in BUR from 2006/07 to 2007/08. There is a spike in Ukhahlamba (EC) in 2006/07 pointing to the possibility of inaccuracies in the data.

Five of the six metro districts decreased their BUR in 2007/08 with the greatest decrease among the metro districts being in Ekurhuleni (8.6 percentage points), which had variable data for the past 4 years. There was a lot of missing data for Nelson Mandela Bay Metro from the end of 2007. Although the BUR remained relatively stable, data quality needs to be investigated.

The annual trends in BUR in district hospitals from 2000/01 to 2007/08 by province and district can be viewed in figure 32.

It is clear from figure 32, that over the last seven years, this data has fluctuated in varying amounts in some districts particularly in the Northern Cape, North West, Eastern Cape and Gauteng. This could be indicative of poor quality data and needs attention.

Figure 32:  Trends in usable bed utilisation rate in district hospitals by province and district, 2000/01 - 2007/08
3.3 Average Length of Stay

The average length of stay (ALOS) measures how much time patients spend in district hospitals. It is calculated by dividing the number of patient days by the number of separations, which include transfers, discharges and deaths. District hospitals generally admit acute, relatively uncomplicated patients and the idea is to treat and discharge them as soon as is possible.

The ALOS is a proxy measure for the quality of care received as well as of the efficiency of the hospital. It is one of the best markers for what is happening in a hospital and a persistently high ALOS means that patients are being kept in hospital for too long. A very low ALOS means that the quality of care is likely to have been compromised.

District View

As can be seen in Map 7 and Figure 33, there was a wide variation in the ALOS in South Africa in 2007/08 with an average value for the country of 4.4 days. This has been constant for three years. The ALOS in 2007/08 ranged from 1.4 days in Kgalagadi (NC) to 8.0 days in O.R. Tambo (EC). Because many of the districts contain more than one district hospital the district averages conceal greater individual hospital variations. There were no data from Metsweding (GP) as this district does not have district hospitals. Similar to the two previous years, the majority of the 10 districts with the highest ALOS were rural districts in the Eastern Cape and KwaZulu-Natal provinces and seven were rural nodes. The ALOS is highest in the most deprived districts (SEQ 1) and declines to the lowest levels in the least deprived districts (SEQ 5).

There were distinct provincial differences. All the Northern Cape and Free State districts had an ALOS of four days and less. On the other hand, four of the seven Eastern Cape districts and seven of the 11 KwaZulu-Natal districts had an ALOS of greater than five days. The remaining provinces were clustered in the middle around four days.

There were large intra-provincial variations in the Eastern Cape and KwaZulu-Natal with a wide range between the district with the lowest and the district with the highest ALOS. The rest of the provinces had relatively narrow ranges.
As can be seen in Figure 34, the ALOS for the metros of 3.9 days ranged from 3.0 days in the Ekurhuleni to 4.7 days in eThekwini, which was the only metro with an ALOS greater than the national average.
Rural View

The ALOS in the rural nodes of 5.2 days was longer than the national average of 4.4 days. Included among this group are the districts with the highest and lowest value in the country (8 days in O.R. Tambo (EC), and 1.4 days in Kgalagadi (NC)). The districts in the Eastern Cape and KwaZulu-Natal tended to have a longer ALOS in district hospitals than the other rural districts. The very long ALOS in O.R. Tambo needs to be investigated to find out why patients are spending such long periods in the individual hospitals of this district. One possible explanation for the long ALOS in the rural hospitals may be due to the shortage of doctors who can discharge or transfer patients timeously. O.R. Tambo also had a very low bed utilisation rate in 2007/08, which may also be indicative of problems with hospital utilisation and efficiency.

Change and trends in average length of stay in a district hospital

In South Africa as a whole there was little change in the average length of stay from 2004/05 to 2007/08. Twenty four of the 52 districts showed no change or change of less than 1 day in the past year. One district however, Alfred Nzo (EC) showed a decrease of over two days in the last year, and iLembe has increased from 1.9 in 2000/01 to 7.5 days in 2007/08, while Kgalagadi decreased from 5.9 to 1.4 days over the same period.

Figure 36 illustrates trends in various districts from 2001/02 to 2007/08. For instance, Motheo district has a consistently longer ALOS compared to other districts in the Free State. The consistently wide differences in ALOS of districts in KwaZulu-Natal and Eastern Cape provinces are also clearly illustrated.
Figure 36: Trends in the average length of stay in district hospitals by province and district, 2001/02 - 2007/08

Annual trends: Average length of stay – all patients

<table>
<thead>
<tr>
<th>EC</th>
<th>FS</th>
<th>GP</th>
</tr>
</thead>
<tbody>
<tr>
<td>KZN</td>
<td>LP</td>
<td>MP</td>
</tr>
<tr>
<td>NC</td>
<td>NW</td>
<td>WC</td>
</tr>
</tbody>
</table>

Legend:
- EC Alfred Nzo
- EC Amatole
- EC Cacadu
- EC Chris Hani
- EC Nelson Mandela
- EC O.R. Tambo
- EC Ulhahlamba
- FS Fakala Tja
di
- FS Lejweleputswa
- FS Motswa
- FS T. Mofokeng
- FS Xhariep
- GP Ekurhuleni
- GP Johannesburg
- GP Tshwane
- GP West Rand
- KZN Amajuba
- KZN eThekwini
- KZN Lethembe
- KZN Sisonke
- KZN Ugu
- KZN Umlungusi
- KZN Umkhanyakude
- KZN Umzinyathi
- NC Frances Baard
- NC Grootvlei
- NC Kgalagadi
- NC Pixley ka Seme
- NC Siyanda
- NW Bojanala Platinum
- NW Kenneth Kaunda
- NW NM Molema
- NW North West
- WC Cape Town
- WC Cape Winelands
- WC Central Karoo
- WC Eden
- WC Overberg
- WC West Coast
3.4 Clinic Supervision Rate

The Clinic supervision rate is defined as the percentage of PHC clinics and CHCs visited by a supervisor at least once a month. Implicit in such a visit is a written visit report and feedback to facility staff. It is one of the most important determinants of quality of care as these supervisory visits are meant to highlight problem areas which the supervisor is expected to assist clinic staff to help resolve. The indicator excludes multiple visits where the supervisor visits the clinic more than once during the month.

District view

Map 8 and Figure 37 show the supervision rates for 2007/08. The national average for 2007/08 was 48%. This indicates an increase of four percent from 2006/07. Despite this increase, the supervision rate remains extremely low and is partly due to data quality issues. The values ranged from an improbably low rate of 7.4% in Namakwa to a high of 94.4% in Ekurhuleni. The Northern Cape and Mpumalanga provinces showed the lowest supervision rates in 2006/07 where less than a third of all clinics were regularly supervised. Twenty seven of the 52 districts had supervision rates above 50%. KwaZulu-Natal had the highest supervision rate of all the provinces with six out of eleven districts above a 60% supervision rate.

Four out of the six districts in the Western Cape were below the national average, ranking the province as the third lowest in the country. The very low values for Namakwa, Pixley ka Seme and Siyanda in the Northern Cape and City of Johannesburg (GP) are probably due to poor recording and incomplete data; for example other sources have suggested that Johannesburg has a very high supervision rate, however the data are not reflected in the national DHIS database.

It is encouraging to see that there are data available for the Eastern Cape in 2007/08. This indicator should approach 100% and it is clear that across the country there is no prioritisation given to ensure that supervision takes place.

Map 8: Clinic supervision rate in South Africa, 2007/08
The supervision rate within the metro areas varied from 94% in Ekurhuleni (GP) to 8% in City of Johannesburg (GP). As previously mentioned the City of Johannesburg rate is due to lack of accurate data.

Metro view

The supervision rate within the metro areas varied from 94% in Ekurhuleni (GP) to 8% in City of Johannesburg (GP). As previously mentioned the City of Johannesburg rate is due to lack of accurate data.
**Rural nodes**

In the ISRDP nodes, nine of the districts had supervision rates higher than the national average. This is an improvement from four districts in 2006/07. All of the rural nodes in KwaZulu-Natal were above the national average. The ISRDP average was 55% which was higher than the national average.

**Change in clinic supervision rate**

As this is the second year of recording this data, it is possible to compare change over the two years except for the Eastern Cape which did not reflect any data for 2006/07. Although 63% of the districts showed an increase in the clinic supervision rate, the rate did not increase significantly year on year (4.1 percentage points). This could be as a result of insufficient management interest in this indicator or inadequate data quality, and more needs to be done to improve the situation.

The greatest increase was shown by Central Karoo (WC), which increased by 48 percentage points. The greatest decrease was shown by West Rand (GP). It is possible that this is a more accurate reflection, as the previous year’s figure of 106% was probably inaccurate.
Figure 40: Change in clinic supervision rate, 2006/07 - 2007/08

Source: DHS (2008)
4. Output Indicators

4.1 Immunisation

Thando Ford-Ngomane

**Immunisation coverage and drop out rate (DTPI-3)**

Children below the age of five years are at risk of fatal acute infectious diseases resulting in infant and child mortality. Control of these infectious diseases is important for the reduction of childhood morbidity and mortality and would make a significant contribution towards the achievement of Millennium Development Goal 4 which aims to reduce child mortality by two thirds by the year 2015 when compared to the baseline of 1990 rates. The Expanded Programme on Immunisation in South Africa aims to protect children as early as possible from vaccine preventable diseases before exposure to the disease.

Immunisation coverage and immunisation drop out rates at PHC level indicate the level at which communities utilise the preventive services and thus serve as a proxy of the strength of the public health system.

Two of the indicators used to measure the effectiveness of the immunisation programme are immunisation coverage and immunisation drop out rate.

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**Expanded Programme on Immunisation – EPI (SA)**

**Revised Childhood Immunisation Schedule from April 2009**

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Vaccines needed</th>
<th>How and where is it given?</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Birth</td>
<td>1. BCG Bacillus Calmette Guerin</td>
<td>Right arm</td>
</tr>
<tr>
<td></td>
<td>2. OPV (0) Oral Polio Vaccine</td>
<td>Drops by mouth</td>
</tr>
<tr>
<td></td>
<td>3. OPV (1) Oral Polio Vaccine</td>
<td>Drops by mouth</td>
</tr>
<tr>
<td></td>
<td>4. RV (1) Rotavirus Vaccine</td>
<td>Liquid by mouth</td>
</tr>
<tr>
<td>6 Weeks</td>
<td>5. DTaP-IPV/Hib (1) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Hemophilus influenzae type b Combined</td>
<td>Intramuscular / Left thigh</td>
</tr>
<tr>
<td></td>
<td>6. Hep B (1) Hepatitis B Vaccine</td>
<td>Intramuscular / Right thigh</td>
</tr>
<tr>
<td></td>
<td>7. PCV (1) Pneumococcal Conjugated Vaccine</td>
<td>Intramuscular / Right thigh</td>
</tr>
<tr>
<td>10 Weeks</td>
<td>8. DTaP-IPV/Hib (2) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Hemophilus influenzae type b Combined</td>
<td>Intramuscular / Left thigh</td>
</tr>
<tr>
<td></td>
<td>9. Hep B (2) Hepatitis B Vaccine</td>
<td>Intramuscular / Right thigh</td>
</tr>
<tr>
<td>14 Weeks</td>
<td>10. RV (2) Rotavirus Vaccine*</td>
<td>Liquid by mouth</td>
</tr>
<tr>
<td></td>
<td>11. DTaP-IPV/Hib (3) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Hemophilus influenzae type b Combined</td>
<td>Intramuscular / Left thigh</td>
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<tr>
<td></td>
<td>12. Hep B (3) Hepatitis B Vaccine</td>
<td>Intramuscular / Right thigh</td>
</tr>
<tr>
<td></td>
<td>13. PCV (2) Pneumococcal Conjugated Vaccine</td>
<td>Intramuscular / Right thigh</td>
</tr>
<tr>
<td>9 Months</td>
<td>14. Measles Vaccine (1)</td>
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<td>15. PCV (2) Pneumococcal Conjugated Vaccine</td>
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<td>18 Months</td>
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<td>17. DTaP-IPV/Hib (4) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Hemophilus influenzae type b Combined</td>
<td>Intramuscular / Left arm</td>
</tr>
<tr>
<td>6 Years (both boys and girls)</td>
<td>18. Td Vaccine Tetanus and reduced strength of diphtheria Vaccine</td>
<td>Intramuscular / Left arm</td>
</tr>
<tr>
<td>12 Years (both boys and girls)</td>
<td>19. Td Vaccine Tetanus and reduced strength of diphtheria Vaccine</td>
<td>Intramuscular / Left arm</td>
</tr>
</tbody>
</table>

* Rotavirus Vaccine should NOT be administered after 24 weeks.
4.1.1 Immunisation coverage

Immunisation coverage measures the percentage of children under one year old who have received the following immunisations:

- At birth: TOPV (0), BCG
- 6 weeks: TOPV (1), DTP-HiB (1), Hep B (1)
- 10 weeks: TOPV (2), DTP-HiB (2), Hep B (2)
- 14 weeks: TOPV (3), DTP-HiB (3), Hep B (3)
- 9 months: Measles (1)

The indicator is calculated as the total number of children under one year old that have received all their immunisations up to the first measles, divided by the total population of children under one year old. This indicator is very sensitive to the denominator (population estimates).

Map 9: Immunisation coverage in South Africa, 2007/08

The wide variation in immunisation coverage in 2007/08 can be seen in Map 9 and Figure 41, from a high of 123.9% in UMgungundlovu (KZN) to a low of 31.5% in Kgalagadi (NC). In the previous year, Kgalagadi district had immunisation coverage of 92.5%. The drop in immunisation coverage for 2007/08 is attributed largely to poor data quality rather than deterioration in performance.

The average immunisation coverage in the country for 2007/08 was 84.2%, which is an indication that this aspect of the PHC system is working well. Four of the districts within the top 10 were in the Western Cape, followed by two each in the Eastern Cape and Northern Cape and one each from KZN and Gauteng. Seven of these districts had an immunisation coverage of over 100%, whilst overall, 15 districts in SA had an immunisation coverage rate of more than 90% in 2007/08, resulting in a slight decline from the 2006/07 performance where 18 districts had an immunisation coverage of more than 90%. The fact that so many districts have coverage over 100%, suggests poor data quality and also probably means that the national average may be an overestimation of the true coverage. The SADHS 1998 and 2003 surveys found immunisation coverage of 55 and 64% respectively.
The average immunisation coverage in the metro districts was 90.9%, 6.7 percentage points higher than the national average. Four of the metros (City of Johannesburg, City of Cape Town, Ekurhuleni and Nelson Mandela Bay) had immunisation coverage rates of more than 90% in 2007/08. eThekwini (ranked 35) achieved a coverage of 78.8%, which is below the national average and the lowest among the metros. As indicated in previous District Health Barometers, any well resourced health district with relatively strong socio-economic areas should show performance above the national average and therefore eThekwini needs to improve its immunisation coverage.
Rural nodes: The average immunisation rate in the rural node districts was 79.3%, below the national average of 84.2%. Seven of the rural districts had immunisation coverage rates lower than the national average. The coverage rates ranged from a high of 101.6% in Alfred Nzo (EC) to 31.5% in Kgalagadi district (NC).

Change and trends in immunisation coverage:
There was a marginal decline in the immunisation coverage nationally from 85.4% in 2006/07 to 84.2% in 2007/08, with 42% of districts (22 out of 52) having improved coverage. Nelson Mandela Bay Metro and UMgungundlovu both increased their immunisation coverage by more than 20 percentage points each in the last year, although there are definite inconsistencies in the data.

The continued uncertainty on the level of correctness of the under one year old population poses the problem of accurately measuring the performance of immunisation coverage. An undercount on children below one year of age could mean a measurable number of children are not accessing the public health service. It is in the best interests of the districts to work towards ensuring access to services to all children within their geographical boundaries with increased focus on mobile populations and areas of high population density. The private sector provides immunisation to a considerable number of children and is expected to report on this service; however, information from this sector is unavailable.

Figure 44 shows the trends in immunisation coverage for districts within provinces and highlights the overall improvement of coverage in Gauteng, Western Cape and Free State provinces in the last eight years.
Figure 44: Trend in immunisation coverage by province and district, 2000/01 - 2007/08

Annual trends: Immunisation coverage under 1 year (annualised)

| Year | EC Alfred Nzo | EC Amatole | EC Cacadu | EC Chris Hani | EC Nelson Mandela | EC O R Tambo | EC Uluthunzima | FS Fecile Dabi | FS Lebogang Dabi | FS Mntseeleng | FS T Mphuthanya | FS Xhanye | GP | EC Series | EC Series | EC Series | EC Series | EC Series | EC Series |
|------|---------------|-----------|-----------|---------------|------------------|-------------|---------------|--------------|----------------|--------------|------------|------------|---------|-----|----------|----------|----------|----------|----------|----------|----------|
| 2000/01 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2001/02 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2002/03 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2003/04 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2004/05 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2005/06 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2006/07 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |
| 2007/08 | □             | □         | □          | □             | □                | □           | □             | □             | □              | □             | □          | □          | □       | □   | □        | □        | □        | □        | □        | □        | □        |

Legend:
- EC: Eastern Cape
- FS: Free State
- GP: Gauteng
- KZN: KwaZulu-Natal
- LP: Limpopo
- MP: Mpumalanga
- NC: Northern Cape
- NW: North West
- WC: Western Cape

IMMUNISATION COVERAGE
4.1.2 Immunisation drop out rate (DTP1-3)

The immunisation drop out rate measures the percentage of children who dropped out between the first and the third dose of the DTP-Hib vaccine. It measures out of 100 children who received their first DTP-Hib vaccination, how many did not receive their third dose. The advantage of this indicator is that both the numerator and the denominator are available from routine health data and are thus not subject to the inherent complications associated with a population-based denominator, as with the immunisation coverage indicator. However, the indicator has fluctuated quite extensively over the last few years and it is difficult to determine whether this is due to poor data quality or variable service delivery.

District View

The national average for 2007/08 was 3.4%, up from 3.2% in 2006/07. Only one district, Siyanda (NC), had a drop out rate higher than 10%, and 25 districts were below the national average in 2007/08. The districts in Mpumalanga generally had low drop out rates with the overall provincial drop out rate of 1.0%, the lowest in the country.

As illustrated in figure 45, a number of districts (Chris Hani, Alfred Nzo, Matheo, Sedibeng, Metsweding, Ekurhuleni, Ugu, Greater Sekhukhune, Gert Sibande, Frances Baard and Dr. Ruth Segomotsi Mompati) showed negative drop out rates in the 2007/08 year, indicating that more children were immunised with DTP3, than DTP1, possibly as a result of inwards migration.

Map 10: Immunisation drop out rate (DTP1-3) in South Africa, 2007/08
Metro View

The metro district rates in 2007/08 varied from -4.4% in Ekurhuleni to 7.9% in the City of Cape Town. The best rates were for the three metros in Gauteng for the second year running. eThekwhini, City of Johannesburg, Nelson Mandela Bay Metro and City of Cape Town all had drop out rates higher than the national average. The metro average however, was marginally higher than the national average of 3.4%.
Rural nodes  The average drop out rate of the rural districts improved from 4.3% in 2006/07 to 3.0% in 2007/08 and was lower than the national average of 3.4%, with O.R. Tambo (EC) having the 3rd highest drop out rate in the country. Chris Hani (EC), Alfred Nzo (EC), Ugu (KZN) and Greater Sekhukhune (LP) districts were ranked among the top ten performing districts in SA. Ugu had a negative drop out rate for the third year running, implying that more children were given their third than their first DTP-Hib vaccination.

Change and trends in immunisation drop out rate (DTP1-3)

Overall the immunisation drop out rate in SA increased from 3.2% in 2006/07 to 3.4% in 2007/08. Nineteen districts decreased their drop out rates, while 30 districts showed increased drop out rates between 2006/07 and 2007/08. The ISRDP average improved from 4.3% in 2006/07 to 3.0% in 2007/08 whilst the metro average increased from 2.9% to 3.6%, with only one metro (Ekurhuleni) showing improvement. The overall trends by district within provinces can be seen in Figure 48, and illustrate that for some districts within certain provinces there is wide variation and fluctuation from the general trend of the majority of districts. i.e Motheo (Free State), Pixley ka Seme and Frances Baard (NC) and Dr Ruth Segomotsi Mompati (NW).
4.1.3 Immunisation coverage (Measles 1st dose) and drop out rate (Measles 1–2)

The level of attendance at primary health care facilities for preventive and promotive services declines after the first year of life. These indicators monitor whether children below the age of five have received the required two doses of measles. The proportion of children immunised against measles is one of the indicators specified under Target 5 of MDG4.

**Measles 1st dose coverage**

The wide variation in Measles 1st dose coverage in 2007/08 can be seen in Figure 49 and varied from a very high value of 147.1% in Dr Ruth Segomotsi Mompati (NW) to a low of 33.7% in Kgalagadi (NC). The average coverage in SA for 2007/08 was 86.6% and 22 districts had coverage rates of more than 100%. The average coverage in the metro districts was 92.5% and in the rural districts was 82.5%. 
Drop out rate (Measles 1 – 2)
The measles immunisation drop out rate monitors the drop out between the first and second measles vaccine given at 9 months and 18 months of age respectively. West Coast district (WC) had the lowest district measles drop out rate of 0.6% in 2006/07 and the Free State province had the lowest overall provincial measles drop out rate of 14.7%. The high drop out rate in North West was largely due to the high drop out rate of 52.4% (the highest in the country) in Dr Ruth Segomotsi Mompati in 2007/08. Although UMgungundlovu district achieved exceptional rates of immunisation coverage in children below the age of one year (DTP1-3), the measles drop out rate in this district was 21.5% (second highest in the country) in 2007/08.
4.2 Caesarean Section Rate

The Caesarean section rate measures the proportion of deliveries in which a Caesarean section was performed. This is a facility based indicator and not a population based indicator. In other words it uses deliveries that take place in a facility (clinic, health centre or district hospital) as the denominator as opposed to using all deliveries (both facility and home deliveries) as the denominator. The numerator is the number of Caesarean section operations done in district hospitals. On the one hand it under-estimates the real rate as many complicated deliveries end up as Caesarean sections at secondary and tertiary level hospitals with the result that the numerator is too low. On the other hand there are a number of normal deliveries that take place outside of the formal health sector (home deliveries) and thus there is an over-estimate of the real rate as the denominator is too low.
In 2007/08 the national average for district hospitals in South Africa was 15.6% \(^\text{15}\). This excluded any Caesarean section operations done in level 2, 3 and 4 hospitals. In 2006/07 the national average for district hospitals was 15.0%.

As can be seen in Map 11 and Figure 51, there was a wide variation in the Caesarean section rates among the 52 districts in 2007/08. At the top end of scale was Nelson Mandela Bay Metro (EC) with a rate of 32.8% whilst at the low end was Frances Baard (NC) with 2.0%. There are no district hospitals in Metsweding (GP) resulting in no data for this district. There was missing data from hospitals in Xhariep (FS) and Siyanda (NC) for the past two years and from Amajuba (KZN) for the past five years. There are also several months of data missing for district hospitals in Dr Kenneth Kaunda (NW) and Namakwa and Kgalagadi districts in the Northern Cape. All these cases suggest problems with the data collection processes and require investigation at the hospital and district levels to remedy the situation.

Six of the ten districts with the highest Caesarean section rates were in KwaZulu-Natal. Within these districts there were also variations among the individual district hospitals.

There were eleven districts with Caesarean section rates above 20% and ten districts (excluding Amajuba, Siyanda and Xhariep) with Caesarean section rates below 10%. Caesarean sections are one of the components of essential obstetric care (EOC) and such wide differences are indicative of very different levels in the quality of obstetric care and inequities in the health system around the country. There were also wide variations between districts in most of the provinces. These variations need to be investigated and the classification of hospitals in some of the provinces needs to be reviewed.

Frances Baard was the only district with an extremely low Caesarean section rate of 2.0%. The probable cause for this is that most of the Caesarean sections are being carried out at higher level hospitals. This results in inefficient use of scarce resources and unnecessarily pushes up the costs of health care.

Map 11: Caesarean section rates in South Africa, 2007/08

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\(^{15}\) The latest (2006) national targets for Caesarean section rates as stated by the Department of Health range from 12.5% for district hospitals, 22% for regional hospitals and 32% for central hospitals. Source: Health Indicators Update: Hospital Efficiency. Department of Health, Cluster Monitoring and Evaluation Directorate. 2006.
Figure 51: Caesarean section rates by district, 2007/08

Metro View

The metro average of 20.2% in 2007/08 was far higher than the South African average. This is largely due to the very high Caesarean section rate in Nelson Mandela Bay Metro of 32.8% and the high rate in the City of Cape Town (32.5%). Five of the six metros were above 10%, four were above the national average and only the City of Tshwane had a low rate of 9.6%. The low Caesarean section rate in the City of Tshwane indicates that there may be data quality issues or it may mean that many cases are referred to a higher level of care (academic hospital). This may be due to limited resources and capacity in the district hospitals.
In 2007/08 the average Caesarean section rate in the rural nodes was 14.1% as opposed to the national average of 15.6%. All of the rural KwaZulu-Natal districts and Central Karoo (WC) were above (or very close to) the national average, with all the Eastern Cape districts below the national average. The Caesarean section rate for Ugu district remains higher than any other rural node district. This may be due to cross border flow from the Eastern Cape, local capacity to perform Caesarean sections with fewer cases referred to higher levels or poor compliance to protocols. The reasons for the high rate in Ugu needs review.

Since 2000/01 there has been a three percentage point increase overall, with a gradual increase apparent in most districts. All of this increase has taken place since 2003/04 when there was an average Caesarean section rate of 12.5% compared to 15.6% in 2007/08. The Caesarean section rate in the rural nodes increased from 10.2% to 14.1% and in the metros from 18.7% to 20.2% over the same time period.

Between 2006/07 and 2007/08 there was an increase of 0.6 percentage points in the national Caesarean section rate. During this time 34 districts showed increased rates with the largest increase, 9.6 percentage points, in the Nelson Mandela Bay Metro (EC). There were five districts which had increases of more than three percentage points and only one district, Uthungulu (KZN) with a decrease of more than two percentage points.

The general increasing trend in the Caesarean section rate may be due to the increasing numbers of women who are ill with HIV related problems. However, it requires some research or case studies to ascertain the real reasons for this as there are both health risks and health systems costs associated with increased rates of Caesarean sections.

Section A: Output Indicators
Figure 54: Trends in Caesarean section rate in district hospitals by province and district, 2000/01 - 2007/08
Figure 55: Change in Caesarean section rate by district, 2006/07 - 2007/08
4.3 Male Condom Distribution Rate

The male condom distribution rate is the number of condoms distributed via public health facilities by the Departments of Health in a year to men 15 years and older. The average number of condoms distributed in SA was 11.8 per man in 2007/08.

District View

The variation in condom distribution is shown in Figure 56 and varied from 55.2 condoms per man per year in Cape Town, which for a number of years has by far been the most proactive district in the country, to 1.7 in Kgalagadi district. The next lowest condom distribution rates in the country were in Motheo (FS) with a rate of 4.1 and Sedibeng (GP) with a rate of 4.6. Mopani (LP) had the second highest distribution rate in South Africa at 17.3 condoms per man per year.

Map 12: Male condom distribution rate in South Africa, 2007/08
Metro view

All the metro districts continued to perform below the SA average in 2007/08, with the exception of Cape Town, which distributed ten times as many condoms (55.2) as Nelson Mandela Bay Metro (5.3). Ekurhuleni only distributed 6.2 and City of Johannesburg 6.8 condoms per male, less than many of the rural districts and below the rural district average.
The average number of condoms distributed for each male in the rural districts in 2007/08 was 9.2 and has decreased from 9.8 in 2006/07. Only two of the rural districts, Ukhahlamba and Central Karoo, were above the national average in 2007/08.

As can be seen in Figure 59, the City of Cape Town has been the overall leader in condom distribution in the country, particularly in the last three years. NGOs working in the HIV/AIDS sector and the City of Cape Town have taken the initiative to work together to dramatically scale up condom distribution in the metro over the three year period, using methods which were proven to be successful in Khayelitsha in 2005. This success can and should be emulated by other districts in their HIV/AIDS prevention strategies.

In 2007/08 the City of Cape Town had the highest increase in SA, by distributing 8.9 more condoms per man per year than in 2006/07. As a result of this, the average distribution in the Western Cape province increased from 33.4 in 2006/7 to 40.5 condoms per man per year in 2007/08, with the West Coast district increasing from 8.3 male condoms distributed in 2006/07 to 14.3 in 2007/08.

The incidence of new STIs treated in the Western Cape has decreased from 3.4% in 2004/05 to 2.5% in 2007/08 whilst the STI incidence in the City of Cape Town decreased from 3.7% to 2.5% over the same time period, which could partially be attributed to the improved distribution of condoms.

In 2007/08, the average rate of male condom distribution in the rural districts in 2007/08 decreased from 2006/07 by 0.6 condoms per man per year to 9.2, but had increased from 7.5 in 2003/04. Eight of the 12 rural districts showed a decrease in 2007/08, which is of concern in terms of HIV prevention.
Figure 59: Change in male condom distribution rate by district, 2006/07 - 2007/08

Source: DMBES (2008)
Figure 60: Trends in male condom distribution rate by province and district, 2000/01 - 2007/08
Section A: Output Indicators

4.4 PMTCT Indicators

Tanya Doherty

Reducing maternal and child mortality are important Millennium Development Goals (MDGs). However, South Africa is currently not on track to meet either of these goals. Despite overall improvements in the health system, South Africa has seen no significant change in child mortality between 1990 and 2007. In 1990 the under-5 mortality rate was estimated at 60 per 1 000 live births and in 2007 it was estimated at 59. The MDG target for South Africa by 2015 is 20. The lack of improvement in child mortality in South Africa is largely due to the HIV epidemic, specifically the transmission of HIV from mother to child (MTCT). The maternal mortality ratio for South Africa was estimated to be 400/100 000 births in 2005 and is also considered to be rising. Preventing mother-to-child transmission of HIV (PMTCT) has been recognised as an essential intervention in the fight against HIV/AIDS as well as improving maternal and child mortality. The imperative to provide an effective PMTCT programme is particularly great in South Africa where 28% of pregnant women attending public sector antenatal clinics in 2007 were HIV infected.

The National Strategic Plan for HIV, AIDS and STIs, 2007-2011, recognises PMTCT as a mainstay of the response against HIV and AIDS in children and the Plan has a target to reduce MTCT to less than 5% by 2011. Since 2002 the South African Department of Health has been implementing a PMTCT programme with a set of core activities. These core activities form a continuum from prevention of HIV in women through to care and support for HIV infected women and infants. Until 2008 the antiretroviral component of the programme included a single dose of nevirapine which is estimated to reduce peri-partum transmission to around 12%. From March 2008, the Department of Health amended the PMTCT protocol to include dual therapy for pregnant women. This revised protocol is estimated to reduce peri-partum mother to child transmission to around 5-6%. However, to date the National Indicator Data Set (NIDS) has not been amended to accommodate this change in the clinical protocol, further adding to the poor management of PMTCT data.

Despite the high burden of HIV and the importance and priority of the PMTCT programme, management at all levels have not monitored the programme adequately. Most of the indicators continue to be plagued by major data collection and quality issues. Generally the data underlying the PMTCT programme is less than optimal, specifically the nevirapine uptake in mothers and children. This is indicative of management neglect of the programme from national to facility level.

A number of the larger specific data issues are described. All of the PMTCT indicators for the Western Cape in the DHIS have been replaced with data supplied by the province from another information system. This is because the correct data were not correctly included in the national DHIS database. The Gauteng data for the HIV testing rate for 2007/08 were unusable due to problems in the denominator. Data in the DHIS were replaced by edited data from the province. In Limpopo high values for Vhembe and Waterberg districts (with rates of over 100% found for the proportion of ANC clients tested) were due to denominator issues.

4.4.1 Proportion of antenatal clients tested for HIV

In order to access PMTCT interventions a pregnant woman needs to know her HIV status, thus HIV testing is seen as the entry point into PMTCT care. This indicator measures the proportion of women who attend antenatal care that are tested for HIV. South Africa has a high antenatal coverage rate of 92% (2003 SADHS) which, if HIV testing is well integrated within antenatal care, should result in high HIV testing coverage amongst antenatal clients. The target for antenatal HIV testing within the National Strategic Plan 2007-2011 is to reach a coverage of 95% by 2011.

17 National Department of Health. National HIV and Syphilis Antenatal Sero-prevalence Survey 2007. Pretoria, South African Department of Health, 2008. An addendum to the antenatal survey results was released on 12 May revising the methodology and values of the survey results with no age weighting. These new values have been included in the Excel data file that is included in the CD that comes with this publication, however it was too late to update all the graphs and figures in this publication. Addendum for published 2007 National HIV and Syphilis prevalence survey report. URL: http://www.doh.gov.za/docs/adendum-tables-f.html.
19 This includes AZT from 28 weeks gestation and single dose of nevirapine during labour (or HAART if the CD4 count is below 250 or if the woman has stage IV disease.) Infants receive a single dose of nevirapine and AZT for 7 days or for 28 days if mother has not received adequate antenatal cover with ARVs.
Overall there have been impressive improvements in HIV test uptake across the country with the national average increasing from 69% to 80%. All districts achieved a testing rate of more than 60% with the exception of Metsweding (GP) which had the lowest testing rate of 50% and eThekwini metro 2nd lowest at 52.1%. Nine districts across five provinces recorded testing rates above 100%, with the highest in Vhembe (LP) at 120%. Most of these are probably due to errors in the recording of the denominator (first antenatal visits). The rates above 100% will have led to an over estimate of the national testing uptake average of 80%.

The improved testing rates overall are encouraging and suggest more effective screening of pregnant women and greater integration of HIV testing within antenatal care. Gauteng and KwaZulu-Natal provinces have the greatest differences between districts. In Gauteng, Sedibeng district achieved an uptake rate of 89% whilst Metsweding achieved only 50%. In KwaZulu-Natal, Umzinyathi achieved an uptake rate of 101% whilst eThekwini achieved only 52%.

Map 13: Proportion of antenatal clients tested for HIV in South Africa, 2007/08
The average HIV testing coverage rate for the metro districts was lower than the national average. Only two metro districts, City of Cape Town and City of Johannesburg achieved higher than the national average. The coverage in Ekurhuleni, Tshwane and especially eThekwini, with a 52% testing rate, is particularly concerning given the high numbers of women attending antenatal clinics in metro areas. These low rates result in many missed opportunities for women to access PMTCT services. It is a matter of urgency that testing rates in these metros are increased dramatically.
Rural nodes

The rural districts had better testing rates than the metropolitan areas and the national average. None of the rural node districts had coverage rates of below 60% and nine achieved coverage of 80% or more. This is a very encouraging finding which indicates that programme improvements can be achieved even in less well-resourced areas. All of the Eastern Cape rural nodes had coverage rates of above 80%, while in KZN there was large variability.

Change and trends in proportion of clients tested for HIV

Overall there have been impressive improvements in HIV testing rates across the country with the national average increasing from 69% to 80% in 2007/08. There were only seven districts whose testing uptake decreased from 2006/07, most of which were small decreases in already well performing districts. In Dr Kenneth Kaunda (NW) and Sisonke (KZN) districts, the decrease has brought the uptake to below 100%. This is indicative of an improvement in accuracy of the data. Metsweding district has, except for the unusually high value in 2006/07, had consistently low rates. A rigorous assessment of the programme is needed to determine the reasons for low uptake and attention needs to be paid to the data quality.

The metro districts also showed improvement especially in the City of Johannesburg (26 percentage points) and Ekurhuleni (15 percentage point increase). The improvements in the rural districts were marked with an overall improvement of 11 percentage points and the largest improvement occurring in Ugu (25 percentage points). Only one rural node district, Umkhanyakude, decreased its testing uptake from 77% to 69% which will need to be investigated by the district management team.
The consistent improvement in HIV testing across the districts is a very positive finding which indicates that attempts have been made to prioritise this programme and to integrate HIV testing within antenatal care. It is also an indication that, should improvements continue at the same rate, the National Strategic Plan target for antenatal HIV testing will be a realisable goal. The upward trends in the HIV testing rates from 2003/04 to 2007/08 in most of the districts are clearly illustrated in the trend graphs in Figure 64.

Figure 64: Trends in the proportion of antenatal clients tested for HIV by province and district, 2002/03 - 2007/08
Figure 65: Change in the proportion of antenatal clients tested for HIV by district, 2006/07 - 2007/08
### 4.4.2 HIV Prevalence amongst antenatal clients tested

The national antenatal sero-prevalence survey is a representative sample of antenatal clients tested in South Africa is run each year. The results show the proportion of pregnant women tested for HIV who have a positive result. The most recent estimate of national antenatal HIV prevalence from the national antenatal survey in 2007 was 28%\(^{22}\) (with age weighting).

In 2006, the annual HIV sero-prevalence survey conducted by the national DoH was disaggregated to district level for the first time. It was able to be disaggregated because of an increased sample size. The results of the 2007 survey are included in this Barometer as part of an attempt to present the most reliable and up to date information that is available for individual districts. There have been questions about how the provincial survey estimates were calculated\(^{23}\). An addendum to the antenatal survey results was released on 12 May revising the methodology and values of the survey results with no age weighting. These new values have been included in the Excel data file that is included in the CD that comes with this publication, but it was too late to update all the graphs and figures in this publication.

### District view

The prevalence rates from the national survey were generally higher than those recorded through the DHIS, except in the Western Cape where the national survey estimate of prevalence (13%) was very similar to the DHIS prevalence (14%). The largest difference between the DHIS (26%) and the national survey (34%) was found in the Free State.

In both the national survey and the DHIS data the Northern Cape, Limpopo and the Western Cape had antenatal HIV prevalence rates below 20%. Gauteng, KwaZulu-Natal and the Free State were all above 30% in the national survey. A few provinces had large variations between districts, most notably the Eastern Cape with a prevalence of 15% in Cacadu and 30% in Ukhahlamba. In Limpopo, Vhembe district had a prevalence of 15% whilst Waterberg was 25% and in the Western Cape the West Coast had a prevalence of 10% whilst the Central Karoo had a prevalence of 24%.


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Metro view

Antenatal HIV prevalence rates in the metro districts range from 16% in the City of Cape Town to 42% in eThekwini. All of the metro districts except the City of Cape Town had prevalence rates above 25%. The largest change in prevalence from 2006 in a metro district was in Nelson Mandela Bay Metro which dropped by four percentage points.

24 As the survey conducted by the Department of Health is based on a sample of all women attending antenatal clinic there is some uncertainty about the exact results. The bar [___________] indicates the range of the HIV prevalence in which the survey confidently expects the "real value" to be contained (95% confidence interval).

25 Although the overall prevalence in the City of Cape Town is low, it has a wide variation of prevalence across the metro which is not reflected here, but can be accessed in the following presentation ‘Western Cape Burden of Disease: HIV and Tuberculosis’ at:

Rural nodes

The antenatal HIV prevalence in the rural nodes ranges from 17% in Kgalagadi to 40% in Umkhanyakude. The largest change in prevalence in the rural districts occurred in the Central Karoo which increased by 15 percentage points.26

Change and trends in HIV prevalence amongst antenatal clients tested

HIV prevalence amongst antenatal clients tested (DHIS) increased marginally between 2006/07 and 2007/08 from 23.8% to 24.4%. Figure 69 shows the trends from 2003/04 to 2007/08 for districts by province.

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26 This should be taken with caution as it could be due to sampling differences between the two surveys in a very low population district; the 95% confidence intervals are wide, and do overlap slightly. The routine data do not suggest any dramatic increases in prevalence in this district.
### 4.4.3 Nevirapine uptake rate among pregnant HIV positive women

This indicator measures the proportion of HIV positive pregnant woman who receive a nevirapine\(^2\) dose during either antenatal care or in labour. This is an extremely important component of the PMTCT package since antiretroviral prophylaxis has a large impact on reducing early mother to child transmission of HIV.

There has been an overall increase in the coverage of nevirapine from a national coverage of 65% in 2006/07 to 76% in 2007/08. While this is encouraging, it however still falls short of the National Strategic Plan target for 2011 which is for 95% of known HIV positive women to receive nevirapine (+AZT).

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\(^{27}\) These trend graphs represent values from the DHIS which differ from the National Survey data but are useful to use to represent trends which are in essence the same in both. Note however that the 2007/08 values will not correspond to Figure 66: HIV prevalence among antenatal clients tested by district for the national antenatal sero-prevalence survey, 2007.

\(^{28}\) Subsequent to the dates for the data in this barometer, viz April 07 to March 08, the policy for PMTCT was extended in March 2008 to dual therapy and to include AZT.

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<table>
<thead>
<tr>
<th>Year</th>
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<td>100</td>
<td>110</td>
<td>120</td>
<td>130</td>
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</tr>
</tbody>
</table>

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Figure 69: Trends in the HIV prevalence in ANC clients tested by province and district\(^2\) (DHIS data), 2003/04 - 2007/08

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HIV PREVALENCE AMONGST ANTENATAL CLIENTS TESTED...
Collection of data on nevirapine coverage is particularly difficult due to the fact that the dose can be dispensed either in the antenatal clinic or the labour ward. Aggregation of data, which is not linked to individual patients, from these two settings has proven difficult. Furthermore, some HIV positive women may be reluctant to disclose their HIV status within labour ward settings and therefore may not be given a nevirapine dose or may take a dose without informing staff, hence the dose would not be recorded in the routine records. These challenges can result in both under and over (double counting) recording of nevirapine doses dispensed. It is expected that coverage of this component of the programme will improve with the introduction of dual therapy since it will no longer be an ‘all or nothing’ intervention.

**District view**

There was a large variation in nevirapine coverage across the districts with the lowest rate of 12% in Lejweleputswa (FS) and the highest of 108% in Uthukela (KZN).

One of the major issues with this indicator is the lack of good quality information. Close scrutiny of the DHIS data from 2003/04 highlighted that generally the data for most of the country seems unreliable, with little internal consistency and there seem to be problems with both the numerators and denominators.

Specifically the Free State showed declining nevirapine coverage rates for the second consecutive year. All five districts were below 40%. However, many facilities did not have numerator data after January 2007, so this is mostly a data quality issue. In Mpumalanga most numerators were missing for the last few months. In some Northern Cape districts, such as Namakwa, small numbers resulted in large swings in the monthly indicator values, making the trends difficult to interpret.

The Eastern Cape had fairly large variations between districts with Alfred Nzo at 46% and Nelson Mandela Bay metro at 89%. A similar situation was found in Gauteng with Metsweding at 60% and Sedibeng at 96%.

Considering the wide fluctuations and poor quality of the data across the years and districts, it is not possible to draw any definite conclusions or make strategic decisions based on these data, other than that management from facility level upwards need to take responsibility for regular monitoring of the data to ensure continuous quality improvement.

**Map 15: Nevirapine uptake rate among pregnant HIV positive women in South Africa, 2007/08**
The metro districts all achieved a nevirapine coverage above 60% with the highest being Ekurhuleni at 90%. The average for all six metro areas of 82% was higher than the national average of 76%. The City of Cape Town, which has reportedly one of the best PMTCT programmes in the country, with a nevirapine uptake rate of 65.3%, is unlikely to be accurate and is almost certainly due to poor data recording/capturing/reporting.
Rural Nodes
Nevirapine coverage in the rural districts varied widely from 25% in Thabo Mofutsanyane district of the Free State to 100% in Kgalagadi district of the Northern Cape. Coverage in the KZN rural districts had improved with all four being above 70%. However, these data need to be viewed with caution as there were several months where the monthly rates exceeded 100%. Overall the nevirapine coverage for the 12 rural districts was 68% which is lower than the national average of 76%. Coverage in these districts will need to be greatly improved in order to reach the target of the National Strategic Plan.

Change and trends in nevirapine uptake rate of pregnant HIV positive women
Nevirapine coverage has increased overall between 2006/07 and 2007/08 from 65% to 76%. The best improvements were seen in KwaZulu-Natal and the North West where all of the districts showed an increase from the last year. It is concerning that all of the districts in the Free State showed a substantial decrease in 2007/08 to extremely low levels of coverage which are caused by missing data. The province should investigate the data quality of this indicator carefully.
Figure 73: Trend in nevirapine uptake rate among pregnant women with HIV by province and district, 2003/04 - 2007/08
4.4.4 Nevirapine uptake rate among babies born to HIV positive pregnant women

The nevirapine uptake rate among babies measures the percentage of babies of HIV positive women who received nevirapine within 72 hours of birth, out of the number of live births in facilities to HIV positive women.

There were serious data quality problems with the nevirapine uptake rate for newborns and this is occurring systematically in almost all the districts. In most years the uptake rate has been around 100%. The denominator used to calculate this indicator (live births to HIV positive women) generally gives an inflated picture of nevirapine coverage to babies as far fewer deliveries to HIV positive women are recorded each month compared with the number of women testing HIV positive. There are also substantial differences in this discrepancy from year to year, so the effect of the bias is not consistent, with much higher denominators around 2006/07, resulting in a dip in the indicator values over the same period. The low recorded number of live births to HIV positive women suggests that either many HIV positive women are delivering at home and are therefore not recorded in facility delivery records, or that HIV positive women are not identified in labour and are therefore not recorded as such in delivery registers. The first explanation is unlikely given that in South Africa overall 91% of births are assisted by a trained health care provider (SADHS 2003). The only year when the denominator is thought to be realistic was in 2006/07 when 81% of HIV positive mothers were identified on delivery, and the nevirapine update rate among newborn babies was 57.3%.

The following table shows the national values for the data elements used in the PMTCT indicators, illustrating the problem of the very low denominators (live births) for this indicator. Major outliers and sections of data with completely missing denominators have been excluded from the original data.

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<th>2006/07</th>
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<tr>
<td>ANC 1st visits</td>
<td>900 130</td>
<td>1 095 064</td>
<td>1 229 251</td>
<td>1 144 002</td>
<td>1 170 998</td>
</tr>
<tr>
<td>ANC clients tested</td>
<td>198 508</td>
<td>451 829</td>
<td>613 255</td>
<td>791 396</td>
<td>931 789</td>
</tr>
<tr>
<td>HIV test ANC rate</td>
<td>22.1</td>
<td>41.3</td>
<td>49.9</td>
<td>69.2</td>
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<tr>
<td>ANC clients HIV+</td>
<td>59 525</td>
<td>131 512</td>
<td>170 816</td>
<td>201 015</td>
<td>229 642</td>
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<tr>
<td>HIV prevalence</td>
<td>29.8</td>
<td>29.0</td>
<td>27.7</td>
<td>23.8</td>
<td>24.4</td>
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<tr>
<td>NVP dose to woman</td>
<td>21 422</td>
<td>58 132</td>
<td>96 271</td>
<td>129 672</td>
<td>172 066</td>
</tr>
<tr>
<td>NVP uptake mothers</td>
<td>40.5</td>
<td>44.2</td>
<td>56.4</td>
<td>64.5</td>
<td>76.1</td>
</tr>
<tr>
<td>Live births to HIV+ women</td>
<td>4 127</td>
<td>16 854</td>
<td>41 391</td>
<td>163 601</td>
<td>105 280</td>
</tr>
<tr>
<td>NVP dose to baby</td>
<td>4 283</td>
<td>16 345</td>
<td>40 379</td>
<td>93 794</td>
<td>107 673</td>
</tr>
<tr>
<td>NVP newborns</td>
<td>103.8</td>
<td>97.0</td>
<td>97.6</td>
<td>57.3</td>
<td>102.3</td>
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<tr>
<td>Proportion of HIV positive mothers identified on delivery</td>
<td>6.9</td>
<td>12.8</td>
<td>24.2</td>
<td>81.4</td>
<td>45.8</td>
</tr>
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</table>

In March 2008, the infant component of the antiretroviral regimen was changed so that it now includes one week of AZT to infants in addition to the single dose of nevirapine. This change in the protocol did not affect the indicator in this Barometer.

**District view**

The nevirapine uptake of babies was generally high with a national average of 102.3% with none of the districts being below 80%. More than half (28) of the districts had coverage levels of 100% or more including all of the districts in Mpumalanga. This finding indicates that there is most likely under recording of live births which has led to an inflated indicator (i.e. more nevirapine doses dispensed than live births recorded).
Figure 74: Nevirapine uptake rate among babies born to women with HIV by district, 2007/08

Metro view

All of the metro districts except for two, reported nevirapine coverage to babies of above 100%. Nelson Mandela Bay and eThekwini had rates of 143% and 136% respectively. These are extreme over-estimates of the true coverage and these districts should examine the data closely to determine where the errors have occurred. Scrutiny of the detailed underlying data for KZN in general revealed huge outliers, variations and missing denominators.
Figure 75: Nevirapine uptake rate among babies born to women with HIV by metro district, 2007/08

Rural Nodes
Nevirapine coverage to infants in the rural node districts ranged from 80% in Alfred Nzo to 105% in Thabo Mofutsanyane. Five of these districts reported coverage rates of 100% or more.

Figure 76: Nevirapine uptake rate among babies born to women with HIV by rural district, 2007/08

Change and trends in nevirapine uptake rate among babies born to women with HIV
Although at face value there was overall improvement in this indicator from 2006/07 with all districts except those in the Western Cape showing increases in coverage, in reality the improvement is much smaller because of the data quality problems discussed in the beginning of this section. In the Western Cape the decreases most likely reflect improvements in data quality since all of the districts reported coverage rates of 100% or more in the previous period. There has been an overall increase in the number of nevirapine doses given, however until the data quality is addressed it will be difficult to determine the actual coverage levels. It will be important to monitor this indicator with the implementation of the new protocol to determine if this leads to improvements in both the quality of data and coverage.
Figure 77: Trends in nevirapine uptake rate among babies born to women with HIV by province and district, 2003/04 - 2007/08

Annual trends: Nevirapine uptake rate among babies born to women with HIV

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<td>NC</td>
<td>NW</td>
<td>WC</td>
</tr>
</tbody>
</table>

Year:
- 2003/04
- 2004/05
- 2005/06
- 2006/07
- 2007/08

Provinces:
- FS: Fesile Dabi, FS Lejweleputswa, FS Mthethwa, FS Mzantsi, FS Xhariep
- GP: E. Johannes, GP Metsweding, GP Sedibeng, GP Taung, GP West Rand
- KZN: KZN eThekwini, KZN iLembe, KZN UMgungundlovu, KZN Umkhanyakude
- NC: NC KwaZulu-Natal, NC Nkandla
- NW: NW Bojanala Platinum, NW Bothaville, NW KwaZulu-Natal, NW Mzimhle
- WC: WC Cape Town, WC Eden, WC Overberg, WC Western Cape

Percentage:
- 0
- 100
- 200
- 300
- 400
- 500

NEVIRAPINE UPTAKE RATE AMONG BABIES BORN TO HIV POSITIVE WOMEN
4.5 Primary Health Care Utilisation Rate

Fiorenza Monticelli

The primary health care utilisation rate indicator measures the average number of visits per person per year to a public PHC facility. The average utilisation of primary health care services in SA in 2007/08 was 2.2 visits per person which is a decrease of 0.1 visits per person over the last year, despite an average increased spending (PCE) of R27 in real terms per person on non-hospital PHC. This decrease is quite likely due to the effect of the public sector strike in June 2007, as the average utilisation is 2.3 when data for this month are excluded. The national target of 3.5 was reached by only a handful of districts in 2007/08, of which three where in the Western Cape province.

District view

Figure 78 shows the range of utilisation rates among the districts from a low of 1.1 visits per person in Metsweding (GP) to a high of 4.3 in the Central Karoo (WC), a rural district of SA. Four of the six districts in Gauteng ranked within the ten lowest utilisation rates in the country and four of the six districts in the Western Cape among the ten highest. Five districts, West Coast, Eden and Central Karoo (WC), Vhembe (LP) and Pixley ka Seme (NC) achieved utilisation rates higher than the national target. Most of the districts in the Northern Cape, fell within the top third of utilisation rates in the country and the very low value for Kgalagadi is clearly a data error caused by missing data for many of the facilities in that district between January to March 2008. There was also a wide intra-provincial variation between districts in the Eastern Cape with a high of 3.4 visits per year for Cacadu and a low of 1.9 for O.R. Tambo. Similarly in the Western Cape and Limpopo provinces there was an almost two-fold difference between the highest and lowest utilisation rates, whilst in KwaZulu-Natal, Mpumalanga and Gauteng, the utilisation rates across the districts did not vary greatly.

Map 16: Primary health care utilisation rate in South Africa, 2007/08
The average utilisation rate for the metro districts was 2.1 visits per year. Three of the six metros, all in Gauteng (City of Johannesburg, Ekurhuleni and Tshwane) had the lowest utilisation rates, which are lower than both the metro and the South African average utilisation rates for 2007/08.
Rural Nodes

The average utilisation rate in the rural districts in 2007/08 was 2.1 visits per person per year, the same as in 2006/07 and lower than the SA average utilisation of 2.2. Seven of the 12 rural districts were above the national average with one district, Central Karoo (WC) with a utilisation rate far exceeding the average and above the national target of 3.5.

Change and trends in primary health care utilisation rate

Because the utilisation rate is based on the total number of visits of patients for all possible health reasons, it represents the full spectrum of all facility PHC activity and is therefore slow to change. Community based PHC activity is still not integrated into the information system and these activities, if incorporated into the calculations, could have significant influence on the total figures. The data show that less than half (22 of the 52 districts) had decreased utilisation rates since 2006/07, whilst 15 had increased and 15 had registered no change. Xhariep (FS) demonstrated the highest average increase in the number of people visiting a PHC facility (0.3) while Kgalagadi (NC) had the largest decline of 1.3 visits per person. This decline for a second year in a row is most probably due to missing data. Tshwane metro had the second largest decline of all the districts and the largest decline in PHC visits amongst the metros (0.6 visits per year less). Besides Ekurhuleni, which registered no change, five of the six metros showed decreased utilisation rates as compared to 2006/07. Four of the rural districts however, had increased their utilisation rates during the year.
Figure 81: Change in primary health care utilisation rate by district, 2006/07 - 2007/08

Figure 82 shows each province individually, illustrating the trend over the last few years in the average PHC utilisation rate for each of the districts within that province. It illustrates amongst other things the wide variation in the utilisation rates among districts in the Eastern Cape and Limpopo provinces and the low utilisation of Gauteng's districts as well as the relatively higher utilisation rates of districts in the Western Cape.
Figure 82: Trends in primary health care utilisation rate by province and district, 2000/01 - 2007/08
5. Outcome Indicators

5.1 Incidence of New Sexually Transmitted Infections

Marion Stevens

This indicator measures the percentage of people 15 years and older who have been treated for a new episode of a sexually transmitted infection (STI). In other words an STI incidence of 5% means that for every 100 people fifteen years and older, during the year under review, five of them were treated in the public sector clinics for a new episode of STI.

The average STI incidence in SA during 2007/08 was 4.4%, a decrease of 0.6 percentage points from 2006/7. The general trend over eight years in all provinces is downward. The average rate in the rural districts improved from 6.0% in 2006/07 to 5.4% in 2007/08. The incidence rates in the metro districts also decreased from 4.7% in 2006/07 to 3.9% in 2007/08.

District View

Of all the districts, Namakwa (NC) had the lowest incidence of STIs (1.5%), while Vhembe (LP) had the highest at 8.0 %. Most of the districts in KZN had high incidences of STIs, well above the national average for the past eight years. Overall the incidence in Gauteng decreased from 4.3% in 2006/07 to 3.5% in 2007/08. All the districts in the North West, Gauteng, Mpumalanga and Free State showed an improvement in STI incidence, while incidence in the Western Cape has remained the lowest in the country.

Map 17: Incidence of new STIs treated by district in South Africa, 2007/08

![Map 17: Incidence of new STIs treated by district in South Africa, 2007/08](image)
The metro average was below the SA average and decreased from 4.7% in 2006/07 to 3.9% in 2007/08. eThekwini continued to have the highest STI incidence among the metros of 6.2% compared with the metro with the lowest incidence, City of Cape Town, which was nearly three times lower at 2.5%.
The average incidence of STIs in the rural nodes in 2007/08 was 5.4%. Most of the rural nodes had a reported STI incidence greater than the South African average.

**Change and trends in STI incidence**

The STI incidence rates in most districts dropped from the previous year. The Central Karoo (WC) had the highest increase of incidence of all districts by 1.4 percentage points from 2.5% in 2006/07 to 3.9% in 2007/08. Kgalagadi (NC) had the largest decrease of 2.5 percentage points of all districts in the country from 5.2% in 2006/07 to 2.7% in 2007/08, although this may be due to data errors since there were substantial missing data in 2007. All the metro districts experienced a decrease in incidence, with the City of Tshwane having the greatest decrease of 1.6 percentage points from 5.0% in 2006/7 to 3.4% in 2007/08.
The average incidence of STIs in the rural districts decreased from 6.0% in 2006/07 to 5.4% in 2007/08. Figure 87 shows clearly the high but declining trend over the past eight years in STI incidence amongst the KwaZulu-Natal districts, the consistently low rates in the Western Cape districts, and the wide variation amongst the Limpopo and Mpumalanga districts.
Figure 87: Trends in the incidence of new STIs treated by province and district, 2001/02 - 2007/08

### 5.2 Tuberculosis

Marian Loveday

Tuberculosis (TB) remains a major public health issue in South Africa. Fuelled by the human immunodeficiency virus (HIV) epidemic, the TB epidemic continues to grow unabated. Over the last decade the incidence has more than doubled from 305 per 100 000 in 1997 to 740 per 100 000 in 2007\(^29\). The increasing incidence of TB has resulted in South Africa being ranked fourth in the list of 22 high burden TB countries in 2008\(^30\). In addition, the low treatment success rate has resulted in an increasing multi-drug resistant TB (MDR-TB) burden. Reducing the incidence of TB is an important Millennium Development Goal (MDG), but meeting this goal is proving difficult and appears unlikely to be achieved. The TB new smear positive incidence in South Africa in 2007 varied across the districts and ranged from 101 cases per 100 000 people in Metsweding (GP) to 673.3 cases per 100 000 in Cacadu (EC), with a national average of 283.4 per 100 000 cases, as illustrated in Figure 88.

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\(^{29}\) National Health Department TB Directorate June 2008. URL: http://www.hst.org.za/healthstats/16/data

Within the last year the national DoH has carried out a number of activities aimed at improving the management of TB. These include the revision of the national TB guidelines to include recent recommendations on the management of children with TB, and the diagnosis of smear-negative and extrapulmonary TB; revising the TB registers to include information on collaborative TB/HIV activities; and the training of health-care workers on infection control. Additional activities which address drug-resistant TB, such as the introduction of an MDR-TB register and training on MDR-TB for medical officers and nurses have also taken place.

Although the drug-resistant TB burden is increasing, the principle aim of the National TB Control Programme (NTCP) remains the successful treatment of new smear positive TB clients. The early detection and effective treatment of these infectious clients will reduce the number of people infected with TB in the country. Smear conversion rate and cure rate are the two indicators used to measure progress towards achieving this aim. In order to achieve the
MDGs the WHO set targets for both indicators at 85%\(^31\). These are the same targets which have been set in the 5 year strategic plan for 2007-2011\(^32\). In the Department of Health’s Annual report of 2005/6, interim annual targets were set\(^33\).

### 5.2.1 Smear conversion rate

Clients diagnosed as having “smear positive” TB have TB in the lungs and the organism that causes TB, the Mycobacterium tuberculosis bacillus, is seen in their sputum at diagnosis. These clients are infectious and when they cough the TB bacilli are spread out into the air and can infect others.

The smear conversion rate (SCR) is the proportion of smear positive clients who no longer have the TB bacillus in their sputum after two months of treatment and are referred to as “smear negative”. As TB treatment is at least six months duration, this is an important process indicator of the effectiveness of TB treatment. It is the first indicator which will alert health workers to the failure of clients to respond to treatment and the possibility of drug-resistant TB. SCR is also a measure of the effectiveness of the health service.

The national target for SCR is 70%. In 2007 the average SCR for South Africa was 60.5% as compared with 55.8% in 2006. The slow but steady increase in SCR from 46.6% in 2004 is very encouraging. As long as this improvement continues, the national target should be attainable within a few years. The North West province showed no improvement in SCR over the last four years and is the only province with a SCR lower than 50%.

**Map 18: Smear conversion rate in South Africa, 2007**

Figure 90 and map 18 illustrate the large variations in SCR across districts, ranging from a high of 88% in Overberg (WC) to a low of 39.7% in Uthukela (KZN). In 2007, 11 districts achieved SCRs higher than the interim national target of 70%. Gauteng province had the highest SCR at 75.1% with four districts above 70%. The Free State and Western Cape also achieved SCRs higher than the national target. All the districts in the North West had SCRs less than 60%.

Metro view

Figure 90 shows that four of the six metros now have SCRs above the national target. In eThekwini (KZN) and in Nelson Mandela Bay Metro (EC), the SCRs are below the national average. However, eThekwini metro which had the highest TB caseload in the country with 38 142 TB cases diagnosed in 2007, managed an improvement in the SCR from 48.3% in 2006 to 52.3% in 2007.
As can be seen in figure 91, Umzinyathi is the only rural district which achieved a SCR of over 70% whilst five of the 12 rural districts had SCRs of less than 45%.

From 2006 to 2007 the SCR improved by over 20 percentage points in Amathole (EC), UMgungundlovu (KZN) and by 18.1 percentage pints in Ehlanzeni (MP). These improvements were made despite these districts having high case loads. The SCR in all three districts in Mpumalanga improved substantially in 2007 and were included in the ten most improved districts in the country. This is probably partially due to improved data management.

Overall, the SCR improved in all but ten districts. Of concern is that the SCR decreased in four districts in KwaZulu-Natal and that seven districts in the province have rates of less than 55%. In the North West province the SCR decreased in Bojanala Platinum and Dr Ruth Segomotsi Mompati districts causing these two districts to be ranked amongst the lowest in the country. In the Central Karoo (WC) there was a dramatic decline in the SCR by 9.1 percentage points to 52.8% in 2007. Reasons for this decline must be identified and addressed as the Central Karoo has a low TB burden which should be possible to manage more effectively.

All the metro districts improved their SCRs with Ekurhuleni (GP) improving by more than 10 percentage points and City of Johannesburg by more than five percentage points in the last year. Four of the rural districts Alfred Nzo, O.R. Tambo (EC) and Umkhanyakude, Umzinyathi (KZN) had improvements in the SCR of more than five percentage points.
Figure 92: Change in smear conversion rate by district, 2006 - 2007

Figure 93 demonstrates the trends in SCR within the provinces from 2004-2007. With only a few exceptions SCRs over the country have improved annually. This consistent improvement is very encouraging and indicative of the focus and commitment of district level managers and health workers, and needs to be acknowledged. The North West is the only province in which SCRs have not improved over the last four years.

A more detailed view of district performance with regards to SCR over the last four years shows that one quarter of all districts (13) have improved their SCR by 20 percentage points or more.
Figure 93: Trend in smear conversion rate by province and district, 2004 - 2007

Annual trends: Smear conversion rate (new Sm+)

Year

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Percentage

Provinces:
- EC: Alfred Nzo, Amatole, Cacadu, Chris Hani, Nelson Mandela, O.R. Tambo, Ulundi, Fezile Dabi, Lejweleputswa, Mohlabatse, Motsoeneng, Tshwane, Xhamphele
- GP: Johannesburg, Metsweding, Sediq, Tshwane, West Rand, Amajuba, KwaZulu-Natal
- KZN: Uthukela, Ulungulu, Zululand
- NC: Namakwa, Pixley ka Seme, Siyanda
- NW: Bojanala Platinum, Kenneth Kaunda, NM, Molera
- WC: Cape Town, Cape Winelands, Central Karoo, Eden, Overberg, West Coast

Years: 2004 - 2007
5.2.2 TB cure rate

The TB cure rate is the proportion of TB cases that have taken TB treatment for a full six months, and as a result no longer have TB bacilli in their sputum. A more technical definition of cure rate is the proportion of smear positive TB cases that are shown to be smear negative at the end of six months treatment and who have also had a negative smear on one previous occasion during the TB treatment.

The WHO target for cure rate is 85\%. The interim South African target is an increase of 10\% each year\(^{35}\).

There has been a steady improvement in the cure rate from 50.8\% in 2004 to 57.6\% in 2005, to 65.2\% in 2006. This improvement is a road to success and all staff working in the TB control programme need to be encouraged to continue these improvements so that the cycle of infectivity can be broken.

District view

Figure 94 and map 19 illustrate the large variations in cure rates across provinces and districts. Two provinces had cure rates of over 70\% (Western Cape and Gauteng), whilst two provinces (KwaZulu-Natal and North West) had cure rates of less than 60\%. Five of the ten districts with the highest cure rates were in the Western Cape. Two of these districts had cure rates of over 80\%; Overberg (83\%) and Eden (80.5\%). Five of the ten districts with the lowest cure rates were in KwaZulu-Natal where two districts Sisonke (37.3\%) and Ugu (39.4\%) had cure rates of less than 40\%. There was a wide variation in the cure rates in all the provinces with at least 10 percentage points separating the district with the highest cure rate from the district with the lowest cure rate.

Map 19: TB cure rate in South Africa, 2006

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Footnotes:

The average cure rate for the metros was higher than the national average, with three metros reaching a cure rate of over 70%. Although the cure rate had increased in eThekweni and the Nelson Mandela Bay Metro since 2005, it remained below the national average. The small improvement in the Nelson Mandela Bay Metro (from 52.7% in 2005 to 56.2% in 2006) is unacceptable given the improvement in other districts which are less resourced and have infrastructural inadequacies to address. The cure rate increased in all metros of the country except for the City of Tshwane, which declined marginally.
Rural View  
Figure 96 shows that Umzinyathi (KZN) and Chris Hani (EC) had cure rates of over 70%. Of concern is that three of the 12 rural districts had cure rates of less than 50% and the cure rate in Ugu was less than 40%.

Change and trends in TB cure rate
The overall increase in cure rate from 2005 to 2006 in South Africa was 5.1 percentage points. Figure 97 shows the change that has occurred from 2005 to 2006, most of which reflects improvement in the cure rate in a number of districts during this time. In 2005 nine districts had cure rates of over 70%. Double this number of districts achieved a cure rate over 70% in 2006. Frances Baard (NC) had the largest increase in cure rate in the country (39.6 percentage points). This is probably partly due to changes in data management. In Uthungulu and UMgungundlovu (both KZN) the cure rates increased by more than 15 percentage points whilst in Cacadu and Amathole (both EC) the cure rates increased by just under 15 percentage points.

The cure rate increased in 2006 in all but 12 districts. The three districts where the cure rate declined the most were Sisonke (KZN), Bojanala Platinum (NW) and Greater Sekhukhune (LP). The declining cure rate in these three districts is of concern, given that their cure rates were not good in 2005 and have further deteriorated in 2006 ranking them amongst the 10 districts with the lowest cure rates in the country. Given that TB is a priority health programme it is an indictment of management at all levels that any district in South Africa should show a deterioration in the TB cure rate.
The TB cure rate improved overall in the ISRD districts by one percentage point since 2005, as opposed to the average 5.1 percentage point increase for South Africa and 6.9 percentage point increase in the metro districts. However, improvements of over five percentage points occurred in Alfred Nzo (EC) and in Umzinyathi and Ugu (both KZN) since 2005.

Only half of the ISRD districts showed an increased cure rate, whilst the remainder showed a deterioration in the cure rate. These districts, along with the TB control programme were earmarked for special attention during 2006. Despite this, the cure rate deteriorated. Management from clinic level to national level needs to be made more accountable for sustained incremental improvements in the TB cure rate.
Figure 99 shows the trends in TB cure rate by province and district 2003 - 2006. The improvement in TB cure rates from 2003 to 2006 is not as encouraging as the improvement in SCRs. Cure rates have improved in KwaZulu-Natal and the Eastern Cape, however, in many provinces they have remained static or increased marginally and remain well below the targets of the National TB control programme.

At a district level the cure rates in three districts Cacadu (EC), Uthungulu (KZN) and Ehlanzeni (MP) have increased by more than 30 percentage points since 2003. In a similar vein cure rates have increased by over 20 percentage points in five districts: O.R. Tambo (EC), Metsweding (GP), eThekwini (KZN), Kgalagadi (NC) and Namakwa (NC). These improvements are very encouraging. However, the provinces which house the eight districts where the cure rate has not improved over the last four years need to target TB service delivery and make a special effort in an attempt to increase cure rates in these districts.
5.3 Diarrhoeal Incidence in Children Under 5

Diarrhoeal diseases are one of the key contributors to morbidity and mortality in young children. The incidence and severity of these diseases are closely related to environmental health factors such as access to adequate amounts of clean water, suitable sanitation and washing facilities, nutritional status, and access to health services. Other factors such as hygiene education, maternal education, and household income also affect the incidence and impact of these diseases. However, many of these social determinants including access to water are largely out of the control of the health department, but are important components of the Integrated Development Planning of all districts in South Africa.
Diarrhoeal incidence under 5 measures the number of new cases of children with diarrhoea per 1,000 children under 5 years in the catchment population. Although diarrhoea is formally defined as three or more watery stools in 24 hours, in practice any complaint by the mother that the child is suffering from diarrhoea is used as the means to define a case of diarrhoea. This lack of standardisation in the definition may make the indicator less reliable. It is also probable that far more cases of diarrhoea occur than are reported by the health facilities, as many children may be treated at home, especially in rural areas where access to a health facility is difficult. The incidence of diarrhoeal disease tends to be seasonal with a high number of cases in the summer months (Nov-Jan in South Africa) and low levels in the winter months (May-July).

**District View**

Figure 100 shows that the average incidence of diarrhoea in South Africa in 2007/08 was 254 new cases per 1,000 children under 5 years old. The distribution of the incidence varied widely with the highest rate in UMgungundlovu district (KZN) with 702 cases per 1,000 children under 5 to a low in Sedibeng district (GP) with 84 cases per 1,000. Districts in Gauteng and North West had amongst the lowest incidences of diarrhoea, whilst those in KwaZulu-Natal registered the highest. The high number of cases of diarrhoea in children under 5 which occurred in Ukhahlamba district in the Eastern Cape early in 2008, are clearly reflected in the monthly DHIS data for 2007/08. Many of the districts in the Eastern Cape and KwaZulu-Natal provinces have amongst the lowest access to piped water in the country and contain four ISRDP districts each, and are thus expected to have higher incidences of diarrhoea in children under 5. The Eastern Cape districts however, reflect relatively low values compared to the very high values in KwaZulu-Natal and range from 119 per 1,000 children under 5 in Amathole to 242 per 1,000 in Ukhahlamba district, whereas the KwaZulu-Natal districts range from a low of 268 in Amajuba to a high of 702 cases per 1,000 children under 5 in UMgungundlovu.

Nine of the eleven districts in KwaZulu-Natal fall within the fifteen districts with the highest incidence rates of diarrhoea in children under 5 in the country. Of note is the large difference in the rates in Northern Cape, which range from a high of 423 cases per 1,000 in Pixley ka Seme district to a low of 170 cases per 1,000 in Kgalagadi district. The rates for Kgalagadi have fluctuated widely over the past 8 years.

**Map 20: Diarrhoeal incidence in children under 5 years in South Africa, 2007/08**

![Map showing diarrhoeal incidence in children under 5 years in South Africa, 2007/08](http://www.dispatch.co.za/multimedia/fulldocument1.pdf)
The average diarrhoeal disease incidence rate of 191 cases per 1 000 for the metros in 2007/08 was substantially lower than the average for South Africa of 254. eThekwini metro (KZN) with a rate of 371 was much higher than the national average and the City of Cape Town had the next highest incidence of 228 cases per 1 000 children. The incidence of diarrhoea in Nelson Mandela metro at 183 cases seems more realistic than the low incidences reported in 2005/06, (10 cases) and 2006/07 (25 cases).
Rural Nodes

In 2007/08 the average diarrhoeal incidence for the rural districts of 299 cases per 1,000 children under 5, was higher than the national average and higher than the average in the previous year. The average household access to piped water for these districts is also considerably lower than the national average (62.7% vs 88.7%). All four rural districts in KwaZulu-Natal had the highest rates amongst the rural districts. Although significantly higher than in 2006/07, the rates in the Eastern Cape rural districts are lower than expected, especially in O.R. Tambo which had the lowest proportion of households with access to piped water in SA in 2007.

Change and trends in diarrhoeal incidence

The graphs depicting the annualised diarrhoeal incidence from 2000/01 to 2007/08, by district within each province can be seen in Figure 103. These trends show the steep increase in diarrhoeal incidence in the Western Cape since 2005/06, as well as the increases (although varied) and wide differences in the incidences for the eleven KwaZulu-Natal districts since 2003/04. Very erratic trends can be seen in the Northern Cape, in particular for Kgalagadi and Pixley ka Seme districts, whilst in Gauteng the trends are consistently low and the incidence rates are very close amongst the districts.
5.4 Rate of Children Under 5 Years Not Gaining Weight

Measurement and monitoring trends of growth parameters in children below the age of 5 years is an essential primary health care service. The indicator of the rate of children under 5 years not gaining weight measures the proportion of children that are not gaining weight relative to the number of children weighed for the first time in a month in a health facility. The weight for age serves as a compass of the general well-being of the child. Where good quality growth promotion is provided children must be weighed monthly and the weight is plotted on the “Road to Health Card”. The growth pattern is analysed taking into consideration the expected weight for age and the growth pattern of the child. Stagnant or declining weight assists in early identification of children at risk of severe malnutrition so that appropriate management can be instituted before the child becomes a victim of the morbidity and high mortality associated with severe malnutrition. Faltering growth is also a pointer for investigation of underlying primary illness such as Tuberculosis and HIV.

In South Africa, an average of 1.3% of children under the age of five years that were weighed in 2007/08 did not gain weight as depicted in Figure 104. This shows similar performance to 2006/07 which also had a rate of 1.3%. There is a wide range from a very high incidence in Namakwa (NC) of 5.9% and the lowest incidence in the City of Johannesburg (GP) of 0.3%. Although the Free State province showed a decline in the percentage of children not gaining weight, it has remained the province with the highest rate of children under 5 years who are not gaining weight for three consecutive years. In 2007/08 Xhariep became the fourth district in the Free State (including Lejweleputswa, Thabo Mofutsanyane and Fezile Dabi) ranked amongst the ten districts with the highest rates. The Northern Cape province had the second highest rate of children not gaining weight. Uthukela was the only district in KwaZulu-Natal that featured amongst the districts with the highest rates of children under 5 not gaining weight.

Studies have shown that health worker practices of growth monitoring have been found to be wanting. It is therefore important to consider that the districts with higher rates

of children not gaining weight may be placing a concerted effort on ensuring quality of growth monitoring practices amongst their health workers.

In addition, some children with poorly performing weight measurements may not be recorded within the health facility due to lack of access to health services. For example, in an HST project that supports development of community IMCI points in the remote villages of O.R. Tambo District, the monthly total number of children found not to be gaining weight was higher than the rates which were recorded and reported from the health facility in the routine (DHIS) data.

Figure 104: Rate of children under 5 not gaining weight by district, 2007/08
Metro View

The average rate of children not gaining weight in the metros increased from 0.9% in 2006/07 to 1.2% in 2007/08, slightly less than the national average of 1.3%. The City of Cape Town had the highest rate amongst the metros with increases over the past three years from 0.5% in 2005/06 to 1.3% in 2006/07 to 2.7% in 2007/08. The City of Johannesburg had the lowest rate for three consecutive years.

Figure 105: Rate of children under 5 not gaining weight by metro district, 2007/08

Rural Nodes

As expected, the rural nodes show a higher average rate of 1.6% than the national rate of 1.3%. The data for Thabo Mofutsanyane suggests that the problem of not gaining weight in children under 5 years is endemic in this district and further probing is necessary to uncover the possible causes. Umzinyathi in KwaZulu-Natal and Alfred Nzo, O.R. Tambo and Ukhahlamba in the Eastern Cape have unusually low rates (lower than some of the metros), even though they have a high poverty rate and are socio-economically below average. This could be a problem of growth monitoring practise and data quality issues that require an analysis by the provincial and district management.

Figure 106: Rate of children under 5 not gaining weight by rural district, 2007/08

Change and trends in the rate of children under 5 not gaining weight

Overall, in South Africa the percentage of children who did not gain weight remained stable at 1.3% between 2006/07 and 2007/08. The Western Cape is the only province where the rate of children not gaining weight worsened in the last year and just over half of all districts in the country improved.

Among the metro districts, the City of Cape Town showed the greatest increase in the percentage of children not
gaining weight, whilst eThekwini had the best improvement. The metros on average showed an increase from 0.9% to 1.2%, but the overall figures for the metros are relatively small in line with their low deprivation indices. Among the rural nodes, half of them showed a deterioration in the rate of children not gaining weight under 5 years and the other half showed an improvement.

Figure 107: Trends in the rate of children under 5 years not gaining weight by province and district, 2000/01 to 2007/08
5.5 Delivery Rate in Facility

This indicator measures the proportion of the estimate of all expected births that take place in the public health facilities. It is an expression of access to the public sector facilities as well as utilisation of these by pregnant women as opposed to giving birth at home. It is one of the indicators in improving maternal health, which is goal number 5 of the Millennium Development Goals.

This indicator is highly sensitive to the denominator, which is directly linked to the estimated number of children under one year old in the district, which are used as the basis to estimate the expected births in the district. There have been problems with these figures due to known under-counting of children under one year old in both the 1996 and 2001 censuses.

District View

Map 22 and Figure 108 show the delivery rates in facilities in 52 districts in South Africa. During the 2007/08 year the average delivery rate in a facility was 80.6%. Amathole (EC) had the lowest delivery rate (56.6%) and Metswedeng district in Gauteng reflected virtually no data as it has no maternity services. Two districts, West Rand (GP) and Eden (WC) had delivery rates of over 100%. This is probably due to an under-estimation of the expected number of deliveries, or women from outside the district delivering in facilities in the district, or a combination of these two.

All the districts in Limpopo province maintained delivery rates of more than 80%, while in the Western Cape only one district, Overberg (69%) had a delivery rate of less than 80%. Two of the four districts in the North West and six of the seven districts in Eastern Cape province had coverage rates of less than 80%. In the Northern Cape, Western Cape, Free State and Gauteng provinces there were wide intra-provincial variation.
The 2007/08 metro average rate of deliveries in facilities was slightly above the SA average of 80.6%, with Ekurhuleni (GP) and City of Tshwane (GP) having the highest delivery rates, which were above 90%. The City of Johannesburg was at the lower end compared to other metros with a delivery rate of 73.9%.
Rural Nodes

The average delivery rate in facilities in the rural nodes was 74.5%, below the SA average of 80.6%. There was a wide gradient from a high of 96.7% in Greater Sekhukhune (LP) to a low of 57% in Kgagadi (NC), which was due to missing data from one of the larger hospitals in this district, resulting in this low value in 2007/08. The four districts in the Eastern Cape were all well below the national average and it is of concern that access to this vital service remains low in the rural districts of this province.

Change and trends in delivery rate in facility

There was very little change in the national delivery rate in facility between 2006/07 and 2007/08, with roughly half of the districts showing decreases whilst the other half showed increases. Five out of the seven Eastern Cape districts and five of the six Western Cape districts had decreased their delivery rates in 2007/08. The large increase seen in Alfred Nzo (EC) district may be due to cross-boundary changes (inclusion of Taylor Bequest Hospital). It is also noted that the population estimate used in DHIS is substantially higher than the 2007 Community Survey estimate (inflating the denominator), and thus it is possible that the generally low delivery coverage in Alfred Nzo may be an underestimate of the true value. In Motheo (FS) missing denominators for the larger hospitals in this district have inflated this indicator value. The large drop in the delivery rate in the City of Cape Town was most probably due to missing data, as was the case in Kgagadi and Namakwa districts (NC).

Over the 8-year period since 2000/01 there is a clear increasing trend in delivery coverage in all provinces, although with quite different starting and ending rates, and a very small increase in KwaZulu-Natal. The gap of about 20 percentage points between the Eastern Cape and Western Cape has remained over this period.
Figure 111: Trend in delivery rate in facility by province and district, 2000/01 - 2007/08
6. Impact Indicators

6.1 Stillbirth Rate

The stillbirth rate measures the number of babies born dead out of 1 000 total births. It is a composite measure of a number of factors. These include foetal factors such as congenital abnormalities; maternal factors including their socio-economic and nutritional status and diseases such as maternal hypertension; and health system factors such as delays in referral of mothers with complications of delivery. In developed countries the stillbirth rate is around 6 per 1 000, while in less developed countries it is 26 per 1 000 and in the least developed countries it is 31 per 1 000. Some 50% of stillbirths remain unexplained. Women over 40 years of age have a higher risk of having a stillbirth. The highest stillbirth rates in the world are found in Sub-Saharan Africa.

Countries badly affected by the HIV epidemic have experienced an increase in the stillbirth rate. The stillbirth rates in this DHB are for public sector facilities only and do not give a full community picture, especially in those places where there are significant numbers of home deliveries.

District View

The average stillbirth rate in South Africa in 2007/08 was 23.0 per 1 000 births and the overall trend indicates a gradual improvement from 27.8 stillbirths per 1 000 since 2003/04. Figure 112 shows the variation in stillbirth rates among the 52 districts. The Overberg (WC) had the lowest stillbirth rate of 13.2 per 1 000, followed by Cape Winelands (WC) at 13.6 and West Rand (GP) at 14.1. Amajuba (KZN) continues to be the district with the worst rate of 34.6 per 1 000 births. The Free State has the highest provincial stillbirth rate with an average of 30.7 per 1 000 births. Updates to the national dataset, as well as retrospective removal of major outliers and impossible values has resulted in a more realistic set of trend data for this indicator, compared to values published in previous years.

Map 23: Stillbirth rate in South Africa, 2007/08

The average metro stillbirth rate in 2007/08 of 22.4 stillbirths per 1 000 was slightly below the SA average. eThekwini metro continues to have the highest rate of all the metros at 26.2 per 1 000 births. The City of Johannesburg, at 17.9 stillbirths per 1 000, had the best rate among the metro districts.
Rural Nodes

The average stillbirth rate in the rural districts in 2007/08 was 23.6 per 1 000, slightly higher than the national average of 23.0, although seven of the 12 rural districts, Umkhanyakude, Chris Hani, Alfred Nzo, Zululand, Umzinyathi, Kgalagadi and Central Karoo were below the SA average. The district with the highest stillbirth rate was Thabo Mofutsanyane in the Free State, with a rate of 29.3 stillbirths per 1 000. Central Karoo (WC) had the lowest stillbirth rate of 14.7 among the rural districts, although the data have shown large fluctuations, probably due to the low number of deaths in a small population.

Change and trends in the stillbirth rate

While there was a slight improvement in the metro average from 23.1 in 2006/07 to 22.4 per 1 000 in 2007/08, three metros had increases in their rates of stillbirths. The City of Cape Town had an increase from 21.2 stillbirths per 1 000 in 2006/07 to 22.6 stillbirths per 1 000 in 2007/08. Two metros in Gauteng, City of Tshwane and Ekurhuleni, had slight increases in their rates. The large decline in Nelson Mandela Bay Metro is most likely due to missing data in 2007.

Of note is the consistent improvement in the stillbirth rate in the rural areas from 26.0 in 2006/07 to 23.6 per 1 000 in 2007/08. Eight of the rural districts experienced decreases with Kgalagadi, the Central Karoo and O.R. Tambo having noticeably improved rates. Zululand had the highest increase whilst Thabo Mofutsanyane had the worst rate of the rural districts of 29.3 per 1 000 stillbirths despite a slight decrease over the previous year.
Figure 115: Trends in stillbirth rate by province and district, 2000/01 - 2007/08
6.2 Perinatal Mortality Rate (PNMR)

The perinatal mortality rate is the number of perinatal deaths per 1 000 live births\(^\text{41}\). Perinatal deaths are the sum of stillbirths plus early neonatal deaths. The PNMR is the most sensitive indicator of obstetric care. For developed countries the rate for babies over 1 000g is usually less than 10 per 1 000 births, whereas for less developed countries, the PNMR is 50, and in the least developed counties it is 61 per 1 000 live births\(^\text{42}\). Because the PNMR incorporates stillbirths, the PNMR indicator to a very large extent follows a similar trend to the stillbirth rate.

**District view**

The South African PNMR in 2007/08 was 31.1 per 1 000 births, a slight improvement from 33.2 in 2006/07. The two districts with the highest rates were Pixley Ka Seme (NC) with a rate of 45.9 per 1 000 births and Lejweleputswa (FS) with a PNMR of 44.3 per 1 000 births. Among provinces, the Free State had the highest average PNMR of 41.7 and included a number of the worst PMNR ranking districts while the Western Cape had the lowest PNMR of 25.3. As with stillbirths, updates to the national dataset, as well as retrospective removal of major outliers and impossible values has resulted in a more realistic set of trend data for this indicator, compared to values published in previous years. Because of the relatively small number of deaths at district level, particularly for areas with small populations, trends should be examined over longer time periods since natural fluctuations do occur, in addition to data quality issues.

Map 24: Perinatal mortality rate in South Africa, 2007/08

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\(^{41}\) The WHO indicates in the definition that the PNMR is per 1 000 live births but many other sources including the USA use total births. The DHIS uses total births and the MRC’s Saving Babies: A perinatal care survey of South Africa 2000, also uses total births.

Figure 116: Perinatal mortality rate by district, 2007/08

Metro view

In 2007/08, the average PNMR rate for the metro districts was 30.2 per 1 000 births, slightly lower than the national average. The PNMR of the metros were all clustered around 30 per 1 000 births.
Rural nodes

The rural PNMR of 31.1 per 1 000 live births is equal to the national average. The rural district with the highest PNMR was Thabo Mofutsanyane with a rate of 39.6 per 1 000. The Central Karoo (WC) had the lowest rural district PNMR of 20.7 per 1 000 births, although this value was substantially lower than values for the previous seven years.

Change and trends in the perinatal mortality rate

The metro with the greatest improvement was Nelson Mandela Bay which improved from 38.7 in 2006/07 to 30.0 per 1 000 live births in 2007/08. In the rural districts there were a number of improvements to the PMNR rate with eight of the 12 districts improving their rates. The Central Karoo district improved substantially in PNMR from 47.0 per 1 000 live births in 2006/07 to 20.7 per 1 000 in 2007/08.
Figure 119: Trends in perinatal mortality rate by province and district, 2000/01 - 2007/08