Introduction and Overview

Background

The 2015/16 *District Health Barometer* (DHB) provides an overview of the delivery of primary health care (PHC) in the public health sector across the provinces and districts of South Africa. The DHB has been issued every year since 2005, and draws data from the District Health Information Software (DHIS), the Ideal Clinic Realisation and Maintenance system, Statistics South Africa (StatsSA), the National Treasury Basic Accounting System (BAS), the National Health Laboratory Service (NHLS), the National Income Dynamics Study (NiDS), the national Electronic Tuberculosis (TB) Register (ETR.Net) and the Electronic Drug-resistant Tuberculosis Register (EDRWeb). The publication seeks to highlight inequities in health outcomes, health-resource allocation and delivery, and to track the efficiency of health processes across all provinces and districts.

Compilation of the DHB is guided by an advisory committee made up of managers from the National Department of Health (NDoH), as well as public health experts.

Timely publication of the DHB is inextricably linked to availability of the data sources from which it draws, and the launch of the DHB is intended to coincide with the NDoH annual planning cycle.

The DHB is available on the Health Systems Trust website at http://www.hst.org.za and on CD upon request.

Methodology and data sources

Indicators used in the 2015/16 DHB

The indicators[a] in this DHB have been approved by the NDoH. The chosen indicators are those linked to measuring the NDoH's Annual Performance Plan (APP), the provincial APPs, the District Health Plans of the health districts, and those indicators that measure important aspects of the burden of disease. All the indicators in this publication are categorised according to the 2013 National Indicator Data Set (NIDS); where applicable, the indicator names are also replicated from the NIDS.

This year, nine new indicators have been added. These are:

- Inpatient death under 5 years rate
- Percentage ideal clinics
- Percentage of fixed PHC facilities with patients who have access to a medical practitioner
- TB MDR treatment success rate
- Diabetes incidence
- Percentage PCR tests positive within 6 days (replaced Infant 1st PCR test positive around 6 weeks rate)
- HIV PCR birth testing coverage (replaced Infant 1st PCR test around 6 weeks uptake rate).

The following indicators reported on in previous years have been dropped, namely:

- PHC supervisor visit rate
- Mental health admission rate
- PHC professional nurse clinical workload
- PHC doctor clinical workload.

The burden of disease chapter is included again.

Most of the indicators in this report, excluding the socio-economic, financial, non-communicable disease (NCD) and TB indicators, were updated from the DHIS data files at facility level (NDoH5) for the financial years ending March, up to 2015/16, which was received in June 2016. Data for the selected indicators were exported into a single MySQL database to facilitate uniform coding of districts and trend analysis for the last 10 years. As in previous reports, data for selected indicators aregiven for **district hospitals only**. These are: Average length of stay, Bed utilisation rate, Delivery by Caesarean section rate, OPD new client not referred rate, and Expenditure per patient day equivalent.

a A table with definitions, references and terms for each indicator used in this report is available in Appendix 1.

District health expenditure indicators

Provincial health expenditure up to 2015/16 was extracted from the National Treasury BAS database. Expenditure allocated to specific health facilities (under the 'Responsibility level' code) was in turn coded to the latest DHIS facility information. All other expenditure that could not be clearly allocated to a specific district was allocated to each district in proportion to the population share of the areas involved. For example, provincial-level expenditure was allocated to each of the districts in the province.

Provincial expenditure was coded according to the programmes and sub-programmes published by the National Treasury. Expenditure from sub-programmes 2.2–2.7 (community health clinics, community health centres, community-based services, other community services, and HIV and nutrition) constitutes the non-hospital PHC expenditure under District Health Services. Total District Health Services expenditure includes all sub-programmes under Programme 2: District Health Services, except sub-programme 2.8 (Coroner services).

Additional data sources used include:

- Data on local government expenditure on PHC from the National Treasury. Net expenditure was used, i.e. expenditure less revenue (which includes transfers from provinces to local government).
- Factors for inflation adjustments based on CPIX (StatsSA) were used to convert expenditure for all years to real 2015/16 prices.
- Medical scheme coverage from the StatsSA General Household Surveys (GHS) was used to calculate the uninsured population. The GHS is the only source of district-level estimates of medical scheme coverage, but these estimates were available for 2005–2007 only, and there were some anomalies in the data during that period. Thus reliable extrapolation of coverage at district level has become difficult over time, exacerbated by adjustment for the change in boundaries. Looking retrospectively to 2001, it is clear that overall the GHS and the Council for Medical Schemes (CMS) data correlate, although in some years the GHS data deviate substantially. Overall, the level has also remained remarkably static at around 16% ± 1%. Therefore, for the purpose of this analysis, it was considered adequate to apply a single-year estimate of medical scheme coverage to the time series population, since the variation in coverage *between* districts is more relevant than changes in coverage over time. The year 2009 was chosen as the most recent year when the overall rate in the GHS was comparable with the CMS and historical trends. This estimate uses the pooled 2005–2007 district-level estimates, adjusted according to the change in provincial coverage between the two periods (for example, where Gauteng Province (GP) and the Western Cape (WC) were clearly under-reported from 2005 to 2007). Estimates for districts affected by boundary changes were made by distributing beneficiaries within each province according to expected patterns for metro/non-metro districts and the socio-economic quintile of the districts and constituent local municipalities. This year, the 2015 GHS published updated medical scheme coverage for the eight metros, but the sample size does not allow for estimates to be made for the remaining districts. This DHB is therefore using the 2015 estimates for the metros and the existing estimates circa 2009 for all other districts in order to estimate the uninsured population per district.
- Data on health facilities, population, patient day equivalents and PHC headcount from the DHIS.

Per capita expenditure indicators use public sector expenditure divided by the uninsured population. However, the GHS and other sources indicate that the uninsured population makes significant use of private sector services, and the insured population also make some use of public sector services. As such, it is acknowledged that there is a wide range of uncertainty surrounding the true size of the population that is dependent on public sector services, which affects the accuracy of the per capita expenditure indicators.

The net local government expenditure on health services was added to provincial expenditure on district health services (see the Finance chapter).

All the figures have been adjusted to take the effect of inflation into account and are presented in real 2015/16 prices. This means that increases in expenditure over time reflect greater availability of resources rather than merely increases to cover the increasing cost of health care due to inflation.

Population data

Indicators requiring population denominators were assigned mid-year population estimates for the relevant year, as available at the time of calculation. The district population estimates (five-year age groups) developed by StatsSA for 2002–2018 (based on the best available information from Census 2011 and other sources of demographic information) were modified by the NDoH to single-year age groups. These are the same population estimates currently included in the DHIS. Data for population-denominated indicators were therefore updated retrospectively from the latest data file back to 2011/12 in most cases; denominators for immunisation coverage were revised according to the new population estimates for all the years presented in this DHB.

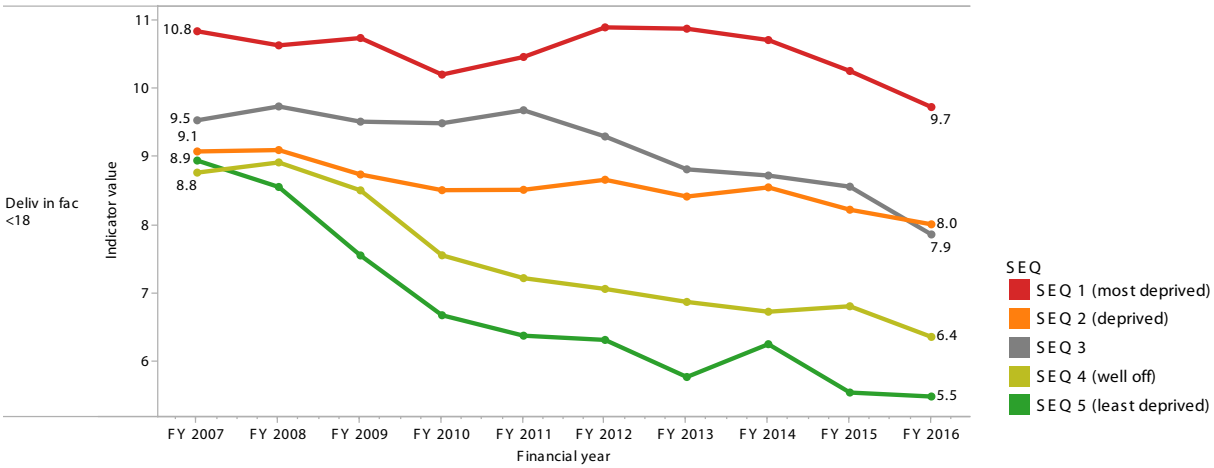
Deprivation index and socio-economic quintiles

The composite indicator of deprivation was replaced in the 2013/14 year with a new index of multiple deprivation developed by Noble et al.,[b] based on a basket of variables from Census 2011. This South African Index of Multiple Deprivation (SAIMD) includes indicators from four domains: income and material deprivation, employment deprivation, education deprivation, and living environment deprivation, measured at either the individual or household level according to the indicator. The overall SAIMD combines these individual domains of deprivation using equal weights. The results were produced at ward level, with the most deprived ward given a rank of 1 and the least deprived a rank of 4 277. The population-weighted average rank of the wards was then calculated at local municipality, district municipality and provincial levels.

The SAIMD therefore provides a measure of relative deprivation across districts within South Africa. Each district was ranked according to level of deprivation and categorised into a socio-economic quintile (SEQ). 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). Since the SAIMD has not been calculated for any other censuses or community surveys according to the current boundaries and deprivation index methodology, the 2011 deprivation ranks have been assumed to remain constant over the time period included in the DHB. Although not ideal, comparison between the latest findings and findings from the previous analyses suggests that although there have been reductions in the *level* of deprivation, there has been little change in the *relative* amount of deprivation (i.e. the spatial distribution of deprivation has remained quite similar).

The DHB indicators have been calculated by SEQ (at district level) to assess trends in inequities. The values have been calculated as the weighted average of all data within each SEQ (Figure 1).[c]

Figure 1: Example of indicator by socioeconomic quintile trends



TB indicators

TB indicators based on the ETR.Net and EDRWeb were calculated from the individual records in the registers after coding all the facilities to the current districts by mapping the ETR facility names to DHIS facility names. In the case of EDRWeb, a substantial number of records (N = 1 315) reflected 'unknown district', and a further 506 had 'unknown province'. In instances where the treatment facility was missing, the drug-resistance unit was used to assign the patient records to districts where possible.

The indicator TB rifampicin resistance confirmed client rate, which gives an indication of what proportion of TB cases are drug resistant, was calculated from NHLS data on GeneXpert tests. The data were coded to districts where the facility names could be linked to DHIS organisational units, although several apparent discrepancies were noted in the district assignments in the NHLS data. These data do not represent all tests for drug susceptibility, although the scale-up of this diagnostic tool has been rapid and probably represents the majority of testing, with 245 918 TB cases identified based on 2.6 million GeneXpert tests in 2015.

District boundaries and maps

Geographical information from the Municipal Demarcation Board was used to define district and provincial boundaries; the same boundaries are used in the DHIS. Sub-district boundaries, which aggregate selected local municipalities in the Eastern Cape (EC) and break some of the metros into smaller management units, are used in the DHIS and were obtained from the NDoH. Indicators in this DHB have been aggregated and presented according to the boundaries that came into effect in May 2011.

b Noble M, Zembe W, Wright G, Avenell D. Multiple Deprivation and Income Poverty at Small Area Level in South Africa in 2011. Cape Town: Southern African Social Policy Research Institute and Southern African Social Policy Research Insights (SASPRI); 2013.

c In previous editions of the DHB the values were calculated as the median of the district values within each SEQ.

Averages

All averages (provincial and national) are **weighted averages**, based on the total numerator and denominator for all the sub-areas included, and are, therefore, not averages of *the district indicator values*. 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.

Data display

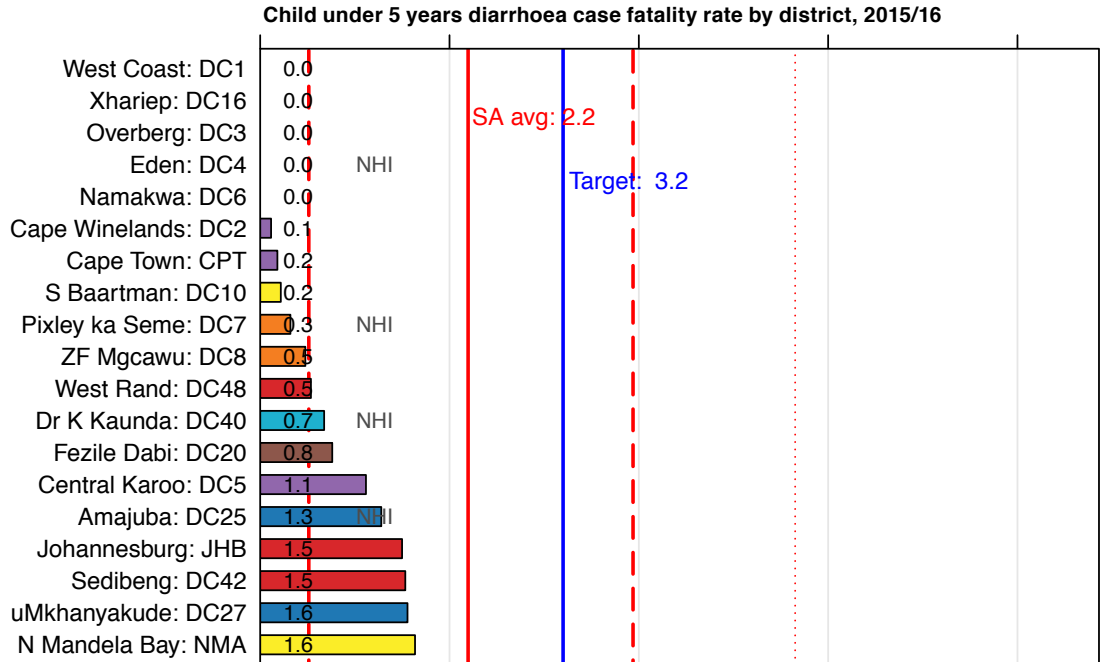
Financial year and calendar year

Indicators from the DHIS and the BAS financial system cover the 12 months from April to March, which is the financial year of the NDoH. Indicators for financial years are annotated as 2015/16 or FY 2016. Other sources, such as the TB data from ETR.Net, and the burden of disease (death) data cover a calendar year. Data from the StatsSA surveys and the NiDS correspond with the period of the survey. In the Excel file produced with the DHB, the single year indicated for summary purposes is the one including the majority of the data.

Indicator ranking – is first always best?

The districts are ranked from 1 to 52 (for the various indicators in the league table graphs where number 1 represents the best performance and number 52 the worst performance). However, with some indicators such as Caesarean section rate, Average length of stay, and expenditure, an indicator in the number 1 position does not mean best performance; 'best' is usually in the middle range close to the South African average. For these indicators, order from top to bottom should therefore not necessarily be considered as best to worst. Individual indicators are therefore ranked as either ascending (low values are best, for example Maternal mortality ratios), descending (high values are best, for example Immunisation coverage), or central (neither low nor high values are good and the optimal values are approximately central, approximated by the South African average for the indicator). On the league graphs the national weighted average is shown as a solid red line, while the ranges of district values falling within one and two standard deviations of the mean of all 52 district values are shown by the dashed and dotted red lines respectively (Figure 2).

Figure 2: Example of graph showing an indicator by district



In the DHB data file, the indicator ranks for all districts are coloured from green to orange to red. It must be noted that this is only a crude indication of performance and is based on the position of a district *relative* to the other 51 districts and not based on a target or fixed standard. Therefore, it is possible that an indicator may improve in a district, but it could drop in rank (i.e. go from green to red) if other districts have improved to a greater extent.

ArcView was used to generate the thematic or choropleth maps of indicator values by district and sub-district. Most of the maps were created using 'natural breaks',[d] with five categories as the default. In some cases the distribution was heavily skewed at the sub-district level and manual breaks were chosen to better illustrate areas of public health importance. For all indicators, low indicator values are represented by light shades and high indicator values by darker shades, regardless

d This is the default classification method in ArcView, using the Jenks Optimisation algorithm to group values within a class, resulting in classes of similar values separated by breakpoints. This method works well with data that are not evenly distributed and not heavily skewed towards one end of the distribution.

of whether high values are 'best' or 'worst'. Therefore, dark shades are not always best, and each indicator map should be interpreted in terms of the desired target range for that indicator.

Indicators by level of care

Some of the hospital indicators included in the DHB are filtered for district hospitals only, since inclusion of higher-level hospitals (which provide services to a wider catchment area) may distort assessment of availability of services at district level. However, to interpret the district-hospital values of the indicator, it may be necessary to consider the context (availability of services at other levels) within the district and province. Figures 3 and 4 summarise the indicator value for each level of care. The right-hand column (% of denominator) shows the relative split of services by level (in the case of Caesarean section rate, this is the % of deliveries in facility). In the district-level graph, the middle column shows the numerical size of the denominator (in this case, number of deliveries). This is relevant because an extreme indicator value is of more importance if the numbers are large.

Figure 3: Example of graph showing indicator by level of care by province

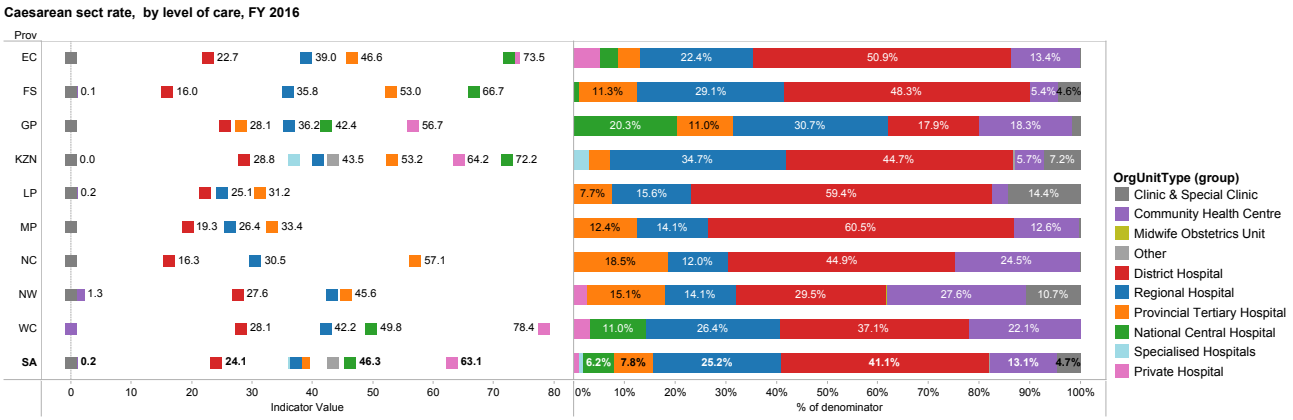
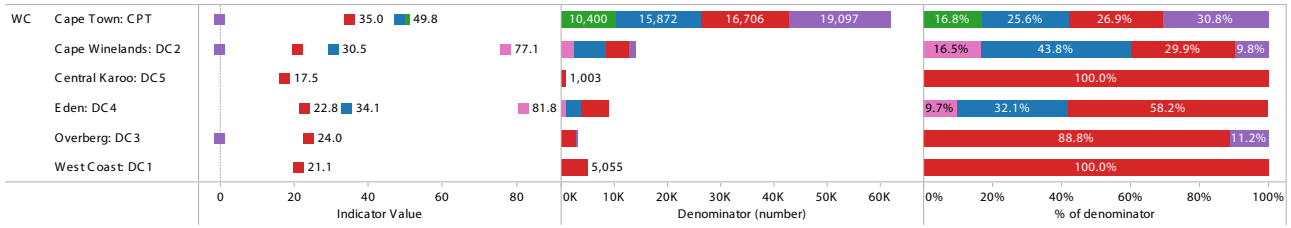


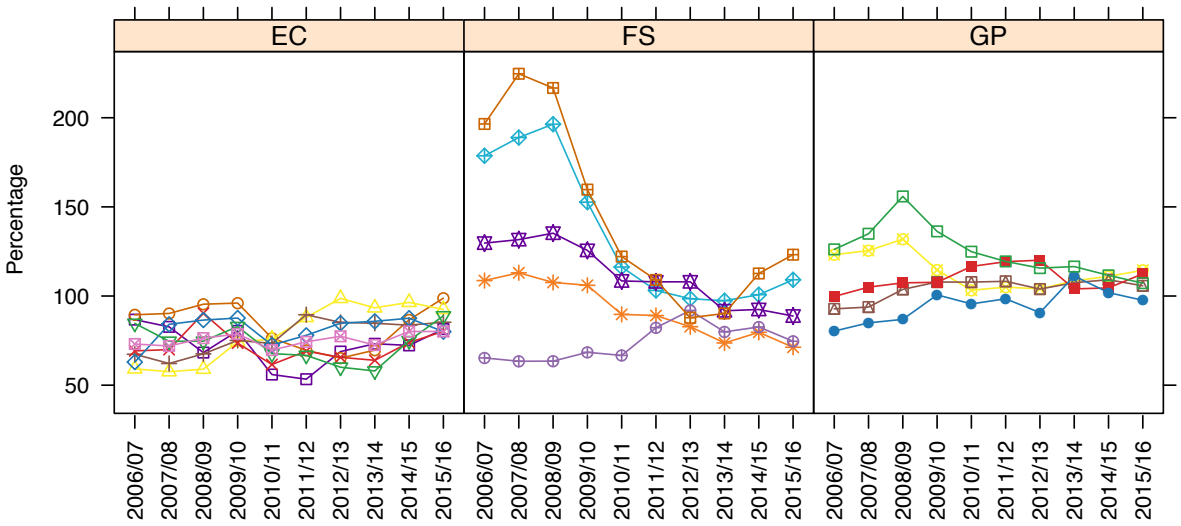
Figure 4: Example of graph showing indicator by level of care by district



Trends

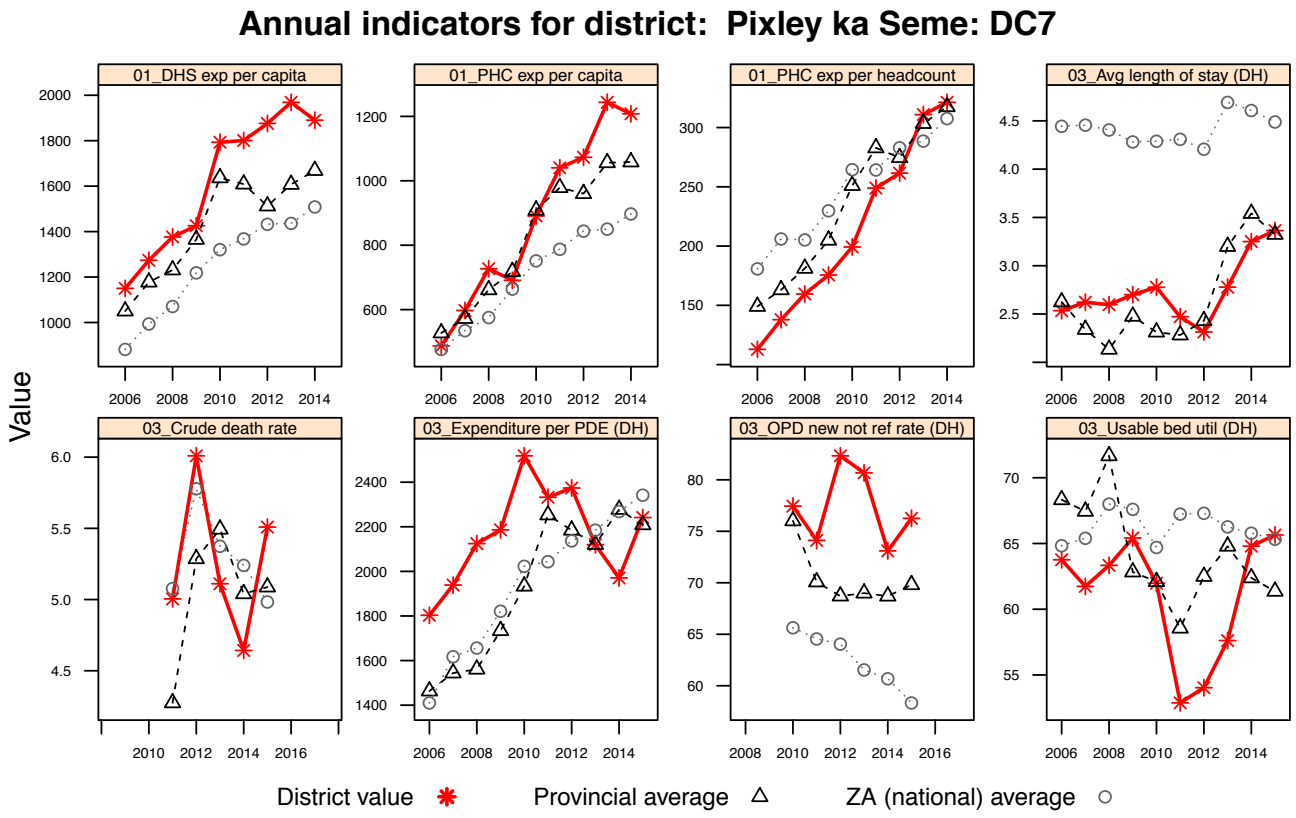
Annual indicator trends (district and provincial) are included in some chapters in Section A (Figure 5). Indicator comparisons by district help the reader to explore how an indicator varies over a number of years across districts and provinces. As the scale of the y-axis is the same for all the graphs, one can notice differences easily. Annual trends also reveal variation and change within the districts in a particular province over time.

Figure 5: Example of annual indicator trends over a number of years across districts and provinces



In Section B, composite graphs show annual trends for all districts for all the indicators included in the DHB. The district indicator value (IndValue) is shown together with the relevant provincial averages (Prov_av) and national averages (ZA_av) (Figure 6).

Figure 6: Example of annual indicator trends for districts



Burden of disease profiles

Graphs have been adapted this year to provide a snapshot of each district's burden of disease profile (Figure 7). In order to make the disaggregated results more robust, data were consolidated for the 2009–2014 period (six years) as in some smaller districts there were limited deaths by single cause in certain age groups.

Figure 7: Example of burden of disease profile by district