Geographic accessibility study of social facility and government service points for the metropolitan cities of Johannesburg and eThekwini 2011/12

PART C: SECTION 1

DEPARTMENT OF HEALTH
1 DEPARTMENT OF HEALTH

1.1 SUMMARY OF FINDINGS ............................................................................................................. 1
1.2 INTRODUCTION .......................................................................................................................... 2
1.3 FACILITIES ANALYSED AND THEIR DEFINITIONS ................................................................. 2
1.4 BASIC APPROACH AND METHODOLOGY ............................................................................. 3
1.5 GENERIC DATA ............................................................................................................................. 6
1.6 POPULATION DATA MANIPULATION AND STATUS ................................................................. 6
1.7 TARGET POPULATION ................................................................................................................ 8
1.8 STANDARDS ................................................................................................................................... 9
1.9 SPECIFIC POLICY ISSUES AND DOCUMENTS CONSIDERED AS INPUT TO THE STUDY ....... 12
1.10 SPECIFIC ANALYSIS PROCESS AND LOCATION FACTORS ................................................. 13
1.11 ANALYSIS AND FINDINGS FOR JOHANNESBURG CLINICS .................................................. 13

   1.11.1 Summary of Criteria and Analysis Process .......................................................................... 13
   1.11.2 Access to Services .............................................................................................................. 14
   1.11.3 Served Regions .................................................................................................................... 16
   1.11.4 Unserved Regions .............................................................................................................. 18
   1.11.5 Areas with high demand pressure on Johannesburg Clinics ............................................. 18
   1.11.6 Full complement resource scenario .................................................................................. 18

1.12 ANALYSIS AND FINDINGS FOR JOHANNESBURG COMMUNITY HEALTH CENTRES (CHCS) ...... 24

   1.12.1 Summary of Criteria and Analysis Process for Johannesburg Community Health Centres .... 24
   1.12.2 Access to Services .............................................................................................................. 24
   1.12.3 Served Regions .................................................................................................................... 26
   1.12.4 Unserved Regions .............................................................................................................. 28
   1.12.5 Areas with high demand pressure on CHCs ...................................................................... 30

1.13 ANALYSIS AND FINDINGS FOR JOHANNESBURG LEVEL 1 (REGIONAL) HOSPITALS .............. 32

   1.13.1 Summary of Criteria and Analysis Process for Level 1 Hospitals in Johannesburg............... 32
   1.13.2 Access to Services ............................................................................................................... 32
   1.13.3 Served Regions .................................................................................................................... 34
   1.13.4 Unserved Regions .............................................................................................................. 36
   1.13.5 Areas with high demand pressure on Level 1 Hospitals in Johannesburg ............................ 38

1.14 ANALYSIS AND FINDINGS FOR ETHEKWINI CLINICS ................................................................. 40

   1.14.1 Summary of Criteria and Analysis Process for eThekwini Clinics ....................................... 40
   1.14.2 Access to Services ............................................................................................................... 40
1.14.3 Served Regions ............................................................................................................42
1.14.4 Unserved Regions ......................................................................................................44
1.14.5 Areas with high demand pressure on eThekwini Clinics ........................................46
1.14.6 Full complement resource scenario ........................................................................48

1.15 ANALYSIS AND FINDINGS FOR ETHEKWINI COMMUNITY HEALTH CENTRES (CHCS) ........................................52
1.15.1 Summary of Criteria and Analysis Process for eThekwini CHCs ................................52
1.15.2 Access to Services ...................................................................................................52
1.15.3 Served Regions ........................................................................................................54
1.15.4 Unserved Regions ...................................................................................................56
1.15.5 Areas with high demand pressure on CHCs .............................................................58

1.16 ANALYSIS AND FINDINGS FOR ETHEKWINI LEVEL 1 (REGIONAL) HOSPITALS ..................................................60
1.16.1 Summary of Criteria and Analysis Process for eThekwini Level 1 Hospitals .................60
1.16.2 Access to Services ...................................................................................................60
1.16.3 Served Regions ........................................................................................................62
1.16.4 Unserved Regions ...................................................................................................65
1.16.5 Areas with high demand pressure on Level 1 Hospitals ..............................................65

1.17 SUMMARY ..................................................................................................................68

1.18 ADDENDUM ..................................................................................................................68
1.18.1 Formal Engagements with Stakeholders ....................................................................68
1.18.2 Contact persons .......................................................................................................69

TABLES

Table 1.1: Steps in the facility accessibility analysis process ..................................................4
Table 1.2: Summary of criteria and analysis process for Johannesburg Clinics ....................14
Table 1.3: Travel distance for the uninsured population to Johannesburg Clinics ..................16
Table 1.4: Service access for uninsured population (number of visits) within travel distance to
Johannesburg Clinics ........................................................................................................18
Table 1.5: Summary of criteria and analysis process for Clinics and all private sector General
Practitioners (GPs) in Johannesburg ..................................................................................21
Table 1.6: Summary of criteria and analysis process for Johannesburg Community Health Centres 24
Table 1.7: Travel distance for uninsured population to Johannesburg CHCs ....................26
Table 1.8: Service access of uninsured population within travel distance from Johannesburg CHCs .28
Table 1.9: Summary of criteria and analysis process for Johannesburg Level 1 Hospital Services 32
Table 1.10: Travel distance for uninsured population to Johannesburg Level 1 Hospitals ......34
Table 1.11: Service access of uninsured population within travel distance from Johannesburg Level 1 Hospitals .................................................................36
Table 1.12: Summary of criteria and analysis process for eThekwini Clinics .........................40
Table 1.13: Travel distance for the uninsured population to eThekwini Clinics ......................42
Table 1.14: Service access for uninsured population (number of visits) within travel distance to
eThekwini Clinics ............................................................................................................44
Table 1.15: Summary of criteria and analysis process for Clinics and all private sector GPs in eThekwini ....................................................... 48
Table 1.16: Summary of criteria and analysis process for eThekwini Community Health Centres .......................................................... 52
Table 1.17: Travel distance for uninsured population to eThekwini CHCs .................................................................................. 54
Table 1.18: Service access of uninsured population within travel distance from eThekwini CHCs .................................................. 56
Table 1.19: Summary of criteria and analysis process for eThekwini Level 1 Hospital Services ................................................. 60
Table 1.20: Travel distance for uninsured population to eThekwini Level 1 Hospitals .............................................................. 62
Table 1.21: Service access of uninsured population within travel distance from eThekwini Level 1 Hospitals .................................................. 63

FIGURES

Figure 1.1: Basic 5-step catchment analysis and planning procedure ........................................................................................................... 3
Figure 1.2: Example of spatialised demand/supply modelling and the use of analysis zones ................................................................. 5
Figure 1.3: Travel distances to the closest Clinic in Johannesburg ........................................................................................................ 15
Figure 1.4: Areas served by capacity constrained Clinics in Johannesburg ........................................................................................ 17
Figure 1.5: Areas unserved by capacity constrained Clinics in Johannesburg (no. of potential visits per hexagon) ........................................ 19
Figure 1.6: Pressure areas with regard to access to Clinics in Johannesburg and needing intervention (no. of potential visits per hexagon) ........................................................................................................................................ 20
Figure 1.7: Areas served with respect to capacity constrained analysis for Clinics and general practitioners in Johannesburg .................................................................................................................. 22
Figure 1.8: Unserved areas with respect to Clinics and general practitioners in Johannesburg (no. of potential visits per hexagon) ...................... 23
Figure 1.9: Travel distances to the closest CHC in Johannesburg ........................................................................................................ 25
Figure 1.10: Areas served by capacity constrained CHCs in Johannesburg ........................................................................................ 27
Figure 1.11: Areas unserved by capacity constrained CHCs in Johannesburg (no. of potential visits per hexagon) ........................................... 29
Figure 1.12: Pressure areas with regard to access to CHCs in Johannesburg and needing intervention (no. of potential visits per hexagon) ........................................................................................................ 31
Figure 1.13: Travel distances to the closest Level 1 Hospital in Johannesburg ........................................................................................ 33
Figure 1.14: Areas served by capacity constrained Level 1 Hospitals in Johannesburg .......................................................... 35
Figure 1.15: Areas unserved by capacity constrained Level 1 Hospitals in Johannesburg (no. of potential visits per hexagon) ......................... 37
Figure 1.16: Pressure areas with respect to access to Level 1 Hospitals in Johannesburg and needing intervention (no. of potential visits per hexagon) .................................................................................. 39
Figure 1.17: Travel distances to the closest Clinic in eThekwini .............................................................................................................. 41
Figure 1.18: Areas served by capacity constrained Clinics in eThekwini ................................................................................................. 43
Figure 1.19: Areas unserved by capacity constrained Clinics in eThekwini (no. of potential visits per hexagon) ........................................... 45
Figure 1.20: Pressure areas with regard to access to Clinics in eThekwini (no. of potential visits per hexagon) and needing intervention .................................................................................................................. 47
Figure 1.21: Areas served with respect to capacity constrained Clinics and general practitioners in eThekwini ......................................................... 49
Figure 1.22: Unserved areas with respect to Clinics and general practitioners in eThekwini (no. of potential visits per hexagon) ......................... 51
Figure 1.23: Travel distances to the closest CHC in eThekwini .............................................................................................................. 53

Geographic accessibility study of social facility and government service points for the metropolitan cities of Johannesburg and eThekwini 2011/12
Figure 1.24: Areas served by capacity constrained CHCs in eThekwini..........................55
Figure 1.25: Areas unserved by capacity constrained CHCs in eThekwini (no. of potential visits per hexagon) .................................................................57
Figure 1.26: Pressure areas with regard to access to CHCs in eThekwini and needing intervention (no. of potential visits per hexagon) ........................................59
Figure 1.27: Travel distances to the closest Level 1 Hospital in eThekwini..............................61
Figure 1.28: Areas served by capacity constrained Level 1 Hospitals in eThekwini..................64
Figure 1.29: Areas unserved by capacity constrained Level 1 Hospitals in eThekwini (no. of potential visits) .................................................................66
Figure 1.30: Pressure areas with regard to Level 1 Hospitals in eThekwini and needing intervention (no. of potential visits per hexagon) ........................................67
1 DEPARTMENT OF HEALTH

1.1 SUMMARY OF FINDINGS

1.1.1 The location of health facilities generally follows the growth pattern of the residential areas of the metropolitan areas. In effect, a new health facility gets planned as the urban areas expand into peripheral areas. Planning for these ad hoc developments makes provision of health facilities problematic in the sense that the geographical spread of the facilities may be very good but the required service capacities are not always well understood.

1.1.2 Clinics are in general well located in both Johannesburg and eThekwini. Travel access to Clinics is fairly good and on average residents can reach a clinic within 3.6 km in Johannesburg and 6.6 km in eThekwini. Of more concern is the service capacity of individual facilities in higher density suburbs, especially the townships characterised by small dwellings, rapidly growing informal settlements and backyard dwellings. The areas with the greatest backlog/ spatial mismatch of supply and demand are also those with the lowest number of private doctors and the highest population density.

1.1.3 Community Health Care Centres (CHCs) provision is a fairly new intervention and is provided almost exclusively in high density areas of both metropolitan municipalities, although unequally so in eThekwini. CHCs show a general lack of capacity although the average travel time to reach a CHC in Johannesburg is 10.1 km citywide. In eThekwini the facilities are more poorly distributed and the average travel distance to a CHC is poor at 15 km, thus exceeding the 10 km access standard. Even the north (KwaMashu/ Phoenix), the only area in eThekwini with more than one CHC, does not have sufficient capacity.

1.1.4 The locations of Level 1 (Regional) Hospitals are generally historically determined and large parts of the poorer population must pay high transport costs to access these facilities. The average access distance is 18.9 km in eThekwini and 12.6 km in Johannesburg. Serious service capacity problems further constrain the delivery of health services to the broad population.

1.1.5 The report has highlighted areas of need pressure in both cities with respect to Clinics, CHCs and Level 1 Hospitals. The identified areas of concern will need to be addressed though a range of existing policies including focussing on preventive health to reduce the demand for services through education and other measures. Operational improvements will also need to be considered. Since in some instances travel distance is a concern, capital expenditure may be inevitable to address the access of residents to health care within an acceptable distance.

1.1.6 The sector report highlights the areas which, in a spatial context, should be the key areas for attention should alternative strategies not have the desired impact of reducing or dealing with the current...
Geographic accessibility study of social facility and government service points for the metropolitan cities of Johannesburg and eThekwini 2011/12 demand. In eThekwini, these include Umlazi primarily and then the Inanda/ KwaMashu/ Phoenix area. In Johannesburg, Soweto and the Inner City are the areas of greatest need.

1.2 INTRODUCTION

1.2.1 This report section provides an overview of the analysis and findings in respect to the provision of primary health care facilities in Johannesburg and eThekwini metropolitan areas.

1.2.2 As a subcomponent of the larger study, the analysis promotes the development of integrated facility plans in relation to each of the metropolitan areas. This is achieved by, firstly, lending support to the attainment of more equitable and affordable access to a range of services in all parts of the selected areas. Secondly, it facilitates the clustering of facilities where appropriate and the provision of services from centralised points, such as Thusong Service Centres.

1.2.3 The analysis also assisted the National Department of Health (NDH), the Gauteng Department of Health (GDH) and the KwaZulu-Natal Department of Health (KZNDH) in testing and refining their geographic access norms and service catchment threshold parameters, i.e. the relationship between service demand within a defined distance of a facility and the capacity of the facility service point. The testing of access and threshold standards was specifically undertaken for the two metropolitan areas but should also prove suitable for application in the other metropolitan areas of South Africa.

1.2.4 Several formal stakeholder engagements were held with officials from the various Departments of Health and key contact people were appointed to represent the Departments for the study purposes (see Addendum, Section 1.14 for details).

1.2.5 This section reports on the findings and outcomes of the geographical accessibility study in terms of:

- The access norms and standards tested and agreed upon for the Department of Health;
- The collated datasets for the spatial distribution, service capacity and hierarchy of facilities;
- The current overall accessibility and service levels;
- High pressure areas of need requiring intervention.

1.3 FACILITIES ANALYSED AND THEIR DEFINITIONS

1.3.1 The facility types selected for analysis were Primary Health Clinics (fixed), Community Health Centres (CHCs) and Level 1 Hospitals.

1.3.2 Clinics are fixed points that provide the full spectrum of primary health care services on the clinic level. These points did not include any specialist services such as TB-centres and centres for pregnant
mothers. Mobile services were not considered part of the fixed points at this stage of the analysis, but were considered in the optimisation phase as potential locations for facility expansion or new facilities.

1.3.3 Community Health Centres (CHCs) form the next level in the referral hierarchy. Patients get referred from Clinics to CHCs for more specialised care when required.

1.3.4 Level 1 District Hospitals form the next referral level after CHCs and include bed care and theatre facilities.

1.4 BASIC APPROACH AND METHODOLOGY

1.4.1 The basic methodology for this project was the application of the service access planning methodology. This uses accessibility analysis tools in a GIS environment to undertake a facility audit and accessibility analysis of the designated facilities following a basic five-step approach (Figure 1.1).

![Diagram: Basic 5-step catchment analysis and planning procedure]

Figure 1.1: Basic 5-step catchment analysis and planning procedure

1.4.2 The basic approach was adapted for this study to include two additional steps: namely, the development and verification of the norms and standards before the analysis commenced; and a final costing step to enhance the decision-support process.
1.4.3 The following step-wise process (Table 1.1) was followed in undertaking the accessibility auditing and planning of new facilities. (A more detailed explanation of each of the Steps is contained in Annexure B.1. of the main report)

Table 1.1: Steps in the facility accessibility analysis process

<table>
<thead>
<tr>
<th>STEP 1:</th>
<th>Verification of access norms and thresholds for a specific facility type. (Also, reviewed and revised if necessary based on outcome of Step 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 2:</td>
<td>Travel distance and catchment area analysis (based on the above standards). Calculation of total demand per current service point.</td>
</tr>
<tr>
<td>STEP 3:</td>
<td>Spatial classification of under-, over- or poorly-served demand (users), backlog quantification and mapping of unserved demand.</td>
</tr>
<tr>
<td>STEP 5:</td>
<td>Planning for new facilities, closures, relocation and right-sizing of facilities – optimization or rationalisation as required.</td>
</tr>
<tr>
<td>STEP 6:</td>
<td>Development of an integrated plan for public investment.</td>
</tr>
<tr>
<td>STEP 7:</td>
<td>Costing of implementation plan.</td>
</tr>
</tbody>
</table>

1.4.4 The study team followed an integrated approach to planning new facilities that is in line with government policy and strategy and which also promotes city building. Groupings of facilities that are required (backlog) and which can be appropriately clustered or can share a precinct/ building were identified. To enable the team to integrate the results, the study made use of the same general analysis process for all facilities and used the same set of analysis zones (hexagons of 20 hectares in size) so that the results could be easily overlaid and integrated for each city. Figure 1.2 illustrates this.
1. Locate service centres (clinics in this case)
2. Demarcate well-served areas (within 30 min walking distance of an uncongested facility)
3. Analyse variations in access times (minutes)
4. Identify concentrations of poorly-served demand
5. Identify good locations for new facilities

Example of spatialised demand/supply modelling

Figure 1.2: Example of spatialised demand/supply modelling and the use of analysis zones

1.4.5 The study assumed that users of services will make a rational choice with respect to selecting to use the facility closest to where they are located, in this case their place of residence. Although this is not true in all cases, the analysis is at such a level that it enables the outputs to be used to achieve an equitable and balanced supply of facilities and services within a specified planning region.

1.4.6 It was also assumed that the current investment in facilities is fixed and that existing facilities will not be relocated unless a specific request was made in this regard. New facilities were clustered (sometimes with existing facilities) where possible. Relocation of facilities was only considered at the express request of the Client; for example, if facilities are leased and will expire in the medium term (up to five years) or the current buildings cannot be retained.

1.4.7 Relevant policy documents were consulted in terms of the following points:

- Desirable travel distances between residents and services;
- Clustering, co-location and sharing of facilities and services between Departments to achieve integration;
- Potential for outsourcing or public private partnerships;
- Delivery of service through technology innovation such as smart phones and Internet;
- Maximum and minimum facility size to achieve operational efficiency;
- Facility hierarchy and distribution network.
1.5 GENERIC DATA

1.5.1 Road network data was provided by the CSIR. This is important attribute data that relates to the distance of road network links and the average time (i.e. speed) it will take a vehicle to traverse a specific section on the road network.

1.5.2 Facility data was provided by the relevant municipality and departments. The attribute data included the name of the facility and the relevant capacity, i.e. the number of professional nurses and the facility hours of operation.

1.5.3 Population for each City: global totals for each metropolitan area were acquired from StatSA and based on the annual mid-year estimates. The data was disaggregated to the analysis units (hexagons) by the CSIR using dasymetric mapping principles.

1.5.4 The demand (uninsured population) for services was derived from the total population as provided by StatsSA and disaggregated as explained above.

1.5.5 Hexagons (20 ha in size) were produced for each metropolitan area as well as for a buffer area of 10 km around the metros. The reason for using the hexagons as analysis units is that it allows the analysis output to be produced on a more detailed level than working with, for instance, sub-places. A finer-grained analysis gives more accurate distance measures, especially in high density areas.

1.6 POPULATION DATA MANIPULATION AND STATUS

1.6.1 The demand for a Department’s services was derived from the total population provided by StatsSA mid-year estimates for the two metropolitan areas for 2011 and was for:

- Johannesburg - 3 685 073; and,
- eThekwini - 3 667 106.

1.6.2 The mid-year estimates from StatsSA, however, did not have a demographic profile and breakdown per age category, income, marital status, and employment status. A demographer, Dr Kok, undertook a projection based on growth patterns since 1996 to derive the changes for these variables for the two metropolitan areas. The geographical detail of this exercise was done on a sub-place level. The CSIR used aerial imagery to determine new growth areas in the Cities. New growth areas were profiled based on the characteristics of neighbouring areas and neighbourhood patterns and the correlation of this with specific socio-economic profiles. Thus, the 2001 population profiles were projected onto the new data and care was taken to match the profile of new growth areas to established areas of a similar character.
1.6.3 This data acted as the basic demand data set for all services. For those facilities that required the data to have specific age and income breakdown, the necessary attributes to enable population and demand profiling for specific services were established once the Departments had clarified the demand profile for each specific service.

1.6.4 In addition to this population, additional demand from a 10 km buffer zone surrounding the Johannesburg and eThekwini municipalities was considered. For this buffer area, the demand per hexagon was reduced by a distance decay factor of 1% per 1 km. Where services are in reach, this additional demand (or specified fraction thereof) was considered as part of the demand for services within the metropolitan boundaries. The reason for this was that the high population densities on the fringes of the Cities mean that there is a strong probability that there is demand on City services from across its boundary. In developing the coverage statistics and implementation plans this buffer population was not considered further.

1.6.5 The Census 2011 data just released shows that the final population total for eThekwini was 3 442 361 and for Johannesburg 4 434 827.

1.6.6 Thus, in eThekwini the population is lower than used in this study but the impact is minimal (242 712 less) and amounts to a 6% lower demand overall. By the time the planned facilities are developed this will not lead to any expected service redundancy.

1.6.7 In the case of Johannesburg, where the estimate was 20% less than the Census count, this will lead to a greater demand for services and some of the proposed facilities may be under greater pressure than anticipated. In undertaking the analysis and planning in Johannesburg, a key issue was to ensure a good distribution of facilities and coverage to all parts of the City. The new facilities proposed are therefore well located with good access for citizens and thus remain relevant although some adjustment in capacity may be required. It is also noted that, should the various Departments increase the effectiveness of service delivery, it may be possible to serve more people without capital projects or staff increases. It is also possible that a more detailed work study of the throughput of certain office types can realise larger thresholds populations than currently specified for certain office sizes. That is, improvements in work environment, technology and efficiency could result in the current staff being able to deal with more cases than presently. The actual demand at each of the new proposed sites can be adjusted based on revealed usage figures in future and could be between 5 to 25% more.

1.6.8 It is not prudent to either re-do or ignore the results of the study since the same areas that are shown to have a backlog will be evident. What is most important is that as each of the proposed projects reaches the detailed planning stage and close to the time of implementation, a basic population count should be undertaken in the service catchment area in order to adjust the facility size.
1.6.9 Given the backlog based on the mid-year estimates there remains a substantial investment that has yet to be made to address the initial backlog. It is thus proposed that the services at each of the facilities proposed be provided as efficiently as possible and that where possible technological solutions such as internet based services be used to expand the capacity.

1.6.10 Once the small area layer becomes available from StatsSA it would be prudent to check if the population change is a general trend across Johannesburg or if it is confined to specific areas. Should the latter be the case, it will be simple to indicate which facilities would need additional capacity. The facilities types for which it may not be easy to make capacity adjustments are those relating to education and health services. In these instances, the detail sector reports have already indicated that studies are required before expansion is undertaken or, in the case of health, that other policy options be considered in order to reduce the demand for services.

1.7 TARGET POPULATION

1.7.1 The target population for government health services was considered to be all people who do not have private health insurance, i.e. the uninsured.

1.7.2 The methodology to calculate the uninsured population was as follows:

- The insured population, as published by the Council for medical schemes for 2011, was used to identify the population with medical insurance. The difference between the total population and the insured population acted as the control for the calculations that followed.
- Using the income classes of the 2001 Census as applied to the 2011 population distribution, persons from the highest income category were first assigned the status of “insured”, and then people from the next highest income category and so on until the total insured population had been assigned.
- Once the total number of insured population was reached, the remainder of the population was assigned the status as uninsured. In this case, it resulted in all the population in households earning up to R38 000 per annum being considered to be uninsured, and approximately 50% of persons in the income category between R38 000 and R76 000 being regarded as uninsured.

1.7.3 Based on the calculation of the target population and confirmed through discussions with the relevant departments and their experience with regard to users of government health services, the target population (uninsured population) was considered to be all persons in households earning up to R 38 000 per annum (R 3 167 per month) and 50% of persons in households earning between R 38 000 and R 76 000 per annum (R 6 333 per month) (based on income levels as at 2001). The contribution for medical aid schemes and private health care is not affordable at these low household income levels.
1.8 STANDARDS

1.8.1 The Constitution provides for the setting of norms and standards to ensure equal access to public services. In terms of Section 146 (subsection 2(b)) of the Constitution, national legislation prevails in the aim of uniformity for effective service delivery. Provincial authorities are responsible for translating national norms into provincially specific forms in law and for playing a monitoring and coordination role.

1.8.2 The national Department of Health’s standards were not applied in this study and the CSIR was advised to use standards specifically tailored to the geographic areas under investigation. After discussions with the Departments of Health of Gauteng Province and KwaZulu-Natal, the City of Johannesburg and the eThekwini Metropolitan Council, the following standards for use in the analysis were agreed upon.

1.8.3 Standards for Clinics

- **Travel distance:**
  A 5 km travel distance for metropolitan environments. This equates to a normal walking time of a maximum of 1 hour to the nearest Clinic for the worst off citizen/patient.

  The 5 km travel distance was discussed with the different stakeholders and it was agreed that a walking distance of more 1 hour is not appropriate. The City of Johannesburg expressed the ideal that a maximum of half an hour walking distance should be used as the norm, but after discussions on the feasibility of the norm it was decided to use the 1 hour (5km) walking norm.

- **Demand:**
  The demand for Clinics (uninsured population) was translated into potential health visits to clinics likely to be generated by the target population – the uninsured.

  The term “visit” means a single visit by an individual to a professional nurse in a clinic on a specific day.

  Once the uninsured population was identified the likely visits/demand from this group needed to be calculated. The demand was calculated by multiplying the number of persons in all the uninsured households with the number of visits each person is likely to generate in a year. In accordance to the information supplied by the Gauteng Department of Health and the eThekwini Department of Health, demand (total number of health visits) was calculated on the agreed assumption that for every child (5 years and younger): 5 visits would be generated in eThekwini and 4 visits in Gauteng per year; and for all persons older than 5 years: 3.5 visits in eThekwini and 3 in Gauteng per year were considered adequate.
The assumptions used for eThekwini are based on agreement reached in a study done by the CSIR in collaboration with the eThekwini Metro on accessibility to Health facilities (2009) and confirmed again in 2012.

The assumptions used for the City of Johannesburg are based on figures given to the CSIR by the Gauteng Department of Health in 2012.

**Supply/Capacity:**

The supply of primary health facilities was translated into the potential to accommodate visits (visit to a professional nurse in a clinic). This excludes any other services at a clinic a person may use on the same day, for example X-rays, doctor consultations, and obtaining medicines from the pharmacy.

The equation applied to calculate the total supply of professional nurse visits was derived as follows:

\[ n \times s \times ps \times d \]

where

- \( n \) = **number of nurses** at a facility per shift (\( s \) = **hours of operation** of a facility)
- \( ps \) = **number of patients a nurse can attend to in one shift**
- \( d \) = **number of days per annum** that the facility operates.

Based on data used in 2008 in eThekwini, the number of patients a nurse can attend to in a shift (\( ps \)) was calculated to be an average of 20 visits per nurse shift (including antenatal visits which are longer). (See details of formula below). This equates to 4 710 annual visits per professional nurse for a 240-day work year.

\[
[ps = p - (ANCV \times 3.125) + ANCV: \]

\[
p = \text{normal patient visits per shift for which one visit takes 16 minutes to attend} \]
\[
\text{to and a shift lasts 8 hours: } p=(60/16) \times 8 \Rightarrow p = 30
\]

\[
\text{ANCV = anti-natal care visits which take 3.125 times longer (50 min) than a normal visit. ANCV is the actual number of anti-natal visits recorded for one year for each facility}]

1.8.4 It is acknowledged that the National Department of Health has planned new initiatives to increase the number of visits to a clinic (for all services which include services rendered by professional nurses as applied above and those to support staff in a well-functioning clinic with an effective skills spread) to 33
visits per shift in a 24-hour clinic and 40 visits per shift/day at 8-hour clinics. However, the figures used above were only those for visits to a professional nurse and included ANC visits.

1.8.5 Standards for CHCs

- **Travel distance:**
  A 10 km travel access distance for metropolitan environments was applied. The 10 km distance took into account travel by public transport to CHC facilities and was considered to be both acceptable and sufficient. It is important to note that this does assume that there is a well-functioning public transport system in the area.

  The 10 km travel distance is also used in various other public facility access norms. This creates an opportunity to develop any new CHC facilities within the vicinity of other multi-purpose government facility hubs and clusters.

- **Demand:**
  All persons in households earning up to R38 000 per annum and 50% of persons in households earning between R38 000 and R76 000 per annum. Referred to in the rest of the document as the uninsured population.

- **Supply/ Capacity:**
  A standard capacity of 245 000 uninsured population per CHC facility was used.

  The assumptions used are based on figures given to the CSIR by the Gauteng Department of Health. This figure was discussed with eThekwini/ KZN officials and considered suitable for use.

  This standard is very specific to the two metropolitan study areas which are characterised by medium to high density developments. It is acknowledged that this standard is not appropriate for lower density rural areas in the rest of the country.

1.8.6 Standards for Level 1 (District) Hospitals

- **Travel distance:**
  A 15 km travel distance by public transport for metropolitan environments. This was decided on after analysis of the current travel distances and deliberations with the stakeholders on the affordability of the number of hospitals in an urban environment. Anything below a 15 km travel distance may put enormous strain on the budget of these departments if they were to provide additional facilities. It is important to note that the specific norm was only discussed in the
meetings with stakeholders and was not based on other prior empirical studies. This was an agreed approach taken to move towards an acceptable metropolitan access norm for Level 1 Hospitals.

This assumes that a well-functioning public transport system is available to transport persons from CHC facilities to the hospitals to which they are referred. In effect, this may become a critical locational factor when planning for new hospitals in the urban environment.

- **Demand:**
  All persons in households earning up to R38 000 per annum and 50% of persons in households earning between R38 000 and R76 000 per annum. Referred to in the rest of the document as the uninsured population.

- **Supply/Capacity:**
  A standard capacity of 1 bed per 1 500 uninsured population (taken from the National Department of Health’s Efficiency Model) was used.

### 1.9 SPECIFIC POLICY ISSUES AND DOCUMENTS CONSIDERED AS INPUT TO THE STUDY

1.9.1 The following documents were considered during the study:


1.10 SPECIFIC ANALYSIS PROCESS AND LOCATION FACTORS

1.10.1 After discussions with national health officials it was decided that the analysis process would follow the standard analysis approach (see Part B of the main report for more details) but would end at indicating the areas of high need/ pressure on health services. It was also agreed that an additional scenario would be tested – that of a “full complement resource scenario” – which included all private sector general practitioners and the full population, including persons with private medical aid schemes.

1.10.2 An unconstrained catchment area analysis was run to compare the total demand and supply for services and the distance of the service points from each hexagon (area of population) to the closest facility. This information was valuable in assessing the realism of any norms and standards in terms of maximum capacity and/or distance constraints.

1.10.3 A catchment profile analysis was then developed which provided insight into the spatial distribution of demand relative to the distribution of facilities in general. It indicated how well the current distribution pattern of facilities fits the distribution pattern of demand; allowing for an assessment of whether the norms and standards are applicable to the specific area being analysed.

1.10.4 A doubly constrained catchment area analysis, applying the norms and standards and using constrained service capacity and distance parameters, was used to test service coverage and spatially match supply and demand.

1.10.5 A calculation of shortfall in the supply of health services, by comparing the total demand of the target population with the actual current capacity of each facility type, was then undertaken. This indicated the shortfall, if any, in supply within the distance constraint. It also theoretically shows by how much capacity must increase at each facility to accommodate all people within the access distance specified.

1.11 ANALYSIS AND FINDINGS FOR JOHANNESBURG CLINICS

1.11.1 Summary of Criteria and Analysis Process
1.11.1.1 Table 1.2 provides a summary of the Clinics analysed, the standards agreed upon and the analysis process undertaken.

**Table 1.2: Summary of criteria and analysis process for Johannesburg Clinics**

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>5 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (2 679 412) of the total population of Johannesburg Municipality 2011 (3 685 073)</td>
</tr>
<tr>
<td></td>
<td>Total estimated visits to Clinics (8 311 157) – children (5 years or younger) 4 visits per year, adults (3 visits per year)</td>
</tr>
<tr>
<td>Supply</td>
<td>112 Clinics with a total capacity of 5 317 712 visits</td>
</tr>
<tr>
<td>Analysis undertaken</td>
<td>• Unconstrained travel distance to nearest Clinic</td>
</tr>
<tr>
<td></td>
<td>• Constrained capacity and travel distance (5 km)</td>
</tr>
<tr>
<td></td>
<td>• Identification of pressure areas</td>
</tr>
</tbody>
</table>

1.11.2 Access to Services

1.11.2.1 The first step in the analysis process is to determine the access distances from all metropolitan areas to the nearest Clinic. This analysis is based on the travel distance to each Clinic and excludes any capacity limits of the Clinics, i.e. any restrictions on the number of people they can serve were not applied.

1.11.2.2 Figure 1.3 indicates the travel distances to the nearest Clinic from all metropolitan areas without any constraints on the distance travelled or the capacity of the Clinics. The measured travel distances are reflected in kilometres (km) and displayed in a range of colour bands of varying km increments.
Figure 1.3: Travel distances to the closest Clinic in Johannesburg
1.11.2.3 From Figure 1.3 it is clear that access to Clinics in the Johannesburg Metropolitan area is very good and Clinics are well distributed throughout the area. The average travel distance to Clinics is 3.6 km across the metropolitan area. Table 1.3 indicates the number of uninsured people that have access to Clinics in the different distance bands. In the Johannesburg Metropolitan area, 83 % of potential Clinic visits are within 2.5 km from a Clinic. If the 2.6 to 5 km distance band is added to this, 97 % of potential visits are within the access norm of 5 km of a Clinic. This is a clear indication that Clinics are very well distributed in the area and that problems would be more related to issues of service capacity than to travel distances.

Table 1.3: Travel distance for the uninsured population to Johannesburg Clinics

<table>
<thead>
<tr>
<th>Clinics: Unconstrained access to a Clinic</th>
<th>Distance bands (km)</th>
<th>No. of visits</th>
<th>% of visits</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 - 2.5 km</td>
<td>6 878 411</td>
<td>82.8</td>
<td>82.8</td>
</tr>
<tr>
<td></td>
<td>2.6 - 5 km</td>
<td>1 191 663</td>
<td>14.3</td>
<td>97.1</td>
</tr>
<tr>
<td></td>
<td>More 5 km</td>
<td>241 083</td>
<td>2.9</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>8 311 157</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

1.11.3 Served Regions

1.11.3.1 The second step in the analysis process is to show the constrained catchment areas (the service area limited by Clinic capacity and distance) for each of the current Clinics. The constrained catchment analysis uses both the capacity of the Clinics (number of visits it can accommodate) and the agreed maximum travel distance standard (5 km) as constraints on the service accessibility of the various Clinics.

1.11.3.2 Figure 1.4 indicates the served population within different distance bands based on the constrained catchment analysis. Of interest in the figure is firstly, the appearance of areas that seem well capacitated in the northern suburbs of the study area and secondly there are indications of capacity shortfalls in areas with higher population densities (central, west and south areas) where the capacity of these facilities runs out within 3 km from them.

1.11.3.3 Figure 1.4 indicates that there are large capacity shortfalls in Clinics as large areas of population are unserved. Table 1.4 shows that only 63% of the total potential visits can be accommodated within the 5 km distance band.
Figure 1.4: Areas served by capacity constrained Clinics in Johannesburg
Table 1.4: Service access for uninsured population (number of visits) within travel distance to Johannesburg Clinics

<table>
<thead>
<tr>
<th>Clinics: Potential level of access to Clinic services (capacity constrained)</th>
<th>Unserved</th>
<th>Served</th>
<th>% served</th>
<th>Total visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance bands (km)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 km</td>
<td>2442252</td>
<td>4436159</td>
<td>64.49</td>
<td>6878411</td>
</tr>
<tr>
<td>5 km</td>
<td>317538</td>
<td>874125</td>
<td>73.35</td>
<td>1191663</td>
</tr>
<tr>
<td>More 5 km</td>
<td>241083</td>
<td>241083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3000873</td>
<td>5310284</td>
<td>63.89</td>
<td>8311157</td>
</tr>
</tbody>
</table>

1.11.3.4 Table 1.4 highlights the fact that although Clinics are very well distributed throughout Johannesburg and there is an average travel distance of 3.6 km to access a Clinic, due to capacity issues many potential visits cannot be accommodated leading to poor service delivery.

1.11.4 Unserved Regions

1.11.4.1 The next step is an in-depth look at the unserved areas. Figure 1.5 highlights the population density of areas which cannot be reached within the 5 km and/or cannot technically utilise the Clinics if service capacity is taken into account. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the current Clinics. Of the potential demand for clinic visits, 36% cannot be accommodated. The majority of the unserved areas are within 2.5 km from a Clinic which is a further indication of the serious capacity problems in some areas.

1.11.5 Areas with high demand pressure on Johannesburg Clinics

1.11.5.1 Figure 1.6 highlights all the areas in which Clinics are most likely experiencing high pressure on their services. These areas include:

- Soweto East at the Baralink area;
- Soweto West at Meadowlands, Protea Glen and the Naledi areas;
- Orange Farm;
- Johannesburg CBD and northwards; and,
- Alexandra.

1.11.6 Full complement resource scenario

1.11.6.1 An additional scenario relating to Clinics was undertaken to study the effect of the availability of private general practitioners on service capacity. This included demand from the total population (insured and uninsured).
Figure 1.5: Areas unserved by capacity constrained Clinics in Johannesburg (no. of potential visits per hexagon)
Figure 1.6: Pressure areas with regard to access to Clinics in Johannesburg and needing intervention (no. of potential visits per hexagon)
1.11.6.2 Table 1.5 provides a summary of the clinics and general practitioners (GPs) analysed and the standards used for the analysis.

Table 1.5: Summary of criteria and analysis process for Clinics and all private sector General Practitioners (GPs) in Johannesburg

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Clinics and all private sector GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>5 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Total population of Johannesburg Municipality 2011 (3 685 073) Total estimated visits (11 415 281): Child (5 years or younger) – 4 visits per year, Adult – 3 visits per year.</td>
</tr>
<tr>
<td>Supply</td>
<td>112 Clinics and 1 180 private doctors with a total capacity of 13 123 412 visits (Nurse clinical workload 2011 financial year – 5 317 712 visits – and 6 615 patients per year per doctor – 7 805 700 visits)</td>
</tr>
<tr>
<td>Analysis undertaken</td>
<td>Constrained capacity and travel distance (5 km)</td>
</tr>
</tbody>
</table>

1.11.6.3 For this scenario only a capacity constrained analysis was undertaken. The addition of the service capacity of the private general practitioners to that of the professional nurses improved the constrained access to clinic services to 80% of the total population from the previous 64% in Table 1.4.

1.11.6.4 In contrast to Figure 1.4, Figure 1.7 indicates a dramatic improvement in access in the historically more affluent northern areas. An almost fully served coverage of the study area is achieved by the addition of the general practitioners in these areas and no real capacity constraints remain.

1.11.6.5 However, when the unserved areas of this scenario were examined (Figure 1.8), an interesting phenomenon appeared. The addition of the general practitioners did not relieve any of the service demand in the most pressured areas in Soweto and Orange Farm (as indicated in Figure 1.6).

1.11.6.6 From Figure 1.8, it would appear that the historical development patterns and the political separation of racial and income classes still determines the poor service situation in the higher density low-income townships. On the one hand, private general practitioners tend to practice in the more affluent areas and, on the other hand, the immense population pressures in the poorer townships require alternative and appropriate strategies to relieve the pressure on clinic services.
Figure 1.7: Areas served with respect to capacity constrained analysis for Clinics and general practitioners in Johannesburg
Figure 1.8: Unserved areas with respect to Clinics and general practitioners in Johannesburg (no. of potential visits per hexagon)
1.12 ANALYSIS AND FINDINGS FOR JOHANNESBURG COMMUNITY HEALTH CENTRES (CHCS)

1.12.1 Summary of Criteria and Analysis Process for Johannesburg Community Health Centres

1.12.1.1 Table 1.6 provides a summary of the Community Health Centres (CHCs) analysed, the standards agreed upon and the analysis process undertaken.

Table 1.6: Summary of criteria and analysis process for Johannesburg Community Health Centres

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Community Health Centres (CHCs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>10 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (2 679 412) of the total population of Johannesburg Municipality 2011 (3 685 073)</td>
</tr>
<tr>
<td>Supply</td>
<td>10 Community Health Centres with a total capacity of 2 450 000 (@1 facility per 245 000 uninsured population)</td>
</tr>
</tbody>
</table>
| Analysis undertaken | • Unconstrained travel distance to nearest CHC  
• Constrained capacity and travel distance (10 km)  
• Identification of pressure areas |

1.12.2 Access to Services

1.12.2.1 The first step in the analysis process is to show the access distance from all metropolitan areas to the nearest CHC irrespective of capacity. This analysis is based on travel distance (km) to each CHC and excludes any capacity limits of the CHCs, i.e. any restrictions on the number of people they can serve are not applied.

1.12.2.2 Figure 1.9 indicates the travel distances to the nearest CHC from all areas in Johannesburg without any constraints on the distance travelled and the capacity of the CHCs. The measured travel distances are reflected in kilometres (km) and displayed in a range of colour bands.
Figure 1.9: Travel distances to the closest CHC in Johannesburg
1.12.2.3 From Figure 1.9 it is clear that the distribution of CHCs in the Johannesburg Metropolitan area is focused on areas of historically disadvantage communities with high population concentrations. The average travel distance to CHCs is 10.1 km across the metropolitan area.

1.12.2.4 Table 1.7 indicates the number of uninsured people that have access to CHCs across different distance bands. In the Johannesburg Metropolitan area, 68% of the population are within 5 km from a CHC. If the 5.1 to 10 km distance band is added to this, then 91% of the population are within the access norm of 10 km of a CHC. This is a clear indication that CHCs are fairly well distributed in the area and, apart from the far northern areas such as Diepsloot, access problems are more likely to relate to capacity issues.

### Table 1.7: Travel distance for uninsured population to Johannesburg CHCs

<table>
<thead>
<tr>
<th>CHCs: Unconstrained access</th>
<th>Distance bands (km)</th>
<th>No. of people</th>
<th>% of people</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 - 5 km</td>
<td>1 813 144</td>
<td>67.67</td>
<td>67.7</td>
</tr>
<tr>
<td></td>
<td>5.1 - 10 km</td>
<td>624 775</td>
<td>23.32</td>
<td>91.0</td>
</tr>
<tr>
<td></td>
<td>More than 10 km</td>
<td>241 493</td>
<td>9.01</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2 679 412</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

1.12.3 Served Regions

1.12.3.1 The second step in the analysis process is to show which areas are served based on a constrained catchment area analysis for each of the current CHCs. The constrained catchment analysis uses both the service capacity of the CHCs and the agreed travel distance standard (maximum of 10 km) as constraints on the service accessibility of the various CHCs.

1.12.3.2 Figure 1.10 indicates the served population within different distance bands based on the constrained catchment analysis. Of interest in the figure are the areas that seem well capacitated in the south-western parts of the study area and the indications of capacity shortfalls in the CBD. There is apparently no access to areas in the north-west and south-east as a result of the travel distance constraint. In the CBD and parts of Soweto with high population densities, the capacity of the facilities runs out in the 5 km distance band.
Figure 1.10: Areas served by capacity constrained CHCs in Johannesburg
1.12.3.3 Table 1.8 highlights the fact that although CHCs are very well distributed in the more densely populated areas of the study area, the issues of limited capacity in the CBD and no coverage for the medium density areas means that 17% of the population cannot be accommodated.

Table 1.8: Service access of uninsured population within travel distance from Johannesburg CHCs

<table>
<thead>
<tr>
<th>Distance bands (km)</th>
<th>Unserved</th>
<th>Served</th>
<th>% served</th>
<th>Total no. of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5 km</td>
<td>47 145</td>
<td>1 765 999</td>
<td>97.40</td>
<td>1 813 144</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
<td>158 273</td>
<td>466 502</td>
<td>74.67</td>
<td>624 775</td>
</tr>
<tr>
<td>More than 10 km</td>
<td>219 632</td>
<td></td>
<td></td>
<td>241 493</td>
</tr>
<tr>
<td>Total</td>
<td>425 050</td>
<td>2 232 501</td>
<td>83.32</td>
<td>2 679 412</td>
</tr>
</tbody>
</table>

1.12.4 Unserved Regions

1.12.4.1 An in-depth review of the unserved areas is the next step in the process. Figure 1.11 highlights the population density of areas which cannot be reached within the 10 km and/or cannot utilise the CHCs if their service capacity is taken into account. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the current CHCs. Of the uninsured population, 17% cannot be accommodated. Apart from the capacity issue in the CBD, the northern areas (which include Diepsloot and Cosmo City) do not have any facilities. Both these areas are growing and Diepsloot is especially characterised by a population dependent on public health care facilities and with limited means of travel.
Figure 1.11: Areas unserved by capacity constrained CHCs in Johannesburg (no. of potential visits per hexagon)
1.12.5 Areas with high demand pressure on CHCs

1.12.5.1 Figure 1.12 highlights all the areas that are likely to experience high levels of unserved demand for CHCs. These areas include:

- East and west of the Johannesburg CBD in suburbs like Fordsburg, Brixton and Langlaagte in the west and Jeppestown and Malvern in the east;
- South of the CBD in suburbs like Booysens, Rosettenville, Turffontein and Mondeor;
- Diepsloot;
- Cosmo City;
- Lenasia.
Figure 1.12: Pressure areas with regard to access to CHCs in Johannesburg and needing intervention (no. of potential visits per hexagon)
1.13 ANALYSIS AND FINDINGS FOR JOHANNESBURG LEVEL 1 (REGIONAL) HOSPITALS

1.13.1 Summary of Criteria and Analysis Process for Level 1 Hospitals in Johannesburg

1.13.1.1 Table 1.9 provides a summary of the Level 1 Hospitals analysed, the standards agreed upon and the analysis process undertaken.

Table 1.9: Summary of criteria and analysis process for Johannesburg Level 1 Hospital Services

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Level 1 Hospital Services (including higher level hospitals that have some Level 1 functions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>15 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (2 679 412) of the total population of Johannesburg Municipality 2011 (3 685 073)</td>
</tr>
<tr>
<td>Supply</td>
<td>6 Level 1 Hospitals services with a total capacity of 1 597 500 (@1 bed per 1 500 uninsured population – Efficiency Model)</td>
</tr>
</tbody>
</table>
| Analysis undertaken | • Unconstrained travel distance to nearest Level 1 Hospitals  
• Constrained capacity and travel distance (15 km)  
• Identification of pressure areas |

1.13.2 Access to Services

1.13.2.1 The first step in the analysis process is to show the access distance from all metropolitan areas to the nearest Level 1 Hospital. This analysis is based on travel distance (km) to each Level 1 Hospital and excludes any capacity limits of the Level 1 Hospital, i.e. any restrictions on the number of people they can serve are not applied.

1.13.2.2 Figure 1.13 indicates the travel distances to the nearest Level 1 Hospital from all metropolitan areas without any constraints on the distance travelled or the service capacity of the Level 1 Hospitals. The measured travel distances are reflected in kilometres (km) and displayed in a range of colour bands.

1.13.2.3 From Figure 1.13 it is clear that access to Level 1 Hospitals in the Johannesburg metropolitan area is focused on the historical pattern of a strong east-west urban settlement with almost no facilities in the relative newer areas in the north and south. The average travel distance to Level 1 Hospitals is 12.6 km across the metropolitan area.
Figure 1.13: Travel distances to the closest Level 1 Hospital in Johannesburg
1.13.2.4 Table 1.10 indicates the number of uninsured people that have access to Level 1 Hospitals within the different distance bands. In the Johannesburg metropolitan area, 37% of the population are within 5 km from a Level 1 Hospital while 77% can reach a Level 1 Hospital within 10 km. The maximum distance constraint of 15 km gives 86% of the total uninsured population access to a Level 1 Hospital. This indicates that Level 1 Hospitals are fairly well distributed in Johannesburg and that apart from the far northern areas such as Diepsloot and the southern areas such as Orange Farm, access problems are likely to be related to capacity issues.

<table>
<thead>
<tr>
<th>Distance bands (km)</th>
<th>No. of people</th>
<th>% of people</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5 km</td>
<td>978 282</td>
<td>36.51</td>
<td>36.5</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
<td>1 093 316</td>
<td>40.80</td>
<td>77.3</td>
</tr>
<tr>
<td>10.1 - 15 km</td>
<td>226 048</td>
<td>8.44</td>
<td>85.8</td>
</tr>
<tr>
<td>More than 15 km</td>
<td>381 766</td>
<td>14.25</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2 679 412</strong></td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

1.13.3 Served Regions

1.13.3.1 The second step in the analysis process is to show the constrained catchment areas for each of the Level 1 Hospitals. The constrained catchment analysis used both the service capacities of the Level 1 Hospitals and the agreed maximum travel distance standard of 15 km as constraints on the service accessibility of the various Level 1 Hospitals.

1.13.3.2 Figure 1.14 indicates the areas with served population within the different distance bands based on the constrained catchment analysis. It should be noted that a large part of the uninsured population of Johannesburg is served by Level 1 Hospitals outside the Johannesburg boundary. Such areas include Rabie Ridge, Roodepoort and Orange Farm.

1.13.3.3 Many areas do not have access either because they are not within the 15 km travel constraint or because there is a lack of service capacity. These areas include most of the relatively newer residential developments in the north and south.

1.13.3.4 Large capacity problems are evident in the central and Soweto area. Although a new facility was recently completed at Zola, Level 1 Hospitals in the Soweto area run out of capacity within the 5 km travel band. The same applies to the Brixton area where the two hospitals run out of capacity within the 10 km travel band.
Figure 1.14: Areas served by capacity constrained Level 1 Hospitals in Johannesburg
1.13.3.5 Table 1.11 highlights the fact that Level 1 Hospitals are not very well distributed or capacitated in the study area. Only 72% of the uninsured population are currently being served. Large capacity problems exist in densely populated areas like Soweto.

1.13.3.6 Of concern are the areas in the north and south which have no access within the travel distance of 15 km. Of these, the only areas which are well served are areas which are dependent on Level 1 Hospitals outside the Johannesburg border.

Table 1.11: Service access of uninsured population within travel distance from Johannesburg Level 1 Hospitals

<table>
<thead>
<tr>
<th>Distance bands (km)</th>
<th>Unserved</th>
<th>Served</th>
<th>% served</th>
<th>Total no. of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5 km</td>
<td>129 412</td>
<td>848 870</td>
<td>86.77</td>
<td>978 282</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
<td>162 708</td>
<td>930 608</td>
<td>85.12</td>
<td>1 093 316</td>
</tr>
<tr>
<td>10.1 - 15 km</td>
<td>74 304</td>
<td>151 744</td>
<td>67.13</td>
<td>226 048</td>
</tr>
<tr>
<td>More than 15 km</td>
<td>381 766</td>
<td></td>
<td></td>
<td>381 766</td>
</tr>
<tr>
<td>Total</td>
<td>748 190</td>
<td>1 931 222</td>
<td>72.08</td>
<td>2 679 412</td>
</tr>
</tbody>
</table>

1.13.4 Unserved Regions

1.13.4.1 A more detailed analysis of the 28% of unserved population is the next step required. Figure 1.15 highlights the unserved population which either cannot reach a Level 1 Hospital within 15 km or cannot reach one with service capacity. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the Level 1 Hospitals. Apart from the capacity issues in the central and south-western areas like Soweto, the northern areas, which include Diepsloot and Cosmo City, do not have any Level 1 Hospital facilities. Both these areas are growing and Diepsloot is especially characterised by a population dependent on public health care facilities and with limited means of travel.

1.13.4.2 Of concern are the capacity problems in the very high density settlements. The location of Level 1 Hospitals is based on the historic east-west development pattern and it is clear that these locations cannot serve the populations that are most dependent on public health facilities and have the least means to travel long distances to facilities.
Figure 1.15: Areas unserved by capacity constrained Level 1 Hospitals in Johannesburg (no. of potential visits per hexagon)
1.13.5 Areas with high demand pressure on Level 1 Hospitals in Johannesburg

1.13.5.1 Figure 1.16 highlights all the areas that are most likely to experience high unserved demand for Level 1 Hospital services. These areas include:

- Eastern parts of Soweto including Protea Glen;
- Southern areas of Johannesburg including Orange Farm, Ennerdale and Lenasia;
- Johannesburg CBD residential areas including Hillbrow and Yeoville;
- Higher density areas of Alexandra and Rabie Ridge;
- Diepsloot.
Figure 1.16: Pressure areas with respect to access to Level 1 Hospitals in Johannesburg and needing intervention (no. of potential visits per hexagon)
1.14 ANALYSIS AND FINDINGS FOR ETHEKWINI CLINICS

1.14.1 Summary of Criteria and Analysis Process for eThekwini Clinics

1.14.1.1 Table 1.12 provides a summary of the Clinics analysed, the standards agreed upon and the analysis process undertaken.

Table 1.12: Summary of criteria and analysis process for eThekwini Clinics

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>5 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (3 026 273) of the total population of eThekwini Municipality 2011 (3 667 1061)</td>
</tr>
<tr>
<td></td>
<td>Total estimated visits to Clinics (11 031 339) – Child (5 years or younger) 4.5 visits per year, Adult (3.5 visits per year)</td>
</tr>
<tr>
<td>Supply</td>
<td>96 Clinics with a total capacity of 4 210 794 visits</td>
</tr>
<tr>
<td>Analysis undertaken</td>
<td>Unconstrained travel distance to nearest Clinic</td>
</tr>
<tr>
<td></td>
<td>Constrained capacity and travel distance (5 km)</td>
</tr>
<tr>
<td></td>
<td>Identification of pressure areas</td>
</tr>
</tbody>
</table>

1.14.2 Access to Services

1.14.2.1 The first step in the analysis process is to show the access distance from all areas in eThekwini to the nearest Clinic. This analysis is based on travel distance (km) to each Clinic and excludes any capacity limits of the Clinics, i.e. any restrictions on the number of people they can serve are not applied.

1.14.2.2 Figure 1.17 indicates the travel distances to the nearest Clinic without any constraints on the distance travelled or the capacity of the Clinics. The measured travel distances are reflected in kilometres (km) and displayed in a range of distance bands.
Figure 1.17: Travel distances to the closest Clinic in eThekwini
1.14.2.3 From Figure 1.17 it is clear that travel distance to Clinics in the eThekwini Metropolitan area is reasonably good with Clinics well distributed in the area. Although the average travel distance to Clinics is 6.3 km across the metropolitan area, those in the more densely populated urban areas only travel 3.5 km on average to their nearest Clinic.

1.14.2.4 Table 1.13 indicates the number of uninsured people that have access to Clinics within the different distance bands. In the eThekwini Metropolitan area, 62% of potential Clinic visits are within 2.5 km from a Clinic. If the 2.6 to 5 km band is added to this, 88% of potential visits are then within the access norm of 5 km from a Clinic. This is a clear indication that Clinics are fairly well distributed in the area and any access problems are more likely to relate to capacity issues.

### Table 1.13: Travel distance for the uninsured population to eThekwini Clinics

<table>
<thead>
<tr>
<th>Distance bands (km)</th>
<th>No. of visits</th>
<th>% of visits</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2.5 km</td>
<td>6 856 455</td>
<td>62.15</td>
<td>62.2</td>
</tr>
<tr>
<td>2.6 - 5 km</td>
<td>2 866 194</td>
<td>25.98</td>
<td>88.1</td>
</tr>
<tr>
<td>More 5 km</td>
<td>1 308 750</td>
<td>11.86</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>11 031 399</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

1.14.3 Served Regions

1.14.3.1 The second step in the analysis process is to show the constrained catchment areas of each of the current Clinics. The constrained catchment analysis uses both the capacity of the Clinics (number of visits it can accommodate) and the agreed maximum travel distance standard of 5 km as constraints on the service accessibility of the various Clinics.

1.14.3.2 Figure 1.18 indicates the served population within the different distance bands based on the constrained catchment analysis. It is clear from the figure that the more central neighbourhoods do not experience high capacity problems but there are clear indications of capacity shortfalls in areas with higher population densities (the northern and eastern areas) where the capacity of these facilities runs out within the 3 km distance band.

1.14.3.3 The figure shows clearly that overall there are serious capacity problems in eThekwini in terms of Clinics.
Figure 1.18: Areas served by capacity constrained Clinics in eThekweni
1.14.3.4 Table 1.14 highlights the fact that although Clinics are very well distributed throughout eThekwini, lack of service capacity means that the large majority of potential visits cannot be accommodated. Only 38% of the uninsured population can be served.

Table 1.14: Service access for uninsured population (number of visits) within travel distance to eThekwini Clinics

<table>
<thead>
<tr>
<th>Distance bands (km)</th>
<th>Unserved</th>
<th>Served</th>
<th>% served</th>
<th>Total visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2.5 km</td>
<td>3 361 622</td>
<td>3 494 833</td>
<td>50.97</td>
<td>6 856 455</td>
</tr>
<tr>
<td>2.6 - 5 km</td>
<td>2 204 902</td>
<td>661 292</td>
<td>23.07</td>
<td>2 866 194</td>
</tr>
<tr>
<td>More 5 km</td>
<td>1 308 750</td>
<td></td>
<td></td>
<td>1 308 750</td>
</tr>
<tr>
<td>Total</td>
<td>6 875 274</td>
<td>4 156 125</td>
<td>37.68</td>
<td>11 031 399</td>
</tr>
</tbody>
</table>

1.14.4 Unserved Regions

1.14.4.1 The next step is to take an in-depth look at the unserved demand. Figure 1.19 highlights the population density of areas which are either not within 5 km or where there is insufficient service capacity. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the current Clinics. Of the potential clinic visits, 62% cannot be accommodated. Of interest is that the majority of the unserved population (49%) live within 2.5 km from a Clinic. This indicates serious capacity problems in many areas. In the next step these problematic areas are highlighted.
Figure 1.19: Areas unserved by capacity constrained Clinics in eThekwini (no. of potential visits per hexagon)
1.14.5 Areas with high demand pressure on eThekwini Clinics.

1.14.5.1 Figure 1.20 highlights all the areas that are most likely to experience high unserved demand pressures. These areas include:

- Umlazi;
- Southern parts of Chatsworth;
- Kwandengezi;
- Mpumalanga;
- Kwadabeka;
- Westville;
- Inanda and Phoenix.
Figure 1.20: Pressure areas with regard to access to Clinics in eThekwini (no. of potential visits per hexagon) and needing intervention
1.14.6 Full complement resource scenario

1.14.6.1 An additional scenario relating to Clinics was undertaken to study the impact of the availability of private general practitioners in relation to the service capacity of Clinics. This was based on using the total population as the demand.

1.14.6.2 Table 1.15 provides a summary of the Clinics and general practitioners (GPs) analysed and the standards used for the analysis.

**Table 1.15: Summary of criteria and analysis process for Clinics and all private sector GPs in eThekwini**

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Clinics and all private sector GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>5 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Total population of eThekwini Municipality 2011 (3 667 106) – Total estimated visits (13 327 896) – Child (5 years or younger) 5 visits per year, Adult (3.5 visits per year)</td>
</tr>
<tr>
<td>Supply</td>
<td>96 Clinics and 805 private doctors with a total capacity of 9 535 869 visits (Nurse clinical workload 2011 financial year – 4 210 794 visits – and 6 615 patients per year per doctor – 5 325 075 visits)</td>
</tr>
<tr>
<td>Analysis undertaken</td>
<td>Constrained capacity and travel distance (5 km)</td>
</tr>
</tbody>
</table>

1.14.6.3 For this scenario only a capacity constrained analysis was undertaken. The addition of the private general practitioners to the professional clinic nurses improved the constrained access to clinic services to 57% of the total population, i.e. a 20% improvement from 37%.

1.14.6.4 Figure 1.21 indicates that a large change in the access occurred in the historically more affluent areas. It implies that the capacity constraints in these areas can be relieved by the addition of the private general practitioners.
Figure 1.21: Areas served with respect to capacity constrained Clinics and general practitioners in eThekwini
1.14.6.5 However, as Figure 1.22 shows, the addition of the general practitioners did not relieve any of the pressures in the most pressurised low income areas such as Inanda, Kwandengezi and Umlazi, as was the case in Johannesburg.

1.14.6.6 It would appear that, as in Johannesburg, the historical development patterns and the political separation of racial and income classes still determine the poor service coverage in the higher density, low-income townships (Figure 1.22). Private general practitioners usually practice in the more affluent areas and the immense population pressures in the poorer townships will require other strategies to relieve the pressure on clinic services.
Figure 1.22: Unserved areas with respect to Clinics and general practitioners in eThekwini (no. of potential visits per hexagon)
1.15 ANALYSIS AND FINDINGS FOR ETHEKWINI COMMUNITY HEALTH CENTRES (CHCS)

1.15.1 Summary of Criteria and Analysis Process for eThekwini CHCs

1.15.1.1 Table 1.16 provides a summary of the Community Health Centres analysed, the standards agreed upon and the analysis process undertaken.

Table 1.16: Summary of criteria and analysis process for eThekwini Community Health Centres

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>10 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (3 026 273) of the total population of eThekwini Municipality 2011 (3 667 106)</td>
</tr>
<tr>
<td>Supply</td>
<td>12 community health centres with a total capacity of 2 940 000 (@1 facility per 245 000 uninsured population)</td>
</tr>
</tbody>
</table>
| Analysis undertaken | • Unconstrained travel distance to nearest CHC  
• Constrained capacity and travel distance (10 km)  
• Identification of pressure areas |

1.15.2 Access to Services

1.15.2.1 The first step in the analysis process is to show the access distance from all metropolitan areas to the nearest CHC. This analysis is based on travel distance (km) to each CHC and excludes any capacity limits of the CHCs, i.e. any restrictions on the number of people they can serve are not applied.

1.15.2.2 Figure 1.23 indicates the travel distances to the nearest CHC for all areas in the metro and without any constraints on distance travelled or the service capacity of the CHCs. The measured travel distances are reflected in kilometres (km) and are displayed in a range of distance bands.
Figure 1.23: Travel distances to the closest CHC in eThekwini
1.15.2.3 Figure 1.23 makes it clear that the distribution of CHCs in eThekwini is focused on areas which have historically disadvantaged communities and high population concentrations. The average travel distance to CHCs is 15 km across the metropolitan area.

1.15.2.4 Table 1.17 indicates the number of uninsured people that have access to CHCs within the different distance bands. In eThekwini, 39% of the uninsured population are within 5 km from a CHC. If the 5.1 to 10 km distance band is added to this, 72% of the population then have access to a CHC within the standard. From the statistics it is clear that some major gaps exist in the provision of CHCs in the study area and it is acknowledged that the provision of CHCs is a relatively new strategy and some areas are not as well covered as others.

Table 1.17: Travel distance for uninsured population to eThekwini CHCs

<table>
<thead>
<tr>
<th>CHCs: Unconstrained access</th>
<th>Distance bands (km)</th>
<th>No. of people</th>
<th>% of people</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 - 5 km</td>
<td>1 188 846</td>
<td>39.28</td>
<td>39.3</td>
</tr>
<tr>
<td></td>
<td>5.1 - 10 km</td>
<td>999 987</td>
<td>33.04</td>
<td>72.3</td>
</tr>
<tr>
<td></td>
<td>More than 10 km</td>
<td>837 440</td>
<td>27.67</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3 026 273</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

1.15.3 Served Regions

1.15.3.1 The second step in the analysis process is to show which areas are served based on a constrained catchment area analysis for each of the current CHCs. The constrained catchment analysis uses both the service capacity of the CHCs and the agreed travel distance standard (a maximum of 10 km) as constraints on the service accessibility of the various CHCs.

1.15.3.2 Figure 1.24 indicates the served population within the different distance bands based on the constrained catchment analysis. Serious capacity issues are evident all over the study area. The figure suggests that an underestimation in the facility to population ratio might have been used in the planning of CHCs in eThekwini thus far. In most areas, the capacity of facilities runs out within the 5 km distance band. It is only in the Tongaat and Pinetown areas that CHCs have the capacity to serve anyone more than 5 km from a CHC.
Figure 1.24: Areas served by capacity constrained CHCs in eThekwini
1.15.3.3 Table 1.18 highlights that apart from there being a poor spatial spread, a serious capacity problem exists in almost all areas. Only 18% of the uninsured population has effective access to a CHC facility. Compared to the fact that 72% of the population are within 10 km of their nearest facility, the extreme lack of service capacity of the CHCs cannot be ignored.

Table 1.18: Service access of uninsured population within travel distance from eThekwini CHCs

<table>
<thead>
<tr>
<th>CHCs: Potential level of access to services (capacity constrained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance bands (km)</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>0 - 5 km</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
</tr>
<tr>
<td>More than 10 km</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

1.15.4 Unserved Regions

1.15.4.1 The next step is a more in-depth analysis of the unserved areas. Figure 1.25 highlights the population density of areas which either cannot reach a CHC within 10 km or which cannot utilise the CHC if service capacity is taken into account. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the current CHCs. Of the target population, 83% cannot currently be accommodated. Apart from the issue of a lack of service capacity in most areas, the southern areas which include the very large high density region of Umlazi are very poorly served in term of the geographical spread. Other areas, like Kwandengezi, do not have any facilities. These areas are growing and are characterised by a population dependent on public health care facilities and with limited means of travel.
Figure 1.25: Areas unserved by capacity constrained CHCs in eThekwini (no. of potential visits per hexagon)
1.15.5 Areas with high demand pressure on CHCs

1.15.5.1 Figure 1.26 highlights all the areas that are likely to experience high unserved demand for CHCs. These areas include:

- The whole Umlazi region;
- Kwandengezi;
- Mpumalanga;
- Kwadabeka;
- Inanda and Ntuzuma area;
- Small portions of the Westville area.
Figure 1.26: Pressure areas with regard to access to CHCs in eThekwini and needing intervention (no. of potential visits per hexagon)
1.16 ANALYSIS AND FINDINGS FOR ETHEKWINI LEVEL 1 (REGIONAL) HOSPITALS

1.16.1 Summary of Criteria and Analysis Process for eThekwini Level 1 Hospitals

1.16.1.1 Table 1.19 provides a summary of the Level 1 Hospitals analysed, the standards agreed upon and the analysis process undertaken.

Table 1.19: Summary of criteria and analysis process for eThekwini Level 1 Hospital Services

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>Level 1 Hospital Services (including higher level hospitals that have some Level 1 functions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel network access distance</td>
<td>15 km maximum</td>
</tr>
<tr>
<td>Demand</td>
<td>Uninsured population 2011 (3 026 273) of the total population of eThekwini Municipality 2011 (3 667 106)</td>
</tr>
<tr>
<td>Supply</td>
<td>7 Level 1 Hospitals services with a total capacity of 2 449 500 (@1 bed per 1 500 uninsured population – Efficiency Model)</td>
</tr>
</tbody>
</table>
| Analysis undertaken | • Unconstrained travel distance to nearest Level 1 Hospitals  
                          • Constrained capacity and travel distance (10 km)  
                          • Identification of pressure areas |

1.16.2 Access to Services

1.16.2.1 The first step in the analysis process is to show the access distance from all areas in eThekwini to the nearest Level 1 Hospital. This analysis is based on travel distance (km) to each Level 1 Hospital and excludes any service capacity limits of the Level 1 Hospitals, i.e. any restrictions on the number of people they can serve are not applied.

1.16.2.2 Figure 1.27 indicates the travel distances to the nearest Level 1 Hospital from all areas without any constraints on the distance travelled or the capacity of the Level 1 Hospitals. The measured travel distances are reflected in kilometres (km) and displayed in a range of colour bands on the map.
Figure 1.27: Travel distances to the closest Level 1 Hospital in eThekwini
1.16.2.3 From Figure 1.27 it is clear that access to Level 1 Hospital in the eThekwini Metropolitan area is determined by the historical pattern of development in eThekwini. Originally hospitals were centrally located and in later years new hospitals were developed in more decentralised locations closer to the suburbs. The distribution of Level 1 Hospitals in eThekwini is not optimal. The average travel distance to Level 1 Hospitals is 18.9 km across the metropolitan area, with an average of 12.5 km for even the more densely populated urban population.

1.16.2.4 Table 1.20 indicates the number of uninsured people that have access to Level 1 Hospitals within different distance bands. In the eThekwini Metropolitan area, only 5.4% of the population are within 5 km from a Level 1 Hospital. If the population in the 10 km band is added to this, only 33% of the population are within a 10 km access distance. The maximum distance constraint of 15 km gives 63% of the total uninsured population access to a Level 1 Hospital within the standard. This indicates that Level 1 Hospitals are only accessible for many through longer distance travel which incurs additional costs generally borne by the poorer sections of the community.

<table>
<thead>
<tr>
<th>Level 1 Hospitals: Unconstrained access</th>
<th>No. of people</th>
<th>% of people</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance bands (km)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5 km</td>
<td>163 872</td>
<td>5.41</td>
<td>5.4</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
<td>836 469</td>
<td>27.64</td>
<td>33.1</td>
</tr>
<tr>
<td>10.1 - 15 km</td>
<td>907 237</td>
<td>29.98</td>
<td>63.0</td>
</tr>
<tr>
<td>More than 15 km</td>
<td>1 118 695</td>
<td>36.97</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>3 026 273</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

1.16.3 Served Regions

1.16.3.1 The second step in the analysis process is to show the constrained catchment areas of each of the current Level 1 Hospitals. The constrained catchment analysis uses both the capacity of the Level 1 Hospital and the agreed travel distance standard (15 km) as constraints on the accessibility of the various Level 1 Hospitals.

1.16.3.2 Figure 1.28 indicates the served population within the different distance bands based on the constrained catchment analysis. It should be noted that some of the uninsured population in the Umkomaas area is served by a Level 1 Hospital which lies outside the municipal boundary and that the Osindisweni Hospital also serves parts of the rural population north of the eThekwini boundary.
1.16.3.3 Large parts of eThekwini do not have access within the 15 km travel constraint (the white areas on the map). These areas include large parts of Umlazi, Tongaat in the north and Mpumalanga in the west. Other areas of concern are those in the west and south of eThekwini which also have no access within the travel distance of 15 km.

1.16.3.4 Serious service capacity problems are evident in the KwaMashu and Phoenix area as well as the Chatsworth area around the RK Khan Hospital.

1.16.3.5 Table 1.21 highlights the fact that generally the current Level 1 Hospitals are fairly well capacitated to serve their populations within the travel norm of 15 km. However, of more concern in eThekwini is the fact that the geographical spread of the Level 1 Hospitals excludes 37% of the uninsured population straight-off (see Table 1.20) and ultimately results in only 44% of the target population being served within the set standard (Table 1.21).

Table 1.21: Service access of uninsured population within travel distance from eThekwini Level 1 Hospitals

<table>
<thead>
<tr>
<th>Level 1 Hospitals: Potential level of access to services (capacity constrained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance bands (km)</td>
</tr>
<tr>
<td>0 - 5 km</td>
</tr>
<tr>
<td>5.1 - 10 km</td>
</tr>
<tr>
<td>10.1 - 15 km</td>
</tr>
<tr>
<td>More than 15 km</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Geographic accessibility study of social facility and government service points for the metropolitan cities of Johannesburg and eThekwini 2011/12

Figure 1.28: Areas served by capacity constrained Level 1 Hospitals in eThekwini
1.16.4 Unserved Regions

1.16.4.1 The next step is to review the unserved areas in more detail. Figure 1.29 highlights the population density of areas which either cannot be reached within 15 km or cannot be served by Level 1 Hospitals because of a lack of service capacity. The white areas on the figure indicate the served areas and the darker areas indicate the population density of areas unserved by the current Level 1 Hospitals. Of the target population, 56% cannot be accommodated. Apart from the capacity issues in the KwaMashu and Phoenix area, a large part of the Umlazi/ Folweni area falls outside the travel distance norm of 15 km, and in areas such as Mpumalanga and Tongaat there is no access within the set norms.

1.16.4.2 The rural areas on the peripheral north and south-west are in general sparsely developed and, although they have no access to Level 1 Hospitals, alternative means of transport and mobile services are generally in operation in these areas.

1.16.5 Areas with high demand pressure on Level 1 Hospitals.

1.16.5.1 Figure 1.30 highlights all the areas that are likely to experience high unserved demand. These areas include:

- Large parts of Umlazi and Folweni;
- Inanda;
- Ntuzuma;
- Mpumalanga/ Hammersdale.
Figure 1.29: Areas unserved by capacity constrained Level 1 Hospitals in eThekwini (no. of potential visits)
Geographic accessibility study of social facility and government service points for the metropolitan cities of Johannesburg and eThekwini 2011/12

Figure 1.30: Pressure areas with regard to Level 1 Hospitals in eThekwini and needing intervention (no. of potential visits per hexagon)
1.17 SUMMARY

1.17.1 The report has highlighted pressure areas of unserved demand in both cities with respect to Clinics, CHCs and Level 1 Hospitals.

1.17.2 The distribution of Clinics is generally good in both cities but areas of limited capacity are evident.

1.17.3 With respect to CHCs, these are currently only concentrated in certain selected areas of both cities and a better spread of facilities is required to ensure all citizens have access within 10 km.

1.17.4 The locations of Level 1 Hospitals reflects the historical distribution of facilities in the older more settled areas along the main east-west axis in Johannesburg and in the central areas of eThekwini. A 15 km access distance for most of the target population can only be achieved if there is investment in the other areas of the cities as indicated.

1.17.5 The identified areas of concern for health services need to be addressed though a range of existing policies, including focusing on preventive health measures to reduce the demand for services through education and other means. Operational improvements should also be considered. The report highlights the areas which in a spatial context should be key areas for attention and will require capital and operation infrastructure should alternative strategies not have the desired impact of reducing or dealing with the current demand. Since in some instances travel distance is a concern, capital expenditure may be inevitable to address the access of residents to health care within an acceptable distance.

1.18 ADDENDUM

1.18.1 Formal Engagements with Stakeholders

1.18.1.1 Formal stakeholder engagements were held with officials from the eThekwini, Gauteng and KZN Departments of Health and National Department of Health on the following dates:

National Department of Health

- Project overview meeting: 29 November 2011
- Follow-up meeting: 30 March 2012

Gauteng Department of Health

- Project overview meeting: 15 November 2011
eThekwini and KZN Department of Health

- Project overview meeting: 8 March 2012
- Follow-up meeting with eThekwini on data: 9 March 2012

1.18.2 Contact persons

1.18.2.1 The contact persons included the following:

**National Department of Health**

- Lead contact person (data and standards): Ms. Milani Wolmarans (Director Strategic Planning)

**Gauteng Department of Health**

- Lead contact person (standards): Ms. Sue le Roux (Director: Policy, Planning & Research)
- Contact person (data): Mr. Francois Venter (Deputy Director IM: GIS Manager)

**City of Johannesburg**

- Lead contact person (standards and data): Ms. Coral Fraser (Manager: Primary Health Care)

**eThekwini and KZN Department of Health**

- Lead contact person (standards): Ms. Candice Samuels (Manager: Departmental GIS)
- Contact person (data): Ms. Candice Samuels (Manager: Departmental GIS)
- Contact persons (standards): Ms. Ester Snyman (Manager: Facility Planning)

**eThekwini Municipality**

- Lead contact person (standards and data): Ms. Busi Grootboom (Manager: Primary Health Care)